

## Overview

### Useful For

Detection of microfilariae in peripheral blood

### Testing Algorithm

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

See [Mosquito-borne Disease Laboratory Testing](#) in Special Instructions.

### Special Instructions

- [Mosquito-borne Disease Laboratory Testing](#)

### Reflex Tests

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

### Method Name

Concentrated, Microscopic Examination

### NY State Available

Yes

## Specimen

### Specimen Type

Whole Blood Na Cit

### Specimen Required

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

**Specimen Volume:** 2.7 mL

**Collection Instructions:** Certain microfilariae have a nocturnal periodicity therefore the blood specimen is best drawn at night between 10 p.m. and 2 a.m.

### Forms

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

## Reject Due To

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

## Specimen Minimum Volume

2 mL

## Specimen Stability Information

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

## 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*, *B timori*, *Loa loa*, *Mansonella perstans*, and *M ozzardi* are found in the blood, while the microfilariae of *Onchocerca volvulus* and *M 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 draw 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.

The blood collection should be timed to correspond with the release of microfilariae in the peripheral circulation. For the agents of lymphatic filariasis, 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.

**Clinical Reference**

Centers for Disease Control and Prevention, Division of Parasitic Diseases and Malaria. DPDx, Diagnostic Procedures. 2013. Available at <http://www.cdc.gov/dpdx/diagnosticProcedures/blood/specimencoll.html>

**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. (Garcia L: Diagnostic Medical Parasitology. Fifth edition. Washington, DC, American Society for Microbiology, 2005)

**PDF Report**

No

**Specimen Retention Time**

until reported

**Performing Laboratory Location**

Rochester

**Fees & Codes****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	Reporting Name	LOINC®
FIL	Filaria, B	10662-5