TABLE 245e-2 ROUNDWORM INFECTIONS

Parasite	Geographic Distribution	Life-Cycle Hosts: Intermediate (Transmission)	Life-Cycle Hosts: Definitive	Diagnosis: Parasite Stage	Diagnosis: Body Fluid or Tissue	Diagnosis: Serologic Tests	Diagnosis: Other
Intestinal Roundworms							
Enterobius vermicularis (pinworm)	Temperate and tropical zones	Fecal-oral	Humans	Ova	Perianal skin	—	"Cellophane tape" test
Trichuris trichiura (whipworm)	Temperate and tropical zones	Soil, fecal-oral	Humans	Ova	Feces	—	Rectal prolapse
Ascaris lumbricoides (roundworm of humans)	Temperate and tropical zones	Soil, fecal-oral	Humans	Ova	Feces	—	Sx of pulmonary migration
Ancylostoma duodenale (Old World hookworm)	Eurasia, Africa, Pacific	Soil to skin	Humans	Ova/larvae	Feces	—	Sx of pulmonary migration, anemia
Necator americanus (New World hookworm)	U.S., Africa, worldwide	Soil to skin	Humans	Ova/larvae	Feces	—	Sx of pulmonary migration, anemia
Strongyloides stercoralis (strongyloidiasis)	Moist tropics and subtropics	Soil to skin	Humans	Larvae	Feces, sputum, duodenal fluid	EIA	Dissemination in immunodeficiency
Capillaria philippinensis	Southeast Asia, Taiwan, Egypt	Raw fish	Birds	Ova, larvae, adults	Feces	—	Malabsorption/ autoinfection, biopsy
Tissue Roundworms							
Trichinella spiralis (trichinellosis)	Worldwide	Swine/humans	Swine/humans	Larvae	Muscle	EIA	Muscle biopsy
Wuchereria bancrofti (filariasis)	Coastal areas in tropics and subtropics	Mosquitoes	Humans	Microfilariae	Blood, lymph nodes	EIA, RAPID, PCR[b]	Nocturnal periodicity[a]
Brugia malayi (filariasis)	Asia, Indian subcontinent	Mosquitoes	Humans	Microfilariae	Blood	EIA, RAPID, PCR[b]	Nocturnal
Loa loa (African eye worm)	West and Central Africa	Mango flies (*Chrysops*)	Humans	Microfilariae	Blood	LIPS[b], PCR[b]	May be visible in eye, diurnal
Onchocerca volvulus (river blindness)	Africa, Mexico, Central and South America	Blackflies	Humans	Adults/larvae	Skin/eye	LIPS[b], PCR[b]	Examine nodules or skin snips
Dracunculus medinensis (guinea worm)	Africa	*Cyclops*	Humans	Adults/larvae	Skin	—	May be visible in lesion
Angiostrongylus cantonensis	Southeast Asia, Pacific, Caribbean	Snails/slugs, shrimp/fish	Rats	Larvae	CSF (rarely found)	—	Eosinophilic meningitis
Larva Migrans Syndromes							
Ancylostoma braziliense (creeping eruption)	Tropical and temperate zones	Soil to skin	Dogs/cats, humans	Larvae	Skin	—	Dog and cat hookworm
Toxocara canis and *T. cati* (visceral larva migrans), *Baylisascaris*	Tropical and temperate zones	Soil, fecal-oral	Dogs/cats, raccoons, humans	Larvae	Viscera, CNS, eye	EIA	Also caused by roundworms of other species

[a]Except for infection acquired in the South Pacific, blood should be drawn at midnight. [b]LIPS (the luciferase immunoprecipitation system) for serology and PCR (polymerase chain reaction) are available from the Laboratory of Parasitic Diseases at the National Institutes of Health: 301-496-5398.

Abbreviations: CNS, central nervous system; CSF, cerebrospinal fluid; EIA, enzyme immunoassay; RAPID, rapid immunographic assay (available internationally); Sx, signs/symptoms.

malaria, rapid detection tests (RDTs) are increasingly being used to fill this gap. These are immunochromatographic capture assays with monoclonal antibodies to species-specific antigens (histidine-rich protein 2 [PfHRP2] or aldolase of *Plasmodium falciparum*) or conserved *Plasmodium* antigens (lactate dehydrogenase). The World Health Organization sponsored a major testing program evaluating the different RDTs. Lower performance rates have been reported in a variety of field sites, especially in areas where deletions of the *pfhrp2* gene have been detected. Subpatent infection and identification of *Plasmodium* species can also be confirmed by polymerase chain reaction (PCR), but for this purpose PCR is primarily a research tool. *P. knowlesi,* a simian parasite, has been identified as the cause of an increasing number of infections in Malaysian Borneo and other areas of Southeast Asia; PCR or another molecular method is required to differentiate *P. knowlesi* from *P. malariae.*

Although most tissue parasites stain with the traditional hematoxylin and eosin, appropriate special stains should also be applied to surgical biopsy specimens. The surgical pathologist who is accustomed to applying silver stains for *Pneumocystis* to induced sputum and transbronchial biopsies may need to be reminded to examine wet mounts and iron-hematoxylin–stained preparations of pulmonary specimens for helminthic ova and *E. histolytica*. The clinician should also be able to advise the surgeon and pathologist about optimal techniques for the identification of parasites in specimens obtained by certain specialized minor procedures (Table 245e-6). For example, the excision of skin snips for the diagnosis of onchocerciasis, the collection of rectal snips