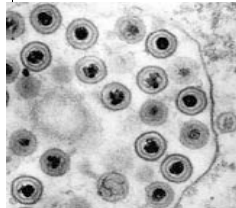

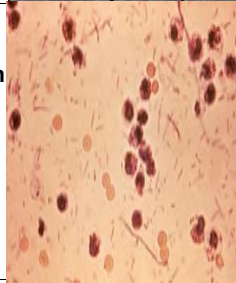
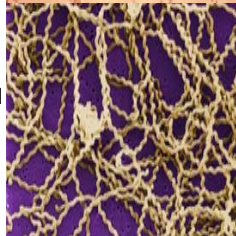


ZOO NOTIC DISEASES FACT SHEET





Disease	Pathogen	Genus species	Host Range	Transmission	Symptoms	Incubation	Fact	Treatment	Photo
Brucellosis*	Bacteria	<i>Brucella (B. melitensis, B. abortus, B. suis, B. canis)</i>	Infected animals (swine, cattle, goats, sheep, dogs)	Skin or mucous membrane contact with infected animals, their blood, tissue, and other body fluids	High and protracted (extended) fever. Infection affects bone, heart, gallbladder, kidney, spleen, and causes highly disseminated lesions and abscess	1-15 weeks	Most commonly reported U.S. laboratory-associated bacterial infection in man	Antibiotic combination: streptomycina, tetracycline, and sulfonamides	
Salmonellosis	Bacteria	<i>Salmonella (S. cholera-suis, S. enteriditis, S. typhymurium, S. typhi)</i>	Domestic (dogs, cats, monkeys, rodents, labor-atory rodents, rep-tiles [especially turtles], chickens and fish) and herd animals (cattle, chickens, pigs)	Direct contact as well as indirect consumption (eggs, food vehicles using eggs, etc.). Human to human transmission also possible	Mild gastroenteritiis (diarrhea) to high fever, severe headache, and spleen enlargement. May lead to focal infection in any organ or tissue of the body)	6 hours to 3 days	Fatality rate of 5-10%	Antibiotic combination: chloramphenicol, neomycin, ampicillin	
Shigellosis*	Bacteria	All <i>Shigella</i> species	Captive non-human primates	Oral-fecal route	Ranges from asymptomatic carrier to severe bacillary dysentery with high fevers, weakness, severe abdominal cramps, prostration, edema of the face and neck, and diarrhea with blood, mucous and inflammatory cells	Varies by species. 16 hours to 7 days.	Highly infective. Low number of organisms capable of causing infection. Rate of infection in im-ported monkeys can be high	Intravenous fluids and electrolytes, Antibiotics: ampicillin, amoxicillin, trimethoprin-sulfamethoxazole	
Leptospirosis	Bacteria	<i>Leptospira interrogans</i>	Animal, human urine	Direct contact with urine of infected dogs, mice or rats. Indirect contact with urine contaminated materials. Droplet transmission via aerosols of urine	Phase 1: headache, muscle ache, eye pain with bright lights, chills and fever. Phase 2: fever with stiffness of the neck and inflammation of the nerves to the eyes, brain, spinal column	7-12 Days	Leptospirosis associated with liver and kidney disease is called Weil's syndrome, characterized by jaundice	Doxycycline and penicillin. Severely ill patients may need IV fluids, antibiotics and dialysis	



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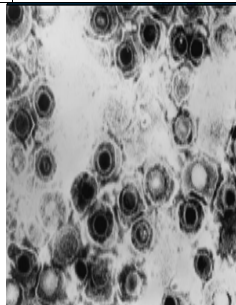
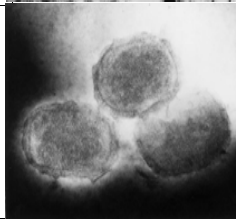


Disease	Pathogen	Genus species	Host Range	Transmission	Symptoms	Incubation	Fact	Treatment	Photo
Relapsing fever	Bacteria	<i>Borreliae</i> spp. [<i>B. recurrentis</i> (louse-borne), <i>B. hemsii</i> (tick-borne)]	Animals	Tick-borne, blood transfusions	Fever, headache and muscle pain that lasts 4-10 days and subsides. Afebrile period lasting 5-6 days followed by a recurrence of acute symptoms	5-15 days	Epidemic relapsing fever (transmitted by lice) is more severe than endemic relapsing fever (transmitted by ticks)	Tetracyclines, chloramphenicol	
Tuberculosis	Bacteria	<i>Mycobacterium tuberculosis</i>	Primarily humans, cattle, non-human primates, other animals (rodents)	Inhalation of aerosol droplets, contaminated equipment, bites	Ranges from fever and fatigue to chronic pulmonary disease (fatal). Lungs, kidney, vasculature (affects all parts of body)	2-5 weeks	Multidrug-resistant TB (MDR TB) is an infection resistant to at least two first-line anti-TB drugs, isoniazid and rifampicin	Isoniazid, rifampin, streptomycin, and ethambutol	
Melioidosis*	Bacteria	<i>Burkholderia pseudomallei</i> (formerly <i>Pseudomonas pseudomallei</i>)	Equines, especially horses and mules; humans are accidental hosts	Transmitted by inhaling dust contaminated by the bacteria and when contaminated soil comes in contact with abraded skin	Cholera-like symptoms (fever, chills, prostration). Skin lesions, swollen lymph glands, abscesses septicemia or pneumonia	2-4 days	Relatively uncommon disease for humans, but when left untreated, has 95% fatality rate	Chloramphenicol, doxycycline, sulfisoxazole, or cotrimoxazole. IV chloramphenicol for bacteremia	
Tularemia*	Bacteria	<i>Francisella tularensis</i>	Isolated from 100 species of wild animals (e.g., rabbits, skunk), 9 domestic mammals, 25 species of birds, frogs, and reptiles	Arthropods, direct or indirect contact, ingestion of contaminated meats, inhalation of dust, materials contaminated with urine, feces or tissues, bites and scratches	High fever, chills, headache, focal ulcers, swollen lymph nodes	1-10 days	Bacterium formerly known as <i>Pasteurella tularensis</i>	Streptomycin, tetracycline	



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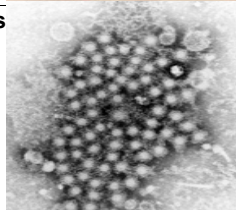

Disease	Pathogen	Genus species	Host Range	Transmission	Symptoms	Incubation	Fact	Treatment	Photo
Herpesvirus	Virus	Herpesvirus Type 1 (fever blister, cold sore) and Type 2 (genital herpes), Herpesvirus hominis, Herpes simiae (Herpes B)	Human, non-human primates	Produce latent infections in host and frequently shed without overt lesions	Frequently asymptomatic. May have vesicular lesions, neurological or flu-like symptoms	5 days to 1 month	Herpes simiae is 100% fatal if untreated; Herpes Types 1 and 2 are not fatal but cause chronic infection from recurrences	Acyclovir or valcyclovir will arrest the virus but will not eliminate virus from the host	
Poxvirus*	Virus	Monkeypox, vaccinia, cowpox, buffalopox, cantagalo, and aracatuba viruses	Non-human primates, swine, cattle, horses, birds	Direct skin contact with lesions on infected animals	Localized lesions, rash, fever, sore throat, malaise, encephalitis	Generally: 5-10 days after infection	Poxviruses are the largest and most complex viruses	smallpox vaccine, cidofovir, and vaccinia immune globulin (VIG)	
Rabies Virus	Virus	Rhabdoviridae, genus Lyssavirus	Natural reservoir: bats. All mammals: wild animals (raccoons, rodents, foxes, etc.) domestic animals (dogs, cats) and humans	Animal bite, contact with infected saliva or tissue	Headache, fever, malaise, nervousness, dilation of pupils, salivation, excessive perspiration, insomnia, paralysis of throat muscles, inability to swallow, convulsions, seizures, generalized paralysis and death	3-8 weeks	Untreated, the fatality rate is 100%; Post-exposure treatment is effective until day 6 post-infection	Antirabies vaccine <u>before</u> clinical onset of symptoms; post-exposure treatment with rabies immune globulin & vaccine	
Viral Hemorrhagic Fever*	Virus	Multiple species: Filoviridae; Ebola virus, Lassa virus, Marburg virus	Humans, non-human primates (Cynomolgous monkeys)	Contact with blood and body fluids of infected animals	Severe fever, sore throat, cough, diarrhea, vomiting, hemorrhage and death	2-21 days (5-12 days in most cases)	50-90% fatality rate for Ebola virus; 25% mortality rate for Marburg virus; 15-20% mortality for Lassa fever virus	No vaccines; Treatment directed at maintaining renal function, electrolyte balance and combating hemorrhage and shock	



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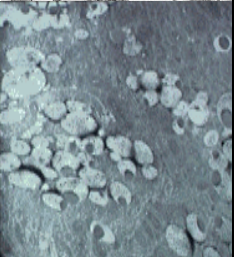


Disease	Pathogen	Genus species	Host Range	Transmission	Symptoms	Incubation	Fact	Treatment	Photo
Arboviral infections*	Virus	Multiple species: <i>Togaviridae</i> , <i>Flaviviridae</i> , <i>Bunyaviridae</i> , <i>Arenaviridae</i>	Ticks, insects, infected animals (deer, birds, rodents, etc.)	Ticks, insects, blood transfusion	Various: viremia, lymphadenopathy leading to systemic infection. Can involve CNS (encephalitis), skin/bone marrow/blood vessels (hemorrhagic fevers)	Multiple Ranges; 14-25 days (Avg. 18 days) post infection	Causes: Rift Valley fever, Dengue fever, Yellow fever; Sandfly (Hantavirus) fever; Omsk hemorrhagic fever, and West Nile virus infections	No vaccines for most (except yellow fever virus), no known antivirals; supportive treatment only	
Viral Hepatitis	Virus	Hepatitis A, B, C, D (delta), E, F, G	Humans, non-human primates (chimpanzee, wooly monkey, gorilla, Celebes ape, some marmosets)	Close contact with infected animals or materials	Fever, anorexia, vague abdominal discomfort, nausea and vomiting, sometimes arthralgias and rash, often progressing to jaundice; fever may be absent or mild	3-6 weeks	Hepatitis A has no carrier state; Hepatitis B 20% chronic; Hepatitis C 85% chronic	Vaccines for Hepatitis A and B only. Treatment with alpha inter-feron and intravenous immunoglobulins (HBIG)	
Lymphocytic Choriomeningitis (LCM)	Virus	Multiple arenaviruses	Rodents (hamsters, mice, guinea pigs), monkeys and humans	Infected mice excrete virus in saliva, urine and feces; man infected through inhalation of aerosolized particles of (urine, feces or saliva) contaminated with virus	Biphasic febrile illness, mild influenza like illness or occasionally meningeal or meningoencephalomyelitic symptoms, transverse myelitis	15-21 days	46 documented laboratory-acquired cases with 5 deaths; cases also reported arising from contaminated cell lines	No specific treatment; anti-inflammatory drugs may be useful; No known vaccines	



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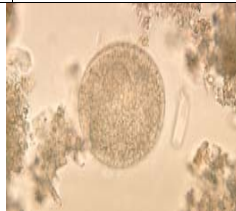
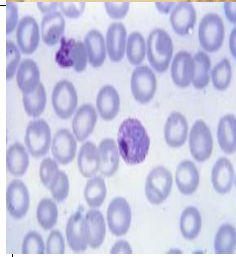
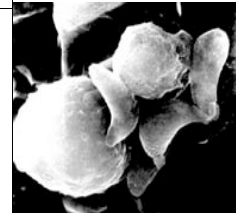

Disease	Pathogen	Genus species	Host Range	Transmission	Symptoms	Incubation	Fact	Treatment	Photo
Vesicular Stomatitis*	Virus	Multiple strains of Vesicular Stomatitis Virus (VSV) <i>Rhabdoviridae</i>	Bovine, equine, porcine animals.	Probably arthropod-borne via the bite of an infected sandfly, mosquito or blackfly; by direct contact with infected animals (vesicular fluid, saliva)	Infuenza-like illness, malaise, fever, headache, nausea and vomiting	24-48 hours	Documented hazard to personnel (45 laboratory-acquired infections before 1980) handling infected livestock, tissues and virulent isolates	Virus is self-limiting and illness is short in duration. (3-6 days)	
Sub-viral Agents and Related Diseases (i.e., Scrapie)*	non-RNA/DNA Infectious Protein Virus-like particle	Transmissible Spongiform Encephalopathies (TSE): BSE and vCJD (vCreutzfeld-Jacob Disease)	Adult sheep goats, and cows can infect humans	Ingestion or handling of brain tissue or unfixed brain cells from infected animals	Degeneration of the nervous system, severe variable alteration of the grey matter of the brain	2-5 years	The agent responsible for TSE's is smaller than the smallest known virus and has not been completely characterized	There are no known treatments or vaccines for these TSE's	
Amoebic Dysentery	Parasite (protozoa)	<i>Entamoeba histolytica</i>	Monkeys can readily transmit the agent to humans	Food, water, fomites, insects. Fecal-oral route. Cyst is resistant to drying	Frequent passage of feces/stool, loose stools and vomiting. Variations depending on parasites. Can be frequent urge with high or low volume of stool, with or without some associated mucus and even blood	2 days to several months to even years	Harmless amoebas can live in the intestines for years without causing symptoms. Attacks can last from a few days to weeks	Antiamoebic drugs (Iodoquinol, metronidazole) and antibiotics to treat any associated bacterial infections	
Giardiasis	Parasite (protozoa)	<i>Giardia lamblia</i>	Dogs, monkeys	Drinking contaminated water, person-to-person contact, eating contaminated food, and direct contact with infected animals	Ranges from asymptomatic to nausea, fatigue, anorexia, severe diarrhea and high fever	3-25 days	Most common waterborne diarrheal disease in humans	Quinacrine hydrochloride, metronidazole, tinidazole, albendazole and furazolidone	



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ZONOTIC DISEASES FACT SHEET




Disease	Pathogen	Genus species	Host Range	Transmission	Symptoms	Incubation	Fact	Treatment	Photo
Balantadidiasis	Parasite (protozoa)	<i>Balantidium coli</i>	Monkeys, pigs, and other nonhuman primates readily transmitted to humans	Direct contact with feces, person-to-person transmission	Ranges from asymptomatic to severe diarrhea	4-5 days	Cysts survive for long periods in the environment	Tetracycline, Iodoquinol, metronidazole	
Malaria	Parasite (protozoa)	Plasmodium species: <i>P. falciparum</i> <i>P. vivax</i> <i>P. ovale</i> <i>P. malariae</i>	Anopheles mosquito	Mosquito bite	Fever, chills sweating, headache, nausea, vomiting, muscle pain, anemia, bloody stools, jaundice, convulsion, coma	10 days to 4 weeks after infection; symptoms then cycle every 48 days	A malaria vaccine has been developed and is being tested in Africa. Results are promising	Chloroquine, primaquine phosphate, Malorone	
Toxoplasmosis	Parasite (protozoa)	<i>Toxoplasma gondii</i>	Amazing lack of host specificity. Primates, carnivores (felines), rodents, birds, undulates	Consuming under-cooked infected meats; ingestion of oocysts in milk, food or water; inhalation of oocysts; -contact with soil containing contaminated cat feces;	Localized lymphadenopathy accompanied with fever, sore throat, rash, pneumonitis, myocarditis, and encephalitis	10-23 days following ingestion of contaminated meats, or inhalation of aerosols	Affects one third of the human race. Especially infective to immunosuppressed individuals	Sulfonamides (sulfadiazene, sulfamerazine, sulfamethazine), pyrimethamine	
Ascariasis (Roundworm)	Nematode	Multiple Ascaris species (<i>A. lumbricoides</i> , <i>A. suum</i>)	Pigs; Humans are the definitive host	Ingestion of contaminated food or water	Lung damage, intestinal symptoms	4 to 8 weeks	<i>Ascaris lumbricoides</i> the largest and, globally, the most widespread of all human intestinal roundworms	Pyrantel pamoate, mebendazole, surgery for removal in lung tissue	



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ZOO NOTIC DISEASES FACT SHEET

Disease	Pathogen	Genus species	Host Range	Transmission	Symptoms	Incubation	Fact	Treatment	Photo
Visceral Larval Migrants (VLM)	Nematode	Nematodes of the <i>Toxocara</i> genus (<i>T. canis</i> , <i>T. felis</i>)	Dogs, cats	Ingestion of eggs through direct contact with feces or contaminated materials	Fever, cough, wheezing, itching/irritation associated with migration of nematodes into tissues. Ocular migration may cause blindness	4 to 7 weeks	More than 80% of all puppies in the U.S. are infected with this nematode	Usually a self-limiting disease--treatment only given in severe cases (glucocorticoids and bronchodilators for pulmonary disease)	
Strongyloidiasis	Nematode	<i>Strongyloides stercoralis</i>	Dogs, cats, monkeys	Careless handling of contaminated fecal materials	Abdominal pain, diarrhea, and rash. Less commonly, nausea, vomiting, weight loss and cough. Severe infection can cause severe tissue damage, systemic damage of various tissues in the body and potential death	skin 7 hours; lung 1 week; intestines 2 wks; average 4-21 days	The parasite penetrates the skin and migrates to the lungs. Then it travels up to the mouth and is swallowed into the intestinal tract	Ivermectin with Albendazole as the alternative	
Trichinosis	Nematode	<i>Trichinella spiralis</i>	Generally pigs or cattle	Eating undercooked flesh of animals infected with the larvae	Nausea, vomiting, diarrhea, fever, neurological disorders, possible cardiac involvement	Abdominal symptoms: 1-2 days. Further symptoms 2-8 weeks after infection	Over 100 species of animals may be a host of this parasite	Thiabendazole (Mintezol), Albendazole (Albenza), Mebendazole (Vermox), Prednisone	

*Images were obtained from the U.S. Centers for Disease Control & Prevention Public Health Image Library (PHIL). 08/2008



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