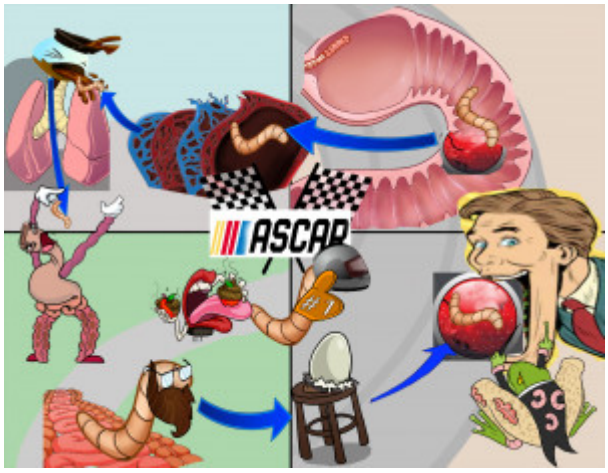
Ascariasis Characteristics and Life Cycle



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Characteristics

Nematode (Roundworm)
Knee-toad with Roundworms
Ascaris lumbricoides is the largest of the intestinal nematodes (also known as roundworms) known to parasitize the human gastrointestinal tract. Nematode is a phylum containing approximately 25,000 species of parasitic roundworms that vary greatly in size and environment.

Most Common Helminth Infection
Number (1) Foam Finger and Worm-helmet
Ascaris lumbricoides is the most common cause of helminth infection worldwide. "Helminth" refers to any kind of parasitic worm and includes multiple phyla, many of which are unrelated.

Fecal-Oral Transmission
Eating Poop-apples
Ascaris lumbricoides infection occurs via the fecal-oral route. This typically happens as a result of ingesting water or soil that has been contaminated with ascaris eggs.

Life Cycle

Eggs Deposited in Soil
Egg in Soil
Ascaris eggs are deposited in the soil through the stool of infected animals, typically mammals such as humans or pigs.

Embryo Ingested
Worm Embryo Being Eaten
After being deposited in the soil, ascaris eggs embryonize over approximately four weeks before being ingested through contaminated water or food. This four weeks gap between deposition and ingestion is necessary for the organism to maintain its infectivity, as the undeveloped egg will not survive the environment of the gastrointestinal tract.

Larvae Hatch in Intestines
Worm Hatching in Intestine
Within several days of oral ingestion, ascaris embryos hatch in the small intestines, releasing larvae that migrate through the intestinal wall.

Larvae Migrate to Lungs Through Bloodstream
Worm Moving Through Blood-vessel Tunnel to Lungs
After larvae hatch in the intestines, they migrate through the intestinal wall into the bloodstream through portal circulation to the liver, then through the hepatic veins to the heart, and subsequently the lungs. There they mature within the alveoli for one to two weeks.

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Larvae Coughed Up and Swallowed

Coffee-coughing up Worms, Worms Being Swallowed

After growing in the alveoli for up to two weeks, larvae ascend the bronchial tree and are coughed up and swallowed and again re-enter the gastrointestinal tract.

Mature into Adults in Intestine

Mature-worm in Intestine

Once larvae are coughed up and swallowed back into the gastrointestinal tract, they reach the intestine and mature into adult worms, reaching anywhere between 15 and 35cm in length. The jejunum specifically is the primary site of maturation in the intestine.

Mature Adults Lay Eggs which are Passed in Stool

Arrow from Adult Worm to Egg on Stool

Approximately nine to eleven weeks folloing initial infection, the now adult ascaris worms begin to lay eggs which are subsequently passed in the stool, beginning the cycle again. For this to occur there must be both male and female worms present in the intestine to produe and fertilize eggs, as an infection with only female worms will result in deposition of infertile eggs, and a male-only infection will produce no eggs.

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