Infectious Diseases of Haiti - 2014 edition
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Scope of Content
Disease designations may reflect a specific pathogen (ie, Adenovirus infection), generic pathology (Pneumonia - bacterial) or etiologic grouping (Coltiviruses - Old world). Such classification reflects the clinical approach to disease allocation in the Infectious Diseases Module of the GIDEON web application. Similarly, a number of diseases which are generally diagnosed and treated outside of the field of Infectious Diseases are not included, despite the fact that a clear infectious etiology exists. Examples include Peptic ulcer, Tropical spastic paraparesis, Hairy-cell leukemia, Creutzfeldt-Jakob disease, Human papilloma virus infections, etc. In contrast, a number of other entities of unknown etiology which do present to Infectious Diseases specialists have been included: Kawasaki’s disease, Chronic fatigue syndrome, Kikuchi and Kimura diseases. Several minor infections having minimal relevance to the field of Geographic Medicine are not covered: Paronychia, Otitis externa, Molluscum contagiosum, etc.
Introduction: The GIDEON e-book series

_Infectious Diseases of Haiti_ is one in a series of GIDEON ebooks which summarize the status of individual infectious diseases, in every country of the world. Data are based on the GIDEON web application (www.gideononline.com) which relies on standard text books, peer-review journals, Health Ministry reports and ProMED, supplemented by an ongoing search of the medical literature.

Chapters are arranged alphabetically, by disease name. Each section is divided into four sub-sections:

1. Descriptive epidemiology
2. Summary of clinical features
3. Status of the disease in Haiti
4. References

The initial items in the first section, Descriptive epidemiology, are defined as follows:

**Agent**
Classification (e.g., virus, parasite) and taxonomic designation.

**Reservoir**
Any animal, arthropod, plant, soil or substance in which an infectious agent normally lives and multiplies, on which it depends primarily for survival, and where it reproduces itself in such a manner that it can be transmitted to a susceptible host.

**Vector**
An arthropod or other living carrier which transports an infectious agent from an infected organism or reservoir to a susceptible individual or immediate surroundings.

**Vehicle**
The mode of transmission for an infectious agent. This generally implies a passive and inanimate (i.e., non-vector) mode.

A chapter outlining the routine vaccination schedule of Haiti follows the diseases chapters.

There are 352 generic infectious diseases in the world today. 204 of these are endemic, or potentially endemic, to Haiti. A number of other diseases are not relevant to Haiti and have not been included in this book.

In addition to endemic diseases, we have included all published data regarding imported diseases and infection among expatriates from Haiti.

The availability and quality of literature regarding specific infectious diseases vary from country to country. As such, you may find that many of the sections in this book are limited to a general discussion of the disease itself - with no data regarding Haiti.

This is a book about the geography and epidemiology of Infection. Comprehensive and up-to-date information regarding the causes, diagnosis and treatment of each disease is available in the GIDEON web application. Many of the diseases are generic. For example, such designations as Pneumonia bacterial and Urinary tract infection include a number of individual diseases. These appear under the subheading, Synonyms, listed under each disease.

We welcome feedback, and will be pleased to add any relevant, sourced material. Email us at ebook@gideononline.com

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Last updated: November 6, 2014
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* Not endemic. Imported, expatriate or other context reported.
+ Country specific note exists for disease
Actinomycosis

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Actinomycetes, Actinomyces spp. An anaerobic gram-positive bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human - oral, fecal, vaginal flora</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Gram stain and bacteriological culture using strict anaerobic technique. Growth is apparent in 3-7 days.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Ampicillin 50 mg/kg/day IV X 4 to 6 weeks - then Amoxicillin 1.5 g/d PO X 6 months. OR Penicillin G 10 to 20 million units/day X 4 to 6w; then Penicillin V X 6 to 12m. Alternatives: Doxycycline, ceftriaxone, Erythromycin Excision/drainage</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Ampicillin 50 mg/kg/day IV X 4 to 6 weeks - then Amoxicillin 20 mg/kg/day PO X 6 months. Penicillin G 100,000 units/kg/day X 4 to 6w; then Penicillin V 25,000 units/day X 6 to 12m. Excision/drainage</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Mandibular osteomyelitis with fistulae (sulfur granules) in the setting of poor dental hygiene [oral actinomycosis]; intrauterine device and pelvic abscesses [pelvic actinomycosis]; fever, right lower quadrant mass and fistulae [abdominal actinomycosis].</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Actinomycetes, Aktinomykose, Lumpy jaw. ICD9: 039. ICD10: A42</td>
</tr>
</tbody>
</table>

Clinical

Anatomic variants of Actinomycosis

Oral-cervical actinomycosis accounts for 55% of actinomycosis, and may be manifested as soft tissue swelling, an abscess, or a mass lesion. 1
- Lesions may be multiple, and relapse following short courses of therapy.
- The disease often spreads to adjacent structures (masseter muscle, carotid artery, cranium, cervical spine, trachea, or thorax) without regard for normal tissue planes.
- Lymphatic spread and lymphadenopathy are rare.
- Infection is associated with pain, fever, and leukocytosis.

Periapical actinomycosis 2 is common and responds to dental care and antibiotics.
- The most common location for actinomycosis is the perimandibular region.
- Periapical infection often precedes infection, which is usually seen at the angle of the jaw; however, the cheek, submental space, retromandibular space, and temporomandibular joint may be affected.
- The overlying skin is often blue to red-purple in color, and sinuses may appear.
- An abscess may ensue, with trismus.
- Mandibular periostitis and osteomyelitis are rarely encountered.
- Maxillary or ethmoid disease, with or without osteomyelitis, is uncommon; but maxillary sinusitis and associated cutaneous fistulas can occur.
- Masses of the hard palate, tongue, nasal septum, head and neck, salivary glands, thyroglossal ducts, thyroid, branchial cleft cysts, lacrimal ducts, orbital structures and larynx have also been reported.
- The tonsils are rarely, if ever, involved; however, infection of the external or middle ear, temporal bone and mastoid may occur following spread of facial disease.

Thoracic actinomycosis 3 accounts for 15% of actinomycosis cases, and represents aspiration of organisms from the pharynx (rarely direct extension from the head and neck or abdominal cavity).
- Most cases present as an indolent, slowly progressive process involving the lung parenchyma and pleura.
- Chest pain, fever, and weight loss are common; occasionally with hemoptyisis and a productive cough.
- X-ray findings are non-specific.
- The usual appearance is either a mass lesion or pneumonitis with or without pleural involvement.
- An air bronchogram within a mass lesion is suggestive when present, pleural thickening, effusion, or empyema is seen in more than 50% of cases.
- An isolated pleural effusion may drain spontaneously through the chest wall or produce a soft tissue or breast mass; or posteriorly, to involve the vertebrae or paraspinal structures or spinal cord
- Pulmonary disease may extend across fissures or pleura, and involve the mediastinum, pericardium (rarely endocardium)
or contiguous bone.

**Abdominal actinomycosis** accounts for 20% of actinomycosis and represents ingestion of bacteria, hematogenous infection or extension from the female pelvis.
- Associated fever, weight loss, abdominal pain or fullness and changing bowel habits may be present for months before the diagnosis is suspected.
- Physical findings include mass lesions and sinus tracts of the abdominal wall.
- Lymphadenopathy is uncommon.
- 65% of cases are associated with appendicitis, and 65% of lesions present in the right iliac fossa.
- Associated tuboovarian infection, hepatic abscesses, diverticulitis or foreign body perforation in the transverse or sigmoid colon may also be encountered.
- Other associated factors include previous gastric or bowel surgery, typhoid fever, amebic dysentery, trauma, and pancreatitis.
- Abdominal infection may extend to the liver hematogenously; and perirectal or perianal infection is occasionally encountered, resulting in chronic fistulae, sinuses and strictures.

**Pelvic actinomycosis** may represent spread from intra-abdominal infection; but is most often a complication of intra-uterine device (IUD) placement.
- Any type of IUD can cause infection; and on average, the device has been in place for eight years prior to the appearance of actinomycosis.
- Infection may even occur months following removal of the device.
- Infection is manifest as endometritis or a mass/abscess of the tubes or ovaries.
- Presenting features consist of chronic fever, weight loss, abdominal pain, and vaginal bleeding.
- A "frozen pelvis" suggestive of malignancy or endometriosis is often encountered; and the infection may involve the ureters, bladder, rectum, small or large bowel or peritoneum.
- The diagnostic value of smears and cultures for Actinomyces among asymptomatic women with IUD’s is controversial.

**Other forms of actinomycosis include:**
- brain abscess
- chronic meningitis
- urogenital infection
- musculoskeletal infection
- isolated skin and muscle disease (including mycetoma)
- infected orthopedic prostheses
- esophagitis
- thyroiditis
- disseminated hematogenous infection of multiple organs

**This disease is endemic or potentially endemic to all countries.**

**References**

### Adenovirus infection

**Agent**
- VIRUS - DNA. Adenoviridae, Adenovirus Enteric strains classified in genus Mastadenovirus

**Reservoir**
- Human
- Non-human primates

**Vector**
- None

**Vehicle**
- Droplet
- Water

**Incubation Period**
- 4d - 12d

**Diagnostic Tests**
- Viral culture/serology or antigen assay. Direct fluorescence of secretions. Nucleic acid amplification.

**Typical Adult Therapy**
- Enteric/secretion precautions. Cidofovir has been used in some cases. Symptomatic therapy

**Typical Pediatric Therapy**
- As for adult

**Vaccine**
- Adenovirus vaccine

**Clinical Hints**
- Atypical pneumonia, upper respiratory infection, tracheitis, bronchiolitis or keratoconjunctivitis with preauricular adenopathy; uncomplicated illness usually lasts 3 to 5 days; this agent may also cause hemorrhagic cystitis.

**Synonyms**
- Adenovirus gastroenteritis, Epidemic keratoconjunctivitis, Pharyngoconjunctival fever.

<table>
<thead>
<tr>
<th>ICD9:</th>
<th>047.9,077.1,077.2,008.62,480.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICD10:</td>
<td>A08.2,B30.1,B34.0,J12.0</td>
</tr>
</tbody>
</table>

### Clinical

Only 50% of Adenovirus infections are clinically apparent.
- Infection in children usually presents as mild pharyngitis or tracheitis.
- Adenovirus type 7 can cause fulminant bronchiolitis and pneumonia in infants.
- Severe respiratory infection is associated with serotype 14.
- Adenoviruses have been isolated more often than any other nonbacterial pathogen from patients with the whooping cough syndrome; however, a causal relation has not been established.

**Respiratory infection:**
- Cough, fever, sore throat, tonsillitis and rhinorrhea are the most common findings, and usually last 3 to 5 days.
- Rales and rhonchi may be present.
- X-ray studies in patients with pneumonias reveal patchy ground-glass infiltrates primarily in the lower lung fields.
- Outbreaks among military personnel are characterized by tracheobronchitis, with 20% requiring hospitalization.
- The disease is usually self-limited, superinfection and death are rare.
- Severe infections are increasingly reported among immunocompromised patients.
- There are also case reports of severe Adenovirus pneumonia in immunocompetent adults.
- Rare instances of fatal Adenovirus myocarditis have been reported.
- In one series of 3,298 adenoviral infections, pneumonia was found in only 2.4%.
- Adenoviral pneumonia is often followed by bronchiolitis obliterans in children.
- Central nervous system dysfunction is present in 3.3% of children with adenoviral respiratory tract infection, and may include seizures, altered consciousness or lethargy.

**Pharyngoconjunctival fever:**
- Pharyngoconjunctival fever often occurs in the setting of small outbreaks.
- Illness is characterized by conjunctivitis, pharyngitis, rhinitis, cervical lymphadenitis, and fever to 38 C.
- The onset is acute, and symptoms last 3 to 5 days.
- Bulbar and palpebral conjunctivitis, usually bilateral, may be the only finding.
- The palpebral conjunctivae have a granular appearance.
- Bacterial superinfection and permanent residua are unusual.
- Respiratory involvement usually does not progress to the bronchi or lungs.
- Contaminated swimming pools and ponds have been implicated as sources of spread.

**Epidemic keratoconjunctivitis:**
- Epidemic keratoconjunctivitis has an incubation period of 4 to 24 days, and lasts for 1 to 4 weeks.
- The conjunctivitis is often bilateral, and preauricular adenopathy is common.
- Multiple subepithelial corneal infiltrates are often present.
• Visual disturbance may persist for several months.
• Secondary spread to household contacts occurs in 10% of the cases.

**Hemorrhagic cystitis:**
Hemorrhagic cystitis is two to three times more common in boys than girls (unlike bacterial cystitis which is predominantly seen in girls).
• Hematuria usually persists for approximately three days.
• There was no seasonal preponderance.
• Adenoviral urethritis and obstructive uropathy have also been reported.

**Infantile adenoviral enteritis:**
Infantile adenoviral enteritis is characterized by watery diarrhea is watery with fever, and may last for 1 to 2 weeks.
• Adenoviruses have also been implicated in the etiology of intussusception, encephalitis and meningoencephalitis.
• Rare instances of intestinal intussusception have been associated with adenoviral gastroenteritis.

**Other forms of infection:**
Adenoviruses have emerged as important pathogens in immunosuppressed patients, particularly those undergoing bone marrow or solid organ transplantation.
• Syndromes include infection of the transplanted organ, or disseminated infection involving the lung, colon (ie, chronic diarrhea), and central nervous system.
• Infection, notably of the urinary and gastrointestinal tracts, is also a common complication of AIDS.
• Adenoviral parotitis and encephalitis are also reported in AIDS patients.

**This disease is endemic or potentially endemic to all countries.**

**References**

Aeromonas & marine Vibrio infx.

| Agent | BACTERIUM. *Aeromonas hydrophila* & *Vibrio vulnificus*, et al Facultative gram-negative bacilli |
|-------|-------------------------------------------------------------------------------------------------
| Reservoir | Salt or brackish water  Fish |
| Vector | None |
| Vehicle | Water/shellfish Contact |
| Incubation Period | Range 2d - 7d |
| Diagnostic Tests | Culture. Notify laboratory if these organisms are suspected in stool. |
| Typical Adult Therapy | Fluoroquinolone or *Sulfamethoxazole/trimethoprim* . Other antimicrobial agent as determined by susceptibility testing |
| Typical Pediatric Therapy | *Sulfamethoxazole/trimethoprim* . Or other antimicrobial agent as determined by susceptibility testing |
| Clinical Hints | Diarrhea, fever, vomiting or sepsis after marine injury or ingestion of raw oysters/contaminated fresh or brackish water; fecal leukocytes present; severe or fatal in immunosuppressed or alcoholic patients. |
| Synonyms | Aeromonas, *Aeromonas hydrophila*, *Vibrio mimicus*, *Vibrio vulnificus*. |
| ICD9: | 005.81,027.9 |
| ICD10: | A48.8 |

Clinical

**Aeromonas hydrophila gastroenteritis:**
There is controversy as to whether *Aeromonas hydrophila* can cause gastroenteritis.
- Volunteer feeding studies using as many as 1 billion cells have failed to elicit illness. 1
- The presence of this species in the stools of individuals with diarrhea, in the absence of other known enteric pathogens, suggests that it has some role in disease. 1
- *Aeromonas* species are often implicated in traumatic and surgical wound sepsis 2,3 and a variety of localized infections. 4-8
- *Aeromonas caviae* and *A. sobria* are considered by many as "putative pathogens," in diarrheal disease.

Two types of gastroenteritis have been associated with *A. hydrophila* 9:
- a cholera-like illness with a watery diarrhea
- a dysenteric illness characterized by loose stools containing blood and mucus
- cases of hemolytic uremic syndrome have followed *Aeromonas* infection 10

Generalized systemic infection has been observed in individuals with underlying illness.

84 cases (24 fatal) of *Aeromonas* pneumonia were treated at a hospital in Taiwan during 2004 to 2011 ● most among elderly men, often as a complication of diabetes or malignancy. 11

**Vibrio vulnificus:**
*Vibrio vulnificus* causes septicemia in persons with chronic liver disease, alcoholism or hemochromatosis, and immunosuppressed patients. 12,13
- The disease appears 12 hours to 3 days after eating raw or undercooked seafood, especially oysters.
- One third of the patients are in shock within 12 hours after hospital admission.
- Three quarters have distinctive, bullous skin lesions which may be mistaken for pemphigus or pemphigoid.
- Thrombocytopenia is common and there is often evidence of disseminated intravascular coagulation.
- Over 50 percent of patients with septicemia die; and the mortality rate exceeds 90 percent among those with hypotension.

Relatively high mortality rates are associated with necrotizing fasciitis caused by *Aeromonas* or *Vibrio* species. 14

*V. vulnificus* can also infect wounds sustained in coastal or estuarine waters.
- Infections range from mild self limited lesions to rapidly progressive cellulitis or myositis that can mimic clostridial myonecrosis clinically.

Additional species of *Aeromonas* and *Vibrio* are described in the Microbiology module.
This disease is endemic or potentially endemic to all countries.

### Aeromonas & marine Vibrio infx. in Haiti

#### Notable outbreaks:
1976 - An outbreak (386 cases) of diarrhea due to *Salmonella*, *Vibrio*, *Shigella*, ETEC and EIEC was reported among passengers of a cruise ship following a visit to Port au Prince.  

#### References

1. Infection 2007 Apr ;35(2):59-64.
AIDS

**Agent**
VIRUS - RNA. Retroviridae, Lentivirinae: Human Immunodeficiency Virus, HIV

**Reservoir**
Human

**Vector**
None

**Vehicle**
Blood, Semen, Sexual, Transplacental, Breast-feeding

**Incubation Period**
2m - 10y (50% within 10y)

**Diagnostic Tests**
HIV antibody (ELISA, Western blot). Nucleic acid amplification. Tests for HIV antigen & viral load as indicated.

**Typical Adult Therapy**
Nucleoside/-nucleotide reverse transcriptase inhibitor + A Non-nucleoside reverse transcriptase inhibitor OR a Protease Inhibitor OR a Strand-transfer integrase inhibitor

**Typical Pediatric Therapy**
Regimens vary - in general: 2 Non-nucleoside reverse transcriptase inhibitors + Ritonavir / Lopinavir OR Nevirapine OR Atazanavir

**Clinical Hints**
Most often associated with drug abuse, blood products, men who have sex with men, hemophilia. Hints: severe herpes simplex or moniliasis, chronic cough, diarrhea, weight loss, lymphadenopathy, retinitis, encephalitis or Kaposi's sarcoma.

**Synonyms**
ARC, Gay cancer, GRID, HIV-1, HIV-2, HIV-AIDS, SIDA, Slim disease.
ICD9: 042
ICD10: B20, B21, B22, B23, B24

**CDC case surveillance definition:**
As of 1993, the CDC (The United States Centers for Disease Control) surveillance case definition for AIDS includes all HIV-infected persons age 13 or over who have either.

1. a) a <200 CD4+ T-lymphocytes
2. b) a CD4+ T-lymphocyte percentage of total lymphocytes of <14%
3. or c) any of the following: pulmonary tuberculosis, recurrent pneumonia, or invasive cervical cancer; or any of the 23 clinical conditions defined in the case definition published in 1987.
4. Revised WHO case definitions 1994
5. Revised WHO case definitions 2008

The clinical features of AIDS are protean and often characterized by multisystem illness, evidence of immune suppression and the presence of one or more superinfections (tuberculosis, Cytomegalovirus infection, cerebral toxoplasmosis, pneumocystosis, penicilliosis, severe or recalcitrant candidiasis, disseminated Acanthamoeba infection, etc).

Acute HIV infection is characterized by fever, generalized lymphadenopathy, headache, fatigue, myalgia, rash, nausea, vomiting, night sweats, sore throat, diarrhea or weight loss.

- 40% to 90% of persons have symptoms suggestive of an acute viral infection.
- Symptoms tend to subside within two weeks; however, some patients continue to be ill for as long as ten weeks.
- In most cases, a history of likely acquisition within the past several weeks can be established: unprotected sex, extramedical injection, transfusion, etc.

**HIV infection and opportunistic pathogens:**
HIV infection increases the incidence and severity of a wide variety of infectious diseases caused by viruses, mycobacteria, actinomycetes, treponemes, fungi, protozoa, and helminths.

- HIV infection increases the incidence and severity of clinical malaria; however, in severe malaria the level of parasitemia is similar in HIV-positive and HIV-negative patients.

  During pregnancy, HIV infection increases the incidence of clinical malaria, maternal morbidity, and fetal and neonatal morbi-mortality.

  HIV infection increases severity of malaria, the risk of malaria treatment failure, and for cerebral malaria in children.

  Some antimalarial drugs may inhibit HIV, while certain anti-retroviral drugs are effective against *Plasmodium* species.

  Reactivation of Chagas disease encephalopathy has been reported among infected HIV-positive patients.

  Acquired syphilis in patients with HIV infection is characterized by severe and accelerated infection, often with overt meningitis, hepatitis and other forms of systemic involvement.

The presence of concurrent syphilis does not affect the progression of AIDS.
• *Haemophilus ducreyi* has been associated with esophageal ulceration in HIV-positive patients. 46
• Hepatitis G infection appears to improve survival among persons with concurrent HIV infection. 47 41% of infants born to mothers with HIV-HGB-C co-infection acquired HGB-C infection (Thailand, 2009 publication) 48
• Concurrent HIV infection increases the incidence of cirrhosis and HCC among Hepatitis B carriers 49 50; and shortens the time to development of chronic liver disease in patients with Hepatitis C. 51
• HIV-HCV and HIV-HEV coinfections are characterized by more rapid progression to cirrhosis and diminished response to peginterferon/ribavirin therapy. 52-60
• Hepatitis D is associated with relatively aggressive disease among patients with HIV-HBV co-infection. 61
• Concurrent HIV infection may prolong the duration of viremia in patients with hepatitis A. 62
• Lesions of Herpes simplex in HIV-positive patients may be vegetative, hypertrophic, condyloma-like, nodular, ulcerative, or tumor-like nodules or plaques. 63

This disease is endemic or potentially endemic to all countries.

**AIDS in Haiti**

The first patient with AIDS reported in the Caribbean was thought to have been diagnosed in Haiti in 1979. 64 65

![Graph: Haiti. AIDS, cases - GIDEON](https://example.com/graph.png)
Notes:
1. The true number of AIDS cases to December 1997 is estimated at 91,000 with 85,000 AIDS deaths.

AIDS is the leading cause of death among sexually-active adults, and 60% of urban hospital beds are occupied by HIV-positive patients.

As of 1997: 54% of AIDS patients were males; 40% men who have sex with men and 52.9% unclassified.

In 2007, Haitian-born immigrants constituted 1.2% of AIDS cases in the United States, but only 0.18% of the population.
Notes:
1. 74,000 AIDS orphans were estimated to December 1999; 200,000 in 2001.

36% of seropositives in 1984 were bisexual males.

**Seroprevalence surveys:**
- 2.2% of persons ages 15 to 49 years (2006)
- 4.4% of pregnant women (2006 to 2007)
- 8.4% of pregnant women in Port au Prince in 1993, 10% of urban pregnant women in 1996
- 4.3% of pregnant women in the Artibonite Valley (1996)
- 4.8% of rural pregnant women in 1996; 2.8% in 2003
- 0% of rural women attending clinics (southwestern Haiti, 2014 publication)
- 42% of CSW in Port au Prince in 1989; 5.3% in 2009
- 7.2% of clients of CSW in Gonaives and St. Marc (2008 publication)
- 19.2% of urban male STD patients (1992)
- 1% of adult female outpatients with gynecological symptoms (2013 publication)
- 5% of the rural population and 10% of urban dwellers in 1993
- 4.5% to 7.7% general population as of November 2003
- 6.3% of females and 5.5% of males in Port au Prince (2005 to 2006)
- 2.60% of blood donors (2000 to 2001)

Graph: Haiti. AIDS - estimated living with HIV/AIDS, cases

Notes:
1. Figure for 1997 represented 5.17% of all adults; 6.1% in 2001; 5.6% in 2003; 3.8% in 2005

The male/female ratio for seropositives decreased from 3.1/1 in 1985, to 2.3/1 in 1987, 1.6/1 in 1990 and 1.3/1 in 1992.
- As of 2004, an estimated 5,000 infected children are born each year.

**Associated infections:**
- The incidence of tuberculosis among persons living with HIV is 7.5% per year (1986 to 1989).
- 50% of tuberculosis patients have AIDS (1991).
- 21% of HIV-positive women are seropositive for syphilis.
- Cryptosporidium was found in 30% of HIV-positive patients with diarrhea, Isospora belli 12%, Cyclospora species 11%, Giardia lamblia 3% and Entamoeba histolytica 1% (1990 to 1993).
- Cryptosporidium was found in 60% of HIV-positive patients with diarrhea, Isospora belli 15%, Cyclospora 34%,
Enterocytozoon bieneusi 6.9% (2008 publication). Cryptosporidium was found in 16% of HIV-positive patients with chronic diarrhea, Giardia 6%, Isospora belli 5%, Cyclospora 3%, Entamoeba histolytica 0.4% (2003 to 2004). Isospora belli was found in 15% of AIDS patients, and is responsible for 11% of AIDS-associated diarrhea.

- 88% of HIV-positive women and 54% of HIV-negative women are infected by HSV-2.

References

2. MMWR Morb Mortal Wkly Rep 1987 Aug 14;36 Suppl 1S-15S.
60. Minerva Gastroenterol Dietol 2014 Sep ;60(3):165-175.
64. AIDS Action 2009 Apr ;16(1):165-70.
# Amoeba - free living

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Protozoa. Centramoebida, Acanthamoebidae: Acanthamoeba and Balamuthia Schizopyrenida, Vahlkampfidae: Naegleria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Water  Soil</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Water (diving, swimming)  Contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>5d - 6d (range 2d - 14d) Granulomatous ? to 2m</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>CNS Naegleria: Amphotericin B to 1 mg/kg/d IV + 1.5 mg intrathecal X 8 days; plus Miconazole 350 mg/sq m/d IV + 10 mg intrathecal qod X 8d Acanthamoeba: Sulfonamides + Flucytosine Miltefosine successful in cases of Acanthamoeba / Balamuthia enceph.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>CNS Naegleria: Amphotericin B to 1 mg/kg/d IV + 1.5 mg intrathecal X 8 days; plus Miconazole 350 mg/sq m/d IV + 10 mg intrathecal qod X 8d Acanthamoeba: Sulfonamides + Flucytosine Miltefosine successful in some cases of Acanth. / Balamuthia enceph.</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Severe, progressive meningoencephalitis (Naegleria, Acanthamoeba or Balamuthia) following swimming or diving in fresh water; or keratitis (Acanthamoeba), often following use of contaminated solutions to clean contact lenses.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Acanthamoben, Acanthamoeba, Amebic keratitis, Balamuthia, Balmuthia, Dictyostelium, Free-living ameba, Leptomyxid ameba, Naegleria, Paravahlkampfia, Primary amebic meningoencephalitis, Sappinia, Vahlkampfia. ICD9: 136.2  ICD10: B60.1, B60.2</td>
</tr>
</tbody>
</table>

## Clinical

Primary amebic meningoencephalitis usually occurs in children and young adults who have been swimming in warm fresh water.  

Infection is heralded by abnormal sensations of taste or smell followed by abrupt onset of fever, nausea, and vomiting.  
• The majority of patients have headache, meningitis and disorders of mental status changes.  
• Coma and death may ensue within one week  
• Only three nonfatal infections had been reported to 2003.  

**Acanthamoeba encephalitis:**  
Granulomatous amebic encephalitis due to *Acanthamoeba* occurs in immunocompromised and debilitated patients.  
• Infection has a gradual onset characterized focal neurological deficits, mental status abnormalities, seizures, fever, headache, hemiparesis and meningismus.  
• Visual disturbances and ataxia are often encountered.  
• Death may ensue within 7 to as long as 120 days.  
• Secondary infection of a cerebral ependymal cyst has been reported.  
• Disseminated *Acanthamoeba* infection has been reported in an HIV-positive patient.  

**Balamuthia encephalitis:**  
*Balamuthia mandrillaris* infection is most commonly reported among rural males of Hispanic ethnicity.  
• *Balamuthia mandrillaris* encephalitis may be associated with headache, low-grade fever, vomiting, ataxia, photophobia, cranial nerve palsy, speech disturbances, cerebellar nystagmus, seizures, and altered mental status.  
• Initial skin lesions, commonly present in Peruvian patients, are characterized by thin, painless plaques • most often on the nose, but also reported on knees, chest or elbows.  
• The case-fatality rate for *Balamuthia* encephalitis is over 90%.  

**Acanthamoeba keratitis:**  
*Acanthamoeba* keratitis is clinically similar to herpetic infection, and presents with a foreign-body sensation followed by severe pain, photophobia, tearing, blepharospasm, conjunctivitis, iritis, anterior uveitis, dendriform keratitis, radial keratoneuritis, ptosis and blurred vision.  
• In rare instances, the infection is painless.  
• Rupture of Descemet's membrane may occur.
• Bilateral infection is common. 18
• Dacryoadenitis may be present in some cases. 19
• Ocular discharge and endophthalmitis are very rare. 20
• Sympathetic ophthalmia of the un-infected eye has been reported. 21
• Atypical presentations have been described in patients with keratoconus. 22

Acanthamoeba infection has also been associated with skin ulcers 23, pneumonia, adenitis, vasculitis, osteomyelitis, and sinusitis.
• Cutaneous acanthamoebiasis has been associated with ulceronecrotic lesions, an infiltrative bluish plaque, or periorbital tumor. 24
• Fatal disseminated Acanthamoeba lenticulata infection has been reported in a heart transplant patient.
• Four cases of disseminated Acanthamoeba infection in stem-cell transplant recipients had been reported as of 2008 25 and five in lung transplant recipients as of 2013 (publication year) 26

This disease is endemic or potentially endemic to all countries.

Amoeba - free living in Haiti

A single case report of Acanthamoeba infection was published in 1986 - A. castellanii paranasal sinusitis in a patient with AIDS. 27

References

Amoebic abscess

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Protozoa. Sarcomastigota, Entamoebidea: Entamoeba histolytica (must be distinguished from non-invasive, Entamoeba dispar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>Fly (Musca) - occasionally</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Food  Water  Sexual contact  Fly</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2w - 6m (rarely; 95% within 6m)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Imaging. Serology. Nucleic acid amplification. Note: Amoebae are usually not present in stool at this stage.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Metronidazole 750 mg TID X 10d OR Tinidazole 800 mg TID X 5d</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Metronidazole 15 mg/kg TID X 10d OR Tinidazole 15 to 20 mg/kg TID X 5d</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Fever, local pain, weight loss. Remember that liver abscess may be bacterial or amoebic - latter most often single and in right hepatic lobe.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Absceso amebiano, Amebic liver abscess.  ICD9: 006.3,006.4,006.5,006.6,006.8  ICD10: A06.4,106.5,A06.7,106.8</td>
</tr>
</tbody>
</table>

Clinical

Amebic liver abscess: The clinical presentation may be acute or subacute in onset.
- Fever than 50% of patients have fever, hepatomegaly or abdominal pain.
- 30% to 40% have concurrent diarrhea.
- Other findings may include shoulder pain, cough, chest pain, pleural or pericardial effusion. 1 2
- The findings of ameboma may mimic those of malignancy. 3
- Cases of IVC thrombosis 4 and Budd-Chiari syndrome complicating amebic abscess have been reported. 5

Laboratory findings include leukocytosis without eosinophilia in 80%, anemia in over 50%, elevated serum alkaline phosphatase levels in 80%.

Extrahepatic infection:
Pleuropulmonary amebiasis is the most common complication of amebic liver abscess, usually representing rupture of a superior right lobe abscess through the diaphragm.
- Symptoms include cough, pleuritic pain, and dyspnea.
- Empyema, hepatobronchial fistula or pericarditis (from left lobe abscesses) may follow.
- Although most cases involve the liver, abscesses may occur in virtually any organ. 6 7
- Entamoeba histolytica encephalitis has been reported. 8

This disease is endemic or potentially endemic to all countries.

Amoebic abscess in Haiti

Epidemiological data regarding Amebic abscess are included in the notes for Amebic colitis

References

### Amoebic colitis

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Protozoa. Sarcomastigota, Entamoebidea: Entamoeba histolytica (must be distinguished from non-invasive, Entamoeba dispar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>Fly (Musca) - occasionally</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Food Water Sexual contact Fly</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1w - 3w (range 3d - 90d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Fresh stool/aspirate for microscopy. Stool antigen assay. Stool PCR. Note: serological tests usually negative.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td><strong>Metronidazole</strong> 750 mg PO TID X 10d Follow with: <strong>Paromomycin</strong> 500 mg PO TID X 7d OR <strong>Iodoquinol</strong> 650 mg PO TID X 20d</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td><strong>Metronidazole</strong> 15 mg/kg TID X 10d Follow with: <strong>Paromomycin</strong> 10 mg/kg PO TID X 7d OR <strong>Iodoquinol</strong> 10 mg/kg PO TID X 20d</td>
</tr>
</tbody>
</table>

### Clinical

Most infections by *Entamoeba histolytica* are characterized by asymptomatic carriage.  

Patients with noninvasive infection may present with nonspecific gastrointestinal complaints such as chronic intermittent diarrhea, mucus, abdominal pain, flatulence and weight loss.

Infection has been documented in children as young as two weeks of age.

A review of amebiasis among men who have sex with men • see reference

Cases of cutaneous amebiasis of the penis have been acquired through insertive anal intercourse.

**Invasive amebiasis:**
The onset of invasive infection is usually gradual (over 1 to 3 weeks) and characterized by abdominal pain, tenderness, and bloody stools.

- Fever is present in one third of cases, and the may be enlarged and tender.
- Signs of fluid loss and electrolyte loss may be seen in severe infections.
- In children, colitis can present as rectal bleeding alone without diarrhea.
- Fecal leukocytes may not be present, and are not as numerous as in shigellosis.
- Charcot-Leyden crystals are often seen in the stool.

**Fulminant colitis:**
Fulminant colitis is rare and carries a very high mortality.

- Predisposing factors include malnourishment, pregnancy and corticosteroid treatment.
- Such patients are severely ill with fever, leukocytosis, profuse bloody and mucoid diarrhea, generalized abdominal pain.
- Hypotension and peritonitis may be evident.
- Intestinal perforation and necrosis, or hepatic abscess may ensue.
- The clinical features of Cytomegalovirus colitis in AIDS patients may mimic those of amebic colitis.

**Additional complications:**
Additional complications include toxic megacolon (complicates 0.5% of amebic colitis cases); annular ameboma of the colon, which may mimic carcinoma.

- Chronic, irritative bowel syndromes, ulcerative post-dysenteric colitis or perianal amebiasis may also follow acute amebic colitis.
- Extraintestinal amebiasis may involve a wide variety of organs.
Other forms of amebiasis include colocutaneous fistula\textsuperscript{10} or amebiasis cutis\textsuperscript{11}, brain abscess, meningoencephalitis\textsuperscript{12}, cervicitis\textsuperscript{13 14}, rectovaginal fistulae and penile infection.

Liver abscess is discussed separately in this module.

This disease is endemic or potentially endemic to all countries.

### Amoebic colitis in Haiti

#### Prevalence surveys:
1. 1% of HIV-positive adults with diarrhea (1990 to 1993)\textsuperscript{15}
2. 0.4% of HIV-positive patients with chronic diarrhea (2003 to 2004)\textsuperscript{16}

#### References

**Angiostrongyliasis**

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Rat  Prawn  Frog</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Snail  Slug  Prawn  Lettuce</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2w (range 5d - 35d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of parasite. Serological tests have limited reliability.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Corticosteroids if severe cns disease <strong>Mebendazole</strong> 100 mg BID X 5d; OR <strong>Albendazole</strong> (20 mg/kg/day)</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Corticosteroids if severe cns disease. <strong>Mebendazole</strong> 100 mg BID X 5d (age &gt;2); OR <strong>Albendazole</strong> (20 mg/kg/day)</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Eosinophilic meningitis or encephalitis - generally self-limited; absent or low grade fever; cranial nerve involvement (II, VI, V and VII); follows ingestion of slugs, snails, prawns or frogs.</td>
</tr>
</tbody>
</table>

**ICD9:** 128.8  
**ICD10:** B83.2

---

**Clinical**

**Signs and symptoms:**

Angiostrongyliasis is characterized by severe headache, neck and back stiffness and paresthesias.  
- Bell’s palsy occurs in 5 percent of patients; and optic neuritis or disturbances of vision / eye movement in 15%.  
- Low-grade fever may be present.  
- Infection may present as meningitis, encephalitis, neuritis, cranial nerve abnormalities, ataxia or ventriculitis  
- Progression of meningitis to encephalitis is more likely in elderly patients, and is associated with prolonged headache and fever >38 C.  
- Communicating hydrocephalus may develop during the course of infection.  
- Sudden death has been associated with infection of the fourth ventricle.  

Neurognathostomiasis (NG) is clinically similar to angiostrongyliasis.  
- Angiostrongyliasis patients present with acute severe headache but without neurological deficit, combined with a history of eating uncooked snails or slugs.  
- NG patients always present with motor weakness, migratory swelling, radicular pain and history of eating uncooked poultry or fish.  

**Laboratory findings:**

The worm has been found in the CSF and the eye.  
- Eye infection manifests with generalized retinal pigment epithelial alteration, subretinal tracks, retinal edema, macular edema, and a pale disc. Visually-evoked potentials show secondary optic neuritis  
- Cerebrospinal fluid usually has a pleocytosis with 25 to 100 percent eosinophiles.  
- Blood eosinophilia is present in most cases.  
- Rare instances of eosinophilic enteritis have been reported.  

CT studies may demonstrate pulmonary nodules and sup-pleural ground-glass opacities.  

The illness may last from a few days to several months.  

Rare instances of *Ascaris suum* infection (discussed under “Toxocariasis”) in humans have been characterized by eosinophilic myelitis.  

**This disease is endemic or potentially endemic to 43 countries.**
Angiostrongyliasis in Haiti

Prevalence surveys:

75% of *Rattus norvegicus* and 21% of *R. rattus* in Port-au-Prince (2002) 21

References

Animal bite-associated infection

Agent | BACTERIUM. Pasteurella multocida, and other zoonotic bite pathogens
Reservoir | Cat | Dog | Marsupial (Tasmanian devil) | Other mammal | Rarely bird
Vector | None
Vehicle | Cat (60%), dog (30%) or other bite. No obvious source in 10%
Incubation Period | 3h - 3d
Diagnostic Tests | Gram stain/culture. Hold specimen for 2 weeks to discount Capnocytophaga & other genera.
Typical Adult Therapy | Penicillin, a Tetracycline or Cefuroxime. Dosage and duration appropriate for nature and severity of infection
Typical Pediatric Therapy | Penicillin or Cefuroxime. Dosage and duration appropriate for nature and severity of infection
Clinical Hints | Infection of cat, dog or other bite wound - acquired during the preceding 3 to 72 hours (no history of bite in 10%); systemic infection (meninges, bone, lungs, joints, etc) may occur.

Synonyms | Bacteroides pyogenes, Bacteroides tectus, Bergeyella zoohelcum, Bisgaard's taxon 16, Capnocytophaga canimorsus, Capnocytophaga cynodegmi, CDC EF-4, CDC NO-1, Corynebacterium kutscheri, Corynebacterium canis, Corynebacterium freiburgense, Fusobacterium caninum, Haemomonas venusta, Kingella potus, Moraxella canis, Neisseria animaloris, Neisseria canis, Neisseria weaveri, Neisseria zoodegmatis, Pasteurella caballi, Pasteurella canis, Pasteurella dagmatis, Pasteurella multocida, Pasteurella stomatis, Psychrobacter immobilis, Staphylococcus intermedius, Vibrio harveyi.
ICD9: 027.2
ICD10: A28.0

Clinical

These are typically skin and soft infections which follow the bites of cats, dogs or other animals • usually during the preceding 3 to 72 hours. ¹
• There is no history of bite in ten percent of cases.
• Systemic infection (meninges ², bone, lungs ³, joints, etc) may occur, with rare instance of severe septicemia. ⁴⁻⁸

See the Microbiology module (Bacteria • Characterize) for a comprehensive discussion of bacterial species associated with bite wound infection in humans.

This disease is endemic or potentially endemic to all countries.

References

Anisakiasis

| **Agent**     | PARASITE - Nematoda. Phasmidea: Anisakis simplex and Pseudoterranova decipiens |
| **Reservoir** | Marine mammals Fish                                                            |
| **Vector**    | None                                                                           |
| **Vehicle**   | Undercooked fish                                                                |
| **Incubation Period** | Hours - 14d                                                        |
| **Diagnostic Tests** | Endoscopic identification of larvae.                                      |
| **Typical Adult Therapy** | Endoscopic removal of larvae; surgery for complications |
| **Typical Pediatric Therapy** | As for adult                                                               |
| **Clinical Hints** | Allergic reactions; or acute and chronic abdominal pain, often with "peritoneal signs" or hematemesis; follows ingestion of undercooked fish (e.g., sushi), squid or octopus. |
| **Synonyms**  | Anasakis, Bolbosoma, Cod worm disease, Contracaecum, Eustrongylides, Herring worm disease, Pseudoterranova, Whaleworm. |

ICD9: 127.1  
ICD10: B81.0

Clinical

The location of the worms and presenting features depend somewhat on the genus.
- Phocanema more commonly associated with infection of the stomach.
- Anisakis is usually associated with intestinal disease.

Invasive anisakiasis:
Symptoms occur within 48 hours after ingestion.
- Gastric anisakiasis is characterized by intense abdominal pain, nausea, and vomiting.
- Small intestinal involvement results in lower abdominal pain and signs of obstruction, and may cause or mimic appendicitis.
- CT studies reveal severe circumferential bowel-wall thickening, submucosal edema and ascites.
- Concurrent gastric and colonic invasion may occur in a given patient.
- Rare instances of duodenal ulcer, overt hemorrhage and intussusception are reported.
- Symptoms may last for months, rarely for years.
- The disease may also suggest tumor, regional enteritis or diverticulitis.
- Patients may also experience a pharyngeal “tickling sensation”, cough or a foreign body in the mouth or throat.

Allergic anisakiasis:
Ingestion of Anisakis larvae with seafood is often responsible for acute allergic manifestations such as urticaria and anaphylaxis, with or without accompanying gastrointestinal symptomatology.
- Eosinophilia is usually not present in either gastric or intestinal anisakiasis; however, leukocytosis is noted in two thirds of patients with intestinal involvement.
- Urticaria is present in 20% of cases

This disease is endemic or potentially endemic to all countries.

References

Anthrax

**Agent**: BACTERIUM. *Bacillus anthracis* An aerobic gram positive bacillus

**Reservoir**: Soil  Goat  Cattle  Sheep  Water  Horse

**Vector**: Fly (rare)

**Vehicle**: Hair  Wool  Hides  Bone products  Air  Meat Contact

**Incubation Period**: 1d-7d; 1-12 cutaneous, 1-7 GI; 1-43 pulmonary

**Diagnostic Tests**: Bacteriological culture. Alert laboratory that organism may be present. Serology and rapid tests by Ref. Centers.

**Typical Adult Therapy**: Isolation (secretions). *Ciprofloxacin* (or Penicillin if susceptible). If systemic infection, add *Meropenem* (or *Imipenem*) + *Linezolid* (or *Rifampin* or *Clindamycin*) Dosage/route/duration as per severity If inhalational anthrax, add *Raxibacumab*

**Typical Pediatric Therapy**: As for adult

**Vaccine**: Anthrax vaccine

**Clinical Hints**: Edematous skin ulcer covered by black eschar - satellite vesicles may be present; fulminant gastroenteritis or pneumonia; necrotizing stomatitis; hemorrhagic meningitis. Acquired from contact with large mammals or their products (meat, wool, hides, bone).

**Synonyms**: Antrace, Antrax, Antraz, Carbunco, Carbunculo, Malcharbon, Malignant pustule, Milbbrann, Miltvuur, Milbrand, Mjaltbrand, Siberian plague, Siberian ulcer, Splenic fever, Wool-sorter's disease.

ICD9: 022
ICD10: A22

---

Clinical

Most cases of anthrax occur in one of four forms: cutaneous, gastrointestinal, oropharyngeal and inhalational. 

**CDC case definition for reporting:**
As of 1996, the CDC (The United States Centers for Disease Control) case definition for reporting purposes consists of any illness with acute onset characterized by one or more of the following:
- cutaneous (a skin lesion evolving during a period of 2-6 days from a papule, through a vesicle to a depressed black eschar)
- pulmonary (hypoxia, dyspnea and mediastinal widening following a brief "viral-type" prodrome)
- intestinal (severe abdominal distress followed by fever or signs of septicemia)
- oropharyngeal (mucosal lesion, cervical adenopathy and edema, and fever)
- demonstration of *Bacillus anthracis* by culture, immunofluorescence or serological response.

**WHO case definition for surveillance:**
The WHO Case definition for surveillance is as follows:
Clinical description:
An illness with acute onset characterized by several clinical forms. These are:
(a) localized form:
- cutaneous: skin lesion evolving over 1 to 6 days from a papular through a vesicular stage, to a depressed black eschar invariably accompanied by edema that may be mild to extensive
- systemic forms:
- gastro-intestinal: abdominal distress characterized by nausea, vomiting, anorexia and followed by fever
- pulmonary (inhalation): brief prodrome resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnea and high temperature, with X-ray evidence of mediastinal widening
- meningeal: acute onset of high fever possibly with convulsions, loss of consciousness, meningeal signs and symptoms; commonly noted in all systemic infections
Laboratory criteria for diagnosis
- isolation of *Bacillus anthracis* from a clinical specimen (e.g., blood, lesions, discharges)
- demonstration of *B. anthracis* in a clinical specimen by microscopic examination of stained smears (vesicular fluid, blood, cerebrospinal fluid, pleural fluid, stools)
- positive serology (ELISA, Western blot, toxin detection, chromatographic assay, fluorescent antibody test (FAT)
- Note: It may not be possible to demonstrate *B. anthracis* in clinical specimens if the patient has been treated with antimicrobial agents.
Case classification
- Suspected: A case that is compatible with the clinical description and has an epidemiological link to confirmed or suspected
animal cases or contaminated animal products.

- Probable: A suspected case that has a positive reaction to allergic skin test (in non-vaccinated individuals).
- Confirmed: A suspected case that is laboratory-confirmed.

**Cutaneous anthrax:**
- 95% of anthrax cases (worldwide) are cutaneous.
- The incubation period for cutaneous anthrax ranges from 12 hours to 12 days.
- Cutaneous anthrax begins with pruritus at the affected site, typically followed by a small, painless papule that progresses to a vesicle in 1 to 2 days. ²
- The lesion erodes, leaving a necrotic ulcer with a characteristic black center.
- Secondary vesicles are sometimes observed.
- Lymphadenopathy may occur, and local edema may be extensive.
- Patients may have fever, malaise, and headache.
- The most common sites of cutaneous anthrax are the hands, forearms, and head.
- Anthrax related to illicit drug injection may present as subcutaneous infection rather than overt skin lesions. ³
- Rarely infection may involve the genital area, eyelids, lips or other sites.
- Cutaneous anthrax is fatal in approximately 20% of cases if left untreated.

**Inhalational anthrax:** ¹² ¹³
- Infection may progress to respiratory failure and shock within 1 to 2 days following onset of symptoms.
- The case-fatality rate exceeds 80%, even with appropriate antibiotic therapy. ¹⁴
- Symptoms include pharyngeal pain, cough, fever and myalgia followed by respiratory distress, cervical edema and venous engorgement suggestive of mediastinitis. ¹⁵ ¹⁶

**Gastrointestinal anthrax:** ¹⁷
- Infection is characterized by pharyngeal pain, nausea, vomiting, and bloody diarrhea. ¹⁸
- Intestinal gangrene, obstruction and perforation may ensue. ¹⁹
- The case-fatality rate for intestinal infection ranges from 25% to 60%.
- Ulcerative lesions, usually multiple and superficial, may occur in the stomach, sometimes in association with similar lesions of the esophagus and jejunum.
- Ulcers may bleed, and in severe cases the hemorrhage may be massive and fatal.
- Ascites may be present.
- Lesions in the mid-jejunum, terminal ileum, or cecum tend to develop around a single site or a few sites of ulceration and edema, similar to cutaneous anthrax.

**Oropharyngeal anthrax:**
- Infection is characterized by painful neck swelling and fever.
- The other common symptoms are sore throat, dysphagia, and hoarseness, enlargement of cervical lymph nodes and soft tissue edema.
- Oral lesions are located on the tonsils, posterior pharyngeal wall, or the hard palate. ²⁰
- In severe cases, the tonsillar lesions extended to involve the anterior and posterior pillars of fauces, as well as the soft palate and uvula.
- Early lesions are edematous and congested.
- By the end of the first week, central necrosis and ulceration produce a whitish patch, which evolves to a pseudomembrane which covers the ulcer after an additional week.

**Meningeal anthrax:** ²¹
- Infection is characterized by fever, malaise, meningeal signs, hyperreflexia, and delirium, stupor, or coma. ²²
- CSF analyses demonstrated hemorrhagic meningitis, with positive Gram’s stains and CSF cultures.
- 75% of patients die within 24 hours of presentation; mortality rates of 100% are reported in some series. ²³ ²⁴
- Pathologic findings include hemorrhagic meningitis, multifocal subarachnoid and intraparenchymal hemorrhages, vasculitis, and cerebral edema. ²⁵

Published case-fatality rates are as follows: cutaneous <1%, gastrointestinal 25% to 60%, inhalational 46% and injectional 33%. ²⁶

This disease is endemic or potentially endemic to 147 countries.

**Anthrax in Haiti**
Notes:
1. 387 clinical cases (7.6 per 10,000) of cutaneous anthrax were reported in 1973; and an additional 59 cases during the first 4 months of 1974.
2. 1,587 cases of human anthrax were reported from the southern peninsula during 1973 to 1977; 1,396 (5 fatal) during 1985 to 1988.
   Individual years:
   1988 - 164 cases of human anthrax were reported in the Commune of Jeremie
   1993 - 183 cases (> 12 fatal) were reported in La Brillere.
   1994 - Cases reported in all departments except Artinite & Ouest.
   1995 - 70.5% from the southeast.
   2002 - A series of 20 cases of human cutaneous anthrax was reported from the Artibonite Valley.
   2010 - A case of fatal anthrax was reported in Leogane.

A case of ocular infection in the United States in 1974 was acquired from a goat-skin drum imported from Haiti.\(^ {28} \)

Anthrax was reported in 220 bovines and 38 caprines in 1998.
- 27% to 50% of goatskin products (drums\(^ {29} \), voodoo dolls, rugs) are contaminated (1974).

**Notable outbreaks:**
- 1770 - An outbreak (15,000 fatal cases) of presumed intestinal anthrax was reported.\(^ {30} \)

**References**

Ascariasis

**Agent**
PARASITE - Nematoda. Phasmidea: Ascaris lumbricoides

**Reservoir**
Human ? Dog

**Vector**
None

**Vehicle**
Vegetables  Fly

**Incubation Period**
10d - 14d (range 7d - >200d)

**Diagnostic Tests**
Stool microscopy.

**Typical Adult Therapy**
Albendazole 400 mg X 1 dose OR Mebendazole 100 mg BID X 3d

**Typical Pediatric Therapy**
Albendazole 200 mg PO single dose OR Mebendazole 100 mg BID X 3 d (> age 2).

**Clinical Hints**
An acute illness characterized by cough, wheezing and eosinophilia; adult worms are associated with abdominal pain (occasionally obstruction), pancreatic or biliary disease; highest rates among children and in areas of crowding and poor sanitation.

**Synonyms**
Ascaris, Ascaris lumbricoides, Askariasis. ICD9: 127.0 ICD10: B77

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**Clinical**

The pulmonary manifestations of ascariasis occur during the stage of larval migration through the lungs and resemble Loffler's syndrome: cough, wheezing, pulmonary infiltration and eosinophilia. 

- Children with heavy *Ascaris* infection experience impaired digestion and absorption of proteins, often with moderate steatorrhea.
- A mass of worms may block the lumen of the small bowel, resulting in acute intestinal obstruction, with vomiting, abdominal distention, cramps and occasionally hemorrhage, gangrene or perforation.
- Gastric perforation, ileal volvulus and intussusception are also reported.

Worms may also invade and obstruct the biliary duct (pancreatic-biliary ascariasis), producing abdominal pain, which may be associated with ascending cholangitis, acute or recurrent pancreatitis, pancreatic pseudotumor or obstructive jaundice. The majority of patients with hepatobiliary and pancreatic ascariasis present with biliary colic.

- Choledocholithiasis, hepatolithiasis, liver abscess and cirrhosis are associated with the presence of dead, rather than viable worms.
- Aberrant worms may appear at umbilical and hernial fistulas, Meckel's diverticula, the fallopian tubes, ovaries, lower esophagus, urinary bladder, peritoneal cavity, pleural space, trans-nasal or trans-ostomy feeding tubes, lungs, nose, paranasal sinuses and other sites.

*Ascaris suum* has been reported to cause rare cases of myelitis, eosinophilic pneumonia and focal liver lesions in humans, and is discussed under "Toxocariasis."

*This disease is endemic or potentially endemic to all countries.*

**Ascariasis in Haiti**

**Prevalence surveys:**
27.3% of school children (2002)

**References**

# Aspergillosis

<table>
<thead>
<tr>
<th>Agent</th>
<th>FUNGUS. Ascomycota, Euroascomycetes, Eurotiales: Aspergillus. A hyaline hyphomycete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Compost  Hay  Cereal  Soil</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Air</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>3d - 21d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Fungal culture. Biopsy. Nasal culture or serologic testing may be useful in select cases.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Voriconazole 6 mg/kg IV Q12h, day 1; follow with 4 mg/kg IV OR Amphotericin B - if invasive, rapidly increase to max dose 0.6 mg/kg/d and to total 2.5g. OR Itraconazole</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Voriconazole 3 to 9 mg/kg IV Q12h OR Amphotericin B - if invasive, rapidly increase to max dose 0.6 mg/kg/d X 6w. OR Itraconazole</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Pulmonary &quot;fungus ball&quot;; adult-onset asthma; consolidation or infected &quot;pulmonary infarct&quot; in setting of immune suppression (e.g., AIDS, leukemia, etc) leads to widespread hematogenous dissemination if not treated promptly.</td>
</tr>
</tbody>
</table>
| Synonyms       | Aspergillose, Aspergillus.  
ICD9: 117.3  
ICD10: B44 |

## Clinical

Clinical forms of aspergillosis include:  
1. allergy (allergic bronchopulmonary aspergillosis)  
2. colonization of air spaces (otomycosis, fungus ball or mycetoma of the paranasal sinuses or lungs)  
3. non-pulmonary invasive (eye, sinuses, cardiac valve, skin, DNS, gastrointestinal tract, genitourinary tract)  
4. pulmonary-invasive

Invasion of the ears and sinuses can cause extensive necrosis in immunocompromised hosts.  
1. The most common central nervous system manifestations include brain abscess or cerebral infarction  
2. Meningitis is rare  
3. Endophthalmitis and keratitis usually occur following injury  
4. Wound infections and infection of vascular access sites has also been reported.  
5. Sporadic instances of Isolated invasive *Aspergillus* tracheobronchitis and chronic necrotizing pulmonary aspergillosis are encountered.

Case-fatality rates range from 10% to 90%.  
1. One series of 289 cases cited a mortality rate of 40.2% (2008 publication)

This disease is endemic or potentially endemic to all countries.

## References

Bacillary angiomatosis

**Agent**
- BACTERIUM. *Bartonella henselae* or *Bartonella quintana*. Rickettsia-like bacteria

**Reservoir**
- Human
- Tick
- Cat

**Vector**
- Cat flea
- Tick (ixodid) - rare

**Vehicle**
- None

**Incubation Period**
- Unknown

**Diagnostic Tests**
- Histology with special stains.
- Specialized culture techniques.
- Serology.
- Nucleic acid amplification.

**Typical Adult Therapy**
- **Clarithromycin** 500 mg BID X 3 months
- Alternatives:
  - **Azithromycin** 250 mg QD
  - **Ciprofloxacin** 500 mg BID
  - **Doxycycline** 100 mg BID
  - **Erythromycin** 500 mg po QID

**Typical Pediatric Therapy**
- **Clarithromycin** 7.5 mg/kg PO BID X 8 months.
- OR
- **Gentamicin** 2 mg/kg IMq12h

**Clinical Hints**
- Hemangiomatous papules and nodules of skin, spleen, liver (peliosis hepatis), bone or other tissues; virtually all in the setting of AIDS or other immune deficiency; rare instances following tick bite in immune-competent individuals.

**Synonyms**
- Bacillary peliosis, Peliosis hepatis.
- ICD9: 757.32, 083.8
- ICD10: K76.4, A44.0

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**Clinical**

Bacillary angiomatosis was originally described as involving skin and regional lymph nodes of HIV-infected persons.  
- Subsequent infections have involved patients with other forms of immune suppression, and presented in a variety of organs including liver, spleen, bone, brain, lung, bowel, and uterine cervix.

Cutaneous lesions often arise in crops and resemble the lesions of verruga peruana.
- Lesions may present as fixed or mobile subcutaneous or dermal nodules.
- Single or multiple dome-shaped, skin-colored, red or purple papules are also described, which may ulcerate and discharge serosanguinous fluid.
- Lesions can range in diameter from millimeters to centimeters, and may mimic pyogenic granuloma or Kaposi sarcoma.
- Regional lymph nodes are frequently enlarged in a variety of distributions.
- Involved organs contain multiple blood-filled cystic structures that range from microscopic to several millimeters in size.
- Bone disease may present as multiple osteolytic lesions.

**This disease is endemic or potentially endemic to all countries.**

**References**

5. J Int Assoc Provid AIDS Care 2014 Apr 9;
**Bacillus cereus food poisoning**

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Bacillus cereus (toxin). An aerobic gram-positive bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Soil Processed &amp; dried foods</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Food</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2h - 9h (range 1h - 24h)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>No practical test available. Isolation of organism from suspect food.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Usually follows ingestion of rice or other vegetables; vomiting within 1 to 6 hours and/or diarrhea within 6 to 24 hours; no fecal leucocytes.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Bacillus cytotoxicus. ICD9: 005.89 ICD10: A05.4</td>
</tr>
</tbody>
</table>

**Clinical**

Two types of illness are caused by two distinct metabolites. 1
- Diarrhea is caused by a large molecular weight protein.
- Vomiting is caused by a low molecular weight, heat-stable peptide. 2

Symptoms of *B. cereus* diarrheal food poisoning mimic those of *Clostridium perfringens* food poisoning.
- Symptoms of the emetic form mimic *S. aureus* food poisoning. 3

**Diarrheal form:**
The onset of watery diarrhea, abdominal cramps, and pain occurs 6 to 15 hours after consumption of contaminated food. 4
- Nausea may accompany diarrhea, but vomiting (emesis) rarely occurs.
- Symptoms persist for 24 hours in most instances.

**Emetic form:**
The emetic type of food poisoning is characterized by nausea and vomiting within 0.5 to 6 h after consumption of contaminated foods.
- Occasionally, abdominal cramps and/or diarrhea may also occur.
- Duration of symptoms is generally less than 24 h.

Only two fatal cases had been reported to 2005. 5 6 Illness was characterized by rhabdomyolysis and renal failure.
- A case of encephalopathy and hepatic failure • similar to Reye's syndrome • was related to *Bacillus cereus* food poisoning. 7
- A case report of fatal *Bacillus cereus* food poisoning was published from Belgium in 2011. 8

This disease is endemic or potentially endemic to all countries.

**References**

4. ProMED <promedmail.org> archive: 20071207.3948
## Bacterial vaginosis

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Gardnerella vaginalis</em> (facultative gram-negative bacillus), <em>Mobiluncus curtisi</em>, <em>Mobiluncus mulieris</em>, <em>Prevotella</em>, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Sexual contact - normal flora in 14% (girls) to 70% (women)</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of &quot;clue cells&quot; or positive KOH test in vaginal discharge. Culture.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Metronidazole 500 mg BID X 7d OR Tinidazole 2 g PO daily X 3d OR <em>Clindamycin</em> 300 mg BID X 7d + intravaginal <em>Clindamycin</em> or <em>Metronidazole</em>? Also treat sexual partner</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Metronidazole 7.5 mg/kg BID X 7d</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Thin vaginal discharge - &quot;fishy&quot; odor when mixed with KOH; mild to moderate pruritus; occasionally urethritis in sexual partner.</td>
</tr>
<tr>
<td>Synonyms</td>
<td><em>Gardnerella</em>, <em>Gardnerella vaginalis</em>, <em>Mobiluncus</em>. ICD9: 041.89,616,10,099.8 ICD10: N76.1</td>
</tr>
</tbody>
</table>

### Clinical

The diagnosis of bacterial vaginosis required three of the following: 1-3
1. A white, noninflammatory vaginal discharge or coating
2. The presence of clue cells 4
3. A vaginal pH above 4.5
4. A fishy odor following addition of 10% KOH to the vaginal discharge (presumably due to liberated trimethylamine).

Note that routine culture is unnecessary.

**Associated conditions:**
Sequelae of bacterial vaginosis include preterm birth 5-7 and neonatal distress 8, low birth weight 9, chorioamnionitis, cervicitis 10, scalp abscess of the newborn, an increased risk of late miscarriage 11 and maternal infection. 12

• Some studies have suggested a correlation between bacterial vaginosis and infertility. 13-19
• Bacterial vaginosis may increase the risk for acquisition of HIV infection.
• Bacterial vaginosis may predispose to urinary tract infection 20 and endometritis. 21

*Gardnerella vaginalis* has rarely been associated with balanitis, urethritis, urinary tract infections, asymptomatic bacteremia and infectious endocarditis in adult males. 22

Cases of osteomyelitis, discitis and septic arthritis due to *Gardnerella vaginalis* have been reported. 23-26

**This disease is endemic or potentially endemic to all countries.**

### Bacterial vaginosis in Haiti

**Prevalence surveys:**
26.3% of microscopic examinations among adult female outpatients with gynecological symptoms (2013 publication) 27
19.8% to 41% of rural women attending clinics (southwestern Haiti, 2014 publication) 28

### References

### Balantidiasis

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Protozoa. Ciliate (Ciliophora), Litostomatea: Balantidium coli</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Pig Non-human primate Rodent</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Water Food</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1d - 7d (range 1d - 60d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Microscopy of stool or colonic aspirates.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td><strong>Tetracycline</strong> 500 mg QID X 10d. OR <strong>Metronidazole</strong> 750 mg TID X 5d. OR <strong>Iodoquinol</strong> 650 mg TID X 20d</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Age &gt;= 8 years: <strong>Tetracycline</strong> 10 mg/kg QID (max 2g/d) X 10d. Age &lt;8 yrs, <strong>Metronidazole</strong> 15 mg/kg TID X 5d; or <strong>Iodoquinol</strong> 13 mg/kg TID X 20d</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Dysentery, often with vomiting; mimics intestinal amebiasis. The disease is most common in pig-raising areas. Symptoms last for one to four weeks, and may recur.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Balantidiose, Balantidiosis, Balantidium coli, Balantidosis, Balindosis, Ciliary dysentery. ICD9: 007.0 ICD10: A07.0</td>
</tr>
</tbody>
</table>

### Clinical

Most cases are asymptomatic.
- Clinical manifestations, when present, include persistent diarrhea, occasionally dysentery, abdominal pain, and weight loss.  

Symptoms can be severe in debilitated individuals.
- *Balantidium* pneumonia has been reported in immune-compromised patients and persons with occupational exposure.

Diagnosis is based on detection of trophozoites in stool specimens or in tissue collected during endoscopy.
- Cysts are less frequently encountered.
- *Balantidium coli* is passed intermittently and once outside the colon is rapidly destroyed. Thus stool specimens should be collected repeatedly, and immediately examined or preserved.
- Cases of pulmonary infection and osteomyelitis have been reported.
- In rare cases, *Balantidium coli* has been identified in the urine.

This disease is endemic or potentially endemic to 110 countries.

### References

Bartonellosis - cat borne

**Agent**  
BACTERIUM. *Afipia felis*, *Bartonella henselae*, *Bartonella clarridgeiae*, *Bartonella grahamii*, et al. A facultative gram-negative coccobacillus

**Reservoir**  
Cat. Possibly tick

**Vector**  
Flea (cat flea = Ctenocephalides)

**Vehicle**  
Cat scratch. Plant matter (thorn, etc)

**Incubation Period**  
3d - 14d

**Diagnostic Tests**  

**Typical Adult Therapy**  
Aspiration of nodes as necessary.  
*Azithromycin* 500 mg day 1, then 250 daily X 4 days  
Alternatives: *Clarithromycin*, *Ciprofloxacin*, *Sulfamethoxazole/trimethoprim*

**Typical Pediatric Therapy**  
Aspiration of nodes as necessary.  
*Azithromycin* 10 mg/kg day 1, then 5 mg/kg daily X 4 days

**Clinical Hints**  
Tender suppurative regional adenopathy following cat scratch (usually kitten); fever present in 25%.  
Systemic infection (liver, brain, endocardium, bone, etc) occasionally encountered; most cases resolve within 6 weeks.

**Synonyms**  
*Afipia felis*, *Bartonella clarridgeiae*, *Bartonella grahamii*, *Bartonella henselae*, *Bartonella koehlerae*, Cat scratch disease, Debre's syndrome, Foshay-Mollaret cat-scratch fever, Katszenkratz-Krankheit, Petzetakis' syndrome, SENLAT.

ICD9: 078.3  
ICD10: A28.1

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**Clinical**

**Clinical history:**  
Approximately 90% of patients have a history of exposure to a cat.  
- The disease has also been reported after exposure to squirrels, dogs, goats, thorns and barbed wire.  
- 75% of patients report a bite or scratch to the head, neck or upper limbs.  
- Subclinical bacteremia is common among immuno-competent persons with animal and arthropod contact.

**Symptoms:**  
Following an incubation period of 3 to 10 days, a small skin lesion appears consisting of a macule, papule, pustule or vesicle.  
- Within 1 to 2 weeks, edema and tenderness of the regional lymph nodes appear.  
- In some cases, the patient may present with Parinaud oculoglandular syndrome (conjunctival granuloma with suppurative preauricular adenitis), encephalopathy, erythema nodosum, thrombocytopenic purpura, arthritis, synovitis or pneumonia.

**Signs:**  
Physical examination reveals involvement of a single node in 50% of cases.  
- 30% have involvement of multiple sites, and 20% involvement of several nodes in the same region.  
- Lymph nodes typically measure 1 to 5 cm.  
- The majority of lesions regress over 2 to 6 months, but may last for as long as 2 years.  
- Suppuration occurs in 10% of cases, and cellulitis is rare.  
- Inguinal lymphadenopathy in cat-scratch disease may suggest a diagnosis of lymphogranuloma venereum.

**Additional findings:**  
One third of patients manifest fever, lasting 1 to 7 days; and some cases may present as Fever of Unknown Origin.  
- Malaise, fatigue, anorexia, vomiting, weight loss, headache, splenomegaly and pharyngitis are occasionally observed.  
- 10.5% of patients have musculoskeletal manifestations, including osteitis and osteomyelitis.  
- Rare features include a transient truncal maculopapular rash, encephalopathy with seizures, lethargy, coma, parotitis, cranial or peripheral nerve involvement, facial nerve paresis, myelitis, uveitis or neuroretinitis, optic neuritis with transient blindness, macular hole, vitreal hemorrhage, polynuereitits, radiculitis, Guillain-Barre syndrome, disseminated visceral infection, osteomyelitis, endocarditis of native or prosthetic valves, or vascular prostheses, hepatitisplenomegaly with hepatic granulomata, autoimmune thyroiditis, splenic abscess, renal microabscesses, erythema marginatum, erythema multiforme, erythema nodosum and thrombocytopenic purpura.  
- Scalp eschar with neck lymphadenopathy (SENLAT) has been reported in some cases, and could be confused with...
tularemia or infection by *Rickettsia slovaca* or *Rickettsia raoultii.* 55

• *B. henselae* accounts for 6.1% of bacterial species causing uveitis (2001 to 2007) 56

29 cases of *Bartonella henselae* infection of solid-organ transplant recipients were reported to 2011 • many with disseminated disease. 57

In one case, *Bartonella koehlerae* infection was associated with depression, anxiety, mood swings, severe headaches, muscle spasms, interphalangeal joint stiffness, decreased peripheral vision, diminished tactile sensation and hallucinations. 58

This disease is endemic or potentially endemic to all countries.

References

56. Medicine (Baltimore) 2008 May ;87(3):167-76.
### Bartonellosis - other systemic

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. Bartonella quintana, B. koehlerae, B. elizabethae, B. tamiae, B. washoensis, etc A fastidious gram-negative coccobacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human Louse Rat Cat Dog Sheep</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>Louse (Pediculus) Flea - rare (Ctenocephalides, Pulex) Mite - rare (Dermanyssus)</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Wound or eye contact with secretions/louse feces Contact</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>9d - 25d (range 4d - 35d)</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Serology. Culture. Nucleic acid amplification.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td><strong>Doxycycline</strong> 100 mg PO BID X 3 to 5 days (if endocarditis, add <strong>Gentamicin</strong> 3 mg/kg daily X 28 days) Alternatives: <strong>Clarithromycin</strong>, <strong>Azithromycin</strong>, <strong>Gentamicin</strong>, Fluoroquinolone (Levofloxacin, Trovaflaxacin, Pefloxacin, Sparfloxacain or Moxifloxacin)</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td><strong>Erythromycin</strong> 10 mg/kg PO QID X 3 to 5 days. OR <strong>Gentamicin</strong> 2 mg/kg IM q12h. Alternatives: <strong>Clarithromycin</strong>, <strong>Azithromycin</strong></td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Headache, myalgias, shin pain, macular rash, splenomegaly; endocarditis &amp; bacteremia seen; relapse common; often associated with poor hygiene &amp; crowding.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Bartonella alsatica, Bartonella bovis, Bartonella capreoli, Bartonella doshiae, Bartonella elizabethae, Bartonella quintana, Bartonella rochalimae, Bartonella schoenbuchensis, Bartonella tamiae, Bartonella vinsonii, Bartonella vinsonii berkoffii, Bartonella volans, Bartonella washoensis, Candidatus Bartonella mayotimonensis, Candidatus Bartonella melophagi, Candidatus Bartonella merieuxii, Candidatus Bartonella rochalimae, Five day fever, His-Werner disease, Meuse fever, Quintan fever, Quintana fever, Shank fever, Shin fever, Shinbone fever, Trench fever, Volhynian fever.</td>
</tr>
<tr>
<td><strong>ICD9:</strong></td>
<td>083.1</td>
</tr>
<tr>
<td><strong>ICD10:</strong></td>
<td>A44.0,A44.8,A79.0</td>
</tr>
</tbody>
</table>

### Clinical

Infection is characterized by abrupt onset of headache, postorbital pain, conjunctivitis, leg and back pain, relapsing fevers, splenomegaly and an erythematous maculopapular rash on the chest, back and abdomen. In 50% of cases, as many as 3 to 8 relapses occur. Subclinical bacteremia is common among immuno-competent persons with animal and arthropod contact. No fatalities have been reported in classic trench fever.

*Bartonella quintana* (formerly *Rochalimaea quintana*) and related bacteria may also produce bacillary angiomatosis (discussed separately in this module), bacteremia, endocarditis, myocarditis, meningocerebralitis, uveitis, neuroretinitis or chronic lymphadenopathy.

- **Bartonella** species other than *B. henselae* account for 8.1% of bacterial uveitis (France, 2008 publication). A single reported case of *Bartonella rochalimae* infection was characterized by fever, myalgia, headache and splenomegaly.

- **Bartonella vinsonii** subsp *berkoffii* genotype has been implicated in a case of epithelioid hemangioendothelioma.

### This disease is endemic or potentially endemic to all countries.

**References**

11. Medicine (Baltimore) 2008 May ;87(3):167-76.
### Blastocystis hominis infection

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Protozoa. Chromista, Bigyra, Blastocystea: Blastocystis hominis. [taxonomic status remains uncertain]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Fecal-oral, Water</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Stool microscopy. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Nitazoxanide 500 mg BID X 3 d. OR Metronidazole 750 mg TID X 10d. OR Iodoquinol 650 mg TID X 20 d. OR Sulfamethoxazole/trimethoprim</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Nitazoxanide - Age 1 to 3 years: 5 ml (100 mg) PO Q12h X 3 days - Age 4 to 11 years: 10 mg (200 mg) PO Q12h X 3 days; OR Metronidazole 15 mg/kg/d X 10d. Sulfamethoxazole/trimethoprim</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Diarrhea and flatulence; usually no fever; illness similar to giardiasis; increased risk among immunosuppressed patients; the exact role of this organism in disease is controversial.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Apoi, Blastocystiose, Blastocystis hominis, Zierdt-Garaveli disease. ICD9: 007.8 ICD10: A07.8</td>
</tr>
</tbody>
</table>

### Clinical

Symptoms ascribed to blastocystosis include leucocyte-negative diarrhea, nausea, pain, flatulence and abdominal distention.  
- Some reports suggest an association between urticaria and Blastocystis infection.  
- Symptoms usually last for 3 to 10 days, but may persist for weeks or months.  
- Blastocystis hominis has also been implicated in the etiology of irritable bowel syndrome, and may contribute to the development of anemia among infected pregnant women.

A search for alternative etiologies (including other infectious agents) should always be made in such patients.

This disease is endemic or potentially endemic to all countries.

### Blastocystis hominis infection in Haiti

Blastocystis hominis infection was first reported from Haiti in 2006, among HIV-infected persons.

### References

Botulism

Agent: BACTERIUM. *Clostridium botulinum*. An anaerobic gram-positive bacillus

Reservoir: Soil Animal Fish

Vector: None

Vehicle: Food Occasionally soil (wound contamination)

Incubation Period: 1d - 2d

Diagnostic Tests: Electrophysiologic (EMG) pattern. Isolation of organism from food (occ. from infant stomach). Mouse toxin assay

Typical Adult Therapy: Heptavalent (types A-G) or trivalent (types A, B, E) antitoxin [following test dose] 10 ml in 100 ml saline over 30 min Additional 10 ml at 2 and 4 hours if necessary. Respiratory support

Typical Pediatric Therapy: As for adult

Vaccine: Botulism antitoxin

Clinical Hints: Clinical manifestations similar to those of atropine poisoning: dysarthria, diplopia, dilated pupils, dry mouth, constipation, flaccid paralysis, etc); onset approximately 36 hrs after ingestion of poorly-preserved food.

Synonyms: Botulisme, Botulismo, Botulismus, Kerner’s disease. ICD9: 005.1 ICD10: A05.1

Clinical

For reporting purposes, the CDC (The United States Centers for Disease Control) case definitions for Foodborne, Infant and Wound Botulism are as follows:

- 1) Neurological syndrome (diplopia, blurred vision, bulbar weakness, symmetric paralysis); or
- 2) Infant exhibiting constipation, poor feeding and failure to thrive, followed by progressive weakness, impaired respiration and death. 1

**Food-borne botulism:**

Symptoms and signs of botulism reflect characteristic electrophysiological abnormalities 2 and include diplopia 3 4, blurred vision, ptosis, slurred speech, difficulty swallowing, dry mouth 5, and muscle weakness.

- In food-borne botulism, symptoms generally begin 18 to 36 hours after ingestion (range 6 hours to 10 days). 6
- Type F botulism is characterized by the appearance of respiratory failure within 24 hours, quadriplegia by the fifth day and rapid recovery beginning on the eighth day. 7 8
- A case of asymmetric cranial nerve demyelination due to type F botulism has been reported. 9
- If untreated, these symptoms progress to paralysis of the arms, legs, trunk and respiratory muscles.
- Patients who experience nausea and vomiting, cranial neuropathy or urinary retention are most likely to develop respiratory failure. 10
- Botulinum toxin may persist in the serum of patients for as long as 12 days. 11

**Infant botulism:**

Infant botulism should be suspected if a previously healthy infant (age <12 months) develops constipation and weakness in sucking, swallowing, or crying; hypotonia; and progressive bulbar and extremity muscle weakness. 12

- Infants are lethargic, "floppy," constipated and feed poorly exhibiting a weak cry and poor muscle tone. 13 14
- Approximately 50% of patients require mechanical ventilation.
- Lumbar puncture and brain imaging studies are usually normal, in contrast to other causes of flaccid weakness.
- The findings of infant botulism may mimic those of Hirschsprung’s disease 15 or acute abdomen. 16

This disease is endemic or potentially endemic to all countries.

References

12. ProMED <promedmail.org> archive: 20070420.1295
## Brain abscess

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM OR FUNGUS. Mixed oral anaerobes / streptococci, <em>Staphylococcus aureus</em> (from endocarditis), etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>None</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Imaging techniques (CT, scan, etc).</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Antibiotic(s) appropriate to likely pathogens + drainage Typical empiric therapy: Intravenous <em>Ceftriaxone</em> 2 gm + <em>Metronidazole</em> 15 mg/kg, Q12h</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Typical empiric therapy: Intravenous <em>Ceftriaxone</em> 50 mg/kg + <em>Metronidazole</em> 15 mg/kg IV, Q12h</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Headache, vomiting and focal neurological signs; often associated with chronic sinusitis or otitis media, pleural or heart valve infection; patients are often afebrile.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Ascesso cerebrale, Cerebral abscess. ICD9: 324.0 ICD10: G06.0</td>
</tr>
</tbody>
</table>

### Clinical

The clinical presentation of brain abscess may range from indolent to fulminant.  
- Most manifestations are due to the size and location of this space-occupying lesion within the brain and the virulence of the infecting microorganism, and not to infection per se.  
- Headache is observed in approximately 70% of patients and may be moderate to severe and unilateral or generalized.  
- Sudden worsening of the headache, accompanied by meningismus, may herald rupture of the abscess into the ventricular space.  
- Less than 50% of patients present with a classic triad of fever, headache, and focal neurological deficit.  
- Mental status changes are seen in 70% of cases, fever in 45 to 50%, seizures in 25 to 35%, vomiting in 25 to 50%, nuchal rigidity in 25% and papilledema in 25%.

Metastatic infections are most often associated with endocarditis, and may present with multiple abscesses.  
- Although the distribution of the middle cerebral artery is most often involved, any part of the brain may be infected.  
- Common pathogens in this setting reflect the usual flora of endocarditis and bacteremia.

### Etiological associations:
- Endocarditis: *Staphylococcus aureus*, streptococci  
- Immunodeficiency: Toxoplasmosis, *Nocardia*, fungi  
- Otitis: Peptostreptococci, streptococci, Enterobacteriaceae  
- Pleuropulmonary infection: anaerobes, *Nocardia*  
- Sinusitis: Streptococci, Enterobacteriaceae, *Bacteroides*, *Haemophilus influenzae*  
- Traumatic or post-surgical: *Staphylococcus aureus*, streptococci, Enterobacteriaceae

This disease is endemic or potentially endemic to all countries.

### References

**Brucellosis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Brucella abortus</em>, <em>Brucella melitensis</em>, <em>Brucella suis</em>, <em>Brucella canis</em> An aerobic gram-negative bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Pig, Cattle, Sheep, Goat, Dog, Coyote, Caribou</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Food, Air, Dairy products, Animal excretions</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>10d - 14d (range 5d - 60d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture of blood or bone marrow. Serology. Note: Alert laboratory to possibility of Brucella.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td><strong>Doxycycline</strong> 100 mg BID + <strong>Rifampin</strong> 600 mg BID X 6 weeks. Alternatives <strong>Tetracycline</strong> + <strong>Gentamicin</strong></td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td><strong>Rifampin</strong> 20 mg/kg/day (maximum 600 mg) plus: &gt; age 8 years: <strong>Doxycycline</strong> 2 mg/kg BID PO X 6w age &lt; 8 years <strong>Sulfamethoxazole/trimethoprim</strong> 4/20 mg/kg BID X 4 to 6w Add <strong>Gentamicin</strong> if severe</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Prolonged fever, hepatosplenomegaly, lymphadenopathy, arthritis, osteomyelitis or chronic multisystem infection following ingestion of unpasteurized dairy products, contact with farm animals or meat processing.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Bang’s disease, Bangsche Krankheit, Brucella, Brucellemia, Brucellassis, Brucellose, Brucelosen, Brucellosi, Brucelose, Brucelosis, Cyprus fever, Febris melitensis, Febris sudoralsis, Febris undulans, Fievre caprine, Gibraltarfever, Goat fever, Malta fever, Maltafeber, Melitococcosis, Neapolitan fever, Rock fever, Typhomalarial fever, Undulant fever. ICD9: 023 ICD10: A23</td>
</tr>
</tbody>
</table>

**Clinical**

For surveillance purposes the CDC (The United States Centers for Disease Control) case definition of brucellosis consists of "an illness characterized by acute or insidious onset of ever, night sweats, undue fatigue, weight loss, headache and arthralgia" associated with epidemiological or laboratory evidence for infection.

**WHO Case definition for surveillance:**

The WHO Case definition for surveillance is as follows:

**Clinical description**
- An illness characterized by acute or insidious onset, with continued, intermittent or irregular fever of variable duration, profuse sweating particularly at night, fatigue, anorexia, weight loss, headache, arthralgia and generalized aching. Local infection of various organs may occur
- Isolation of *Brucella* spp. from clinical specimen or
- *Brucella* agglutination titer (e.g., standard tube agglutination tests: SAT>160) in one or more serum specimens obtained after onset of symptoms or
- ELISA (IgA, IgG, IgM), 2-mercaptoethanol test, complement fixation test, Coombs, fluorescent antibody test (FAT), and radioimmunoassay for detecting antilipopolysaccharide antibodies; and counterimmunoelectrophoresis (CIEP)

**Case classification**
- Suspected: A case that is compatible with the clinical description and is epidemiologically linked to suspected or confirmed animal cases or contaminated animal products.
- Probable: A suspected case that has a positive Rose Bengal test.
- Confirmed: A suspected or probable case that is laboratory-confirmed.

**Clinical manifestations:**

The clinical picture of brucellosis is nonspecific, and most often consists of fever, sweats, malaise, anorexia, headache, depression and back pain. Asymptomatic infection has been reported. The fever of brucellosis may mimic that of enteric fever; and an undulant fever pattern is seen in chronic infections. Fever may be absent among patients with end-stage renal disease who acquire brucellosis. Mild lymphadenopathy is seen in 10 to 20% of patients; and splenomegaly or hepatomegaly in 20 to 30%. Rare instances of splenic rupture have been reported. Bone and joint infections are common, including a high rate of vertebral osteomyelitis. Rare instances of acute or sternotomy infection, granulomatous myositis, bursitis and soft tissue or muscular abscesses have also been reported. Most cases of brucellar monoarthritis represent reactive rather than septic disease.
natural 26 or prosthetic joints 27 28 and soft tissue has been reported. 29 Subclinical salciroilitis is common. 30 • Vertebral osteomyelitis is characterized by osteolysis, often associated with paravertebral masses, spondylodiscitis 31 32 , epidural abscess 33-35 , or psosas abscesses. 36-38 • Epididymoorchitis is found in 7.6% to 12.7% of male patients with brucellosis. 39-46 Brucellar orchitis may be mistaken for testicular tumor. 47 Prostatitis has also been reported. 48 49 • Endocarditis is well documented 50-59 , including isolated case reports of Brucella infection of prosthetic valves 60-62 and devices such as implantable defibrillators 63 and pacemaker leads. 64 Rare instances of aortitis 65-68 , venous 69 or arterial thrombosis 70 , myocarditis 71 and pericarditis are also reported. 72-76 • Pulmonary infiltrates 77-81 , pleural effusion 82 , ileitis 83 , chest wall infection 84 , cholestatic jaundice 85 , acalculous cholecystitis 86 , pancreatitis 87 , acute gastroenteritis 88 , spontaneous bacterial peritonitis 89 or peritonitis associated with dialysis 90 , and abscesses of the liver 91 92 , kidneys 93 and spleen have been reported. 94-96 • Ocular manifestations include uveitis, visual loss due to suprasellar mass 97 , keratitis, conjunctivitis, papillitis, retinal hemorrhages and third-nerve palsy. 98 99 • Neurological manifestations may include encephalitis 100 , meningitis 101-105 , cranial 106 or peripheral neuropathy 107 108 , progressive paraparesis 109 , polyradiculopathy 110 or Guillain-Barre syndrome 111 112 , spinal epidural abscess 113 , cerebral venous 114 or arterial vasculitis with infarct 115 , intracranial hypertension or hydrocephalus 116 117 , infection of ventriculo-peritoneal shunt 118 , psychosis 119 , and parenchymal granulomata 120 or abscesses. 121-129 • Renal infection may present at hematuria, proteinuria, pyuria, overt nephritis or renal failure. 130 Rare instances of renal abscess 131 and glomerulonephritis have also been reported. 132-134 • Persons working with animals may present with severe pharyngitis as an initial feature of brucellosis. 135 • Abscesses involving a variety of body areas and solid organs may occur 136-144 • Various forms of rash occur in 6% to 13% of patients including generalized or localized papules or macules 145 , ulcers, purpura, vasculitis / leukocytoclastic vasculitis 146 , panniculitis 147 and erythema nodosum 148 149 • Brucellosis has been implicated in cases of human abortion. 150 151

Virtually any organ or body system may be infected during the course of illness 152-163 • Chronic brucellosis generally represents persistence of local infection in bone, joints, liver 164 , spleen or kidneys. • Relapses are common, especially following inadequate therapy. • Pancytopenia is reported in 15% of cases 165 166 • Brucellosis has been reported to cause myelofibrosis 167 , and to trigger hemolytic anemia in patients with Glucose-6-Phosphate Dehydrogenase deficiency. 168 • Isolated thrombocytopenia mimicking ITP is reported in 6% of cases. 169-175 Hepatic dysfunction 176 177 , colitis 178 Coombs-positive hemolytic anemia 179-181 , reactive hemophagocytic 182 183 or myelodysplastic syndrome 184 , pancytopenia 185 186 , disseminated intravascular coagulation 187 , TTP 188 189 , Guillain-Barre syndrome 190 and syndrome of inappropriate secretion of antidiuretic hormone (SIADH) have also been documented. 191 192

This disease is endemic or potentially endemic to 179 countries.

**Brucellosis in Haiti**

Human disease in this country is due to *Brucella abortus*.

No cases were reported in 1998.

**References**

191. Case Rep Med 2010;2010
Campylobacteriosis

Agent | BACTERIUM. *Campylobacter jejuni subsp jejuni*, et al A microaerophilic gram-negative bacillus
--- | ---
Reservoir | Human  Mammal  Bird
Vector | None
Vehicle | Water  Food
Incubation Period | 2d - 4d (range 1d - 10d)
Diagnostic Tests | Stool (rarely blood, CSF) culture. Nucleic acid amplification. Alert laboratory when these organisms are suspected.
Typical Adult Therapy | Stool precautions. **Azithromycin** 500 mg QD X 3 days Alternatives **Erythromycin**, **Fluoroquinolone** *(Ciprofloxacin, Levofloxacin, Trovafloxacin, Pefloxacin, Sparfloxacin or Moxifloxacin)*, **Gentamicin**
Typical Pediatric Therapy | Stool precautions. **Azithromycin** 10 mg/kg QD X 3 days Alternatives - **Erythromycin**, **Gentamicin**
Clinical Hints | Febrile diarrhea or dysentery; vomiting or bloody stool often noted; severe abdominal pain may mimic appendicitis; disease is most common among children and lasts one to four days.
Synonyms | Campylobacter. ICD9: 008.43  ICD10: A04.5

Clinical

Following an incubation period of 1 to 10 days, patients develop diarrhea (often bloody) and abdominal pain.
- Initial symptoms of malaise, dizziness, fever, headache and myalgia are common.
- Vomiting is unusual.
- Leucocytes are usually seen on stool smears.
- Leukopenia and thrombocytopenia are occasionally encountered. 1

Infection may be complicated by cholecystitis 2, pancreatitis 3, pseudoappendicitis, peritonitis 4, 5 (including peritonitis associated with dialysis 6, 7), massive lower-gastrointestinal hemorrhage 8, hemolytic-uremic syndrome, bacteremia 9-12, myocarditis 13-16, endocarditis 17-19, myocarditis 20, 21, pericarditis 22, 23, pleurisy 24-26, mycotic iliac 27, popliteal 28 and aortic aneurysms 29-31, menigitis 32, 33, encephalopathy 34, epidural abscesses 35, 36, septic arthritis of native 37 or prosthetic joints 38, cellulitis 39, Sweet’s syndrome 40, spontaenous abortion, reactive arthritis or Guillain-Barre syndrome.
- Reactive arthritis has been reported in 1% to 13% of cases 41, 42
- The risk for reactive arthritis following *Campylobacter* infection was 2.1/100,000 cases (United States, 2002 to 2004) 43
- Elderly patients are at risk for complicated or fatal infection. 44

**Guillain Barre syndrome** (GBS) has been estimated to complicate 0.1% of *Campylobacter* infections. 45-50
- *Campylobacter* infection is implicated in 14% to 40% of GBS episodes. 51-56
- Risk for GBS continues for up to 2 months following an episode of Campylobacteriosis.
- The rate of GBS is 19.2 per 100,000 episodes of Campylobacteriosis. 57
- There have been case reports of brain stem encephalitis 58, cranial neuropathy 59, acute transverse myelitis 60, and demyelization of the central nervous system or spinal cord following *C. jejuni* infection. 61

There is evidence that campylobacteriosis may increase the risk for later development of inflammatory bowel disease. 62

This disease is endemic or potentially endemic to all countries.

References

5. BMJ Case Rep 2013 ;2013
Candidiasis

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Contact Catheter</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture. Serology and assays for cell-specific antigens are performed in some centers,</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Topical, oral, systemic antifungal agent depending on clinical presentation and species [in Therapy module, scroll through upper left box]</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Dermal erythema with satellite pustules; &quot;cheesy&quot; mucosal discharge; severe, widespread or intractable disease should suggest the possibility of underlying diabetes, AIDS or other form of immune suppression.</td>
</tr>
</tbody>
</table>
| Synonyms         | Candida, Candida-Mykosen, Candidiase, Candidiasi, Candidose, Monilia, Moniliasis, Salmonella, Thrush.  
|                  | ICD9: 112  
|                  | ICD10: B37                        |

Clinical

The clinical features of candidiasis range from localized mucosal or skin inflammation to multi-organ candidal sepsis.

Often infection represents overgrowth of Candida species following use of antimicrobial agents, or in the presence of the high mucosal glucose concentrations found in diabetics.
- Other predisposing factors include chronic intertrigo, oral contraceptive use, and cellular immune deficiency.
- Candidiasis is a common initial event in HIV-infected individuals.
- White exudative plaques may occur on the tongue or buccal mucosa (thrush), vaginal or rectal mucosa.
- Fissured, macerated lesions at the corners of the mouth (perleche) are common among individuals with poorly-fitting dentures. In fact, candidal infections have a predilection for sites that are chronically wet and macerated.
- Intertriginous lesions are edematous, erythematous, and scaly; and associated with scattered "satellite pustules."  
- The glans penis and scrotum as inner aspect of the thighs are often involved.

Systemic Candida infections may involve virtually any organ or organ system, and mimic bacterial sepsis.  
- Case fatality rates for infected vascular catheters range from 26% to 38%; 33% for infected prosthetic cardiac valves; 20% to 40% for urinary catheters.

This disease is endemic or potentially endemic to all countries.

Candidiasis in Haiti

Prevalence surveys:
- 2.2% of microscopic examinations among adult female outpatients with gynecological symptoms (2013 publication)  
- 9% of rural women attending clinics (vaginitis, southwestern Haiti, 2014 publication)

References

# Chancroid

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Haemophilus ducreyi. A facultative gram-negative bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Sexual contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>3d - 10d (2d - 21d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture (inform laboratory when this diagnosis is suspected). Fluorescent staining under development</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td><strong>Azithromycin</strong> 1.0 g PO X 1 dose. OR <strong>Ceftriaxone</strong> 250 mg IM X 1 dose. OR <strong>Ciprofloxacin</strong> 500 mg PO BID X 3 days OR <strong>Erythromycin</strong> 500 mg PO TID X 7d.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td><strong>Azithromycin</strong> 12 mg/kg PO X 1 dose OR <strong>Erythromycin</strong> 10 mg/kg PO TID X 7d. OR <strong>Ceftriaxone</strong> 10 mg/kg IM X 1</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Soft, painful and tender chancre on erythematous base, with regional lymphadenopathy (generally unilateral and painful); onset 3 to 10 days following sexual exposure.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Blot sjanker, Chancre mou, Chancro blando, Haemophilus ducreyi, Nkumunye, Soft chancre, Ulcera mole, Ulcus molle, Weeke sjanker, Weicher Schanker. ICD9: 099.0 ICD10: A57</td>
</tr>
</tbody>
</table>

## Clinical

For surveillance the CDC (The United States Centers for Disease Control) case definition consist of a sexually-transmitted disease characterized by painful genital ulceration and inflammatory inguinal adenopathy; but without evidence for *Treponema pallidum* by dark field and serological examination (after at least 7 days) and without clinical or laboratory evidence for herpes simplex infection.

Infection begins with a papule or pustule which ulcerates and enlarges over a period of 1 to 2 days.  
- The lesion is soft, painful and bleeds easily; and the ulcer edges are undermined and irregular.  
- Two thirds of patients present with more than one ulcer  
- Painful unilateral or bilateral lymphadenopathy is present in 40% of cases.  
- Systemic signs are unusual.  
- Extragenital skin ulcers are occasionally encountered.  
- *Haemophilus ducreyi* has been associated with esophageal ulceration in HIV-positive patients.

Although yaws and chancroid may co-exist in some regions, lesions of yaws tend to be more circular in shape, and are more likely to have central granulating tissue and indurated edges.

## This disease is endemic or potentially endemic to all countries.

### References

The fever of Chikungunya is characterized by a rapid rise in temperature to as high as 40°C, often accompanied by rigors, myalgia, headache, photophobia, retro-orbital pain, sore throat with objective signs of pharyngitis, nausea, and vomiting.  

- Fever may abate after a few days, only to recrudesce ("saddle-back" fever curve").
- Polyarthralgia occurs in 70% of cases, favors small joints and sites of previous injury, and is most intense on arising.
- Joints may swell, but without significant fluid accumulation.  
- Joint pain is most severe in adults.
- Symptoms may last for from 1 week to several months.  
- Joint involvement may progress to residual chronic pain or destructive arthritis.
- Arthralgia may persist for as long as 36 months.  
- Imaging studies may reveal joint effusion, bony erosion, marrow edema, synovial thickening, tendonitis and tenosynovitis.
- Laboratory tests reveal mild leukopenia and relative lymphocytosis; persistent mixed cryoglobulinemia is present in most cases.  

Dermatological manifestations:
A rash characteristically appears on the first day of illness, but may be delayed.
- The patient exhibits erythema of the face and neck, which evolves to a macular or maculopapular exanthem of the trunk, limbs, face, palms, and soles in 50% of cases.
- Common findings also include hyperpigmentation, xerosis, excoriated papules, aphthous-like ulcers, vesiculobullous eruptions, and exacerbation of pre-existing or quiescent dermatoses.
- Pigmentary changes are seen in 42% of cases, intertriginous aphthous-like ulcers in 21.37% and a vesiculobullous eruption in 2.75% (only in infants).
- Morbilliform eruptions are most common, followed by scaling, macular erythema, intertrigo, hypermelanosis, xerosis, excoriated papules, urticaria and petechiae.
- Vesiculo-bullous lesions are most common in children; and extensive bullous lesions have been reported in infected infants.
- Pruritus is common, and petechiae have been seen in some patients.
- Purpuric macules, genital ulcers, desquamation of the facial skin, erythema multiforme and erythema nodosum have also been reported in patients with Chikungunya.
- In one series, erythema / chondritis of the external ear was present in 25% of cases.

Complications:
Complications include hemorrhagic syndrome, myopericarditis, hemodynamic disorders and rare instances of renal failure.  
- Fatal infection and transplacental infections have been reported.  
- Peritonitis, encephalitis and secondary bacterial infections have been reported among immunocompromised patients with Chikungunya.  
- The case fatality rate may be as high as 1 per 1,000 cases.  
- Children occasionally present with seizures or convulsions.  
- Sudden sensorineural hearing loss has been reported.  
- Eye involvement may present as transient granulomatous and nongranulomatous anterior uveitis, optic neuritis, retinitis, retrobulbar neuritis, Fuchs' heterochromic iridocyclitis, and dendritic lesions.  
- Chikungunya has no observable effect on the outcome of pregnancy; however, infection of infants during the perinatal period is characterized by fever, rash, peripheral edema, thrombocytopenia, lymphopenia, decreased prothrombin value, and elevation of aspartate aminotransferase levels.  
- Neurological complications include altered mental function, seizures, encephalitis, myelopathy, myeloradiculopathy, acute flaccid paralysis, focal neurological deficit with abnormal CT scan of head, Guillain-Barre syndrome, urinary retention and altered CSF biochemistry.  
- Intrauterine infection may result in neonatal encephalopathy and neurocognitive residua.

In some cases Chikungunya may mimic Kawasaki disease.  
- Although the clinical features of dengue and chikungunya are similar, chikungunya patients are more likely to exhibit early myalgia or arthralgia; while sore throat, cough, nausea, vomiting, diarrhea, abdominal pain, anorexia, tachycardia and thrombocytopenia will favor a diagnosis of dengue.

Infection by a related agent, *Semliki Forest virus*, is characterized by fever, myalgia, arthralgia and persistent headache.

This disease is endemic or potentially endemic to 95 countries.

### Chikungunya in Haiti

2014 - An outbreak (64,695 suspect cases to July) of Chikungunya was reported. Two cases of imported (from Haiti and the Dominican Republic) Chikungunya were reported in Panama.

Imported cases (from Haiti) were reported in Brazil, Canada, Italy, Spain and the United States.

### References

15. ProMED <promedmail.org> archive: 20101115.0178
17. ProMED <promedmail.org> archive: 20101115.0178
43. ProMED <promedmail.org> archive: 20061006.2873
44. ProMED <promedmail.org> archive: 20070524.1669
45. ProMED <promedmail.org> archive: 20070718.2305
48. ProMED <promedmail.org> archive: 20080304.0895
## Chlamydia infections, misc.

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Chlamydiaceae, Chlamydiae, Chlamydia trachomatis; Simkania negevensis; Waddlia chondrophila</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Sexual contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>5d - 10d</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Doxycycline 100 mg BID X 7d. OR Azithromycin 1g as single dose OR Levofloxacin 500 mg daily X 7 days OR Ofloxacin 300 mg BID X 7 days</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Weight &lt;45 kg: Erythromycin 10 mg/kg QID X 14d Weight &gt;=45 kg, but age &lt;8 years: Azithromycin 1 g as single dose Age &gt;= 8 years: Azithromycin 1 g as single dose OR Doxycycline 100 mg BID X 7d</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Thin, scant penile discharge; cervicitis; conjunctivitis; neonatal pneumonia; pelvic inflammatory disease; concurrent gonorrhea may be present.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Bedsonia, Chlamydia trachomatis, Chlamydieng-Urethritis, Chlamydieng-Zervizitis, Chlamydophila, Inclusion blenorrhoea, Non-gonococcal urethritis, Nonspecific urethritis, Parachlamydia, Parachlamydia acanthamoebae, Prachlamydia, Protochlamydia, Protochlamydia naegleriophila, Rhabdochlamydia, Simkania negevensis, Waddlia chondrophila. ICD9: 099.41,099.5 ICD10: A56,A55</td>
</tr>
</tbody>
</table>

### Clinical

Genito-urinary infection with *Chlamydia trachomatis* may result in urethritis, epididymitis, obstructive uropathy, cervicitis, Fitz-Hugh-Curtis syndrome, acute salpingitis, tubal scarring, reduced conception rates (even in the absence of scarring), ectopic pregnancy, miscarriage, preeclampsia, low birth weight or pre-term delivery. The rates of orchitis/epididymitis, prostatitis, infertility, and urethral stricture following genital infection in males are 4.28%, 1.41%, 1.27%, and 0.13% respectively.

The extent to which *Chlamydia* infection contributes to male and female infertility is unclear. Levels of serum Prostate-specific Antigen (PSA) may be elevated in patients with *Chlamydia trachomatis* infection. Perinatal infections may result in inclusion conjunctivitis or pneumonia in the newborn.

*Chlamydia trachomatis* infection is implicated in the etiology of reactive arthritis.

Parachlamydiaceae (including *Parachlamydia acanthamoebae*) have been associated with human respiratory infections, conjunctivitis, keratitis and uveitis.

The signs and symptoms of infection are similar to those of genital *Mycoplasma* infection.

Recurrent infection may represent either reinfection or treatment failure.

For surveillance purposes, the CDC (The United States Centers for Disease Control) case definition of nongonococcal urethritis requires that gonorrhea has been discounted in the setting of:

- a visible abnormal urethral discharge
- or, a positive leukocyte esterase test from a male aged <60 who does not have a history of kidney disease or bladder infection, prostatic enlargement, anatomical abnormality of the urogenital tract, or recent urinary tract instrumentation
- or microscopic evidence of urethritis (over 5 leukocytes per high-power field) on stain of a urethral smear.

This disease is endemic or potentially endemic to all countries.
Chlamydia infections, misc. in Haiti

Prevalence surveys:
10.7% of pregnant women in the Artibonite Valley (1996) 57
12% of pregnant women in Cite Soleil are infected with *Chlamydia*, Gonorrhea - or both (1995 publication) 58
5.4% of adult female outpatients with gynecological symptoms (2013 publication) 59
1.9% to 11.9% of rural women attending clinics (southwestern Haiti, 2014 publication) 60
4.4% of rural men with urethritis (2014 publication) 61

References

24. Hum Reprod Update 2010 Mar-Apr;16(2):189-204.
48. PMID 23328833
51. Int J STD AIDS 2014 May 14;
54. Medicine (Baltimore) 2008 May ;87(3):167-76.
60. Am J Trop Med Hyg 2014 Sep 8;
61. Int J STD AIDS 2014 Sep 15;
# Chlamydia pneumoniae infection

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. Chlamydiaceae, <em>Chlamydia</em>, Chlamyphila [Chlamydia] pneumoniae</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Droplet</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>7d - 28d</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Direct fluorescence of sputum. Serology and culture in specialized laboratories. Nucleic acid amplification.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Respiratory isolation. Azithromycin 500 mg day 1, then 0.25 g daily X 4 days OR Levofoxacin 750 mg po BID X 7d. OR Alternatives: Doxycycline 100 mg BID X 7d. Erythromycin 500 mg QID X 10d. Clarithromycin 0.5 g BID X 7d</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>Respiratory isolation Azithromycin 10 mg/kg PO day 1; 5 mg/kg PO days 2 to 5</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Atypical pneumonia, often associated with pharyngitis and myalgia; consider when Mycoplasma, Legionella and influenza are discounted.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Chlamydia pneumoniae, Chlamydia TWAR, Chlamyphila pneumoniae, TWAR. ICD9: 078.88 ICD10: J16.0</td>
</tr>
</tbody>
</table>

## Clinical

Asymptomatic infection is common.

- Pneumonia and bronchitis are the most common clinical syndromes associated with *C. pneumoniae*.  
- Sinusitis and pharyngitis may also occur, even in the absence of lower respiratory tract infection.  
- Initial symptoms may consist of rhinitis, sore throat, or hoarseness; followed after several days or weeks prominent cough.  
- Fever is often absent.  
- Cough and malaise may persist for months; and reinfection may occur.

A single, subsegmental, patchy infiltrate may be seen on chest X ray.

- Other findings described include, lobar pulmonary consolidation, interstitial infiltrates, bilateral pneumonia, pleural effusion, acute respiratory distress syndrome, hilar adenopathy, myo-pericarditis, and encephalitis associated with respiratory infection.  
- The appearance of a miliary infiltrate may suggest a diagnosis of tuberculosis.  
- *Chlamyphila pneumoniae* has been identified as an agent of otitis media.  
- Rare instances of acute glomerulonephritis, granulomatous hepatitis and intra-hepatic cholestasis have been reported.  
- The peripheral white blood cell count is usually not elevated.

*C. pneumoniae* has been identified as a cause of acute respiratory exacerbations in patients with cystic fibrosis and acute respiratory infection in children with sickle cell disease.

- *C. pneumoniae* infection is implicated in the etiology of recurrent tonsillitis.  
- The organism has also been implicated in development of asthma, chronic rhinosinusitis, otitis media, migraine, endocarditis, lumbosacral meningoradiculitis, erythema nodosum, erythema multiforme, erythema exsudativum multiforme, nodular vasculitis, Guillain-Barre syndrome, keratoconjunctivitis sicca, hemophagocytic lymphohistiocytosis, reactive arthritis and atherosclerosis.

This disease is endemic or potentially endemic to all countries.

## References

22. PMID 21058284
# Cholecystitis & cholangitis

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. <em>Escherichia coli</em>, Klebsiella pneumoniae, enterococci, et al.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Endogenous bacteria</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>Variable</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Roentgenograms/imaging (cholecystogram, ultrasound, CT, etc).</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Antibiotics and surgical intervention as required</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Fever, chills and right upper quadrant abdominal pain; often &quot;female, fat and 40&quot;; may be associated with gallstones or pancreatitis, or present as &quot;fever of unknown origin&quot;.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Acute cholecystitis, Angiocholite, Ascending cholangitis, Cholangitis, Cholecystite, Cholecystitis, Cholezystitis, Colangite, Colangitis, Colecistite, Gall bladder.</td>
</tr>
<tr>
<td></td>
<td>ICD9: 575.0,576.1</td>
</tr>
<tr>
<td></td>
<td>ICD10: K81,K83.0</td>
</tr>
</tbody>
</table>

## Clinical

Cholangitis is caused by obstruction of the common bile duct, which subsequently becomes infected. 1
- Strictures, stenosis, tumors, or endoscopic manipulation of the CBD cause bile stasis.
- The resultant infection ascends into the hepatic ducts, while increased biliary pressure spreads infection into the biliary canaliculi, hepatic veins and perihepatic lymphatics, leading to bacteremia.

Charcot's triad (fever, right upper quadrant pain, and jaundice) is found in 70% of patients.
- Additional findings include right upper quadrant pain, mild hepatomegaly, tachycardia, altered mental status, rigors, fever, hypotension, jaundice, pruritis, acholic stools.
- The case-fatality rate is 7% to 40%, and is highest in patients with hypotension, renal failure, liver abscess, cirrhosis, inflammatory bowel disease, malignant strictures and advanced age, or delays in diagnosis or surgery.

This disease is endemic or potentially endemic to all countries.

## References

**Cholera**

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Vibrio cholerae A facultative gram-negative bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Water Fecal-oral Seafood (oyster, ceviche) Vegetables Fly</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1d - 5d (range 9h - 6d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Stool culture. Advise laboratory when this organism is suspected.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Stool precautions. <strong>Doxycycline</strong> 100 mg BID X 5d, or Fluoroquinolone (Levofloxacin, Trovafloxacin, Pefloxacin, Sparfloxacin or Moxifloxacin), or <strong>Azithromycin</strong> Fluids (g/l): NaCl 3.5, NaHCO3 2.5, KCl 1.5, glucose 20</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Stool precautions. Age &gt;=8 years: <strong>Doxycycline</strong> 2 mg/kg BID X 5d. Age &lt;8 years: Sulfamethoxazole/trimethoprim Fluids (g/l): NaCl 3.5, NaHCO3 2.5, KCl 1.5, glucose 20</td>
</tr>
<tr>
<td>Vaccines</td>
<td>Cholera - injectable vaccine Cholera - oral vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Massive, painless diarrhea and dehydration; occasionally vomiting; apathy or altered consciousness common; rapid progression to acidosis, electrolyte imbalance and shock; fever is uncommon.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Colera, Kolera. ICD9: 001 ICD10: A00</td>
</tr>
</tbody>
</table>

**Clinical**

**WHO Case definition for surveillance:**
The WHO Case definition for surveillance is as follows:

**Clinical case definition**
- In an area where the disease is not known to be present: severe dehydration or death from acute watery diarrhea in a patient aged 5 years or more or
- In an area where there is a cholera epidemic: acute watery diarrhea, with or without vomiting in a patient aged 5 years or more

**Laboratory criteria for diagnosis**
- Isolation of *Vibrio cholerae* O1 or O139 from stools in any patient with diarrhea.
- **Case classification**
  - Suspected: A case that meets the clinical case definition.
  - Probable: Not applicable.
  - Confirmed: A suspected case that is laboratory-confirmed.

Note: In a cholera-threatened area, when the number of confirmed cases rises, shift should be made to using primarily the suspected case classification.
- Cholera does appear in children under 5 years; however, the inclusion of all cases of acute watery diarrhea in the 2-4 year age group in the reporting of cholera greatly reduces the specificity of reporting.
- For management of cases of acute watery diarrhea in an area where there is a cholera epidemic, cholera should be suspected in all patients.

Symptoms and signs of cholera reflect the degree of fluid loss: thirst, postural hypotension, tachycardia, weakness, fatigue and dryness of the mucous membranes.
- Following an incubation period of 12 hours to 5 days \(^1\), the patient experiences sudden onset of painless, watery diarrhea, which may later be accompanied by vomiting. \(^2\)
- Abdominal cramps may occur.
- Fever is typically absent in adults, but present in children.
- The diarrhea has a "rice water" appearance and fishy odor.
- In patients with severe disease, stool volume can exceed 250 ml per /kg during the first 24 hours (17.5 liters in a 70 kg adult!).
- Severe cases exhibit sunken eyes (depressed fontanelles in infants), thready pulse, somnolence or coma.
- Without replacement of fluids and electrolytes, hypovolemic shock and death ensue.
- The clinical features of cholera due to *Vibrio cholerae* O139 are indistinguishable from disease due to other strains. \(^3\)
- Rare cases of acalculous \(^4\) and infectious cholecystitis have been ascribed to *Vibrio cholerae*. \(^7\)
This disease is endemic or potentially endemic to 121 countries.

**Cholera in Haiti**

<table>
<thead>
<tr>
<th>Year</th>
<th>Cholera Cases</th>
<th>Death Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>280,000</td>
<td>12%</td>
</tr>
<tr>
<td>2011</td>
<td>320,000</td>
<td>15%</td>
</tr>
<tr>
<td>2012</td>
<td>260,000</td>
<td>10%</td>
</tr>
</tbody>
</table>

Notes:
- Individual years:
  - 2010 - Haiti accounted for 56.5% of global cholera cases and 52.9% of cholera deaths.  
  
  - 2011 - Haiti accounted for 57.7% of global cholera cases and 36.7% of cholera deaths.
  
  - 2012 - Haiti accounted for 45.7% of global cholera cases and 29.5% of cholera deaths.
  
  - 2013 - Haiti accounted for 45.6% of global cholera cases and 30.2% of cholera deaths.
  
  - 2014 - 2,536 cases (18 fatal) were reported to February.
Prevalence surveys:

63.7% of patients hospitalized with watery diarrhea (2010 to 2013) 16

0.23% of Cuban health-care workers returning from a cholera epidemic zone in Haiti (asymptomatic carriage, 2014 publication) 17

41.8% of post-earthquake diarrhea (2011 to 2012) 18

1.7% of water sources for environmental reservoirs (2012 to 2013) 19

Notable outbreaks:

2010 to 2014 - An outbreak (780,541 cases, 8,562 fatal - to July 2014) of cholera in Haiti followed a major earthquake. The outbreak strain appears to have been introduced by a Nepalese soldier serving with peace-keeping forces. During the course of the outbreak, 31,628 cases (471 fatal) of cholera were confirmed in the Dominican Republic (Dominican and Haitian nationals), 23 in the United States (13 from Haiti and 9 from the Dominican Republic) and one in Canada (imported from Haiti). These reports included an outbreak (8 cases) among Americans who had attended a banquet in the Dominican Republic. Suspected cholera was reported in a group of 21 French nationals working in Haiti during the outbreak. A separate outbreak (37 cases) among Venezuelans returning from the Dominican Republic. One traveler from Puerto Rico, 1 from Germany and 1 from Britain were infected in the Dominican Republic. 20-191 6,689 cases (31 fatal) were reported during January to July 2014. 192

2012 - An outbreak (3,593 cases) followed a hurricane. 193

2013 - A case of cholera was reported in Martinique - imported from Haiti. 194

References

13. ProMED <promedmail.org> archive: 20140221.2290975
14. ProMED <promedmail.org> archive: 20140322.2349186
15. ProMED <promedmail.org> archive: 20140709.2595720
# Chromomycosis

<table>
<thead>
<tr>
<th>Agent</th>
<th>FUNGUS. Ascomycota, Euascomycetes, Chaetothyriales. Dematiaceous molds: Phialophora, Cladiophialophora, Fonsecaea, Rhinocladiella</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Wood  Soil  Vegetation</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Minor trauma</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>14d - 90d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Biopsy and fungal culture.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td><strong>Itraconazole</strong> 100 mg PO QID X (up to) 18 m. OR (for late disease) <strong>Flucytosine</strong> 25 mg/kg QID X 4m. OR <strong>Posaconazole</strong> 400 mg PO BID <strong>Terbinafine</strong> has been used in some cases. Local heat; excision as necessary</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td><strong>Itraconazole</strong> 1 mg/kg PO BID X (up to) 18 m. OR <strong>Ketoconazole</strong> (if age &gt;2) 5 mg/kg/d X 3 to 6m. Local heat; excision as necessary</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Violaecous, verrucous, slowly-growing papule(s) or nodules, most commonly on lower extremities; usually follows direct contact with plant matter in tropical regions.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Chromoblastomycosis, Chromomykose, Verrucous dermatitis. ICD9: 117.2  ICD10: B43.0</td>
</tr>
</tbody>
</table>

## Clinical

The lesions of chromomycosis typically progress from a papule to cicatricial fibrosis: nodules, tumors, plaques, warty lesions, and scarring lesions.  
• The verrucous form appears at the site of inoculation. 
• The primary lesion, a small pink scaly papule, may be pruritic but rarely painful. 
• Over time (often months to years), new crops of lesions appear in the same or adjacent areas as warty, purplish, scaly nodules or smooth, firm tumors. 
• Peripheral spread may occur with healing in the center, as lesions enlarge and become grouped. 
• Older lesions resemble cauliflower, with small ulcerations or "black dots" of hemopurulent material on the surface. 
• These lesions can be pruritic and are rarely painful. 
• Satellite lesions may develop through autoinoculation or lymphatic spread, in some cases suggesting a diagnosis of sporotrichosis. 
• Coalesced lesions form a large verrucous mass. 
• Occasionally, an annular, flattened, papular lesion having a raised border is encountered. 
• Keloid formation, fibrosis, lymphostasis and marked edema may follow. 
• Fistulae are not seen. 
• Malignant transformation has been reported in long-lasting lesions. 

Signs of mucosal infection may mimic those of rhinosporidiosis, while those of cutaneous infection may mimic dermal leishmaniasis or carcinoma.

Rare cases of mycotic keratitis and postoperative eye infection have been reported.

Rare cases of hematogenous spread to the brain, lymph nodes, liver, lungs, bones and joints, soft tissues and other organs have been reported.

This disease is endemic or potentially endemic to all countries.

## References

Chronic meningococcemia

Agent | Neisseria meningitidis, an aerobic gram-negative coccus
Reservoir | Human
Vector | None
Vehicle | Air, infected secretions
Incubation Period | Unknown
Diagnostic Tests | Blood culture. Test patient for complement component deficiency.
Typical Adult Therapy | Intravenous Penicillin G, 20 million units daily × 7 days
Typical Pediatric Therapy | Intravenous Penicillin G, 200,000 units daily × 7 days
Clinical Hints | Recurrent episodes of low-grade fever, rash, arthralgia and arthritis - may persist for months; rash is distal, prominent near joints and may be maculopapular, petechial or pustular; may be associated with complement component deficiency.
Synonyms | Meningococcemia, chronic. ICD9: 036.2 ICD10: A39.3

Clinical

Chronic meningococcemia is characterized by persistent meningococcal bacteremia associated with low-grade fever, rash and arthritis.

- The rash is similar to that of gonococcemia. ¹ ²
- The illness may recur over a period of weeks to months.
- Patients (or their contacts) may ultimately present with acute bacterial meningitis or septicemia.

Non-bacteremic cases occur, and may be diagnosed through demonstration of meningococci in skin lesions. ³

This disease is endemic or potentially endemic to all countries.

References

Clostridial food poisoning

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Clostridium perfringens An anaerobic gram-positive bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Soil Human Pig Cattle Fish Poultry</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Food</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>8h - 14h (range 5h - 24h)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Laboratory diagnosis is usually not practical. Attempt culture of food for C. perfringens.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Abdominal pain; watery diarrhea (usually no fever or vomiting) onset 8 to 14 hours after ingestion of meat, fish or gravy; no fecal leucocytes; usually resolves within 24 hours.</td>
</tr>
<tr>
<td>Synonyms</td>
<td></td>
</tr>
</tbody>
</table>

**Clinical**

Seven to 15 hours after ingestion of toxin (range 6 to 24), the patient develops watery diarrhea (90%), abdominal cramps (80%); and occasionally nausea (25%), vomiting (9%) or fever (24%).

- Symptoms may persist for 8 to 72 hours (usually one day)
- Fatal cases are rare

This disease is endemic or potentially endemic to all countries.

**References**

**Clostridial myonecrosis**

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. <em>Clostridium perfringens</em> An anaerobic gram-positive bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Soil Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Soil Trauma</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>6h - 3d</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Gram stain of exudate. Wound and blood cultures. Presence of gas in tissue (not specific).</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Prompt, aggressive debridement. <strong>Penicillin G</strong> 3 million units IV Q3h + <strong>Clindamycin</strong> 900 mg IV Q8h. Hyperbaric oxygen</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>Prompt, aggressive debridement. <strong>Penicillin G</strong> 50,000 units/kg IV Q3h + <strong>Clindamycin</strong> 10 mg/kg IV Q6h. Hyperbaric oxygen</td>
</tr>
<tr>
<td><strong>Vaccine</strong></td>
<td>Gas gangrene antitoxin</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Gas gangrene is heralded by rapidly progressive tender and foul smelling infection of muscle associated with local gas (crepitus or seen on X-ray), hypotension, intravascular hemolysis and obtundation.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Anaerobic myonecrosis, Clostridial gangrene, Gas gangrene. ICD9: 040.0 ICD10: A48.0</td>
</tr>
</tbody>
</table>

**Clinical**

Gas gangrene is a fulminant infection with prominent findings at the infection site and severe systemic disease. ¹

The process may follow trauma (usually of an extremity), surgery (notably intestinal or biliary), septic abortion or delivery, vascular insufficiency or burns, underlying colorectal or pelvic cancer, or neutropenia complicating leukemia or cytotoxic therapy.

Following an incubation period of 1 to 4 days (range 6 hours to 3 weeks) the patient develops severe local pain, heaviness or pressure.

- The infection then progresses within minutes to hours, with localized edema, pallor and tenderness.
- Gas may be noted in the soft tissues by palpation, x-ray or scans, but crepitance is a late finding.
- The skin initially appears pale, and progresses to a magenta or bronze discoloration with hemorrhagic bullae and subcutaneous emphysema.
- A thin, brown, serosanguinous discharge may be present, associated with an offensive odor described as sweetish or "mousey.
- Gram's stain of the discharge shows a large number of gram-positive or gram-variable rods, with few or no white blood cells.

Profound systemic toxicity is also present, diaphoresis, anxiety, and tachycardia disproportionate to fever.
- In fact, fever may be low or absent in the early stages.
- Other complications include intravascular hemolysis, hemoglobinuria, hypotension, renal failure, and metabolic acidosis.
- Central nervous system manifestations are rare and most frequently comprise meningitis with or without pneumencephalon, encephalitis, plexitis, cerebral abscess, or subdural empyema. ²
- Coma and generalized "bronze’ edema are seen preterminally.

**This disease is endemic or potentially endemic to all countries.**

**References**

## Clostridium difficile colitis

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. <em>Clostridium difficile</em> An anaerobic gram-positive bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Endogenous</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>Variable</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Assay of stool for <em>C. difficile</em> toxin.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td><strong>Metronidazole</strong> 500 mg PO TID X 10d. OR <strong>Vancomycin</strong> 125 mg [oral preparation] QID X 10d OR <strong>Fidaxomicin</strong> 200 mg PO BID X 10d Fecal transplantation (PO or by enema) has been effective in some cases.</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td><strong>Vancomycin</strong> 2 mg/kg [oral preparation] QID X 10d</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Fever, leukocytosis, abdominal pain; mucoid or bloody diarrhea during / following antibiotic therapy; fecal leukocytes present; suspect even when mild diarrhea follows antibiotic intake.</td>
</tr>
</tbody>
</table>
| **Synonyms** | Klebsiella oxytoca colitis, Pseudomembranous colitis.  
ICD9: 008.45  
ICD10: A04.7 |

### Clinical

Symptoms may appear as early as the first or second day of antimicrobial therapy; or as late as 10 weeks after cessation.  

- Occasionally, a single dose of an antimicrobial or antineoplastic agent has been implicated.  

The frequency of diarrhea ranges from three to as many as 20 stools per day.  

- Stools may be soft or watery, but rarely demonstrate overt blood.  
- Occult blood in the stool is found in approximately 25% of patients.  
- Abdominal pain is present in 22% of patients, fever in 28% and leukocytosis in 50%.  
- Reactive polyarthritis, venous thromboembolism and hemolytic-uremic syndrome have been reported in some cases.  
- Rare instances of *Clostridium difficile* bacteremia are reported (15 published cases to 2009).  
- Disease caused by *C. difficile* 027 is relatively severe and carries a higher mortality rate than infection by other strains.

This disease is endemic or potentially endemic to all countries.

### References

Common cold

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Droplet Contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1d - 3d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Viral culture and serology are available, but not practical.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive; Pleconaril under investigation</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Nasal obstruction or discharge, cough and sore throat are common; fever &gt;38 C unusual in adults; illness usually lasts one week, occasionally two.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Acute coryza, Raffreddore. ICD9: 079.460 ICD10: J00</td>
</tr>
</tbody>
</table>

Clinical

In young adults, the common cold runs its course in an average of 7 days.

Fever is uncommon, and in most cases, rhinorrhea and nasal obstruction predominate. ¹
- Sore throat, cough and hoarseness are often present.
- The nasal tip is often red, and mucoid secretions and a glistening nasal mucosa are evident.
- The pharynx may be mildly edematous and erythematous, but without exudate.

Complications include bacterial sinusitis, otitis media, exacerbation of chronic bronchitis and precipitation of asthma. ²
- Rare instances of pneumonia have been attributed to infection by Coronavirus strains OC43 and 229E.
- Severe symptoms, including bronchiolitis are associated with Coronavirus HCoV-NL63 infection in young children.

This disease is endemic or potentially endemic to all countries.

References

**Conjunctivitis - inclusion**

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Chlamydia, Chlamydia trachomatis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Infected secretions  Sexual contact  Water (swimming pools)</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>5d - 12d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Demonstration of chlamydiae on direct fluorescence or culture of exudate.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Secretion precautions. Topical Erythromycin. Erythromycin 250 mg PO QID. X 14 days OR Doxycycline 100 mg PO BID X 14 days</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Secretion precautions. Topical Erythromycin. Azithromycin 1 g PO as single dose. Alternative If age &gt;8 years, Doxycycline 100 mg PO BID X 7 days.</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Ocular foreign body sensation, photophobia and discharge which may persist for months to as long as 2 years; keratitis and conjunctival follicles may be evident.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Inclusion conjunctivitis, Paratrachoma. ICD9: 077.0 ICD10: P39.1,A74.0</td>
</tr>
</tbody>
</table>

**Clinical**

Ophthalmia neonatorum caused by *Chlamydia* is characterized by conjunctival injection without follicles. ¹

Follicular conjunctivitis in adults is most prominent on the lower lid, and the presence of bulbar follicles is highly suggestive of a Chlamydia etiology. ²
• The infection is usually bilateral and accompanied by profuse discharge.

Parachlamydiaceae (including *Parachlamydia acanthamoebae*) have been associated with conjunctivitis, keratitis and uveitis. ³

Trachoma may be differentiated from inclusion conjunctivitis by the presence of corneal scarring and a preference of the latter for the upper tarsal conjunctivae.

**This disease is endemic or potentially endemic to all countries.**

**References**

### Conjunctivitis - viral

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS. Picornavirus, Adenovirus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1d - 3d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Viral isolation is available but rarely practical.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Watery discharge, generalized conjunctival injection and mild pruritus; may be associated with an upper respiratory infection.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Apollo conjunctivitis, Apollo eye, Congiuntivite virale, Hemorrhagic conjunctivitis, Viral conjunctivitis. ICD9: 077.1,077.2,077.3,077.4,077.8,372.0 ICD10: B30,B30.3,H10</td>
</tr>
</tbody>
</table>

#### Clinical

The symptoms of viral conjunctivitis include erythema, itching and lacrimation.

- The presence of large quantities of pus may suggest a bacterial etiology.  
  
Hemorrhagic conjunctivitis is characterized by sudden onset of painful, swollen, red eyes with subconjunctival hemorrhaging, palpebral follicles, photophobia, foreign body sensation, eyelid edema, punctate keratitis, and excessive tearing.

- Symptoms usually persist for 3 to 5 days.

This disease is endemic or potentially endemic to all countries.

#### References

4. ProMED <promedmail.org> archive: 20071006.3302
**Cryptococcosis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>FUNGUS - Yeast. Basidiomycota, Hymenomycetes, Sporidiales: Cryptococcus neoformans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Pigeon Soil</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Air</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Amphotericin B 0.3 mg/kg/d X 6w (+/- Flucytosine); then 0.8 mg/kg qod X 8w. OR Fluconazole 200 mg/d</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Amphotericin B 0.3 mg/kg/d X 6w (+/- Flucytosine); then 0.8 mg/kg qod X 8w. OR Fluconazole 3 mg/kg/d</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Chronic lymphocytic meningitis or pneumonia in an immune-suppressed patient; meningitis may be subclinical, or &quot;wax and wane&quot; - nuchal rigidity absent or minimal; bone, skin, adrenals, liver, prostate and other sites may be infected.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Busse-Buschke disease, Cryptococcus, European blastomycosis, Torulosis. ICD9: 117.5,321.0 ICD10: B45</td>
</tr>
</tbody>
</table>

**Clinical**

**Central nervous system infection:**
Central nervous system infection may be acute or gradual in onset, with acute manifestations most common in immunosuppressed patients (eg, with AIDS). 1
- Often, the onset is characterized by waxing and waning manifestations over weeks to months, interspersed by asymptomatic periods.
- Complaints may be mild and nonspecific, and consist of headache, nausea, dizziness, irritability, somnolence, confusion, or obtundation. 2
- Decreased visual acuity, diplopia, and facial weakness may be evident.
- Fever is often absent, and patients have minimal or no nuchal rigidity.
- Papillodema is noted as many as one third of cases, and cranial nerve palsies in 20%. Bilateral amaurosis 3 4 and bilateral ophthalmoplegia 5 have also been reported.
- Hyperreflexia, choreoathetoid movements or myoclonic jerks may be present.
- Elevated CSF protein concentrations are present in 50%, hypoglycorrhachia in 33% and pleocytosis above 20 cells per cu. Mm. In 20%.
- Peripheral blood eosinophilia may be present. 6 7

**Respiratory tract infection:**
Respiratory tract cryptococcosis may be asymptomatic, or limited to a mild productive cough with blood-streaked sputum and minor ache in the chest. 8 9
- Pulmonary infection may present as a single rounded lesion, lobar pneumonia, bronchiolitis obliterans 10 or miliary disease.
- Rales or pleural friction rub are unusual, and pleural effusions are uncommon.
- Pulmonary infection in immunocompetent patients may progress or regress spontaneously over long periods.
- Cryptococcosis among patients with AIDS often presents as a solitary cavitary pulmonary nodule. 11
- Concurrent CNS infection may be evident in some cases.
- Rare instances of laryngeal cryptococcosis are reported. 12

One-half of AIDS patients with cryptococcal meningitis have concurrent pulmonary involvement, and two-thirds are fungemic. 13
- Initial cough and dyspnea are found in 5 to 25% of HIV-positive patients with cryptococcosis.
- Cryptococcal immune reconstitution inflammatory syndrome may present as a clinical worsening of cryptococcal disease after initiation of antiretroviral therapy. 14
- Case-fatality rates for treated cryptococcosis in AIDS patients are 10% to 25%.
- Concurrent diabetes is associated with a poor prognosis in HIV-positive patients with cryptococcal meningitis. 15
The clinical features of Cryptococcus neoformans var. gattii infection are similar to those of C. neoformans infection. 16

- Blindness due to high cerebrospinal fluid pressure, optic neuropathy or endophthalmitis, is relatively common among immunocompetent individuals infected with C. gattii. 18

Cryptococcosis may involve a variety of other sites including skin 19-29 and soft tissues 30-33 , blood stream 34-36 , colon or intestine 37-40 , gall bladder and bile ducts 41 42 , liver, peritoneum 43-46 , lymph nodes 47-50 , bones and joints 51-58 , breasts, pericardium, ventriculo-peritoneal shunt 59 , genital tract 60-62 , prostate 63 , placenta (without neonatal involvement) 64 , adrenals 65 66 , eyes 67 68 , parotid glands 69 , tongue 70 71 , larynx 72 , retropharyngeal space 73 , etc.

The cutaneous features of cryptococcosis include papules, pustules, nodules, subcutaneous swelling, abscesses, molluscum contagiosum-like or tumor-like lesions, cellulitis, blisters, ulcers and very rarely, necrotizing fasciitis 74

- Primary cutaneous cryptococcosis may occur in persons working with birds. 75

Note: Cryptococcus neoformans is one of at least a dozen Cryptococcus species. See the Microbiology • Yeasts module.

This disease is endemic or potentially endemic to all countries.

References

1. CNS Drugs 2003 ;17(12):869-87.

See the Microbiology • Yeasts module.
Cryptosporidiosis

**Cryptosporidiosis affects the gastrointestinal tract and may be asymptomatic or associated with watery diarrhea and abdominal cramps.**

- Fever and anorexia are uncommon, and fecal leukocytes are not seen.
- Although vomiting is not common among adults, it is often encountered in children.  

Rare instances of pulmonary infection 2-4 and post-infectious hemolytic-uremic syndrome have been reported. 5

There is some evidence that *Cryptosporidium hominis* infection in children is associated with diarrhea, nausea, vomiting, general malaise, and increased oocyst shedding intensity and duration.

- In contrast, infections caused by *C. parvum*, *C. meleagridis*, *C. canis*, and *C. felis* are associated with diarrhea only.

Illness persists for 1 to 20 days (mean 10) in immunocompetent individuals

- Protracted, severe diarrhea leading to malabsorption, dehydration, extraintestinal (ie, biliary or pulmonary 6-8 ) and fatal infection may develop in immunocompromised individuals. 9 10

**This disease is endemic or potentially endemic to all countries.**

**Cryptosporidiosis in Haiti**

Human infection is Haiti is caused by *Cryptosporidium hominis*, *C. parvum* 11 and *C. felis*. 12

**Prevalence surveys:**
- 16.3% of childhood diarrhea (1982 to 1984) 13
- 30% of HIV-positive adults with diarrhea (1990 to 1993) 14
- 60% of HIV-positive patients with chronic diarrhea (2008 publication) 15
- 16% of HIV-positive patients with chronic diarrhea (2003 to 2004) 16
- 65% of surface water samples in Port-au-Prince, and 91% of reservoirs in peripheral areas (2000 to 2007) 17
References

### Cutaneous larva migrans

| **Agent** | PARASITE - Nematoda. Phasmidea: Anclylostoma braziliense, A. caninum, Bunostomum phlebotomum, Strongyloides myopotami |
| **Reservoir** | Cat, Dog, Cattle |
| **Vector** | None |
| **Vehicle** | Soil, Contact |
| **Incubation Period** | 2d - 3d (range 1d - 30d) |
| **Diagnostic Tests** | Biopsy is usually not helpful. |
| **Typical Adult Therapy** | Albendazole 200 mg BID X 3d OR Ivermectin 200 micrograms/kg as single dose. OR Thiabendazole topical, and oral 25 mg/kg BID X 5d (max 3g). |
| **Typical Pediatric Therapy** | Albendazole 2.5 mg/kg BID X 3d OR Ivermectin 200 micrograms/kg once OR Thiabendazole topical, and oral 25 mg/kg BID X 5d (max 3g). |
| **Clinical Hints** | Erythematous, serpiginous, pruritic advancing lesion(s) or bullae - usually on feet; follows contact with moist sand or beach front; may recur or persist for months. |
| **Synonyms** | Creeping eruption, Pelodera, Plumber's itch. ICD9: 126.2,126.8,126.9 ICD10: B76.9 |

### Clinical

Cutaneous larva migrans is characterized by one or more erythematous linear, vesicular or bullous lesions which tend to be raised and palpable.  
- The lesions are intensely pruritic and extend in length from day to day.  
- The site of the lesions reflects contact with sand / soil, as from walking barefoot or lying on a beach.  
- Infection may persist for over one year.  

This disease is endemic or potentially endemic to all countries.

### References

### Cyclosporiasis

**Agent**  
PARASITE - Protozoa. Sporozoa, Coccidea, Eimerida: Cyclospora cayetanensis

**Reservoir**  
Human  
Non-human primate

**Vector**  
None

**Vehicle**  
Water  
Vegetables

**Incubation Period**  
1 d - 11 d

**Diagnostic Tests**  
Identification of organism in stool smear. Cold acid fast stains and ultraviolet microscopy may be helpful.

**Typical Adult Therapy**  
Sulfamethoxazole/trimethoprim 800/160 mg BID X 7 d  
Ciprofloxacin 500 mg PO BID X 7 d (followed by 200 mg TIW X 2 w) has been used in sulfa-allergic patients

**Typical Pediatric Therapy**  
Sulfamethoxazole/trimethoprim 10/2 mg/kg BID X 7 d

**Clinical Hints**  
Watery diarrhea (average 6 stools daily), abdominal pain, nausea, anorexia and fatigue lasting up to 6 weeks (longer in AIDS patients); most cases follow ingestion of contaminated water in underdeveloped countries.

**Synonyms**  
Cryptosporidium muris, Cyanobacterium-like agent, Cyclospora.

ICD9: 007.5  
ICD10: A07.8

---

### Clinical

Symptoms appear abruptly in 68% of cases

- Patients usually present with intermittent watery diarrhea, with up to eight or more stools per day.  
- Other symptoms may include anorexia, nausea, abdominal cramps, bloating, flatulence, mild to moderate weight loss, fatigue, and myalgia.  
- Fever is rare.

In the immunocompetent patient, the diarrhea may last from a few days to up to three months, with the organism detectable in the stool for up to two months.

- In immune compromised individual, particularly AIDS patients, the disease can persist for weeks to several months.

Reactive arthritis syndrome (Reiter’s syndrome) has been associated with progression of the disease.

Acalculus *Cyclospora* cholecystitis has been demonstrated in a patient with AIDS.

### This disease is endemic or potentially endemic to all countries.

### Cyclosporiasis in Haiti

*Cyclospora* infection was first reported in Haiti in 1983.

**Prevalence surveys:**

- 11% of HIV-positive adults (1990 to 1993)  
- 34% of HIV-positive patients with chronic diarrhea (2008 publication)  
- 3% of HIV-positive patients with chronic diarrhea (2003 to 2004)  
- 12% of healthy persons in Leogane (85% of these asymptomatic) in 2001  
- 15% to 20% of mothers and children in Leogane (1997 to 1998)

### References

Cysticercosis

Agent | PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: Taenia solium
Reservoir | Pig Human
Vector | None
Vehicle | Soil (contaminated by pigs) Fecal-oral Fly
Incubation Period | 3m - 3y
Diagnostic Tests | Serology (blood or CSF) and identification of parasite in biopsy material.
Typical Adult Therapy | Albendazole 400 mg PO BID X 30d. OR Praziquantel 30 mg/kg TID X 14d (15 to 30d for neurocysticercosis). Combination of Albendazole + Praziquantel may be superior for neurocysticercosis. Surgery as indicated Add corticosteroids if brain involved.
Typical Pediatric Therapy | Albendazole 15 mg/kg PO BID X 30d. OR Praziquantel 30 mg/kg TID X 14d (15 to 30d for neurocysticercosis). Combination of Albendazole + Praziquantel may be superior for neurocysticercosis. Surgery as indicated Add corticosteroids if brain involved.
Clinical Hints | Cerebral, ocular or subcutaneous mass; usually no eosinophilia; calcifications noted on X-ray examination; lives in area where pork is eaten; 25% to 50% of patients have concurrent Taenia infestation.
Synonyms | Taenia crassiceps, Taenia martis.
ICD9: 123.1
ICD10: B69

Clinical

Cysticercosis is manifest as painless, rubbery (average 2 cm) nodules in skin and soft tissues, or other body sites. • "Rice grain" calcifications are often visible on routine roentgenograms of soft tissue, notably the pelvis and upper legs.
Cysts have been reported in the breast, pharynx, tongue, lips, heart, thyroid, carpal tunnel, masseter and temporalis muscles, spleen, pancreas, kidneys, liver, and virtually every other area of the body.
Cysticercosis involving the subcutaneous tissues may mimic malignancy or tuberculous lymphadenitis.
Rare instances of cysticercosis are reported in infants and young children.

Cysticercosis of the central nervous system:
Central nervous system infection may present as seizures, increased intracranial pressure or hydrocephalus, altered mental status, reversible dementia, eosinophilic meningitis, ventriculitis, intrasellar mass, focal neurological defects, stroke, intramedullary or extramedullary spinal mass, quadriplegia, pseudobulbar palsy, spinal subarachnoid infection or encephalitis.
In humans, cysticerci are more frequently located in the ventricles and subarachnoid space at the base of the brain, while in pigs, cysticerci are more frequently found in the parenchyma.
Parenchymal infestation and epilepsy are most common among children, while ventricular cysts with blockage of cerebrospinal fluid predominates among adults.
There is evidence suggesting a relationship between neurocysticercosis and the subsequent development of brain tumors.

Cysticercosis of the eyes:
The eyes are infested in 15% to 45% of patients, usually presenting as a cyst in the vitreous cavity, less commonly the anterior chamber.
The first ophthalmologic signs of cysticercosis are papilledema, pupillary abnormalities, or nystagmus.
Cysticercosis of the extraocular muscles is associated with limitation of eye movement, ptosis, proptosis and local mass.

This disease is endemic or potentially endemic to all countries.
Cysticercosis in Haiti

Seroprevalence surveys:
2.8% in Port au Prince (2007) 97

References

12. Diagn Cytopathol 2014 Mar 8;
29. BMJ Case Rep 2014 ;2014
35. Abdom Imaging 2014 May 8;
44. BMJ Case Rep 2014 ;2014
74. BMJ Case Rep 2012 ;2012
91. Strabismus 2008 Jul-Sep;16(3):97-106.
**Cytomegalovirus infection**

**Agent**
VIRUS - DNA. Herpesviridae, Betaherpesvirinae: Human herpesvirus 5 (Cytomegalovirus)

**Reservoir**
Human

**Vector**
None

**Vehicle**
Droplet (respiratory) Urine Dairy products Tears Stool Sexual contact (rare) Transplacental

**Incubation Period**
3w - 5w (range 2w - 12w)

**Diagnostic Tests**
Viral culture (blood, CSF, urine, tissue). Serology. Direct viral microscopy. Nucleic acid amplification

**Typical Adult Therapy**
[Most cases self-limited]. Ganciclovir 5 mg/kg q12h IV X 2 to 3w. OR Foscarnet 90 mg/kg Q12h IV OR Cidofovir 5 mg/kg IV weekly

**Typical Pediatric Therapy**
[Most cases self-limited] Ganciclovir 5 mg/kg q12h IV X 2 to 3w

**Vaccine**
Cytomegalovirus immunoglobulin

**Clinical Hints**
Heterophile-negative "mononucleosis"; mild pharyngitis (without exudate); variable lymphadenopathy and splenomegaly; retinitis in AIDS patients; pneumonia in setting of immune suppression.

**Synonyms**
Cytomegalovirus, Zytomegalie.
ICD9: 078.5
ICD10: B25

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**Clinical**

Acute Cytomegalovirus infection is clinically similar to infectious mononucleosis (IM), and characterized by fever, generalized lymphadenopathy and hepatosplenomegaly.  

- In contrast to IM, pharyngitis is uncommon in Cytomegalovirus infection.
- Cytomegalovirus infection is often identified in cases of fatal myocarditis in immunocompetent patients.  
- Primary CMV infection may be associated with uveitis 3, retinitis or pneumonia 4, even in immunocompetent patients 5.  
- Additional manifestations of CMV infection may include prostatitis 7, cervicitis, vulvovaginitis 8, adrenal failure 9, protracted diarrhea 10, esophagitis 11, gastritis 12, duodenitis / enteritis 13 14, colitis with megacolon 15 16, appendicitis 17, colonic pseudotumor 18, or colonic polyposis 19, pancreatitis 20, myocarditis 21, rhabdomyolysis 22, and protein-losing gastropathy (Menterier’s disease). 23 
- Sexually-acquired Cytomegalovirus proctitis is characterized by rectal bleeding associated with a mononucleosis-like syndrome. 24 
- The clinical features of Cytomegalovirus colitis in AIDS patients may mimic those of amebic colitis 25 or Crohn’s disease. 27 
- Cases of pruritic maculo-papular exanthem due to CMV infection are reported among patients with AIDS. 28 
- Evidence for primary CMV infection is often present among infants hospitalized for wheezing. 29 
- Ocular infection may present as inflammatory ocular hypertensive syndrome (IOHS), corneal endothelitis 30, or retinitis with retinal necrosis. 31-33 
- Rare instances of splenic rupture 34 and erythema multiforme complicating Cytomegalovirus infection have been reported. 35 36 
- CMV / EBV co-infection may be associated with prolonged illness. 37

Severe or fatal multisystem disease occurs is encountered in congenital infection 38-43 and infection of immune-suppressed individuals. 44-47 
- Instances of pure red-cell aplasia 48, severe leukemoid reaction 49, and hemophagocytic syndrome have been reported. 50 
- Sensorineural hearing loss 51 is detected in 21% of asymptomatic and 33% of symptomatic congenital infections 52-57. A meta-analysis published in 2014 identified hearing loss in 12.6% of children with congenital CMV infection, and noted that CMV is responsible for 10% to 20% of hearing impairment among children. 58 
- Residual neurological damage including epilepsy is common among infants with congenital infection. 59 
- Rare instances of persistent pulmonary hypertension have been reported in infants with congenital infection. 60
Immunocompetent persons may also develop major complications: cerebral sinus thrombosis, peripheral venous thrombosis, mesenteric venous thrombosis, portal vein thrombosis, colitis, prostatitis, appendicitis, hemolytic anemia, hemorrhagic lymphohistiocytosis, rhabdomyolysis, and cholecytitis.

This disease is endemic or potentially endemic to all countries.

References

3. Medicine (Baltimore) 2008 May;87(3):167-76.
10. An Pediatr (Barc) 2009 Jun ;70(6):582-5.
22. Transpl Infect Dis 2014 Sep 24;
49. J Pediatri Hematol Oncol 2013 Sep 25;
82. BMC Gastroenterol 2006 ;6:10.
90. J Mal Vasc 2014 Apr 4;
99. Transpl Infect Dis 2014 Sep 24;
Dengue

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>VIRUS - RNA. Flaviviridae, Flavivirus: Dengue virus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human, Mosquito, Monkey (in Malaysia and Africa)</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>Mosquito - Stegomyia (Aedes) aegypti, S. albopictus, S. polynesiensis, S. scutellaris</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Blood (rare)</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>5d - 8d (range 2d - 15d)</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Supportive; IV fluids to maintain blood pressure and reverse hemoconcentration</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Headache, myalgia, arthralgia, relative bradycardia, leukopenia and macular rash; dengue hemorrhagic (DHF) = dengue + thrombocytopenia and hemoconcentration; dengue shock = DHF + hypotension.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Bouquet fever, Break-bone fever, Dandy fever, Date fever, Dengue Fieber, Duengero, Giraffe fever, Petechial fever, Polka fever.</td>
</tr>
</tbody>
</table>

WHO Case definitions for surveillance:

1. **DENGUE FEVER**:
   - Clinical description
     - An acute febrile illness of 2-7 days duration with 2 or more of the following: headache, retro-orbital pain, myalgia, arthralgia (as many as 41% of cases), rash, hemorrhagic manifestations, leucopenia.
   - Laboratory criteria for diagnosis
     - One or more of the following:
       - Isolation of dengue virus from serum, plasma, leukocytes, or autopsy samples
       - Demonstration of a fourfold or greater change in reciprocal IgG or IgM antibody titers to one or more dengue virus antigens in paired serum samples
       - Demonstration of dengue virus antigen in autopsy tissue by immunohistochemistry or immunofluorescence or in serum samples by EIA
       - Detection of viral genomic sequences in autopsy tissue, serum or CSF samples by polymerase chain reaction (PCR)
   - Case classification
     - Suspected: A case compatible with the clinical description.
     - Probable: A case compatible with the clinical description with one or more of the following:
       - Supportive serology (reciprocal hemagglutination-inhibition antibody titer >1280, comparable IgG EIA titer or positive IgM antibody test in late acute or convalescent-phase serum specimen).
       - Occurrence at same location and time as other confirmed cases of dengue fever.
     - Confirmed: A case compatible with the clinical description, laboratory confirmed.

2. **DENGUE HEMORRHAGIC FEVER**:
   - A probable or confirmed case of dengue and hemorrhagic tendencies evidenced by one or more of the following:
     - Positive tourniquet test (sensitivity questioned • see reference 2
     - Petechiae, ecchymoses or purpur
     - Bleeding: mucosa, gastrointestinal tract, injection sites or other
     - Hematemesis or melena
     - And thrombocytopenia (100 000 cells or less per mm3)
     - And evidence of plasma leakage due to increased vascular permeability, manifested by one or more of the following:
       - 20% rise in average hematocrit for age and sex
       - 20% drop in hematocrit following volume replacement treatment compared to baseline
     - Signs of plasma leakage (pleural effusion, ascites, hypoproteinemia)

3. **DENGUE SHOCK SYNDROME**:
   - All the above criteria, plus evidence of circulatory failure manifested by rapid and weak pulse, and narrow pulse pressure (≤20 mm Hg) or hypotension for age, cold, clammy skin and altered mental status.

CDC case definition:
For surveillance purposes, the U.S. Centers for Disease Control (CDC) case definition of dengue fever consists of "acute febrile illness characterized by frontal headache, retro-ocular pain, muscle and joint pain, and rash."

- The initial fever rises rapidly and lasts for two to seven days.
- Occasionally "saddleback" fever pattern is evident, with a drop after a few days and rebound within 24 hours. Relative bradycardia is common.
- Conjunctival injection and pharyngeal inflammation may occur as well as lymphadenopathy.
- Rash occurs in up to 50 percent of patients, either early in the illness with flushing or mottling, or between the 2nd to the 6th day as a scarlatiniform or maculopapular rash that usually spreads centrifugally.
- The later rash usually lasts for two to three days.
- Diffuse erythema and late desquamation of hands and feet may be confused with toxic shock syndrome.
- As fever drops, petechiae may be seen.
- Additional manifestations of dengue may include post-dengue depression, acalculous cholecystitis, uveitis, retinitis and psychological depression.

**Additional clinical features:**

- The likelihood of encountering classic clinical findings of dengue fever increases with patient age.
- The rash of dengue may be mistaken for measles or rubella.
- A long time interval between attacks of dengue may actually increase the risk of dengue hemorrhagic fever.
- Rare instances of encephalopathy or encephalitis, seizures, splenic rupture, pancreatitis, myocarditis, pericarditis, hemophagocytic lymphohistiocytosis and aplastic anemia have been reported.
- Hepatic dysfunction is often encountered; however, overt hepatitis is less common, and over liver failure is rare.
- Retinal involvement may manifest as foveolitis, which can be diagnosed by funduscopy and optical coherence tomography.
- Prolonged post-dengue fatigue is common.
- Renal failure is associated with increased mortality rates in dengue.
- Risk factors for fatal dengue hemorrhagic fever among elderly patients in include male sex, chronic obstructive pulmonary disease, dengue shock syndrome and acute renal failure.

The diagnosis of Dengue Hemorrhagic Fever (DHF) is defined by:

- thrombocytopenia (<100,000/mm3)
- evidence of plasma leakage (hematocrit increased by at least 20%) or other objective evidence of increased capillary permeability
- Dengue Shock Syndrome (DSS) consists of DHF in addition to hypotension or narrow pulse pressure (less than 21 mm Hg).

Note that Leptospirosis, Zika, Crimean-Congo hemorrhagic fever and dengue are clinically similar, and may coexist in a given country. Fatal cases of leptospirosis / dengue co-infection are reported (2014 publication).

- Although the clinical features of dengue and chikungunya are similar, chikungunya patients are more likely to exhibit early myalgia or arthralgia; while sore throat, cough, nausea, vomiting, diarrhea, abdominal pain, anorexia, tachycardia and thrombocytopenia will favor a diagnosis of dengue.
- Dengue-Mayaro co-infection may occur in regions which are endemic for both diseases.
- Elevated levels of serum bilirubin or C-reactive protein favor a diagnosis of malaria rather than dengue.

This disease is endemic or potentially endemic to 145 countries.

**Dengue in Haiti**
Graph: Haiti. Dengue, cases

Notes:
1. No cases were officially reported during 1994 to 1996; but 185 cases were documented among children at a UN mission during this period; and 30 cases were confirmed among U.S. military personnel serving in this area during 1994.

Seroprevalence surveys:
- 43% of children ages 1 to 4 (1976 publication)
- 53% of infants below age 12 months, and 65% by age 36 months (2007)
- 3% of the general population during the 1990's

Dengue hemorrhagic fever was first reported on Haiti in 2000 (314 cases, 10 fatal).

Notable outbreaks:
- 2010 - An outbreak (16 clinical cases, 7 confirmed) of dengue was reported among American missionaries who had returned from Haiti.

References

Dermatophytosis

**Agent**

**Reservoir**
Human, Dog, Cat, Rabbit, Marsupial, Other mammal

**Vector**
None

**Vehicle**
Contaminated soil/flooring, Animal Contact

**Incubation Period**
2w - 38w

**Diagnostic Tests**
Fungal culture and microscopy of skin, hair or nails. Nucleic acid amplification.

**Typical Adult Therapy**
Skin - topical Clotrimazole, Miconazole, etc. Hair/nails - Terbinafine, Griseofulvin, Itraconazole or Fluconazole PO

**Typical Pediatric Therapy**
As for adult

**Clinical Hints**
Erythematous, circinate, scaling or dyschromic lesions of skin, hair or nails; pruritus, secondary infection and regional lymphadenopathy may be present.

**Synonyms**

ICD9: 110,111
ICD10: B35,B36

**Clinical**
Dermatophytosis is characterized by indolent infection of skin, hair or nails.  
Common findings include scaling, pruritis and discoloration • usually without overt signs of inflammation.

Tinea imbricata, a superficial mycosis caused by *Trichophyton concentricum*, an anthropophilic dermatophyte.
• The skin lesions are characteristically concentric and lamellar (imbricata: in Latin, tiled) plaques of scale.
• Predisposing conditions include humidity, inheritance, and immunologic factors.

Rare instances of mycetoma of the scalp due to *Microsporum canis* have been reported.

This disease is endemic or potentially endemic to all countries.

**Dermatophytosis in Haiti**
Although *Trichophyton tonsurans* had not been reported in Haiti until 1988, this species accounted for 63.6% of tinea capitis cases in Port-au-Prince in 2006.

**References**
**Dicrocoeliasis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Platyhelminthes, Trematoda. Plagiorchiida, Dicrocoeliidae: Dicrocoelium dendriticum and D. hospes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Sheep  Cattle  Pig  Goat  Snail  Ant</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Ingested ant</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of ova in stool, bile or duodenal aspirate.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Praziquantel 25 mg/kg PO TID X 1d (investigational)</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Abdominal pain, often accompanied by eosinophilia; follows inadvertent ingestion of ants (with raw vegetables or fruit) in sheep-raising areas.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Dicrocoelium dendriticum, Dicrocoelium hospes, Halzoun, Lancet liver fluke. ICD9: 121.8 ICD10: B66.2</td>
</tr>
</tbody>
</table>

**Clinical**

Human infection occurs after accidental ingestion of infected ants.  
- Spurious infections are more frequently observed and are the consequence of the ingestion of raw or undercooked animal liver. In Lebanon, this syndrome presents as severe allergic pharyngitis reported in Lebanon (Halzoun).  
- Symptoms and signs of hepato-biliary involvement are usually mild and limited to hepatomegaly, bloating and abdominal discomfort.  
- Eosinophilia is present during the early stages of infection.

This disease is endemic or potentially endemic to 40 countries. Although Dicrocoeliasis is not endemic to Haiti, imported, expatriate or other presentations of the disease have been associated with this country.

**Dicrocoeliasis in Haiti**

**Prevalence surveys:**

1.1% of sheep (2007 publication)

**References**

**Dientamoeba fragilis infection**

| Agent | PARASITE - Protozoa. Archezoa, Parabasala, Trichomonadea. Flagellate: Dientamoeba fragilis |
| Reservoir | Human Gorilla Pig |
| Vector | None |
| Vehicle | Fecal-oral (? on pinworm ova) |
| Incubation Period | 8d - 25d |
| Diagnostic Tests | Identification of trophozoites in stool. Nucleic acid amplification. Alert laboratory if this diagnosis is suspected. |
| Typical Adult Therapy | Stool precautions. **Iodoquinol** 650 mg PO TID X 20d. OR **Tetracycline** 500 mg QID X 10d. OR **Paromomycin** 10 mg/kg TID X 7d OR **Metronidazole** 750 mg PO TID X 10d |
| Typical Pediatric Therapy | Stool precautions. **Iodoquinol** 13 mg/kg PO TID X 20d. OR (age >8) **Tetracycline** 10 mg/kg QID X 10d OR **Paromomycin** 10 mg/kg TID X 7d OR **Metronidazole** 15 mg/kg PO TID X 10d |
| Clinical Hints | Abdominal pain with watery or mucous diarrhea; eosinophilia may be present; infestation may persist for more than one year. |

**Clinical**

Most infections are asymptomatic.
- Symptoms may include diarrhea, flatulence, abdominal pain, fatigue and anorexia; and may rarely mimic acute appendicitis. 1-3
- An etiological role for *Dientamoeba fragilis* among children with abdominal pain is not well established. 4
- Clinical features are similar to those of giardiasis; however, vomiting, anorexia and weight loss are less common in *Dientamoeba* infection. 5
- The presence of abdominal pain or diarrhea in a patient with enterobiasis should suggest the diagnosis of concurrent *Dientamoeba* infection. 6
- Eosinophilia if often associated with *Dientamoeba fragilis* infection. 7-11

**This disease is endemic or potentially endemic to all countries.**

**References**

4. Arch Dis Child 2014 Jul 22;
## Diphtheria

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. Corynebacterium diphtheriae A facultative gram-positive bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Droplet Contact Dairy products Clothing</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>2d - 5d (range 1d - 10d)</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Culture on special media. Advise laboratory when this diagnosis is suspected.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Respiratory isolation. Equine antitoxin 20,000 to 80,000 units IM. (first perform scratch test) Erythromycin 500 mg QID (or Penicillin preparation) X 14d</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>Respiratory isolation. Equine antitoxin 1,000 units/kg IM. (first perform scratch test) Erythromycin 10 mg/kg QID (or penicillin preparation) X 14d</td>
</tr>
<tr>
<td><strong>Vaccines</strong></td>
<td>Diphtheria antitoxin Diphtheria vaccine DTP vaccine DT vaccine DTaP vaccine Td vaccine</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Pharyngeal membrane with cervical edema and lymphadenopathy; or punched out skin ulcers with membrane; myocarditis or neuropathy (foot/wrist drop) appears weeks later.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Corynebacterium diphtheriae, Difteri, Difteria, Difterie, Difterite, Diphterie.</td>
</tr>
</tbody>
</table>

### WHO Case definition for surveillance:

**Clinical description:**
- An illness of the upper respiratory tract characterized by laryngitis or pharyngitis or tonsillitis, and adherent membranes of tonsils, pharynx and/or nose.

**Laboratory criteria for diagnosis:**
- Isolation of Corynebacterium diphtheriae from a clinical specimen.
- Note: A rise in serum antibody (fourfold or greater) is of interest only if both serum samples were obtained before administration of diphtheria toxoid or antitoxin. This is not usually the case in surveillance, where serological diagnosis of diphtheria is thus unlikely to be an issue.

**Case classification:**
- Suspected: Not applicable.
- Probable: A case that meets the clinical description.
- Confirmed: A probable case that is laboratory confirmed or linked epidemiologically to a laboratory confirmed case.

**Note:** Persons with positive C. diphtheriae cultures who do not meet the clinical description (i.e. asymptomatic carriers) should not be reported as probable or confirmed diphtheria cases.

### Faucaal diphtheria:

- Following an incubation period of 2 to 5 days (7 days after primary skin infection for cutaneous diphtheria), the patient presents with nonspecific symptom which may include fever and chills, malaise, sore throat, hoarseness or dysphagia, cervical edema and lymphadenopathy, rhinorrhea (mucopurulent or blood-tinged), cough, stridor, wheezing, nausea and vomiting and headache. 1
  - Respiratory diphtheria may progress rapidly to respiratory arrest from airway obstruction by a tracheobronchial pseudomembrane.
  - Tachycardia, pallor, and foul breath may be present.
  - The pseudomembrane is generally firm, adherent, thick, fibrinous and of a gray-brown color.
  - It may occur over the palate, pharynx, epiglottis, larynx, or trachea occasionally extending into the tracheobronchial tree.
  - The area may bleed if disturbed.
  - Marked edema of the tonsils, uvula, submandibular region and anterior neck (“bull neck”) may be observed and may be associated with thick speech, stridor, anterior cervical lymphadenopathy, and petechial hemorrhages.

### Cutaneous diphtheria:
Cutaneous diphtheria is associated with a history of a break in the skin, followed by pain, tenderness, erythema, or exudate.
• Lesions appear as punched-out ulcers with dirty gray membranes at their margins.
• Genital ulcers may be misdiagnosed as venereal disease.

Cardiac complications:
Cardiovascular signs ensue 1 to 2 weeks following the initial illness.
• Myocarditis occurs in as many as two thirds of patients, and approximately 20% develop cardiac dysfunction.
• Circulatory collapse, heart failure, atrioventricular blocks and arrhythmias may occur.
• Endocarditis and mycotic aneurysms also have been reported, typically in intravenous drug users.

Neurological complications:
Approximately 70% of patients with severe infection develop neuropathy, neuritis or motor paralysis 2 to 8 weeks following initial illness.
• Clinical and cerebrospinal fluid findings at this stage are indistinguishable from those Guillain-Barre syndrome.
• Potentially fatal paralysis of the diaphragm may ensue.
• Paralysis typically resolves completely with resolution of infection.

The neurological manifestations of diphtheria include:
• hypesthesia and paralysis of the soft palate
• weakness of the posterior pharyngeal, laryngeal, and facial nerves, resulting in a "nasal tone" to the voice, difficulty in swallowing, and occasionally aspiration
• cranial neuropathies, typically during the fifth week, leading to oculomotor and ciliary paralysis (strabismus, blurred vision, and loss of accommodation)
• symmetric polyneuropathy beginning within 10 days to 3 months after infection, and manifest as motor deficit with diminished deep tendon reflexes
• proximal muscle weakness of the extremities progressing distally (or distal weakness progressing proximally).

Other forms of diphtheria:
Other less common manifestations include infection of the genitourinary tract, gastrointestinal tract, vagina, external ear, and conjunctiva.
• Hemorrhagic conjunctivitis and dissolution of the cornea may occur.
• Focal necrosis of the kidneys, liver, and adrenal glands may be observed.
• Cases of septic arthritis, osteomyelitis, splenic abscesses, and bacteremia have been reported.

A rare case of diphtherial urethritis was acquired through orogenital contact.

This disease is endemic or potentially endemic to all countries.

Diphtheria in Haiti

Vaccine Schedule:
BCG - birth, 10, 14 weeks
DTwPHibHep - 6, 10, 14 weeks
MR - 9 months
OPV - birth; 6, 10, 14 weeks
Pneumo conj - from April 2015
Pneumo ps - from January 2015
Rotavirus - from April 2014
Td - 1st contact; +4 weeks; +6 months; +1, +1 years pregnant women
Notes:
Individual years:
2009 - A survey found that 92.0% of children ages 12 to 23 months had been immunized (DPT-1).  

Graph: Haiti. Diphtheria - WHO-UNICEF est. vaccine (DTP3 %) coverage

Graph: Haiti. Diphtheria, cases

Notes:
Individual years:
2007 - Included 14 fatal cases.
In 1990, a child in the United States died of diphtheria, following close contact with persons coming from Haiti. In 2003, a visitor from the United States died of diphtheria following a trip to Haiti.

**Notable outbreaks:**
- 2009 to 2010 - An outbreak (33 cases, 15 fatal) was reported.

**References**
10. ProMED <promedmail.org> archive: 20091030.3755
11. ProMED <promedmail.org> archive: 20091030.3755
12. ProMED <promedmail.org> archive: 20100519.1644
Diphyllobothriasis

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Platyhelminthes, Cestoda. Pseudophyllidea, Diphyllobothriidae: Diphyllobothrium latum, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human Dog Bear Fish-eating mammal</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Fresh-water fish - notably (for D. latum) perch, burbot and pike</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>4w - 6w (range 2w - 2y)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of ova or proglottids in feces.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Praziquantel 10 mg/kg PO as single dose OR Niclosamide 2 g PO once</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Praziquantel 10 mg/kg PO as single dose OR Niclosamide 50 mg/kg PO once</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Abdominal pain, diarrhea and flatulence; vitamin B12 deficiency is noted in 0.02% of patients; rare instances of intestinal obstruction have been described; worm may survive for decades in human intestine.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Bandwurmer [Diphyllobothrium], Bothriocephalus aequalongnathi, Bothriocephalus latus, Broad fish tapeworm, Diphyllobothrium latum, Diplogonoporiasis, Fish tapeworm. ICD9: 123.4 ICD10: B70.0</td>
</tr>
</tbody>
</table>

Clinical

Patients may experience abdominal pain, diarrhea, weight loss, asthenia or vertigo. Vitamin B-12 deficiency is described in cases of prolonged infestation by Diphyllobothrium latum (but not other Diphyllobothrium species). A single case of human infection by Bothriocephalus aequalongnathi was characterized by abdominal pain (French Guiana, 2013 publication).

This disease is endemic or potentially endemic to all countries.

References

**Dipylidiasis**

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Dipylidiidae: Dipylidium caninum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Dog, Cat</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Flea = Ctenocephalides spp. (by ingestion)</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>21d - 28d</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Identification of proglottids in feces.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Praziquantel 10 mg/kg PO as single dose OR Niclosamide 2 g PO once</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>Praziquantel 10 mg/kg PO as single dose OR Niclosamide 50 mg/kg PO once</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Diarrhea, abdominal distention and restlessness (in children); eosinophilia may be observed; proglottids may migrate out of anus.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Cucumber tapeworm, Dipylidium caninum, Dog tapeworm, Double-pored dog tapeworm. ICD9: 123.8 ICD10: B71.1</td>
</tr>
</tbody>
</table>

**Clinical**

Most infections with *Dipylidium caninum* are asymptomatic.
- Severe diarrhea, urticaria, fever and eosinophilia are occasionally encountered. ¹
- The principal sign (in animals and children) consists of the passage of proglottids on the perianal region, feces, diapers, or occasionally on floor covering and furniture.
- Infection has been reported in patients as young as four months ² to two years. ³
- Proglottids are motile when freshly passed and may be mistaken for maggots or fly larvae.

**This disease is endemic or potentially endemic to all countries.**

**References**

**Dirofilariasis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Nematoda. Phasmidea, Filariae: Dirofilaria (Nochtiella) immitis (pulmonary); D. tenuis &amp; D. repens (subcutaneous infection) &amp; D. ursi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Mammal  Dog  Wild carnivore (D. tenuis in raccoons; D. ursi in Bears)</td>
</tr>
<tr>
<td>Vector</td>
<td>Mosquito</td>
</tr>
<tr>
<td>Vehicle</td>
<td>None</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>60d - 90d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of parasite in tissue (ie, lung biopsy). Serologic tests available in some centers.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Not available; excision is often diagnostic and curative</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Most patients are asymptomatic; occasional instances of cough and chest pain, with solitary pulmonary coin lesion; or multiple tender subcutaneous nodules; eosinophilia usually not present.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Candidatus Dirofilaria hongkongensis, Dirofilariosis, Dirofilaria, Dog heartworm, Filaria conjunctivae, Loaina, Pelecitus. ICD9: 125.6  ICD10: B74.8</td>
</tr>
</tbody>
</table>

**Clinical**

Pulmonary infections usually present as a well-circumscribed coin lesion. 1
- Occasionally the lesions are transient or multiple. 2
- Symptoms such as chest pain, dyspnea, fever, cough and eosinophilia are present in only 50% of cases.
- Isolated infections have been reported in the mesentery, spermatic cord, epididymis 3, peritoneal cavity 4, anterior chamber of the eye 5, buccal mucosa 6, orbital muscles 7 and liver.
- Lesions may suggest malignancy 8, and coexistence of dirofilariasis and lung cancer has been reported. 9
- In rare cases pulmonary cavitation may occur 10

Skin and subcutaneous infections are caused by D. tenuis, D. repens 11, D. ursi, D. immitis and D. striata. Clinical manifestations are limited to a small (0.5 to 1.5 cm) discrete nodule which may appear on any area of the body. 12-16
- Local pain, inflammation, eosinophilia and a sensation of motion may be present in some cases.
- Rare instances of local nerve compression 17 and scrotal pseudotumor are reported. 18

A novel Dirofilaria species ("Candidatus Dirofilaria hongkongensis") has been identified as a cause of human (cervical lymphadenopathy, abdominal subcutaneous mass and subconjunctival nodule) and canine infection in Hong Kong. 19

**This disease is endemic or potentially endemic to 228 countries.**

**References**

Echinococcosis - unilocular

| Agent | PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: Echinococcus granulosus, Echinococcus canadensis |
| Reservoir | Dog  Wolf  Digo  Sheep  Horse  Pig |
| Vector | None |
| Vehicle | Soil  Dog  Feces  Fly |
| Incubation Period | 1y - 20y |
| Diagnostic Tests | Serology. Identification of parasite in surgical specimens. |
| Typical Adult Therapy | Albendazole 400 mg BID X 28d. Repeat X 3, with 2 week hiatus between cycles. Praziquantel has been used preoperatively to sterilize cyst. Follow by surgery as indicated. PAIR (puncture-aspiration-injection-reaspiration) is also used |
| Typical Pediatric Therapy | Albendazole 10 mg/kg/day X 28d. Repeat X 3, with 2 week hiatus between cycles. Praziquantel has been used preoperatively to sterilize cyst. Follow by surgery as indicated. PAIR (puncture-aspiration-injection-reaspiration) also used |
| Clinical Hints | Calcified hepatic cyst or mass lesions in lungs and other organs; brain and lung involvement are common in pediatric cases. |
| Synonyms | Echinococcus canadensis, Echinococcus granulosus, Echinococcus ortleppi, Hydatid cyst, Unilocular echinococcosis. |
| ICD9 | 122.0, 122.1, 122.2, 122.3, 122.4 |
| ICD10 | B67.0, B67.1, B67.2, B67.3, B67.4 |

Clinical

Symptoms are often absent, even when large cysts are present; and cysts are often discovered incidentally on a routine x-ray or ultrasound study.  

**Hepatic echinococcosis:**

**Hepatic echinococcosis** often presents as abdominal pain with or without a palpable mass in the right upper quadrant.  
- Biliary compression or rupture of the cysts into a bile duct may mimic cholecystitis or cholelithiasis.  
- Ductal compression may also result in pancreatitis.  
- Leakage from a cyst may produce fever, pruritis, urticaria, eosinophilia or even anaphylactic shock.  

**Pulmonary echinococcosis:**

**Pulmonary cysts** may rupture into the bronchial tree and produce cough, hemoptysis and chest pain.  
- Rupture of cysts may disseminate protoscolices to contiguous organs or into the vascular system, resulting in the formation of additional cysts.  
- Late intrathoracic complications include intrapulmonary or pleural rupture, infection of the ruptured cysts, reactions of the adjacent tissues, thoracic wall invasion and iatrogenic involvement of pleura.  
- Rupture can occur spontaneously or as a result of trauma or surgery.  
- Anaphylaxis may follow cyst rupture, but has also reported in patients with intact cysts. In rare cases, anaphylactic shock (eg, following blunt trauma) may be the initial presenting feature of echinococcosis.  
- Secondary colonization of hydatid cysts by Aspergillus has been reported.  

**Echinococcosis of other organs:**

In contrast to hepatic echinococcosis, extrahepatic cysts are often non-calcified and may at times be mistaken for malignancy.  
- **Extra-hepatic echinococcosis** presents as space-occupying lesions of brain, lung, pleura, thorax, bone (spine in 45% of the latter), muscles, joints, parapharyngeal spaces, or paranasal sinuses, heart and heart valves, pericardium, breast, subcutaneous tissue, abdominal wall, axilla, supraclavicular region, peripheral nerves, thyroid, orbits, parotid gland, spleen, pancreas, adrenals, kidneys, urinary bladder, peritoneum / mesentry / omentum, appendix, retroperitoneal region, uterus, Fallopian tubes and ovaries, or virtually any other organ.  
- The brain is involved in 1 to 2% of all Echinococcus granulosus infections.
• The spleen is involved in 0.5% to 6.0% of abdominal infections. 151
• The clinical features of cerebral coenurosis may mimic those of echinococcosis. 152
• Primary spinal hydatidosis occurs in 1% of cases and may be confused with space-occupying non-infectious disorders 153-157

Primary superinfection of cysts by bacteria or fungi occurs in approximately 7.3% of cases. 158

This disease is endemic or potentially endemic to 155 countries. Although Echinococcosis - unilocular is not endemic to Haiti, imported, expatriate or other presentations of the disease have been associated with this country.

Echinococcosis - unilocular in Haiti

Prevalence surveys:
25% of dogs, 5.2% of pigs, 2.1% of sheep, 0.9% of goats and 0.3% of cattle (2007 publication) 159

References

108. BMJ Case Rep 2014;2014
124. BMJ Case Rep 2012;2012
127. BMJ Case Rep 2013;2013
Endocarditis - infectious

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM OR FUNGUS. viridans streptococci, Staphylococcus aureus, enterococci, Candida albicans, et al.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Blood culture, clinical findings, ultrasonography of heart valves.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Bactericidal antibiotic appropriate to species</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Consider in any patient with fever, multisystem disease (i.e., skin lesions, hematuria, neurological symptoms, single or multiple abscesses or bone, brain, lung, etc) and a preexisting cardiac valvular lesion.</td>
</tr>
</tbody>
</table>

**Clinical**

The definitive diagnosis of infective endocarditis requires: 1, 2

1) Demonstration of microorganisms; and/or histological lesions in the heart or heart valves; or
2) Presence of two major criteria; or 1 major and 3 minor criteria; or 5 minor criteria, as follows:

**Major Criteria:**
A. Culture:
   • 1. Typical microorganisms (HACEK, Streptococcus viridans, Streptococcus bovis) in 2 separate blood cultures; or community acquired Staphylococcus aureus or enterococcus without obvious focus.
   • 2. Persistently positive blood cultures (drawn more than 12 hours apart; or three positive cultures at least one hour apart).
B. Evidence of endocardial or valvular involvement (echocardiogram, abscess, new valvular regurgitant lesion)

**Minor Criteria:**
A. Predisposition (heart condition, drug abuse)
B. Fever
C. Embolic phenomena, mycotic aneurysm, Janeway lesion, or intracranial hemorrhage.
D. Immunological phenomena (Osler nodes, positive rheumatoid factor)
E. Echocardiogram with suggestive, but not specific findings.
F. Positive blood culture, but not meeting Major criteria.

**Etiological associations:**
• Injecting drug user: Staphylococcus aureus, enterococci, Enterobacteriaceae, Pseudomonas aeruginosa, Candida
• Prosthetic valve: Staphylococcus epidermidis Enterobacteriaceae, Candida, Aspergillus
• Rheumatic or other valvular disease: viridans Streptococci, enterococci
• "Culture negative" endocarditis: Coxiella burnetii, Bartonella spp., Tropheryma whippell, et al.

This disease is endemic or potentially endemic to all countries.

**References**
**Entamoeba polecki infection**

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Protozoa. Sarcomastigota, Entamoebidea: Entamoeba polecki</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Pig, Monkey</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Contaminated food</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of cysts in stool.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Metronidazole 750 mg PO TID X 10d (investigational)</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Metronidazole 15 mg/kg TID X 10d (investigational)</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Mucoid diarrhea and abdominal pain; severe disease is unusual and should suggest another etiology.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Entamoeba chattoni. ICD9: 007.8 ICD10: A07.8</td>
</tr>
</tbody>
</table>

**Clinical**

Most infections are mild or subclinical.

Symptoms may include mucoid diarrhea and abdominal pain.\(^1\)

This disease is endemic or potentially endemic to 16 countries.

**Entamoeba polecki infection in Haiti**

*Entamoeba polecki* infection was first reported from Haiti in 2006, among HIV-infected persons.\(^2\)

**References**

Enterobiasis

Agent | PARASITE - Nematoda. Phasmidea: Enterobius vermicularis
Reservoir | Human
Vector | None
Vehicle | Fecal-oral, Air, Clothing, Sexual contact (rare)
Incubation Period | 14d - 42d
Diagnostic Tests | Apply scotch tape to anal verge in a.m. & paste onto glass slide for microscopy.
Typical Adult Therapy | Albendazole 400 mg PO as single dose - repeat in 2w. OR Mebendazole 100 mg PO as single dose - repeat in 2w. OR Pyrantel pamoate 11 mg/kg (max 1g) PO as single dose; OR
Typical Pediatric Therapy | Mebendazole 100 mg PO as single dose (>age 2) - repeat in 2w. OR Pyrantel pamoate 11 mg/kg (max 1g) PO X 1
Clinical Hints | Nocturnal anal pruritus; occasionally vaginitis or abdominal pain; eosinophilia is rarely, if ever, encountered.
Synonyms | Enterobio, Enterobius vermicularis, Oxyuriasis, Oxyuris, Pinworm, Seatworm.
ICD9: 127.4
ICD10: B80

Clinical

The typical manifestation of enterobiasis is nocturnal pruritus ani related to hypersensitivity to worm antigens.

- Local dermal "tingling" is also encountered. ¹
- Migration of adult females to the vulva may result in vaginal pain ² and vulvovaginitis ³, or predispose to urinary tract infection.
- Eosinophilia is occasionally present.

Complications are rare, and include salpingitis ⁴-⁶, oophoritis ⁷, cystitis ⁸, peritonitis ⁹-¹², hepatitis, colonic or anal granuloma ¹³ ¹⁴, urethritis ¹⁵, prostatitis ¹⁶ and Bartholin gland abscess. ¹⁷
- Although abdominal symptoms may mimic those of appendicitis, Enterobius is at least as common in normal as in inflamed appendices. ¹⁸-²³
- Symptoms and mucosal lesions suggestive of Crohn's colitis have been reported in a patient with enterobiasis. ²⁴
- Adults and ova of Enterobius have been identified in the kidneys ²⁵ ²⁶ and eyes ²⁷ of infested patients.

The presence of diarrhea or abdominal pain suggests coinfection with Dientamoeba fragilis.

This disease is endemic or potentially endemic to all countries.

References

5. J Clin Microbiol 2014 Jul 2;
Enterovirus infection

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA. Picornaviridae: Coxsackievirus, ECHO virus, Enterovirus, Parechovirus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Droplet Fecal-oral</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2d-7d</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive. Pleconaril 200 to 400 mg PO TID X 7d has been used for severe infections</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Supportive. Pleconaril 5 mg/kg PO BID has been used for severe infections</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Summer-to-autumn sore throat; occasionally chest pain, macular or vesicular rash, meningitis, myopericarditis, etc.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Boston exanthem [Coxsackie. A 16], Coxsackie, Coxsackievirus, ECHO, Echovirus, Enteroviruses, Hand, foot and mouth disease, Hand-foot-and-mouth disease, Herpangina [Coxsackievirus A], HEV 68, HPeVs, Human Enterovirus 68, Human Parechovirus, Ljungan virus, Myocarditis, enteroviral, Parechovirus, Pericarditis, enteroviral. ICD9: 049,079.2,008.67,074.0,074.8,074.3,070.4,078.89 ICD10: A88.0,A87.0,B08.4,B08.5,B08.8,B30.3,B34.1</td>
</tr>
</tbody>
</table>

Clinical

The various enteroviruses are associated with fever and pharyngitis, which may be followed by appearance of: 1 2
- rash
- aseptic meningitis
- encephalitis 3
- acute disseminated encephalomyelitis 4
- epidemic conjunctivitis
- herpangina
- hand-foot-and-mouth disease
- myocarditis
- pericarditis
- pleurodynia
- pneumonia
- acute flaccid paralysis 5-9
- conjunctivitis, etc

Hand, foot and mouth disease (HFM) is characterized by a prodrome of fever and sore throat, followed by the appearance of vesicles on the palm and plantar regions, and oral mucosa.
- Vesicles in the mouth are often pleomorphic, with rectangular and triangular shapes.
- Most patients with HFM disease have additional skin lesions on sites other than the hands, feet and mouth. 10
- Hand foot and mouth disease has been associated with onychomadesis • complete nail shedding from the proximal portion, affecting both fingernails and toenails. 11-20
- HFM due to Enterovirus 71 is often complicated by central nervous system disease and sequelae. 21-48
- In some cases, HFM may present as a more extensive vesiculobullous and erosive eruption ("Eczema coxsakium") 49
- Coxsackievirus A6 infection may produce widespread blistering mucocutaneous reactions suggestive of Stevens Johnson syndrome. 50

The clinical features of Enterovirus infection among neonates and infants are similar to those of Parechovirus infection. 51

Human Enterovirus D68 infection is associated with respiratory illness ranging from relatively mild illness that did not require hospitalization to severe illness requiring intensive care and mechanical ventilation. Acute flaccid paralysis is also encountered. 52-54, and some infections have been fatal. 55 56

Echoviruses 22 and 23 have been reclassified as human parechovirus (HPeV) 1 and 2, respectively. 57
- Parechovirus infections have been associated with respiratory and gastrointestinal disease 58 59, epidemic myalgia 60 61
and rarely meningitis, encephalitis, myocarditis and acute flaccid paralysis. HPeV2 is usually associated with gastrointestinal illness. HPeV3 has been associated with transient paralysis, sepsis-like syndromes, or myalgia with muscle weakness. In one outbreak, infants with HPeV3 infection exhibited a high rate of severe sepsis-like syndrome. HPeV4 has been associated with fever in a neonate. HPeV6 (NII561-2000) has been associated with infectious gastroenteritis, fever with rash, upper respiratory infection and Reye’s syndrome.

This disease is endemic or potentially endemic to all countries.

References

8. ProMED <promedmail.org> archive: 20140930.2819618
9. ProMED <promedmail.org> archive: 20140930.2818951
13. Euro Surveill 2008 Jul 3;13(27)
15. Euro Surveill 2010 Sep 16;15(37)
16. Euro Surveill 2010 Sep 16;15(37)
17. An Pediatr (Barc) 2014 Jul;11;
18. ProMED <promedmail.org> archive: 20100916.3356
19. ProMED <promedmail.org> archive: 20100921.3401
20. ProMED <promedmail.org> archive: 20100922.3421
39. ProMED <promedmail.org> archive: 20060305.0712
40. ProMED <promedmail.org> archive: 20060313.0792
41. ProMED <promedmail.org> archive: 20060319.0854
42. ProMED <promedmail.org> archive: 20060406.1035
43. ProMED <promedmail.org> archive: 20100329.0985
44. ProMED <promedmail.org> archive: 20100412.1184
45. ProMED <promedmail.org> archive: 20100416.1235
46. ProMED <promedmail.org> archive: 20100507.1489
47. ProMED <promedmail.org> archive: 20100625.2121
52. ProMED <promedmail.org> archive: 20140930.2819618
53. ProMED <promedmail.org> archive: 20140930.2818951
54. ProMED <promedmail.org> archive: 20141002.2826111
56. ProMED <promedmail.org> archive: 20110929.2945
62. Ugeskr Laeger 2014 Mar 10;176(118)
Epidural abscess

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Staphylococcus aureus</em>, facultative gram negative bacilli, etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Imaging (CT scan, MRI). Gram-stain and culture of blood or pus.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Intravenous antibiotic(s) appropriate to identified or suspected pathogens. Drainage as indicated</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Intravenous antibiotic(s) appropriate to identified or suspected pathogen. Drainage as indicated</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Frontal bone abscess; or spinal cord compression with signs of infection - often in setting of injecting drug abuse or preexisting staphylococcal infection.</td>
</tr>
<tr>
<td>Synonyms</td>
<td></td>
</tr>
</tbody>
</table>

**Clinical**

**Intracranial epidural abscesses:**
Intracranial epidural abscesses may appear gradually, with initial findings suggestive of the underlying sinusitis or otitis.  
- Early findings include local pain followed by generalized headache, often with alteration of mental status.
- Focal neurological signs and focal or generalized seizures appear, which reflect the local anatomy of the lesion:
  - abscess near the petrous bone may involve cranial nerves V and VI, with unilateral facial pain and lateral rectus weakness (Gradenigo's syndrome)
  - an occipital epidural abscess may obstruct the superior sagittal sinus
  - Eventually, papilledema and other signs of elevated intracranial pressure develop.
- Extension into the subdural space is accompanied by rapid neurological deterioration.

**Spinal epidural abscess:**
Spinal epidural abscess is more common in men than in women and may occur at any age.  
- The presentation may be acute or gradual, over several months.
- Most begin with focal vertebral pain, which begins to radiate along the course of involved nerve roots.
- Signs of spinal cord compression (long-tract findings), later progress to paralysis below the level of the lesion.
- Hematogenous infection of the epidural space produces rapid progression with prominent systemic signs, and severe local pain.
- Chronic abscesses may mimic epidural neoplasia, often without systemic signs of infection.
- Cervical abscesses may compromise respiration, and produce rapid evolving flaccid hyporeflexia, suggestive of Guillain-Barre syndrome.
- Epidural abscess has occasionally been reported as a complication of pyomyositis.

**This disease is endemic or potentially endemic to all countries.**

**References**

Erysipelas or Cellulitis

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Erysipelas: <em>Streptococcus pyogenes</em> Cellulitis: <em>Staphylococcus aureus</em>, <em>Streptococcus pyogenes</em>, occasionally others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1d - 7d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Clinical diagnosis is usually sufficient. Aspiration of lesion for smear and culture may be helpful in some cases.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Antibiotic directed at likely pathogens (Group A Streptococcus and Staphylococcus aureus)</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Erysipelas is well-circumscribed, tender, edematous (peau d'orange), warm and painful; cellulitis is less painful, flat and without a distinct border.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Cellulite, Cellulitis, Celulite, Cellulitis, Erisipela, Erysipelas, St. Anthony's fire (erysipelas), St. Francis' fire (erysipelas), Zellulitis. ICD9: 035,681,682 ICD10: A46,L03</td>
</tr>
</tbody>
</table>

Clinical

**Erysipelas:**

Erysipelas is characterized by abrupt onset of “fiery-red” superficial swelling of the face or extremities. ¹
- The lesion is typically recognized by the presence of well-defined indurated margins, particularly along the nasolabial fold; rapid progression; and intense pain. ²
- Flaccid bullae may develop on the second or third day of illness; but extension to deeper soft tissues is rare.
- Desquamation occurs between the fifth and tenth days of illness.

**Cellulitis:**

Cellulitis is characterized by local pain, erythema, swelling, and heat. ³ ⁴
- Cellulitis may be caused by any of a wide variety of bacteria or yeasts; however, *S. aureus* or *S. pyogenes* are most often implicated.
- A history of preceding trauma, insect bite, needle insertion or surgery is often present.
- Cultures of biopsy specimens or aspirates are positive in only 20% of cases.
- Infection by *S. aureus* often spreads out from a localized infection (abscess, folliculitis) or foreign body
- Streptococcal cellulitis tends to be more diffuse and rapid in onset, and associated with lymphangitis and fever.
- Streptococci also cause recurrent cellulitis in the setting of lymphedema resulting from elephantiasis or lymph node damage.

Recurrent staphylococcal cutaneous infections are encountered in patients with "Job's syndrome" (eosinophilia and elevated serum levels of IgE); and nasal carriers of staphylococci.

This disease is endemic or potentially endemic to all countries.

**References**

# Erysipeloid

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Erysipelothrix rhusiopathiae</em> A facultative gram-positive bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Mammal  Bird  Fish</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Contact with meat, mammal, poultry or fish</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1d - 4d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Oral therapy for 10 days: Penicillin V, Ampicillin, third-generation cephalosporin, Fluoroquinolone (Levofloxacin, Trovafoxacin, Pefloxacin, Sparfloxacin or Moxifloxacin), Erythromycin, Clindamycin or Tetracycline are generally adequate</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Oral therapy for 10 days: Penicillin V, Ampicillin, third-generation cephalosporin or Erythromycin, Clindamycin are generally adequate</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Annular erythema or &quot;target lesion&quot; on hand following contact with raw animal or fish products; local pain and swelling; no discharge is noted and fever is present in only 10% of cases.</td>
</tr>
</tbody>
</table>
| Synonyms | Erysipelothrix rhusiopathiae, Rutlauf.  
ICD9: 027.1  
ICD10: A26 |

## Clinical

Erysipeloid is generally limited to the skin (mainly hands and fingers)

Infection is characterized by pain, edema and purplish erythema with sharp irregular margins which extends peripherally but clears centrally.  
- Relapses and extensions of the lesions to distant areas are common, but there is no fever.  
- There is no permanent immunity following an attack.  
- Lesions of cutaneous leishmaniasis may mimic those of erysipeloid.  

### Complications:
- 31 cases of endocarditis due to *Erysipelothrix rhusiopathiae* had been reported to 1976; and approximately 50 to 1988.  
- Rarely-reported complications have included chronic granulomatosis cheilitis, peritonitis associated with peritoneal dialysis, bacteremia, pneumonia and spinal infection with epidural empyema.

This disease is endemic or potentially endemic to all countries.

## References

Erythrasma

Agent: BACTERIUM. Corynebacterium minutissimum A facultative gram-positive bacillus

Reservoir: Human

Vector: None

Vehicle: Indigenous flora

Incubation Period: Unknown

Diagnostic Tests: Coral fluorescence of skin lesion under Wood’s lamp. Culture (alert lab regarding diagnosis).

Typical Adult Therapy: Erythromycin 250 mg PO QID X 14d. Topical Clindamycin 2% and topical Fusidic acid have also been used

Typical Pediatric Therapy: Erythromycin 10 mg/kg PO QID X 14d. Topical Clindamycin 2% and topical Fusidic acid have also been used

Clinical Hints: Pruritic, scaling, slowly-progressive red-brown patch; usually in groin - occasionally in toe webs; common in obese or diabetic males; coral fluorescence with Wood’s light.

Synonyms: Corynebacterium minutissimum, Eritrasma.

ICD9: 039.0
ICD10: L08.1

Clinical

Erythrasma is characterized by slowly spreading, reddish-brown, pruritic patches usually in the groin and axillae. 1

- Other areas include the interdigital regions of the feet 2, the vulva 3 and intergluteal and crural folds.
- Most patients are obese, male diabetics. 4-6
- The lesions fluoresce red when exposed to Wood’s lamp. 7-10
- The differential diagnosis of erythrasma includes psoriasis, dermatophytosis, candidiasis and intertrigo.

The etiologic agent of erythrasma, Corynebacterium minutissimum, has also been associated with bacteremia 11-14, meningitis 15, breast abscess 16, eye infection 17, endocarditis 18 19, peritonitis 20, cutaneous granulomas 21, costochondral abscess 22, puerperal infection 23 and pyelonephritis. 24 25

This disease is endemic or potentially endemic to all countries.

References

7. AMA Arch Derm Syphilol 1952 May ;65(5):614-5.
**Clinical**

**Enterotoxigenic Escherichia coli (ETEC)** infection is characterized by a short incubation period, and watery diarrhea without blood or mucus.

- Fever and vomiting occur in a minority of patients.  
- The disease may be life-threatening in infants.

**Enteropathogenic E. coli (EPEC)** causes watery diarrhea with fever and vomiting, primarily among children under age 2 years.

**Enteroinvasive E. coli (EIEC)** causes watery diarrhea; only a minority of patients experience dysentery.

**Enterohemorrhagic E. coli (EHEC)** causes diarrhea without fever, often with blood and cramps at all ages.  
- Rare instances of toxic megacolon have been reported  
- One strain of EHEC, O157:H7 is an important cause of hemolytic-uremic syndrome (HUS).  
- Approximately 6% to 10% of patients infected by this strain develop HUS  
- with an overall mortality rate of 0.6% for STEC O157 infections and 4.6% for HUS.  
- Nearly 40% of patients with STEC-HUS require at least temporary renal replacement therapy and up to 20% will have permanent residual kidney dysfunction.  
- Hemolytic-uremic syndrome can also follow infection by *Clostridium difficile* and by non-O157 strains of *E. coli*.  
- Reactive arthritis is reported in 10% of cases

**Enteroaggregative E. coli (EAggEC)** causes watery, persistent diarrhea (over 2 weeks) without vomiting.

- Low-grade fever may be observed, and gross blood may occasionally be present in stools.

*This disease is endemic or potentially endemic to all countries.*
Escherichia coli diarrhea in Haiti

Notable outbreaks:

1976 - An outbreak (386 cases) of diarrhea due to Salmonella, Vibrio, Shigella, ETEC and EIEC was reported among passengers of a cruise ship following a visit to Port au Prince.  

References

# Fascioliasis

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th><strong>PARASITE - Platyhelminthes, Trematoda. Echinostomatida, Fasciolidae: Fasciola hepatica or Fasciola gigantica</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td><strong>Sheep  Cattle  Snail  (Lymnaea, Galba, Fossaria)</strong></td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td><strong>None</strong></td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td><strong>Food  Aquatic plants  Watercress (Nasturtium officinale)</strong></td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td><strong>2w - 3m</strong></td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td><strong>Identification of ova in stool or duodenal aspirates (adult parasite in tissue). Serology. PCR. CT scan.</strong></td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td><strong>Triclabendazole 10 mg/kg PO X 2 doses. OR Bithionol 50 mg/kg every other day X 10 doses OR Nitazoxanide 500 mg PO BID X 7d</strong></td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td><strong>Triclabendazole 10 mg/kg PO X 2 doses. OR Bithionol 50 mg/kg every other day X 10 doses OR Nitazoxanide: Age 1 to 3y 100 mg BID X 7 d Age 4 to 11y 200 mg BID X 7d</strong></td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td><strong>Fever, hepatomegaly, cholangitis, jaundice and eosinophilia; urticaria occasionally observed during the acute illness; parasite may survive more than 10 years in the biliary tract.</strong></td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td><strong>Eurytrema, Fasciola gigantica, Fasciola hepatica, Hepatic distomiasis, Lederegelbefall, Sheep liver fluke. ICD9: 121.3 ICD10: B663.</strong></td>
</tr>
</tbody>
</table>

## Clinical

The presence and severity of fascioliasis depend on the intensity of infection and the host.

Symptoms may appear a few days after ingestion of larvae, when the immature worms reach the abdominal cavity and begin migrating across or within the liver. 
- Typical early symptoms include fever, abdominal pain, gastrointestinal disturbances and urticaria. 
- Hepatomegaly, anemia and jaundice may also be present.
- Creeping eruption has been reported.
- Rare instance of ectopic adult worms and ova are reported 4-9

A latent phase follows during which the only finding is prominent eosinophilia.
- Eventually, the patient enters a chronic phase characterized by biliary colic 10, epigastric pain 11, jaundice, hepatomegaly and abdominal tenderness. 12 13
- Sporadic cases of liver abscess 14, ectopic worms in the brain or orbits 15, systemic vasculitis 16, pancreatitis 17-22 and hepatic pseudotumor are reported. 23

This disease is endemic or potentially endemic to 102 countries.

## Fascioliasis in Haiti

**Prevalence surveys:**
10.7% to 22.78% of livestock, 3.2% of sheep and 0.9% of goats (2007 publication) 24

**Seroprevalence surveys:**
6.5% of healthy adults in Port-au-Prince (2011 publication) 25

## References

**Clinical**

**WHO Case definition for surveillance:**

Clinical case definition

- Hydrocoele or lymphedema in a resident of an endemic area for which other causes of these findings have been excluded.

Laboratory criteria for diagnosis

- Microfilaria positive, antigen positive or biopsy positive.

Case classification

- Suspected: Not applicable.
- Probable: A case that meets the clinical case definition.
- Confirmed: A person with laboratory confirmation even if he/she does not meet the clinical case definition.

Clinical manifestations reflect either acute inflammation or lymphatic obstruction.  

- Repeated episodes of lymphangitis, lymphadenitis, fever, headache, backache and nausea may occur; and arthritis, funiculitis, epididymitis, or orchitis are common.
- In long-standing cases lymphedema or persistent adenopathy may develop.
- Hydrocoele is the most common clinical manifestation of lymphatic filariasis, and causes sexual disability.
- Hydrocoelectomy accounts for 25% of all surgical procedures performed in endemic areas of Ghana and Kenya.
- Lower limb involvement is characterized by initial pretibial pitting edema, which eventually becomes nonpitting and involves the entire leg.
- The skin of the leg or scrotum becomes thick, fissured, and warty; and ulceration and secondary infection may occur.
- Rare instances of pleural effusion, multiple subcutaneous nodules and intra-abdominal cysts are reported.
- Chyluria reflects rupture of swollen lymphatics into the urinary tract. Microscopic (occasionally gross) hematuria is reported in some cases.
- Filarial granuloma may mimic testicular cancer or Kimura disease.

Microfilariae may be found in properly timed blood specimens, hydrocoele fluid, chylous urine and organ aspirates.

- Adult worms are identified in biopsy material.
- Eosinophilia usually appears only during acute episodes of inflammation.

There is extensive evidence that endosymbiont bacteria (Wolbachia spp.) are necessary for the development of filarial larvae, and fertility of adult parasites.

- Doxycycline has proven effective in therapy, presumably through inhibition of Wolbachia spp.

This disease is endemic or potentially endemic to 117 countries.
Filariasis - Bancroftian in Haiti

Time and Place:
An estimated 6 million persons (73 communes) are considered at risk as of 2002.
- The nationwide disease prevalence is estimated at 2.85%.
- The disease is found in scattered urban foci, mainly in the north and Gulf of La Gonave.
- Infection is found in 117 of the country’s 133 communes, with highest rates in the north (2001). 29
- Filariasis has been identified among Haitian refugees in Florida. 30

Prevalence surveys:
Carriage rates of 20% have been documented in coastal cities, including Leogane 31, Petit-Goave, Arachaie and Limbe.
- 16.1% of school children in Leogane Commune (1999)
- 2.9% in Corail Lemaire and 38.2% in Dampus (2010 publication) 32
- 7.3% of school children nationwide (2001) 33
- 6.7% of Haitian immigrants in the United States (1981 to 1982) 34

21% of disease-free children in an endemic area developed microfilaremia during a ten-year period (1990 to 1999) 35

Seroprevalence surveys:
14.3% to 19.7% of children ages 2 to 4 years (2010 publication) 36
Notes:
1. Mass treatment was administered to 105,750 persons in 4 communes in Leogane during 2001.
2. After 5 years of annual mass administration of diethylcarbamazine and albendazole in Leogane Commune (commenced in 2000), microfilaremia, antigenemia, and mosquito infection rates were significantly reduced, but transmission was not interrupted. 37
3. MDA was administered in Port-au-Prince for the first time during 2011 to 2012, resulting in 71% coverage. 38
3. Additional references: 2005 39  2007 40

The local vector is *Culex quinquefasciatus*. 41

References

### Fungal infection - invasive

<table>
<thead>
<tr>
<th>Agent</th>
<th>FUNGUS. Various (major syndromes such as Candidiasis, Blastomycosis, etc are discussed separately in this module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture of blood, urine, biopsy material. Serum antigen or antibody assay in some cases.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Antifungal agent(s) directed at known or likely pathogen</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>This diagnosis should be suspected in any patient with evidence of severe local or multisystem infection, particularly in the setting of immune suppression.</td>
</tr>
</tbody>
</table>

### Synonyms


### ICD9: 117.6,117.8,117.9,118

### ICD10: B43.1,B43.2,B43.8,B48.2,B48.3,B48.7,B48.8

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**Clinical**

Major syndromes (Aspergillosis, Candidiasis, Coccidioidomycosis, Cryptococcosis, Penicilliosis, etc) are discussed elsewhere in this module.

**Clinical syndromes associated with systemic fungal infection (in alphabetical order):**

**Adiaspiromycosis** (Haplomycosis) is a pulmonary infection due to *Emmonsia (Chrysosporium)* species.  
- Most cases have been described in Latin America and Central Europe, with additional reports from Israel and the United States.  
- Three forms are recognized: solitary granuloma, localized granulomatous disease and diffuse, disseminated granulomatous disease.  

**Arthrographis kairaee** has been reported as a cause of sinusitis and meningitis in patient with AIDS.

**Blastobotrys proliferans** is an ascomycetous yeast that has been reported to cause peritonitis in a dialysis patient.

**Curvularia inaequalis** has been associated with several cases of peritonitis complicating peritoneal dialysis.

**Exophiala jaenselmei** and **Rhinocladiella** species have been implicated in cases of nosocomial fungemia.  
- An outbreak of *Exophiala* infection in the United States was associated with contamination of injectable steroids.

**Exserohilum** is a dematiaceous fungus that has been associated with skin infections, keratitis, systemic infections and sinusitis.

**Fusarium** often infects the cornea, but may occasionally cause subcutaneous infection, fungemia, pneumonia, arthritis, bursitis, brain abscess and a variety of other systemic infection.  
- Pathogenic members of the *Fusarium solani* complex are common in the environment.
**Geotrichosis** is a rare form of pneumonia and systemic mycosis caused by *Geotrichum candidum*.
- The organism is ubiquitous in nature and often found in the stool of healthy humans.
- Pulmonary disease simulates tuberculosis; and mucosal infection is similar to moniliasis.

*Graphium basitruncatum* has been associated with fungemia in a patient with leukemia. 8

*Hansenula* species have been implicated in nosocomial infections, endocarditis, fungemia and urinary tract infection

*Lasiodiplodia theobromae* has been reported to cause keratomycoses. 9

*Neocosmospora vasinfecta*, a plant pathogen, has caused at least 3 cases of soft tissue infection (lower extremities, in Senegal) or fatal disseminated infection in immunocompromised humans. 10

*Neosartorya hiratsukae* has been implicated in a case of brain abscess.

*Penicillium* • 31 cases of invasive infection by *Penicillium* species other than *P. marneffei* were reported during 1951 to 2001 • including 12 of pulmonary disease, and 4 prosthetic valve endocarditis.

**Phaeohyphomycosis** (infection by demataceous fungi) is manifested as:
- brain abscess (typically *Cladosporium trichoides*; also *Exophiala dermatitidis*, *Fonsecaea pedrosoi*, *Ramichloridium obovoidum*, *Ochrocosis galopavum*, *Chaetomium atrobruneum*, et al),
- sinusitis (*Drechslera*, *Bipolaris*, *Exsorohilum*, *Curvularia*, *Alternaria*, *Cladosporium*)
- subcutaneous infection (typically due to *Exophiala* and *Phialophora* species • occasionally *Fonsecaea*, *Cladosporidium*, *Alternaria*, *Daetlyaria*, *Mycocdentrospora*, *Phaeoacremonium* 12 , *Veronaea*, *Cyphellophora pluriseptata*, etc)
- endocarditis.

**Pseudoallescheriasis** (Petriellidiosis) is caused by *Scedosporium apiospermum* (*Pseudoallescheria boydii*) and may present as mycetoma; or infection of the brain, bone and joints, orbits and other tissues. 13 14

*Ramichloridium mackenziei* has been reported to cause brain abscess in the Middle East.

*Sarcopodium oculorum* has been implicated as a cause of corneal ulcer in Brazil.

*Trichoderma* spp. are associated with peritonitis among dialysis patients, and disseminated infection in the immune-suppressed.

**Fungal eye infection:**
- Fungal endophthalmitis may be exogenous or endogenous.
- Clinically, onset is delayed and more gradual than infection due to bacteria.
- Hyaline fungi:
  - *Fusarium* species are implicated in keratitis, scleritis and intraocular infections
  - *Aspergillus* in keratitis following industrial trauma or surgery, orbital infection, dacryocystitis, scleritis and endophthalmitis
  - *Scedosporium* in keratitis, scleritis, endophthalmitis, orbital infection
  - *Paecilomyces* in keratitis, endophthalmitis and intralenticular infections
  - *Acremonium* in keratitis and endophthalmitis.
- *Dematiaceous fungi* *Bipolaris*, *Curvularia*, *Exophiala*, *Exserohilum*, *Lecytophora* and *Phialophora* are implicated in keratitis and intraocular infections
  - *Lasiodiplodia* in keratitis and endophthalmitis.
- Other fungal agents (*Candida*, *Cryptococcus*, *Coccidioides*, *Paracoccidioides*, *Blastomyces*, *Histoplasma*, *Sporothrix*) which may cause ocular infection are discussed separately in this module.

This disease is endemic or potentially endemic to all countries.

**References**

### Gastroenteritis - viral

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA Calicivirus (Norwalk, Hawaii, Sapporo, Snow Mountain, Norovirus); Torovirus; or Astrovirus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Food Water Shellfish Vegetables</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Norwalk 1d - 2d; Astrovirus 3d - 4d</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Stool precautions; supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Vomiting (less common with Astrovirus), abdominal pain; loose, watery diarrhea lasting 1 to 3 days; no fecal leucocytes; fever in 50% - headache and myalgia in some cases.</td>
</tr>
</tbody>
</table>

#### Clinical

The median incubation period for Astrovirus infection is 4.5 days, 1.2 days for Norovirus genogroups I and II, 1.7 days for Sapovirus, and 2.0 days for Rotavirus.  

The onset of infection due to the Norwalk virus group may be gradual or abrupt, and is heralded by abdominal cramps with or without nausea.

- In most cases, both vomiting and diarrhea occur.  
- Four to eight non-bloody stools are passed per day; and fecal leucocytes are absent.  
- 87% of patients with NLV infection develop diarrhea within 5 days; and only 60% of patients with Sapporo-like virus [SLV] infection.
- 59% of children below age 1 year develop vomiting with NLV, and 44% with SLV.
- Myalgias, malaise, headaches and benign febrile seizures may also be present.
- A low-grade fever occurs in 50% of cases.
- Original publications stated that symptoms remit in 48 to 72 hours without sequelae; however, recent studies suggest that illness usually persists for 5 to 6 days.
- The duration of illness has been correlated with fecal concentration of virus.
- Residual dyspepsia, constipation or gastroesophageal reflux disease may persist following Norovirus infection.
- Cases of Guillain-Barre syndrome, encephalitis and necrotizing enterocolitis in newborn infants have been ascribed to Norovirus infection.
- Review of the clinical features of fatal Norovirus infection • see reference

Astrovirus diarrhea is similar to NLV infection; however, the former is characterized by a milder illness and lower incidence of vomiting.

Rare instances of meningitis have been associated with Saffold virus infection.

#### This disease is endemic or potentially endemic to all countries.

#### References

7. Pediatr Infect Dis J 2014 Sep;16;
**Gianotti-Crosti syndrome**

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>UNKNOWN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Clinical features and skin biopsy findings.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Generalized skin eruption involving the extremities, face and buttocks; lymphadenopathy of the axillae and inguinal region; anicteric hepatitis; resolves in 15 to 42 days. Rare outbreaks have been reported.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Acrodermatitis papulosa infantilis, Papular acrodermitis of childhood, Papulovesicular acrolocated syndrome. ICD9: 693.0 ICD10: L27.8</td>
</tr>
</tbody>
</table>

**Clinical**

Most patients are in the age group 2 to 6 years; however, the disease has occasionally been reported in infants and young adults. 1 2

Clinical features are largely limited to discrete flat-topped papules on the face, extensor surfaces of the extremities and buttocks. 3
- The eruption is symmetrical, occasionally pruritic, either skin-colored or erythematous, and evolves over a period of two to three days.
- The skin lesions measure 2 to 4 mm in diameter, with a tendency for larger lesions among young children. 4
- Koebner phenomenon has been described.
- In most cases, the exanthem resolves after 15 to 20 days, but may persist for as long as 5 weeks.
- Hemorrhagic skin lesions and petechiae have been described in some cases. 5
- Prominent lymphadenopathy is noted, primarily in the inguinal and axillary regions.
- Hepatomegaly and anicteric hepatitis are common.

Gianotti-Crosti syndrome may be the only presenting manifestation of Epstein-Barr virus infection. 6

The features of Gianotti-Crosti syndrome may mimic those of atopic dermatitis. 7

The diagnosis is confirmed by skin biopsy, which reveals spongiosis of the upper epidermis and upper dermis, with perivascular lymphocytic and histiocytic infiltrates. 8

**This disease is endemic or potentially endemic to all countries.**

**References**

Giardiasis

**Agent**  
PARASITE - Protozoa. Archezoa, Metamonada, Trepomonadea. Flagellate: Giardia lamblia [G. intestinalis, G. duodenalis]

**Reservoir**  
Human  
Beaver  
Muskrat  
Dog  
Cat  
Carnivores  
Sheep  
Goat  
Horse  
Cattle

**Vector**  
None

**Vehicle**  
Food  
Water  
Fecal-oral  
Fly

**Incubation Period**  
1w - 3w (range 3d - 6w)

**Diagnostic Tests**  
String test (gelatin capsule containing string). Stool microscopy or antigen assay. Nucleic acid amplification.

**Typical Adult Therapy**  
Tinidazole 2 g PO X1. OR Nitazoxanide 500 mg PO BID X 3d. Alternatives: Metronidazole 250 mg PO TID X 5d. OR Furazolidone 100 mg PO QID X 7d. OR Paromomycin 10 mg/kg PO TID X 7d OR Quinacrine 100 mg PO TID X 5d

**Typical Pediatric Therapy**  
Tinidazole 50 mg PO X 1 (maximum 2g). OR Nitazoxanide: Age 1 to 3y 100 mg PO X 7d Age 4 to 11y 200 mg PO X 7d Alternatives: Metronidazole 5 mg/kg PO TID X 5d. OR Furazolidone 1.5 mg/kg QID X 7d

**Clinical Hints**  
Foul smelling, bulky diarrhea, nausea and flatulence; may "wax and wane"; weight loss and low-grade fever are common.

**Synonyms**  
Beaver fever, Giardia duodenalis, Giardia intestinalis, Giardia lamblia, Lambiliasis.  
ICD9: 007.1  
ICD10: A07.1

---

**Clinical**

The usual interval between infection and the onset of acute symptoms ranges from one to two weeks.

In most instances, the individual will experience sudden explosive, watery, foul-smelling diarrhea; excessive gas; abdominal pain; bloating; nausea; asthenia; and anorexia.  
- Symptoms consistent with irritable bowel syndrome and functional dyspepsia are reported in 80.5% and 24.5% of patients, respectively  
- Upper gastrointestinal symptoms such as vomiting may predominate.  
- Fever is unusual, and asymptomatic infection is common.  
- Blood or mucus in the stool is rare, and there is neither leucocytosis nor eosinophilia.

Occasionally, the illness may last for months, or even years, causing recurrent episodes of impaired digestion, lactose intolerance, diarrhea, depression, asthenia and weight loss.  
- Recurrence of symptoms is also common following effective treatment.  
- Severe and prolonged infections are reported among patients with IgA deficiency and malnutrition.  
- Infection in children may result in stunted growth, delayed development and vitamin A deficiency.

**Sequelae:**  
- Reactive arthritis may occasionally follow infection by *Giardia intestinalis*.  
- Giardiasis has been implicated in the etiology of irritable bowel syndrome and chronic fatigue syndrome.

**This disease is endemic or potentially endemic to all countries.**

**Giardiasis in Haiti**

**Prevalence surveys:**  
- 3% of HIV-positive adults with diarrhea (1990 to 1993)  
- 6% of HIV-positive patients with chronic diarrhea (2003 to 2004)

---

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References


14. Ugeskr Laeger 2013 Dec 2;175(49A)
## Gonococcal infection

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th><strong>BACTERIUM. Neisseria gonorrhoeae</strong> An aerobic gram-negative coccus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Sexual contact, Childbirth, Exudates</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>2d - 7d</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Smear (male), culture. Consult laboratory for proper acquisition &amp; transport. Nucleic acid amplification.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td><strong>Ceftriaxone</strong> 250 mg IM X 1. PLUS <strong>Azithromycin</strong> 1 g PO as single dose.</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>Weight ( \leq 45 \text{ kg} ): <strong>Ceftriaxone</strong> 125 mg IM X 1 Weight ( &gt;45 \text{ kg} ): as for adult. PLUS <strong>Azithromycin</strong></td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Copious urethral discharge (male) or cervicitis beginning 2 to 7 days after sexual exposure; PID; fever, painful pustules and suppurative arthritis (primarily encountered in postmenstrual females).</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Blennorragie, Blenorragia, Gonococcemia, Gonore, Gonorre, Gonorrhea, Gonorrhee, Gonorrho, Gonorrhoe, Infeccion gonococica, Infeccoes gonococicas, Neisseria gonorrhoeae.</td>
</tr>
</tbody>
</table>

### Clinical

**Gonorrhea:**
Gonorrhea in males typically presents as urethral discomfort, dysuria, and discharge.

- The degree of discomfort and discharge are variable.
- Asymptomatic infection is common among females, but may also occur in males.
- Gonococcal epididymitis presents with unilateral pain and swelling localized posteriorly within the scrotum.
- Gonorrhea in the female are usually manifest as vaginal discharge and endocervicitis.
- The discharge is thin, purulent and mildly odorous.
- Dysuria or a scant urethral discharge may be present.
- Non-gonococcal urethritis, including infection by *Chlamydia trachomatis* and other *Neisseria* species may mimic gonococcal infection.
- Infection can be passed to the male urethra from the pharynx through fellatio.
- Levels of serum Prostate-specific Antigen (PSA) may be elevated in patients with gonorrhea.

**Gonococcal PID:**
Pelvic or lower abdominal pain suggests infection of the endometrium, fallopian tubes, ovaries or peritoneum.

- Pain may be midline, unilateral, or bilateral.
- Fever and vomiting may be present.
- Right upper quadrant pain from perihepatitis (Fitz-Hugh-Curtis syndrome) may occur following the spread of organisms upward along peritoneal planes to the hepatic capsule (The syndrome is also reported as a complication of gonorrhea in males).

**Other clinical forms:**

**Gonococcal proctitis** is often asymptomatic, but rectal pain, pruritus, tenesmus, bloody diarrhea and rectal discharge may be present.

**Gonococcal pharyngitis** may be asymptomatic, or associated with severe inflammation. *Neisseria gonorrhoeae* is often present in throat specimens from patients with urethritis.

**Gonococcal conjunctivitis** is usually unilateral in adults; however, neonatal infection (ophthalmia neonatorum) involves both eyes.

- Symptoms include pain, redness, and a purulent discharge and may result in blindness.
- Rare instances of corneal perforation are reported.

**Disseminated gonococcal infection** is characterized by joint or tendon pain, of single or multiple joints.

- Severe pain, swelling, and decreased mobility in a single joint (usually the knee) suggest purulent arthritis.
- Tenosynovitis is common, usually affecting the small joints of the hands.
- A rash is present in 25% of patients with gonococccemia.
- Additional complications include meningitis, endocarditis, aortic aneurysm, septic shock with ARDS, subcutaneous
abscess, Fournier's gangrene\textsuperscript{18}, pyomyositis\textsuperscript{19} and other localized infections.\textsuperscript{20}

This disease is endemic or potentially endemic to all countries.

**Gonococcal infection in Haiti**

**Prevalence surveys:**
- 2.3\% of pregnant women in the Artibonite Valley (1996)\textsuperscript{21}
- 1\% of adult female outpatients with gynecological symptoms (2013 publication)\textsuperscript{22}
- 1\% to 4.1\% of rural women attending clinics (southwestern Haiti, 2014 publication)\textsuperscript{23}
- 0\% of rural men with urethritis (2014 publication)\textsuperscript{24}

12\% of pregnant women in Cite Soleil are infected with *Chlamydia*, Gonorrhea - or both (1995 publication)\textsuperscript{25}

**References**

24. Int J STD AIDS 2014 Sep 15;
### Granuloma inguinale

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. <em>Klebsiella granulomatis</em> (formerly <em>Calymmatobacterium granulomatis</em>) An gram-negative bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Sexual contact  Direct contact</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>7d - 30d (range 3d - 1 year)</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Identification of organism in stained smears. Culture in specialized laboratories (HEp-2 cells).</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td><strong>Doxycycline</strong> 100 mg BID PO X 3w. Alternatives: <strong>Azithromycin</strong> 1 g weekly X 3 w. <strong>Sulfamethoxazole/trimethoprim</strong> 800/160 mg BID X 3w <strong>Erythromycin</strong> 500 mg QID X 3w.</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td><strong>Doxycycline</strong> 2 mg/kg BID X 2 to 3w (above age 8). Alternatives: <strong>Sulfamethoxazole/trimethoprim</strong>, <strong>Erythromycin</strong> or <strong>Azithromycin</strong></td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Slowly expanding, ulcerating skin nodule with friable base; usually painless; may be complicated by edema or secondary infection - rarely spreads to bone or joints.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Calymmatobacterium granulomatis, Donovanosis, Granuloma genitoinguinale, Granuloma inguinale tropicum, Granuloma venereum, Sixth venereal disease. ICD9: 099.2 ICD10: A58</td>
</tr>
</tbody>
</table>

#### Clinical

The primary lesion of granuloma inguinale appears on the perineum or genitals in 80% to 90% of cases.
- Infection begins as a small painless papule or indurated nodule which progresses to a painless beefy-red ulcer with rolled edges and a friable surface.
- Multiple ulcers may coalesce, and new lesions may also form through autoinoculation. ¹
- Scar formation, deformity, keloids, lymphedema and scar carcinoma ² may develop.
- The most common sites of infection are the prepuce, coronal sulcus, and penile shaft; the labia and the fourchette.
- Rectal lesions may follow anal intercourse.
- Systemic disease of bones, joints, liver and lymphatics is rare, and may follow infection of the uterine cervix.
- Granuloma inguinale may present as mass lesions which mimic malignancy ⁴ ⁵ or elephantiasis ⁶; and cutaneous metastases from mucinous carcinoma may mimic granuloma inguinale. ⁷

This disease is endemic or potentially endemic to all countries.

#### References

### Hepatitis A

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA. Picornaviridae, Hepatovirus: Hepatitis A virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human  Non-human primate</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Fecal-oral  Food  Water  Fly</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>21d - 30d (range 14d - 60d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Serology. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Stool precautions; supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Vaccines</td>
<td>Hepatitis A vaccine  Hepatitis A + Hepatitis B vaccine  Immune globulin</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Vomiting, anorexia, dark urine, light stools and jaundice; rash and arthritis occasionally encountered; fulminant disease, encephalopathy and fatal infections are rare (case-fatality rate 0.15% to 2.7%, depending on age).</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Botkin's disease, Epatite A, HAV, Hepatite per virus A, Infectious hepatitis, Sosuga. ICD9: 070.0  ICD10: B15.0, B15.9</td>
</tr>
</tbody>
</table>

### Clinical

**WHO Case definition for surveillance of acute viral hepatitis (all types):**

**Clinical description**
- Acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness.
- Biological signs include increased urine urobilinogen and >2.5 times the upper limit of serum alanine aminotransferase.
- Note: Most infections occur in early childhood. A variable proportion of adult infections is asymptomatic.

**Laboratory criteria for diagnosis**
- Hepatitis A: IgM anti-HAV positive
- Hepatitis B: positive for Hepatitis B surface antigen (HBsAg) or IgM anti-HBC-positive
- Non-A, non-B: IgM anti-HAV and IgM anti-HBc (or HBsAg) negative

**Note 1:** The anti-HBc IgM test, specific for acute infection, is not available in most countries.
- HBsAg, often available, cannot distinguish between acute new infections and exacerbations of chronic hepatitis B, although continued HBsAg seropositivity (>6 months) is an indicator of chronic infection.

**Note 2:** For patients negative for hepatitis A or B, further testing for a diagnosis of acute hepatitis C, D, or E is recommended:
- Hepatitis C: anti-HCV positive
- Hepatitis D: HBsAg positive or IgM anti-HBc positive plus anti-HDV positive (only as co-infection or super-infection of hepatitis B)
- Hepatitis E: IgM anti-HEV positive

**Case classification**
- Suspected: A case that is compatible with the clinical description.
- Probable: Not applicable.
- Confirmed: A suspected case that is laboratory confirmed or, for hepatitis A only, a case compatible with the clinical description, in a person who has an epidemiological link with a laboratory-confirmed case of hepatitis A (i.e. household or sexual contact with an infected person during the 15-50 days before the onset of symptoms).

**Clinical features of Hepatitis A:**

The prodrome is characterized by anorexia, asthenia, headache, myalgia and moderate fever.
- Patients develop nausea, vomiting and right upper abdominal pain and later overt jaundice.
- Symptoms persist for 4 to 8 weeks, and the patient may remain asthenic and anorectic for several months thereafter.
- As many as 90% of cases in children less than 5 years of age are asymptomatic; fewer 50% among adults.
- Relapses may occur for up to 6 months following the initial infection.
- Rare instances of acute disseminated encephalomyelitis, myelitis, acute motor and sensory neuropathy, meningoencephalitis, acute cholestatic syndrome, acalculous cholecystitis, urticaria, pancreatitis,
pleural effusion or ascites, acute glomerulonephritis or renal failure, pure red-cell aplasia, hemophagocytic lymphohistiocytosis, cerebral venous thrombosis and rhabdomyolysis have been reported. Concurrent HIV infection may prolong the duration of viremia in patients with hepatitis A.

Hepatitis A accounts for 3.1% of acute hepatic failure cases (United States, 1998 to 2005). The case-fatality rate is 0.1% among children below age 4 years; 0.4% ages 5 to 29 years; and 1% above age 40. 55% of hepatitis A patients with acute hepatic failure recover; the remainder either die of the disease or require transplantation.

A false positive serological reaction toward Epstein-Barr virus has been associated with Hepatitis A.

This disease is endemic or potentially endemic to all countries.

References

27. PMID 19685373
## Hepatitis B

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - DNA. Hepadnaviridae, Orthohepadnavirus: Hepatitis B virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human Non-human primate</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Blood Infected secretions Sexual contact Transplacental</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2m - 3m (range 1m - 13m)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Serology. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Needle precautions. For post-exposure or chronic infection: Peginterferon alfa-2a or Peginterferon alfa-2b OR Entecavir OR Tenofovir</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Vaccines</td>
<td>Hepatitis A + Hepatitis B vaccine Hepatitis B + Haemoph. influenzae vaccine Hepatitis B immune globulin Hepatitis B vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Vomiting and jaundice; rash or arthritis occasionally noted; risk group (drug abuse, blood products, sexual transmission); cirrhosis or hepatoma may follow years after acute illness; fulminant and fatal infections are encountered.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Epatite B, HBV, Hepatite per virus B, Serum hepatitis. ICD9: 070.1 ICD10: B16.2,B16.9, B16.1</td>
</tr>
</tbody>
</table>

### Clinical

**WHO Case definition for surveillance of acute viral hepatitis (all types):**

**Clinical description**
- Acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness.
- Biological signs include increased urine urobilinogen and >2.5 times the upper limit of serum alanine aminotransferase.
- Note: Most infections occur in early childhood. A variable proportion of adult infections is asymptomatic.

**Laboratory criteria for diagnosis**
- Hepatitis A: IgM anti-HAV positive
- Hepatitis B: positive for Hepatitis B surface antigen (HBsAg) or IgM anti-HBc positive
- Non-A, non-B: IgM anti-HAV and IgM anti-HBc (or HBsAg) negative

**Note 1:** The anti-HBc IgM test, specific for acute infection, is not available in most countries.
- HBsAg, often available, cannot distinguish between acute new infections and exacerbations of chronic hepatitis B, although continued HBsAg seropositivity (>6 months) is an indicator of chronic infection.

**Note 2:** For patients negative for hepatitis A or B, further testing for a diagnosis of acute hepatitis C, D, or E is recommended:
- Hepatitis C: anti-HCV positive
- Hepatitis D: HBsAg positive or IgM anti-HBc positive plus anti-HDV positive (only as co-infection or super-infection of hepatitis B)
- Hepatitis E: IgM anti-HEV positive

**Case classification**
- Suspected: A case that is compatible with the clinical description.
- Probable: Not applicable.
-Confirmed: A suspected case that is laboratory confirmed or, for hepatitis A only, a case compatible with the clinical description, in a person who has an epidemiological link with a laboratory-confirmed case of hepatitis A (i.e. household or sexual contact with an infected person during the 15-50 days before the onset of symptoms).

**Clinical features of Hepatitis B:**

Infection can be asymptomatic (particularly in young children) or quite mild, with only fatigue, anorexia, and malaise.
- Clinical disease with jaundice occurs in 50% of adults and 10% of young children.
- Extrahepatic manifestations include arthralgia, arthritis, rash, inflammatory myopathy, dry-eye syndrome (similar to Sjogren's syndrome), nephrotic syndrome, focal segmental glomerulosclerosis, and acute glomerulonephritis. Rare instances of pure red cell aplasia, symmetric sensorimotor polyneuropathy, and pancreatitis have been
Hepatitis B in Haiti

Vaccine Schedule:

BCG - birth, 10, 14 weeks
DTwPHibHep - 6, 10, 14 weeks
MR - 9 months
OPV - birth; 6, 10, 14 weeks
Pneumo conj - from April 2015
Pneumo ps - from January 2015
Rotavirus - from April 2014
Td - 1st contact; +4 weeks; +6 months; +1, +1 years pregnant women

HBsAg-positivity surveys:

5.5% of blood donors in 1990; 5.56% in 2001.
13% of rural Haitians (1988) 25
2% to 7% of pregnant women (1996); 3.8% in 2000.

References

13. Liver Int 2014 Feb 6;

This disease is endemic or potentially endemic to all countries.
### Clinical

**WHO Case definition for surveillance of acute viral hepatitis (all types):**

**Clinical description**
- Acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness.
- Biological signs include increased urine urobilinogen and >2.5 times the upper limit of serum alanine aminotransferase.
- Note: Most infections occur in early childhood. A variable proportion of adult infections is asymptomatic.

**Laboratory criteria for diagnosis**
- Hepatitis A: IgM anti-HAV positive
- Hepatitis B: positive for Hepatitis B surface antigen (HBsAg) or IgM anti-HBc positive
- Non-A, non-B: IgM anti-HAV and IgM anti-HBc (or HBsAg) negative

Note 1: The anti-HBc IgM test, specific for acute infection, is not available in most countries.

Note 2: For patients negative for hepatitis A or B, further testing for a diagnosis of acute hepatitis C, D, or E is recommended:
- Hepatitis C: anti-HCV positive
- Hepatitis D: HBsAg positive or IgM anti-HBc positive plus anti-HDV positive (only as co-infection or super-infection of hepatitis B)
- Hepatitis E: IgM anti-HEV positive

**Case classification**
- Suspected: A case that is compatible with the clinical description.
- Probable: Not applicable.
- Confirmed: A suspected case that is laboratory confirmed or, for hepatitis A only, a case compatible with the clinical description, in a person who has an epidemiological link with a laboratory-confirmed case of hepatitis A (i.e. household or sexual contact with an infected person during the 15-50 days before the onset of symptoms).

**Clinical features of Hepatitis C:**

Patients with acute infection typically are either asymptomatic or have a mild clinical illness.

- 60% to 70% of patients have no symptoms
- 20% to 30% of patients have jaundice
- 10% to 20% of patients have non-specific symptoms, such as anorexia, malaise, or abdominal pain.

Clinical illness in patients with acute hepatitis C who seek medical care is similar to that of other types of viral hepatitis.
- The average time period from exposure to symptom onset is 6-7 weeks, whereas the average time period from exposure to seroconversion is 8-9 weeks.
- Anti-HCV can be detected in 80% of patients within 15 weeks after exposure, in >90% within 5 months after exposure, and in >97% by 6 months after exposure.
Rarely, seroconversion is delayed for as long as 9 months after exposure.
Rare instances of optic neuritis have been reported. 3

The clinical course is variable; and fluctuating elevations in serum ALT levels, are the most characteristic feature. 4 5
Fulminant hepatic failure following acute infection is rare.
15% to 25% of infections resolve without sequelae.
Chronic HCV infection develops 75% to 85% of patients who exhibit persistent or fluctuating ALT elevations.
75% to 85% of patients with acute hepatitis C infection progress to chronic disease, and 20% to cirrhosis within 20 to 25 years. 6
No clinical or epidemiological features among patients with acute infection are predictive of persistent infection or chronic liver disease.
Chronic liver disease is usually insidious, progressing without symptoms or physical signs in the majority of patients during 20 or more years following acute infection.
Cirrhosis develops in 10% to 20% of persons with chronic hepatitis C over a period of 20 to 30 years; and hepatic cell carcinoma in 1% to 5%.
HCV infection appears to have little short-term impact on survival after bone marrow transplantation, but is a risk factor for veno-occlusive disease and graft-versus-host disease. 7
Concurrent HIV infection shortens the time to development of chronic liver disease in patients with Hepatitis C. 8-16

Hepatitis B predominates among patients with hepatocellular carcinoma in most Asian, African and Latin American countries; while hepatitis C predominates in Japan, Pakistan, Mongolia, Egypt, Europe and the United States. 17

Additional manifestations seen in patients with chronic hepatitis C infection 18 may include mixed cryoglobulinemia 19-22 with systemic vasculitis of the skin, erythema induratum 23, arthritis 24, retarded growth in children 25, renal disease 26-33; CNS vasculitis 34, acute disseminated encephalomyelitis 35, dorsal root ganglionopathy 36, acute myelitis 37 and other nervous system disorders 38-41; thrombocytopenia 42-46; non-Hodgkin lymphoma; porphyria cutanea tarda and lichen planus 46-54; hypothyroidism 55; lymphocytic sialoadenitis (similar to that of Sjogren’s syndrome) and ischemic retinitis 56 57; autoimmune and other rheumatological disorders 58-62, nectolytic acral erythema 63 64; scleritis 65; and orbital plasmacytoma. 66

This disease is endemic or potentially endemic to all countries.

Hepatitis C in Haiti

The nationwide carriage rate in 1997 was estimated at 2.00%.

Seroprevalence surveys:
1.20% of blood donors (2000 to 2001)
4.4% of outpatients in Cap-Haitien (2004 publication) 67

References

20. Medicine (Baltimore) 2013 Aug 22;
22. Med Clin (Barc) 2014 Apr 28;
37. BMJ Case Rep 2013 ;2013
43. BMC Res Notes 2012 ;5:142.

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64. Dermatol Online J 2013 Dec ;19(12):20709.
### Hepatitis D

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA. Deltavirus: Hepatitis D virus - a 'satellite' virus which is encountered as infection with a co-virus (Hepatitis B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Infected secretions Blood Sexual contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>4w - 8w (range 2w - 20w)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Serology. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Needle precautions; supportive Interferon alfa 2-a has been used.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Vomiting and jaundice - biphasic course often noted; occurs as a coinfection or superinfection of hepatitis B; may be chronic or fulminant (combined hepatitis B and delta carries a worse prognosis than seen with hepatitis B alone).</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Epatite D, Hepatitis delta. ICD9: 070.41,070.52 ICD10: B17.0</td>
</tr>
</tbody>
</table>

#### Clinical

**WHO Case definition for surveillance of acute viral hepatitis (all types):**

**Clinical description**

- Acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness.  
  - Biological signs include increased urine urobilinogen and >2.5 times the upper limit of serum alanine aminotransferase.
  - Note: Most infections occur in early childhood. A variable proportion of adult infections is asymptomatic.

**Laboratory criteria for diagnosis**

- **Hepatitis A:** IgM anti-HAV positive
- **Hepatitis B:** Positive for Hepatitis B surface antigen (HBsAg) or IgM anti-HBc positive
- **Non-A, non-B:** IgM anti-HAV and IgM anti-HBc (or HBsAg) negative

  **Note 1:** The anti-HBc IgM test, specific for acute infection, is not available in most countries.
  
  **Note 2:** HBsAg, often available, cannot distinguish between acute new infections and exacerbations of chronic hepatitis B, although continued HBsAg seropositivity (>6 months) is an indicator of chronic infection.

**Case classification**

- **Suspected:** A case that is compatible with the clinical description.
- **Probable:** Not applicable.
- **Confirmed:** A suspected case that is laboratory confirmed or, for hepatitis A only, a case compatible with the clinical description, in a person who has an epidemiological link with a laboratory-confirmed case of hepatitis A (i.e. household or sexual contact with an infected person during the 15-50 days before the onset of symptoms).

**Clinical features of Hepatitis D**

- Hepatitis D is characterized by gradual onset of abdominal pain and vomiting, followed by development of jaundice.
  - A biphasic course often noted.
  - Hepatitis D coinfection in patients with Hepatitis B increases the rate of gastrointestinal hemorrhage, ascites, hepatic encephalopathy, cirrhosis and other complications.  
  - 80% of patients with chronic hepatitis D infection progress to cirrhosis within 5 to 10 years.

**This disease is endemic or potentially endemic to all countries.**
References

### Hepatitis E

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>VIRUS - RNA. Caliciviridae: Hepatitis E virus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human  Rodent  Pig</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Fecal-oral  Water  Shellfish  Blood (rare)  Meat (rare)</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>30d - 40d (range 10d - 70d)</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Stool precautions; supportive</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Vaccine</strong></td>
<td>Hepatitis E vaccine</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Clinically similar to hepatitis A - no chronic residua; severe or fatal if acquired during pregnancy (10% to 24% case-fatality rate).</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Epatite E, Non-A, non-B enteric hepatitis. ICD9: 070.43,070.53 ICD10: B17.2</td>
</tr>
</tbody>
</table>

### Clinical

**WHO Case definition for surveillance of acute viral hepatitis (all types):**

**Clinical description**
- Acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness.
- Biological signs include increased urine urobilinogen and >2.5 times the upper limit of serum alanine aminotransferase.
- Note: Most infections occur in early childhood. A variable proportion of adult infections is asymptomatic.

**Laboratory criteria for diagnosis**
- Hepatitis A: IgM anti-HAV positive
- Hepatitis B: positive for Hepatitis B surface antigen (HBsAg) or IgM anti-HBc positive
- Non-A, non-B: IgM anti-HAV and IgM anti-HBc (or HBsAg) negative

Note 1: The anti-HBc IgM test, specific for acute infection, is not available in most countries.
- HBsAg, often available, cannot distinguish between acute new infections and exacerbations of chronic hepatitis B, although continued HBsAg seropositivity (>6 months) is an indicator of chronic infection.

Note 2: For patients negative for hepatitis A or B, further testing for a diagnosis of acute hepatitis C, D, or E is recommended:
- Hepatitis C: anti-HCV positive
- Hepatitis D: HBsAg positive or IgM anti-HBc positive plus anti-HDV positive (only as co-infection or super-infection of hepatitis B)
- Hepatitis E: IgM anti-HEV positive

**Case classification**
- Suspected: A case that is compatible with the clinical description.
- Probable: Not applicable.
- Confirmed: A suspected case that is laboratory confirmed or, for hepatitis A only, a case compatible with the clinical description, in a person who has an epidemiological link with a laboratory-confirmed case of hepatitis A (i.e. household or sexual contact with an infected person during the 15-50 days before the onset of symptoms).

**Clinical features of Hepatitis E:**
In contrast to hepatitis A, hepatitis E is characterized by:
- relatively long incubation period
- prolonged clinical course
- severe and often fatal illness among pregnant women, patients with pre-existing hepatic cirrhosis, HIV-positive patients, hemodialysis patients and possibly women taking oral contraceptive medication.
- poor protective value of immune serum globulin.

In most hepatitis E outbreaks, the highest rates of clinically evident disease have been among young to middle-age adults.
- Lower disease rates in younger age groups may be the result of anicteric and/or subclinical HEV infection.
- Clinical disease in western countries and Japan is most common among males and persons above age 60 years.
Clinical signs and symptoms are similar to those of other types of viral hepatitis and include abdominal pain anorexia, dark urine, fever, hepatomegaly, jaundice, malaise, nausea, and vomiting. 13

- Less common findings include arthralgia, arthritis 14 , diarrhea, acute pancreatitis 15-18 , pruritus, urticarial rash, severe thrombocytopenia 19-21 , photophobia, Guillain-Barre syndrome 22-30 , Parsonage Turner syndrome 31 , neuralgic amyotrophy, 32 inflammatory polyradiculopathy 33 , vestibular neuritis 34 , encephalitis or encephalopathy 35-38 , aplastic anemia 39 , pregnancy associated with fetal ascites 40 , and hemophagocytic syndrome. 41
- A false positive serological reaction toward Epstein-Barr virus has been reported in Hepatitis E virus infection. 42
- Transient signs of auto-immune disease (anti-nuclear antibodies, anti-smooth muscle antibodies, hypergammaglobulinemia) has been reported in a patient with acute Hepatitis E. 43
- The case fatality rate for young adults is 0.5% to 3%; 15% to 20% for pregnant women. 44
- A subsequent publication estimated the CFR for all cases at 0.019 among non-pregnant patients vs. 0.198 among pregnant women. 45

The period of infectivity following acute infection is not known; however, virus excretion in stools has been demonstrated up to 14 days after illness onset.

- The period of viral excretion appears to be prolonged among patients with hematological malignancy. 46

Cases of chronic Hepatitis E virus infection are reported, notably among immunosuppressed patients. 47-60
- Rare cases of chronic hepatitis E infection have been reported in immuno-competent individuals. 61 62

This disease is endemic or potentially endemic to all countries.

**Hepatitis E in Haiti**

**Notable outbreaks:**

1995 - An outbreak (4 cases) was reported among Bangladeshi United Nations peacekeepers in Haiti. 63 3% of United Nations peacekeepers in this country are seropositive. 64

**References**

6. Transpl Int 2014 Mar 7;
18. BMJ Case Rep 2014 ;2014(apr30_2)
34. Aliment Pharmacol Ther 2014 Oct 10;
38. BMJ Case Rep 2014 ;2014
40. Transpl Int 2014 Mar 7;
52. BMJ Case Rep 2014 ;2014
55. BMJ Case Rep 2014 ;2014
69. J Hepatol 2012 Mar 7;
70. BMJ Case Rep 2014 ;2014
### Hepatitis G

| **Agent** | VIRUS - RNA. Flaviviridae, Hepacivirus: Hepatitis G virus. HGBV-A, B and C appear to be related |
| **Reservoir** | Human |
| **Vector** | None |
| **Vehicle** | Blood Vertical transmission has also been documented Sexual transmission suspected |
| **Incubation Period** | Unknown |
| **Diagnostic Tests** | Serology. Nucleic acid amplification. |
| **Typical Adult Therapy** | Supportive. Alpha interferon has been shown to transiently eliminate the carrier state |
| **Typical Pediatric Therapy** | As for adult |
| **Clinical Hints** | Acute or chronic hepatitis acquired from blood (needles, etc); clinically milder than hepatitis C - most cases limited to anicteric elevation of hepatic enzyme levels; viremia documented for as long as 10 years. |
| **Synonyms** | Epatite G, Hepatitis GB, HPgV. ICD9: 070.59 ICD10: B17.8 |

**Clinical**

Hepatitis G is characterized by acute or chronic hepatitis acquired from blood (needles, etc).  
- The disease is milder than hepatitis C, with most cases limited to anicteric elevation of hepatic enzyme levels.  
- Viremia has been documented for as long as 10 years.  
- A case of aplastic anemia complicating Hepatitis G infection has been reported.

**This disease is endemic or potentially endemic to all countries.**

**References**

Herpes B infection

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - DNA. Herpesviridae, Alphaherpesviridae, Simplexvirus: Cercopithecine herpesvirus 1 (Herpes B virus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Monkey (usually Macaca species and cynomolgus)</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Contact or bite</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>10d - 20d (range 2d - 60d)</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Therapy: Acyclovir 12 mg/kg IV q8h. OR Ganciclovir 5 mg/kg IV q12h. Follow with prolonged Acyclovir 800 mg PO 5X daily. Postexposure prophylaxis: Valacyclovir 1g PO q8h X 14 days. OR Acyclovir 800 mg PO X 5 X 14 days</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Acyclovir or Ganciclovir as for adult.</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Vesicles, lymphadenopathy, myalgia, singultus, major neurological signs; usually within one month following contact with monkey; case-fatality rates exceed 80%. permanent neurological residua are common.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Cercopithecine herpesvirus 1, Herpes B, Herpesvirus simiae, Macacine herpesvirus 1.</td>
</tr>
</tbody>
</table>

Clinical

Most human infections have been fatal, consisting of myelitis and hemorrhagic encephalitis with concomitant multiorgan involvement. ¹

The illness begins with fever, malaise, diffuse myalgia, nausea, abdominal pain and headache.
- Lymphadenitis is seen proximal to the site of inoculation.
- Dermal vesicles may be present.
- Abdominal pain and nausea may occur.
- Neurological findings then predominate, with dysesthesia, ataxia, diplopia, seizures, and ascending flaccid paralysis. ²
- A lymphocytic CSF pleocytosis and elevated protein levels are noted, often with numerous erythrocytes.
- In contrast to herpes simplex infection, the encephalitis is multifocal.
- Rarely, isolated skin infection and even an isolated meningitis may be encountered.

This disease is endemic or potentially endemic to all countries.

References

**Herpes simplex encephalitis**

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>VIRUS - DNA. Herpesviridae, Alphaherpesvirinae, Simplexvirus: Human herpesvirus (usually type I)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Infected secretions, including Sexual contact</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Viral culture CSF usually negative. CT brain. Compare CSF/blood antibody levels. Nucleic acid amplification.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Acyclovir 10 mg/kg IV Q8h</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>Acyclovir 10 mg/kg IV Q8h</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Rapidly-progressive severe encephalitis, usually without exanthem; often unilateral, temporal and parietal lobe predominance; permanent residua and high case-fatality rate in untreated cases.</td>
</tr>
</tbody>
</table>

**Clinical**

Although fever, headache, behavioral changes, confusion, focal neurological findings, and abnormal cerebrospinal fluid are suggestive of herpetic encephalitis, signs are not pathognomonic.

- Typical findings include fever, headache, psychiatric symptoms, altered consciousness, dysphagia, seizures and vomiting.

- Relatively severe and atypical presentations of encephalitis may occur in immunosuppressed patients.

- Focal weakness, ataxia, hemiparesis, and memory loss are common.

- In some cases, patients exhibit memory loss, psychiatric disorders, photophobia, cranial nerve deficits, papilledema, loss of visual fields, olfactory disturbance, new-onset refractory status epilepticus, choreoathetosis or other movement disorders.

- Concurrent herpetic encephalitis and cutaneous herpes simplex are uncommon.

- Infection is usually frontotemporal and unilateral, and characterized by severe, often fatal disease.

- Unilateral involvement of the temporoparietal region is typical, and helps distinguish herpetic infection from other forms of viral encephalitis which tend to be bilateral and symmetrical.

- Cases of overt cerebral hemorrhage, acute disseminated encephalomyelitis, Charles Bonnet syndrome (complex visual hallucinations) and symmetric brain stem encephalitis have been reported.

- Neurological sequelae are more common following HSV-1 than HSV-2 encephalitis.

West Nile viral encephalitis may mimic herpes simplex encephalitis.

An unrelated condition, severe acute disseminated encephalomyelitis, has been reported as a complication of herpetic gingivostomatitis.

Herpes encephalitis is a risk factor for acute retinal necrosis.

Relapse of encephalitis occurs in 12% of treated patients.

**This disease is endemic or potentially endemic to all countries.**

**References**

Herpes simplex infection

**Agent**  
VIRUS - DNA. Herpesviridae, Alphaherpesvirinae, Simplexvirus: Human herpesvirus I and II

**Reservoir**  
Human

**Vector**  
None

**Vehicle**  
Infected secretions, including Sexual contact

**Incubation Period**  
1d - 14d

**Diagnostic Tests**  
Viral culture or microscopy of lesions. Serology. Nucleic acid amplification.

**Typical Adult Therapy**  
Famciclovir 500 mg PO BID X 7d. OR Valacyclovir 2 g PO BID X 1d OR Acyclovir 400 mg PO X 5 per day X 5d

**Typical Pediatric Therapy**  
Acyclovir 10 mg/kg PO QID X 7d

**Clinical Hints**  
Recurring localized crops of painful vesicles on a red base; regional adenopathy often present; may follow a prodrome of neuropathy or hyperesthesia.

**Synonyms**  
Herpes gladiatorum, Herpes rugbiorum, Herpes simplex, Scrum pox.  
ICD9: 054.0,054.1,054.2,054.4,054.5,054.6,054.7,054.8,054.9  
ICD10: A60,B00

---

**Clinical**

The initial attack of herpes simplex is generally more overt than recurrent episodes; however, primary infections are often asymptomatic.  
- Symptoms will also vary depending on the site of infection (eye, esophagus, anal region, etc).

**Signs and symptoms:**  
Following a prodrome of local discomfort, tender papular, vesicular or ulcerative lesions on an erythematous base appear.  
- Anorexia, malaise and fever may accompany individual episodes.  
- The lesions coalesce, and tender bilateral lymphadenopathy develops.  
- Skin lesions usually heal over the next several days to weeks.  
- Patients may give a history of occupational exposure (ie, herpetic whitlow, found in medical or dental personnel; herpes gladiatorum among wrestlers).  
- Vesicular skin lesions of tularemia may mimic those of herpes simplex; and herpetic infection may present as folliculitis.

**Complications:**  
Immunosuppressed patients and neonates are at particular risk for disseminated and severe infections.  
- Lesions of the tongue may present as herpetic geometric glossitis.  
- Mucosal herpetic lesions may serve as a portal for bacterial invasion.  
- Ocular complications include conjunctivitis, scleritis, severe keratitis and retinal necrosis.  
- Corneal infection may present as epithelial keratitis (dendritica/geographica), stromal keratitis (necrotizing vs. non-necrotizing or "interstitial keratitis"), endotheliitis (disciform keratitis), neurotrophic keratopathy (metaherpetic keratitis) or vascularized corneal scars.  
- Over 10% of keratouveitis cases are complicated by secondary glaucoma.  
- Herpetic keratitis may complicated ocular steroid injection.  
- Herpes simplex infection has been etiologically linked to facial (Bell's) palsy.  
- Paralysis of the fourth and sixth cranial nerves has also been reported.  
- Pancreatitis, esophagitis, cardiomyopathy and rhabdomyolysis with renal failure have been reported to complicate herpes simplex infection.  
- Herpes simplex hepatitis is most common in the setting of pregnancy or immune suppression; however, rare instances of hepatitis and fulminant hepatic failure due to HSV infection have been reported in immunocompetent persons.  
- HSV-related erythema multiforme has been reported in stem-cell transplant recipients.  
- Disseminated infection among patients with eczema (Eczema herpeticum) may resemble smallpox or present as atopic dermo-respiratory syndrome.  
- Chronic (>1 month) mucocutaneous infections may occur in HIV-positive patients, in the absence of disseminated disease.
• Seroprevalence surveys:

  88% of HIV-positive women and 54% of HIV-negative women (HSV-2, 1992 publication)
  22% of clients of CSW in Gonaives and St. Marc (HSV-2, 2008 publication)

References

3. Medicine (Baltimore) 2008 May ;87(3):167-76.
### Clinical

The condition represents reactivation of dormant Varicella-Zoster virus in dorsal root ganglia.

Disease is characterized by grouped vesicular lesions distributed along one to three sensory dermatomes, usually unilateral and on the trunk or face.  
- Mild pruritis or excruciating pain may be present, and persist after the disappearance of the rash.
- Although pain typically presents for 1 to 3 days prior to the appearance of a rash, the pre-eruptive prodromal period may persist for as long as 18 days.
- Granulomatous dermatitis may appear following the acute eruption.
- In immunocompromised individuals, herpes zoster may become disseminated.
- A chronic verrucous form of herpes zoster seen in HIV-positive patients is associated with antiviral drug-resistance.

Most healthy persons recover without complications; however, individuals above age 50 years are at increased risk of postherpetic neuralgia which may persist for months to years after the rash has healed.
- The possible effect of antiviral drugs in prevention of post-herpetic neuralgia is controversial.
- Immunocompromised patients are risk for chronic herpes zoster; or infection of the central nervous system, liver, lungs or pancreas.
- Chronic (>1 month) mucocutaneous infections may occur in HIV-positive patients, in the absence of disseminated disease.
- Visual impairment or scleral damage may follow zoster ophthalmia. Over 10% of keratouveitis cases are complicated by secondary glaucoma. Rare instances of orbital apex syndrome and optic neuritis are also reported. VZ virus infection may be associated with myotomal paresis, urinary dysfunction, facial nerve palsy or Ramsay-Hunt syndrome (Bell palsy unilateral or bilateral, vesicular eruptions on the ears, ear pain, dizziness, preauricular swelling, tingling, tearing, loss of taste sensation, and nystagmus). VZ virus infection can be a presenting symptom of hyperparathyroidism and occurs twice as often in persons with hypercalcemia than age-matched controls. In some cases, reactivation of VZ virus may present as radiculitis, cranial nerve palsy or other features of herpes zoster but without rash (zoster sine herpete).

This disease is endemic or potentially endemic to all countries.
References

### Histoplasmosis

| Agent | FUNGUS. Ascomycota, Euascomycetes, Onygenales: Histoplasma capsulatum var. capsulatum A dimorphic fungus |
| Reservoir | Soil  Caves  Chicken roosts  Bat |
| Vector | None |
| Vehicle | Air |
| Incubation Period | 10d - 14d (range 5d - 25d) |
| Diagnostic Tests | Fungal culture. Serologic tests less helpful. Antigen tests currently under study. Nucleic acid amplification. |
| Typical Adult Therapy | Itraconazole 200 mg daily X 9m For severe or immunocompromized patients: Liposomal Amphoterican B 3 to 5 mg/kg/d X 2w, followed by Itraconazole as above |
| Typical Pediatric Therapy | Itraconazole 2 mg/kg daily X 9 m. For severe or immunocompromized patients: Liposomal Amphoterican B 3 to 5 mg/kg/d X 2w, followed by Itraconazole as above |
| Clinical Hints | Fever, cough, myalgia, pulmonary infiltrates and calcifying hilar lymphadenopathy; chronic multisystem infection often encountered. |
| Synonyms | Darling’s disease, Histoplasma capsulatum, Histoplasmose, Ohio River Valley Fever, Ohio Valley disease, Reticuloendothelial cytomycosis. |

### Clinical

Asymptomatic infection is common, and may be found as an incidental finding on chest X-ray, or through serological or skin tests. ¹

**Pulmonary histoplasmosis:**
Acute benign respiratory infection is characterized by weakness, fever, chest pains, and cough. ²
- The severity of illness is related to the magnitude of the exposure.
- Chronic pulmonary infection occurs in persons with pre-existing lung diseases such as emphysema.
- The infection is most common in males over the age of 40.
- Chronic pulmonary lesions are characterized by extensive cavitation, but may resemble those of tuberculosis. ³

**Disseminated histoplasmosis:**
Disseminated infection is seen in immunocompromised patients (AIDS ⁴-¹⁰, leukemia, corticosteroid therapy, transplant recipients ¹¹, anti-TNF therapy ¹², etc) and may be characterized by fever, anemia, hepatitis ¹³, pneumonia, pleuritis, pericarditis ¹⁴, acalculous cholecystitis ¹⁵, meningitis, atypical skin lesions (10% of cases) ¹⁶-¹⁸ and ulcers of the mouth ¹⁹, tongue ²⁰, nose ²¹, nasal septum ²², larynx. ²³-²⁵, paranasal sinuses ²⁶, esophagus ²⁷-²⁹, vulva ³⁰, and colon. ³¹-³³
- Associated findings include upper lobe cavitation with fibrosis (similar to tuberculosis); sclerosing mediastinitis with obstruction of the superior vena cava, pulmonary arteries and veins; esophagus; and constrictive pericarditis. ³⁴
- Fungemia is most common in patients with immunosuppression or neutropenia (<3,000 per cu mm). ³⁵
- Central nervous system infection can present at chronic meningitis, focal parenchymal lesions of the brain or spinal cord, stroke due to infected emboli, and diffuse encephalitis. ³⁶-³⁸
- Spinal infection may mimic tuberculosis spondylodiscitis. ³⁹
- Adrenal masses ⁴⁰-⁴⁴ and renal infection are occasionally reported ⁴⁵ ⁴⁶ and may mimic carcinoma. ⁴⁷
- Peritoneal histoplasmosis has been reported as a complication of peritoneal dialysis. ⁴⁸
- Instances of Histoplasma endocarditis are reported, involving both native and prosthetic valves. ⁴⁹-⁶⁶ Infection of arterial bypass grafts has also been reported. ⁶⁷
- Epididymo-orchitis and prostatitis are occasionally reported. ⁶⁸-⁷³
- Gastrointestinal infection may mimic colonic carcinoma ⁷⁴-⁷⁶ or abdominal tuberculosis. ⁷⁷
- Dermatological manifestations include erythema nodosum ⁷⁸, erythema multiforme ⁷⁹, purpuric lesions, or the appearance of ulcerating verrucous plaques. ⁸⁰ ⁸¹ Primary infection may present as a dermal nodule with regional adenopathy. ⁸² Skin lesions may mimic secondary syphilis. ⁸³
• Osteomyelitis limited to a single bone has been reported in some cases. 84-88
• Hypercalcemia has been reported in some cases. 89-93

"Ocular histoplasmosis syndrome" is characterized by peripapillary atrophy, punched out lesions, a macular disciform lesion or scar in one eye without vitritis.
• The role of Histoplasma capsulatum in this condition is unclear. 94 95
• Overt Histoplasma keratitis has been reported 96

Acute disseminated infection is also seen in infants and young children and is marked by fever, cough, exhaustion and hepatosplenomegaly. 97
• Roentgenographic findings include multiple nodules (3 to 4 mm) changing into punctate calcifications; histoplasmoma (non-calculifying nodules <3 mm); a "target lesion" (ie, central calcification); or hilar/mediastinal adenopathy ("popcorn" calcification).

Primary histoplasmosis of the larynx 98 and mouth has been reported. 99

This disease is endemic or potentially endemic to 93 countries. Although Histoplasmosis is not endemic to Haiti, imported, expatriate or other presentations of the disease have been associated with this country.

Histoplasmosis in Haiti

Sporadic case reports of histoplasmosis are encountered. 100

References

20. Histoplasma capsulatum
21. Histoplasmosis
22. Histoplasmosis in Haiti
37. Histoplasma capsulatum
38. Histoplasmosis
39. Histoplasmosis in Haiti
49. Histoplasma capsulatum
50. Histoplasmosis
51. Histoplasmosis in Haiti
56. Histoplasma capsulatum
57. Histoplasmosis
58. Histoplasmosis in Haiti
HIV infection - initial illness

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA. Retroviridae, Lentivirinae: Human Immunodeficiency Virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Blood  Semen  Sexual Transplacental  Breast-feeding</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1w - 6w</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>HIV antibody (ELISA, Western blot). HIV or HIV antigen assays. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Antiretroviral therapy - most experts will initiate treatment even if no symptoms + normal CD4 count.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Antiretroviral therapy - most experts will initiate treatment even if no symptoms + normal CD4 count.</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Fever, diarrhea, sore throat and a mononucleosis-like illness in a &quot;high risk&quot; patient (eg, men who have sex with men, drug abuser, etc).</td>
</tr>
<tr>
<td>Synonyms</td>
<td>HIV, HIV infection. ICD9: 042  ICD10: B20,B21,B22,B23,B24</td>
</tr>
</tbody>
</table>

Clinical

The clinical features of acute HIV infection are protean and often characterized by fever, generalized lymphadenopathy, headache, fatigue, myalgia, rash, nausea, vomiting, night sweats, sore throat, diarrhea or weight loss. 1
- 40% to 90% of persons have symptoms suggestive of an acute viral infection.
- Symptoms tend to subside within two weeks; however, some patients continue to be ill for as long as ten weeks.
- In most cases, a history of likely acquisition within the past several weeks can be established: unprotected sex, extra-medical injection, transfusion, etc.

This disease is endemic or potentially endemic to all countries.

HIV infection - initial illness in Haiti

Data and background information regarding HIV infection are included in the note for AIDS

References

# Hookworm

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human  Non-human primates</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Soil  Contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>7d - 2y</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Examination of stool for ova.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td><strong>Albendazole</strong> 400 mg X 1 dose. OR <strong>Mebendazole</strong> 100 mg BID X 3d. OR <strong>Pyrantel pamoate</strong> 11 mg/kg (max 3g) X 3d</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td><strong>Albendazole</strong> 200 mg PO single dose OR <strong>Mebendazole</strong> 100 mg BID X 3 d (&gt; age 2).</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Pruritic papules (usually of feet) - later cough and wheezing; abdominal pain and progressive iron-deficiency anemia; eosinophilia common; dyspnea and peripheral edema in heavy infections; <em>Ancylostoma caninum</em> implicated in eosinophilic enteritis.</td>
</tr>
<tr>
<td>ICD9</td>
<td>126.0,126.1</td>
</tr>
<tr>
<td>ICD10</td>
<td>B76.0,B76.1,B76.8</td>
</tr>
</tbody>
</table>

## Clinical

Initial manifestations of hookworm consist of pruritus, erythema, and a papular, or vesicular rash at the site of larval penetration ("ground itch").

- Migration of larvae through the lungs may result in a Loeffler-like syndrome with transitory cough, wheezing, diffuse opacities on x-ray and eosinophilia in sputum and blood.  
- Migration of *A. duodenale* larvae to the breast, with infection of nursing infants ("hypobiosis") has been described.  
- The major finding in overt infection is iron-deficiency anemia.  
- Heavy intestinal infection may also produce local symptoms of abdominal pain, diarrhea, and occasionally malabsorption with weight loss (most commonly in children).  
- Rare instances of overt bleeding or melena have been reported.

**This disease is endemic or potentially endemic to all countries.**

## Hookworm in Haiti

### Prevalence surveys:

- 3.8% of school children (2002)  

## References

Human herpesvirus 6 infection

Agent | VIRUS - DNA. Herpesviridae, Betaherpesvirinae, Roseolovirus: Herpesvirus 6 (Herpesvirus 7 is also implicated)
---|---
Reservoir | Human
Vector | None
Vehicle | Droplet Contact
Incubation Period | 10d - 15d
Diagnostic Tests | Viral isolation and serologic tests rarely indicated. Nucleic acid amplification has been used
Typical Adult Therapy | Supportive Gancyclovir has been used in unusual and severe cases.
Typical Pediatric Therapy | As for adult
Clinical Hints | High fever followed by sudden defervescence and fleeting rash; most patients are below the age of 2 years; only 10% to 20% of herpesvirus 6 infections are associated with a rash.
Synonyms | Dreitagefieber, Exanthem criticum, Exanthem subitum, Herpesvirus 6, HHV-6, Pseudorubella, Roseola, Roseola infantilis, Roseola subitum, Sixth disease, Zahorsky's disease.
ICD9: 057.8
ICD10: B08.2

Clinical

Roseola typically is characterized by high fever (often to 40 C) lasting from three to seven days, followed by rapid defervesence and a characteristic pink rash. 1 2
- The rash is maculopapular or erythematous, beginning on the trunk and spreading to the neck and extremities. 3
- Skin lesions are discrete, not pruritic, blanch on pressure and fade within 3 to 48 hours.

Diarrhea, cough and irritability are common, and seizures may rarely occur in individual cases. 4
- HHV-6 infection accounts for 10% to 20% of febrile seizures in children below the age of two years. 5 6
- Other findings may include bulging anterior fontanel, Nagayama spots (erythematous papules on the soft palate and uvula), periorbital edema, inflamed tympanic membranes, cervical, post auricular, and post occipital lymphadenopathy, splenomegaly, meningsitis with radiculitis 7 , encephalopathy or encephalitis 8-16 , fourth cranial nerve palsy 17 , chorea 18 , arthropathy (4.3% of cases) 19 , rhadomolysis 20 , uveitis 21 22 , optic neuritis 23 , acute retinal necrosis 24 , corneal inflammation 25 and conjunctival injection. 26
- Rare instances of acute hepatic failure 27 and purpura fulminans have been reported. 28

Newborns with congenital HHV-6 infection may exhibit neurodevelopmental disorders. 29

Reactivation and severe disease have been encountered in bone-marrow, solid organ transplant and other immune-deficient patients. 30-33
- HHV-6-associated pleurisy has been reported following stem-cell transplantation (2007 publication) 34
- Fatal hepatitis and myocarditis has been reported in immunocompetent adults. 35 36

This disease is endemic or potentially endemic to all countries.

References

26. Eye Contact Lens 2013 Nov 27;
29. Pediatrics 2014 Nov 3;
**Hymenolepis diminuta infection**

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Hymenolepididae: Hymenolepis diminuta</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Rodent  Various insects</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Arthropod - ingestion</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>2w - 4w</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Identification of ova in stool</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td><em>Praziquantel</em> 25 mg/kg as single dose. OR <em>Niclosamide</em> 2g, then 1g/d X 6d</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td><em>Praziquantel</em> 25 mg/kg as single dose. OR <em>Niclosamide</em> 1g, then 0.5g/d X 6d (1.5g, then 1g for weight &gt;34kg)</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Nausea, abdominal pain and diarrhea; eosinophilia may be present; primarily a pediatric disease, in rodent-infested areas; infestation resolves spontaneously within 2 months.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Hymenolepis diminuta, Mathevotaenia, Rat tapeworm. ICD9: 123.6 ICD10: B71.0</td>
</tr>
</tbody>
</table>

**Clinical**

Patients, usually children, may develop mild abdominal pain, nausea diarrhea and eosinophilia. ¹

**This disease is endemic or potentially endemic to all countries.**

**References**

**Hymenolepis nana infection**

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Hymenolepididae: Hymenolepis (Rodentolepis) nana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human Rodent (especially hamster)</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Food Water Fecal-oral</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2w - 4w</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of ova in stool</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Praziquantel 25 mg/kg once. OR Nitazoxanide 500 mg daily for 3 days OR Niclosamide 2g/d X 1, then 1g/d X 6d</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Praziquantel 25 mg/kg once. OR Nitazoxanide 100 mg (age 1 to 3 years) to 200 mg (age 4 to 11 years) BID X 3d OR Niclosamide 1g/d X 1, then 0.5g/d X 6d (1.5g, then 1g for weight &gt;34kg)</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Nausea, abdominal pain, diarrhea, irritability and weight loss; eosinophilia may be present; infection is maintained by autoinfection (worm reproduces within the intestinal lumen).</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Dwarf tapeworm, Hymenolepis nana, Rodentolepis (Hymenolepis) microstoma, Rodentolepsiasis, Vampirolepis nana. ICD9: 123.6 ICD10: B71.0</td>
</tr>
</tbody>
</table>

**Clinical**

Infestation by *Hymenolepis nana* is largely asymptomatic. ¹
- Children are most likely to exhibit symptoms consisting of abdominal pain and diarrhea. ²
- Pruritis ani and behavioral and sleep disturbances are occasionally encountered. ³
- Most patients have eosinophilia (5% to 10% of total leucocyte count).

**This disease is endemic or potentially endemic to all countries.**

**Hymenolepis nana infection in Haiti**

**Prevalence surveys:**
2% of school children (2002) ⁴

**References**

### Infection of wound, puncture, IV line, etc

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. <em>Staphylococcus aureus</em>, streptococci, facultative or aerobic gram negative bacilli, anaerobes, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human  Soil  Water  Air (spores)  Various animals and plants</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Trauma  Water  Medications  Bandages  Autoinoculation</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>Variable</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Smear and culture of catheter, material from wound.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Drainage, remove catheter, debridement and antibiotics appropriate to infecting species</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Source (ie, venous line, postoperative, marine, animal bite) may suggest species; onset less than 24 hrs = group A Strep. or <em>Cl. perfringens</em>; 2 to 7 days <em>S. aureus</em>; over 7 days gram negative bacilli; foul odor anaerobes.</td>
</tr>
</tbody>
</table>
| **Synonyms** | Intravenous catheter infection, Line infection, Surgical wound infection, Wound infection.  
ICD9: 686.9,451  
ICD10: T79.3,I80.0, Y95  |

### Clinical

Wound infection is a self-defined illness.

The features and severity of infection are largely determined by the health status of the patient, and the nature of the wound and infecting organism.

Signs of infection which develop in a patient with an intravenous catheter should be assumed to be related to the catheter until proven otherwise.

**This disease is endemic or potentially endemic to all countries.**
Infectious mononucleosis or EBV infection

### Clinical

Symptoms of Infectious Mononucleosis (IM) usually consist of fever, pharyngitis, and lymphadenopathy.  
- Patients usually do not recall a history of possible exposure. 
- A prodrome consisting of 1 to 2 weeks of fatigue, malaise, and myalgia is common; however, abrupt presentations may occur. 
- A low-grade fever is usually present and lasts for 1 to 2 weeks, occasionally up to 5 weeks. 
- CMV / EBV co-infection may be associated with prolonged illness.

Pharyngitis may be severe, particularly during the first week of illness. 
- Tonsillitis may be present, and lymphadenopathy is almost universal, lasting for 1 to 2 weeks. 
- Posterior cervical nodes are often affected, and generalized adenopathy may occur. 
- Periorbital edema and palatal petechiae are often present. 
- Splenomegaly is found in most cases, and hepatomegaly in 25%. 
- Asymptomatic pericardial effusions are common. 
- Patients often complain of headache. 
- A morbilliform or papular erythematous eruption of the upper extremities or trunk is noted in 5% of cases. 
- Lemierre’s syndrome has been reported as a complication of infectious mononucleosis. 
- Guillain-Barre syndrome, encephalitis and membranous glomerulonephritis have been reported during the course of primary EBV infection.

It is of note that a macular erythematous rash may occur in patients treated with ampicillin, usually appearing 5 to 9 days following the first dose. 
- This phenomenon should not be misinterpreted as a penicillin allergy. 
- Erythema nodosum and erythema multiforme have been associated with IM, as have petechiae and jaundice. 
- The presence of severe abdominal pain may herald splenic rupture.

Other diseases ascribed to Epstein-Barr virus include nasopharyngeal carcinoma, Burkitt’s lymphoma (African type), post-transfusion lymphoproliferative disorder (PTLD), hemophagocytic lymphohistiocytosis and hemolytic anemia. 
- Epstein-Barr virus infection, like many other infectious diseases, is occasionally followed by Guillain-Barre syndrome. 
- Gianotti-Crosti syndrome may be the only presenting manifestation of Epstein-Barr virus infection.

A false positive serological reaction toward Epstein-Barr virus has been associated with a variety of conditions, including rheumatoid arthritis, Hepatitis E, Hepatitis A and Parvovirus B19 infection.
This disease is endemic or potentially endemic to all countries.

References

Influenza

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA. Orthomyxoviridae, Orthomyxovirus: Influenza virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human Occasionally Ferret Bird Pig</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Droplet</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1d - 3d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Viral culture (respiratory secretions). Serology. Nucleic acid amplification techniques are available.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Respiratory precautions. Influenza A or B: Oseltamivir 75 mg PO BID X 5d OR Zanamavir 10 mg BID X 5 days</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Respiratory precautions. Influenza A or B: Oseltamivir 2 mg/kg (max 75 mg) PO BID X 5d OR Zanamavir (age &gt; 5 years) 10 mg BID X 5 days</td>
</tr>
<tr>
<td>Vaccines</td>
<td>Influenza - inactivated vaccine</td>
</tr>
<tr>
<td></td>
<td>Influenza - live vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Myalgia, headache, cough, fever; pharyngitis and conjunctivitis often present; usually encountered in the setting of an outbreak; leucocytosis, chest pain and lobar infiltrate herald bacterial (pneumococcal or staphylococcal) pneumonia.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Asian flu, Aviaire influenza, Avian flu, Avian influenza, Bird flu, Epidemic catarrh, Grippe, H10N8, H1N1, H2N2, H3N2, H5N1, H7N9, Hong Kong flu, LPAI, Spanish influenza, Swine flu, Swine influenza. ICD9: 487 ICD10: J09, J10, J11</td>
</tr>
</tbody>
</table>

**Clinical**

Influenza is characterized by acute onset of fever, headache, myalgia, nonproductive cough, sore throat, and rhinitis. The illness usually resolves in 2 to 7 days; however, symptoms often persist for up to two weeks.

- Severe illness or death may complicate the acute infection, notably in pregnant women, the elderly and patients with underlying medical conditions.
- Complications include primary viral pneumonia or bacterial pneumonia (most commonly pneumococcal); myocarditis, myositis, Guillain-Barre syndrome, encephalitis, Gianotti-Crosti syndrome and transverse myelitis.

**WHO Case definition for surveillance ● Influenza:**
Clinical case definition
A person with sudden onset of fever of >38°C and cough or sore throat in the absence of other diagnoses.

Laboratory criteria for diagnosis
- Virus isolation: Swab or aspirate from the suspected individual, or
- Direct detection of influenza viral antigen.
- Serology: Fourfold rise in antibody titer between early and late serum.

Case classification
- Suspected: A case that meets the clinical case definition.
- Confirmed: A case that meets the clinical case definition and is laboratory-confirmed (used mainly in epidemiological investigation rather than surveillance).

**WHO definition for surveillance ● Swine influenza (H1N1):**
confirmed case • person with swine influenza A (H1N1) virus infection laboratory confirmed by
- real-time RT-PCR and/or
- viral culture and/or
- 4-fold rise in swine influenza A(H1N1) virus specific neutralizing antibodies
probable case • either
- person with influenza test positive for influenza A, but unsubtypable by reagents used to detect seasonal influenza virus infection, or
- person with clinically compatible illness or who died of unexplained acute respiratory illness who is considered to be epidemiologically linked to probable or confirmed case

**CDC definition for surveillance ● Swine influenza (H1N1):**
confirmed case • person with acute respiratory illness with swine influenza A (H1N1) virus infection laboratory confirmed at
Influenza

**Avian influenza H5N1 infection:**
Avian influenza H5N1 infection is characterized by fever greater than 38°C, shortness of breath and cough.\(^1^\)\(^1^\)\(^1^\)
- The incubation period is 2 to 4 days.
- All patients reported to date have presented with significant lymphopenia and marked chest radiograph abnormalities consisting of diffuse, multifocal or patchy infiltrates.
- Some cases showed segmental or lobular consolidation with air bronchograms.
- Crackles were frequently heard on auscultation.
- Some of the patients reported sore throat, conjunctivitis, myalgia, rash or rhinorrhea.
- Watery diarrhea or loose stools was noted in approximately 50% of the cases.
- Myocardial dysfunction and hepatic dysfunction are also reported.
- Reactive hemophagocytic syndrome is the most characteristic pathological finding and may contribute to the lymphopenia, liver dysfunction, and abnormal clotting profiles observed among patients with severe infection.
- Approximately 90% of patients with H5N1 infection have been below age 40.\(^1^\)\(^3^\)
- Approximately 60% of patients have died, on an average of 10 days after onset of symptoms.
- Rare instances of subclinical infection have been reported.\(^1^\)\(^4^\)

**Influenza virus H1N1 infection:**
- During the "Spanish flu" H1N1 pandemic of 1918 to 1919, illness was characterized by unusual severity, tendency to affect young healthy adults, rapid progression, and overwhelming pneumonia.
- During the outbreak of A(H1N1)pdm09 virus of 2009 to 2010, children and young adults accounted for a large proportion of cases.\(^1^\)\(^5^\)\(^1^\)\(^6^\)\(^1^\)\(^9^\)\(^1^\)\(^9^\)\(^1\)\(^0^\)\(^1^\)\(^5^\)\(^6^\)\(^1^\)\(^7^\)\(^1^\)\(^8^\)\(^1^\)\(^9^\)\(^1^\)\(^0^\)\(^1^\)\(^1^\)\(^2^\)\(^3^\)\(^1\)\(^5^\)\(^2^\)\(^1^\)\(^6^\)\(^1^\)\(^7^\)\(^1^\)\(^1^\)\(^8^\)\(^2^\)\(^9^\)\(^2^\)\(^0^\)\(^2^\)\(^1^\)\(^3^\)\(^2^\)\(^4^\)\(^2^\)\(^5^\)\(^2^\)\(^6^\)\(^2^\)\(^7^\)\(^2^\)\(^8^\)\(^2^\)\(^9^\)\(^3^\)
- Severe cases were not necessarily associated with underlying disease. Obesity,\(^1^\)\(^2^\)\(^1^\)\(^3^\)\(^4^\)\(^2^\)\(^5^\)\(^2^\)\(^6^\)\(^2^\)\(^7^\)\(^2^\)\(^8^\)\(^2^\)\(^9^\)\(^3^\)\(^0^\)\(^2^\)\(^1^\)\(^2^\)\(^3^\)\(^4^\)\(^5^\)\(^6^\)\(^7^\)\(^8^\)\(^9^\)\(^1^\)\(^0^\)\(^1^\)\(^2^\)\(^3^\)\(^4^\)\(^5^\)\(^6^\)\(^7^\)\(^8^\)\(^9^\)
- Myocardial and respiratory failure, with refractory hypoxemia and multiple organ failure (the major cause of death).
- Approximately 90% of patients with H5N1 infection have been below age 40.
- Children below age 5 years, particularly those with neuro-developmental disorders, were also found to be at risk.
- Most deaths were caused by primary viral pneumonia, and bacterial co-infection was identified in as many as 29% of fatal cases.\(^8^\)\(^5^\)\(^8^\)\(^9^\)
- Vomiting and diarrhea were reported in 25% of patients, and as many as 6% were afebrile.\(^9^\)\(^2^\)
- Cas-fatalitity rates were not necessarily higher than those reported for other strains of Influenza virus.\(^9^\)\(^3^\)\(^9^\)\(^4^\)
- Additional complications included myopathy or rhabdomyolysis, encephalitis or encephalopathy, ischemic stroke, aseptic meningitis, acute disseminated or hemorrhagic leukoencephalitis, deafness, cerebellitis, acute myelopathy, Guillain-Barre syndrome, parkinsonism, narcolepsy, quadriplegia, glomerulonephritis, tubulointerstitial nephritis, renal failure, hemolytic-uremic syndrome, hepatic failure, reactive thrombocytosis, hemophagocytic lymphohistiocytosis, myopathy, cold agglutinin syndrome, autoimmune thrombotic thrombocytopenic purpura, myocarditis, reversible myocardial dysfunction, pericarditis, subacute thyroiditis, rash, pancreatitis, vascular thrombosis, plastic bronchitis, hemorrhagic pneumonia, and Acute Respiratory Distress Syndrome (ARDS).\(^2^\)\(^2^\)\(^5^\)\(^2^\)\(^9^\)
- In some cases, the clinical features of leptospirosis suggested a diagnosis of H1N1 influenza.\(^2^\)\(^4^\)\(^0^\)

**Influenza H7N9 infection:**
The most common presenting signs and symptoms of Influenza H7N9 infection are typical of influenza.\(^2^\)\(^4^\)\(^1^\)\(^2^\)\(^3^\)
- Encephalopathy and conjunctivitis are uncommon, and nasal congestion and rhinorrhea are not encountered as initial presentations. Hemoptyisis was a common finding in one series and a nonspecific rash has been reported in some cases.\(^2^\)\(^4^\)\(^5^\)
- Laboratory findings included normal white cell count, leukocytopenia, lymphocytopenia, thrombocytopenia, and mildly elevated hepatic enzymes. Most cases are severe, and often deteriorate within 1 to 2 days of hospitalization to acute respiratory failure, with refractory hypoxemia and multiple organ failure (the major cause of death).\(^2^\)\(^4^\)\(^6^\)\(^2^\)\(^4^\)\(^8^\)
- A few mild cases have been reported, notably in children.\(^2^\)\(^4^\)\(^9^\)\(^2^\)\(^5^\)\(^1^\)
- One case of presumed human-to-human transmission was reported.\(^2^\)\(^5^\)\(^2^\)
- Infection occurring below the age of 12 years is associated with relatively mild illness, and no deaths had been
This disease is endemic or potentially endemic to all countries.

### Influenza in Haiti

**GIDEON** does not follow routine country reports on human influenza, since the scope and nature of these data are often diffuse, sporadic or inconsistent. See the "Worldwide" note for material regarding pandemic influenza, influenza vaccine, avian influenza in humans and other relevant subjects.

Avian influenza (H5N2) was reported among poultry in 2008. **259**

#### Notable outbreaks:

- **2009 to 2010 - An outbreak (95 cases) was reported.**  
  **Context:** A pandemic of H1N1 Influenza virus A (H1N1)pdm09 infection occurred. **262** Over 600,000 cases had been officially-reported worldwide as of March, 2010. **382-394** 18,449 fatal cases were reported to August 1, 2010 (true number for first 12 months estimated at 293,500 **385 386**). **387-413** Indigenous populations from Australia, Canada, the United States and New Zealand were found to have at least a 3-fold greater death rate than others in their countries.

- **2009 to 2010 - An outbreak (95 cases) was reported.**  
  **Context:** A pandemic of H1N1 Influenza virus A (H1N1)pdm09 infection occurred. **263-381** Over 600,000 cases had been officially-reported worldwide as of March, 2010. **382-394** 18,449 fatal cases were reported to August 1, 2010 (true number for first 12 months estimated at 293,500 **385 386**). **387-413** Indigenous populations from Australia, Canada, the United States and New Zealand were found to have at least a 3-fold greater death rate than others in their countries. **414-437** Reporting of case-number summaries was suspended by WHO as of July 6 **438**; and on August 10, the pandemic was declared to have ended. **439 440** The pandemic began in Mexico, spreading rapidly to the United States and Canada. Swine were not implicated in the transmission of disease. **441-444** Human-to-swine transmission was confirmed in Argentina **445**, Cambodia **446 447**, Sri Lanka **448**, Vietnam **450**, Italy **451** and Canada during the outbreak **452-464**; and infected swine were identified in Argentina **465-467**, Australia **468-470**, Brazil **471**, Cameroon **472 473**, China **474-477**, Denmark **478**, Finland **479 480**, Germany **481 482**, Hungary **483**, Iceland **484**, India **485**, Indonesia **486**, Ireland **487**, Italy **488 489**, Japan **490 491**, England **492**, Mexico **493**, Northern Ireland **494**, Norway **495-498**, Republic of Korea **499 500**, Reunion Island **501**, Russian Federation **502**, Scotland **503**, Taiwan **504**, Thailand **505-507**, the United Kingdom **508 509** and the United States. **510-518** Infected turkeys were subsequently identified in Canada **519-521** Chile **522-526** France **527** the United Kingdom **528 529** and the United States. **530 531** Infection was reported in cats **532-544**, ferrets **545-550**, a badger (**Taxidea taxus**), a captive Bornean binturong (**Arctictis binturong penicillata**) **551 552**, elephant seals (**Mirounga angustirostris**) **553 554**, and a cheetah (**555 556** in the United States **557-563**; skunks in Canada **564**; dogs in Italy **565** and China **566 567**;) and dogs in and swine in the United States, Hong Kong and mainland China. **569-571**

- Reporting dates vary by country. The following updates include incidence data as of December 31, 2010. **572 573**
  - Afghanistan (17 fatal) **574 575**, Albania (6 fatal), Algeria (57 fatal cases), American Samoa (94 - 0 fatal), Andorra (1), Angola (37) **576**, Anguilla (14), Antigua and Barbuda (0 fatal), Argentina (626 fatal) **577-599**, Armenia (3 fatal), Aruba (13), Australia (51,170 - 195 fatal) **600-648**, Austria (24 fatal) **649-651**, Azerbaijan (2), Bahamas (4 fatal), Bahrain (7 fatal), Bangladesh (7 fatal) **652**, Barbados (157 - 3 fatal) **653**, Belarus (20 fatal) **654**, Belgium (17 fatal) **655-658**, Belize (60), Bermuda (1 fatal), Bhutan (847) **659**, Bolivia (59 fatal) **660**, Bosnia and Herzegovina (10 fatal), Botswana (23), Brazil (2,125 fatal) **661-671**, British Virgin Islands (25), Brunei (850 - 1 fatal), Bulgaria (40 fatal), Burundi (7), Cambodia (6 fatal) **672-675**, Cameroon (4) **676**, Canada (429 to 740 fatal) **677-711**, Cape Verde (118) **712**, Cayman Islands (130 - 1 fatal), Chad (1), Chile (156 fatal) **713-728**, Central African Republic **729**, China (724 fatal - including 56 in Hong Kong **730-757** and 2 in Macao **758-813**, Colombia (306 fatal) **814**, Comoros (2 fatal in Mayotte) **815**, Congo (21) **816**, Cook Islands (106 - 1 fatal), Costa Rica (65 fatal) **817**, Croatia (25 fatal), Cuba (1,805 - 83 fatal) **818 819**, Cyprus (6 fatal) **820 821**, Czech Republic (98 fatal), Democratic Republic of Congo (222) **822 823**, Democratic Republic of Korea (9) **824**, Denmark (32 fatal) **825-829**, Dominica (51), Dominican Republic (464 - 24 fatal), Ecuador (130 fatal) **830**, Egypt (281 fatal) **831-834**, El Salvador (34 fatal) **835**, Estonia (19 fatal), Ethiopia (12), Falkland Islands (7), Fiji (268 - 0 fatal), Finland (43 fatal) **836-839**, France (349 fatal) **840-847**, French Guiana (29 - 1 fatal) **848**, French Polynesia (185 - 7 fatal) **849 850**, Gabon (72) **879**, Georgia (20 fatal), Germany (253 fatal) **880-901**, Ghana (1 fatal), Gibraltar (16), Greece (141 fatal) **903-912**, Grenada (28), Guadeloupe (5 fatal) **913**, Guam (341 - 2 fatal) **914**, Guatemala (26 fatal) **915 916**, Guinea **917**, Guyana (30), Haiti (95) **918 919**, Honduras (18 fatal), Hong Kong (232 fatal) **920-947**, Hungary (333 fatal) **948**, Iceland (2 fatal) **949 950**, India (44,958 - 2,703 fatal) **951-969**, Indonesia (691 - 10 fatal) **970 971**, Iran (147 fatal) **972-981**, Iraq (42 fatal) **982**, Ireland (24 fatal) **983-985**, Israel (113 fatal, including 28 in Gaza and the West Bank) **986-1002**, Italy (256 fatal) **1003-1015**, Ivory Coast (5) **1016**, Jamaica (7 fatal), Japan (198 fatal) **1017-1048**, Jordan (19 fatal) **1049**, Kazakhstan (17) **1050**, Kenya (417) **1051-1055**, Kiribati (4 - 0 fatal), Kuwait (30 fatal), Laos (156 - 1 fatal) **1056-1059**, Latvia (34 fatal), Lebanon (5 fatal) **1060 1061**, Lesotho (65), Libya (1 fatal), Liechtenstein (5), Lithuania (23 fatal) **1062**, Luxembourg (3 fatal) **1063**, Macao (2 fatal) **1064**, Macedonia (23 fatal), Madagascar (3 fatal) **1065-1070**, Malaysia (1,780 - 77 fatal) **1071-1079**, Malawi (4), Maldives (1 fatal), Mali (12) **1080**, Malta (5 fatal), Marshall Islands (115 - 1 fatal), Martinique (44 - 1 fatal) **1081**, Mauritania (15) **1082**, Mauritius (8 fatal), Mexico (1,969 fatal) **1083-1127**, Micronesia (82 - 0 fatal), Moldova (35 fatal) **1128**, Monaco
References

13. ProMED <promedmail.org> archive: 20070211.0522
26. ProMED <promedmail.org> archive: 20090711.2482
29. Influenza Other Respir Viruses 2012 Nov ;6(6):449-60.
33. Obesity (Silver Spring) 2013 Nov ;21(11):2377-86.
57. Influenza Other Respir Viruses 2012 Nov ;6(6):449-60.
65. Euro Surveill 2009 ;14(33)
69. ProMED <promedmail.org> archive: 20090619.2260
84. ProMED <promedmail.org> archive: 20091208.4188
**Intestinal spirochetosis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Brachyspira pilosicoli and B. aalborgi Anaerobic gram-negative spirochetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human, Fowl, Pigs</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Spirochetes resemble 'brush border' on bowel biopsy; identification of Brachyspira by PCR</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Metronidazole appears to be effective in some cases.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult.</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Chronic diarrhea and abdominal pain in the absence of other identifiable etiology</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Human intestinal spirochetosis. ICD9: 009.1, ICD10: A04.8</td>
</tr>
</tbody>
</table>

**Clinical**

This diagnosis should be suspected in patients with persistent or chronic diarrhea lasting more than several weeks, in whom alternative etiologies are not identified.

- Abdominal pain, hematochezia, flatulence and intermittent constipation are also reported in some cases. 1-3
- *Brachyspira* has been identified in the blood in some cases 4, even in the absence of intestinal disease. 5
- Asymptomatic infection is common. 6
- Intestinal spirochetosis in children may mimic acute appendicitis 7 or inflammatory bowel disease. 8
- Although some patients improve following administration of Metronidazole, other cases resolve without specific therapy. 9

Roentgenographic studies may reveal colonic mucosal edema and luminal narrowing. 10

Standard H & E staining of colonic biopsies reveals a "pseudo-brush border" consisting of tiny spirochetes 11-13; or free-floating spirochetes in the intestinal mucus. 14

- Similar findings are often present in asymptomatic individuals. 15
- The organism can be identified using specialized culture 16 or molecular methods. 17-19

**This disease is endemic or potentially endemic to all countries.**

**References**

**Clinical**

Intra-abdominal abscesses often occur in the setting of prior abdominal trauma, surgery or infection.

Signs and symptoms may include fever, pain, tenderness and leucocytosis.
- In many cases, the sole presenting feature is prolonged fever, which may be accompanied by weight loss, lethargy and anemia.
- One or more localized masses may be detectable on palpation or through the use of imaging techniques.

Comprehensive reviews of clinical presentation:
- Pelvic Inflammatory Disease 1-6
- Splenic Abscess 7,8
- Pancreatic Abscess 9,10
- Pylephlebitis.11

This disease is endemic or potentially endemic to all countries.

**References**

Intracranial venous thrombosis

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Oral anaerobes, streptococci, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture (blood, CSF if indicated). Ophthalmoscopy. Roentgenographic studies of skull &amp; sinuses.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Antibiotic(s) directed at known or suspected pathogens</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Headache, seizures and fever; cranial nerve dysfunction may be present; usually occurs in the setting of facial, otic or sinus infection.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Cavernous sinus thrombosis, Cerebral sinus thrombosis, Cortical vein thrombosis, Internal cerebral vein thrombosis, Straight sinus thrombosis, Superior sinus thrombosis, Transverse sinus thrombosis.</td>
</tr>
</tbody>
</table>

**Clinical**

**Cortical vein thrombosis** may occasionally be clinically silent, or produce only transient neurological findings.  
- Septic cortical vein or venous sinus occlusion may progress to subdural empyema, meningitis, brain abscess, systemic infection or pulmonary embolism.  
- Severe headache is present in 90% of cases, and cerebral lesions with neurological signs in 50%.  
- If collateral flow is compromised, the resulting neurological may mimic brain abscess, with impairment of consciousness, focal or generalized seizures, and increased intracranial pressure.  
- Depending on the site of the lesion, one may encounter hemiparesis, which involves the face and hand if veins; unilateral or bilateral leg weakness; aphasia; etc.

**Cavernous sinus thrombosis** is characterized by diplopia, photophobia, orbital edema, and progressive exophthalmos.  
- Involvement of cranial nerves III, IV, V, and VI is reflected by ophthalmoplegia, fixed pupil, a loss of the corneal reflex and diminished upper facial.  
- Papilledema, retinal hemorrhages, and visual loss may also occur.

**Anterior superior sagittal sinus thrombosis** may produce intracranial hypertension without other signs.  
- More extensive blockage of this sinus is associated with bilateral leg weakness followed by arm weakness and clouding of consciousness.

**Lateral sinus thrombosis** causes pain over the ear and mastoid, occasionally with edema over the mastoid itself (Griesinger's sign); or ipsilateral facial pain and lateral rectus weakness (Gradenigo's syndrome).

This disease is endemic or potentially endemic to all countries.

**References**

Isosporiasis

Agent | PARASITE - Protozoa. Sporozoa, Coccidea, Eimeriida: Isospora [Cystoisospora] belli
Reservoir | Human
Vector | None
Vehicle | Food, Liquids, Fecal-oral, Sexual (homosexual) contact
Incubation Period | 7d - 10d
Diagnostic Tests | Microscopy of stool or duodenal contents. Advise laboratory when this organism is suspected.
Typical Adult Therapy | Sulfamethoxazole/trimethoprim 800/160 mg BID X 10 days - Then BID X 3 weeks (may be indefinite in AIDS patient) Increase dosage / duration in immune-suppressed patients Pyrimethamine 50 to 75 mg per day + leucovorin if allergic to sulfa
Typical Pediatric Therapy | Sulfamethoxazole/trimethoprim 25/5 mg/kg BID X 10 days - Then BID X 3 weeks
Clinical Hints | Myalgia, watery diarrhea, nausea and leukocytosis; eosinophilia may be present; prolonged and severe in AIDS patients.
Synonyms | Cystoisospora belli, Isospora belli.
ICD9: 007.2
ICD10: A07.3

Clinical

Isosporiasis is characterized by abdominal cramps, watery diarrhea, headache, weight loss and myalgias. ¹
- Fever and vomiting may also be present.
- A low-grade eosinophilia is present in 50% of patients
- Fecal leucocytes are not seen.

Infection in AIDS patients may cause significant weight loss and dehydration, requiring hospitalization. ²
- Disease is also more severe among patients with lymphoma and leukemia. ³
- Chronic and severe infection may occasionally affect immunocompetent patients as well, and infants and young children are most likely to suffer severe disease. ⁴
- Paralysis related to severe potassium depletion has been reported in an AIDS patient with isosporiasis. ⁵
- Biliary disease similar to primary sclerosing cholangitis has been reported. ⁶
- Disseminated extraintestinal infection has rarely been reported.

This disease is endemic or potentially endemic to all countries.

Isosporiasis in Haiti

Prevalence surveys:
- 15% of AIDS patients in this country and 11% of AIDS-related diarrhea (1986 publication) ⁷
- 12% of HIV-positive adults with diarrhea (1990 to 1993) ⁸
- 5% of HIV-positive patients with chronic diarrhea (2003 to 2004) ⁹

References

Kawasaki disease

**Agent**  UNKNOWN

**Reservoir**  Unknown

**Vector**  None

**Vehicle**  Unknown

**Incubation Period**  Diagnosis is based on clinical criteria only.

**Diagnostic Tests**  Intravenous gamma globulin 2.0 g/kg over 10 to 12h X 1 dose. Plus aspirin 100 mg/kg/day X 14d (or until defervesence) - then 5 to 10 mg/kg/day until normal ESR Infliximab 5 mg/kg has been successful in some studies.

**Typical Adult Therapy**
- Intravenous gamma globulin 2.0 g/kg over 10 to 12h X 1 dose. Plus aspirin 100 mg/kg/day X 14d (or until defervesence) - then 5 to 10 mg/kg/day until normal ESR Infliximab 5 mg/kg has been successful in some studies.

**Typical Pediatric Therapy**  As for adult

**Clinical Hints**  Fever, conjunctivitis, stomatitis, erythematous rash which desquamates; occasional coronary artery occlusion; the disease is most common among children; case-fatality rates of 1% to 4% are reported.

**Synonyms**  Kawasaki's disease, Mucocutaneous lymph node syndrome.

ICD9: 446.1

ICD10: M30.3

---

**Clinical**

**Diagnostic criteria:**
1. Fever for at least five days in addition to at least 4 of the following:
   1. Changes in the oral mucosa (erythema, strawberry tongue, etc)
   2. Changes in hands and feet (erythema, swelling, periungual desquamation, rarely gangrene)
   3. Rash, primarily on trunk (maculopapular, scarlatiniform, erythema multiforme).
   4. Cervical lymphadenopathy
   5. Absence of other etiology.

Kawasaki disease is encountered among adults as well as children.
- The incidence of specific diagnostic criteria are roughly similar in both groups
- Cheilitis, meningitis, and thrombocytosis are more common in children. Rare instances of thrombocytopenia are also reported
- Arthralgia is common, and may involve one or multiple joints
- Arthralgia, adenopathy, and liver function abnormality are more common in adults.
- Older children may have a more marked inflammatory response and worse outcome, as compared to young children.
- Absence of fever, acute hepatitis, pleural effusion, disseminated intravascular coagulopathy, pancreatitis and cholestasis have been reported in some cases.
- Recurrence of Kawasaki disease is not unusual.

There is no specific diagnostic test for Kawasaki disease.

**Atypical or Incomplete Kawasaki Disease:**
As many as 23% of patients may present with "incomplete (atypical) Kawasaki disease" characterized by fever >=5 days and the presence of <4 "classic signs."  
- The clinical picture in atypical Kawasaki disease may be dominated by one unusual finding: seizure, bloody diarrhea, nephrotic syndrome, hyponatremia or compressive cervical lymphadenopathy.
- Of 232,263 cases reported in Japan during 2007 to 2008, 80% had classic clinical findings and 20% had "incomplete" Kawasaki disease.
- Occasionally, the initial presentation of Kawasaki disease may be limited to erythema multiforme or fever with cervical lymphadenopathy.
- Patients with incomplete and atypical Kawasaki disease are more likely than those with other febrile diseases to present with mucosal changes, conjunctivitis, extremity abnormalities, perineal desquamation, and later development of coronary artery abnormalities.
- Patients with incomplete Kawasaki disease are less likely to develop coronary artery lesions, than are those with overt illness. 33
- Incomplete Kawasaki disease was diagnosed in a 75-year-old man. 34

The appearance of redness or crusting at a BCG inoculation site is a valuable predictive sign for Kawasaki disease. 35 36
- Orange-brown discoloration of nails (chromonychia) is a common finding in some series. 37

**Additional findings:**
Neonates account for 1/5,500 cases of Kawasaki disease (2014 publication). 38
- Infants below age 1 year have a relatively high incidence of cardiac involvement. 39
- Cardiac involvement is present in 13.6% of cases (Japan, 2003 to 2004) 40
- Coronary arteritis is common, and coronary artery aneurysms may rupture 41 42 or persist into adulthood. 43-46
- Meningoencephalitis, often with seizures, has been reported as a presenting feature of Kawasaki disease. 47 48
- Additional complications may include oculomotor 49 or facial palsy 50 51, sensorineural hearing loss 52, stroke (carotid artery occlusion) 53, parotitis 54, large pleural effusions 55, retropharyngeal cellulitis 56 or mass 57, gallbladder distention 58 or cholestatic jaundice 59-61, colitis 62, appendicitis 63, nephrotic syndrome 64, sterile pyuria 65 66, sensorineural hearing loss 67 68, peripheral vascular gangrene 69, necrotic lesions on the face 70 and recurrent lip swelling. 71
- 7% of affected children develop Kawasaki disease shock syndrome, with decreased systolic blood pressure or evidence of hypoperfusion. The shock syndrome is characterized by an increased rate of echocardiographic abnormalities and is less likely to respond to IVIG therapy 72 73
- Neutrophilia, anemia, thrombocytosis, hemophagocytic lymphohistiocytosis 74-76, hepatic dysfunction 77 and sterile pyuria 78 are common. Syndrome of inappropriate ADH secretion has been reported. 79

Diseases which may mimic Kawasaki disease include Chikungunya 80, meningococcal septicemia 81, Takayasu's arteritis 82, retropharyngeal abscess 83, systemic onset juvenile idiopathic arthritis 84 and Q fever. 85

**This disease is endemic or potentially endemic to all countries.**

**References**

46. Cardiol Young 2011 Feb ;21(1):74-82.
# Kikuchi's disease and Kimura disease

<table>
<thead>
<tr>
<th>Agent</th>
<th>UNKNOWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Unknown</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Unknown</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Biopsy.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive Hydroxychloroquine and corticosteroids have been successful for Kikuchi's disease in some cases.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Most patients of Asian origin. Kikuchi disease: prolonged (1 to 12 months) cervical lymphadenopathy (rubbery, non-matted - may be tender), fever (40%), weight loss, 'sweats', leukopenia. Salivary gland involvement, glomerulitis, painless subcutaneous masses and eosinophilia suggest Kimura disease.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Angiolymphoid hyperplasia, Angiolymphoid hyperplasia-eosinophilia, Eosinophilic follicular lymphadenitis, Histiocytic necrotizing lymphadenitis, Kikuchi and Fujimato's disease, Kikuchi's disease, Kimura disease.</td>
</tr>
</tbody>
</table>

## Clinical

**Kikuchi's disease:**

Kikuchi's disease (histiocytic necrotizing lymphadenitis) is characterized by histiocytic necrotizing lymphadenitis, usually of the cervical region; however, other anatomic regions may be involved.

- Generalized lymphadenopathy is occasionally encountered.
- The disease is primarily seen in young Japanese women or women of Oriental descent in the third decade of life.
- Pediatric, male and elderly patients are occasionally encountered.
- Leukopenia is present in 50% of cases, and atypical lymphocytes may be seen in the peripheral blood smear.
- Additional features may include aseptic meningitis, maculopapular or urticarial rash, arthralgia, myalgia, hepatosplenomegaly, hepatic dysfunction, neuropathy, venous thrombosis, optic neuritis, orbital pseudotumor, pericarditis, pulmonary infiltrates with pleural effusion and pulmonary hemorrhage.
- Biopsy material reveals paracortical hyperplasia without granulocytic infiltration and a typical "starry sky" pattern.
- Clinical features may mimic those of lupus erythematosus, tuberculous meningitis, or lymphoma.
- The prognosis is good, and patients recover after a mean of 3 months.
- A case of fatal disseminated intravascular coagulopathy complicating Kikuchi disease has been reported.
- Relapse occurs in 20% of cases and recurrence in 3% to 4%.
- Hydroxychloroquine and corticosteroids have been advocated by some authorities.

**Kimura disease:**

Kimura disease (angiolymphoid hyperplasia with eosinophiles (eosinophilic follicular lymphadenitis) is also most common among Oriental males.

- Most present as painless subcutaneous masses and lymphadenopathy of the cervical region.
- Cases of isolated Kimura disease of the pulmonary hilum, epiglottis, earlobe and eyelid have been reported.
- In contrast to Kikuchi's disease, salivary gland involvement, glomerulitis, nephrotic syndrome, elevated IgE and eosinophilia are often encountered.
- Hypercoagulability and arterial thromboses of the intestines and extremities have been reported.
- Kimura disease may be misdiagnosed as filariasis.

**Angiolymphoid hyperplasia with eosinophilia** is clinically similar to Kimura disease, but is histologically distinct from the latter.

- The condition is characterized by reddish-brown nodules and plaques in the dermis and the subcutaneous tissues, typically...
occurring on the neck and head. 48 49

This disease is endemic or potentially endemic to all countries.

References

17. Hum Pathol 2010 Sep ;41(9):1245-54.
30. Head Neck Pathol 2013 Aug 2;
37. Clin Rheumatol 2013 Dec 19;
49. Ear Nose Throat J 2013 Sep ;92(9):E10-1.
**Kingella infection**

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. <em>Kingella kingae</em>, et al A facultative gram-negative coccobacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Endogenous</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Culture of blood, joint fluid, CSF, etc. Alert laboratory if these organisms are suspected.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Penicillin G or Penicillin V usually effective - dosage per severity/site</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>A relatively rare cause of septic arthritis, endocarditis, meningitis and other infections; most infections have been in young children.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td><em>Kingella kingae</em>, <em>K. (Suttonella) indologenes</em>, <em>K. denitrificans</em> and <em>K. oralis</em> are found in the normal respiratory tract, and occasionally associated with bacteremia, bone and joint infection (notably in young children) and endocarditis (the &quot;K&quot; in the HACEK group). <em>Kingella potus</em> has been isolated from a kinkajou wound in a zookeeper. Clusters of <em>Kingella kingae</em> infection among children have been characterized by high rates of illness and contact carriage. Illness has been characterized by osteomyelitis, septic arthritis, bacteremia, endocarditis and meningitis.</td>
</tr>
</tbody>
</table>

**Clinical**

*Kingella kingae*, *K. (Suttonella) indologenes*, *K. denitrificans* and *K. oralis* are found in the normal respiratory tract, and occasionally associated with bacteremia, bone and joint infection (notably in young children) and endocarditis (the "K" in the HACEK group). *Kingella potus* has been isolated from a kinkajou wound in a zookeeper.

Clusters of *Kingella kingae* infection among children have been characterized by high rates of illness and contact carriage. Illness has been characterized by osteomyelitis, septic arthritis, bacteremia, endocarditis and meningitis.

**This disease is endemic or potentially endemic to all countries.**

**References**

Laryngotracheobronchitis

| Agent | VIRUS OR BACTERIUM. Parainfluenza virus, Influenza virus, Mycoplasma, et al |
| Reservoir | Human |
| Vector | None |
| Vehicle | Droplet |
| Incubation Period | 3d - 8d |
| Typical Adult Therapy | Supportive |
| Typical Pediatric Therapy | As for adult |
| Clinical Hints | Usually encountered in the setting of bronchiolitis, laryngitis or croup following a minor upper respiratory infection in young children. |
| Synonyms | Bronchitis, Croup, Laringitis, Laryngite, Laryngitis, Laryngotracheitis. |

ICD9: 464,466  
ICD10: J04,J05,J20,J21

Clinical

Laryngotracheobronchitis is a self-defined syndrome consisting of hacking cough, often with an "itching" or "foreign body" sensation in the airways, and hoarseness.  
- Viral croup and epiglottitis are two major inflammatory causes of airway obstruction in children.  
- Spasmodic croup and membranous laryngotracheobronchitis may be associated with obstruction.

Bacterial tracheitis is an uncommon (>200 cases reported worldwide) severe condition usually affecting children that manifests as cough, stridor, mucopurulent tracheal secretions and lack of response to therapeutic modalities used for treating viral croup.  
- Fever may be low-grade or even absent.  
- 75% of patients require intubation and mechanical ventilation.  
- The case/fatality rate is approximately 2%.  
- Causative pathogens include *Staphylococcus aureus* (50% of cases) and *S. pneumoniae, H. influenzae, M. catarrhalis* and *S. pyogenes*. Gram-negative bacilli are also reported in some cases.  
- Occasionally, co-infection with viral croup agents is found.

This disease is endemic or potentially endemic to all countries.

References

**Legionellosis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Legionella pneumophila, et al An aerobic gram-negative bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Water</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Water, Aerosols</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>5-6d (range 2-12d); Pontiac fever = 1-2d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Serology, Culture, Urine antigen (certain types), Nucleic acid amplification, Alert lab if organism suspected.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Fluoroquinolone (Levofloxacin, Trovafloxacin, Pefloxacin, Sparfloxacin or Moxifloxacin), OR Azithromycin, OR Erythromycin + Rifampin OR Clarithromycin</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Azithromycin, OR Erythromycin + Rifampin OR Clarithromycin</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Respiratory illness with extrapulmonary manifestations (diarrhea, confusion, renal or hepatic dysfunction, relative bradycardia, etc.), most cases reported during summer in temperate areas; case-fatality rates of 5% to 25% are reported.</td>
</tr>
</tbody>
</table>

**Clinical**

**WHO Case definition for surveillance:**

**Clinical description**

An illness characterized by an acute lower respiratory infection with focal signs of pneumonia on clinical examination and/or radiological evidence of pneumonia.

**Laboratory criteria for diagnosis**

**Presumptive:** one or more of the following:

- Detection of specific *Legionella* antigen in respiratory secretions or urine
- Direct fluorescent antibody (DFA) staining of the organism in respiratory secretions or lung tissue, using evaluated monoclonal reagents
- A fourfold or greater rise in specific serum antibody titer to *Legionella* species other than *Legionella pneumophila* serogroup 1, using a locally validated serological test

**Confirmative:** one or more of the following:

- Isolation of *Legionella* from respiratory secretions, lung tissue, pleural fluid, or blood
- A fourfold or greater rise in specific serum antibody titer to *L. pneumophila* serogroup 1 by indirect immunofluorescence antibody test or microagglutination
- Most European countries and others such as the United States now include the detection of *L. pneumophila* serogroup 1 antigen in urine as a confirmatory test.

**Case classification**

- **Suspected:** Not applicable.
- **Probable:** A case compatible with the clinical description, with presumptive laboratory results.
- **Confirmed:** A case compatible with the clinical description, with confirmative laboratory results.

Pneumonia associated with extrapulmonary findings should suggest the possibility of Legionnaire’s disease.

- Q-fever may be mistaken for Legionnaires’ disease
- The most common clinical manifestation is pneumonia, ranging from mild to severe, with respiratory failure and death.
- Risk factors for overt disease include advanced age, smoking, chronic obstructive pulmonary disease, immunosuppression, and recent surgery.
- Person-to-person transmission has not been demonstrated.

**Legionnaire’s disease vs. Pontiac fever:**

There are 2 currently recognized distinct clinicoepidemiological manifestations of legionellosis:

- Both forms are characterized initially by anorexia, vomiting, myalgia and headache, followed within a day by rising fevers and chills.
- Legionnaires’ disease (pneumonic form) and Pontiac fever (non-pneumonic Legionnaires disease)
Legionnaires disease

- In the pneumonic form, non-productive cough, abdominal pain / diarrhea, confusion / delirium are common.
- It is not possible, clinically, to distinguish *Legionella* pneumonia from other pneumonias; suspicion should be raised in any pneumonia connected with epidemiological information (e.g., recent traveling, hospitalization, gatherings, immunosuppression).
- In addition, age (>50), sex (M), smoking, alcohol consumption have been shown to be risk factors.

Pontiac fever:

- Pontiac fever is a self-limited, influenza-like illness lasting 2 to 5 days, often in healthy persons following exposure to contaminated whirlpools or spas.
- Pontiac fever is not associated with pneumonia. It is thought to represent a reaction to inhaled antigen, rather than to bacteria.
- Proposed case definition for Pontiac fever include occurrence of at least one symptom among headache, myalgia, fever and rigors, beginning 2 to 8 days following exposure.

Complications:

- Reported complications of legionellosis have included empyema, pleural effusion, lung abscess, renal failure (in 10% to 50% of cases), endocarditis, peritonitis, cerebellar ataxia, cutaneous and visceral abscesses, arteriovenous fistula infection, pericarditis and myocarditis.
- Case-fatality rates may approach 40%, particularly among patients with underlying disease or immunosuppression.
- Additional risk factors for fatal infection include heart disease, malignancy, alcoholism and renal disease.

This disease is endemic or potentially endemic to all countries.

References

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Mycobacterium leprae</em> An acid-fast bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human ? Armadillo</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Patient secretions</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>3y - 5y (range 3m - 40y)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Visualization of organisms in exudate, scrapings or biopsy. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Multibacillary: One year therapy Dapsone 100 mg + Clofazimine 50 mg daily; and, Rifampin 600 mg + Clofazimine 300 mg once monthly Paucibacillary: Six month therapy Dapsone 100 mg daily; and Rifampin 600 mg once monthly</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Multibacillary: One year therapy Dapsone 1 to 2 mg/kg + Clofazimine 1 mg/kg daily; and, Rifampin 10 mg/kg + Clofazimine 1 mg/kg once monthly Paucibacillary: Six month therapy Dapsone 1 to 2 mg/kg daily; and Rifampin 10 mg/kg once monthly</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Anesthetic, circinate hypopigmented skin lesions and thickened peripheral nerves (tuberculoid leprosy); or diffuse, destructive papulonodular infection (lepromatous leprosy); or combined/intermediate forms.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Aussatz, Doence de Hansen, Hansen's disease, Lebbra, Lepra, Mycobacterium leprae, Mycobacterium lepromatosis.</td>
</tr>
</tbody>
</table>

### Clinical

**WHO Case definition for surveillance:**

**Clinical description**

- The clinical manifestations of the disease vary in a continuous spectrum between the two polar forms, lepromatous and tuberculoid leprosy:
  - In lepromatous (multibacillary) leprosy, nodules, papules, macules and diffuse infiltrations are bilateral symmetrical and usually numerous and extensive; involvement of the nasal mucosa may lead to crusting, obstructed breathing and epistaxis; ocular involvement leads to iritis and keratitis
  - In tuberculoid (paucibacillary) leprosy, skin lesions are single or few, sharply demarcated, anesthetic or hypoesthesic, and bilateral asymmetrical, involvement of peripheral nerves tends to be severe
  - Borderline leprosy has features of both polar forms and is more labile
  - Indeterminate leprosy is characterized by hypopigmented maculae with ill-defined borders; if untreated, it may progress to tuberculoid, borderline or lepromatous disease

**Laboratory criteria for confirmation**

- Alcohol-acid-fast bacilli in skin smears (made by the scrape-incision method).
- In the paucibacillary form the bacilli may be so few that they are not demonstrable.
- In view of the increasing prevalence of HIV and hepatitis B infection in many countries where leprosy remains endemic, the number of skin smear sites and the frequency of smear collection should be limited to the minimum necessary.

**Case classification:**

WHO operational definition:

A case of leprosy is defined as a person showing one or more of the following features, and who as yet has to complete a full course of treatment:

- hypopigmented or reddish skin lesions with definite loss of sensation
- involvement of the peripheral nerves, as demonstrated by definite thickening with loss of sensation
- skin smear positive for acid-fast bacilli

**Classification (microbiological):**

- Paucibacillary (PB): includes all smear-negative cases
- Multibacillary (MB): includes all smear-positive cases

**Classification (clinical):**

- Paucibacillary single lesion leprosy: 1 skin lesion.
- Paucibacillary leprosy: 2 to 5 patches or lesions on the skin.
- Multibacillary leprosy: >5 patches or lesions on the skin.
The major forms of leprosy are as follows:

1. **Tuberculoid** • one or a few well-demarcated, hypopigmented, and anesthetic skin lesions, frequently with active, spreading edges and a clearing center; peripheral nerve swelling or thickening also may occur.

2. **Lepromatous** • a number of erythematous papules and nodules or an infiltration of the face (including oral mucosa), hands, and feet with lesions in a bilateral and symmetrical distribution that progress to thickening of the skin. Histoid leprosy, a variant of lepromatous leprosy, is characterized by well-defined smooth shiny papules and nodules.

3. **Borderline (dimorphous)** • skin lesions characteristic of both the tuberculoid and lepromatous forms.

4. **Indeterminate** • early lesions, usually hypopigmented macules, without developed tuberculoid or lepromatous features.

Relapsing disease may manifest as lymphadenopathy mimicking tuberculosis.

- Relapses may follow effective antimicrobial therapy.

- The skin lesions of paracoccidioidomycosis may mimic those of tuberculoid leprosy.

- Lepromatous leprosy may mimic sarcoidosis.

- Lupus vulgaris may mimic actinomycosis or mycetoma.

- Post-kala-azar dermal leishmaniasis and diffuse cutaneous leishmaniasis may mimic lepromatous leprosy.

- The lesions of both cutaneous and mucocutaneous leishmaniasis could be mistaken for those of borderline tuberculoid leprosy.

- Leprosy may be initially misdiagnosed as adult stills disease or an auto-immune disorder.

Leprosy may be associated with endocrine dysfunction including hypogonadism, sterility and osteoporosis.

- Six percent of leprosy patients exhibit rheumatological manifestations, most commonly resembling rheumatoid arthritis.

- Rare instances of spondylodiscitis have been reported.

- Lucio’s phenomenon is a rare and aggressive necrotizing variant of erythema nodosum leprosum that classically occur in patients with undiagnosed, diffuse non-nodular lepromatous leprosy.

- Erythema multiforme and lesions suggestive of erythema gyratum repens are occasionally encountered among patients with leprosy.

- Chronic skin lesions may undergo malignant transformation.

- Cranial nerve involvement, most often trigeminal, olfactory and facial, is not uncommon.

- Neuropathic pain may persist for decades following successful antimicrobial treatment.

- Segmental necrotizing granulomatous neuritis is reported in some cases.

**This disease is endemic or potentially endemic to all countries.**

**Leprosy in Haiti**
Graph: Haiti. Leprosy - registered prevalence, cases

Notes:
1. 1,998 cases were registered during 1977 to 1996 - 80.5% paucibacillary.
2. 2,160 cases were registered during 1977 to 1999.
   Individual years:
   1980 - True number estimated at 1,452 cases (30 per 100,000).

MDT coverage is 100% (1998).
References

**Leptospirosis**

**Agent**  
BACTERIUM Leptospira interrogans An aerobic non-gram staining spirochete

**Reservoir**  
Cattle  Dog  Horse  Deer  Rodent  Fox  Marine mammal  Cat  Marsupial  Frog

**Vector**  
None

**Vehicle**  
Water  Soil  urine contact

**Incubation Period**  
7d - 12d (range 2d - 26d)

**Diagnostic Tests**  
Culture on specialized media. Dark field microscopy of urine, CSF. Serology.

**Typical Adult Therapy**  
Penicillin 1.5 million units Q6h iv OR  
Doxycycline 100 mg BID X 5 to 7d OR  
Ceftriaxone 1g IV daily

**Typical Pediatric Therapy**  
Penicillin G 50,000u/kg q6h iv X 5 to 7d Age >= 8y:  
Doxycycline 2.2 mg/kg BID X 5 to 7d may also be used

**Clinical Hints**  
"Sterile" meningitis, nephritis, hepatitis, myositis and conjunctivitis; often follows recent skin contact with fresh water in rural or rodent-infested areas; case-fatality rates of 5% to 40% are reported.

**Synonyms**  

**WHO Case definition for surveillance:**

**Clinical description**

Acute febrile illness with headache, myalgia and prostration associated with any of the following symptoms:

- conjunctival suffusion
- meningeal irritation
- anuria or oliguria and/or proteinuria
- jaundice
- hemorrhages (from the intestines; lung bleeding is notorious in some areas)
- cardiac arrhythmia or failure
- skin rash

and a history of exposure to infected animals or an environment contaminated with animal urine. Other common symptoms include nausea, vomiting, abdominal pain, diarrhea, arthralgia.

**Laboratory criteria for diagnosis**

- Isolation (and typing) from blood or other clinical materials through culture of pathogenic leptospires
- Positive serology, preferably Microscopic Agglutination Test (MAT), using a range of *Leptospira* strains for antigens that should be representative of local strains

**Case classification**

- Suspected: A case that is compatible with the clinical description.
- Probable: Not applicable.
- Confirmed: A suspect case that is confirmed in a competent laboratory.

**Note:** Leptospirosis is difficult to diagnose clinically in areas where diseases with symptoms similar to those of leptospirosis occur frequently.

**SPECIAL ASPECTS**

- Serology by Microscopic Agglutination Test (MAT) may provide presumptive information on causative serogroups.
- Attempts should be made to isolate leptospires, and isolates should be typed to assess locally circulating serovars.
- Questioning the patient may provide clues to infection source and transmission conditions.
- Animal serology may give presumptive information on serogroup status of the infection Isolation followed by typing gives definite information on serovar.

Disease due to *Leptospira interrogans* serovar. *icterohaemorrhagiae* is usually overt, and often manifest as hepatitis, meningitis and nephritis. ¹

- Canicola fever is due to serovar. *canicola* (occasionally *L. interrogans* serovar. *pomona*) and characterized by a milder lymphocytic meningitis, without hepatic or renal involvement.
- Serovar. *autumnalis* (occasionally *L. interrogans* serovar. *pomona*) produces Fort Bragg fever, a febrile illness associated with raised, erythematous, and mildly tender pretibial skin lesions.

**Acute phase**
Subclinical infection is common.

- Overt leptospirosis (90% of cases) is characterized by a self-limited, systemic illness.
- Patients are at risk for severe and potentially fatal illness which may present with renal failure, liver failure, pneumonia or hemorrhagic diathesis.
- Illness begins abruptly with such symptoms as fever (38 to 40 °C), headache (over 95% of cases), rigors, myalgia (over 80%), conjunctivitis (30 to 40%), abdominal pain (30%), vomiting (30 to 60%), diarrhea (15 to 30%), cough, muscular (calf) tenderness, pharyngitis (20%) and a pretibial maculopapular rash (fewer than 10%).
- Additional findings have included lymphadenopathy, splenomegaly, atypical lymphocytosis, thrombocytopenia, transitory paraparesis, hepATOMegaly, polyarthritis, mononeuritis multiplex and pancreatitis.
- During the acute illness, bacteria can be recovered from or seen in blood, CSF, or tissue using specialized techniques.
- Organisms are demonstrated in urine after the 5th to 7th days. Pyuria, hematuria and proteinuria may be evident as well.
- Severe hypomagnesemia has been reported during the acute phase of infection.

Latency and relapse:
The acute phase is followed by an asymptomatic period of 4 to 30 days.
- At this point, illness reappears, with conjunctival suffusion, photophobia, eye pain, myalgia, lymphadenopathy and hepatomegaly.
- Additional findings may lymphocytic meningitis (70 to 80% of patients) with normal glucose levels; pretibial purpura, uveitis, iridocyclitis or chorioretinitis, facial nerve palsy, thrombocytopenia, hypotension, myopericarditis, cardiac arrhythmias and pancreatitis.
- Weil’s disease is characterized by hepatic and renal function which may progress to severe and even fatal hepatorenal failure which carries a case-fatality rate of 5 to 40%.
- Renal involvement, principally interstitial nephritis and tubular necrosis may be severe, even in the absence of jaundice.
- Pulmonary infiltrates, severe hemorrhagic pneumonia and acute pulmonary distress syndrome may be encountered, even in the absence of hepatic and renal failure.
- Congestive heart failure is rare; however, cardiac arrhythmias may occur and result in sudden deaths.
- Acute disseminated encephalomyelitis has been reported as a complication of leptospirosis.
- Relatively severe infection is reported among pregnant women.

Persistent, asymptomatic renal colonization by Leptospirae may follow infection in humans.

The clinical features of dengue, influenza pneumonia and pyomyositis may mimic those of leptospirosis.

- Fatal cases of leptospirosis / dengue co-infection are reported (2014 publication).

This disease is endemic or potentially endemic to all countries.

Leptospirosis in Haiti

64 cases were reported in 1995; 32 during January to April 1996.

References

12. Medicine (Baltimore) 2008 May ;87(3):167-76.
**Listeriosis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Listeria monocytogenes</em> A facultative gram-positive bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Mammal Human Bird Soil Water</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Transplacental Dairy products (eg, soft cheeses), Infected secretions Vegetables Poultry Water</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>3d - 21d (-60d post-ingestion)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture of blood or CSF.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Ampicillin 2g IV q6h X 2w (higher dosage in meningitis) + Gentamicin. Sulfamethoxazole/trimethoprim recommended for Penicillin-allergic patients</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Ampicillin 50 mg/kg IV Q6h X 2w (higher dosage in meningitis). Sulfamethoxazole/trimethoprim recommended for Penicillin-allergic patients</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Meningitis or sepsis, often immune-suppressed patients (lymphoma, AIDS, etc); gastroenteritis - may follow ingestion of &quot;over-the-counter&quot; foods; neonatal septicemia occasionally encountered.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Listeria monocytogenes, Listeriose, Listeriosi. ICD9: 027.0 ICD10: A32</td>
</tr>
</tbody>
</table>

**Clinical**

Major risk factors for invasive Listeriosis reflect T-cell mediated immune compromise, including old age, pregnancy, hematological malignancy, chemotherapy, corticosteroid therapy and anti-TNF-alpha agents.

Signs of *Listeria* meningitis are often atypical:  
- brain stem and cerebellar involvement (rhombencephalitis) occurs in 11% of cases  
- nuchal rigidity in only 80% to 85%  
- movement disorders (ataxia, myoclonus) in 15% to 20%  
- seizures in 25%.  

The blood culture is positive in 75% of meningitis cases; and the cerebrospinal fluid gram stain is positive in only 40%.

Symptoms of food-borne listeriosis develop between one day and three months after ingestion the bacteria in food.  
- Most cases are characterized by diarrhea and fever  
- Headache, myalgia and arthralgia are common.  
- The bacteria may be excreted in stool for several months.

**Other forms of listeriosis:**
- Hepatic listeriosis may present as single or multiple abscesses, or diffuse granulomatous hepatitis.  
- Numerous cases of *Listeria* endocarditis of both native and prosthetic valves have been reported. Instances of pericarditis, cardiac pseudotumor, and aortitis / mycotic aneurysm with aortic dissection have also been reported.  
- Sporadic cases of prosthetic joint infection, renal failure, brain abscess, cutaneous infection, mycotic aortic aneurysm, pericarditis, uveitis, endophthalmitis, cholecystitis and rhabdomyolysis have been reported.  
- *Listeria* peritonitis has been reported in a patient undergoing peritoneal dialysis and in a patient with biliary cirrhosis. Cholecystitis, cholangitis, spontaneous bacterial peritonitis and ventriculo-peritoneal shunt infections due to *Listeria monocytogenes* have also been reported.

This disease is endemic or potentially endemic to all countries.
Listeriosis in Haiti

Listeriosis, cases: None reported between 1998 and 1999

References

34. ProMED <promedmail.org> archive: 23711639
35. BMJ Case Rep 2014;2014
Liver abscess - bacterial

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Various species from portal (Bacteroides, mixed aerobe-anaerobe) or biliary (Escherichia coli, etc) source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Ultrasonography, CT or radionucleotide scan. If amoebic abscess suspected, perform Entamoeba serology</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Intravenous antibiotic(s) directed at likely or suspected pathogens. Percutaneous or open drainage</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Tender liver, and prolonged fever in a patient with history of diverticulosis, cholecystitis, appendicitis, etc; clinically similar to amoebic abscess, but often multiple.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Ascesso fegato, Bacterial liver abscess, Hepatic abscess - bacterial, Liver abscess. ICD9: 572.0 ICD10: K75.0</td>
</tr>
</tbody>
</table>

**Clinical**

Symptoms of pyogenic hepatic abscess include fever and rigors of several days' to several weeks' duration.
- Dull right upper quadrant pain may be associated with cough and pleuritic pain with radiation to the right shoulder and an associated pleural rub. 1
- Tender hepatomegaly is present in 50 to 70% of the patients.
- Jaundice is uncommon, unless the abscess is extensive or associated with ascending.
- In some cases, the sole presentation may be fever of unknown origin.

Serological studies, a history of diarrhea, edema of the right chest wall, and limitation to a single abscess in the posterior, superior right hepatic lobe may be suggestive of amoebic abscess. 2 3

Alkaline phosphatase is the most consistently elevated serum enzyme in patients with liver abscess.
- Blood cultures are positive in 50% of cases.
- Acute kidney injury is common in patients with pyogenic liver abscess. 4

**This disease is endemic or potentially endemic to all countries.**

**References**

**Lymphocytic choriomeningitis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA. Arenaviridae, Arenavirus: Lymphocytic choriomeningitis virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>House mouse  Guinea pig  Hamster  Monkey</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Urine  Saliva  Feces  Food  Dust</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>8d - 12d (range 6d - 14d)</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Headache, myalgia, meningitis and encephalitis; photophobia or pharyngitis may be present; prior exposure to rodents; infection resolves within 2 weeks, however convalescence may require an additional 2 months.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Acute infection: 35% of Lymphocytic choriomeningitis virus infections are asymptomatic and 50% are characterized by a nonspecific flu-like illness. Overt infections are characterized by fever, headache, nausea and systemic symptoms, leukopenia and thrombocytopenia. Patients may also exhibit lymphadenopathy and a maculopapular rash (12% to 15% of patients have rash and/or meningitis or encephalitis). Relapses characterized by a more severe headache with meningitis may occur after initial improvement. Papilledema may be noted. The CSF protein concentration ranges from 50 to 300 mg/dl. A pleocytosis of several hundred lymphocytes/mm3 is commonly observed. Decreases in CSF glucose concentration are documented in over 20% of cases. Complications: Complications include encephalitis, psychosis, paraplegia, transitory aqueductal stenosis, and disturbances of cranial, sensory, or autonomic nervous function. Occasionally, orchitis, myocarditis, arthritis, or alopecia are encountered. Lymphocytic choriomeningitis is increasingly recognized as a cause of hydrocephalus, psychomotor retardation, congenital chorioretinitis and blindness, most often when acquired during the first or second trimesters of pregnancy. Congenital infection is also associated with microencephaly, periventricular calcifications, ventriculomegaly, pachygyria, cerebellar hypoplasia, porencephalic and periventricular cysts. The case-fatality rate for Lymphocytic choriomeningitis is less than one percent; however, patients with sustained viremia lacking an inflammatory response seem to be at risk for fatal outcome. This disease is endemic or potentially endemic to all countries.</td>
</tr>
</tbody>
</table>

**References**

2. ProMED <promedmail.org> archive: 20050804.2273  
Lymphogranuloma venereum

Agent: BACTERIUM. Chlamyiaceae, Chlamydiae, Chlamydia trachomatis, types L1, L2, L3

Reservoir: Human

Vector: None

Vehicle: Sexual contact

Incubation Period: 7d - 12d (range 3d - 30d)

Diagnostic Tests: Serology. Culture of pus performed in specialized laboratories.

Typical Adult Therapy: Doxycycline 100 mg PO BID X 3w. OR Erythromycin 500 mg QID X 3w OR Azithromycin 1g po weekly X 3w

Typical Pediatric Therapy: Age < 8 years: Erythromycin 10 mg/kg PO QID X 2 to 4w. Age >= 8 years: Doxycycline 2 mg/kg PO BID X 2 to 4w

Clinical Hints: Genital nodule or vesicle with large, suppurating regional nodes; generalized lymphadenopathy or proctitis may be present; late complications include genital edema, rectal strictures and perianal abscesses.


ICD9: 099.1
ICD10: A55

Clinical

Acute illness:
The first stage of Lymphogranuloma venereum (LGV) is characterized by a papule or ulcer on the genital or anal mucosa, or of the adjacent skin. • Occasionally, the lesion is intraurethral or cervical, producing urethritis or cervicitis. • The secondary stage occurs days to weeks after the primary lesion and is characterized by lymphadenopathy and systemic illness. • Cervical lymphadenopathy may occur if infection is acquired through oro-genital contact.

Lymphadenitis:
The inguinal lymph nodes are most often affected, and are unilateral in two thirds of patients. • The obturator and iliac nodes are occasionally affected in women. • Initially the lymph nodes are discrete and tender with overlying erythema. • A characteristic "groove" may be evident between the femoral and inguinal lymph nodes. • In some cases, patients may present with a "bubonulus": penile adenopathy and secondary local acute lymphedema. • Later, the nodes may suppurate and coalesce, forming a bubo that may rupture spontaneously (30% of cases) to produce fistulae or sinus tracts which may drain for months.

Inguinal lymphadenopathy in cat-scratch disease may suggest a diagnosis of lymphogranuloma venereum. • Rectal involvement may suggest a diagnosis of inflammatory bowel disease.

Systemic manifestations at this stage include fever, headache, and myalgia. • Meningitis may also occur. • LGV is increasingly recognized as a cause of hemorrhagic proctitis in men who have sex. • Reactive arthritis has been reported following LGV proctitis

Relapse occurs in 20% of untreated patients.

Only 25% of women present with inguinal lymphadenopathy. • Women and homosexual men may present with proctitis or pain in the lower abdomen and back pain related to involvement of pelvic and lumbar lymph nodes. • Late complications include esthiomene (chronic hypertrophic and ulceration of the vulva, scrotum or penis), and elephantiasis of the male or female genitalia. • Major lower leg involvement may suggest a diagnosis of deep-vein thrombosis.
This disease is endemic or potentially endemic to all countries.

References

Malaria

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human Primate (Plasmodium knowlesi)</td>
</tr>
<tr>
<td>Vector</td>
<td>Mosquito (Anopheles)</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Blood</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>12d - 30d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Examination of blood smear. Serology, antigen &amp; microscopic techniques. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Resistant falcip: Lufenantrine/Artemether OR Quinine + Doxycycline or Clindamycin OR Atovaquone/proguanil OR Artesunate IV if severe malaria If sens., Chloroquine 1g, then 500 mg at 6, 24 &amp; 48 hrs. If P. ovale or P. vivax - follow with Primaquine</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Resistant falcip: Lufenantrine/Artemether OR Quinine + Clindamycin OR Atovaquone/proguanil OR Artesunate (&gt;age 8) IV (severe malaria) If sens, Chloroquine 10 mg/kg, then 5 mg/kg at 6, 24, &amp; 48 hrs. If P. ovale or P. vivax - follow with Primaquine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Fever, headache, rigors (&quot;shaking chills&quot;), vomiting, myalgia, diaphoresis and hemolytic anemia; fever pattern (every other or every third day) and splenomegaly may be present; clinical disease may relapse after 7 (ovale and vivax) to 40 (malariae) years.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Ague, Bilious remittent fever, Chagres fever, Estiautumnal fever, March fever, Marsh fever, Paludism, Paludismo, Plasmodium falciparum, Plasmodium knowlesi, Plasmodium malarie, Plasmodium ovale, Plasmodium vivax. ICD9: 084 ICD10: B50,B51,B52,B53,B54</td>
</tr>
</tbody>
</table>

Clinical

**WHO Case definition for surveillance** (For use in endemic areas and people exposed to malaria, e.g., a history of visit to endemic area).

- Malaria must be defined in association with clinical disease symptoms.
- The case definition for malaria cannot be uniform: it will vary according to how malaria is perceived in a given country, local patterns of transmission, and disease consequences.
- The suggested definitions are deliberately broad.
- Each national malaria control program must adapt the definition and introduce additional indicators to make it more applicable to local epidemiology and control targets.

Clinical description

- Signs and symptoms vary; most patients experience fever.
- Splenomegaly and anemia are commonly associated signs.
- Common but non-specific symptoms include otherwise unexplained headache, back pain, chills, sweating, myalgia, nausea, vomiting.
- Untreated *Plasmodium falciparum* infection can lead to coma, generalized convulsions, hyperparasitemia, normocytic anemia, disturbances of fluid, electrolyte, and acid-base balance, renal failure, hypoglycemia, hyperpyrexia, hemoglobinuria, circulatory collapse / shock, spontaneous bleeding (disseminated intravascular coagulation), pulmonary edema, and death.

Laboratory criteria for diagnosis

Demonstration of malaria parasites in blood films (mainly asexual forms).

Case classification

- In areas without access to laboratory-based diagnosis.
  - Probable uncomplicated malaria: A person with symptoms and/or signs of malaria who receives anti-malarial treatment.
  - Probable severe malaria: A patient who requires hospitalization for symptoms and signs of severe malaria and receives anti-malarial treatment.
  - Probable malaria death: death of a patient diagnosed with probable severe malaria.
- In areas with access to laboratory-based diagnosis.
  - Asymptomatic malaria: A person with no recent history of symptoms and/or signs of malaria who shows laboratory confirmation of parasitemia.
  - Confirmed uncomplicated malaria: A patient with symptoms and/or signs of malaria who received anti-malarial treatment, with laboratory confirmation of diagnosis.

**Acute infection:**

Most cases present with non-specific signs suggestive of "sepsis," such as fever, rigors, headache and myalgia.

- Clinical findings include cough, fatigue, malaise, arthralgia, myalgia, headache, and diaphoresis.
In Africa, tickborne relapsing fever and rabies are often mis-diagnosed as malaria. Elevated levels of serum bilirubin or C-reactive protein favor a diagnosis of malaria rather than dengue.

The typical malarial paroxysm begins with rigors lasting 1 to 2 hours, followed by high fever. This is followed by marked diaphoresis and a fall in temperature.

Tertian (fever every other day) fever may occur in infection by Plasmodium falciparum, Plasmodium vivax and Plasmodium ovale; quartan (every third day) fever with Plasmodium malariae infection; and daily fever with Plasmodium knowlesi infection.

P. knowlesi malaria appears to be more severe than P. malariae malaria, with higher rates of parasitemia and fatality.

"Classical" fever patterns are rarely helpful, and anemia and splenomegaly develop only after several attacks.

Less common findings include anorexia, vomiting, diarrhea and hypotension.

In some cases, malaria may present as fever accompanied by an urticarial rash.

Complications:

Complications include pulmonary disease (ARDS), encephalopathy (cerebral malaria), nephropathy, retinopathy or optic neuritis, cranial nerve palsy, cerebral venous thrombosis, cerebellar ataxia, acute disseminated encephalomyelitis, hypocalcemia with tetany, shock ("algid malaria"), purpura fulminans, disseminated intravascular coagulation (DIC), symmetrical peripheral gangrene, endotoxemia, massive diarrhea, pancreatitis, splenic infarction or rupture, acalculous cholecystitis, myocarditis and dysfunction of other organs.

Patients with P. falciparum malaria are at increased risk for bacteremia.

Occasionally, patients experience Post-malaria Neurological Syndrome: acute confusion, cerebellar ataxia, diffuse cerebral demyelination, seizures, hearing loss, cognitive dysfunction or other neuropsychiatric findings several days to weeks following successful treatment of falciparum malaria.

Plasmodium falciparum infection accounts for most complications and deaths from malaria; however, severe disease may occasionally complicate infection by other species.

The presence of malarial retinopathy is associated with a poor prognosis.

P. falciparum is also responsible for most malarial drug resistance.

Maternal infection is associated with vertical transmission to the newborn, fetal loss and low birth weight in infants.

5% of African children with severe malaria were found to have concomitant bacteremia.

Severe and fatal disease associated with Plasmodium vivax infection is increasingly reported in recent years.

Instances of acute glomerulonephritis, IgA nephropathy, renal cortical necrosis, acalculous cholecystitis, jaundice, pancreatitis, thrombocytopenia, disseminated intravascular coagulation, shock, peripheral gangrene, splenic infarction or rupture, cerebral malaria, optic neuritis, cerebral venous thrombosis, cranial nerve palsy, myelitis, hemiparesis with seizures, myocarditis, hypoglycemia and acute respiratory distress syndrome have been reported with Plasmodium vivax infections.

Plasmodium malariae infection is rarely associated with severe illness; and may lead to renal glomerular damage and nephrotic syndrome. Relapse following treatment is rarely reported.

Rare instances of severe and fatal infection have been associated with Plasmodium ovale infection.

Pericarditis and acute respiratory distress syndrome have been reported in Plasmodium ovale infection. There appear to be subtle clinical differences between infections caused by Plasmodium ovale curtisi vs. P. ovale wallikeri.

Malaria and HIV infection:

HIV infection increases the incidence and severity of clinical malaria; however, in severe malaria the level of parasitemia is similar in HIV-positive and HIV-negative patients.

During pregnancy, HIV infection increases the incidence of clinical malaria, maternal morbidity, and fetal and neonatal morbi-mortality.

HIV infection increases the risk for malaria treatment failure, and for cerebral malaria in children.

Some antimalarial drugs may inhibit HIV, while certain anti-retroviral drugs are effective against Plasmodium species.

Relapse:

Relapse may occur months to years following the initial episode.

Relapses of Plasmodium vivax and Plasmodium ovale infection result from release of parasites which had remained dormant in the liver.

As such, treatment of infection by either of these two species should include a drug (eg, primaquine) active against intrahepatic parasites.

Although infections caused by Plasmodium falciparum and Plasmodium knowlesi do not relapse, re infection may occur.

Plasmodium malariae persists without symptoms in the blood, rather than the liver.

Relapse has been reported as long as 40 to 50 years following exit from an endemic area.
This disease is endemic or potentially endemic to 188 countries. Chloroquine resistant falciparum malaria endemic to 81 countries. Chloroquine-sensitive malaria endemic to 28 countries.

Malaria in Haiti

Time and Place:
Highest rates are registered during May to November.
Malaria is endemic to 75% of the land area, with most cases in coastal areas, particularly in rice-growing areas and Artibonite.
- 80% of the population live in endemic areas.
- There is no risk in the port of Labadee (ie, tourist ship area)

Infected species:
Plasmodium falciparum accounts for virtually 100% of cases.
- Chloroquine-resistant P. falciparum is NOT reported (ie, clinical failure); however strains with in-vitro resistance have been identified by some studies since 2006.
- Two cases of chloroquine-resistant P. falciparum malaria were reported among foreign aid workers in 2010.
- Indigenous P. vivax was last reported in 1983.
- There is evidence for ongoing transmission of Plasmodium malariae as recently as 2004.

Prevalence surveys:
3.2% of persons (gametocyte carriage, five departments, 2010 to 2013)
3.1% of persons in Artibonite (rainy season, 2006)
20.3% of patients with suspected malaria, following the 2010 earthquake
9.5% of persons in the Southeast District (rainy season, 2013 publication)
17.4% of patients with fever, in Corail, Grand'Anse (2014 publication)

Seroprevalence surveys:
30.3% of persons in Ouest and Sud-Est Departments (2013)

Graph: Haiti. Malaria, cases - GIDEON

Notes:
1. The true incidence of malaria has been estimated at approximately 200,000 cases per year (2010 publication)
   Individual years:
   2010 - 11 cases (including 8 expatriates) were identified following an earthquake.
   2011 - Malaria was identified in 3 members of a Haitian football team visiting Jamaica.
Haiti accounted for 171 (85.5%) of the 200 malaria cases acquired by Americans in Central America and the Caribbean.

Graph: Haiti. Malaria, deaths

Notes:
1. Figures for 1980, 1990, 2000 and 2010 are based on estimates of true mortality. Since these estimates are significantly higher than official Health Ministry reports for other years during this period, resultant graphs will suggest unusual fluctuation in trends.

Eight cases were diagnosed among UN peace-keeping forces during 1995.

Vectors:
- The sole vector is Anopheles albimanus; however, An. pseudopunctipennis has recently been introduced into the south.

References
12. ProMED <promedmail.org> archive: 20080105.0060
27. BMJ Case Rep 2014 ;2014
35. BMJ Case Rep 2014 ;2014
## Malignant otitis externa

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Pseudomonas aeruginosa</em>: aerobic gram-negative bacillus (virtually all cases)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture of otic exudate and biopsy material. Careful roentgenographic and neurological examinations.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Early debridement <em>Ciprofloxacin</em> 400 mg iv Q8h Alternatives: <em>Imipenem</em>, <em>Meropenem</em>, <em>Ceftazidime</em>, <em>Cefepime</em> Early debridement</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Early debridement <em>Imipenem</em>: Age 0 to 7 days: 25 mg/kg IV Q12h Age 8 to 28 days: 25 mg/kg IV Q8h Age &gt;28 days: 15 to 25 mg/kg IV Q6h (maximum 2 g/day) Alternatives: <em>Meropenem</em>, <em>Ceftazidime</em>, <em>Cefepime</em></td>
</tr>
</tbody>
</table>
| Clinical Hints | Otic pain, swelling and discharge; infection of bony and cartilaginous ear canal; over 80% of patients are diabetics over age 50; cranial nerve (usually VII) signs in 50%. case-fatality rate > 55%.

### Clinical

The case definition of Malignant Otitis Externa consists of pain, edema, exudate, granulations, microabscesses (when explored), positive bone scan or failure of local treatment often more than 1 week. • Additional criteria may include cranial nerve involvement, positive radiograph, debilitating condition and old age.

Severe pain and tenderness in the mastoid area are accompanied by drainage of pus from the external canal. • Involvement of the temporal bone, meninges, venous sinuses, internal carotid arteries, orbital apex, cranial nerves (IX, X, XII) and brain may follow.

### This disease is endemic or potentially endemic to all countries.

### References

3. Laryngoscope 2014 Aug 14;
**Mansonelliasis - M. ozzardi**

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Nematoda. Phasmidea, Filariae: Mansonella ozzardi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>Fly (black fly = Simulium) or midge (Culicoides)</td>
</tr>
<tr>
<td>Vehicle</td>
<td>None</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>5m - 18m (range 1m - 2y)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of microfilariae in skin snips or blood. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Ivermectin 150 ug/kg PO as single dose</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Arthralgia, pruritus, urticaria, rash, bronchospasm, headache, lymphadenopathy and eosinophilia.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Filaria ozzardi, Mansonella ozzardi, Microfilaria bolivarensis, Ozzardiasis, Tetrapetalonema ozzardi. ICD9: 125.5 ICD10: B74.4</td>
</tr>
</tbody>
</table>

**Clinical**

Clinical features are mild, and limited to any combination of pruritus, bronchospasm, rash, headache, arthralgias, fever, eosinophilia and lymphadenopathy. Nummular keratitis, associated with the presence of microfilaria in the cornea, is common. 1-3

This disease is endemic or potentially endemic to 23 countries.

**Mansonelliasis - M. ozzardi in Haiti**

**Time and Place:**
Mansonelliasis was reported in Haiti as early as 1923. 4
- Ozzardiasis is prevalent in the rural coastal areas of northern and southern Haiti. 5 6
- Large foci are present in the north, between Port-de-Paix and Cap Haitien; and in the Miragoane area, within the Nippes district. This focus includes the area stretching from Petit-Trou-de-Nippes to Roseaux in the Grande Anse district, including the Baraderes peninsula and the Cayemites Islands
- In the south, a focus is located in the Saint-Louis-du-Sud area, near Les Cayes and on the island Ile a Vache.
- Limited foci are located in the western district, north of Port-au-Prince, in Leogane and around Gonave Island.

489 cases of mansonelliasis were reported in 1974.

**Prevalence surveys:**
- 16% of persons in Bayeux (1980 publication) 7
- 16.5% of persons in Corail (2014 publication) 8
- 18.8% of persons in Bon Dos village, Nippes District (1983) 9
- 1.3% of Haitian immigrants in the United States (1981 to 1982) 10

The principal vector is Culicoides furesens. 11
- C. barbosai 12 and Leptoconops bequaerti 13 have also been implicated

**References**

1. BMJ Open 2012 ;2(6)

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<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>VIRUS - RNA. Paramyxoviridae, Paramyxovirinae, Morbillivirus: Measles virus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Droplet</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>8d - 14d</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Viral culture (difficult and rarely indicated). Serology. Nucleic acid amplification.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Respiratory isolation; supportive. Ribavirin 20 to 35 mg/kg/day X 7 days has been used for severe adult infection</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Vaccines</strong></td>
<td>Measles vaccine, Measles-Mumps-Rubella vaccine, Measles-Rubella vaccine</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Coryza, fever, headache, conjunctivitis, photophobia and a maculopapular rash after 3 to 5 days; Koplik's spots (bluish-grey lesions on buccal mucosa, opposite second molars) often precede rash; encephalitis or viral pneumonia occasionally encountered.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Masern, Massling, Mazelen, Meslinger, Morbili, Morbillo, Rubeola, Rugeole, Sarampion, Sarampo. ICD9: 055 ICD10: B05</td>
</tr>
</tbody>
</table>

### Clinical

**WHO Case definition for surveillance:**
Any person with:
- fever, and
- maculopapular (i.e. non-vesicular) rash, and
- cough, coryza (i.e. runny nose) or conjunctivitis (i.e. red eyes).

or

Any person in whom a clinician suspects measles infection.

**Laboratory criteria for diagnosis**
- At least a fourfold increase in antibody titer or
- Isolation of measles virus or
- Presence of measles-specific IgM antibodies

**Case classification**
- Clinically confirmed: A case that meets the clinical case definition.
- Probable: Not applicable.
- Laboratory-confirmed: only for outbreak confirmation and during elimination phase A case that meets the clinical case definition and that is laboratory-confirmed or linked epidemiologically to a laboratory-confirmed case.

**Acute illness:**
Symptoms begin to appear about 10 to 12 days after exposure to the virus, with fever followed by cough, rhinorrhea, and/or conjunctivitis.  
- The rash appears approximately 14 days after exposure and lasts 5 to 6 days.  
- The rash begins at the hairline, spreading to the face and neck.  
- Over the next three days, the rash gradually extends, eventually reaching the hands and feet.  

**Complications:**
Complications of measles include diarrhea, otitis media (10%), pneumonia (5%), encephalitis (0.1%) , sudden deafness, arthropathy (28%), seizures, and death.  
- Twenty percent of patients experience one or more complications, most often children below five years of age and adults over 20.  
- Measles in pregnancy may be associated with maternal pneumonia, abortion, low birth weight or congenital infection of the newborn.  
- In developing countries, measles has been known to kill as many as one out of four people.
Measles in Haiti

Vaccine Schedule:

BCG - birth, 10, 14 weeks
DTwPHibHep - 6, 10, 14 weeks
MR - 9 months
OPV - birth; 6, 10, 14 weeks
Pneumo conj - from April 2015
Pneumo ps - from January 2015
Rotavirus - from April 2014
Td - 1st contact; +4 weeks; +6 months; +1, +1 years pregnant women

This disease is endemic or potentially endemic to all countries.

Seroprevalence surveys:
94.1% of pregnant women (2012)
Notes:
1. Average disease rates of 24 per 100,000 were reported during 1989 to 1994.
2. No confirmed cases were reported during 2007 to 2010.  
   Individual years:
   2001 - 37% of all cases for the Americas

Notable outbreaks:
2000 - An outbreak (992 cases, or 57% of all cases for the Americas region) was reported - most from Artibonite and metropolitan Port-au-Prince. The outbreak may have started with imported cases from the Dominican Republic.

References
5. PMID 24097452
**Melioidosis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Burkholderia pseudomallei</em> An aerobic gram-negative bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Soil Water Sheep Goat Horse Pig Rodent Monkey Marsupial</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Water: Contact, ingestion, aerosol Breast milk (rare)</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>3d - 21d (range 2d - 1y)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture of blood, sputum, tissue. Serology. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td><em>Ceftazidime</em> or <em>Meropenem</em> or <em>Imipenem</em> IV X at least 14 days May be combined with <em>Sulfamethoxazole/trimethoprim</em> PO Follow with <em>Sulfamethoxazole/trimethoprim</em> +/- <em>Doxycycline</em> X at least 3 months.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td><em>Ceftazidime</em> or <em>Meropenem</em> or <em>Imipenem</em> IV X at least 14 days May be combined with <em>Sulfamethoxazole/trimethoprim</em> PO Follow with <em>Sulfamethoxazole/trimethoprim</em> X at least 3 months.</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>May present as: lymphangitis with septicemia; or fever, cough and chest pain; or diarrhea; bone, central nervous system, liver and parotid infection are occasionally encountered; case-fatality rate 10% to over 50% (septicemic form).</td>
</tr>
<tr>
<td>Synonyms</td>
<td><em>Burkholderia pseudomallei</em>, <em>Burkholderia thailandensis</em>, Melioidose, Nightcliff Gardeners' Disease, Whitmore disease.</td>
</tr>
</tbody>
</table>

**ICD9:** 025  
**ICD10:** A24.1,A24.2,A24.3,A24.4

**Clinical**

The clinical features of melioidosis are similar to those of tuberculosis: prolonged fever, weight loss, latency with reactivation, upper-lobe infiltrates, etc.  
1-5  
- As in tuberculosis, long latent periods may precede appearance of the disease; in some reports 29 years 6, or even 69 years. 7  
- Disease rates are highest among diabetics. 8-10 Other predisposing conditions include collagen-vascular disease, alcoholism, malnutrition, chronic renal or hepatic disease, corticosteroid therapy, splenectomy, pregnancy, chronic granulomatous disease, leukemia and lymphoma.

Acute melioidosis can be divided into five clinical forms:  
- septicemia without abscess formation  
- septicemia with disseminated foci  
- localized infection  
- transitory bacteremia  
- "fever of unknown origin"

Most patients with overt infection present with pneumonia which may include pulmonary nodules, consolidation, necrotizing lesions, pleural effusion, pleural thickening and mediastinal abscesses. 11-13  
- Occasionally, the only lesion may be a pleural mass.  
- Although confluent upper lobe infiltrates are common, the apices are generally spared in non-septicemic cases.  
- Rapid progression and early cavitation are common.  
- Pleural effusion is seen in 21% of patients with acute disease, and 13% of patients with chronic melioidosis  
- Pericarditis occurs in six to ten percent of all patients.  
- Patients with cystic fibrosis (ie, traveling to endemic countries) appear to be at high risk for pulmonary infection.  
- The pattern of organ involvement in recurrent or relapsing melioidosis is similar to that of primary infection. 14

45% of cases present as septicemia with infection of multiple organs.  
- Pericarditis 15-18 may complicate the pulmonary infection, and necessitate surgical drainage for tamponade.  
- Visceral abscesses may involve the spleen 19-21, liver 22-25, kidneys 26, pancreas 27, omentum 28 or peritoneum 29, prostate 30 or other organs. 31  
- Osteomyelitis is common. 33-38  
- Generalized or local suppurative lymphadenitis is occasionally encountered. 39-42  
- Primary cutaneous diseases occurs in 12% of cases, and secondary cutaneous dissemination in 2%. 43 44  
- Complications of melioidosis include nasopharyngitis or sinusitis 45, brain abscess 46, septic arthritis 47-52, dural sinus
This disease is endemic or potentially endemic to 76 countries.

References

63. Indian Pediatr 2010 Sep ;47(9):799-801.
76. PMID 24285732.
**Meningitis - aseptic (viral)**

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA. Picornaviridae, enteroviruses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Fecal-oral  Droplet</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Viral isolation (stool, CSF, throat). Serology.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Lymphocytic meningitis (normal CSF glucose); often follows sore throat; typically occurs during late summer and early autumn in temperate regions.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Aseptic meningitis, Encephalitis - viral, Meningite virale, Meningitis, viral, Meningo-encefalite virale, Viral encephalitis, Viral meningitis. ICD9: 047,048,049,320.2 ICD10: A87,G03.0</td>
</tr>
</tbody>
</table>

**Clinical**

**WHO Case definition for surveillance:**

**Clinical case definition**
A case with fever 38.5°C and one or more of the following:
- neck stiffness
- severe unexplained headache
- neck pain and 2 or more of the following: photophobia, nausea, vomiting, abdominal pain, pharyngitis with exudates
For children <2 years of age a case is defined as
- A case with fever 38.5°C and one or more of the following: irritability, bulging fontanelle

**Laboratory criteria for confirmation**
- The specific virus confirmed on cell culture.

**Case classification**
- Suspected: A case that meets the clinical case definition and one or more of the following:
  - normal CSF glucose and normal or mild increase in CSF protein (>50 mg/dl), moderate increase CSF cells (<500/mm3) and lymphocyte predominance (>50%) 
  - CSF Positive for viral genomic sequences using PCR (Polymerase Chain Reaction)
  - Epidemiological link to a confirmed case
- Confirmed: A suspected or probable case with laboratory confirmation.

As a group, the viral meningitides are characterized by fever, headache, meningismus and lymphocytic pleocytosis. 1 2

- Major complications and sequelae are unusual. 3 4
- The cerebrospinal fluid glucose level is normal, and a transitory neutrophilic pleocytosis is occasionally encountered.
- CSF pleocytosis is often absent among children with enteroviral meningitis. 5-7

This disease is endemic or potentially endemic to all countries.

**References**

7. Ugeskr Laeger 2014 Mar 10;176(11B)
## Meningitis - bacterial

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Neisseria meningitidis, Streptococcus pneumoniae, Haemophilus influenzae, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Air Infected secretions</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>CSF microscopy and culture. Blood culture. Note: Antigen detection is non-specific and rarely useful.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Bactericidal agent(s) appropriate to known or suspected pathogen + dexamethasone</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Vaccines</td>
<td>H. influenzae (HbOC-DTP or -DTaP) vaccine Haemophilus influenzae (HbOC) vaccine Haemophilus influenzae (PRP-D) vaccine Haemophilus influenzae (PRP-OMP) vaccine Haemophilus influenzae (PRP-T) vaccine Meningococcal vaccine Hepatitis B + Haemoph. influenzae vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Headache, stiff neck, obtundation, high fever and leukocytosis; macular or petechial rash and preceding sore throat suggest meningococcal infection.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Bacterial meningitis, Enfermedad Meningococica, Haemophilus influenzae, Haemophilus influenzaes, HIB meningitis, Hib, Infections a meningocooque, Meningite bacterica, Meningite meningococcica, Meningococcal, Meningokokken Erkr., Meningokokkose. ICD9: 036.0,320 ICD10: A39,G00,G01,G02</td>
</tr>
</tbody>
</table>

### Clinical

**WHO Case definition for surveillance of Meningococcal infection:**

Clinical case definition
- An illness with sudden onset of fever (>38.5°C rectal or >38.0°C axillary) and one or more of the following:
  - Neck stiffness
  - Altered consciousness
  - Other meningeal sign or petechial or purpuric rash
- In patients <1 year, suspect meningitis when fever accompanied by bulging fontanelle.

Laboratory criteria for diagnosis
- Positive CSF antigen detection or
- Positive culture

Case classification
- Suspected: A case that meets the clinical case definition.
- Probable: Not applicable.
- Confirmed: A suspected or probable case with laboratory confirmation.

**WHO Case definition for surveillance of Haemophilus influenzae type b (Hib disease):**

Clinical description
- Bacterial meningitis is characterized by fever of acute onset, headache and stiff neck.
- Meningitis is not a specific sign for Hib disease, and Hib disease cannot be diagnosed on clinical grounds.

Laboratory criteria for diagnosis
- Culture: isolation of Hib from a normally sterile clinical specimen, such as cerebrospinal fluid (CSF) or blood.
- Culture of Hib from non-sterile sites such as the throat, where bacteria can grow without causing disease, does not define Hib disease.
- Antigen detection: identification of Hib antigen in normally sterile fluids, by methods such as latex agglutination or counter-immunoelectrophoresis (CIE).

Case classification
- Potential: (bacterial meningitis case): a child with a clinical syndrome consistent with bacterial meningitis.
- Probable: Not applicable.
- Confirmed: A case that is laboratory-confirmed (growth or identification of Hib in CSF or blood).
Meningitis - bacterial in Haiti

Note: Any person with Hib isolated from CSF or blood may be reported as a confirmed case, regardless of whether their clinical syndrome was meningitis.

As a group, the bacterial meningitides are characterized by signs of sepsis, fever, headache, meningismus and neutrophilic pleocytosis.  
- 33% to 69% of patients with meningococcal infection have hyperglycemia on admission
- 7.5% of patients with meningococcal infection present with arthritis.
- Major complications and sequelae are common.
- Delayed cerebral thrombosis is encountered in 1.1% of cases.

This disease is endemic or potentially endemic to all countries.

Meningitis - bacterial in Haiti

Graph: Haiti. Meningococcal infection, cases - GIDEON

Vaccine Schedule:
BCG - birth, 10, 14 weeks  
DTwPHibHep - 6, 10, 14 weeks  
MR - 9 months  
OPV - birth; 6, 10, 14 weeks  
Pneumo conj - from April 2015  
Pneumo ps - from January 2015  
Rotavirus - from April 2014  
Td - 1st contact; +4 weeks; +6 months; +1, +1 years pregnant women

Notable outbreaks:
1994 - An outbreak (100 cases, approximate - 9 fatal) of group C meningococcal infection was reported in Quanaminthe (Northeast Department)
References

7. ProMED <promedmail.org> archive: 19950619.0425
### Microsporidiosis

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Rabbit Rodent Carnivore Non-human primate Fish Dog Bird</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Microscopy of duodenal aspirates. Inform laboratory if this organism is suspected. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Albendazole 400 mg PO BID X 3 weeks. Add Fumagillin for ocular S. intestinalis may respond to Albendazole and Fumagillin. Nitazoxanide has been used for E. bieneusi.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Albendazole 200 mg PO BID X 3 weeks. Add Fumagillin for ocular S. intestinalis may respond to Albendazole and Fumagillin. Nitazoxanide has been used for E. bieneusi.</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>In AIDS patients, infection is characterized by chronic diarrhea, wasting and bilateral keratoconjunctivitis; hepatitis and myositis may be present.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Annacalia, Brachiola, Encephalitozoon, Enterocytozoon, Microsporidium, Nosema, Pleistophora, Trachipleistophora, Tubulinosema, Vittaforma. ICD9: 136.8 ICD10: A07.8</td>
</tr>
</tbody>
</table>

### Clinical

Intestinal disease in immunocompetent patients is characterized by self-limited diarrhea, traveler's diarrhea or asymptomatic carriage.  

- Immunocompromised patients present with diarrhea, cholangitis, cholecystitis, sinusitis or pneumonia.  

Ocular microsporidiosis is associated with keratoconjunctivitis.  

Other syndromes include sinusitis, nephritis, cerebritis, myositis and prostatitis.  

This disease is endemic or potentially endemic to all countries.

### Microsporidiosis in Haiti

#### Prevalence surveys:

6.9% of HIV-positive patients with chronic diarrhea (Enterocytozoon bieneusi, 2008 publication)  

### References

## Moniliformis and Macracanthorhynchus

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>PARASITE - Archiacanthocephala. Moniliformida: Moniliformis moniliformis, Oligocanthorhynchida: Maracanthorhynchus hirudinaceus.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Pig (Maracanthorhynchus), rat and fox (Moniliformis),</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Insect (ingestion)</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>Unknown - presumed 15 to 40 days</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Identification of worm in stool.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Infection is usually self-limited. Pyrantel pamoate has been used against Moniliformis moniliformis - 11 mg/kg PO - repeat once in 2 weeks</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>Infection is usually self-limited. Pyrantel pamoate has been used against Moniliformis moniliformis - 11 mg/kg PO - repeat once in 2 weeks</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Most infections are characterized by asymptomatic passage of a worm; however, vague complaints such as 'periumbilical discomfort' and 'giddiness' have been described.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Acanthocephalan worms, Macracanthorhynchus, Moniliform acanthocephalan, Moniliformis moniliformis. ICD9: 128.9 ICD10: B83.8</td>
</tr>
</tbody>
</table>

### Clinical

Most infections are characterized by asymptomatic passage of a worm; however, vague complaints such as "periumbilical discomfort" and "giddiness" have been described. 

- In one instance, a man developed marked abdominal pain following experimental self-infection.
- In another case, intestinal perforation was associated with *Macracanthorhynchus hirudinaceus* infestation.

**This disease is endemic or potentially endemic to all countries.**

### References

Mumps

Agent | VIRUS - RNA. Paramyxoviridae, Paramyxovirinae, Rubulavirus: Mumps virus
--- | ---
Reservoir | Human
Vector | None
Vehicle | Aerosol
Incubation Period | 14d - 24d (range 12d - 24d)
Diagnostic Tests | Viral culture (saliva, urine, CSF) indicated only in complicated cases. Serology. Nucleic acid amplification.
Typical Adult Therapy | Respiratory isolation; supportive
Typical Pediatric Therapy | As for adult
Vaccines | Measles-Mumps-Rubella vaccine
| Mumps vaccine
| Rubella - Mumps vaccine
Clinical Hints | Fever, parotitis, orchitis (20% of post-pubertal males), meningitis (clinically apparent in 1% to 10%), oophoritis, or encephalitis (0.1%); most cases resolve within 1 to 2 weeks.
Synonyms | Bof, Epidemic parotitis, Fiebre urliana, Infectious parotitis, Kusma, Oreillons, Paperas, Parotidite epidemica, Parotiditis, Parotite epidemica, Passjuka.
ICD9: 072
ICD10: B26

Clinical

One third of Mumps virus infections are asymptomatic.

**Acute illness:**
The prodrome of mumps consists of low-grade fever, anorexia, malaise, and headache.
- Usually within one cay, the patient complains "earache" and tenderness is noted over the parotid gland. ¹
- The gland is soon visibly enlarged and progresses to maximum size over the next 2 to 3 days, often with lifting of the ear lobe upward and outward.
- The orifice of Stensen's duct is edematous and erythematous, and trismus and pain on chewing may be present.
- It is important to remember that the enlarged gland obscures the angle of the mandible, while cervical adenopathy does not.
- Parotid involvement if unilateral in 25% of cases.
- As the disease progresses, fever may reach 40C.
- Subsequently pain, fever, and tenderness resolve, and the parotid gland returns to normal size within a week.
- Involvement of the other salivary glands occurs in 10% of cases, but are rare in the absence of parotid involvement.
- Presternal edema develops in 6% of patients, most often in those who have submandibular adenitis.

8% to 15% of patients will continue shedding Mumps virus 5 days after the onset of symptoms. ²

**Neurological manifestations:**
Central nervous system involvement is the most common extrasalivary gland manifestation of this disease.
- Cerebrospinal fluid pleocytosis has been documented in 51% patients with mumps, without other evidence of meningitis.
- Clinical meningitis occurs in 1 to 10% of persons with mumps parotitis; while parotitis is documented in less than 50% of patients with mumps.
- Meningitis may occur before, during or after salivary gland involvement.
- The features of mumps meningitis are similar to those of other viruses, and the clinical course is benign; however, polymorphonuclear CSF pleocytosis and reduced glucose levels are not unusual.

Encephalitis occurs in less than 0.1% of cases, and may be accompanied by altered consciousness, seizures, paresis, aphasia, involuntary movements; and sequelae such as psychomotor retardation, deafness (1 per 1,000 to 20,000 cases ³) and convulsive disorders.
- Other neurological complications of mumps include cerebellar ataxia ⁴, facial nerve palsy, transverse myelitis, Guillain-Barre syndrome, and aqueductal stenosis.

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**Epididymo-orchitis:**
Epididymo-orchitis is the most common extra-salivary gland manifestation in adults, developing in 20 to 30% of infected postpubertal males.
- This complication is bilateral in 15% of cases, and appears during the first week of mumps in 70% of cases.
- Rarely, this is the only manifestation of mumps.
- Onset is abrupt, with elevation of fever, chills, headache, vomiting, and testicular pain.
- The testis is warm, swollen (to as much as four times normal size), and tender, with erythema of the scrotum.
- Epididymitis is present in 85%, and usually precedes the orchitis.
- Tenderness may persist for more than 2 weeks in 20% of cases; and some degree of atrophy is noted in 50% of the patients, even after 2 years.
- Impotence is not encountered, and sterility is rare.

**Additional manifestations of mumps:**
Other features of mumps include oophoritis, fetal wastage, migratory polyarthritis, monoarticular arthritis and arthralgia, electrocardiographic changes (with or without overt myocarditis), nephritis, thyroiditis, mastitis, prostatitis, hepatitis, cholecystitis and thrombocytopenia.

**This disease is endemic or potentially endemic to all countries.**

**Mumps in Haiti**

594 cases were reported in 2005.

**References**

Myalgic encephalomyelitis

<table>
<thead>
<tr>
<th>Agent</th>
<th>UNKNOWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Unknown</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Unknown</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Clinical diagnosis; ie, discount other diseases.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive; ? immune modulators (experimental)</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Unexplained depression, fatigue, cognitive disorders, sleep disturbance, recurrent bouts of pharyngitis and adenopathy, rheumatological symptoms and fever lasting more than six months.</td>
</tr>
</tbody>
</table>
| Synonyms    | Chronic fatigue syndrome.  
ICD9: 780.71  
ICD10: G93.3 |

Clinical

The CDC (The United States Centers for Disease Control) consensus definition of Chronic Fatigue Syndrome (currently Myalgic encephalomyelitis 1-3 ) requires the presence of two major criteria, in addition to at least six symptom criteria and at least two physical criteria (or the presence of eight symptom criteria, without need for physical criteria) as follows: 4-13

Major criteria:
A. New onset of persistent or relapsing, debilitating fatigue or fatigability without a history of similar illness. Fatigue does not resolve with bed rest, and reduces daily activity by at least 50% for at least 6 months.
B. Exclusion of other disorders through history, physical examination and laboratory studies.

Minor criteria:
A. Symptoms.
1. Mild fever or chills
2. Sore throat
3. Painful cervical or axillary adenopathy
4. Myalgia
5. Muscle weakness
6. Migratory arthralgia
7. Prolonged fatigue not meeting major criteria
8. Generalized headaches
9. Neuropsychological complaints (photophobia), scotomata, forgetfulness, irritability, confusion, problems in thinking or concentration 14-16 , depression)
10. Sleep disturbances
11. Description of the initial symptom complex as developing over a period of hours to days.

B. Physical criteria.
1. Low grade fever
2. Nonexudative pharyngitis
3. Cervical or axillary lymphadenopathy (nodes may be tender, and are usually no larger than 2 cm).

Some authorities suggest that several features (cognitive impairment, muscle weakness, circulatory disturbances, marked variability of symptoms, and post-exertional malaise) are present in Myalgic encephalomyelitis, but not in Chronic fatigue syndrome. 17

Affected children present with low levels of school attendance, fatigue, anxiety, functional disability and pain. 18 19
• Three phenotypes of Chronic Fatigue Syndrome are described in children: musculoskeletal, migraine and "sore throat." 20

Patients with disease onset above age 50 years present with relatively high rates of fatigue, depression and autonomic dysfunction. 21
Additional findings described in Chronic fatigue syndrome have included generalized hyperalgesia, impaired cardiac function, intracranial hypertension, migraine headache, and postural orthostatic tachycardia.

In one series, 33% of patients referred to an Infectious Diseases clinic for suspected Lyme disease were found to have Chronic Fatigue Syndrome, and only 23% Lyme disease.

This disease is endemic or potentially endemic to all countries.

References

13. J Health Psychol 2014 Feb 7;
27. QJM 2008 Dec ;101(12):961-5.
## Mycetoma

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM OR FUNGUS. Nocardia spp, Madurella mycetomatis, Actinomadura pellitieri, <em>Streptomyces somaliensis</em>, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Soil  Vegetation</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Contact Wound Soil</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>2w - 2y</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Bacterial and fungal culture of material from lesion.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Antimicrobial or antifungal agent as determined by culture. Excision as indicated</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Painless, chronic, draining, fistulous subcutaneous nodule - usually involving lower extremity; osteolytic lesions may be noted on x-ray; usually no fever; most patients are males age 20 to 40 (ie, occupational exposure).</td>
</tr>
<tr>
<td><strong>Synopsis</strong></td>
<td>Curvularia lunata, Fusarium subglutinans, Leptosphaeria tompkinsii, Madura foot, Madura-Fuss, Madurella, Mycetom, Pleurostomophora, White grain eumycetoma. ICD9: 039.4,117.4 ICD10: B47</td>
</tr>
</tbody>
</table>

### Clinical

Mycetoma is typically characterized by a painless nodule or thickening, which involve the feet in 80% of cases. The lesions slowly enlarge and form sinus tracts which drain bloody, serous or purulent fluid containing granules of various colors. Systemic findings are absent. Lesional hyperhydrosis is common, and tendons and nerves are usually spared until late stages of the infection. Regional lymphadenopathy is encountered in 1% to 3% of cases. Lupus vulgaris may mimic mycetoma.

Hematogenous spread of infection is extremely rare. Mycetoma may spread to involve contiguous bone or regional lymph nodes. In Actinomycotic infections, the course is more rapid and aggressive, with prominent inflammation and early destruction of bone.

Dark granules characterize Madurella infection, while pale colored granules are seen in Acremonium infection. *Actinomadura madurae*, *Nocardia brasiliensis*, and *Streptomyces somaliensis* produce smaller white, yellow, or brownish granules.

Rare instances of mycetoma of the scalp due to *Micosporum canis* have been reported. Perianal actinomycetoma may mimic other chronic diseases of the anal region. Ocular mycetoma has been reported as a complication of a trauma or sub-tenon injection. Rare cases of oral-palatal, lingual, paranasal and cavernous sinus infection have been reported. The clinical features of mycetoma may mimic those of soft tissue tumors.

Diagnosis is based on radiological and ultrasonic imaging, histology, culture and serology. A characteristic "dot in circle" sign may be seen on magnetic resonance imaging (MRI) studies. Although Actinomycotic lesions may be amenable to antibiotic therapy, eumycetoma requires aggressive surgical excision.

This disease is endemic or potentially endemic to all countries.

### References

13. PMID 19818480
# Mycobacteriosis - M. marinum

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. Actinomycetes, <em>Mycobacterium marinum</em> An aerobic acid-fast bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Fresh and salt water (eg, swimming pools, aquaria) Fish (ornamental, salmon, sturgeon, bass)</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Water per areas of minor skin trauma Contact</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>5d - 270d (median 21d)</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Mycobacterial culture from lesion. Alert laboratory when this organism is suspected.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td><strong>Clarithromycin</strong> 500 mg BID X 3m Or Rifampicin 600 mg/day + <strong>Ethambutol</strong> 20 mg/kg/day X 6w. OR <strong>Minocycline</strong> 100 mg /day X 3m</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td><strong>Sulfamethoxazole/trimethoprim</strong> 5 mg-25 mg/kg BID X 6w. Alternative <strong>Minocycline</strong> (Age &gt;= 8)</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Violaceous papule, ulcer, plaque, psoriaform lesion; onset weeks after exposure (swimming pool, aquarium); commonly involves the elbow, knee, hand or foot.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Aquarium granuloma, Fish fanciers’ finger syndrome, Fish tank granuloma, Mariner's TB, Mycobacterium balnei, Mycobacterium marinum, Mycobacterium scrofulaceum, Spam, Swimming pool granuloma. ICD9: 031.1 ICD10: A31.1</td>
</tr>
</tbody>
</table>

## Clinical

The incubation period varies from 5 to 170 days (median 21 days); with 35% of cases exceeding 30 days.
- Characteristic painful, slowly-growing blue papules usually involve the extremities, and may ulcerate.  
- The upper extremities are involved in 75% to 95%, and spread to deeper structures (tendons, bones, joints) occurs in 29%.  
  6. [ProMED <promedmail.org> archive](http://promedmail.org) : 20110704.2026

- Dissemination is rare, but has been described in AIDS patients.  
- Multiple sporotrichoid subcutaneous nodules have been reported.  
- Extensive verrucous dermal plaques have been reported among Pacific Islanders infected by *Mycobacterium marinum*.  
  10. [ProMED <promedmail.org> archive](http://promedmail.org) : 20110704.2026
  11. [ProMED <promedmail.org> archive](http://promedmail.org) : 20110704.2026
- Tenosynovitis ("fish-tank finger") is occasionally encountered.  
- A rare case of nasal infection presenting as epistaxis has been reported.  
- Scarring may occur, but is less pronounced than that which follows *M. ulcerans* infection.

This disease is endemic or potentially endemic to all countries.

## References

6. [ProMED <promedmail.org> archive](http://promedmail.org) : 20110704.2026
### Mycobacteriosis - M. scrofulaceum

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. Actinomycetes, <em>Mycobacterium scrofulaceum</em> An aerobic acid-fast bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Water (lakes, rivers)  Soil  Raw milk  Plant material</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Water  Soil  ? Through areas of minor trauma  Contact</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Culture of tissue or aspirates.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Excision. Drugs (Isoniazid - Rifampin - Streptomycin - Cycloserine) are rarely indicated</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Painless lymphadenopathy, most commonly unilateral and submandibular (true tuberculosis involves the lower neck and produces a strongly positive tuberculin reaction and/or suggestive chest X-ray). The disease is most common during early childhood.</td>
</tr>
</tbody>
</table>
| **Synonyms** | *

**Clinical**

*Mycobacterium scrofulaceum* is a common cause of lymphadenitis, most commonly among children ages 1 to 3 years.

- Most infections involve the submandibular region, however involvement of other lymph node groups or body organs may occur. ¹
- Rare instances of dissemination are reported. ² ³

**This disease is endemic or potentially endemic to all countries.**

**References**

Clinical

The clinical features of systemic mycobacterial infection are protean, and can involve disease of virtually any organ or tissue. Specific syndromes reflect the immune status of the patient and the specific fungal species involved (see Worldwide note).

*Mycobacterium avium-intracellulare* infection is clinically similar to tuberculosis, producing localized pulmonary disease or disseminated lesions of virtually any organ. Bacteremia is common, and can be detected using specialized blood culture systems.

*Mycobacterium kansasii* infection is characterized by productive cough, dyspnea, and chest pain. 16% of patients are asymptomatic. A right sided, apical or subapical, thin walled cavitary infiltrate is characteristic.

*Mycobacterium malmoense* infection is usually characterized by pulmonary disease suggestive of tuberculosis, or pediatric cervical lymphadenopathy.

Note: Over 110 species of *Mycobacterium* have been associated with human infection. See Microbiology • Mycobacteria module

This disease is endemic or potentially endemic to all countries.

References

Mycoplasma (miscellaneous) infections

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Mycoplasmatales Mycoplasma genitalium, Mycoplasma hominis, Mycoplasma fermentans, Mycoplasma penetrans, Ureaplasma urealyticum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Secretion, Sexual transmission</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Azithromycin 1 g orally as single dose OR Doxycycline 100 mg PO BID X 7 days OR Levofloxacin 500 mg daily X 7 days OR Ofloxacin 300 mg BID X 7 days</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Erythromycin 10 mg/kg PO QID X 2w</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Urethritis, vaginitis, neonatal pneumonia; rarely stillbirth, prematurity or infertility</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Acholeplasma laidlawii, Epirypthrozoon, Hemotrophic Mycoplasma, Mycoplasma amphoriforme, Mycoplasma buccale, Mycoplasma faecium, Mycoplasma felis, Mycoplasma fermentans, Mycoplasma genitalium, Mycoplasma hominis, Mycoplasma lipophilum, Mycoplasma orale, Mycoplasma penetrans, Mycoplasma pirum, Mycoplasma primatum, Mycoplasma salivarium, Mycoplasma spermaphilum, T Mycoplasmas, T strains, Ureaplasma parvum, Ureaplasma urealyticum. ICD9: 041.81 ICD10: A49.3</td>
</tr>
</tbody>
</table>

Clinical

Asymptomatic pharyngeal and vaginal carriage of *Mycoplasma* species and *Ureaplasma* is common.

- As many as 70% of sexually-active persons are colonized.

The signs and symptoms of infection are similar to those of *Chlamydia* infection. 1

- Urogenital infection may present as vaginitis, cervicitis, non-gonococcal urethritis, epididymitis 2, prostatitis 3 or urethral discharge.
- Less common findings may include pelvic inflammatory disease 4-6, post-partum fever 7 8, chorioamnionitis, infertility 9, prematurity 10 and stillbirth. 11-15
- Bronchitis, arthritis 16 17, neonatal meningitis and encephalitis 18-20, osteitis 21, endocarditis 22 23, brain abscess 24, soft tissue infections 25, genital under disease 26, bacteremia 27, respiratory distress in the newborn 28 and pneumonia have been reported. 29-32

Infection by hemotrophic *Mycoplasma* species (formerly *Epirythrozoon*) is characterized by fever, anemia and hemolytic jaundice • notably among pregnant women and newborns. 33

This disease is endemic or potentially endemic to all countries.

Mycoplasma (miscellaneous) infections in Haiti

Prevalence surveys:

- *Mycoplasma genitalium* was found in 6.7% to 10.1% of rural women attending clinics (southwestern Haiti, 2014 publication) 34
- *Mycoplasma genitalium* was found in 6.3% of rural men with urethritis (2014 publication) 35

References

34. Am J Trop Med Hyg 2014 Sep 8;  
35. Int J STD AIDS 2014 Sep 15;
### Mycoplasma pneumoniae infection

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Mollicutes. Mycoplasma pneumoniae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Droplet</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>6d - 23d</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Erythromycin 500 mg PO BID X 2w. OR Azithromycin 1 g, followed by 500 mg PO daily X 5 days. OR Doxycycline 100 mg PO BID OR Levofloxacin 750 mg PO X 5d</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Azithromycin 10 mg/kg PO day 1; 5 mg/kg PO days 2 to 5 OR Erythromycin 10 mg/kg PO QID X 2w</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Coryza, &quot;hacking&quot; cough; subsegmental infiltrate; bullous otitis media is often present; most patients below age 30; cold agglutinins are neither sensitive nor specific for infection, and appear only during second week.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Mycoplasma pneumoniae, Primary atypical pneumonia. ICD9: 041.81,483.0 ICD10: B96.0</td>
</tr>
</tbody>
</table>

#### Clinical

**Acute infection:**
Onset is insidious and gradual, and characterized by fever, malaise, a dry cough, headache, "scratchy" throat and chest wall (ie, muscular) pain.  
- Pleuritic pain, productive cough and rigors are unusual and should suggest infection by other bacterial species.  
- A lymphocytic pleural effusion may be present and rare instances of overt empyema are reported.  
- The pharynx and tympanic membranes are often erythematous, without adenopathy; and the lungs are usually normal to auscultation.  
- A macular, urticarial or vesicular rash is occasionally present; and erythema multiforme / mucosis (including Toxic epidermal necrolysis and Stevens-Johnson syndrome) is reported in some cases.

**Atypical manifestations:**
Atypical and severe disease is encountered among older adults.  
- Rare instances of acute hepatitis, glomerulonephritis, rhadbodymolysis, septic shock, endocarditis, myocarditis, pericarditis, ARDS, sepsis without pulmonary findings, multi-organ failure, acute respiratory distress syndrome and empyema have been reported.  
- Neurological findings may include encephalitis, brainstem / striatal encephalopathy, transient parkinsonism, post-encephalitic seizures, ocular flutter, ataxia, cerebellitis with obstructive hydrocephalus, aseptic meningitis, acute transverse myelitis, stroke, optic neuritis, or polyradiculopathy.  
- Obsessive-compulsive disorder has been ascribed to Mycoplasma pneumoniae infection.  
- Extrapulmonary manifestations may also include hematologic abnormalities (including autoimmune hemolytic anemia, pancytopenia, acute thrombocytosis and hemophagocytic syndrome); arterial thromboembolism, priapism, renal; gastrointestinal; genitourinary; hepatic; osteoarticular; cutaneous (rash, angioedema with eosinophilia), hemolytic-uremic syndrome, papular purpuric gloves and socks syndrome (PPGSS), leukocytoclastic vasculitis, urticarial vasculitis suggestive of adult Still's disease, toxic epidermal necrolysis, mucusitis, myositis; possible splenic infarction and ocular involvement (including vasculitis and optic neuritis / papillitis).  
- Mycoplasma pneumoniae infection is implicated in the etiology of Guillain-Barre syndrome, recurrent tonsillitis and asthma.  
- Mycoplasma pneumoniae may play an etiologic role in some cases of acute hemorrhagic edema of infancy.  
- Mycoplasma pneumoniae infection is independently associated with risk of subsequent development of ischemic stroke and may play a role in the development of atherosclerosis.
This disease is endemic or potentially endemic to all countries.

<table>
<thead>
<tr>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>63. J Child Neurol 2013 Dec 5;</td>
</tr>
</tbody>
</table>
### Myiasis

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>PARASITE - Insecta (Diptera) larvae</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Mammal</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>Biting arthropod</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Fly eggs deposited by biting arthropod</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>1w - 3m</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Identification of extracted maggot.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Removal of maggot</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Pruritic or painful draining nodule; fever and eosinophilia may be present; instances of brain, eye, middle ear and other deep infestations are described.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Calliphora, Chrysomya, Chrysomyia, Cochliomyia, Cordylobia, Cuterebrosis, Dermatobia, Eristalis, Furuncular myiasis, Gasterophilus, Hypoderma, Lucilia, Lund’s fly, Maggot infestation, Megalobia, Musca, Muscina, Oedemagen, Oestrus larvae, Ophthalmomyiasis, Psychoda, Rectal myiasis, Sarcophaga, Screw worm, Telmatoscopus, Urinary myiasis, Vaginal myiasis, Wohlfarthia. ICD9: 134.0 ICD10: B87</td>
</tr>
</tbody>
</table>

### Clinical

Myiasis may be primary (active invasion) or secondary (colonization of wound).  
- Primary furuncular myiasis is usually characterized by one or more erythematous, painful "pustules" having a central perforation.  
  - Eosinophilia may be present.  
- Other clinical forms include ophthalmomyiasis (migrating larvae in the conjunctival sac), pharyngeal, nasal, urinary, vaginal, tracheopulmonary and rectal infestation.  
- Migratory myiasis is characterized by migratory dermal swellings and regional lymphadenopathy of the head and face.  
- Larvae may rarely invade the paranasal sinuses and even cause eosinophilic meningitis.  
- Penile myiasis may mimic a sexually transmitted disease

**This disease is endemic or potentially endemic to all countries.**

### References

Necrotizing skin/soft tissue infx.

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Streptococcus pyogenes</em>, <em>Clostridium perfringens</em>, mixed anaerobic and/or gram-negative bacilli</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Clinical features. Smear and culture (including anaerobic culture) of exudate.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Debridement and parenteral antibiotics directed by smear and culture results. Hyperbaric oxygen in more severe infections</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>At least 7 syndromes in this category: most characterized by local pain and swelling, skin discoloration or edema, gas formation, foul odor and variable degrees of systemic toxicity.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Anaerobic cellulitis, Chancrum oris, Clostridial cellulitis, Clostridium novyi, Fasciitis, Fournier's gangrene, Gangrenous cellulitis, Gangrenous stomatitis, Invasive group A strep. Infections, Melene'y's synergistic gangrene, Necrotizing fasciitis, Noma, Streptococcal fasciitis, Synergistic necrotizing cellulitis. ICD9: 686.8,528.1 ICD10: M72.6,A69.0</td>
</tr>
</tbody>
</table>

Clinical

Infections often begin in areas of minor trauma or loss of dermal integrity (as in varicella), and may spread within hours to involve large areas and endanger life. 1-5

Clinical forms of necrotizing skin and soft tissue infection (in alphabetical order):

**Clostridial cellulitis** usually follows local trauma or surgery, and has a gradual onset following an incubation period of 3 or more days.
- There is minimal pain and discoloration, with moderate swelling.
- A thin, occasionally foul and dark colored exudate is noted and copious gas is present.
- Systemic signs are minimal.

**Clostridial myonecrosis** is discussed elsewhere in this module but is distinguishable from the above syndromes by its severity, prominent systemic toxicity and the presence of overt muscle involvement.

**Fournier's gangrene** is a form of necrotizing fasciitis which involves the scrotum and penis. 6-9
- Most patients are over the age of 50 • diabetic, alcoholic or suffering from rectal cancer.
- The lesion is markedly destructive and mutilating, and typically due to a mixed flora of anaerobic and facultative or aerobic gram negative bacilli.
- Fournier's gangrene may occasionally complicate varicella 10
- The case-fatality rate for Fournier's gangrene is over 20% 11

**Gangrenous stomatitis** (chancrum oris, Noma) is a mutilating condition of the skin and soft tissues of the face which affects primarily immune-suppressed 12-14 and malnourished children. 15-20
- Most patients are under the age of 6 years.
- The disease usually begins as a painful red or purple intraoral lesion, which rapidly spreads to destroy surrounding bone and soft tissues of the mouth and face.
- The case-fatality rate is 70% to 90%.

**Infected vascular gangrene** is a complication of peripheral vascular insufficiency and has a gradual onset beginning 5 or more days after the initiating event.
- Onset is gradual, and pain may vary from absent to prominent.
- The area is discolored and painful, and associated with foul malodorous gas and involvement of underlying muscle.
- Systemic signs are minimal.
Meleney’s gangrene (progressive bacterial synergistic gangrene) usually involves sites of fistulae, retention sutures or draining empyema.  
- The infection begins 1 to 2 weeks following surgery, and is characterized by erythema and moderate swelling, with minimal crepitus.

Necrotizing fasciitis is typically associated with diabetes mellitus or recent abdominal surgery.  
- Following an incubation period of 1 to 4 days, the patient becomes increasingly ill, with moderate local pain and gas formation, and a foul seropurulent discharge.  
- Pain may be severe, and areas of erythema and necrosis are evident.  
- Relatively high mortality rates are associated with necrotizing fasciitis caused by *Aeromonas* or *Vibrio* species.

Non-clostridial anaerobic cellulitis is usually associated with diabetes mellitus or a preexisting local infection.  
- Onset may be gradual or rapid, with moderate swelling, dark pus, minimal discoloration and copious foul-smelling gas.  
- Pain is minimal, and the patient is moderately ill.

Synergistic necrotizing cellulitis is associated with diabetes, renal disease, obesity or preexisting perirectal infection.  
- The incubation period varies from 3 to 14 days, and onset is acute.  
- Swelling may be marked, and associated with intense local pain, foul "dishwater" pus and small amounts of gas.  
- Moderate muscle involvement and marked systemic disease are present.

This disease is endemic or potentially endemic to all countries.

References

## Neutropenic typhlitis

| **Agent** | BACTERIUM. *Clostridium septicum* (occasionally *Clostridium tertium*, *Clostridium sporogenes*, *Clostridium sordellii* or *Clostridium tertium*) |
| **Reservoir** | Human |
| **Vector** | None |
| **Vehicle** | Endogenous |
| **Incubation Period** | Unknown |
| **Diagnostic Tests** | Typical findings in the setting of neutropenia. Ultrasonography may be helpful. |
| **Typical Adult Therapy** | Broad spectrum antimicrobial coverage, which should include clostridia and Pseudomonas aeruginosa; ie Piperacillin-Tzobactam (or Imipenem or Meropenem) OR Cefepime + Metronidazole Role of surgery is controversial |
| **Typical Pediatric Therapy** | As for adult |
| **Clinical Hints** | Fever, abdominal pain, diarrhea (occasionally bloody) and right lower quadrant signs in a neutropenic (leukemic, etc) patient; may spread hematogenously to extremities; case-fatality rate 50% to 75%. |
| **Synonyms** | Neutropenic enterocolitis. ICD9: 540.0 ICD10: A04.8 |

### Clinical

Neutropenic typhlitis is clinically similar to acute appendicitis, but limited to patients with severe neutropenia. ¹⁻³

This disease is endemic or potentially endemic to all countries.

### References

Nocardiosis

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Actinomycetes, Nocardia spp. An aerobic gram positive bacillus (acid-fast using special technique)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Soil</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Air Dust Wound Contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>? days to weeks</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture and gram stain of exudates, sputa, tissue specimens. Advise laboratory when Nocardia suspected.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Lymphadenitis or skin / soft tissue infection: Sulfamethoxazole/trimethoprim OR Minocycline Pneumonia: Sulfamethoxazole/trimethoprim + Imipenem; OR Imipenem + Amikacin Brain abscess: Sulfamethoxazole/trimethoprim + Imipenem; OR Linezolid + Meropenem</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Pneumonia, lung abscess, brain abscess, or other chronic suppurative infection; often in the setting of immune suppression.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Nocardia, Nocardiose. ICD9: 039 ICD10: A43</td>
</tr>
</tbody>
</table>

Clinical

Nocardiosis may present as an acute or chronic suppurative infection with a tendency to remission and exacerbation. ¹

• Infections are most common among immunocompromised patients. ² ³

• The most common presentation is pneumonia.

• Brain abscesses account for 33% of cases.

• Infection of virtually any other organ may occur. ⁴-⁷

Nocardiosis may mimic tuberculosis, particularly in the setting of HIV infection. ⁸

• Nodular lymphadenitis, seen with Nocardia brasiliensis infection, may mimic nocardiosis. ⁹

The ecology and phenotypic characteristics of Nocardia species ¹⁰ are discussed in the Microbiology module.

This disease is endemic or potentially endemic to all countries.

References

Orbital and eye infections

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM OR FUNGUS. <em>Streptococcus pyogenes</em>, oral anaerobes, Aspergillus spp., facultative gram-negative bacilli, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Endogenous  Introduced flora (trauma, surgery)</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Trauma  Surgery  Contiguous (sinusitis)  Hematogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Imaging techniques (CT or MRI). Culture of aspirates or surgical material.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Local and systemic antimicrobial agents appropriate for species and severity</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Proptosis, chemosis, extraocular palsy, or hypopyon associated with sinusitis, bacteremia, eye trauma or surgery. Involves the eye (endophthalmitis); periosteum (peri orbital infection); orbit (orbital cellulitis); orbit + eye (panophthalmitis).</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Bacterial keratitis, Ceratite, Cheratite, Endophthalmitis, Eye infection, Keratite, Keratitis, Orbital infection, Panophthalmitis, Queratitis.</td>
</tr>
</tbody>
</table>

ICD9: 360.0  
ICD10: H05.0

Clinical

Endophthalmitis involves the ocular cavity and adjacent structures.  
- Infection may occur in the setting of endocarditis or other bacteremic infections, or follow surgery or penetrating trauma.  
- The onset of fungal endophthalmitis is more gradual than infection due to bacteria.  
- Several species of parasites (ie, *Toxoplasma*, *Toxocara*, *Onchocerca*, etc) and viruses (CMV, Herpes simplex, measles) may also infect a variety of orbital structures, and are discussed elsewhere in this module.

Panophthalmitis involves all ocular tissue layers, including the episclera.  
- Pain on eye movement is prominent.

Orbital cellulitis is an acute infection of the orbital contents.  
- Infection can easily spread to the cavernous sinuses.  
- The most common sources for infection are the paranasal sinuses (most commonly ethmoid in children).  
- Fever, lid edema, orbital pain, proptosis and limited motion of the globe are important symptoms.

Keratitis can be caused by viruses (Herpes simplex, zoster, smallpox), bacteria, fungi, protozoa (*Acanthamoeba*) or helminths (*Onchocerca volvulus*).  
- Microbial keratitis complicating orthokeratology is mainly caused by *P. aeruginosa* or *Acanthamoeba*.

This disease is endemic or potentially endemic to all countries.

References

**Orf**

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - DNA. Poxviridae, Parapoxvirus: Orf virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Sheep, Goat, Reindeer, Musk ox</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Contact, Infected secretions, Fomite, Cat-scratch (rare)</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>3d - 6d (range 2d - 7d)</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Skin pustule or ulcer following contact with sheep or goats; most lesions limited to finger or hand; heals without scarring within 6 weeks.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Contagious ecthyma, Contagious pustular dermatitis, Ecthyma contagiosum, Ovine pustular dermatitis, Scabby mouth.</td>
</tr>
<tr>
<td></td>
<td>ICD9: 078.89</td>
</tr>
<tr>
<td></td>
<td>ICD10: B08.0</td>
</tr>
</tbody>
</table>

**Clinical**

Human infection is milder than that of sheep, and usually limited to indolent vesicles and pustules on the hands.  

- Pustules may attain a size of 1 to 2 cm, and are often associated with low-grade fever and regional lymphadenitis.
- Lesions heal over a period of 2 to 6 weeks, without scarring.
- Bullous lesions, secondary bacterial infection, disseminated orf, Guillain-Barre syndrome and erythema multiforme have been described in some cases.

**This disease is endemic or potentially endemic to all countries.**

**References**

Ornithosis

Agent: BACTERIUM. Chlamydiaceae, Chlamydiae, Chlamydophila [Chlamydia] psittaci

Reservoir: Parakeet, Parrot, Pigeon, Turkey, Duck, Cat, Sheep, Goat, Cattle, Dog

Vector: None

Vehicle: Bird droppings, Dust, Air, Aerosol from cat [rare]

Incubation Period: 7d - 14d (range 4d - 28d)

Diagnostic Tests: Serology. Culture (available in special laboratories) rarely indicated.

Typical Adult Therapy:
- Doxycycline 100 mg PO BID X 10d.
- Alternatives: Azithromycin 1 g, then 0.5 g daily X 4 days.
- Clarithromycin 0.5 g BID, Erythromycin 500 mg PO QID X 10d. Levofloxacin 750 mg PO X 7 days

Typical Pediatric Therapy:
- Azithromycin 10 mg/kg PO day 1; 5 mg/kg PO days 2 to 5 OR Erythromycin 10 mg/kg QID X 10d.
- Alternative (Age >=8 years): Doxycycline 100 mg PO BID X 10d.

Clinical Hints:
- Headache, myalgia and pneumonia, often with relative bradycardia, hepatomegaly or splenomegaly; onset 1 to 4 weeks following contact with pigeons, psittacine birds or domestic fowl; case-fatality rate without treatment = 20%.

Synonyms: Chlamydophila abortus, Chlamydyphia psittaci, Ornitose, Pepegojsjuka, Parrot fever, Psitacosis, Psittacosis, Psittakose.
- ICD9: 073
- ICD10: A70

Clinical

Onset may be insidious or abrupt, and the illness may subclinical, or take the form of nonspecific fever and malaise, pharyngitis, hepatosplenomegaly, and adenopathy. 1
- Bradycardia and splenomegaly may suggest typhoid at this stage.

A more common presentation consists of atypical pneumonia, with nonproductive cough, fever, headache and pulmonary infiltrates. 2, 3
- Additional findings may include photophobia, tinnitus, ataxia, deafness, anorexia, vomiting, abdominal pain 4, diarrhea, constipation, hemoptysis, epistaxis, arthralgia, and rash (Horder’s spots) reminiscent of the rose spots of typhoid. 5
- Fever, pharyngitis, rales, and hepatomegaly are noted in over 50% of cases.

Complications include pericarditis, myocarditis, and "culture-negative" endocarditis, ARDS 6, overt hepatitis, hemolytic anemia, DIC, reactive arthritis, cranial nerve palsy, cerebellar dysfunction, transverse myelitis, meningitis, encephalitis and seizures, thrombophlebitis, pancreatitis and thyroiditis.
- Subclinical infection by Chlamydyphia psittaci has been implicated in the etiology of chronic polyarthritis. 7
- Rare instances of abortion have been reported.

Chlamydyphia abortus, a related species which affects goats, cattle and sheep, had been associated with rare instances of abortion, stillbirth and even maternal death in humans.

This disease is endemic or potentially endemic to all countries.

References

Osteomyelitis is a self-defined condition characterized by infection of one or more bones. Signs and symptoms vary widely, and reflect associated underlying conditions, infecting species and location of the infection.  

Etiological associations:
- Animal bite: Pasteurella multocida
- Diabetes and vascular insufficiency: Usually mixed infection (Staphylococcus aureus, Staphylococcus epidermidis, Gram-negative bacilli, Anaerobes)
- Hematogenous: Usually single organism (Staphylococcus aureus, Enterobacteriaceae)
- Injecting drug user: staphylococci, Gram-negative bacilli, Candida spp.
- Secondary to contiguous infection: Often mixed infection (Staphylococcus aureus, Gram-negative bacilli)
- Sickle cell anemia: Staphylococcus aureus, Salmonella spp.

This disease is endemic or potentially endemic to all countries.

References
Otitis media

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM OR VIRUS. <em>Haemophilus influenzae</em> &amp; <em>Streptococcus pneumoniae</em> in most acute cases; RSV, Parainfluenza, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>None</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Clinical findings. Culture of middle ear fluid if available.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>If evidence of bacterial infection (severe otalgia &gt;48 hours / fever &gt;39 C): Amoxicillin/clavulanate 1000/62.5 mg BID X 3 days Alternatives: Cefdinir, Cefpodoxime proxtil, Cefprozin, fluoroquinolone</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>If evidence of bacterial infection (severe otalgia &gt;48 hours / fever &gt;39 C): Amoxicillin/clavulanate 45/3.2 mg/kg BID X 3 days</td>
</tr>
<tr>
<td>Vaccine</td>
<td>Pneumococcal conjugate vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Acute bacterial otitis media often represents the final stage in a complex of anatomic, allergic or viral disorders of the upper airways; recurrent or resistant infections may require surgical intervention.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Otitis media aguda. ICD9: 382.0 ICD10: H65,H66</td>
</tr>
</tbody>
</table>

Clinical

Signs and symptoms of otitis media consist of local pain and tenderness, with or without fever and signs of sepsis.  

This disease is endemic or potentially endemic to all countries.

References

### Parainfluenza virus infection

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Droplet</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>3d - 8d</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Viral culture (respiratory secretions). Serology. Nucleic acid amplification.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Supportive</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Upper respiratory infection - often croup or laryngitis. The disease is most common during infancy; older children develop a &quot;cold-like&quot; illness; the infection is complicated by pneumonia in 7% to 17% of cases.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Parainfluenza, Sendai. ICD9: 078.89,480.2 ICD10: J12.2</td>
</tr>
</tbody>
</table>

**Clinical**

Clinical forms of Parainfluenza virus infection include "the common cold," otitis media, croup (acute laryngotracheobronchitis) ¹, "flu-like illness" ², bronchiolitis ³ and pneumonia.

**This disease is endemic or potentially endemic to all countries.**

**References**

Parvovirus B19 infection

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - DNA. Parvoviridae, Parvovirinae: Erythrovirus B19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Droplet</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>4d - 14d (range 3d - 21d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Serology. Nucleic acid amplification (testing should be reserved for the rare instance of complicated infection).</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Erythema infectiosum (erythema of cheeks; lacelike or morbilliform rash on extremities); febrile polyarthralgia, or bone marrow aplasia/hypoplasia may be present.</td>
</tr>
</tbody>
</table>

Clinical

**Acute infection:**
Erythema infectiosum is a mild childhood illness characterized by a facial rash ("slapped cheek" appearance), and a reticulated or lacelike rash on the trunk and extremities. 1 2

- Papular-purpuric gloves-and-socks syndrome 3, or localized and generalized petechial rashes may occur in some cases. 4-9
- Reappearance of the rash may occur for several weeks following nonspecific stimuli such as change in temperature, sunlight, and emotional stress.
- The patient is otherwise well at rash onset but often gives a history of a systemic prodrome lasting 1 to 4 days.
- In some outbreaks, pruritis has been a common clinical feature. 10
- Rubella-like, morbilliform 11, vesicular and purpuric 12 rashes have also been reported.
- Asymptomatic infection has been reported in approximately 20% of children and adults.
- Rare instances of hepatosplenomegaly 13 and heart failure have been reported. 14
- Co-infection with parvovirus and other hepatitis viruses may result in fulminant hepatic failure 15

**Joint manifestations:**
In some outbreaks, arthralgias and arthritis have been commonly reported. 16

- Infection may produce a symmetrical peripheral polyarthropathy.
- The hands are most frequently affected, followed by the knees and wrists.
- Symptoms are usually self-limited but may persist for several months.
- Joint symptoms, more common in adults, are encountered in approximately 20% of cases 17 and may occur as the sole manifestation of infection.

Instances of seizure 18, coma, encephalitic ataxia or chorea 19-22, meningoencephalitis 23, autonomic or sensory neuropathy 24, cranial nerve palsy 25, acute transverse myelitis 26, myocarditis 27, 28, severe endothelialitis (Degos-like syndrome) 29, myositis 30, hepatitis (acute, fulminant, chronic, cholestatic) have been reported. 31-35

- Sequelae remain in 22% of patients with neurological involvement 36
- A distinct form of Parvovirus infection known as "papular-purpuric gloves and socks syndrome" is characterized by fever and edematous rash, often associated with conjunctivitis and arthritis 37, 38
- Additional complications may include glomerulonephritis 39, 40, inflammatory cardiomyopathy 41, Melkersson-Rosenthal syndrome and hemophagocytic lymphohistiocytosis 42, 43
- Hepatic dysfunction may be present in some cases. 44

**Parvovirus B19 infection and hematological disease:**
Parvovirus B19 is the primary etiologic agent causing Transient Aplastic Crisis (TAC) in patients with chronic hemolytic
anemias (e.g., sickle cell disease, hemoglobin SC disease, hereditary spherocytosis, alpha-thalassemia, and autoimmune hemolytic anemia) and occasionally causes anemia due to blood loss. 45

- Patients with TAC typically present with pallor, weakness, and lethargy and may report a nonspecific prodromal illness during the preceding 1 to 7 days.
- Few patients with TAC report a rash.
- In the acute phase, patients usually have a moderate to severe anemia with absence of reticulocytes; and bone marrow examination shows a hypoplastic or aplastic erythroid series with a normal myeloid series.
- Recovery is indicated by a return of reticulocytes in the peripheral smear approximately 7 to 10 days after their disappearance.
- TAC may require transfusion and hospitalization and can be fatal if not treated promptly.

A false positive serological reaction toward Epstein-Barr virus has been reported in Parvovirus B19 infection. 46

A Parvovirus B19-related severe chronic anemia associated with red cell aplasia has been described in transplant recipients 47, patients on maintenance chemotherapy for acute lymphocytic leukemia, patients with congenital immunodeficiencies, and patients with human immunodeficiency virus (HIV)-related immunodeficiency. 48

Infection of the intestinal mucosa may produce symptoms of inflammatory bowel disease. 49

**Intrapartum infections:**

Intrauterine infections can lead to specific or permanent organ defects in the fetus (e.g. heart anomalies, eye diseases, micrognathy, chronic anemia, myocarditis, hepatitis, meconium peritonitis and central nervous system anomalies). 50-52

- Thrombocytopenia is reported in 46% of cases. 53
- Rare cases of transient neonatal leukoerythroblastosis have been reported. 54
- In most reported B19 infections occurring during pregnancy, the fetus has not been adversely affected; however, in some cases B19 infection has been associated with fetal death. 55-57
- The risk of fetal death attributable to maternal parvovirus infection is estimated at less than 10%.
- Fetal death most commonly occurs from the 10th through the 20th weeks of pregnancy.
- Although maternal infection appears to be common in late pregnancy, hydrops is relatively rare. 58

A related member of the family Parvovirinae, Human Bocavirus, is discussed under "Respiratory viruses • miscellaneous"

This disease is endemic or potentially endemic to all countries.

**References**

39. PMID 19735054.
**Pediculosis**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agent</strong></td>
<td>PARASITE - Insecta. Anoplura: Pediculus humanus, Phthirus pubis.</td>
</tr>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>Louse</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Contact</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>7d</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Identification of adults and &quot;nits.&quot;</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Permethrin 1%; or malthion 0.5%; or lindane OR Ivermectin 200 mcg/kg PO</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>Permethrin 1%; or malthion 0.5%; or lindane OR Ivermectin 200 mcg/kg PO (&gt; 15 kg body weight)</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Pruritus in the setting of poor personal hygiene; adults or nits may be visible; note that the body louse (<em>Pediculus humanus</em> var. corporis; not the head louse) transmits diseases such as epidemic typhus, trench fever and relapsing fever.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Crab louse, Lausebefall, Pediculose, Pediculus capitus, Pediculus corporis, Pedikulose, Phthirus pubis, Pidocci. ICD9: 132 ICD10: B85</td>
</tr>
</tbody>
</table>

**Clinical**

Most louse infestations are asymptomatic, with only 15% to 36% of patients complaining of pruritis.
- The principal clinical finding consists of presence of the lice themselves, and their eggs (*"nits".* ¹ ²

**This disease is endemic or potentially endemic to all countries.**

**References**

# Pentastomiasis - Linguatula

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>PARASITE - Pentastomid worm. Linguatula serrata</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Herbivore</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Meat (liver or lymph nodes of sheep/goat)</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Identification of larvae in nasal discharge.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>No specific therapy available</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Pharyngeal or otic itching, cough, rhinitis or nasopharyngitis which follows ingestion of undercooked liver.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Linguatula, Marrara syndrome. ICD9: 128.8 ICD10: B83.8</td>
</tr>
</tbody>
</table>

## Clinical

Infestation ("halzoun" or "marrara syndrome") is associated with pain and itching in the throat or ear, lacrimation, cough, hemoptysis, rhinorrhea or hoarseness. ¹ ² ³ (Halzoun is also associated with infection by *Dicrocoelium dendriticum*) ³ • Complications include respiratory obstruction, epistaxis, facial paralysis or involvement of the eye.

*This disease is endemic or potentially endemic to 184 countries.*

## References

Pericarditis - bacterial

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Streptococcus pneumoniae, Staphylococcus aureus</em>, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Ultrasonography and cardiac imaging techniques. Culture of pericardial fluid (include mycobacterial culture).</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Antimicrobial agent(s) appropriate to known or anticipated pathogen. Drainage as indicated</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Fever, chest pain and dyspnea; patients are acutely ill and have overt signs such as venous distention, and an enlarged cardiac &quot;shadow&quot;; concurrent pneumonia or upper respiratory infection may be present; case-fatality rate = 20%.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Bacterial pericarditis, Pericardite. ICD9: 074.23,074.2,115.03,420 ICD10: I30</td>
</tr>
</tbody>
</table>

Clinical

Viral pericarditis often follows a prodrome of upper respiratory infection.
- Typical findings include fever and chest pain.¹ ²
- The pain may be pleuritic or positional (ie, exacerbated by bending forward) and associated with signs and symptoms of congestive heart failure.
- Concurrent myocarditis, pneumonia or pleuritis are often present.

This disease is endemic or potentially endemic to all countries.

References

Perinephric abscess

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM OR FUNGUS. Escherichia coli, other facultative gram negative bacilli, Candida albicans, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>None</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Urine and blood culture. Renal imaging (CT, etc).</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Antimicrobial agent(s) appropriate to known or anticipated pathogen. Surgery as indicated</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Unexplained fever, leukocytosis and flank pain; patients are typically over age 50, often diabetic; consider in the patient with nonresponsive &quot;pyelonephritis&quot; or a renal mass (by examination or x-ray).</td>
</tr>
<tr>
<td>Synonyms</td>
<td></td>
</tr>
</tbody>
</table>

Clinical

Symptoms may be overt or subtle, and limited to unexplained fever; indeed, 33% of such lesions are first diagnosed at autopsy.

- Typical patients are female and over the age of 50. 1-3
- Diabetes and evidence for preceding or current urinary tract infection or bacteremia (including endocarditis) may be present.

This disease is endemic or potentially endemic to all countries.

References

**Perirectal abscess**

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. Various (often mixed anaerobic and aerobic flora)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Endogenous</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>Variable</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Culture of drainage material.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Surgical drainage and antibiotics effective against fecal flora</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Anal or perianal pain with fever and a tender mass suggest this diagnosis; granulocytopenic patients commonly develop small, soft and less overt abscesses - often due to <em>Pseudomonas aeruginosa</em>.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Clinical**

Perirectal abscess is a self-defined illness usually associated with overt local pain, swelling, tenderness and fluctuance.  
- Abscesses in neutropenic patients are often more subtle, and may present as unexplained fever without marked local findings.

**This disease is endemic or potentially endemic to all countries.**

**References**

### Peritonitis - bacterial

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. Various (often mixed anaerobic and aerobic flora)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Endogenous</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>Variable</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Culture of blood and peritoneal fluid. Peritoneal fluid cell count may also be useful.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Antimicrobial agent(s) appropriate to known or anticipated pathogens. Surgery as indicated</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Abdominal pain and tenderness, vomiting, absent bowel sounds, guarding and rebound; diarrhea may be present in children; search for cause: visceral infection or perforation, trauma, underlying cirrhosis (spontaneous peritonitis) etc.</td>
</tr>
</tbody>
</table>
| **Synonyms**       | Acute peritonitis, Bacterial peritonitis, Peritonite.  
ICD9: 567  
ICD10: K65 |

### Clinical

Bacterial peritonitis following trauma, infection or perforation of an abdominal viscus is usually overt clinically.  

The features of spontaneous bacterial peritonitis are somewhat more subtle, and should be suspected when unexplained deterioration occurs in a patient with ascites or chronic liver disease.  
- As many as 30% of patients are asymptomatic, and the remainder present with fever, chills, abdominal pain, diarrhea, increasing ascites, encephalopathy or renal dysfunction.  
- Abdominal tenderness, guarding and hypotension may be present.  
- Bacteremia is a poor prognostic factor in these patients.

**This disease is endemic or potentially endemic to all countries.**

### References

**Pertussis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Bordetella pertussis: An aerobic gram-negative coccobacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Air: Infected secretions</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>7d - 10d (range 5d - 21d)</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Respiratory precautions. <strong>Azithromycin</strong> 500 mg po X 1, then 250 mg daily X 4 days OR <strong>Clarithromycin</strong> 500 mg po BID X 7 days OR <strong>Sulfamethoxazole/trimethoprim</strong></td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Respiratory precautions: <strong>Azithromycin</strong> 10mg /kg po daily for 5 days OR <strong>Clarithromycin</strong> 15/mg/kg BID X 7 days OR <strong>Sulfamethoxazole/trimethoprim</strong></td>
</tr>
<tr>
<td>Vaccines</td>
<td>DTaP vaccine DTP vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Coryza, paroxysmal cough, occasional pneumonia or otitis; lymphocytosis; most often diagnosed in young children; epistaxis and subconjunctival hemorrhage often noted; seizures (below age 2); case-fatality rate = 0.5%.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Bordetella holmesii, Bordetella parapertussis, Bordetella pertussis, Coqueluche, Keuchhusten, Kikhosta, Kikhost, Kinkhoest, Parapertuss, Pertosse, Syndrome coqueluchoidie, Tos convulsa, Tos farina, Tosse convulsa, Tussis convulsa, Whooping cough.</td>
</tr>
<tr>
<td>ICD9:</td>
<td>033</td>
</tr>
<tr>
<td>ICD10:</td>
<td>A37</td>
</tr>
</tbody>
</table>

**Clinical**

**WHO Case definition for surveillance:**

Clinical case definition
A person with a cough lasting at least 2 weeks with at least one of the following:
- paroxysms (i.e. fits) of coughing
- inspiratory whooping.
- post-tussive vomiting (i.e. vomiting immediately after coughing)
- without other apparent cause

Laboratory criteria for diagnosis
- Isolation of **Bordetella pertussis**, or
- Detection of genomic sequences by polymerase chain reaction (PCR)

Case classification
- Suspected: A case that meets the clinical case definition.
- Confirmed: A person with a cough that is laboratory-confirmed.

**Acute illness:**
Following an incubation period of 7 to 10 days (range 6 to 20) the patient develops coryza and cough (the catarrhal stage).
- After one to two weeks, the cough progresses into the paroxysmal stage. 
- Post-tussive vomiting is common, and young children and older infants may exhibit an inspiratory "whoop."
- Among infants younger than six months, apnea is common and the whoop may be absent.
- The paroxysmal stage lasts three to four weeks (range one to six).
- The convalescent stage lasts for two to four weeks.

**Complications:**
Infants are at increased risk of complications from pertussis, while pertussis among adolescents and adults tends to be milder and may be limited to a persistent cough.
- Over 70% of infants younger than 6 months require hospitalization.
- Complications of pertussis can include secondary bacterial pneumonia (the most common cause of death in pertussis), seizures and encephalopathy.
- Other, less serious complications include otitis media and dehydration.
- Severe coughing can lead to pneumothorax, epistaxis, subdural hematomata, acute carotid dissection with stroke, hernia, and rectal prolapse.
• Pertussis in adults is often characterized by unexplained prolonged cough. 10-12
• Pertussis-RSV infection is common. 13
• Rare cases of acute disseminated encephalomyelitis 14 and hemolytic-uremic syndrome have been ascribed to pertussis 15 16
• Human Bocavirus infection may mimic the symptoms of pertussis 17

Parapertussis is caused by Bordetella parapertussis, and shares many of the clinical features of pertussis.  
• 70% of infections are asymptomatic.

This disease is endemic or potentially endemic to all countries.

Pertussis in Haiti

Vaccine Schedule:

BCG - birth, 10, 14 weeks
DTwPHibHep - 6, 10, 14 weeks
MR - 9 months
OPV - birth; 6, 10, 14 weeks
Pneumo conj - from April 2015
Pneumo ps - from January 2015
Rotavirus - from April 2014
Td - 1st contact; +4 weeks; +6 months; +1, +1 years pregnant women

Graph: Haiti. Pertussis - WHO-UNICEF est. vaccine (DTP3 %) coverage - GIDEON

Individual years:
2009 - A survey found that 92.0% of children ages 12 to 23 months had been immunized (DPT-1). 18
Clinical

Signs and symptoms reflect the site of infection:
1. masticator, buccal, canine or parotid spaces
2. submandibular, submaxillary and submandibular spaces (Ludwig's angina)
3. lateral pharyngeal, retropharyngeal or paratracheal spaces
4. peritonsillar tissues (quinsy)
5. jugular vein (post-anginal septicemia = Lemierre's syndrome)

Lemierre's syndrome is a potentially fatal infection caused by Fusobacterium necrophorum.
1. The condition is most common among young healthy persons and typically begins with pharyngotonsillitis which spreads to the parapharyngeal spaces to produce septic phlebitis of the internal jugular vein.
2. Submandibular edema and tenderness along the sternocleidomastoid muscle are noted, usually unilaterally.
3. After one to two weeks, the patient develops multiple metastatic abscesses of the lungs, muscles, bones, joints or rarely, brain.
4. Hyperbilirubinemia and mild disseminated intravascular coagulation may be present.
5. The case-fatality rate is 4% to 33%, even with appropriate antimicrobial therapy.

This disease is endemic or potentially endemic to all countries.

References

Pharyngitis - bacterial

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Most often Streptococcus pyogenes; Str. groups B, C, F and G are occasionally isolated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Droplet Rarely food</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1d - 5d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Throat swab for culture or antigen detection (group A Streptococcus) ASLO titer may not indicate current infection</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Penicillin G or Penicillin V or other antistreptococcal antibiotic to maintain serum level for 10 days</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Purulent pharyngitis and cervical lymphadenopathy usually indicate streptococcal etiology; however, viruses (mononucleosis, enteroviruses) and other bacteria (gonorrhea, diphtheria) should also be considered.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Acute pharyngitis, Bacterial pharyngitis, Mal di gola batterica, Oral thrush, Streptococcal pharyngitis, Tonsillitis - bacterial, Vincent’s angina. ICD9: 034.0,462 ICD10: J02, J03</td>
</tr>
</tbody>
</table>

Clinical

This is a self-defined condition characterized by erythema and pain in the pharynx, often associated with fever, dysphagia and upper respiratory tract infection. 1

This disease is endemic or potentially endemic to all countries.

References

Philophthalmosis

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Platyhelminthes, Trematoda. Philophthalmus gralli, Ph. lucipetus, Ph. lacrimosus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Snail</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Aquatic plants</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown Less than 24 hours in birds</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of excised worm</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Removal of worm</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Conjunctivitis, lacrimation and the finding of an adult worm in the conjunctival sac.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Oriental avian eye fluke, Oriental eye fluke, Philophthalmus. ICD9: 121.8 ICD10: b66.8</td>
</tr>
</tbody>
</table>

Clinical

Philophthalmosis is characterized by conjunctivitis, lacrimation and the finding of an adult worm (length ca. 1 to 3 mm) in the conjunctival sac.

In some cases, infection had persisted for months before extraction of the worm. ¹

This disease is endemic or potentially endemic to all countries.

References

# Pinta

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Treponema carateum</em> A microaerophilic gram-negative spirochete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>? Fly (black fly = Simulium)</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>7d - 21d (range 3d - 60d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>VDRL &amp; FTA (or MHTP) - as in syphilis.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Benzathine Penicillin G 1.2 million units IM as single dose</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Benzathine Penicillin G: Weight &lt;14 kg 300,000u IM Weight 14 to 28kg 600,000u IM Weight &gt;28kg 1.2 million u IM</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Acute, pruritic erythematous papules which evolve to chronic, enlarging dyschromic plaques; a generalized papulosquamous rash may be noted later in the illness; lesions may recur for 10 years in some cases.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Azul, Carate, Empeines, Mal del pinto, Tina. ICD9: 103 ICD10: A67</td>
</tr>
</tbody>
</table>

## Clinical

The primary lesion is usually located on exposed areas of the arms or legs, and is accompanied by painless regional lymphadenopathy. 1 2

- Secondary lesions ("pintids") appear after several months and may disseminate to other areas of the skin. 3 4
- There is no latent stage.
- Late pinta is characterized by skin atrophy and hypopigmentation.

Results of dark field microscopy and serological tests are indistinguishable from those of syphilis.

**This disease is endemic or potentially endemic to 7 countries.**

### References

Pityriasis rosea

<table>
<thead>
<tr>
<th>Agent</th>
<th>UNKNOWN. Human herpesvirus 7 has been implicated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Unknown</td>
</tr>
<tr>
<td>Vector</td>
<td>Unknown</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Unknown</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Clinical features.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive; ultraviolet B exposure is suggested</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>3 to 8 week illness; herald patch followed by crops of salmon-colored macules and papules; pruritus; systemic symptoms rare.</td>
</tr>
<tr>
<td>Synonyms</td>
<td></td>
</tr>
</tbody>
</table>

**Clinical**

Pityriasis rosea is a mild exanthem characterized by oval or round macules or papules which evolve following the appearance of a "herald patch" (80% of cases). 1-5

- Fine desquamation and pruritus are common.
- Rarely, the condition may persist or recur. 6-9
- In Black patients, Pityriasis rosea may present with facial and scalp involvement, post-inflammatory disorders of pigmentation and papular lesions. 10
- Acral lesions 11 or dermal follicles may predominate in some cases. 12
- The disease should be distinguished from secondary syphilis • the latter characterized by prominent lymphadenopathy, lack of pruritus and herald patch, and accompanying fever and systemic signs. 13

This disease is endemic or potentially endemic to all countries.

**References**

7. Singapore Med J 2013 Sep 27;
Plesiomonas infection

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Plesiomonas shigelloides</em> A facultative gram-negative bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Fish Animal Soil Reptile Bird</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Water Food</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1d - 2d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Stool culture - alert laboratory when this organism is suspected. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Stool precautions. <em>Ciprofloxacin</em> 400 mg IV or 750 mg PO, BID Alternatives: <em>Sulfamethoxazole/trimethoprim</em>, Amoxicillin/Clavulanate, Ceftriaxone</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Stool precautions. <em>Sulfamethoxazole/trimethoprim</em>, Amoxicillin/Clavulanate, Ceftriaxone</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Fever, abdominal pain, vomiting and severe diarrhea; symptoms often persist for 2 to 4 weeks; follows ingestion of shellfish or recent travel to developing countries in many cases.</td>
</tr>
<tr>
<td>Synonyms</td>
<td><em>Plesiomonas shigelloides</em>. ICD9: 008.8 ICD10: A04.8</td>
</tr>
</tbody>
</table>

Clinical

The infection is characterized by a self-limited diarrhea, often with blood or mucus in stool. ¹
- Watery diarrhea is most common; however, a cholera-like illness with as many 30 bowel movements per day may occur.
- Associated abdominal pain may mimic that of appendicitis, including enlargement of peritoneal lymph nodes. ²
- Fecal leukocytes are present.
- As many as 30% of cases continue for over four weeks, and symptoms may persist for as long as 3 months.
  *Plesiomonas* has been rarely associated with fatal meningitis and septicemia, ³⁻¹³ proctitis, ¹⁴ cellulitis and dermal abscesses, ¹⁵ pneumonia, ¹⁶ pleural effusion, ¹⁷ osteomyelitis, ¹⁸ cholecystitis, ¹⁹ peritonitis, ²⁰, ²¹ salpingitis, ²² epididymo-orchitis, ²³ pancreatitis, ²⁴ splenic abscess, ²⁵ keratitis, ²⁶ and endophthalmitis. ²⁷
- 21 cases of *Plesiomonas* septicemia had been reported as of 1996. ²⁸

This disease is endemic or potentially endemic to all countries.

References


Pleurodynia is characterized by a prodrome of upper respiratory tract infection, followed by abrupt onset of pleuritic chest pain.

- The pain may be severe and lead to a misdiagnosis of myocardial infarction.
- Some patients present with abdominal pain suggestive of peritonitis.
- Important diagnostic features include appearance of cases in clusters (often in late summer to autumn) and lack of leucocytosis or other findings suggestive of pneumonia or peritonitis.

This disease is endemic or potentially endemic to all countries.

References

# Pneumocystis pneumonia

<table>
<thead>
<tr>
<th>Agent</th>
<th>FUNGUS. Ascomycota ?, Archiascomycetes, Pneumocystidales: Pneumocystis jiroveci (now separate from Pneumocystis carinii)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>? Air</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>4d - 8w</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of organisms in induced sputum, bronchial washings, tissue. Serology. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Therapy: Sulfamethoxazole/trimethoprim 25 mg/5 mg/kg QID X 14d. OR Pentamidine 4 mg/kg/d X 14d. OR Dapsone + Trimethoprim. OR Atovaquone OR Primaquine + Clindamycin Prophylaxis - similar, but at altered dosage. Dapsone also used.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Therapy: Sulfamethoxazole/trimethoprim 25 mg/5 mg/kg QID X 14d. OR Pentamidine 4 mg/kg/d X 14d. OR Dapsone + Trimethoprim. OR Atovaquone OR Primaquine + Clindamycin Prophylaxis - similar, but at altered dosage.</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Dyspnea, hypoxia and interstitial pneumonia; usually encountered in the setting of severe immune suppression (AIDS, leukemia, etc); roentgenographic findings (typically bilateral alveolar pattern) may follow symptoms only after several days.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>PCP, Pneumocystis carinii, Pneumocystis jiroveci. ICD9: 136.3 ICD10: B59</td>
</tr>
</tbody>
</table>

## Clinical

*P. jiroveci* infection often presents as a self-limiting upper respiratory tract infection in infants, predominantly in the age group 1.5 to 4 months of age.

The major presenting symptoms are shortness of breath, fever, and a nonproductive cough. ¹
- Sputum production, hemoptysis and chest pain are rarely encountered. ²
- Tachypnea and tachycardia are usually prominent
- Children may demonstrate cyanosis, flaring of the nasal alae, and intercostal retractions.

Lung auscultation is usually not helpful, with rales present in only 1/3 of adults with this disease.
- The x-ray usually shows bilateral diffuse infiltrates extending from the perihilar region. ³
- Other findings can unilateral infiltrates, nodules, cavities, pneumatoceles, hilar lymphadenopathy and pleural effusion.
- Patients receiving aerosolized pentamidine as prophylaxis have an increased incidence of apical infiltrates and pneumothorax.
- Impaired oxygenation is common.

Extrapulmonary infection by *P. jiroveci* may occur in as many as 3% of infected patients and is reported as an unexpected finding at autopsy.
- The main sites of involvement are lymph nodes, spleen, liver, bone marrow, gastrointestinal tract, eyes ⁴, thyroid, adrenal glands, and kidneys.
- The clinical correlate of these findings is rapidly progressive multisystem disease, an enlarging thyroid mass, pancytopenia, retinal infiltrates, pleural effusion, splenic lesions, and calcifications in the spleen, liver, adrenal, or kidney.
- Rare instances of intestinal pseudotumor ⁵ and cutaneous infection have been reported. ⁶

This disease is endemic or potentially endemic to all countries.

## References

# Pneumonia - bacterial

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Streptococcus pneumoniae</em>, Klebsiella pneumoniae ssp pneumoniae, other aerobic and facultative gram negative bacilli, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Droplet Endogenous infection</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1d - 3d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture of sputum, blood. Analyze (&quot;grade&quot;) sputum cytology to assess significance of culture.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Antimicrobial agent(s) appropriate to known or suspected pathogen</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Vaccine</td>
<td>Pneumococcal vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Rigors (&quot;shaking chills&quot;), pleuritic pain, hemoptysis, lobar infiltrate and leukocytosis; empyema and lung abscess suggest etiology other than pneumococcus; foul sputum with mixed flora may herald anaerobic (aspiration) pneumonia.</td>
</tr>
</tbody>
</table>

## Clinical

The designation "Pneumonia ● bacterial" in this module is generic, and includes a large variety of etiological agents and anatomical presentations (ie, empyema, lung abscess, lobar● vs. broncho-pneumonia, etc.)

- The clinical features of bacterial pneumonia are largely determined by the infecting species and clinical setting. 1-4
- All forms are characterized by fever, chest pain, productive cough, and physical or roentgenographic evidence for pulmonary consolidation.

### Etiological associations:
- AIDS: *Pneumocystis jiroveci*, Mycobacteria (non-tuberculous), Tuberculosis, Nocardiosis, Cryptococcus, Cytomegalovirus
- Animal contact: Q-fever, Ornithosis
- Aspiration: Oral Anaerobes; if nosocomial, Enterobacteriaceae, *Acinetobacter, Pseudomonas*
- Cystic fibrosis (Fibrocystic disease) ● *Burkholderia cepacia*
- Drowning ("near-drowning"): *Pseudoallescheria boydii*
- Endocarditis: *Staphylococcus aureus*
- Immunosuppression: Aspergillosis, Cryptococcosis, Nocardiosis, *Pneumocystis jiroveci*, Cytomegalovirus
- Infant: see Respiratory syncytiatal virus, Parainfluenza virus, Respiratory viruses ● misc.
- Influenza: Influenza virus, *Streptococcus pneumoniae, Staphylococcus aureus*
- Myeloma: *Streptococcus pneumoniae*
- Nosocomial pneumonia: Enterobacteriaceae, *Acinetobacter, Pseudomonas, Staphylococcus aureus*
- Pulmonary alveolar proteinosis: *Nocardia*
- Traveler or tourist: Histoplasmosis, Legionellosis, Melioidosis

## This disease is endemic or potentially endemic to all countries.

### References

## Poliomyelitis and acute flaccid paralysis

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>VIRUS - RNA. Picornaviridae, Picomavirus: Polio virus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Fecal-oral  Dairy products  Food  Water  Fly</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>7d - 14d (range 3d - 35d)</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Viral culture (pharynx, stool). Serology. Nucleic acid amplification.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Stool precautions; supportive</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Vaccines</strong></td>
<td>Poliomyelitis - injectable vaccine  Poliomyelitis - oral vaccine</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Sore throat, headache, vomiting and myalgia followed by flaccid paralysis; meningeal involvement in 1% of cases - paralysis in only 0.1%. paralysis tends to be more extensive in adult patients.</td>
</tr>
</tbody>
</table>
| **Synonyms** | Acute flaccid paralysis, Heine-Medin disease, Infantile paralysis, Kinderlahmung, Kinderverlamming, Paralisi infantile, Paralisis flaccida, Paralisis flacida aguda, PFA (Paralisis Flacidas Agudas), Polio, Poliomyelitis, Poliomyelitt.  
ICD9: 045  
ICD10: A80 |

**Clinical**

**CDC (The United States Centers for Disease Control) case definition for surveillance:**

For surveillance purposes, the CDC (The United States Centers for Disease Control) case definition of paralytic poliomyelitis requires, "Acute onset of a flaccid paralysis of one or more limbs with decreased or absent tendon reflexes in the affected limbs, without other apparent cause, and without sensory or cognitive loss."

- A "confirmed case" requires persistence of the neurological deficit 60 days after onset of initial symptoms, fatal illness or unknown follow-up status.

The WHO Case definition for surveillance includes any child under fifteen years of age with acute, flaccid paralysis or any person with paralytic illness at any age when poliomyelitis is suspected.

Poliomyelitis is typically a late summer illness in temperate climates, and often begins as a mild upper respiratory tract infection.

- In some cases, the disease follows vaccination (live vaccine) or recent contact with a vaccinee.
- Patients have been known to excrete virus for as long as ten years following an episode of poliomyelitis.
- Antecedent injection in a given site may precipitate paralytic poliomyelitis in the same limb.

90% to 95% of poliomyelitis infections are asymptomatic.

- Symptoms include fever, sore throat, headache, vomiting and still neck.
- Paralysis is typically asymmetrical, and most often involves the lower extremities.
- Bulbar paralysis or encephalitis may occur in patients in the absence of limb paralysis.
- 4% to 8% experience minor symptoms, and 1% to 2% develop paralysis.
- Paralysis is most common in the very young and very old, following minor blunt trauma to a limb, and among persons who had undergone tonsillectomy.
- The case/fatality rate for paralytic poliomyelitis in 2% to 10%.

**This disease is endemic or potentially endemic to 88 countries.** Although Poliomyelitis and acute flaccid paralysis is not endemic to Haiti, imported, expatriate or other presentations of the disease have been associated with this country.
Poliomyelitis and acute flaccid paralysis in Haiti

**Vaccine Schedule:**

- BCG - birth, 10, 14 weeks
- DTwPHibHep - 6, 10, 14 weeks
- MR - 9 months
- OPV - birth; 6, 10, 14 weeks
- Pneumo conj - from April 2015
- Pneumo ps - from January 2015
- Rotavirus - from April 2014
- Td - 1st contact; +4 weeks; +6 months; +1, +1 years pregnant women

---

**Graph:** Haiti. Poliomyelitis - WHO-UNICEF est. % vaccine (POL3) coverage - GIDEON

Individual years:
2009 - A survey found that 93.4% of children ages 12 to 23 months had been immunized. ¹⁰
Notes:
1. The last case of wild viral infection was reported in 1989, and natural disease was declared eradicated as of 1991.
Notable outbreaks:
2000 - An outbreak (23 suspected cases) of vaccine-related poliomyelitis was reported on Hispaniola, including 8 cases in Haiti (Nan Citron town). Sabin virus type 1 was implicated as the causative agent. 11-22

Graph: Haiti. AFP, rate per 100,000 below age 15

References
22. ProMED <promedmail.org> archive: 20020331.3848
Protothecosis and chlorellosis

Agent
ALGA. *Prototheca wickerhamii*; rarely *Pr. zopfii, Pr. cutis* Achloric algae *Chlorella* spp. contain chloroplasts

Reservoir
A rare animal pathogen (cat, dog, cattle). *Chlorella* spp. are reported to infect domestic and wild mammals.

Vector
None

Vehicle
Water Sewage Food Local trauma

Incubation Period
Unknown

Diagnostic Tests
Culture on fungal media. Biopsy. Nucleic acid amplification.

Typical Adult Therapy
Surgical excision. There are anecdotal reports of successful therapy with *Amphotericin B*, *Ketoconazole* and *Itraconazole* (latter 200 mg/day X 2 months) or *voriconazole*

Typical Pediatric Therapy
As for adult (*Itraconazole* 2 mg/kg/day X 2 months)

Clinical Hints
May follow immune suppression or skin trauma; dermal papules, plaques, eczematoid or ulcerated lesions; olecranon bursitis; systemic infection also reported.

Synonyms
Chlorellosis, Prototheca, Protothecosis.

ICD9: 136.8
ICD10: B99

Clinical

Four forms of disease are reported:
- cutaneous infection
- olecranon bursitis
- disseminated
- onychomycosis

The incubation period of protothecosis is unknown; however, infections which have followed trauma have appeared after approximately two weeks.

- Most cases presented as a single painless, slowly progressive, well-circumscribed plaque or papulonodular skin lesion that may become eczematoid or ulcerated
- Soft tissue lesions favor the olecranon bursa; sites of minor trauma or corticosteroid injection; or surgical wounds which have been exposed to soil or water
- Lesions enlarge gradually over weeks to months, with no tendency for healing
- Other presentations have included tenosynovitis; algemia complicating immune-suppression; nasopharyngeal ulcerated lesion followed prolonged intubation, and infection of ambulatory peritoneal catheters.
- Skin lesions in HIV-infected patients are similar to those of healthy patients
- Peritonitis due to *P. wickerhamii* has been reported in peritoneal dialysis patients.
- A case of subacute endocarditis due to *Prototheca wickerhamii* has been reported.

Rare cases of *Chlorella* wound infection have been reported.

This disease is endemic or potentially endemic to all countries.

References
### Pseudocowpox

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - DNA. Poxviridae, Parapoxvirus: Pseudocowpox virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Cattle</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>5d - 14d</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Umbilicated nodule on the hand following contact with cattle; mild regional lymphadenopathy.</td>
</tr>
</tbody>
</table>
| Synonyms           | Bovine papular stomatitis, Farmyard pox, Milker’s nodule, Noduli mulgentinum, Sealpox.  
ICD9: 051.1  
ICD10: B08.0 |

### Clinical

Pseudocowpox is mild and self-limited and characterized by a red-to-blue dermal nodule associated with minimal lymphadenopathy. ¹

This disease is endemic or potentially endemic to all countries.

### References

**Clinical**

**Impetigo** is characterized by multiple superficial lesions caused by group A-hemolytic streptococci and/or *Staphylococcus aureus*.

- The lesions consist of pustules that rupture and form a characteristic honey-colored crust.
- Lesions caused by staphylococci are associated with tense, clear bullae (bullous impetigo).
- Ecthyma is a variant of impetigo that usually presents as punched-out ulcers on the lower extremities.
- Streptococcal impetigo is most common among children 2 to 5 years of age, and epidemics may occur in settings of poor hygiene, lower socioeconomic status or tropical climates.
- The most important complication of impetigo is poststreptococcal glomerulonephritis.

**Folliculitis** is most often caused by *Staphylococcus aureus*.

- Blockage of sebaceous glands may result in sebaceous cysts, which may present as extensive abscesses or become secondarily infected.
- Infection of specialized sweat glands (hidradenitis suppurativa) occur in the axillae.
- Chronic folliculitis is a hallmark of acne vulgaris, in which normal flora (e.g., *Propionibacterium acnes*) may play a role.
- Diffuse folliculitis may herald infection by *Pseudomonas aeruginosa* or *Aeromonas hydrophila*, in waters that are insufficiently chlorinated and maintained at temperatures above 37°C. Although such infection is usually self-limited, bacteremia and septic shock have been reported.

**Erysipelas** is caused by *Streptococcus pyogenes* and is characterized by abrupt onset of "fiery-red" superficial swelling of the face or extremities.

- The lesion is typically recognized by the presence of well-defined indurated margins, particularly along the nasolabial fold; rapid progression; and intense pain.
- Flaccid bullae may develop on the second or third day of illness; but extension to deeper soft tissues is rare.
- Desquamation occurs between the fifth and tenth days of illness.

**Cellulitis** is characterized by local pain, erythema, swelling, and heat.

- Cellulitis may be caused by any of a wide variety of bacteria or yeasts; however, *S. aureus* or *S. pyogenes* are most often implicated.
- A history of preceding trauma, insect bite, needle insertion or surgery is often present.
- Cultures of biopsy specimens or aspirates are positive in only 20% of cases.
- Infection by *S. aureus* often spreads out from a localized infection (abscess, folliculitis) or foreign body.
- Streptococcal cellulitis tends to be more diffuse and rapid in onset, and associated with lymphangitis and fever.
- Streptococci also cause recurrent cellulitis in the setting of lymphedema resulting from elephantiasis or lymph node damage.
- Recurrent staphylococcal cutaneous infections are encountered in patients with "Job's syndrome" (eosinophilia and elevated serum levels of IgE); and nasal carriers of staphylococci.
**Cellulitis associated with animal bites** is commonly caused by *Pasteurella multocida, Staphylococcus intermedius* and *Capnocytophaga canimorsus* (formerly DF-2) and is discussed separately in this module under "Animal-bite infections"

- Human bites contain a variety of anaerobic organisms (*Fusobacterium, Bacteroides*), aerobic and anaerobic streptococci, and *Eikenella corrodens*.
- *Aeromonas hydrophila* causes an aggressive form of cellulitis following minor trauma in marine environments.
- *P. aeruginosa* is the most common cause of ecthyma gangrenosum and infection following penetrating injuries to the foot.
- Gram-negative bacillary cellulitis, (including *P. aeruginosa* infection) is common among hospitalized, immunocompromised patients.

**This disease is endemic or potentially endemic to all countries.**

**References**

Pyomyositis

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Usually Staphylococcus aureus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Hematogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Ultrasonography or CT scan.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Antibiotic directed at confirmed or suspected pathogen (usually Staphylococcus aureus); drainage</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Pain, swelling and &quot;woody&quot; induration of a large muscle (usually lower limb or trunk) associated with fever and leukocytosis; often follows trauma to the involved region; lymphadenopathy uncommon; leucocytosis in most cases.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Tropical pyomyositis. ICD9: 040.81 ICD10: M60.0</td>
</tr>
</tbody>
</table>

Clinical

The initiating lesion may be overt blunt or penetrating trauma; however, some cases may represent complications of viral or parasitic myositis.  
- An increasing percentage of reported patients have been HIV-positive.  
- 20 to 50% of patients with pyomyositis recall recent blunt trauma or vigorous exercise involving the area of infection; and most infections involve a single muscle or muscle group.  
- Rare cases of pyomyositis have been associated with spinal epidural abscess, Lemierre's syndrome and pyopericardium.  
- The major muscles of the lower extremities and trunk muscles are most often infected; however, virtually any muscle can be involved.

Onset is often subacute with fever, swelling with or without erythema, mild pain and minimal tenderness.  
- The involved area is indurated or has a wooden consistency.  
- 10 to 21 or more days later, the patient complains of fever, with muscle tenderness and swelling.  
- Overlying skin is intact and warm, usually without erythema.  
- There is no regional lymphadenitis.  
- At this point, pus can be aspirated from the involved muscle.  
- Eventually, manifestations of sepsis appear, with local erythema, tenderness and fluctuance.  
- Additional symptoms may reflect compression of contiguous structures.  
- Septicemia, ARDS and rapidly progressive or fatal infections are also encountered.

Leukocytosis is present.  
- Eosinophilia suggests a diagnosis of "tropical myositis" but is thought to represent the presence of concurrent parasitic infection.

The clinical features of pyomyositis may mimic those of leptospirosis.

This disease is endemic or potentially endemic to all countries.

References

### Q-fever

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Coxiella burnetii Intracellular organism related to Rickettsiae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Cattle  Sheep  Goat  Bird  Fish  Rodent  Rabbit  Tick  Bandicoot  Marsupial  Dog  Cat</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Air  Dust  Infected secretions  Dairy products</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>18d - 21d (range 4d - 40d)</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Doxycycline 100 mg BID X 2w OR Fluoroquinolone Add Hydroxychloroquine 600 mg per day if endocarditis</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Age &lt; 8 years: Erythromycin 10 mg/kg QID X 2 weeks Age &gt;= 8 years: Doxycycline 100 mg BID X 2 weeks</td>
</tr>
<tr>
<td>Vaccine</td>
<td>Q fever vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Headache, myalgia, cough and hepatic dysfunction; hepatosplenomegaly, &quot;F.U.O.&quot; and endocarditis encountered; proximity to farming or animals during 2 to 4 weeks preceding illness; most infections resolve in 1 to 2 weeks; case-fatality rate = 1.5%.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Balkan grippe, Coxiella burnetii, Febbre australiana, Febre Q, Nine Mile fever, Q-Fieber, Q-koorts, Query fever, Red River fever. ICD9: 083.0 ICD10: A78</td>
</tr>
</tbody>
</table>

## Clinical

The typical clinical presentation of Q-fever (pneumonia vs. hepatitis) seems to vary from region to region. 1 2

Q-fever is often asymptomatic or mistaken for an acute viral illness.
- Q-fever may be mistaken for Legionnaires’ disease 3
- After an incubation period of 2 to 3 weeks, the patients develops fever, headache, and myalgias. 4
- Cough is present in 25% to 70%, and hepatosplenomegaly in 30% to 50%.
- An evanescent rash may appear in 5% of cases.
- The blood CRP is elevated; however leukocytosis is present in only 20% of cases. 5
- Acute thrombocytosis may also be encountered. 6
- False-positive tests toward a variety of non-related agents and conditions may be encountered: anti-nuclear antibody (ANA), smooth muscle antibody, rheumatoid factor, Epstein-Barr Virus, Cytomegalovirus, Mycoplasma pneumoniae, Parvovirus, Bordetella pertussis, Rickettsia conorii and Rickettsia typhi. 7

The frequency of pneumonitis is highly variable (10% to 60%) 8 9; and clinical and radiological features are non-specific. 10-12
- Neurological complications may include encephalitis 13, brachial plexopathy 14, Guillain-Barre syndrome 15, status epilepticus and pseudotumor cerebri 16
- Several cases of Q-fever uveitis have been reported. 17 In one case, a patient developed anterior uveitis accompanied by exudative bilateral inferior retinal detachment and optic disk edema. 18
- Q-fever during pregnancy increases the risk for fetal death and malformation. 19 20

Occasionally, the illness may be prolonged, with severe pneumonitis 21 22 and hepatic involvement. 23-25
- Independent risk factors for development of chronic Q fever include valvular surgery, vascular prosthesis, aneurysm, renal insufficiency, and older age. 26
- Chronic fatigue is common following Q-fever, and in some cases may actually represent persistent infection. 27-32

Although the acute disease is usually self-limited, Q-fever endocarditis may occasionally develop 3 to 20 years following the acute infection and is often fatal. 33 34
- Over 16% of patients with acute Q fever experience endocarditis, approximately 16% to 37% of patients with Q fever endocarditis will have a history compatible with previous symptomatic acute Q fever infection. 35
Pericarditis 36-39, myocarditis 40, optic neuritis 42, uveitis 43-45, disseminated intravascular coagulation 46, hemophagocytic syndrome 47-49, bleeding phenomena (melena, epistaxis, petechiae) 50, autoimmune hemolytic anemia 51, osteomyelitis 52-54, monarthritis 55-56, prosthetic joint infection 57-58, recurrent subcutaneous abscesses and nodules 59, spontaneous abortion 60, splenic and hepatic abscesses, and cerebral venous thrombosis 62, cholecystitis 63 and tubulointerstitial nephritis 64 have been reported as complications of Q-fever. 65-67

• Over 80% of patients with Q-fever endocarditis have a history of underlying valvular disease.

• Vascular complications of Q-fever include aortitis 68, aneurysm rupture, aorto-enteric fistulae 69 and lower-limb embolisation. 70-71

• Q fever may mimic Kawasaki disease 72, lupus erythematosus 73 or Crimean-Congo hemorrhagic fever. 74

This disease is endemic or potentially endemic to all countries.

References

### Rabies

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA. Rhabdoviridae, Mononegavirales, Lyssavirus: Rabies virus. Other human Lyssaviruses = Mokola, Duvenhage, European Bat (EBL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Dog Fox Skunk Jackal Wolf Cat Raccoon Mongoose Bat Rarely rodent or Rabbit</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Saliva Bite Transplants Air (bat aerosol)</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1m - 3m (range 4d to 19 years)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Viral culture &amp; direct immunofluorescence of saliva, CSF, corneal smears. Serology. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Strict isolation; supportive. The Milwaukee protocol (prolonged deep sedation and support) has been successful in some cases. See Vaccines module for pre- and post-exposure schedules</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Vaccines</td>
<td>Rabies vaccine Rabies immune globulin</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Follows animal bite (rarely lick) - often after months: agitation, confusion, seizures, painful spasms of respiratory muscles, progressive paralysis, coma and death; case-fatality rate &gt; 99%.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Aravan, Australian bat lyssavirus, Ballina, BBLV, Bokeloh bat lyssavirus, Duvenhage, EBL, European bat Lyssavirus, Hondsdoelheid, Hydrophobia, Ikoma lyssavirus, Irkut, Khujand, Lyssa, Mokola, Pteropus lyssavirus, Rabia, Rage, Raiva, Saint Hubert's disease, Shimoni bat virus, Tollwut, West Caucasian bat, Wutkranke</td>
</tr>
</tbody>
</table>

### Clinical

**WHO Case definition for surveillance:**
- An acute neurological syndrome (encephalitis) dominated by forms of hyperactivity (furious rabies) or paralytic syndromes (dumb rabies) that progresses towards coma and death, usually by respiratory failure, within 7 to 10 days after the first symptom if no intensive care is instituted.
- Bites or scratches from a suspected animal can usually be traced back in the patient medical history.
- The incubation period may vary from days to years but usually falls between 30 and 90 days.

Laboratory criteria for diagnosis
One or more of the following
- Detection of rabies viral antigens by direct fluorescent antibody (FA) in clinical specimens, preferably brain tissue (collected post mortem)
- Detection by FA on skin or corneal smear (collected ante mortem)
- FA positive after inoculation of brain tissue, saliva or CSF in cell culture, in mice or in suckling mice
- Detectable rabies-neutralizing antibody titer in the CSF of an unvaccinated person
- Identification of viral antigens by PCR on fixed tissue collected post mortem or in a clinical specimen (brain tissue or skin, cornea or saliva)
- Isolation of rabies virus from clinical specimens and confirmation of rabies viral antigens by direct fluorescent antibody testing

Case classification
Rabies:
- Suspected: A case that is compatible with the clinical description.
- Probable: A suspected case plus history of contact with suspected rabid animal.
- Confirmed: A suspected case that is laboratory-confirmed.

Rabies exposure:
- Possibly exposed: A person who had close contact (usually a bite or scratch) with a rabies-susceptible animal in (or originating from) a rabies-infected area.
- Exposed: A person who had a close contact (usually a bite or scratch) with a laboratory-confirmed rabid animal.

**Clinical variants:**
The initial symptoms of rabies are often limited to low grade fever and pain or paresthesia at the site of inoculation.
- Progressive encephalitis then ensues.
- "Furious rabies" is characterized by hyperactivity, fluctuating level of consciousness, aerophobia and hydrophobia.
Rabies in Haiti

Bizarre behavior and lack of focal neurological signs are typical. Hydrophobia may manifest as "jerky" inspiratory spasms progressing to opisthotonus, generalized seizures or cardiorespiratory arrest. Similar reactions may be elicited by fanning the patient ("aerophobia"). Paralytic ("dumb") rabies is characterized by progressive flaccid paralysis, with fasciculation and pain in the affected muscles. Minor sensory disturbances may be present. Such patients may survive for as long as one month, ultimately dying of bulbar and respiratory paralysis. Rare instances of survival have been documented (13 cases as of 2014). In Africa, rabies is often mis-diagnosed as cerebral malaria.

Dog-associated vs. Bat-associated rabies

Bat-associated rabies is more often misdiagnosed than dog-associated rabies, and more likely to lack a bite history. Encephalopathy, hydrophobia, and aerophobia are more common in dog-acquired cases; while abnormal cranial nerve, motor and sensory examinations, tremor, myoclonus, local sensory symptoms, symptoms at the exposure site and local symptoms in the absence of a bite or scratch are more common in bat-acquired cases. Bat-acquired cases are more commonly associated with increased cerebrospinal fluid protein levels.

This disease is endemic or potentially endemic to 151 countries.

Rabies in Haiti

Notes:
1. The average annual incidence for human rabies was 2 (1970 to 1979); 2.4 (1980 to 1984); 2.0 (1985 to 1989); 3 (1990 to 1994).
   Individual years:
   1994 - All from dogs.
   1996 - All from dogs.

182 postexposure treatment courses were administered in 1994, and 85 in 1998.

Exported cases:
1994 - A man died of rabies in the United States following the bite of a rabid animal in Haiti.
2004 - A man died of rabies in the United States following the bite of a rabid dog in Haiti.
2011 - A woman died of rabies in the United States following the bite of a rabid dog in Haiti.
2013 - A traveler from the Netherlands acquired rabies from a dog bite in Haiti.
Graph: Haiti. Rabies, animal

Notes:
1. One rabid bat was reported in 1999; 0 during 2001 to 2007.

Graph: Haiti. Rabies, dog

References
### Rat bite fever - spirillary

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. <em>Spirillum minus</em> An aerobic gram-negative spirochete</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Rat, Mouse, Cat</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Bite</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>7d - 21d (range 5d - 40d)</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Dark-field exam of wound. Animal inoculation.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Amoxicillin/clavulanate 875/125 mg PO BID X 7d. OR Procaine Penicillin G 600,000u IM q12h X 7d. OR Doxycycline 200 mg BID X 7d</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>Amoxicillin/clavulanate 10 mg/kg PO BID X 7d OR Procaine Penicillin G 25,000u/kg IM q12h X 7d</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Lymphadenopathy, myalgia, maculopapular rash and recurrent fever beginning 1 to 3 weeks after rat bite; infection resolves after 3 to 6 days; case-fatality rate = 6%.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Sodoku, Spirillosis, Spirillum minor, Spirillum minus. ICD9: 026.0 ICD10: A25.0</td>
</tr>
</tbody>
</table>

#### Clinical

Most patients present with a recent rat bite wound, which may later form an ulcer with local swelling, pain and skin changes.
- Regional lymphatics and lymph nodes are enlarged and tender.
- Fever rises to as high as 40°C, with accompanying rigors.
- After 3 days, fever ends in "crisis," followed by a quiescent interval of 5 to 10 days.
- One or more relapses follow, and are associated with a purple papular exanthem on the chest and arms.
- Additional findings include generalized hyperreflexia, arthralgia, myalgia and hyperesthesia.
- The fatality rate without treatment is 10%.

Features which may distinguish spirillary [S] from streptobacillary [B] rat bite fever include the following:

<table>
<thead>
<tr>
<th>Incubation</th>
<th>S up to 30 days</th>
<th>B up to 10 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bite wound</td>
<td>S may produce a chancre</td>
<td>B heals promptly</td>
</tr>
<tr>
<td>Relapses</td>
<td>S regular</td>
<td>B intermittent</td>
</tr>
<tr>
<td>Rash</td>
<td>S generalized macular</td>
<td>B macular, pustular or petechial</td>
</tr>
<tr>
<td>Arthritis</td>
<td>S rare</td>
<td>B common</td>
</tr>
</tbody>
</table>

This disease is endemic or potentially endemic to all countries.

#### References

### Rat bite fever - streptobacillary

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Streptobacillus moniliformis</em> A facultative gram-negative bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Rat, Squirrel, Weasel, Turkey</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Infected secretions, Bite, Dairy products</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>3d - 10d (range 1d - 22d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture of blood or joint fluid. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td><em>Amoxicillin/clavulanate</em> 875/125 mg PO BID X 7d. OR <em>Doxycycline</em> 100 mg PO BID X 7d</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td><em>Amoxicillin/clavulanate</em> 10 mg/kg TID X 7d. OR (if age&gt;8 years) <em>Doxycycline</em> 2 mg/kg PO BID X 7 days (maximum 200 mg/day)</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Headache, myalgia, maculopapular rash and arthralgia or arthritis; history of a rat bite during the preceding 1 to 3 weeks in most cases; case-fatality rate = 10%.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Haverhill fever, Streptobacillosis, Streptobacillus moniliformis. ICD9: 026.1 ICD10: A25.1</td>
</tr>
</tbody>
</table>

**Clinical**

Most patients present with a recent rat bite wound, which may later form an ulcer with local swelling, pain and skin changes.

- Symptoms include fever, prostration, marked myalgia and muscle tenderness, headache and a generalized morbilliform rash most marked on the hands and feet.
- Generalized lymphadenopathy is present, and migratory arthropathy is often present.
- Fever resides in 5 to 10 days, but may relapse repeatedly over a period of weeks to months.

One or more relapses follow, and are associated with a purple papular exanthem on the chest and arms.

- Additional findings include generalized hyperreflexia, migratory polyarthralgia (over 50% of cases), myalgia and hyperesthesia.
- Arthritis affects more than one joint in 83.3% of patients, involving the knee in most.
- Rare instances of endocarditis, psoas abscess, epidural abscess and spondylodiscitis have been reported.

The fatality rate without treatment is 10%, and results from endocarditis or multiple visceral abscesses.

Features which may distinguish spirillary [S] from streptobacillary [B] rat bite fever include the following:

- **Incubation**
  - S up to 30 days
  - B up to 10 days
- **Bite wound**
  - S may produce a chancre
  - B heals promptly
- **Relapses**
  - S regular
  - B intermittent
- **Rash**
  - S generalized macular
  - B macular, pustular or petechial
- **Arthritis**
  - S rare
  - B common

This disease is endemic or potentially endemic to all countries.
References

Respiratory syncytial virus infection

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA. Paramyxoviridae, Pneumovirinae: Human respiratory syncytial virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Droplet Infected secretions (hands)</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2d - 8d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Viral culture or DFA (nasal and other respiratory secretions). Serology. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Ribavirin aerosol 20 mg/ml for 12h/d X 3 to 5d [severe infections]. Effectiveness not proven</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Vaccine</td>
<td>RSV immune globulin</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Rhinorrhea, cough, wheezing, bronchiolitis and respiratory distress; encountered primarily in infancy.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Chimpanzee coryza agent, Respiratory syncytial virus, RSV. ICD9: 079.6,480.1 ICD10: B97.4,J12.1</td>
</tr>
</tbody>
</table>

Clinical

RSV infections are manifested as:
- lower respiratory tract disease (pneumonia, bronchiolitis, tracheobronchitis)
- upper respiratory tract illness, often accompanied by fever and otitis media. 1

Asymptomatic infection is rare.
- Pneumonia or bronchiolitis occurs in 30% to 71% of patients (89% among closed populations of infants).
- Croup accounts for only 5% to 10% of cases.
- Wheezing, rhonchi, rales, and pulmonary infiltrates are encountered with bronchiolitis as well as pneumonia. 7
- Bronchiolitis is characterized by wheezing and hyperaeration of the lung.
- RSV infection in adults is usually mild; however severe disease may develop. 8-11

Lower respiratory tract infection is heralded by nasal congestion and often pharyngitis.
- Fever occurs in young children, with temperatures ranging from 38 to 40C.
- Fever is present for 2 to 4 days; however, the extent and duration of the fever does not correlate with the severity of the disease.
- Fever is frequently absent at the time of admission to the hospital.
- Cough is often a predominant sign.
- The cough may be paroxysmal and associated with vomiting, but without the "whoop" typical of pertussis.
- Laryngitis and hoarseness are not common.

Dyspnea, increased respiratory rate, and retractive of the intercostal muscles are common.
- In bronchiolitis, expiration is prolonged, and the respiratory rate may be remarkably elevated. 12
- Intercostal retractions are also prominent in bronchiolitis.
- On auscultation, the infant may have crackles and wheezing, which may be present intermittently and may fluctuate in intensity.
- Cyanosis is rare, despite hypoxemia. In most infants, the duration of illness is 7 to 21 days, and hospitalization, if required, averages 3 to 7 days.
- Thrombocytosis is common among children hospitalized with RSV bronchiolitis. 13
- The severity and / or duration of RSV bronchiolitis is exacerbated by concomitant human metapneumovirus infection. 14-17
- RSV infection accounts for approximately 5% of bronchiolitis obliterans in children (Beijing, 2001 to 2007) 18
- Infection in premature infants may result in long term effects on airway function. 19-21

Otitis media is a common complication of RSV infection in young children. 22-25
- Viral meningitis, encephalopathy / encephalitis and seizures are also encountered. 27-30
- Repeated or secondary infections occurring after the first 3 years of life are most commonly manifested as an upper respiratory tract illness or tracheobronchitis.
• Young adults may present with flu-like illness, pneumonia, chronic cough suggestive of tracheobronchitis or bronchitis, and occasionally with otitis. 31
• Infection among the elderly is often nosocomially acquired, and may result in pneumonia in 5% to 50% of the cases, with a fatal outcome in up to 20%.
• Additional extrapulmonary manifestations of RSV infection have included myocarditis 32, supraventricular tachycardia, ventricular tachycardias, pericarditis 33 34, focal neurological abnormalities, brainstem encephalitis 35, hyponatremia and hepatitis 36 37

Signs and symptoms of Human Metapneumovirus (hMPV) infection are similar to those of Respiratory syncytial virus infection 38-40, and coinfection by these two agents may be particularly severe. 41-45 Children with hMPV infection are likely to be older than those with RSV, and more likely to present with pneumonia and less likely to present with bronchiolitis. 46
• Clinical signs of Rhinovirus infection 47 and of Human Bocavirus infection are also similar to those of Respiratory syncytial virus infection; however, hypoxia, and neutrophilia may be more common in Human Bocavirus infection. 48
• Superinfection of RSV by Staphylococcus aureus 49, Bordetella pertussis 50 and other bacteria is not unusual. 51

This disease is endemic or potentially endemic to all countries.

References

33. Cardiol Young 2013 Apr ;23(2):299-300.
45. ProMED <promedmail.org> archive: 20120223.1050554
Respiratory viruses - miscellaneous

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA and DNA Pneumovirinae: Human Metapneumovirus Coronaviridae: New Haven Coronavirus, HKU1 Parvovirinae: Human Bocavirus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Droplet  Infected secretions (on hands)</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>NA</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>NA</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Rhinorrhea, cough, wheezing, bronchiolitis and respiratory distress; encountered primarily in infancy.</td>
</tr>
</tbody>
</table>

| ICD9 | 079.89 |
| ICD10 | B34.2, J12.8 |

Clinical

For a comprehensive review of newer respiratory viral infections, see 1

**Human Metapneumovirus:**
Signs and symptoms of Human Metapneumovirus (hMPV) infection are similar to those of Respiratory syncytial virus infection 2-4, and coinfection by these two agents may be relatively severe and / or prolonged. 5-10 Children with hMPV infection are likely to be older than those with RSV, and more likely to present with pneumonia and less likely to present with bronchiolitis. 11

- Findings include either lower respiratory tract disease (pneumonia, bronchiolitis, tracheobronchitis) or upper respiratory tract illness, often accompanied by fever and otitis media. 12 13
- Asymptomatic infection is reported. 14 15
- Wheezing, rhonchi, rales, and pulmonary infiltrates are encountered with bronchiolitis, hyperaeration and pneumonia. 16
- Severe and potentially-fatal infections are reported. 17
- Apnea has been reported in newborn infants. 18
- hMPV has been recovered from the middle ear in patients with otitis media. 19 and is associated with 6% of otitis media cases in children. 20
- Central nervous system disease has been reported, ranging from febrile seizures 21 to severe encephalopathy / encephalitis. 22-25
- Reinfection is common. 26-28
- Although infection in adults is usually mild or asymptomatic 29, severe disease is reported in elderly adults with underlying disease. 30-32

**New Haven coronavirus:**
New Haven coronavirus infection is characterized by fever, cough and rhinorrhea. 33 34
- Tachypnea, hypoxia and pulmonary infiltrates may be present.
- The agent has also been identified as a common cause for croup. 35

**Coronavirus infections:**
HKU1 (HCoV-HKU1), a human coronavirus, was isolated in Hong Kong in 2005, from two adult patients with pneumonia. 36
- An additional 6 cases in Hong Kong were characterized by gastroenteritis, fever, otitis and febrile seizures.
- Human Coronavirus OC43 infection is associated with fever, rhinitis, pharyngitis, laryngitis, otitis, bronchitis, bronchiolitis or pneumonia. 37
**Human Bocavirus:**

Human Bocavirus is a common cause of lower respiratory tract infection in children.  
- Bocavirus infections, including cases of severe pneumonia, have also been reported in adults.  
- Patients are often co-infected by Respiratory syncytial virus, Adenovirus, Influenza virus, Human metapneumovirus or other pathogens.  
- Clinical presentation may include fever, cough, rhinorrhea, conjunctivitis, wheezing, respiratory distress, pneumonia or pleural effusion.  
- Rarely, severe and life-threatening infection is encountered.  
- Human Bocavirus infection may mimic the symptoms of pertussis.
- Rare instances of Human Bocavirus myocarditis, spontaneous pneumomediastinum, and encephalitis have been reported.
- Clinical signs are also similar to those of Respiratory syncytial virus infection; however, hypoxia, and neutrophilia may be more common in Human Bocavirus infection.
- Disseminated Bocavirus infection, including diarrhea and viremia, has been reported in a stem cell transplant patient.

**Other viruses:**

Although Rhinovirus infection is usually associated with the common cold, infection may be associated with severe lower respiratory tract infections, and outbreaks of major and even fatal disease have been reported in chronic care facilities.

Melaka virus, a bat-associated Reovirus, has been identified as a cause of fever and acute respiratory tract infection in Malaysia.

Saffold Cardiovirus, a member of the Picornaviridae, has been associated with cases of upper respiratory tract infection in children.

- Human infection by an additional Cardiovirus, Encephalomyocarditis Virus, have been characterized by fever, headache, nausea and dyspnea. (2009 publication) One such patient also experienced weight loss, arthralgia, photophobia, myalgia, chills, vomiting, and abdominal pain.

Sosuga virus (tentative name) infection was reported in a single patient. The illness consisted of fever, malaise, headache, generalized myalgia and arthralgia, neck stiffness, and a sore throat.

**This disease is endemic or potentially endemic to all countries.**

**References**

10. ProMED <promedmail.org> archive: 20120223,105054
35. ProMED <promedmail.org> archive: 20050825,2512
39. ProMED <promedmail.org> archive: 20050824,2494
55. ProMED <promedmail.org> archive: 20070626,2063

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Reye's syndrome

<table>
<thead>
<tr>
<th>Agent</th>
<th>UNKNOWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Unknown</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Unknown</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Clinical diagnosis.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Electrolyte &amp; glucose management, ? enemas, ? dialysis</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Vomiting, lethargy, coma, seizures, hepatomegaly, hypoglycemia and elevated blood ammonia concentration; usually anicteric; follows viral infection; aspirin ingestion is often implicated.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Reye syndrome. ICD9: 331.81 ICD10: G93.7</td>
</tr>
</tbody>
</table>

Clinical

Signs and symptoms of Reye's syndrome include protracted vomiting and encephalopathy, in the absence of fever or jaundice. 1 2

- Hepatomegaly is present in 50% of cases.
- Twelve hours to 3 weeks following an antecedent viral illness, the patient develops vomiting and lethargy, followed by restlessness, irritability, combativeness, disorientation, delirium, tachycardia, hyperventilation, dilated pupils with sluggish response, hyperreflexia, positive Babinski sign, and appropriate response to noxious stimuli.

Diarrhea and hyperventilation are often the first signs in children below age 2 years.

- Later, obtundation, coma and decorticate rigidity are associated with inappropriate response to noxious stimuli.
- Coma deepens, and the patient is found to have fixed and dilated pupils, loss of oculovestibular reflexes and dysconjugate gaze with caloric stimulation.
- Seizures ensue, with flaccid paralysis, absent deep tendon reflexes, lack of pupillary response and respiratory arrest.

Similar disease (Reye-like syndrome) is caused by inborn errors of metabolism, hypoglycemia, hypoketonemia, elevated ammonia, and organic aciduria. 3

- A case of encephalopathy and hepatic failure similar to Reye's syndrome was related to Bacillus cereus food poisoning. 4

This disease is endemic or potentially endemic to all countries.

References

### Rheumatic fever

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Streptococcus pyogenes</em> A facultative gram-positive coccus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Droplet</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1w - 5w</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Clinical diagnosis.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive; salicylates</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Migratory arthritis, fever, carditis, chorea, subcutaneous nodules, erythema marginatum and leukocytosis; follows overt pharyngitis after 1 to 5 weeks in most cases; acute attack persists for approximately 3 months.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Febbre reumatica. ICD9: 390,391 ICD10: I00,I01,I02</td>
</tr>
</tbody>
</table>

### Clinical

**Case definition for surveillance:**

The CDC (The United States Centers for Disease Control) case definition for surveillance requires evidence for preceding group A streptococcal infection (culture, serology) in addition to two major clinical criteria; or one major and two minor criteria, as follows:

**Major clinical criteria:**
- carditis
- polyarthritis
- chorea
- subcutaneous nodules
- erythema marginatum.

**Minor criteria:**
- previous rheumatic fever or rheumatic heart disease
- arthralgia
- fever
- elevation of erythrocyte sedimentation rate [ESR]
- positive C-reactive protein
- leucocytosis
- prolongation of the P-R interval on electrocardiogram.

**This disease is endemic or potentially endemic to all countries.**

### References

Rhinoscleroma and ozena

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Klebsiella pneumoniae ssp ozaenae</em> and <em>Klebsiella pneumoniae ssp rhinoscleromatis</em> Facultative gram-negative bacilli</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Infected secretions Contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture. Biopsy. Nucleic acid amplification. Advise laboratory when this diagnosis is suspected.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Rhinoscleroma: <em>Streptomycin</em>, often with systemic or topical <em>Rifampin</em> - for 3 to 6 weeks; fluoroquinolones also appear to be effective. Ozena: <em>Ciprofloxacin</em> or <em>Sulfamethoxazole/trimethoprim</em> for 3 months</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Rhinorrhea associated with a painless intranasal mass; may extend to sinuses or ears.</td>
</tr>
<tr>
<td>Synonyms</td>
<td><em>Klebsiella pneumoniae ssp ozaenae</em>, Ozena, Rhinoscleroma. ICD9: 040.1 ICD10: J31.0</td>
</tr>
</tbody>
</table>

Clinical

**Rhinoscleroma**
The nose is involved in over 90% of cases of rhinoscleroma.
- Findings include fetid discharge, a crusting granulomatous mass and cicatization.  
  • The pharynx is involved in 15% to 40%, the larynx in 2% to 2%, the tracheobronchial tree in 15%  and the paranasal sinuses in 2% to 25%.  
- Rare instances of laryngeal stenosis resulting from rhinoscleroma are reported.  
- Standard therapy consists of streptomycin in combination with topical or systemic rifampicin, for at least 3 to 6 weeks.  
- Recent studies suggest that fluoroquinolones are also effective.

**Ozena:**
Ozena (primary atrophic rhinitis) is characterized by progressive atrophy of the nasal mucosa and underlying bone.
- Findings include foul-smelling, thick, dry crusts and greatly enlarged nasal cavities.  
- Laryngeal involvement has been reported.  
- Ozena may be associated with tracheobronchopathia osteochondroplastica  
- Rare instances of disseminated systemic infection are reported.  

This disease is endemic or potentially endemic to all countries.

References

# Rhodococcus equi infection

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Rhodococcus equi</em> An aerobic gram-positive coccobacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Farm animal Farm soil</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>? Inhalation Contact Ingestion</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture of blood, body fluids and secretions. Advise laboratory when these organisms are suspected.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Two drugs from the following, administered for two months: Levofloxacin, Rifampin, Azithromycin, Ciprofloxacin, Imipenem, Vancomycin</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Two drugs from the following, administered for two months: Levofloxacin, Rifampin, Azithromycin, Imipenem, Vancomycin</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Most often encountered as pleuropulmonary infection in an immune-suppressed patient; history of contact with farm or farm animals in 40% of cases.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Rhodococcus. ICD9: 027.9 ICD10: A92.8</td>
</tr>
</tbody>
</table>

## Clinical

The clinical features of *Rhodococcus equi* disease are largely determined by the site of infection and clinical substrate in which it occurs.  
- 49% of patients are HIV-positive.
- Pulmonary infection predominates among HIV-positive patients.
- Extrapulmonary disease (abscesses, septicemia, eye or wound infection, etc) is most common in immunocompetent individuals.

This disease is endemic or potentially endemic to all countries.

### References

Rotavirus infection

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA. Reoviridae: Rotavirus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human, Pig</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Fecal-oral, Water</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2.0 d (range 12h - 3d)</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Stool precautions; supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Vaccine</td>
<td>Rotavirus vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Vomiting, diarrhea and mild fever: the illness lasts approximately 1 week, and is most severe in infancy; fatal cases are associated with dehydration and electrolyte imbalance.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Rotavirus. ICD9: 008.61 ICD10: A08.0</td>
</tr>
</tbody>
</table>

Clinical

The median incubation period for Rotavirus gastroenteritis is 2.0 days. 1

Infants and young children present with fever, vomiting, diarrhea, and occasionally dehydration. 2
- Most hospitalized patients had experienced fever and vomiting for 2 to 3 days, and diarrhea for 4 to 5 days.
- The diarrhea is watery without blood or mucus.
- Leukocytes are detected in the stool in a small percentage of patients.
- Approximately 36% of episodes are characterized by "dehydrating diarrhea."
- Viremia is present in over 50% of patients with Rotavirus diarrhea. 3 4
- Asymptomatic infection is common. 5

Infection in immunodeficient children may persist for weeks to months.

Rotavirus infection is not unusual in adults. 6

Complications:
- Rotavirus infection increases the risk of bacteremia in children with nontyphoid Salmonella gastroenteritis 7
- Rare instances of toxic megacolon 8 and duodenal perforation have been reported. 9
- Although intestinal intussusception may occur in some cases 10, a causal role for Rotavirus infection (ie, as opposed to Rotavirus vaccine 11) is not established. 12
- Central nervous system dysfunction may complicate Rotavirus infection, in the form of seizures 13-17 (even in the absence of fever 18), cerebellitis 19-22, encephalopathy 23-27, acute flaccid paralysis 28 and death. 29
- Some reports have linked Rotavirus infections with instances of aseptic meningitis 30 31, necrotizing enterocolitis, myositis, liver abscess, pancreatitis 32-34, pneumonia, Kawasaki's disease, acute hemorrhagic edema 35, sudden infant death syndrome and Crohn's disease.

This disease is endemic or potentially endemic to all countries.

Rotavirus infection in Haiti

Vaccine Schedule:
- BCG - birth, 10, 14 weeks
- DTwPHibHep - 6, 10, 14 weeks

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MR - 9 months
OPV - birth; 6, 10, 14 weeks
Pneumo conj - from April 2015
Pneumo ps - from January 2015
Rotavirus - from April 2014
Td - 1st contact; +4 weeks; +6 months; +1, +1 years pregnant women

**Prevalence surveys:**
3.9% of patients hospitalized with watery diarrhea (2010 to 2013) 36

**References**

Rubella

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA. Togaviridae: Rubella virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Contact, Air, Transplacental</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>16d - 18d (range 14d - 23d)</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Respiratory precautions. Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Vaccines</td>
<td>Rubella vaccine</td>
</tr>
<tr>
<td></td>
<td>Rubella - Mumps vaccine</td>
</tr>
<tr>
<td></td>
<td>Measles-Mumps-Rubella vaccine</td>
</tr>
<tr>
<td></td>
<td>Measles-Rubella vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Maculopapular rash following a one-day prodrome of coryza and headache; post auricular lymphadenopathy; arthralgia and arthritis encountered in adults; severe thrombocytopenia or encephalitis may follow acute infection.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Epidemic roseola, German measles, Roda hund, Rode hond, Rode hunder, Rodehond, Rosolia, Roteln, Rubeola [Spanish], Three-day measles.</td>
</tr>
</tbody>
</table>

ICD9: 056  
ICD10: B06

Clinical Hints

A "confirmed" case requires either laboratory confirmation or epidemiological link to a laboratory-confirmed case.

- Arthralgia/arthritis, lymphadenopathy, or conjunctivitis" 1  Arthropyathy may occur in as many as 41% of cases 2
- A "confirmed" case requires either laboratory confirmation or epidemiological link to a laboratory-confirmed case.
- Atypical features may be seen in adults with rubella; ie, hepatitis, conjunctival hemorrhage 3  , uveitis 4  , retinitis 5  and a high incidence of polyarthritis.
- Rare instances of acute hepatic failure 6  and hemophagocytic syndrome 7  are reported.

Congenital rubella should be suspected if any of the following is present in a newborn infant 8  9  :
- cataracts (45% of cases), congenital glaucoma, pigmentary retinopathy
- congenital heart disease (70%, most commonly patent ductus arteriosus or pulmonary artery stenosis) Both anomalies may appear concurrently in up to 50% of cases 10
- hearing loss (35% to 60%)
- purpura
- splenomegaly
- jaundice
- microcephaly, mental retardation 11  , meningoencephalitis
- radiolucent bone disease
- duodenal stenosis 12

The chance of fetal defects from a viremic mother is 40% to 90% during the first trimester. 13
- Infection also increases the risk for spontaneous abortion and miscarriage by 50%. 14
- The rate of congenital rubella syndrome during epidemics is 0.5 to 2.2 per 1,000 live births.
- 60% of children with CRS have hearing impairment, 45% congenital heart disease, 27% microcephaly, 25% cataracts, 23% low birth weight (< 2,500 grams), 17% purpura, 19% hepatosplenomegaly, 13% mental retardation and 10% meningoencephalitis.
**Anterior uveitis • differential diagnosis:**

Anterior uveitis due to Rubella virus is characterized by younger age at onset and a chronic course, typically associated with cataract at presentation.  

- Rubella virus has been implicated in the etiology of Fuchs heterochromic iridocyclitis.  
- Anterior uveitis due to Herpes simplex and Varicella-Zoster viruses is more common in adults, and often follows an acute course.  
- Herpes simplex anterior uveitis presents with conjunctival redness, corneal edema, a history of keratitis, and the presence of posterior synechiae. Anterior chamber inflammation is common with Herpes simplex virus, while vitritis is more common with Rubella and Varicella-Zoster virus.  
- Rubella, Herpes simplex and Varicella-zoster viruses are associated with intraocular pressure of more than 30 mmHg and development of glaucoma (18%-30%; P = 0.686).  
- Focal chorioretinal scars were present in 22% of Rubella cases, 0% of HSV and in 11% of VZV uveitis cases.

This disease is endemic or potentially endemic to all countries.

**Rubella in Haiti**

**Vaccine Schedule:**

- BCG - birth, 10, 14 weeks  
- DTwPHibHep - 6, 10, 14 weeks  
- MR - 9 months  
- OPV - birth; 6, 10, 14 weeks  
- Pneumo conj - from April 2015  
- Pneumo ps - from January 2015  
- Rotavirus - from April 2014  
- Td - 1st contact; +4 weeks; +6 months; +1, +1 years pregnant women

---

Graph: Haiti. Rubella - WHO-UNICEF est. % (Rubella1) vaccine coverage - GIDEON
Notes:
1. Confirmed cases only.
2. No confirmed cases were reported during 2007 to 2010.  

Notes:
1. The true incidence of congenital rubella syndrome in Haiti is estimated at 163 to 440 cases per year (2001).  

Seroprevalence surveys:
96.0% of pregnant women in Port-au-Prince and 89.9% in rural areas (2002) \(^\text{19}\)
93.4% of pregnant women (2012) \(^\text{20}\)

References

Salmonellosis

Agent | BACTERIUM. Salmonella A facultative gram-negative bacillus
Reservoir | Mammal  Bird  Reptile
Vector | None
Vehicle | Food  Milk  Eggs  Poultry  Shellfish  Meat  Vegetables  Fruit  Fecal-oral Fly
Incubation Period | 12h - 36h (range 6h - 5d)
Diagnostic Tests | Culture (stool, blood, infected tissue). Serology.
Typical Adult Therapy | Stool precautions. Therapy not indicated for uncomplicated diarrhea; if necessary, treat per antibiogram
Typical Pediatric Therapy | As for adult
Clinical Hints | Fever, chills & watery diarrhea 12 to 24 hours after ingestion of eggs, meat, poultry; fecal leucocytes present; fever resolves in 2 days; but diarrhea persists for up to 7 days (occasionally weeks).
Synonyms | Salmonellosen, Salmonellosi.
ICD9: 003
ICD10: A02

Clinical

**WHO Case definition for surveillance:**
- An illness with the following symptoms: diarrhea, abdominal cramps, fever, vomiting and malaise.
- Laboratory criteria for confirmation
  - Isolation of *Salmonella* spp. from the stool or blood of a patient.
- Case classification
  - Suspected: An individual showing one or more of the clinical features.
  - Confirmed: A suspected case with laboratory confirmation.

**Acute infection:**
*Salmonella* gastroenteritis is usually indistinguishable from that caused by other bacterial and viral pathogens. 1
- Nausea, vomiting, and diarrhea begin 6 to 48 hours following ingestion of contaminated food or water.
- Incubation periods as long as 8 days have been reported. 2
- Abdominal cramps and fever as high as 39 C are common.
- The diarrhea is usually characterized as loose, non-bloody stools of moderate volume.
- Voluminous diarrhea, bloody stools, and tenesmus may also occur.

The infection is usually self-limited.
- Fever resolves within 3 days, and diarrhea resolves within 3 to 7 days.
- Stool cultures may remain positive for 4 to 5 weeks after infection, and carriage may persist for as long as one year in fewer than 1% of cases. 3
- Antibiotic treatment is reserved for unusual and complicated infections: septicemia, neonates, immunosuppressed patients, etc.

**Complications:**
The spectrum of extraintestinal salmonellosis is similar to that of other gram-negative bacterial infections: osteomyelitis 4-8, meningitis 9-11, endocarditis 12-14, etc.
- Endovascular infections are particularly common, and may result in aneurysms of the aorta and other large vessels. 15 16
- *Salmonella* osteomyelitis is common in children with underlying hemoglobinopathies. Pyomyositis has also been reported in such cases. 17
- Septicemia is often described in patients with schistosomiasis 18-22, lymphoma, lupus erythematosus 23 24, bartonellosis, malaria 25 and hepatic cirrhosis.
- Rotavirus infection increases the risk of bacteremia in children with nontyphoid *Salmonella* gastroenteritis 26
- Elderly patients are at risk for complicated or fatal infection. 27
- Reactive arthritis has been reported in as many as 16.8% of cases 28-30
- The risk for reactive arthritis following *Salmonella* infection 31 was 1.4/100,000 cases (United States, 2002 to 2004) 32
- There is evidence that salmonellosis may increase the risk for later development of inflammatory bowel disease. 33
This disease is endemic or potentially endemic to all countries.

**Salmonellosis in Haiti**

**Prevalence surveys:**
- 0.4% of patients hospitalized with watery diarrhea (2010 to 2013) 34

**Notable outbreaks:**
- 1976 - An outbreak (386 cases) of diarrhea due to *Salmonella*, *Vibrio*, *Shigella*, ETEC and EIEC was reported among passengers of a cruise ship following a visit to Port au Prince. 35

**References**

5. Orthopedics 2009 Sep ;32(9).
Sarcocystosis

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Protozoa. Sporozoa, Coccidea, Eimeriida: Sarcocystis bovihominis or S. suihominis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Cattle  Pig</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Meat  Water</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>9d - 39d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of cysts in stool.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Diarrhea and abdominal pain of varying severity; muscle pain and eosinophilia occasionally encountered.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Isospora hominis, Kudoa, Sarcocystiasis, Sarcocystis, Sarcosporidiosis. ICD9: 136.5 ICD10: A07.8</td>
</tr>
</tbody>
</table>

Clinical

Human infection follows ingestion of undercooked beef or pork.
- Clinical features are limited to abdominal pain, vomiting, moderate diarrhea or asymptomatic infection of muscle. 1 2
- Recent outbreaks have been characterized by a high incidence of headache, arthralgia and myalgia. 3
- Myositis is common 4-6, and eosinophilia has been reported.

This disease is endemic or potentially endemic to all countries.

References

Scabies

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Arthropod. Arachnid, Acarina (Mite), Sarcoptiae: Sarcoptes [Acarus] scabiei</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>mite</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Contact, including Sexual contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>3d - 42d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of mites in skin scrapings.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Permethrin 5%. OR Lindane. OR Crotamiton 10% OR Ivermectin 150 to 200 ug/kg PO as single dose</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Permethrin 5%. OR Lindane. OR Crotamiton 10% OR Ivermectin 200 mcg/kg PO (&gt; 15 kg body weight)</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Intensely pruritic papules, vesicles and burrows - interdigital webs, wrists, elbows, axillae, perineal region, buttocks, penis; pruritus most intense at night; severe psoriaform infestation (Norwegian scabies) noted in debilitated patients.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Cheyletiella, Cheyletiella infestation, Escabiose, Escabiosis, Histiostomatid mites, Kratze, Mange, Ornithonyssus, Pyemotes, Sarcoptes scabiei, Sarna, Scabbia, Skabies, Tropical rat mite. ICD9: 133 ICD10: B86</td>
</tr>
</tbody>
</table>

Clinical

The lesions of scabies are usually symmetrical.

- Typical sites include the interdigital webs, buttocks, penis, scrotum, breasts and nipples, axillae and flexor surfaces of the wrists. 1
- Pruritis is often worse at night.
- Skin lesions consist of burrows, papules or vesicles. 2
- Exaggerated eczematous patches ("crusted", or Norwegian scabies) 3 4 may be encountered • notably in institutions for Down's syndrome and leprosy. 5
- Lesions in children are atypical and tend to involve the buttocks and perineum. 6
- Complications include secondary infection and acute glomerulonephritis.

Otoacaria is due to Histiostomatid mites has been reported in Saudi Arabia. 7

This disease is endemic or potentially endemic to all countries.

References

Scarlet fever

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Streptococcus pyogenes A facultative gram-positive coccus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Infected secretions Occasionally food</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1d - 4d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Typical clinical features associated with group A streptococcal pharyngitis.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Benzathine Penicillin G 1.2 million units IM as single dose</td>
</tr>
</tbody>
</table>
| Typical Pediatric Therapy | Benzathine Penicillin G  
Weight <14kg: 300,000 units IM  
Weight 14 to 28kg: 600,000 units IM  
Weight >28kg: 1.2 million units IM |
| Clinical Hints         | Overt pharyngitis followed within 24 to 48 hrs by florid erythematous rash. |
| Synonyms               | Escharlatina, Lanhousha, Scarttina, Scharlach.  
ICD9: 034.1  
ICD10: A38 |

Clinical

Signs of streptococcal pharyngitis (fever, pharyngeal exudate and pain) are followed by the appearance of a rash within 12 to 24 hours.

- The exanthem appears initially on the trunk and spreads rapidly over the body to finally involve the extremities. 1
- The exanthem has the texture of sandpaper, and blanches with pressure.
- Pruritis may be present.
- Facial flushing and circumoral pallor are characteristic.

The patient appears ill, with fever, tachycardia, pharyngitis, tender adenopathy and palatal petechiae.
- Within a few days, the rash becomes more intense along skin folds, producing lines of confluent petechiae (Pastia sign).
- The rash begins to fade within 3 to 4 days, with desquamation evident over the face, palms and fingers.
- Skin peeling may persist for as long as a month.

During the first 2 days of illness, the tongue has a white coat through which the red and edematous papillae project (“white strawberry tongue”).
- The tongue later desquamates and becomes markedly reddened (“red strawberry tongue”).

Complications are those associated with the streptococcal infection itself • spread to regional, retropharyngeal tissues, middle ears, and sinuses; acute rheumatic fever or post-streptococcal glomerulonephritis.
- Septic complications such as meningitis, pyogenic arthritis, and endocarditis, are occasionally encountered.

This disease is endemic or potentially endemic to all countries.

References

Schistosomiasis - mansoni

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Platyhelminthes, Trematoda. Strigeida, Schistosomatidae: Schistosoma mansoni</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Snail (Biomphalaria) Dog Cat Pig Cattle Rodent Horse Non-human primate</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Water (skin contact)</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2w - 6w</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of ova in stool or biopsy specimens. Serology. Antigen detection.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Praziquantel 20 mg/kg PO BID X one day OR Oxamnique 15 mg PO X one dose</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Praziquantel 20 mg/kg PO BID X one day OR Oxamnique 10 mg PO BID X one day</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Early urticaria, fever and eosinophilia; later, hepatosplenomegaly and portal hypertension; parasite may survive for decades in human host.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Bilharziasis, intestinal, Katayama fever [3], Schistosoma mansoni.</td>
</tr>
<tr>
<td>ICD9</td>
<td>120.1</td>
</tr>
<tr>
<td>ICD10</td>
<td>B65.1</td>
</tr>
</tbody>
</table>

Clinical

**WHO Case definition for surveillance (all forms of intestinal schistosomiasis):**

Endemic areas (moderate or high prevalence)

- **Suspected:** A person with chronic or recurrent intestinal symptoms (blood in stool, bloody diarrhea, diarrhea, abdominal pains) or, at a later stage, hepatosplenomegaly.
- **Probable:** A person who meets the criteria for presumptive treatment, according to the locally applicable diagnostic algorithms.
- **Confirmed:** A person with eggs of *S. mansoni*, or *S. japonicum/mekongi* in stools (microscope).

Non-endemic areas and areas of low prevalence

- **Suspected:** A person with chronic or recurrent intestinal symptoms (blood in stool, bloody diarrhea, diarrhea, abdominal pains) or, at a later stage, hepatosplenomegaly.
- **Probable:** Not applicable.
- **Confirmed:** A person with eggs of *S. mansoni* or *S. japonicum* in stools (microscope). A person with positive reaction to immunoblot test.

The clinical features caused by *Schistosoma* species infecting man are similar\(^1\), will be discussed together.

**Acute infection:**

Within 24 hours of penetration by cercariae, the patient develops a pruritic papular skin rash known as swimmer’s itch. [The more overt form of Cercarial dermatitis associated with avian schistosomes is discussed elsewhere in this module.]

- One to two months after exposure, an overt systemic illness known as Katayama fever (named for Katayama district, Hiroshima, Japan) begins, heralded by acute onset of fever, chills, diaphoresis, headache, and cough.\(^2\)
- The liver, spleen, and lymph nodes are enlarged, and eosinophilia is present.
- Although deaths have been described at this point (notably in *S. japonicum* infection) these findings subside within a few weeks in most cases.

**Chronic schistosomiasis:**

The likelihood of progression to chronic schistosomiasis is related to the extent of infestation.

- Chronic schistosomiasis caused by *S. mansoni*, *S. japonicum*, or *S. mekongi* is characterized by fatigue, abdominal pain and intermittent diarrhea or dysentery.
- Colon polyps is has been associated with infection by *S. mansoni*, *S. japonicum*, and *S. intercalatum*.\(^3\)
- Retroperitoneal fibrosis has been reported with *S. japonicum* infection.\(^4\)
- Blood loss from intestinal ulcerations may lead to moderate anemia.
- In *S. mansoni*, *S. japonicum*, and *S. mekongi* infections, ova remain in the venous portal circulation and are carried to the liver where they produce granulomata and fibrosis\(^5\), and block portal blood flow.
- Portal hypertension and portosystemic collateral circulation result.
- Although liver function tests remain normal for a long time, hepatosplenomegaly and variceal hemorrhage develop.
- The spleen is firm and may reach massive size.
- Fatal hematemesis is unusual.
- Laboratory tests reveal moderate eosinophilia and anemia related to blood loss and hypersplenism.
• Eventually, hepatic function deteriorates, with late ascites and jaundice.

In *S. haematobium* infection, ova are located in the bladder and ureters, leading to granuloma formation, inflammation, hematuria, ureteral obstruction, secondary infection and often carcinoma of the bladder. \(^6-9\) Ova are also commonly present in the seminal vesicles and prostate. \(^10\) \(^11\)

• Genital lesions may present a risk factor for acquisition of HIV infection \(^12\) \(^\); and schistosomal co-infection may accelerate HIV disease progression and facilitate viral transmission to sexual partners. \(^13\)

• Terminal hematuria and dysuria are common symptoms.

*S. intercalatum* infection is characterized by abdominal pain and bloody diarrhea.

*S. mekongi* is an important cause of hepatomegaly in endemic areas.

**Complications:**

The following are some of the many complications described in chronic schistosomiasis.

• Pulmonary schistosomiasis is manifested by symptoms and signs of right ventricular congestion related to blockage of pulmonary capillaries by ova in the course of hepatosplenic schistosomiasis. \(^14-16\)

• Central nervous system schistosomiasis is manifested as delirium, coma, seizures, dysphasia, visual impairment, ataxia, a cerebral mass, generalized encephalopathy, cerebral vasculitis with stroke, or focal epilepsy (notably in *S. japonicum* infection). \(^17\) \(^30\)

• Granulomata of *S. haematobium* and *S. mansoni* may involve the spinal cord (most commonly the cauda equina or conus medularis), producing transverse myelitis. \(^31-44\)

• Rare instances of cerebral infection by *S. haematobium* have been reported. \(^45\)

**Schistosoma mansoni** infection may occasionally involve the bladder, mimicking *S. haematobium* infection or malignancy. \(^46\)

• *S. mansoni* infection has been implicated in cases of colorectal cancer. \(^47\)

• Although best known for damage to the urinary bladder and ureters, the female genitalia are involved in 50% to 70% of women with *S. haematobium* infection; resulting in vaginal deformities and fistulae; hypogonadism, ectopic pregnancy, miscarriage and malignancy. \(^61\) \(^64\)

**Schistosoma mansoni** is implicated in the etiology of appendicitis \(^65\) \(^66\); and membranoproliferative glomerulonephritis and amyloidosis \(^67\); and may also involve the fallopian tubes \(^68\) \(^69\); and uterine cervix \(^70\); and cause ovarian \(^71\); or testicular granulomata with infertility \(^72\) \(^73\); and acute abdomen associated with granulomatous peritonitis \(^74\); or panniculitis. \(^75\)

• In rare instances, the skin may be involved in *Schistosoma mansoni* infection \(^76\); and the prostate in *Schistosoma japonicum* infection. \(^77\)

• *Salmonella* bacteremia is often reported among persons with hepato-splenic schistosomiasis. \(^78\) \(^82\)

• Concurrent chronic Hepatitis B infection enhances the deleterious effect of schistosomiasis on the liver. \(^83\)

**This disease is endemic or potentially endemic to 59 countries.** Although Schistosomiasis - *mansoni* is not endemic to Haiti, imported, expatriate or other presentations of the disease have been associated with this country.

**Schistosomiasis - mansoni in Haiti**

Schistosomiasis is not reported in Haiti; however, the snail intermediate *Biomphalaria glabrata*, has been identified in Department du Nord since 1891, and in several additional sites on the north coast since 1977. \(^84\)

**References**

12. Lancet Neurol 2011 Sep ;10(9):853-64.
16. Lancet Neurol 2011 Sep ;10(9):853-64.
47. World J Surg Oncol 2010;8:68.
**Septic arthritis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM or FUNGUS. Gram positive cocci most common; gram negative bacilli, gonococci, mycobacteria, fungi, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Smear and culture of joint fluid. Cytological and chemical analysis of joint fluid also useful.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Antimicrobial agent(s) directed at known or likely pathogen</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Fever (60% to 80%) associated with swelling, erythema and tenderness (usually single joint, most commonly a knee; elbow or ankle in child); mean fluid leukocyte count in acute bacterial forms = 50,000 / cu mm.</td>
</tr>
</tbody>
</table>

**Clinical**

Most cases present with fever, malaise and local findings of warmth, swelling and decreased range of motion.  
- Lack of erythema and local warmth are not uncommon.  
- The most commonly involved joints are the knee and hip, followed by the shoulder and ankle.  
- Non-gonococcal arthritis is mono-articular in 80% to 90% of cases.  
- Infection of the costochondral, sternoclavicular and sacroiliac joints is common in intravenous drug users.  

Synovial fluid demonstrates low viscosity and turbidity.  
- Leucocyte counts usually exceed 50,000 per cu mm.  
- Note that leucocytosis, low glucose and high lactate levels are also encountered in some non-infectious forms of arthritis.  
- Gram stains are positive in 50% of cases, and cultures in 90%.  
- Unlike Lyme disease, septic arthritis is usually associated with leukocytosis and an erythrocyte sedimentation rate >= 40 mm / hour.  

**Etiological associations:**  
- Adult below age 30: *Neisseria gonorrhoeae* (often monoarticular involving knee)  
- Associated rash: Lyme disease, gonococcemia (often monoarticular, involving knee)  
- Child below age 5 years: *Haemophilus influenzae*, *Staphylococcus aureus*, *Streptococcus* spp.  
- Chronic arthritis: Tuberculosis, Mycobacteria • nontuberculous, Sporotrichosis and other fungi  
- Hematogenous infection: *Staphylococcus aureus*, *Streptococcus pyogenes*  
- Injecting drug user: *Pseudomonas aeruginosa* (often sternoclavicular or sacroiliac)  
- Traumatic injury to joint: *Staphylococcus aureus*, Enterobacteriaceae, *Pseudomonas aeruginosa*

**This disease is endemic or potentially endemic to all countries.**

**References**

Septicemia - bacterial

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Escherichia coli</em>, <em>Staphylococcus aureus</em>, facultative gram negative bacilli, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture of blood and sepsis source.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Antimicrobial agent(s) directed at known or likely pathogen</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Fever, rigors, leukocytosis, tachypnea, mental changes; hypotension, acidosis and bleeding diathesis herald septic shock; further signs (eg, urinary infection, phlebitis, etc) may point to the source of infection.</td>
</tr>
</tbody>
</table>

**Clinical**

Bacterial septicemia is defined as the presence of signs and symptoms related to bacteremia. ¹

- The clinical spectrum and severity of disease are largely determined by the infecting species, underlying diseases and source of infection.
- Most patients present with fever, tachycardia and leucocytosis, in addition to signs and symptoms referable to a primary infectious focus (eg, urinary tract, abdominal infection, endocarditis, etc).

**This disease is endemic or potentially endemic to all countries.**

**References**

Shigellosis

| Agent | BACTERIUM. *Shigella sonnei, Shigella flexneri, Shigella boydii* or *Shigella dysenteriae* A facultative gram-negative bacillus |
| Reservoir | Human  | Non-human primate |
| Vector | None |
| Vehicle | Fecal-oral  | Water  | Dairy products  | Fomite | Fly | Vegetables |
| Incubation Period | 48h - 72h (range 7h - 1w) |
| Diagnostic Tests | Stool culture. |
| Typical Adult Therapy | Stool precautions. Choice of antimicrobial agent based on regional susceptibility patterns. Continue treatment for five days |
| Typical Pediatric Therapy | As for adult |
| Clinical Hints | Watery or bloody diarrhea, tenesmus, abdominal pain and headache; colonic hyperemia and abundant fecal leucocytes are present; usually resolves in 3 days (may persist for up to 14); case fatality rate = 1%. |
| Synonyms | Bacillaire dysenterie, Bacillary dysentery, Dissenteria batterica, Dysenteria bacillaris, Leptospirenerkrankung, Ruhr, Shigella, Shigellose, Shigelose, Ubertragbare Ruhr. |

ICD9: 004
ICD10: A03

**Clinical**

**Acute infection:**
Approximately 50% of infections are limited to transient fever or self-limited diarrhea.
- 50% of patients progress to bloody diarrhea and dysentery.  
- Fever may rise rapidly to 40°C, and febrile seizures are common in children.
- Seizures rarely recur or result in neurological sequelae.
- Dysentery is characterized by passage of 10 to 30 small-volume stools consisting of blood, mucus, and pus.
- Abdominal cramps and tenesmus are noted, and straining may lead to rectal prolapse, notably in young children.  
- On endoscopy, the colonic mucosa is hemorrhagic, with mucous discharge and focal ulcerations. Most lesions are in the distal colon.

**Complications:**
Patients with mild disease generally recover without specific therapy in two to seven days.
- Severe shigellosis can progress to toxic dilatation or perforation of the colon, which may be fatal.
- Mild dehydration is common, and protein-losing enteropathy can occur with severe disease.
- Complications are most commonly described in developing countries and are related both to the relative prevalence of *S. dysenteriae* type 1 and *S. flexneri*, and the poor nutritional state of the local populations.
- *Shigella* bacteremia is not uncommon, and is associated with increased mortality, particularly among infants below one year of age and persons with protein-energy malnutrition.  
- Hemolytic-uremic syndrome (HUS) may complicate shigellosis due to *S. dysenteriae* type 1, and usually develops toward the end of the first week of shigellosis.  
- Profound hyponatremia and hypoglycemia may occur.
- Other complications include encephalopathy, seizures, altered consciousness, and bizarre posturing, pneumonia, meningitis, vaginitis, keratoconjunctivitis, pneumonia and "rose spots."
- Reiter's syndrome is seen in patients having histocompatibility antigen HLA-B27.  
- Reactive arthritis follows 7% to 10% of *Shigella* infections.

This disease is endemic or potentially endemic to all countries.

**Prevalence surveys:**
- 0.8% of patients hospitalized with watery diarrhea (2010 to 2013)  

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**Notable outbreaks:**

1976 - An outbreak (386 cases) of diarrhea due to *Salmonella, Vibrio, Shigella*, ETEC and EIEC was reported among passengers of a cruise ship following a visit to Port au Prince.  

**References**

## Sinusitis

<table>
<thead>
<tr>
<th>Agent</th>
<th>Various (Haemophilus influenzae &amp; Streptococcus pneumoniae in most acute cases)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>None</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Variable</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Imaging techniques. Culture of sinus drainage.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Amoxicillin/clavulanate 2000/125 mg BID X 7 days Drainage as indicated Alternatives: Levofloxacin, Clindamycin, Cefuroxime, Cefdinir</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Amoxicillin/clavulanate 90/6.4 mg/kg BID X 7 days Drainage as indicated Alternatives: Clindamycin, Cefuroxime, Cefdinir</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Sinusitis often follows upper respiratory infections; headache, fever and local tenderness are common, however the precise presentation varies with patient age and anatomic localization.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Acute sinusitis, Mastoidite, Mastoiditis, Rhinosinusitis, Sinusite. ICD9: 473.9,383.0,461 ICD10: H70,J01</td>
</tr>
</tbody>
</table>

---

### Clinical

Acute community-acquired bacterial sinusitis is usually superimposed on preexisting viral sinusitis.
- In most cases, it is not possible to distinguish between viral and bacterial infections.
- Sneezing, nasal discharge and obstruction, facial pressure and headache are common in both conditions.  
- Fever of 38°C or more, facial pain, and erythema occur may occasionally herald bacterial infections.
- The nasal discharge may be colored in both viral and bacterial sinusitis.
- Cough and hyposmia may also be present.

Sinusitis following dental infection is associated with molar pain and a foul breath odor.
- Sphenoid sinusitis is associated with severe frontal, temporal, or retroorbital headache that radiates to the occipital region; and hypesthesia or hyperesthesia of the ophthalmic or maxillary dermatomes of the fifth cranial nerve.
- Lethargy and findings suggestive of cavernous sinus or cortical vein thrombosis, orbital cellulitis or orbital abscess may also be present.
- In severe cases of frontal sinusitis, pus may collect under the periosteum of the frontal bone resulting in a "Pott puffy tumor."

Rare instances of toxic shock syndrome have followed sinusitis.  

---

**This disease is endemic or potentially endemic to all countries.**

### References

Sporotrichosis

<table>
<thead>
<tr>
<th>Agent</th>
<th>FUNGUS. Ascomycota, Euascomycetes, Ophiostomatales: Sporothrix schenckii, S. brasiliensis and S. globosa A dimorphic dematiaceous fungus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Soil, Vegetation, Wood</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Trauma, Contact, Air (rare)</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1w - 3m</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Fungal culture. Serologic tests available in some centers.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Itraconazole 100 to 200 mg PO daily X 3 to 6 months. OR Fluconazole 400 mg PO daily X 6 months</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Itraconazole 2 mg/kg PO daily X 3 to 6 months. OR Fluconazole 3 mg/kg PO daily X 6 months</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Draining nodules which follow lymphatics; acquired from contact with flowers, thorns, trees or other plant material; eye, brain, testis, bone and other tissues may be involved.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Schenck's disease, Sporothrix brasiliensis, Sporothrix globosa, Sporothrix mexicana, Sporothrix schenckii, Sporotrichose.</td>
</tr>
</tbody>
</table>

**Clinical**

**Clinical forms of sporotrichosis:**

**Cutaneous sporotrichosis** begins as a painless erythematous papule which enlarges and suppurates, without systemic symptoms. 
- Multiple lesions may spread along lymphatic channels. 
- Occasionally only a single lesion appears, which may persist for decades. 
- Bilateral infection may occur. 
- Hematogenous infection of multiple skin sites has also been described, notably among immuno-suppressed patients. 
- In some cases, ulcers appear on multiple body sites.

Infection associated by *Sporothrix brasiliensis* may be associated with disseminated cutaneous infection without underlying disease, hypersensitivity reactions, and mucosal involvement.

**Nodular lymphadenitis** is also seen in *Nocardia brasiliensis* infection, tularemia, *Mycobacterium marinum* infection, chromomycosis and infections caused by *Leishmania panamensis/guyanensis*. Lesions of sporotrichosis may rarely mimic those of pyoderma gangrenosum or keratoacanthoma.

**Pulmonary sporotrichosis** characteristically presents as a single upper lobe cavity associated with cough and low-grade fever. 
- Multifocal lung lesions have also been reported. 
- 86 cases of pulmonary sporotrichosis were reported in the world's literature during 1960 to 2010. Extrapulmonary multifocal disease involved the joints in 45.4%.

**Osteoarticular sporotrichosis** is characterized by infection of a single bone or large peripheral joint • hip and shoulder involvement is not encountered. 
- Most patients are afebrile when first seen. 
- Occasionally, the infection presents as tenosynovitis, usually of the wrist or ankle.

**Other forms** include conjunctival infection, dacrocystitis, hematogenous endophthalmitis, brain abscess, soft tissue mass, meningitis, orchitis, etc.

This disease is endemic or potentially endemic to all countries.
References

# St. Louis encephalitis

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>VIRUS - RNA. Flaviviridae, Flavivirus: St. Louis encephalitis virus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Bird  Mammal</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>Mosquito (Culex pipiens, Cx. tarsalis, Cx. nigripalpus, Cx. restuans, Cx. salinarius, Aedes, Sabethes)</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>4d - 21d</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Supportive</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Headache, meningitis, encephalitis, sore throat, myalgia, vomiting and photophobia; most cases encountered during late summer; infection resolves in 5 to 10 days; case-fatality rate 8% (over 25% above age 65).</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>American encephalitis, Modoc, Rio Bravo, SLE. ICD9: 062.3 ICD10: A83.3</td>
</tr>
</tbody>
</table>

## Clinical

Adults account for 75% of patients with both overt and fatal infections. 1
- Five to ten percent of patients will suffer from chronic neurological sequelae.

The disease may initially present with constitutional symptoms; aseptic meningitis; and overt and even fatal encephalitis. 2
- Infection begins with malaise, fever, headache, respiratory symptoms, diarrhea, vomiting and myalgias.
- Symptoms may progress after several days to lethargy, confusion, tremor, clumsiness, and ataxia.
- General motor weakness is the rule, rather than focal neurological signs; however, 25% of patients develop cranial nerve signs.
- Signs of meningeal irritation are more common among children.
- Tremor and cerebellar signs are common.
- Seizures are uncommon, and carry a poor prognosis.
- Pneumonia, thrombophlebitis, pulmonary embolism, stroke, gastrointestinal hemorrhage, and nosocomial infections may intervene.
- The case-fatality rate is 8% (20% above age 60).

The peripheral leucocyte count may be slightly elevated
- Hyponatremia occurs in over 33% of patients.
- The CSF pressure is elevated in 33% of cases
- CSF protein is elevated in 70%.
- Between five to several hundred cells/ cu mm are present.

**This disease is endemic or potentially endemic to 22 countries.**

## References

Staphylococcal food poisoning

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Staphylococcus aureus</em> exotoxins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human (nares, hands) Occasionally cattle (udder), dog/cat (nasopharyngeal)</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Food (creams, gravies, sauces)</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2h - 4h (range 30 min - 9h)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of bacterium in food.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>&quot;Explosive&quot; diarrhea and vomiting; usually no fever; no fecal leucocytes; onset 1 to 6 hours after food; resolves within 1 to 2 days; fatality is rare.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Staphylococcus aureus food poisoning.</td>
</tr>
<tr>
<td></td>
<td>ICD9: 005.0</td>
</tr>
<tr>
<td></td>
<td>ICD10: A05.0</td>
</tr>
</tbody>
</table>

Clinical

Usually symptoms start within several hours of ingestion of potentially contaminated foods
- Illness is heralded by nausea, vomiting and intestinal cramping, followed by urgency and profuse watery non-bloody diarrhea.
- Symptoms resolve within 12 to 24 hours.
- Multiple family members or patrons of the same eating establishment may be affected.
- The presence of both explosive diarrhea and vomiting, lack of fever and short incubation period are helpful in distinguishing this entity from other forms of food poisoning.

This disease is endemic or potentially endemic to all countries.
Staphylococcal scalded skin syndrome

### Agent
- BACTERIUM. *Staphylococcus aureus* phage group 2 A facultative gram-positive coccus

### Reservoir
- Human

### Vector
- None

### Vehicle
- Direct contact; infected secretions

### Incubation Period
- 1d - 4d

### Diagnostic Tests
- Typical clinical features; Recovery of *S. aureus* from localized wound or blood; skin biopsy may be helpful

### Typical Adult Therapy
- Fluid replacement (as for burn); Intravenous Nafcillin or Oxacillin, in addition to application of anti-staphylococcal drug to local source infection; Vancomycin if MRSA

### Typical Pediatric Therapy
- Fluid replacement (as for thermal burn); Intravenous Nafcillin or Oxacillin, in addition to application of anti-staphylococcal drug to local source infection; Vancomycin if MRSA

### Clinical Hints
- Acute, generalized exfoliative dermatitis which occurs primarily in infants and young children; a pre-existing localized skin infection is present in most - but not all - cases.

### Synonyms
- Lyell disease, Ritter disease, Ritter von Ritterschein disease, Scalded skin syndrome, SSSS. ICD9: 695.81 ICD10: L00

---

**Clinical**

Staphylococcal scalded skin syndrome (SSSS) is characterized by diffuse erythematous cellulitis followed by extensive skin exfoliation.

- Generalized erythema and then bulla formation with separation of the skin at the granular cell layer.
- A warm, “sandpaper” erythema with accentuation in the flexor creases may mimic scarlet fever; while the presence of flaccid bullae and Nikolsky sign may suggest pemphigus.
- Skin biopsy can be used to differential SSSS from Toxic epidermal necrolysis.
- Facial edema and perioral crusting are often present.

Dehydration may indicate fluid loss (as in thermal burns)
- Complete recovery occurs in most cases, within one to two weeks.
- The case-fatality rate in uncomplicated SSSS is less than 2%.
- Rare instances of recurrence have been reported.
- Staphylococcal septicemia complicates SSSS in a minority of cases.

**This disease is endemic or potentially endemic to all countries.**

**References**

### Streptococcus suis infection

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Streptococcus suis</em> I and <em>Streptococcus suis</em> II A facultative gram-positive coccus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Pig</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Air, secretions, meat, local wounds, contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown. Probably hours to few days</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture of blood, tissue, body fluids</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Systemic antibiotic. Usually susceptible in vitro to Penicillin, <em>Amoxicillin</em>, Chloramphenicol and Gentamicin</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Systemic antibiotic</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Severe multisystem disease, hemorrhagic diatheses, deafness or meningitis appearing hours to a few days after contact with pigs or pig products.</td>
</tr>
<tr>
<td>Synonyms</td>
<td><em>Streptococcus suis</em>. ICD9: 027.8; ICD10: A48.8</td>
</tr>
</tbody>
</table>

### Clinical

#### Demography:
- Virtually all patients have been farmers and butchers, of whom 80 percent were men.
- Most had been involved in butchering sick pigs or selling the pork.
- Over 40 percent of the patients were in the age group 50 to 60 years, and none were children.  

#### Signs and symptoms:
- Clinical features of *Streptococcus suis* II infection include high fever, malaise, nausea and vomiting followed by meningitis, subcutaneous hemorrhage, multi-organ failure (hepatic, renal, pulmonary, cardiac) and coma in severe cases.
- Toxic shock syndrome is common.
- Sensorineural hearing loss is often present.
- Peritonitis, endocarditis, mycotic aortic aneurysm, rhabdomyolysis, spondylodiscitis, salcroiliitis, monoarthritis, prosthetic joint infection, endophthalmitis and cranial nerve palsy have been reported.
- Persons with occupational exposure may exhibit asymptomatic seropositivity toward *S. suis*.
- Relapses of meningitis may occur. 

This disease is endemic or potentially endemic to 227 countries.

### References

1. ProMED <promedmail.org> archive: 20050816.2399
3. ProMED <promedmail.org> archive: 20050804.2271
26. ProMED <promedmail.org> archive: 20070823.2756
**Strongyloidiasis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Nematoda. Phasmidea: Strongyloides stercoralis (Strongyloides fulleborni is occasionally implicated in systemic disease)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human ▼ Dog ▼ Monkey (for Strongyloides fulleborni)</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Skin contact ▼ Soil ▼ Feces ▼ Autoinfection ▼ Sexual contact (rare)</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>14d - 30d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of larvae (or ova, for Strongyloides fulleborni) in stool or duodenal aspirate. Serology.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Ivermectin 200 micrograms/kg/d PO daily X 2d OR Thiabendazole 25 mg/kg BID (max 3g) X 2d OR Albendazole 400 mg/d X 3d (7 days for hyperinfection syndrome)</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Ivermectin 200 micrograms/kg/d PO daily X 2d OR Thiabendazole 25 mg/kg BID (max 3g) X 2d. OR Albendazole 200 mg/d X 3d (7 days for hyperinfection syndrome)</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Diarrhea, gluteal or perineal pruritus and rash; eosinophilia often present; widespread dissemination encountered among immune-suppressed patients because of uncontrolled autoinfection (case-fatality rate for this complication = 80%).</td>
</tr>
<tr>
<td>ICD9</td>
<td>127.2</td>
</tr>
<tr>
<td>ICD10</td>
<td>B78</td>
</tr>
</tbody>
</table>

Clinical

Strongyloidiasis may present as long as 75 years following initial acquisition of the parasite. 1

**Gastrointestinal strongyloidiasis:**

The symptoms of strongyloidiasis reflect invasion of the skin, larval migration of larvae intestinal penetration.
- Approximately one third of patients are asymptomatic.
- Dermal and pulmonary symptoms resemble those of hookworm 2, pruritic papular or linear urticarial rash (larva currens 3 4) and a Loeffler-like syndrome.
- Intestinal penetration is characterized by abdominal pain, mucous diarrhea and eosinophilia. 5
- Vomiting, weight loss, protein-losing enteropathy and inappropriate ADH excretion 6 are occasionally encountered.
- Intestinal obstruction has been reported. 7 8
- Yellowish mucosal nodules are seen on colonoscopy, predominantly in the ascending colon. 9
- Findings in colonic infection may mimic those of ulcerative colitis. 10

**Generalized strongyloidiasis:**

5 to 22% of patients develop a generalized or localized urticarial rash beginning in the anal region and extending to the buttocks, abdomen, and thighs.
- Extraintestinal infection may involve a wide variety of organs. 11-16
- Autoinfection is characterized by massive larval invasion of the lungs and other organs.
- Massive systemic strongyloidiasis occurs in patients with lymphoma, leukemia and AIDS; and during high-dose therapy with corticosteroids. 17 Rare instances of disseminated disease are reported in immune-competent individuals. 18-20
- Findings include generalized abdominal pain, concurrent gram-negative bacillary septicemia (55% of cases) 21, bilateral diffuse pulmonary infiltrates and ileus.
- Cases of fulminant gastrointestinal hemorrhage 22 and inappropriate ADH secretion have been reported. 23
- Hyperinfection may mimic acute exacerbation of COPD 24
- Eosinophilia may be present or absent at this stage; and rare instances of eosinophilic endocarditis 25 and eosinophilic meningitis have been reported. 26
- An outbreak of hyperinfection strongyloidiasis has been reported among immune-suppressed renal transplant recipients. 27
- **Strongyloides stercoralis** is the only helminth responsible for disseminated infection in immunocompromised patients. 28

**Strongyloides fulleborni** infection is usually asymptomatic.
**Strongyloidiasis** infection is most common among infants, and consist of abdominal distention, mild diarrhea and protein-losing enteropathy.

- Respiratory distress may occur, and is associated with a characteristic high-pitched cry.

**Halicephalobus (Micronema) deletrix** has been associated with five human infections all fatal and characterized by meningoencephalitis, with or without visceral involvement.

This disease is endemic or potentially endemic to all countries.

### Strongyloidiasis in Haiti

**Prevalence surveys:**

- 0.2% of school children (2002)

### References

**Subdural empyema**

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>BACTERIUM. <em>Haemophilus influenzae</em>, oral anaerobes, streptococci, et al</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Human</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Endogenous</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>Variable</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Imaging techniques (CT scan, etc.)</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Antimicrobial agent(s) directed at known or likely pathogen</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Fever, severe headache, vomiting, and signs of meningeal irritation and increased cerebrospinal fluid pressure; may follow head trauma, meningitis, otitis or sinusitis; case-fatality rate 15% (alert) to 60% (comatose).</td>
</tr>
</tbody>
</table>
| **Synonyms**            | Most patients present with headache, meningismus, decreased mental status and hemiparesis. 1  
                         | • 32 cases of suppurative parotitis in neonates were reported during 1970 to 2004. 2  
                         | • In 60 to 90% of cases, sinusitis or otitis is present. 3  
                         | • Extension of the infection into the subdural space is heralded by fever, focal and later generalized headache, vomiting, and meningismus. 3  
                         | • 50% of patients exhibit altered mental function. 3  
                         | • Focal neurological signs appear within 24 to 48 hours, and rapidly progress to hemispheric dysfunction with hemiparesis and hemisensory deficit. 3  
                         | • Seizures, usually focal, occur in 50% of cases, and papilledema in less than 50%. 4  
                         | • Signs of increased intracranial pressure appear, leading to cerebral herniation and death. 3  
                         | • Chronic and even sterile subdural collections are also encountered, often following antibiotic therapy. 3  
| **This disease is endemic or potentially endemic to all countries.** |                                                                         |

**References**

Suppurative parotitis

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Most commonly <em>Staphylococcus aureus</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Endogenous</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Clinical features (local swelling and purulent discharge from salivary ducts). Stain and culture of discharge.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Surgical drainage and aggressive parenteral antistaphylococcal therapy</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Consider when confronted by unexplained fever in the setting of malnutrition, dehydration and obtundation; local swelling and discharge of pus from salivary duct are diagnostic.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Parotitis, bacterial. ICD9: 527.2 ICD10: K11.3</td>
</tr>
</tbody>
</table>

**Clinical**

Suppurative parotitis is characterized by the sudden onset of firm, erythematous swelling of the pre- and post-auricular areas, extending to the angle of the mandible.  
- Marked pain and tenderness is accompanied by high fever, chills and marked toxicity.  
- Pus may be seen exiting from the parotid duct.  
- Progression of the disease can result in massive swelling of the neck, respiratory obstruction, septicemia, facial nerve palsy, fistula formation and osteomyelitis of the adjacent facial bones.  
- The condition should be suspected in any patient with unexplained or prolonged fever.

This disease is endemic or potentially endemic to all countries.

**References**

## Syphilis

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Treponema pallidum subsp. pallidum A microaerophilic gram-negative spirochete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Sexual contact. Infected secretions</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2w - 4w (range 10d - &gt;8w)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Dark field microscopy (chancre). VDRL confirmed by antitreponemal test (FTA, MHTP). Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Primary, secondary or early (&lt; 1 year) latent: Benzathine Penicillin G 2.4 million units IM Other stages: Repeat dosage at one and two weeks Alternatives: Tetracycline, Ceftriaxone</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Primary, secondary or early (&lt; 1 year) latent: Benzathine Penicillin G : Weight &lt;14 kg: 600,000u IM Weight 14 to 28 kg: 1,200,000u IM Other stages: Repeat dosage at one and two weeks</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Firm, painless chancre (primary syphilis); later fever, papulosquamous rash and multisystem infection (secondary syphilis); late lesions of brain, aorta, bone or other organs (tertiary syphilis).</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Canton rash, Chinese ulcer, Christian disease, French disease, German sickness, Harde sjanker, Lues, Neopolitan itch, Polish sickness, Sifilide, Sifilis, Spanish pockes, Syfilis, Treponema pallidum. ICD9: 090,091,092,093,094,095,096,097 ICD10: A50,A51,A52,A53</td>
</tr>
</tbody>
</table>

## Clinical

**WHO Case definition for surveillance:**
The signs and symptoms of syphilis are multiple.
- The primary stage usually, but not necessarily, involves ulceration of the external genital organs and local lymphadenopathy; secondary and tertiary syphilis show mainly dermatological and systemic manifestations. For surveillance purposes, only confirmed cases will be considered.

**Confirmed case**
- A person with a confirmed positive serology for syphilis (Rapid Plasma Reagin (RPR) or VDRL confirmed by TPHA (Treponema pallidum hemagglutination antibodies) or FTA (fluorescent treponemal antibody absorption)).

**Case classification**
- Congenital syphilis: An infant with a positive serology, whether or not the mother had a positive serology during pregnancy.
- Acquired syphilis: All others.

**Additional notes:**
- The prevalence rate among pregnant women in developing countries varies between 3% and 19%. Maternal syphilis is associated with congenital syphilis (one third of births from such pregnancies), and with spontaneous abortion and stillbirth.
  - Because the primary lesion is often painless and secondary syphilis is usually not diagnosed, women are mainly identified through serological screening.

Syphilis is a chronic disease with a waxing and waning course; and is reported from all countries.
- Transmission is mainly by sexual contact.
- Primary, secondary, and early latent syphilis are potentially infectious.
- Treponema pallidum has been identified in the blood of 34.5% of patients with early syphilis. 2

**Stages of syphilis:**
- Primary syphilis is characterized by a painless chancre at the site of inoculation. 3 Penile swelling without an overt chancre has also been reported. 4
- The secondary stage is characterized by a generalized (rarely localized 5 non-pruritic polymorphic 6-8 , pustular 9 or papulonecrotic 10 rash , lymphadenopathy, and systemic manifestations. 11-16 Moist flat genital or mucosal lesions (condyloma lata)17 or granulomatous dermatitis 18 may be evident.
- An asymptomatic latent period follows, which for epidemiological purposes is divided into early (<1 year) and late (>1 year) stages.
- The tertiary stage is the most destructive and is marked by cardiovascular 19 and neurological sequelae 20-25 , and gummatous involvement of any organ system. 26-31
- As of 2009, the world’s literature contained 165 reports of cerebral syphilitic gummata • 64% in men and 66% located on
Syphilis in Haiti

Seroprevalence surveys:

- 3% to 6% of low risk urban dwellers (Port-au-Prince) in 1990; 6% to 8% in 1991
- 3.5% of adult female outpatients with gynecological symptoms (2013 publication) 55
- 7.7% of rural women attending clinics (southwestern Haiti, 2014 publication) 56
- 4% of pregnant women during 1992 to 1993; 5.6% in 2000.
- 5.7% to 6.8% of pregnant women in the Artibonite Valley (1996) 58
- 11% of pregnant women in Cite Soleil (1995 publication) 59
- 7.6% of pregnant women in rural villages in the area of Jeremie (2004 to 2006) 60
- 4.2% of pregnant women (PAHO statistic) (2004) 63
- 0.8% of blood donors during 1999 to 2000
- 13.4% of clients of CSW in Gonaives and St. Marc (2008 publication) 62
- 21% of HIV-positive women (1992 publication) 63

This disease is endemic or potentially endemic to all countries.

References

35. Curr Opin Ophthalmol 2014 Sep 17;
38. J Fr Ophtalmol 2014 Mar 18;
Taeniasis

| Agent | PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: Taenia solium & T. saginata (other species occasionally encountered) |
| Reservoir | Cattle  Pig |
| Vector | None |
| Vehicle | Meat |
| Incubation Period | 6w - 14w |
| Diagnostic Tests | Identification of ova or proglottids in feces. |
| Typical Adult Therapy | Praziquantel 10 mg/kg PO as single dose OR Niclosamide 2 g PO once |
| Typical Pediatric Therapy | Praziquantel 10 mg/kg PO as single dose OR Niclosamide 50 mg/kg PO once |
| Clinical Hints | Vomiting and weight loss; often symptomatic or first appreciated due to passage of proglottids or "tape" segments; parasite may survive for over 25 years in the human intestine. |
| Synonyms | Bandwurmer [Taenia], Drepanidotaenia, Gordiid worm, Hair snake, Mesocestoides, Raillietina, Taenia asiatica, Taenia longihamatus, Taenia saginata, Taenia saginata asiatica, Taenia solium, Taenia taeniaformis, Taeniarhynchiasis, Tapeworm (pork or beef), Tenia. ICD9: 123.0,123.2 ICD10: B68 |

Clinical

Most cases of Taenia infestation are subclinical.

Symptomatic taeniasis may be associated with nausea, vomiting, epigastric fullness, weight loss or diarrhea.  
- Taenia saginata often becomes apparent when motile proglottids are passed through the anus; however, this is uncommon with T. solium infestations.  
- Eosinophilia is not a prominent finding.  
- Rare complications include appendicitis, cholangitis, cholecystitis, pancreatitis or intestinal obstruction.  
- The major complication of T. solium infection, Cysticercosis, is discussed separately in this module.

This disease is endemic or potentially endemic to all countries.

Taeniasis in Haiti

Prevalence surveys:  
0.3% of school children (2002)  

References

## Tetanus

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. <em>Clostridium tetani</em> An anaerobic gram-positive bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Animal feces Soil</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Injury</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>6d - 8d (range 1d - 90d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Isolation of C. tetani from wound is rarely helpful. Serology (specimen taken before administration of antitoxin).</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Human antitoxin (see Vaccine module). <em>Metronidazole</em> (2 g daily) or <em>Penicillin G</em> (24 million u daily) or <em>Doxycycline</em> (200 mg daily). Diazepam (30 to 240 mg daily). Tracheostomy, hyperalimentation</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Human antitoxin (see Vaccine module). <em>Metronidazole</em> (30 mg/kg daily); or <em>Penicillin G</em> (300,000 units/kilo daily). Diazepam. Tracheostomy, hyperalimentation</td>
</tr>
<tr>
<td>Vaccines</td>
<td>DT vaccine DTaP vaccine DTP vaccine Td vaccine Tetanus immune globulin Tetanus vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Trismus, facial spasm, opisthotonus, tachycardia and recurrent tonic spasms of skeletal muscle; sensorium is clear; disease may persist for 4 to 6 weeks; case fatality rate = 10% to 40%.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Lockjaw, Starrkrampf, Stelkramp, Tetano, Tetanos. ICD9: 037,771.3 ICD10: A33,A34,A35</td>
</tr>
</tbody>
</table>

### Clinical

Tetanus may present in any of four clinical forms: generalized, localized, cephalic, and neonatal.  
- In general, shorter incubation periods are associated with a worse prognosis. 
- Certain portals of entry (compound fractures) and underlying conditions (heroin addiction) are also associated with poorer prognoses. 
- A series of 11 cases of tetanus related to tungiasis (25% of all tetanus cases) was reported by a single hospital in Congo over an 11-month period (1989 publication). 
- An outbreak of 12 cases of tetanus in Argentina was reported among elderly women treated with sheep cell therapy (1996). 
- In some cases, tetanus was associated with chronic otitis media or injudicious attempts to remove foreign objects ("otogenic tetanus"). 
- Tetanus has been reported in a child who bit her own tongue during a convulsion and following a snake bite (2007 publication). 
- An attack of tetanus does not result in immunity. Therefore, recurrent tetanus is possible, unless the patient is given a series of toxoid following recovery. 

**Generalized tetanus**, the most common form, begins with trismus ("lockjaw") and risus sardonicus (increased tone in the orbicularis oris). 
- Abdominal wall rigidity may be present. 
- The generalized spasm consists of opisthotonic posturing with flexion of the arms and extension of the legs. 
- The patient does not lose consciousness, and experiences severe pain during these spasms. 
- Spasms often are triggered by sensory stimuli. 
- Respiration may be compromised by upper airway obstruction, or by participation of the diaphragm in the general muscular contraction. 
- Autonomic dysfunction, usually occurring after several days of symptoms, is currently the leading cause of death in tetanus. 
- Complications of tetanus include rhabdomyolysis and renal failure. 
- The illness can progress for two weeks, while the severity of illness may be decreased by partial immunity. 
- Recovery takes an additional month, but is complete unless complications supervene. 
- Lower motor neuron dysfunction may appear after the spasms remit, and persist for several additional weeks. 
- A case of *Clostridium tetani* bacteremia has been reported.
• Case-fatality rates of 10% to 50% are reported, but may be as high as 70% in Africa. 20
• The differential diagnosis of tetanus includes strychnine poisoning and neuromyotonia (Isaac's syndrome). 21

**Localized tetanus** presents as rigidity of the muscles associated with the site of inoculation.
• Initial symptomatology may be limited to back pain 22
• The illness may be mild and persistent, and tends to resolve spontaneously.
• Weakness and diminished muscle tone are often present in the most involved muscle.
• Localized tetanus is often a prodrome of generalized tetanus.

**Cephalic tetanus** is a form of localized disease affecting the cranial nerve musculature.
• Facial nerve weakness, is often apparent, and extraocular muscle involvement is occasionally noted.

**Neonatal tetanus** follows infection of the umbilical stump, most commonly as a result of a failure of aseptic technique following delivery of non-immune mothers.
• The condition usually manifests with generalized weakness and failure to nurse; followed by rigidity and spasms.
• The mortality rate exceeds 90%, and psychomotor retardation is common among survivors.
• Poor prognostic factors include age younger than 10 days, symptoms present for fewer than 5 days before presentation to hospital, fever, and the presence of risus sardonicus. 23
• Apnea is the leading cause of death in the first week of disease, and sepsis in the second week.
• Bacterial infection of the umbilical stump leads to sepsis in almost half of babies with neonatal tetanus.

The WHO Case definition for surveillance of neonatal tetanus is as follows:
• Suspected case: Any neonatal death between 3-28 days of age in which the cause of death is unknown; or any neonate reported as having suffered from neonatal tetanus between 3-28 days of age and not investigated.
• Confirmed case: Any neonate with a normal ability to suck and cry during the first two days of life, and who between 3 and 28 days of age cannot suck normally, and becomes stiff or has convulsions (i.e. jerking of the muscles) or both.
• Hospital-reported cases of neonatal tetanus are considered confirmed.
• The diagnosis is purely clinical and does not depend upon laboratory or bacteriological confirmation.

**This disease is endemic or potentially endemic to all countries.**

**Tetanus in Haiti**

**Vaccine Schedule:**

- BCG - birth, 10, 14 weeks
- DTwPHibHep - 6, 10, 14 weeks
- MR - 9 months
- OPV - birth; 6, 10, 14 weeks
- Pneumo conj - from April 2015
- Pneumo ps - from January 2015
- Rotavirus - from April 2014
- Td - 1st contact; +4 weeks; +6 months; +1, +1 years pregnant women

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Individual years:
2009 - A survey found that 92.0% of children ages 12 to 23 months had been immunized (DPT-1).
Notes:
1. 1983 - Haiti had the highest rate of tetanus for the Caribbean.
2. 985 cases (22% fatal) were reported during 1958 to 1972 (excluding neonatal tetanus).

References
# Thelaziasis

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>PARASITE - Nematoda. Phasmidea: Thelazia callipaeda [rarely T. californiensis]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Dog  Rabbit  Deer  Cat</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>Fly (? Musca and Fannia species)</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>not known</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Identification of parasite.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Extraction of parasite.</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Conjunctivitis and lacrimation associated with the sensation of an ocular foreign body.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Conjunctival spirurosis, Oriental eye worm, Rictularia, Thelazia californiensis, Thelazia callipaeda. ICD9: 372.15 ICD10: B83.8</td>
</tr>
</tbody>
</table>

## Clinical

The signs and symptoms of Thelaziasis are related to the presence of a worm in the conjunctival sac, and consist of pain, lacrimation and a foreign body sensation. 

**This disease is endemic or potentially endemic to all countries.**

## References

Toxic shock syndrome

Agent
BACTERIUM. *Staphylococcus aureus, Streptococcus pyogenes*, et al - (toxins) Facultative gram-positive cocci

Reservoir
Human

Vector
None

Vehicle
Tampon (occasionally bandage, etc) which induces toxinosis

Incubation Period
Unknown

Diagnostic Tests
Isolation of toxigenic *Staphylococcus aureus*. Toxin assay available in specialized laboratories.

Typical Adult Therapy
The role of topical (eg, vaginal) and systemic antistaphylococcal antibiotics is unclear; however, most authorities suggest intravenous administration of an anti-staphylococcal (anti-MRSA, anti-streptococcal as indicated) antibiotic.

Typical Pediatric Therapy
As for adult

Clinical Hints
Fever (>38.9), hypotension (<90 mm Hg) and dermal erythema with desquamation; respiratory, cardiac or other disease present; most cases associated with "super absorbent" tampon use or staphylococcal wound infection; case-fatality rate = 5% to 10%.

Synonyms
Streptococcal toxic shock syndrome, TSS. ICD9: 040.82 ICD10: A48.3

Clinical

**CDC (The United States Centers for Disease Control) case definition for surveillance**: For surveillance purposes, the CDC (The United States Centers for Disease Control) case definition of toxic shock syndrome requires an illness with the following clinical manifestations:

1. fever at least 38.9 C
2. diffuse macular erythema
3. desquamation 1 to 2 weeks after onset of illness (particularly of the palms and soles)
4. hypotension (less than 90 mm Hg for adults, or less than fifth percentile if below age 16 years • or orthostatic hypotension)
5. multisystem involvement, consisting of three or more of the following: acute vomiting or diarrhea; myalgia and elevation of creatine phosphokinase levels; vaginal, oropharyngeal or conjunctival hyperemia; elevation of blood urea nitrogen or creatine to at least twice normal, or sterile pyuria; elevation of serum bilirubin or aminotransferase levels to at least twice normal; platelet count < 100,000/ cu mm; disorientation or alteration in consciousness unrelated to fever and hypotension
6. laboratory examination
   • negative cultures of blood, throat or cerebrospinal fluid (however, *S. aureus* may be present in blood)
   • negative tests for measles, leptospirosis or rickettsiosis

A probable case requires at least five of the above clinical findings. A confirmed case requires all six clinical findings (unless the patient dies before desquamation can occur).

The case definition for Streptococcal toxic shock syndrome includes isolation of *Streptococcus pyogenes* in addition to:

1. hypotension as above
2. multiorgan involvement characterized by at least two of the following (defined above)
   • renal impairment
   • coagulopathy
   • hepatic dysfunction
   • acute respiratory distress syndrome
   • a generalized erythematous macular rash which may desquamate
   • soft tissue necrosis (fasciitis, myositis, gangrene)

This disease is endemic or potentially endemic to all countries.
References

**Toxocariasis**

<table>
<thead>
<tr>
<th><strong>Agent</strong></th>
<th>PARASITE - Nematoda. Phasmidea: Toxocara cati and canis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir</strong></td>
<td>Cat Dog Mouse</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td>Soil ingestion</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>1w - 2y</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td>Identification of larvae in tissue. Serology.</td>
</tr>
<tr>
<td><strong>Typical Adult Therapy</strong></td>
<td>Albendazole 400 mg BID X 5d. OR Mebendazole 100 to 200 mg PO bid X 5 days Add corticosteroids if eye, brain, heart or lung involvement is present.</td>
</tr>
<tr>
<td><strong>Typical Pediatric Therapy</strong></td>
<td>As for adult</td>
</tr>
<tr>
<td><strong>Clinical Hints</strong></td>
<td>Cough, myalgia, seizures, urticaria, hepatomegaly, pulmonary infiltrates or retrobulbar lesion; marked eosinophilia often present; symptoms resolve after several weeks, but eosinophilia may persist for years.</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Ascaris suum, Toxocara canis, Toxocara cati, Toxocarose, Visceral larva migrans. ICD9: 128.0 ICD10: B83.0</td>
</tr>
</tbody>
</table>

**Clinical**

Most infections present in children below the age of 5 years, and are asymptomatic or mild; however rare instances of infection are reported in adults. 1 2

Overt disease is characterized by fever, cough 3, wheezing, eosinophilia, myalgia, tender hepatomegaly and abdominal pain. 4

- A tender nodular rash may be present on the trunk and legs.
- Chronic urticaria, chronic pruritus, relapsing eosinophilic cellulitis 5 and eczema are also reported. 6
- Myocarditis 7-9, pericarditis 10 11, nodular pulmonary infiltrates 12, acute respiratory distress syndrome 13, seizures, nephritis, encephalopathy 14, spinal involvement (usually cervical or thoracic) including transverse myelitis 15 16, encephalomyelitis 17, cerebral vasculitis 18, brain abscess 19, Bell's palsy 20, eosinophilic meningitis 21-23, eosinophilic pneumonia 24 or pleural effusion 25 26, eosinophilic ascites 27 28, eosinophilic abscesses of the liver 29-31, cystitis 32 33 and renal dysfunction have been described in heavy infections.
- Eye disease is rare in toxocariasis. 34 Ocular toxocariasis usually presents in children ages 5 to 10 years, and is typically unilateral and characterized by formation of a retinal granuloma at or near the macula, resulting in strabismus, iridocyclitis, glaucoma, papillitis or visual loss. 35-42 Retinal vasculitis and neuroretinitis are also reported.
- Toxocariasis has been identified as a cause of chronic cough in childhood 44; and of asthma 45 and diminished lung function (FEV-1) at any age. 46 47
- In some cases, pulmonary and hepatic nodular lesions could be mistaken for malignancy. 48 49
- Toxocariasis has been implicated in the etiology of epilepsy 50 and decreased cognitive function among children. 51

*Ascaris suum*, a parasite of pigs, has been reported to cause rare cases of myelitis 52, encephalopathy 53, eosinophilic pneumonia 54-56 and focal liver lesions in humans. 57-61

- *A. suum* has been implicated in cases of eosinophilic colitis 62 and intestinal obstruction. 63

**This disease is endemic or potentially endemic to all countries.**

**References**

33. Cancer Res Treat 2014 Jul 18;
# Toxoplasmosis

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Protoza. Sporozoa, Coccidea, Eimeriida: <em>Toxoplasma gondii</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Rodent, Pig, Cattle, Sheep, Chicken, Bird, Cat, Marsupial (kangaroo)</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Transplacental, Meat ingestion, Soil ingestion, Water or milk (rare), Fly</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>1w - 3w (range 5d - 21d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Serology. Cultivation or identification of organisms per specialized laboratories. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td><em>Pyrimethamine</em> 25 mg/d + <em>Sulfonamides</em> 100 mg/kg (max 6g)/d X 4w - give with folic acid. Alternatives: <em>Clindamycin</em>, <em>Azithromycin</em>, <em>Dapsone</em>. <em>Spiramycin</em> (in pregnancy) 4g/d X 4w</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td><em>Pyrimethamine</em> 2 mg/kg/d X 3d, then 1 mg/kg/d + <em>Sulfonamides</em> 100 mg/kg/d X 4w - give with folic acid. Alternatives: <em>Clindamycin</em>, <em>Azithromycin</em>, <em>Dapsone</em>.</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Fever, lymphadenopathy and hepatic dysfunction; chorioretinitis; cerebral cysts (patients with AIDS); congenital hydrocephalus, mental retardation or blindness.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Toxoplasma, Toxoplasmosis, Toxoplasmosi. ICD9: 130 ICD10: B58</td>
</tr>
</tbody>
</table>

## Clinical

**Acquired toxoplasmosis:**
The clinical features of acquired toxoplasmosis can range from subclinical infection to lymphadenopathy (the most common presentation) to fatal, fulminant disease.
- In healthy adults, infection is usually subclinical, or mimics infectious mononucleosis; however, pharyngitis, posterior and posterior cervical lymphadenopathy are unusual in toxoplasmosis.
- Most patients with acute *Toxoplasma* lymphadenitis experience fatigue, headache, difficulty concentrating and muscle aches.  
- In immunocompromised hosts, toxoplasmosis may mimic other opportunistic infections, such as tuberculosis or infection with *P. jiroveci* (formerly *P. carinii*), or extensive varicella.
- In patients with AIDS, CNS involvement is the most common manifestation, followed by pulmonary disease.

**Congenital toxoplasmosis:**
The rate and severity of congenital toxoplasmosis are largely related to gestational age at the time of infection.
- Overt clinical signs appear to be more common among American infants vs. European infants with congenital toxoplasmosis.
- The brain and eyes are often affected, presenting as chorioretinitis, hydrocephalus, intracranial calcifications, and seizures.
- 97% of children infected during the first trimester of pregnancy and having normal antenatal ultrasounds are asymptomatic or only slightly affected.
- Rare instances of nephrotic syndrome complicating congenital toxoplasmosis have been reported.

**Ocular toxoplasmosis:**
Ocular toxoplasmosis occurs from reactivation of cysts in the retina.
- Focal necrotizing retinitis is characteristic lesion, and approximately 35% of all cases of retinochoroiditis can be attributed to toxoplasmosis.
- Risk factors for early (first two years of life) retinochoroiditis include a delay of >8 weeks between maternal seroconversion and the beginning of treatment, female gender, and the presence of cerebral calcifications.
- The incidence and severity of ocular toxoplasmosis varies from country to country.

**CNS toxoplasmosis:**
The manifestations of CNS toxoplasmosis in the immunocompromised patient range from an insidious process evolving over several weeks to acute onset of a confusional state.
- Signs may be focal or symmetrical.
- *T. gondii* has a predilection to localize in the basal ganglia and brain stem, producing extrapyramidal symptoms resembling...
Toxoplasmosis in Haiti

Seroprevalence surveys:
5.9% of persons in the rural southern region (1986 publication)

References

Toxoplasmosis and AIDS:
Patients with AIDS tend to present subacutely with nonspecific symptoms such as neuropsychiatric complaints, headache, fever, weight loss, confusion, or lethargy evolving over 2 to 8 weeks.
• Later findings include evidence of focal CNS mass lesions, ataxia, aphasia, hemiparesis, visual field loss, vomiting, confusion, dementia, stupor and seizures.
• Toxoplasmosis presenting as subcutaneous mass has been reported among HIV-positive patients.
• Primary cerebral lymphoma in AIDS patients may be mistaken for Toxoplasmosis.

This disease is endemic or potentially endemic to all countries.
Trachoma

Agent | BACTERIUM. Chlamydia trachomatis, type A
Reservoir | Human
Vector | Fly
Vehicle | Infected secretions Contact Fly Fomite
Incubation Period | 5d - 12d
Diagnostic Tests | Culture or direct immunofluorescence of secretions. Serology. Nucleic acid amplification.
Typical Adult Therapy | Azithromycin 1 g po as single dose. OR Doxycycline 100 mg/day PO X 21 days. Also administer topical Tetracycline
Typical Pediatric Therapy | Azithromycin 20 mg/kg as single dose. Also administer topical Tetracycline
Clinical Hints | Keratoconjunctivitis with palpebral scarring and pannus formation; 0.5% of infections result in blindness.
Synonyms | Egyptian ophthalmia, Granular conjunctivitis, Kornerkrankheit, Trachom, Tracoma.
ICD9: 076
ICD10: A71

Clinical

Early symptoms include erythema and swelling of both bulbar and palpebral conjunctivae, associated with a watery or purulent discharge. Additional findings may include preauricular lymphadenopathy and rhinitis. Examination reveals follicular hypertrophy and conjunctival scarring. Corneal scars (Herbert's pits), punctate keratitis and pannus formation may also be present. As scarring progresses, the eyelashes deviate (entropion) and may produce additional trauma and ulceration of the conjunctivae. Reinfection and bacterial superinfection are common and may contribute to the progression of follicular trachoma.

Trachoma may be differentiated from inclusion conjunctivitis by the presence of corneal scarring and a preference of the latter for the upper tarsal conjunctivae.

This disease is endemic or potentially endemic to all countries.

References
## Trichinosis

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Wild carnivore Omnivore Marine mammal</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Meat ingestion</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>10d - 20d (range 1w - 10w)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of larvae in tissue. Serology.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td><strong>Albendazole</strong> 400 mg PO BID X 14d. OR <strong>Mebendazole</strong> 200 to 400 mg PO tid X 3 days, then 400 to 500 mg PO. tid X 10 days. Give with prednisone 50 mg PO daily X 3 to 5 days (then 'taper' dosage)</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td><strong>Albendazole</strong> 7 mg/kg BID X 14 d. OR <strong>Mebendazole</strong> 200 to 400 mg PO tid X 3 days, then 400 to 500 mg PO. tid X 10 days. Give with prednisone 50 mg PO daily X 3 to 5 days (then 'taper' dosage)</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Early diarrhea and vomiting; subsequent myalgia, facial edema and eosinophilia; onset 1 to 4 weeks following ingestion of undercooked meat (usually pork); symptoms may persist for two months; case-fatality rate for symptomatic infection = 2%.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Trichinellose, Trichinellosis, Trichinose, Trikinose, Triquiniase, Triquinosis.</td>
</tr>
<tr>
<td></td>
<td>ICD9: 124 ICD10: B75</td>
</tr>
</tbody>
</table>

### Clinical

The great majority of infections are subclinical.
- The development of symptoms depends on the number of larvae ingested.

**Signs and symptoms:**

During the first week of illness, the patient may diarrhea, abdominal pain and vomiting.  
- Symptoms associated with larval invasion appear during the second week and include fever, periorbital edema, subconjunctival hemorrhages and chemosis.
- Myositis is also common, and often appears in the extraocular muscles, progressing to involve the masseters, neck muscles, limb and lumbar muscles.
- Additional symptoms may include headache, cough, dyspnea, hoarseness and dysphagia.
- Occasionally, a macular or petechial rash, or retinal or subungual splinter hemorrhages are seen.
- Hepatomegaly is common.
- Laboratory studies may reveal marked eosinophilia, hypoalbuminemia, decreased erythrocyte sedimentation rate, proteinuria or hematuria.
- Rare instances of renal dysfunction, encephalitis, heart failure, and eosinophilic meningitis have been reported.

**Clinical course:**

- Systemic symptoms usually peak 2 to 3 weeks after infection and then slowly subside; however, weakness may persist for weeks.
- A number of clinical findings may persist for several months: hypocalcemia, hypomagnesemia, fatigue, myalgia (notably in the legs), cardiovascular disorders, neurological, psychiatric, and allergic illnesses.
- Deaths are ascribed to myocarditis, encephalitis or pneumonia.

This disease is endemic or potentially endemic to all countries.

### Trichinosis in Haiti

Trichinosis, cases: None reported between 1998 and 1999
References

Trichomoniasis

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Protozoa. Archezoa, Parabasala, Trichomonadea. Flagellate: Trichomonas vaginalis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Sexual contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>4d - 28d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Microscopy of vaginal discharge. ELISA, culture, antigen detection tests available. Nucleic acid amplification.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Metronidazole or Tinidazole 2g PO as single dose to both sexual partners</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Metronidazole 5 mg/kg PO TID X 7d. OR Tinidazole 50 mg/kg PO X 1 (maximum 2 grams)</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Vaginal pruritus, erythema and thin or frothy discharge; mild urethritis may be present in male or female.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Pentatrichomonas, Tetratrichomonas, Trichomonaden, Trichomonas, Trichomonas vaginalis, Trichomiasis, Tritrichomonas.</td>
</tr>
<tr>
<td>ICD9:</td>
<td>131</td>
</tr>
<tr>
<td>ICD10:</td>
<td>A59</td>
</tr>
</tbody>
</table>

10% to 50% of infections are asymptomatic. • Symptoms often begin or worsen during the menstrual period. • Infection is usually characterized by vaginal discharge and vulvovaginal irritation. ¹ • Dysuria may be present, and dyspareunia is common. • As many as two thirds of infected women complain of a disagreeable odor. • Abdominal discomfort is present in 5% to 12%. Examination reveals a copious loose discharge that pools in the posterior vaginal fornix. ² • The discharge is yellow or green in 5% to 40%, and bubbles are observed in the discharge in 10% to 33%. ³ • The material has a pH above 4.5 in 66% to 91% of cases. • Endocervical disease is not caused by T. vaginalis. • Punctate hemorrhages (colpitis macularis or "strawberry cervix") are seen on colposcopically in 45% of infected women, but in only 2% by visual inspection alone. • Parasites can be recovered from the urethra and paraurethral glands in more than 95% of the women, and may explain the association of the infection with urinary frequency and dysuria. Reported complications of trichomonal vaginitis include vulvar ulceration ⁴, and vaginitis emphysematosa • the presence gas-filled blebs in the vaginal wall. ⁵ • Gestational trichomoniasis may be associated with premature labor and low birth weight, postabortal infection or premature rupture of the membranes. • Spread of trichomonads beyond the lower urogenital tract is extremely rare. • Rare cases of Trichomonas vaginalis conjunctivitis have been reported in adults. ⁶-⁹ • Sporadic cases of neonatal pneumonia due to Trichomonas vaginalis are reported. ¹⁰ ¹¹ Trichomoniasis has been associated with endometritis, adnexitis, pyosalpinx, infertility, preterm birth, low birth weight, bacterial vaginosis, and increased risk of cervical cancer, HPV, and HIV infection. ¹² • In men, its complications include urethritis, prostatitis, epididymitis, and infertility through interference with sperm function. ¹³ Most men carrying trichomonads are asymptomatic; however, the organism is implicated in 5% to 15% of patients with nongonococcal urethritis. • The discharge from trichomonal urethritis is usually milder than that seen with other infections. • Epididymitis, superficial penile ulcerations (often beneath the prepuce) and prostatitis are also described. Tritrichomonas foetus pneumonia ¹⁴ and peritonitis have been reported in immunosuppressed patients. ¹⁵ • Trichomonas tenax has been reported to cause pneumonia in an immunosuppressed patient. ¹⁶
This disease is endemic or potentially endemic to all countries.

**Trichomoniasis in Haiti**

**Prevalence surveys:**
- 0% of microscopic examinations among adult female outpatients with gynecological symptoms (2013 publication) 17
- 13.5% to 19.9% of rural women attending clinics (southwestern Haiti, 2014 publication) 18
- 25.4% of pregnant women in the Artibonite Valley (1996) 19
- 35% in Cite Soleil (1995 publication) 20
- 13.7% of rural men with urethritis (2014 publication) 21

**References**

Clinical Trichuriasis

### Agent
PARASITE - Nematoda. Adenophorea: Trichuris trichiura

### Reservoir
Human

### Vector
None

### Vehicle
Soil ingestion  Sexual  contact (rare)  Fly

### Incubation Period
2m - 2y

### Diagnostic Tests
Stool microscopy or visualization of adult worms (adults are approximately 3 cm long).

### Typical Adult Therapy
- **Mebendazole**: 100 mg PO BID X 3d. OR  **Albendazole**: 400 mg PO daily X 3 to 7 days OR  **Ivermectin**: 200 mg/kg PO daily X 3 days

### Typical Pediatric Therapy
- **Albendazole**: 200 mg PO single dose OR  **Mebendazole**: 100 mg BID X 3 d (> age 2). OR  **Ivermectin**: 200 mg/kg PO daily X 3 days

### Clinical Hints
- Abdominal pain, bloody diarrhea, rectal prolapse or intestinal obstruction are occasionally encountered; the parasite may survive for as long as five years in the human host.

### Synonyms
Trichocephaliasis, Trichuris trichiura, Tricuriasis, Whipworm.

ICD9: 127.3
ICD10: B79

---

### Clinical

The vast majority of infections are asymptomatic.  
- Symptoms are aggravated by concurrent shigellosis, balantidiasis or amebiasis.
- Heavy infestations are characterized by dysentery or rectal prolapse.  
- Infants may develop hypoproteinemia, anemia, mental retardation and digital clubbing.
- In some cases, chronic infection may result in edema of the ileocecal valve, suggestive of "malignancy"

**This disease is endemic or potentially endemic to all countries.**

### Trichuriasis in Haiti

**Prevalence surveys:**
- 7.3% of school children (2002)

### References

Tropical phagedenic ulcer

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM Mixed infection by ? Fusobacterium species and Borrelia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Direct inoculation ? via minor trauma</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Wound smear suggestive of fusobacterial infection.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Systemic Penicillin G . Excision/debridement as necessary</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>A deep, painful, foul-smelling ulcer (usually of the leg) with undermined edges; may be complicated by secondary infection.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Acute phagadenic ulcer, Aden ulcer, Delagoa sore, Malabar ulcer, Naga sore, Rhodesian sore, Tropical sloughing phagedaena.</td>
</tr>
</tbody>
</table>

**Clinical**

95% of ulcers involve the ankle or lower third of the leg.
- Minor trauma is followed by a tender indurated area which evolves into a round or oval skin ulcer.  
- Ulcers favor the lower extremities, and tend to be single, painful and foul-smelling.
- Ulcers spread rapidly, and result in exposure of underlying muscles and tendons.
- Fever and restlessness are common.
- After 4 or more weeks, ulcers may become painless and chronic, and persist for decades.
- Scar carcinomas develop in 2% of cases, and constitute a common form of malignancy in parts of Africa.

**This disease is endemic or potentially endemic to 69 countries.**

**References**

Tropical pulmonary eosinophilia

Agent | UNKNOWN Possibly related to filarial infection
Reservoir | Unknown
Vector | Unknown
Vehicle | Unknown
Incubation Period | Unknown
Diagnostic Tests | Antifilarial antibodies may be present. Response to therapeutic trial.
Typical Adult Therapy | Diethylcarbamazine 2 mg/kg PO TID X 21d
Typical Pediatric Therapy | As for adult
Clinical Hints | Chronic cough, wheezing, dyspnea, reticular-nodular pulmonary infiltrates and eosinophilia (over 3,000/cu. mm.) acquired in countries known to be endemic for filariasis.

Clinical

Tropical pulmonary eosinophilia is characterized by recurrent episodes of paroxysmal, dry cough, wheezing, and dyspnea. 1-3
• Malaise, anorexia, and weight loss are common.
• Symptoms are worse and night.
• Physical examination reveals scattered wheezes and crackles.
• Some patients have fever, hepatomegaly and lymphadenopathy.
• Symptoms fluctuate in severity over many months.

Eosinophilia is present in the majority of patients, often at very high levels (as high as 60,000/cu mm) • however, the level of eosinophilia is not related to the severity of symptoms.
• Chest radiographs reveal scattered reticulonodular opacities 4 which may be mistaken for miliary tuberculosis. 5
• Serum antibodies to filaria are present.
• A presumptive clinical diagnosis can usually be made through successful response to antifilarial therapy.
• A second course may be necessary in some cases.

This disease is endemic or potentially endemic to 109 countries.

References

Tropical sprue

<table>
<thead>
<tr>
<th>Agent</th>
<th>UNKNOWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Unknown</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Unknown</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Unknown - probably at least 6 months</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Typical functional, roentgenographic and histological changes in bowel. Prompt response to therapy.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Tetracycline 250 mg PO QID + folate 5 mg PO daily. Administer for 6 months</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Nonabsorbable sulfa drug + folate. Administer for 6 months</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Chronic (months to years) diarrhea, bloating, weight loss, anemia; occasional early fever, glossitis, neuropathy, dermatitis, nausea; malabsorption of fats, protein &amp; minerals.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Hill diarrhea, Postinfectious tropical malabsorption. ICD9: 579.1 ICD10: K90.1</td>
</tr>
</tbody>
</table>

**Clinical**

Illness is characterized by delayed onset (ie, expatriates are usually affected only 6 or more months following arrival), soft mucous diarrhea, weight loss and anorexia.  
- Subsequent anemia, stomatitis, lactose intolerance, vitamin and mineral malabsorption, neuropathy and dermatitis may ensue.
- Rapid response to therapy is virtually diagnostic.

**This disease is endemic or potentially endemic to 28 countries.**

**References**

Tuberculosis

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Actinomycetes, <em>Mycobacterium tuberculosis</em> An aerobic acid-fast bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human, Cattle</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Air, Dairy products</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>4w - 12w (primary infection)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Microscopy. Culture. Nucleic acid amplification. Inform laboratory when this diagnosis is suspected.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Respiratory isolation. Typical pulmonary infection is treated with 6 months of <em>Isoniazid</em>, <em>Rifampin</em> &amp; <em>Pyrazinamide</em></td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Vaccine</td>
<td>BCG vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Cough, &quot;night sweats&quot; and weight loss; often presents as prolonged fever (FUO) or infection of bone, meninges, kidneys or other organs; most infections represent reactivation of old foci in lungs, brain, bone, kidneys etc.</td>
</tr>
</tbody>
</table>

Clinical

WHO Case definition for surveillance:
Pulmonary tuberculosis, sputum smear positive (PTB+)
- Tuberculosis in a patient with at least two initial sputum smear examinations (direct smear microscopy) positive for Acid-Fast Bacilli (AFB), or
- Tuberculosis in a patient with one sputum examination positive for acid fast bacilli and radiographic abnormalities consistent with active pulmonary tuberculosis as determined by the treating medical officer, or
- Tuberculosis in a patient with one sputum specimen positive for acid-fast bacilli and at least one sputum that is culture positive for acid-fast bacilli.

Pulmonary tuberculosis, sputum smear negative (PTB-)
Tuberculosis in a patient with symptoms suggestive of tuberculosis and having one of the following:
- Three sputum specimens negative for acid-fast bacilli
- Radiographic abnormalities consistent with pulmonary tuberculosis and a lack of clinical response to one week of a broad-spectrum antibiotic
- Decision by a physician to treat with a full curative course of antituberculous chemotherapy

Pulmonary tuberculosis, sputum smear negative, culture positive
- Tuberculosis in a patient with symptoms suggestive of tuberculosis and having sputum smear negative for acid-fast bacilli and at least one sputum that is culture positive for *M. tuberculosis* complex
- Extra-pulmonary tuberculosis
- Tuberculosis of organs other than lungs: pleura, lymph nodes, abdomen, genito-urinary tract, skin, joints and bones, tuberculous meningitis, etc.
- Diagnosis should be based on one culture positive specimen from an extra-pulmonary site, or histological or strong clinical evidence consistent with active extra-pulmonary tuberculosis, followed by a decision by a medical officer to treat with a full course of anti-tuberculous therapy
- Any patient diagnosed with both pulmonary and extra-pulmonary tuberculosis should be classified as a case of pulmonary tuberculosis

The clinical features of tuberculosis are protean, and largely determined by the site of infection and clinical substrate.
- Most infections represent reactivation of a dormant focus in a lung, with resultant chronic fever, weight loss, nocturnal diaphoresis, productive cough and typical roentgenographic findings.
- Reactivation of an extrapulmonary focus (kidney, bone, central nervous system, skin, gastrointestinal and hepatobiliary system, eyes, skeletal muscle, reproductive tract, breast, etc) will result in signs referable to the infected organ.
- The extent and severity of disease are influenced by patient age, nutrition, immune function, and many other
factors which are beyond the scope of this module.

- Nocardiosis may mimic tuberculosis, particularly in the setting of HIV infection.\(^\text{28}\)
- The appearance of a miliary infiltrates in tropical pulmonary eosinophilia\(^\text{29}\) or *Chlamydia pneumoniae* infection may suggest a diagnosis of tuberculosis.\(^\text{30}\)
- Spinal histoplasmosis may mimic tuberculosis spondylodiscitis\(^\text{31}\); and gastrointestinal histoplasmosis may mimic abdominal tuberculosis.\(^\text{32}\)
- Rare instances of tuberculous septic shock are reported.\(^\text{33}\)
- The clinical features of melioidosis are similar to those of tuberculosis: prolonged fever, weight loss, latency with reactivation, upper-lobe infiltrates, etc.\(^\text{34-38}\)
- The pulmonary and cerebral manifestations of paragonimiasis are similar to those of tuberculosis.\(^\text{39}\)
- Tularemia\(^\text{40, 41}\) and leprosy may manifest as lymphadenopathy mimicking tuberculosis.\(^\text{42}\)

This disease is endemic or potentially endemic to all countries.

### Tuberculosis in Haiti

**Vaccine Schedule:**

- BCG - birth, 10, 14 weeks
- DTwPHibHep - 6, 10, 14 weeks
- MR - 9 months
- OPV - birth; 6, 10, 14 weeks
- Pneumo conj - from April 2015
- Pneumo ps - from January 2015
- Rotavirus - from April 2014
- Td - 1st contact; +4 weeks; +6 months; +1, +1 years pregnant women

![Graph: Haiti. Tuberculosis - WHO-UNICEF est. % BCG coverage - GIDEON](https://www.gideononline.com/gideon/Graphs/343_Haiti_Tuberculosis_BCG_coverage.png)

Note:

Individual years:
2009 - A survey found that 87.3% of children ages 12 to 23 months had been immunized.\(^\text{43}\)
Graph: Haiti. Tuberculosis, cases - GIDEON

Graph: Haiti. Tuberculosis, estimated (WHO) deaths - GIDEON

Notes:
Individual years:
2007 - Also see reference 44

Tuberculosis and HIV infection:
- 19% of patients are HIV-positive (1992 to 1993); 50% of tuberculosis patients have AIDS (1991).
- The incidence of tuberculosis among persons living with HIV is 7.5% per year (1986 to 1989). 45
- 17% of HIV-infected patients are PPD-positive.
In 2007, 1.8% of cases were caused by multi-drug resistant *Mycobacterium tuberculosis*.

**References**

1. Acad Emerg Med 2000 Sep ;7(9):1056-60.
44. ProMED <promedmail.org> archive: 20100207.0409
Tungiasis

<table>
<thead>
<tr>
<th>Agent</th>
<th>PARASITE - Insecta Siphonaptera (Flea), Tungidae: Tunga penetrans and T. trimamillata (&quot;sand fleas&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Pig, Dog, Various other mammals</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>8d - 12d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Identification of parasite.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Extraction of parasite Ivermectin has been advocated in some publications.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Painful papule or nodule, usually on the feet - may be multiple; begins 1 to 2 weeks after walking on dry soil; secondary infections and tetanus are described.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Bicho de pe, Chica, Chigger, Chigoe flea, Jigger, Nigua, Puce-chique, Tu, Tunga penetrans, Tunga trimamillata, Tungosis.</td>
</tr>
</tbody>
</table>

ICD9: 134.1
ICD10: B88.1

Clinical

Virtually all infestations are limited to the foot, notably the interdigital and periungual regions.  
- Ectopic infections are occasionally noted on the hands, elbows, thighs or gluteal region and even the eyelids and tongue.  
- Irritation begins 8 to 12 days following infection, and is manifested as a small "pit" which evolves into a circular ulcer associated with pain, edema, erythema and pruritis.  
- On dermoscopy, circumferential rings may be evident surrounding a central black lesion - the "radial crown" sign.  
- Secondary bacterial infection, thrombophlebitis or even tetanus may follow.  
- Most infestations are characterized by 2 to 3 fleas, although hundreds may occasionally be present.  
- Severe disease may be characterized by deep ulcerations, necrosis leading to denudation of underlying bone, and auto-amputation of digits.  
- Ectopic infection (hands, elbows, knees, neck, anus and genitals) is encountered, often in small children.  
- Studies in an endemic region of Brazil revealed 17 lesions (maximum 98) per patient, and almost all had nail deformation and edema.  
- Nail loss (46%), pain and fissures (70%), digit deformation (25%), abscesses (42%), and walking difficulty (59%) were common. (Brazil, 2007 publication)

A series of 11 cases of tetanus related to tungiasis (25% of all tetanus cases) was reported by a single hospital in Brazzaville over an 11-month period (1989 publication).  
- Tungiasis is implicated in the etiology of 10% of tetanus cases in Sao Paulo, Brazil (2001 publication).  

This disease is endemic or potentially endemic to 89 countries.

Tungiasis in Haiti

Notable outbreaks:

2004 - An outbreak (132 cases) was reported in a rural area.

References

Typhoid and enteric fever

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Salmonella serotype Typhi (other Salmonella species cause 'paratyphoid' fever) A facultative gram-negative bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Fecal-oral Food, Fly Water</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>15d - 21d (range 5d - 34d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Culture (blood, urine, sputum culture). Stool usually negative unless late, untreated infection. Serology.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Ceftriaxone 2 g IV q12h to q 24h X 5 to 7d. OR Azithromycin 1 gram PO on day 1; then 500 mg days 2 to 7. Fluoroquinolones resistance common - not recommended for empiric therapy. Add corticosteroids if evidence of shock or decreased mental status.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Ceftriaxone 50 to 80 mg/kg IV daily X 5 to 7d. OR Azithromycin 15 mg/kg PO on day 1; then 7.5 mg/kg on days 2 to 7.</td>
</tr>
<tr>
<td>Vaccines</td>
<td>Typhoid - injectable vaccine Typhoid - oral vaccine</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Transient diarrhea followed by fever, splenomegaly, obtundation, rose spots (during second week of illness); leukopenia and relative bradycardia often observed; case fatality rate = 0.8% (treated) to 15% (untreated).</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Abdominal typhus, Abdominaltyphus, Buiktyphus, Enteric fever, Febbre tifoide, Febbre tifoide, Fiebre tifoidea, Paratifoidea, Paratyfus, Paratyphoid, Salmonella serotype Typhi, Tyfoid, Typhoid, Typhoide.</td>
</tr>
</tbody>
</table>

Enteric fever is a defined syndrome of systemic illness associated with Salmonella infection.
- Enteric fever caused by S. typhi is referred to as "typhoid fever," and that caused by S. paratyphi, is referred to as "paratyphoid fever."
- Symptoms are often nonspecific and insidious in onset. 1 2
- The differential diagnosis of fever, abdominal pain with hepatosplenomegaly also includes malaria, amebic liver abscess, brucellosis 3, visceral leishmaniasis, and dengue fever.
- The clinical features of scrub typhus 4 and melioidosis may also mimic those of enteric fever. 5

Acute illness:
Following an incubation period of 5 to 21 days, an initial enterocolitis may develop without associated fever.
- Constipation is present in 10 to 40% of patients; abdominal pain 20 to 40%; hepatosplenomegaly in 50%.
- Such symptoms as chills, diaphoresis, headache, anorexia, cough, sore throat, vertigo and myalgia often precede the onset of fever.
- Psychosis or confusion ("muttering delirium") occur in 5 to 10%, encephalopathy in 21%, 6 and seizures and coma in less than 1%.
- Patients appear acutely ill.
- Cervical lymphadenopathy develops in some patients, and pulmonary disease is rare at this stage.
- 3% have signs and symptoms of cholecystitis, and jaundice is reported in as many as 12% of cases. 7
- Instances of "typhoid hepatitis" appear to represent super-infection by hepatitis virus, rather than a complication of typhoid fever. 8

Course of illness and complications:
Symptoms resolve by the fourth week of infection without antimicrobial therapy.
- Weight loss, and debilitation may persist for months, and 10% of patients will experience a relapse.
- Relapse is more common among antibiotic-treated than non-treated patients.
- Intestinal perforation is characterized by recurrent fever, abdominal pain, intestinal hemorrhage and tachycardia occurring in the 3rd to 4th week of illness. 65.7% of perforations are solitary and involved the anti-mesenteric border of the terminal ileum 9-12 There is a male predominance among patients with typhoidal perforation. 13 During a typhoid fever outbreak in
Typhoid and enteric fever in Haiti

Uganda, 43% of patients presented with intestinal perforation. The case-fatality rate for typhoidal perforation in developing countries is 15.4% (meta-analysis, 1991 to 2011).  
- 70% of pregnancies will end in miscarriage when complicated by untreated typhoid.
- Instances of acalculous cholecystitis, gall-bladder perforation, pancreatitis, intestinal intussusception, rhabdomyositis, renal failure, genital ulceration, spondylitis/spondylodiscitis, transverse myelitis, cranial nerve palsy, Guillain-Barre syndrome, catatonia with parkinsonism, cerebral venous sinus thrombosis, myocarditis, endophthalmitis and ectopic abscesses have been reported in typhoid patients.
- The case-fatality rate among untreated cases is 10% to 15%

Carrier state:
The carrier state is defined as persistent shedding of *Salmonella typhi* in stool and/or urine for >=12 months.  
- Approximately 5% of people who contract typhoid continue to carry the disease after they recover.
- Long-term carriage is associated with an increased incidence of cancers of the gallbladder, pancreas, colo-rectum and lung.

Vertical transmission of *Salmonella typhi* to the fetus has been documented.

Laboratory findings include leukopenia (albeit an initial leucocytosis is common), thrombocytopenia, coagulopathy and hepatic dysfunction.
- The most sensitive laboratory test for enteric fever is blood culture.
- Serum transaminase elevations appear to reflect myopathy rather than hepatic disease in most cases.

This disease is endemic or potentially endemic to all countries.

**Typhoid and enteric fever in Haiti**

![Graph: Haiti. Typhoid and paratyphoid, cases - GIDEON](image)

Notes:
1. During 1943 to 1949, the mean annual incidence was 222 cases.
Epidemics were reported in low-income areas of Port-au-Prince in 1991; and in the south during 1992 to 1993.

**Notable outbreaks:**

1991 - An outbreak (6 cases) was reported among Swiss students in Haiti.  
2003 - An outbreak (200 cases, 40 fatal) was reported in the Grand Bois area.
References

38. World J Gastroenterol 2010 Nov.21;16(43):5395-404.
53. Trends Parasitol 2014 Jun 6;
Typhus - endemic

Agent | BACTERIUM. Rickettsia typhi
Reservoir | Rat
Vector | Flea (Xenopsylla or Nosopsyllus spp.)
Vehicle | None
Incubation Period | 10d - 12d (range 4d - 18d)
Diagnostic Tests | Serology. Identification of rickettsiae in smear or culture of skin lesions. Nucleic acid amplification.
Typical Adult Therapy | Doxycycline 100 mg BID X 7d
Typical Pediatric Therapy | Doxycycline 2 mg/kg BID X 7d (maximum 200 mg/day); or Chloramphenicol 12.5 mg/kg QID X 7d
Clinical Hints | Fever, headache and myalgia; truncal maculopapular rash (present in 60%) appears on days 3 to 5 and persists for 4 to 8 days; fever resolves after 12 to 16 days; case fatality rate (untreated) = 2%
Synonyms | Endemic typhus, Murine typhus, Rickettsia typhi, Ship typhus, Tifo murino, Tifus pulgas, Vlektyphus.
ICD9: 081.0
ICD10: A75.2

Clinical

The features of endemic typhus are similar to those of epidemic typhus, but less severe.  
- Headache and myalgia predominate.
- The rash is nonspecific and may be lacking in 50% of patients.
- Major complications are rare.
- The severity of infection has been associated with old age, delayed diagnosis, hepatic and renal dysfunction, central nervous system abnormalities, and pulmonary compromise.
- Ocular complications include uveitis, retinal hemorrhage, choroidal dots, papilledema and optic neuritis.
- Rare instances of meningoencephalitis, splenic infarction, myositis, Perinaud’s oculoglandular syndrome, acute respiratory distress syndrome and hemophagocytic syndrome have been reported.
- As many as 4% of hospitalized cases are fatal.

This disease is endemic or potentially endemic to all countries.

References

Clinical

Young children often exhibit nonspecific signs such as fever, poor feeding and vomiting.  
• Abdominal pain may be present.  
• After early childhood, dysuria, urgency, and frequency are generally present in UTI.  
• Adult women with cystitis have frequent and urgency, often with lower abdominal or lower back pain.  
• The urine may be foul smelling or turbid and is often bloody.  
• Onset of symptoms is usually abrupt.  
• Some infections progress to upper tract involvement, with fever, rigors, nausea, vomiting, abdominal and flank pain.  
• Classical signs of "upper" vs. "lower" UTI are often misleading and do not necessarily point to the location of infection.  

In the elderly, UTIs are often asymptomatic or manifest by nonspecific signs.  
• Frequency, urgency, nocturia, and incontinence in this age group may also mimic other disorders in this age group.  
• Infection associated with neurogenic bladders and indwelling catheters may not necessarily present with localizing symptoms.  

Acute uncomplicated cystitis is most common in young women but may also be seen in men, children or the elderly.  
• Typical symptoms include dysuria, frequency, urgency, and suprapubic or pelvic pain.  
• Suprapubic tenderness is present in 10 to 20 percent, and gross hematuria in 20 to 30 percent.  
• Approximately ten percent of patients with symptoms of acute cystitis will be found to have occult infection of the upper urinary tract.  
• Bacterial vaginosis may predispose to urinary tract infection  

Acute pyelonephritis presents with flank, low back, or abdominal pain, in addition to fever, rigors, sweats, headache, nausea, vomiting, malaise, and prostration.  
• Antecedent or concomitant symptoms of cystitis may or may not be present.  
• Fever and flank pain are relatively specific indicators of renal infection.  
• A minority of patients with pyelonephritis develop septicemia, or necrotizing renal or perinephric abscesses.  
• The latter are often associated with urinary tract obstruction or diabetes [see Perinephric abscess].  

All urinary infections in males should be considered complicated until proven otherwise, and prompt a careful search for anatomical or functional abnormality of the urinary tract.  

Comprehensive reviews of prostatitis.  

This disease is endemic or potentially endemic to all countries.
References

6. BMC Infect Dis 2008;8:12.
**Vaccinia and cowpox**

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - DNA. Poxviridae, Orthopoxvirus. Cowpox virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Cattle, Cat, Rodent</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Cattle, Cat</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2d - 4d</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Viral isolation from skin exudate or biopsy. Nucleic acid amplification. Biosafety level 3.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Secretion precautions; supportive. In severe cases, Tecovirimat, 400 to 600 mg PO OD X 14 d.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Vaccine</td>
<td>Vaccinia immune globulin</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Vesicles or pustules (usually on hand) progressing to crusts; painful regional lymphadenopathy; follows contact with infected animals or smallpox vaccination (largely abandoned); see Buffaloopox (India note).</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Aracatuba, Buffaloopox, Camelpox, Cantagalo, Cowpox, Passatempo, Vaccinia, Vaiolo. ICD9: 051.0 ICD10: B08.0</td>
</tr>
</tbody>
</table>

**Clinical**

Cowpox is characterized by single or multiple vesicles of the hands or face, which evolve to pustules that may persist for two or more months.  
- The surrounding tissues are swollen and painful, and tender regional adenopathy is present.  
- Most lesions occur on the thumbs, forefinger and first interdigital cleft.  
- Secondary lesions may appear on the hands, forearms or face through self-inoculation.  
- Facial cellulitis with necrotizing lymphadenitis has been reported.  
- Vaccinia infections caused by unintentional transfer from vaccination sites usually involve the face, nose, mouth, lips, genitalia, anus, or eye.  
- Poxviruses are known to remain infectious in the scabs of patients for months to years.  
- Infectious virus is present at the site of primary vaccination for at least 21 days.  

The rash evolves as follows:  
- One to six days following inoculation), an inflamed macule appears at the site of contact.  
- On days 7 to 12, the lesion becomes papular, then vesicular.  
- On days 13 to 20, the vesicle becomes hemorrhagic and then pustular, and tends to ulcerate, with surrounding edema and induration. Secondary contiguous lesions may appear.  
- After 3 to 6 weeks, the vesicopustule progresses to a hard, black eschar  
- Often surrounded by edema, induration and erythema.  
- At weeks 6 to 12, the eschar sloughs, and the lesion heals with scarring.  
- Additional findings include lethargy, vomiting, sore throat, conjunctivitis, periorbital edema and keratitis during the early phase of infection.  
- A generalized rash does not occur.  

One case of post-cowpox encephalitis has been reported.  
- During 2002 to 2010, cases of vulvar vaccinia in the United States were acquired through sexual exposure to recently-vaccinated military personnel.  

Previous smallpox vaccination may attenuate the severity of infection.  

The clinical features of buffaloopox include fever, lymphadenopathy and pox lesions on the hands (acquired from contact with the udders of cattle).  

Camelpox virus infection in humans is characterized by papules, vesicles, ulceration and finally scabs over fingers and hands (eg, areas in contact with infected camels).
This disease is endemic or potentially endemic to 180 countries.

References

3. ProMED <promedmail.org> archive: 20070503.1443
9. ProMED <promedmail.org> archive: 20130228.1564715
### Varicella

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - DNA. Herpesviridae, Alphaherpesvirinae: Human Herpesvirus 3 (Varicella-zoster virus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Air Direct contact</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>2w - 3w</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Respiratory isolation. Severe/complicated cases: Acyclovir 10 to 12 mg/kg IV q8h X 7d Adolescent / young adult: 800 mg PO X 5 per day X 7 d. Alternatives: Valacyclovir 1 g PO TID; or Famciclovir 500 mg PO TID</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Respiratory isolation. Acyclovir [severe/complicated cases] 150 mg/sq m IV q8h X 7d</td>
</tr>
<tr>
<td>Vaccines</td>
<td>Varicella vaccine</td>
</tr>
<tr>
<td></td>
<td>Varicella-Zoster immune globulin</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Cough and fever followed by a pruritic papulovesicular rash after 1 to 2 days; pneumonia is often encountered; case fatality rate = 4.3 per 100,000 cases (7% in immune-suppressed patients).</td>
</tr>
<tr>
<td></td>
<td>ICD9: 052</td>
</tr>
<tr>
<td></td>
<td>ICD10: B01</td>
</tr>
</tbody>
</table>

#### Clinical

**Acute infection:**
The predominant features of varicella are fever, cough, malaise, lymphadenopathy and a generalized pruritic vesicular rash typically consisting of 250 to 500 lesions.
- The rash generally begins on the scalp and proceeds to the trunk and extremities, with most lesions on the trunk.
- Skin lesions are initially maculopapular, progressing to vesicles on an erythematous base. 1
- Atypical varicella, including lesions on palms and soles, may mimic monkeypox in endemic areas. 2

**Complications:**
Complications include hepatitis 3-4, encephalitis (10% of hospitalized cases; notably involving the cerebellum) 5-8, myelitis 9, arthritis 10, secondary bacterial infections, Reye's syndrome, disorders of the facial 11-13 and other cranial nerves 14, cerebellar mutism 15, meningitis 16, cerebral venous thrombosis 17, 18, transverse myelitis 19, Guillain-Barre syndrome 20, sudden deafness 21, peripheral facial palsy 22, acute urinary retention 23, pancreatitis 24-25, appendicitis 26, pneumonia 27-29, empyema 30, acute respiratory distress syndrome (ARDS) 31-34, spontaneous pneumothorax 35, myocarditis 36, atroventricular block 37, hemorrhagic pericarditis 38, 39, optic neuritis 40-42, uveitis 43, acute retinal necrosis 44, 45, necrotizing scleritis 46, 47, deep venous thrombosis or thromboembolism 48, purpura fulminans 49, 50, idiopathic thrombocytopenic purpura 51, marked thrombocytopenia 52, and hemophagocytic lymphohistiocytosis. 53
- Pyomyositis 54, osteomyelitis 55, necrotizing fasciitis or Fournier's gangrene may occasionally complicate varicella 56
- Post varicella cerebral infarction has been described in young, previously healthy children within a few months of VZV infection and is characterized by middle cerebral artery territory infarction and proximal MCA disease. 57, 58 A similar condition has been reported in immunocompromised patients following herpes zoster involving the ophthalmic branch of the trigeminal nerve as well as in the context of primary varicella complicated by granulomatous angiitis 59 Extra-cranial vascular thrombosis of large or small vessels has also been reported 60
- VZ virus infection may be associated with facial nerve palsy 61 or Ramsay-Hunt syndrome (Bell palsy unilateral or bilateral, vesicular eruptions on the ears, ear pain, dizziness, preauricular swelling, tingling, tearing, loss of taste sensation, and nystagmus) 62
- Immunocompromised individuals, neonates, infants, adolescents and adults are at risk of severe illness and complications. 63-65
- VZ virus infection can be a presenting symptom of hyperparathyroidism and occurs twice as often in persons with hypercalcemia than age-matched controls. 66
- Use of nonsteroidal anti-inflammatory drugs during primary varicella, has been implicated as a risk factor for subsequent occurrence of streptococcal necrotizing fasciitis.
Anterior uveitis • differential diagnosis:

Anterior uveitis due to Rubella virus is characterized by younger age at onset and a chronic course, typically associated with cataract at presentation. 67

• Rubella virus has been implicated in the etiology of Fuchs heterochromic iridocyclitis. 68

• Anterior uveitis due to Herpes simplex and Varicella-Zoster viruses is more common in adults, and often follows an acute course.

• Herpes simplex anterior uveitis presents with conjunctival redness, corneal edema, a history of keratitis, and the presence of posterior synechia. Anterior chamber inflammation is common with Herpes simplex virus, while vitritis is more common with Rubella and Varicella-Zoster virus.

• Rubella, Herpes simplex and Varicella-zoster viruses are associated with intraocular pressure of more than 30 mmHg and development of glaucoma (18%-30%; P = 0.686).

• Focal chorioretinal scars were present in 22% of Rubella cases, 0% of HSV and in 11% of VZV uveitis cases.

Perinatal infection: 69 70

Newborn infants whose mothers had onset of varicella within 5 days before delivery or within the 48 hours after delivery are at risk for neonatal varicella. 71-76

• Neonatal varicella carries a case-fatality rate as high as 30%.

• Maternal infection 77 during the first 20 weeks of pregnancy carries a risk (0.4% to 2.0%) of congenital varicella, characterized by low birth weight, hypoplasia of extremities, dermal scarring, focal muscular atrophy, encephalitis, cortical atrophy, chorioretinitis and microcephaly. 78-80

This disease is endemic or potentially endemic to all countries.

References

21. PMID 24097452
43. Medicine (Baltimore) 2008 May ;87(3):167-76.
63. Lancet 2006 Oct 14;368(9544):1365-76.
70. Presse Med 2014 May 23;
### Vibrio parahaemolyticus infection

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM <em>Vibrio parahaemolyticus</em> A facultative gram-negative bacillus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Marine water  Seafood  Fish</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Seafood</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>10h - 20h (range 2h - 4d)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>Stool culture - alert laboratory when this organism is suspected.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Vomiting and explosive diarrhea, 4 to 24 hours following ingestion of seafood (often steamed crabs); diarrhea may persist for 7 to 10 days; case fatality rate = 0.1%.</td>
</tr>
<tr>
<td>Synonyms</td>
<td><em>Vibrio parahaemolyticus.</em>  ICD9: 005.4  ICD10: A05.3</td>
</tr>
</tbody>
</table>

### Clinical

Symptoms usually begin within 10 to 20 hours after ingestion of seafood, and persist for 2 to 10 days.
- Illness is characterized by vomiting (50%), abdominal pain and watery or explosive diarrhea.
- Fever is noted in 25% of patients.
- Dysentery has been described in some cases. 1

Rare instances of bacteremia and extra-intestinal infection are reported. 2-5

### This disease is endemic or potentially endemic to all countries.

### References

West Nile fever

<table>
<thead>
<tr>
<th>Agent</th>
<th>VIRUS - RNA. Flaviridae, Flavivirus: West Nile virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Bird, Horse, Bat, ? Tick</td>
</tr>
<tr>
<td>Vector</td>
<td>Mosquito (Culex univittatus, Cu. pipiens, Cu. vishnui, Cu. neavei, Coquillettidia, Aedes and Anopheles spp.)</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Blood transmission [rare]</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>3d - 6d (range 1d - 14d)</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Supportive</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>As for adult</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Myalgia, arthralgia, lymphadenopathy, headache, conjunctivitis and a macular rash; sporadic instances of encephalitis, meningitis and myocarditis are reported; illness resolves within one week in most cases.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Bagaza, Fiebre del Oeste del Nilo, Lourdige, Near Eastern equine encephalitis, Ntaya, Usutu, WNF.</td>
</tr>
</tbody>
</table>

ICD9: 066.4
ICD10: A92.3

Clinical

Acute infection:
It has been estimated that 25% of infected humans develop clinical illness, with neuroinvasive disease in less than 1%. 10% of the latter result in death. 1
- West Nile fever in humans usually is a minor influenza-like illness, characterized by an abrupt onset of moderate to high fever lasting 3 to 5 days.
- The fever is occasionally biphasic, and may be accompanied by rigors.
- Additional findings include frontal headache, sore throat, backache, myalgia, arthralgia, fatigue, conjunctivitis and retrobulbar pain. 2
- A maculopapular or roseolar rash 3 4 appears in approximately 50% of cases, spreading from the trunk to the extremities and head.
- Lymphadenopathy, anorexia, nausea, abdominal pain, diarrhea, and respiratory symptoms are also encountered.

Neuroinvasive disease:
Occasionally (<15% of cases), acute aseptic meningitis or encephalitis occurs, associated with neck stiffness, vomiting, confusion, disturbed consciousness, somnolence, tremor of extremities, abnormal reflexes, convulsions, pareses, and coma. 5 6
- Such patients may then develop anterior myelitis and acute asymmetric flaccid paralysis, reminiscent of poliomyelitis or Guillain-Barre syndrome. 7-12 Rare instances of progressive brachial plexitis or diplegia are reported. 13 14
- Focal encephalitis with seizures may mimic herpes simplex encephalitis. 15 16 Opsoclonus myoclonus syndrome has also been encountered. 17
- Cases of acute psychosis 18, diplopia 19 and stuttering (? lingual myoclonus) during the course of West Nile fever have been reported. 20
- Risk factors for neuroinvasive disease include age >45 years, male sex, hypertension, immune-compromise (HIV infection, post-transplant) and diabetes mellitus. 21 22
- Multifocal chorioretinitis is common among patients with neuroinvasive disease. 23-28 A case of acute hemorrhagic conjunctivitis, bilateral subconjunctival hemorrhages, and nystagmus has been reported. 29
- Most fatal cases occur in patients older than 50 years. 30

Hepatosplenomegaly, hepatitis, pancreatitis 31, myocarditis 32 and hemorrhagic fever have been reported. 33

Prolonged convalescence (up to one year) may follow recovery from encephalitis; and myalgia, confusion and lightheadedness may persist beyond this period. 34-38
- Recovery is complete (less rapid in adults than in children, often accompanied by long-term myalgias and weakness), and permanent sequelae have not been reported.
- Prolonged depression persists in as many as 31% of patients following recovery. 39 40
• Residual kidney disease is common following West Nile fever. 41

Laboratory findings:
Laboratory findings consist of a slightly increased sedimentation rate and mild leukocytosis.
• Profound and prolonged lymphocytopenia is reported in some cases. 42
• Cerebrospinal fluid in patients with central nervous system involvement is clear, with moderate pleocytosis and elevated protein.
• A distinctive CSF plasmacytosis may be present.
• The virus can be recovered from the blood for up to 10 days in immunocompetent febrile patients, and as late as 22 to 28 days after infection in immunocompromised patients.
• Peak viremia occurs 4 to 8 days postinfection.

Usutu virus infection was reported in two immune-compromised humans in 2009 43-45 and in three patients in 2013. 46
• Clinical features included fever of 39.5 °C, headache, meningo-encephalitis, tremor and hyper-reflexia. One patient developed fulminant hepatitis.

Ntaya virus, a related flavivirus, has been associated with febrile illness and neurological findings. 47

This disease is endemic or potentially endemic to 90 countries. Although West Nile fever is not endemic to Haiti, imported, expatriate or other presentations of the disease have been associated with this country.

West Nile fever in Haiti

The first cases of West Nile fever in Haiti were reported following a hurricane in 2004. 48

References

41. ProMED <promedmail.org> archive: 20120714.1202043
43. Euro Surveill 2009 ;14(50)
44. Euro Surveill 2009 ;14(50)
45. ProMED <promedmail.org> archive: 20091217.4273
46. J Neurovirol 2014 Nov 1;
Whipple's disease

**Agent**
BACTERIUM. Actinomycetes, *Tropheryma whipplei* A gram positive bacillus

**Reservoir**
Unknown

**Vector**
None

**Vehicle**
None

**Incubation Period**
Unknown

**Diagnostic Tests**

**Typical Adult Therapy**
Ceftriaxone 2.0 g IV daily X 14 days. OR Penicillin G 12 million u + Streptomycin 1 g daily X 14d. Then, Sulfamethoxazole/trimethoprim  X 1 year OR: Doxycycline 100 mg PO BID + Hydroxychloroquine X 1 year, followed by Doxycycline for life

**Typical Pediatric Therapy**
Disease is rarely, if ever, encountered in children

**Clinical Hints**
A chronic multisystem disorder characterized by weight loss, diarrhea, abdominal and joint pain; dermal hyperpigmentation, fever and lymphadenopathy often present; PAS-positive macrophages present in intestinal biopsy material.

**Synonyms**
Intestinal lipodystrophy, Lipophagic granulomatosis, Mesenteric chyladenectasis, Steatorrhea arthropericarditica, Tropheryma whipplei.

ICD9: 040.2
ICD10: K90.8

Clinical

The typical patient with Whipple's disease has a history of recurrent arthralgia or arthritis involving multiple joints for several years. 1

- Joint complaints precede systemic and gastrointestinal disease in approximately one-third of patients 2, and may persist for years in the absence of diarrhea. 3 4
- Infection of prosthetic joints has been reported. 5
- Diarrhea, low-grade fever and weight loss are characteristic, and hyperpigmentation is present in 50% of patients.
- Generalized lymphadenopathy is common.
- A syndrome of dementia and obesity or ataxia linked associated with *T. whipplei* infection has been recently described. 6

As many as one third of the patients develop cardiac involvement characterized by the presence of systolic murmurs, a pericardial friction rub, congestive heart failure, and nonspecific electrocardiographic changes. 7

- The most common pathological changes are endocarditis 8-10 with negative blood cultures, presenting with thickened and deformed mitral or aortic valves. 11
- In one series, Whipple's disease was identified in 6.3% of patients with culture-negative endocarditis (2011 publication) 12
- 30 to 40% of patients develop pleuritic chest pain, chronic nonproductive cough, and dyspnea.
- The chest X-ray may show a pleural effusion or pulmonary infiltrates.
- Isolated *T. whipplei* endocarditis may occur without other systemic features of Whipple's disease. 13-15

Relapse of Whipple's disease has been reported following therapy. 16

- Recurrence of symptoms following therapy may represent an immune reconstitution syndrome. 17

*Tropheryma whipplei* was isolated from 6.4% of blood specimens from febrile patients with cough (Senegal, 2008 to 2009) 18

Other features of Whipple's disease may include personality changes or dementia 19-22, hypersomnia 23, amnesic syndrome 24, peripheral or cranial nerve neuropathy, 25, encephalitis 26, 27, cerebral pseudotumor 28, 29, ataxia 30, chronic headache 31, endocarditis 32-35, confusion, delirium 36, pericarditis 37, 38, pneumonia 39, 40, pulmonary hypertension 41, 42, hypothyroidism 43, subcutaneous nodules 44, anemia, myoclonus, chorioretinitis 45, vitritis 46, uveitis 47, 48, Parinaud syndrome 49, salcrolitis 50 and spondylitis 51, recurrent monoarthritis 52, thrombocytopenia 53, pancytopenia 54, hypoalbuminemia and hypokalemia. 55

The features of Whipple's disease may resemble those of lymphoma, celiac disease, Crohn's vasculitis, sepsis, an
inflammatory process, liposarcoma, rheumatoid arthritis, seizure disorder, cerebrovascular accident, xanthoma, or central nervous system neoplasm.  

This disease is endemic or potentially endemic to all countries.

References

48. Medicine (Baltimore) 2008 May; 87(3):167-76.
52. Z Rheumatol 2013 Sep; 72(7):714-6, 718.
54. J Community Hosp Intern Med Perspect 2014; 4
Yaws

<table>
<thead>
<tr>
<th>Agent</th>
<th>BACTERIUM. Treponema pallidum subsp. pertenue: microaerophilic gram-negative spirochete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir</td>
<td>Human ? Non-human primate</td>
</tr>
<tr>
<td>Vector</td>
<td>None</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Contact ? Insect bite ? Fomite</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>3w - 5w (range 10d - 12w)</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>VDRL and antitreponemal tests (FTA, MHTP) positive as in syphilis.</td>
</tr>
<tr>
<td>Typical Adult Therapy</td>
<td>Benzathine Penicillin G 1.2 million units IM as single dose. A single oral dose of Azithromycin is also effective.</td>
</tr>
<tr>
<td>Typical Pediatric Therapy</td>
<td>Benzathine Penicillin G : Weight &lt;14kg: 300,000u IM Weight 14 to 28kg: 600,000u IM Weight &gt;28kg - 1.2 million u IM A single oral dose (30 mg/kg) of Azithromycin is also effective.</td>
</tr>
<tr>
<td>Clinical Hints</td>
<td>Dermal papillomata, periostitis and soft tissue suppuration; regional lymphadenopathy common; relapses often seen during initial 5 years of illness; gummas and hyperkeratotic plaques in later stages.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Anakhre, Bouda's disease, Charlouis' Disease, Frambesia, Gangosa, Goundou, Granuloma tropicum, Gundo, Henpue, Henpuye, Ogo Mutilans, Parangi, Patek, Pian, Treponema pallidum subsp pertenue.</td>
</tr>
</tbody>
</table>

Clinical

Yaws has three clinical stages.  
- Stage 1 is characterized by the a variety of flat and/or raised skin lesions.
- Stage 2 (Gangosa Syndrome, Ogo, or Rhinopharyngitis Mutilans) may involve the bones, joints, and/or skin.
- Stage 3 (Goundou Syndrome, Henpue, Henpuye, Gundo, or Anakhre) may also involve the bones, joints, and/or skin.

After an incubation period of approximately 3 weeks, a primary painless 2 to 5 cm pruritic papule ("mother yaw") appears at the site of inoculation.  
- The lesions may ulcerate, but generally heal completely after 3 to 6 months.
- Secondary lesions appear in crops from weeks to months later, measure 1 to 5 cm and tend to ulcerate or take the shape of raspberries (frambesoids), round or discoidal papillomas.
- Osteoperiostitis may be evident at this stage however systemic symptoms are usually not present.
- The secondary stage may persist for up to 6 months, and relapse over periods as long as 10 years.
- The third stage is characterized by destructive necrotic and gummatous lesions of skin, bone, nasopharynx and contiguous structures.

Although yaws and chancroid may co-exist in some regions, lesions of yaws tend to be more circular in shape, and are more likely to have central granulating tissue and indurated edges.

This disease is endemic or potentially endemic to 67 countries.

Yaws in Haiti
Graph: Haiti. Yaws, cases

Notes:
Individual years:
1952 - The prevalence rate of yaws was 4,982 per 100,000.  
1993 - 11 cases were identified in Grande-Anse Department.

Prevalence surveys:
0.57% nationwide, following a mass treatment campaign (1954 to 1955)

An anti-yaws treatment campaign was initiated in 1950.

References

### Yellow fever

| **Agent** | VIRUS - RNA. Flaviridae, Flavivirus: Yellow fever virus |
| **Reservoir** | Human, Mosquito, Monkey, Marsupial |
| **Vector** | Mosquito - Stegomyia (Aedes), Haemagogus, Sabethes |
| **Vehicle** | None |
| **Incubation Period** | 3d - 6d (range 2.5d - 14d) |
| **Typical Adult Therapy** | Supportive |
| **Typical Pediatric Therapy** | As for adult |
| **Vaccine** | Yellow fever vaccine |
| **Clinical Hints** | Headache, backache, vomiting, myalgias, jaundice, hemorrhagic diathesis, relative bradycardia and leukopenia; illness is often biphasic; 10% to 60% die within 7 days of onset. |
| **Synonyms** | Bulan fever, Febbre gialla, Febre amarela, Fever of Fernando Po, Fever of the blight of Benin, Fiebre amarilla, Fievre jaune, Gelbfieber, Gele koorts, Gul feber, Gula febern, Inflammatory fever, Kendal's disease, Magdalena fever, Maladie de Siam, Pest of Havana, Stranger's fever. |

### Clinical

**WHO Case definition for surveillance:**

**Clinical description**
- Characterized by acute onset of fever followed by jaundice within 2 weeks of onset of first symptoms.
- Hemorrhagic manifestations and signs of renal failure may occur.

**Laboratory criteria for diagnosis**
- Isolation of yellow fever virus, or
- Presence of yellow fever specific IgM or a four-fold or greater rise in serum IgG levels in paired sera (acute and convalescent) or
- Positive post-mortem liver histopathology or detection of yellow fever antigen in tissues by immunohistochemistry or
- Detection of yellow fever virus genomic sequences in blood or organs by PCR.

**Case classification**
- Suspected: A case that is compatible with the clinical description.
- Probable: A suspected case with presence of yellow fever IgM antibody (in the absence of vaccination within 30 days); or positive postmortem liver histopathology; or an epidemiological link to a confirmed case or outbreak.
- Confirmed: A probable case; and a fourfold or greater increased in antibody titers; or presence of yellow fever neutralization antibody; or detection of yellow fever virus, viral genome or antigen in blood or tissues.

The clinical presentation of yellow fever can range from a self-limited flu-like illness to overwhelming hemorrhagic fever, with a case-fatality rate of 50%. 5%
- 55% of yellow fever infections are asymptomatic, 33% mild and 12% severe. The case-fatality rate in severe illness is 47% (meta-analysis, 1969 to 2011). 3%

Infection is heralded by abrupt onset of fever, headache, and myalgias associated with conjunctival injection, facial flushing, relative bradycardia (Faget's sign) and leukopenia. 4%
- Although most cases do not progress beyond this stage, a remission of fever for a few hours to several days may be followed by high fever, headache, lumbosacral pain, nausea, vomiting, abdominal pain, and somnolence.
- At this stage, the patient exhibits icteric hepatitis and a hemorrhagic diathesis with prominent bleeding from the gastrointestinal tract, epistaxis, bleeding gums, and petechial and purpuric hemorrhages.
- Weakness, prostration, protracted vomiting and albuminuria are prominent.
- Deepening jaundice and elevations in serum transaminase levels continue for several days, accompanied by azotemia and progressive oliguria.
- Direct bilirubin levels rise to 5 to 10 mg/dl, while alkaline phosphatase levels are only slightly raised.
- Eventually, hypotension, shock, and metabolic acidosis develop, compounded by myocardial dysfunction and arrhythmias.
- Additional findings may include acute tubular necrosis, confusion, seizures, and coma.
- CSF examination reveals an elevated protein level without pleocytosis.
• Death usually occurs within 7 to 10 days after onset.

**This disease is endemic or potentially endemic to 47 countries.** Although Yellow fever is not endemic to Haiti, imported, expatriate or other presentations of the disease have been associated with this country.

### Yellow fever in Haiti

Yellow fever does not occur in Haiti.

Proof of vaccination **IS** required for travelers arriving from a country with risk of yellow fever transmission

**Notable outbreaks:**

1. 1802 - An outbreak was reported among French soldiers in Haiti.

### References

**Yersiniosis**

**Agent**  
BACTERIUM. *Yersinia enterocolitica* and *Yersinia pseudotuberculosis* A facultative gram-negative bacillus

**Reservoir**  
Pig, Rodent, Rabbit, Sheep, Goat, Cattle, Horse, Dog, Cat, Bat

**Vector**  
None

**Vehicle**  

**Incubation Period**  
4d - 7d (range 1d - 11d)

**Diagnostic Tests**  
Stool, blood. Alert laboratory when these organisms are suspected.

**Typical Adult Therapy**  
Stool precautions; diarrhea is self-limited. If severe disease - **Ciprofloxacin** 500 mg BID X 5 to 7d. OR **Sulfamethoxazole/trimethoprim**

**Typical Pediatric Therapy**  
Stool precautions; diarrhea is self-limited. If severe disease - **Sulfamethoxazole/trimethoprim** 20 mg-4 mg/kg BID X 5 to 7d

**Clinical Hints**  
Fever, diarrhea, right lower quadrant pain; fecal leucocytes present; may be associated with rheumatologic manifestations such as erythema multiforme, Reiter's syndrome and chronic arthritis.

**Synonyms**  
*Yersinia enterocolitica*, *Yersinia pseudotuberculosis*, *Yersiniose*.  
ICD9: 008.44  
ICD10: A04.6, A28.2

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**Clinical**

*Yersinia enterocolitica* infection typically presents as febrile diarrhea, and occasionally bloody diarrhea.  
- Lower abdominal pain without diarrhea occurs in over 15% of cases, and may mimic acute appendicitis.  
- Several instances of intestinal intussusception have been associated with *Yersinia enterocolitica* and *Y. pseudotuberculosis* infections.
  
  - Pharyngitis and tonsillitis are encountered; and metastatic infection of bone, soft tissues, spleen, meninges or other organs may occur.
  
  - Chronic arthritis, erythema nodosum, Reiter's syndrome, Sweet's syndrome, glomerulonephritis, hemophagocytic lymphohistiocytosis, pneumonia and endocarditis have also been reported.
  
  - Reactive arthritis has been reported in over 20% of cases.
  
  - *Yersinia enterocolitica* septicemia (associated with transfusion of contaminated red blood cell products) is fatal in over 50% of cases.

*Yersinia enterocolitica* is one of at least a dozen *Yersinia* species encountered in humans. See the Microbiology module for further details.

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**This disease is endemic or potentially endemic to all countries.**

**References**

Zygomycosis

Agent | FUNGUS. Zygomycota, Zygomycetes, Mucorales: Mucor spp., Rhizopus spp., Lichtheimia (formerly Absidia) spp, Saksenaea spp, et al
Reservoir | Saprophytes
Vector | None
Vehicle | Air Bandages Contact
Incubation Period | Variable
Diagnostic Tests | Fungal smear and culture.
Typical Adult Therapy | Amphotericin B to maximum dose 0.8 mg/kg/d; and to total dose of 3g. Excision as indicated
Typical Pediatric Therapy | Amphotericin B max dose 0.8 mg/kg/d; and to total dose of 40 mg/kg. Excision as indicated
Clinical Hints | Periorbital pain, sinusitis, and palatal, nasal or cerebral infarcts; occurs in the setting of preexisting acidosis (diabetes, uremia); pulmonary infection may complicate leukemia.
Synonyms | Absidia, Actinomucor, Apophysomyces, Cokeromyces, Cunninghamella, Hormographiella, Lichtheimia, Mucor, Mucormycosis, Mycocladus, Phycomycosis, Rhizomucor, Rhizopus, Saksenaea, Syncephalastrum.
ICD9: 117.7
ICD10: B46

Clinical

Infection is most commonly associated with hyperglycemia, metabolic (diabetic, uremic) acidosis, corticosteroid therapy and neutropenia, transplantation, heroin injection or administration of desferoxamine. Major risk factors identified in children are neutropenia, diabetes mellitus, and prematurity. Virtually any organ can be involved; however, most infections involve the paranasal sinuses and contiguous structures (orbit, cavernous sinus, cranial nerves, cerebral arteries), lungs, skin and gastrointestinal tract.

Disease manifestations reflect the mode of transmission, with rhinocerebral and pulmonary diseases being most common. Cutaneous, gastrointestinal, and allergic diseases are also seen. The Mucorales are associated with blood vessel invasion, often leading to thrombosis, infarction and tissue destruction. Rare cases of sinusitis have been ascribed to Actinomucor elegans. Dissemination is common. Therapy must be started early and consists of antifungal drugs, surgical intervention, and reversal.

Rhinocerebral zygomycosis initially manifests with headache (often unilateral), fever, facial pain, diplopia, lacrimation, and nasal stuffiness. As the infection spreads, necrotic lesions appear in the turbinates, nose, paranasal skin or hard palate. Rare cases of mycotic mandibular osteomyelitis have been reported. Chemosis, proptosis, and external ophthalmoplegia may occur. Cranial nerve abnormalities are common (nerves II through VII, IX, and X), and blindness may ensue following invasion of the cavernous sinus, ophthalmic artery, and orbit. Hemiparesis, seizures, or monocular blindness suggest advanced disease. Invasion of the internal carotid artery in the cavernous sinus can occur, with metastatic lesions in the frontoparietal cortex and deepening coma.

Pulmonary zygomycosis presents with nonspecific symptoms such as fever, cough and dyspnea. Hemoptysis may occur with vascular invasion. Radiological findings include segmental consolidation which progresses to contiguous areas of the lung and may cavitate. In 74% of pulmonary zygomycosis cases, the infection is limited to the lung.

Gastrointestinal zygomycosis usually affects patients with severe malnutrition, and may involve the stomach, ileum, colon or peritoneum. Clinical findings mimic intra-abdominal abscess. The diagnosis is often made at autopsy.
**Cutaneous zygomycosis** may present as primary infection, characterized by necrotic lesions following trauma; or secondary extension from a focus of rhinocerebral infection.\(^{20-22}\)

**Renal zygomycosis** may mimic malignancy.\(^{23-26}\)

Zygomycetes peritonitis may complicate peritoneal dialysis.\(^{27}\)

59 case reports (38 fatal) of neonatal zygomycosis had been published to July 2007 • 77% premature infants, 54% gastrointestinal and 36% dermal.\(^{28}\)

Zygomycosis has a poor prognosis, with a mortality rate of 44%.\(^{29}\)

**This disease is endemic or potentially endemic to all countries.**

**References**

Vaccine Schedule for Haiti

A given generic vaccine may have multiple designations in this list due to variations in terminology used by individual countries. Vaccination policies evolve rapidly in response to changes in disease occurrence and the introduction of new vaccines. Every effort has been made to update these lists accordingly.

Vaccine Abbreviations

aP - Attenuated pertussis
ap - Attenuated pertussis
BCG - Bacillus Calmette Guerin
CBAW - Childbearing age women
D - Diphtheria
Hep - Hepatitis B
HEP - Hepatitis B
HepA - Hepatitis A
HepB - Hepatitis B
Hib - Haemophilus influenzae type B
IPV - Injectable polio vaccine
MenACWY - Meningococcus types A,C,Y and W
MenC-conj - Meningococcus type C conjugate
MR - Measles, Rubella
MMR - Measles, Mumps, Rubella
OPV - Oral polio vaccine
P - Pertussis
Pneumo - Pneumococcal vaccine
Pneumo conj - Pneumococcal conjugate
Pneumo ps - Pneumococcal polysaccaride
T - Tetanus
Td - Tetanus + lower dose diphtheria
TT - Tetanus toxoid
wP - Attenuated pertussis
YF - Yellow fever

BCG - birth, 10, 14 weeks
DTwPHibHep - 6, 10, 14 weeks
MR - 9 months
OPV - birth; 6, 10, 14 weeks
Pneumo conj - from April 2015
Pneumo ps - from January 2015
Rotavirus - from April 2014
Td - 1st contact; +4 weeks; +6 months; +1, +1 years pregnant women
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