MAYO CLINIC LABORATORIES

Test Definition: FIL

Filaria, Blood

Overview

Useful For

Detecting microfilariae in peripheral blood

Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
FILB	Filaria Bill Only	No, (Bill Only)	No

Testing Algorithm

In the event that microfilaria is discovered in the Knott Concentration; a Giemsa stain for identification will be performed at an additional charge.

For more information see Mosquito-borne Disease Laboratory Testing.

Special Instructions

- Mosquito-borne Disease Laboratory Testing

Method Name

Microscopic Examination

NY State Available

Yes

Specimen

Specimen Type

Whole Blood Na Cit

Specimen Required

Container/Tube: Light-blue top (3.2% sodium citrate)

Specimen Volume: 2.7 mL

Collection Instructions: Certain microfilariae have a nocturnal or diurnal periodicity, therefore the blood collection should be timed to correspond with the release of microfilariae in the peripheral circulation. For the agents of lymphatic filariasis (*Wuchereria bancrofti* and the *Brugia* species), blood should be collected between 10 p.m. and 2 a.m., whereas for detection of *Loa loa,* blood should be collected between 10 a.m. and 2 p.m.

Forms

If not ordering electronically, complete, print, and send a Microbiology Test Request (T244) with the specimen.

Specimen Minimum Volume
2 mL

Reject Due To
All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Whole Blood Na Cit	Ambient (preferred)	72 hours	
	Refrigerated	72 hours	

Clinical & Interpretive

Clinical Information
The filariae are parasitic nematodes (roundworms) that cause significant human morbidity in tropical regions worldwide. The macroscopic adults live in the human host and release microscopic offspring (microfilariae) into the blood or skin. The microfilariae of *Wuchereria bancrofti*, *Brugia malayi*, *Brugia timori*, *Loa loa*, *Mansonella perstans*, and *Mansonella ozzardi* are found in the blood, while the microfilariae of *Onchocerca volvulus* and *Mansonella streptocerca* are found in the skin. If microfilariae are taken up by a biting insect vector (mosquitos, blackflies, midges, and deer flies), they undergo further development in the insect and can then be transmitted to other humans.

W bancrofti and the *Brugia* species cause a serious condition called lymphatic filariasis. The adults live in the lymphatics and cause inflammation and scarring of the lymph vessels. Over time, the lymphatic channels are obstructed, and fluid cannot drain back to the heart resulting in massive lymphedema (elephantiasis) of the affected limb or groin. *W bancrofti* is found in the tropics worldwide, while *Brugia* species are found in parts of Asia and Southeast Asia.

Loa loa causes migratory subcutaneous angioedema referred to as "calabar swellings" as the adult worm migrates throughout the body. The adult occasionally migrates across the surface of the eye, giving it the moniker "the African eye worm." *Loa loa* is only found in Africa.

Finally, *M perstans* and *M ozzardi* cause a relatively mild form of filariasis. Patients are often asymptomatic. When present, symptoms include fever, angioedema, headache, myalgias, arthralgias, pruritus, and neurologic manifestations. *M perstans* is found in parts of Africa and South America, while *M ozzardi* is only found in Mexico and Central and South America.

The microfilariae of these filarial worms can be seen on conventional thick and thin blood films, which allows for their definitive identification. However, microfilariae may be in low numbers, and therefore, use of concentration methods, such as the Knott's technique, improves the detection sensitivity. Some microfilariae are released into the blood at certain times of the day; *W bancrofti* and *Brugia* species are usually released between 10 p.m. and 2 a.m. (nocturnal periodicity), while *L loa* is released mostly from 10 a.m. and 2 p.m. (diurnal periodicity). It is therefore important to collect blood during these time periods for optimal detection sensitivity. *Mansonella* species microfilariae do not exhibit any periodicity and, therefore, a random blood collection is acceptable. Since the levels of parasitemia may fluctuate, multiple smears may be needed to detect the filarial worms. Blood should be obtained and examined every 8 to 12 hours for 2 to 3 days before excluding infection.

Reference Values
Negative
If positive, organism is identified.

Interpretation
Positive results are provided with the genus and species of the microfilariae, if identifiable.

Cautions
This exam will not detect the microfilariae of *Onchocerca volvulus* and *Mansonella streptocerca* since they are found primarily in the skin. The "skin-snip" examination is the preferred method for detecting the microfilariae of these worms.

Microfilariae may be seen in peripheral blood on routine thick and thin blood films, but concentration techniques, such as the Knott's concentration and Nucleopore membrane filtration technique, offer increased detection sensitivity.

Multiple smears may be needed to detect microfilariae in blood. Repeat specimens can be collected every 8 to 12 hours over a period of 2 to 3 days.

Clinical Reference
1. Centers for Disease Control and Prevention (CDC) Global Health, Division of Parasitic Diseases and Malaria. Blood Specimens - Specimen Collection. DPDx - Laboratory Identification of Parasites of Public Health Concern. CDC; Updated October 28, 2020. Accessed October 31, 2022. Available at www.cdc.gov/dpdx/diagnosticProcedures/blood/specimencoll.html
2. Mathison BA, Couturier M, Pritt BS: Diagnostic identification and differentiation of microfilariae. J Clin Microbiol. 2019 Sep 24;57(10):e00706-19

Performance

Method Description
A portion of the blood specimen is concentrated by centrifugation after adding 2% formalin. The sediment is examined as a wet preparation and, if positive, the slide is air dried, fixed in methyl alcohol, and stained with Giemsa to aid in species identification.(Orihel TC, Ash LR, Ramachandran CP: Bench Aids for the diagnosis of filarial infections. World Health Organization; 1997; Garcia LS: Diagnostic Medical Parasitology. 6th ed.ASM Press; 2016; Centers for Disease Control and Prevention (CDC), Global Health, Division of Parasitic Diseases and Malaria: Diagnosis. Parasites - Lymphatic Filariasis. CDC; Updated March 16, 2018. Accessed November 2, 2022. Available at www.cdc.gov/parasites/lymphaticfilariasis/diagnosis.html)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available

1 to 4 days

Specimen Retention Time

7 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

Fees & Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification

This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

87015
87210

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
FIL	Filaria, B	10662-5

Result ID	Test Result Name	Result LOINC® Value
FIL	Filaria, B	10662-5