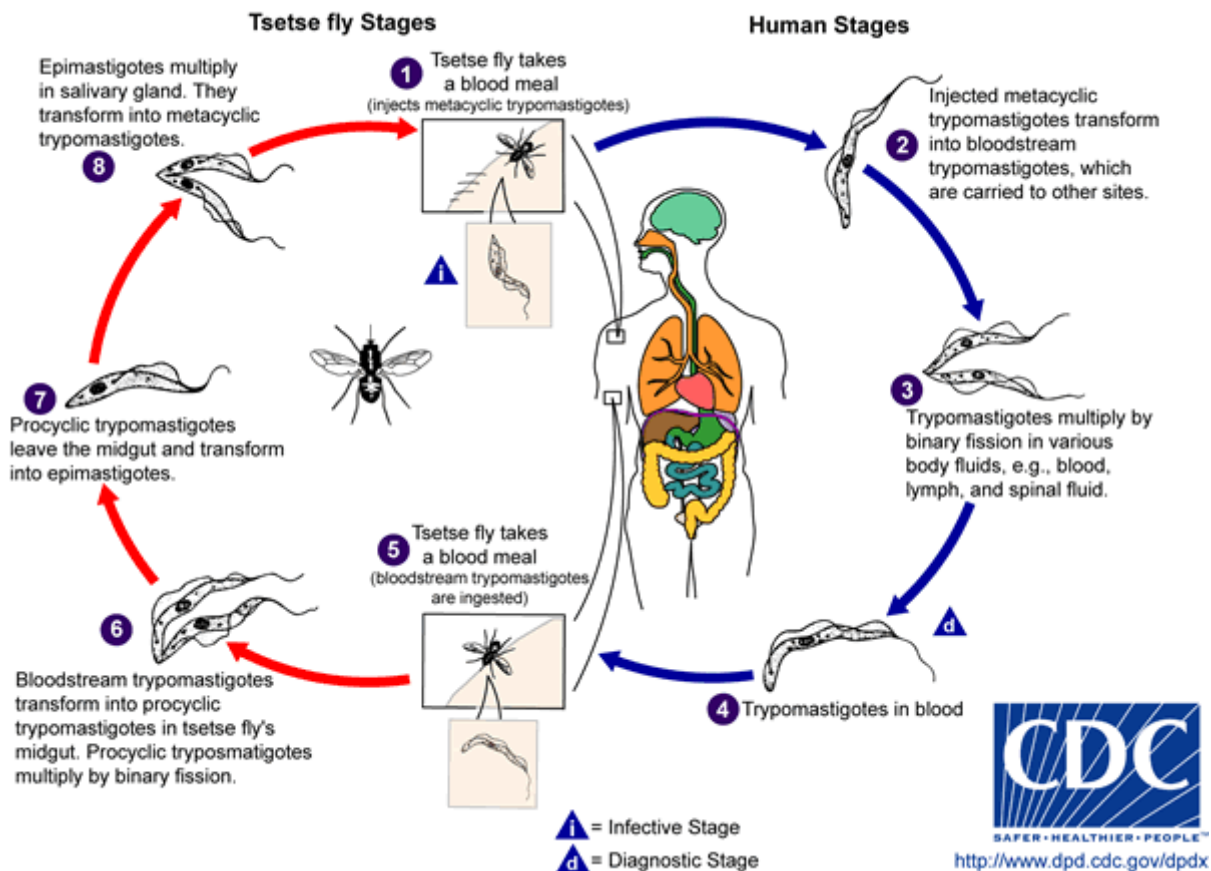


Trypanosomiasis, African

Causal Agents:

Protozoan hemoflagellates belonging to the complex *Trypanosoma brucei*. Two subspecies that are morphologically indistinguishable cause distinct disease patterns in humans: *T. b. gambiense* causes West African sleeping sickness and *T. b. rhodesiense* causes East African sleeping sickness. (A third member of the complex, *T. b. brucei*, under normal conditions does not infect humans.)

Life Cycle:



During a blood meal on the mammalian host, an infected tsetse fly (genus *Glossina*) injects metacyclic trypomastigotes into skin tissue. The parasites enter the lymphatic system and pass into the bloodstream **1**. Inside the host, they transform into bloodstream trypomastigotes **2**, are carried to other sites throughout the body, reach other blood fluids (e.g., lymph, spinal fluid), and continue the replication by binary fission **3**. The entire life cycle of African Trypanosomes is represented by extracellular stages. The tsetse fly becomes infected with bloodstream trypomastigotes when taking a blood meal on an infected mammalian host (**4**, **5**). In the fly's midgut, the parasites transform into procyclic trypomastigotes, multiply by binary fission **6**, leave the midgut, and transform into epimastigotes **7**. The epimastigotes reach the fly's salivary glands and continue multiplication by binary fission **8**. The cycle in the fly takes approximately 3 weeks.

Humans are the main reservoir for *Trypanosoma brucei gambiense*, but this species can also be found in animals. Wild game animals are the main reservoir of *T. b. rhodesiense*.

Geographic Distribution:

T. b. gambiense is found in foci in large areas of West and Central Africa. The distribution of *T. b. rhodesiense* is much more limited, with the species found in East and Southeast Africa.

Clinical Features:

Infection occurs in 3 stages. A trypanosomal chancre can develop on the site of inoculation. This is followed by a hemolymphatic stage with symptoms that include fever, lymphadenopathy, and pruritus. In the meningoencephalitic stage, invasion of the central nervous system can cause headaches, somnolence, abnormal behavior, and lead to loss of consciousness and coma. The course of infection is much more acute with *T. b. rhodesiense* than *T. b. gambiense*.

Laboratory Diagnosis:

The diagnosis rests upon demonstrating trypanosomes by microscopic examination of chancre fluid, lymph node aspirates, blood, bone marrow, or, in the late stages of infection, cerebrospinal fluid. A wet preparation should be examined for the motile trypanosomes, and in addition a smear should be fixed, stained with Giemsa (or Field), and examined. Concentration techniques can be used prior to microscopic examination. For blood samples, these include centrifugation followed by examination of the buffy coat; mini anion-exchange/centrifugation; and the Quantitative Buffy Coat (QBC) technique. For other samples such as spinal fluid, concentration techniques include centrifugation followed by examination of the sediment. Isolation of the parasite by inoculation of rats or mice is a sensitive method, but its use is limited to *T. b. rhodesiense*. Antibody detection has sensitivity and specificity that are too variable for clinical decisions. In addition, in infections with *T. b. rhodesiense*, seroconversion occurs after the onset of clinical symptoms and thus is of limited use.

Diagnostic findings

- Microscopy
- Case history 20-2002 from the *New England Journal of Medicine* (Vol. 346, No. 26, June 27, 2002).

Treatment:

Treatment should be started as soon as possible and is based on the infected person's symptoms and laboratory results. The drug regimen depends on the infecting species and the stage of infection. Pentamidine isethionate* and suramin (under an investigational New Drug Protocol from the CDC Drug Service) are the drugs of choice to treat the hemolymphatic stage of West and East African Trypanosomiasis, respectively. Melarsoprol is the drug of choice for late disease with central nervous system involvement (infections by *T.b. gambiense* or *T. b. rhodiense*).

* This drug is approved by the FDA, but considered investigational for this purpose.