Laboratory Testing and Guidance

Spotted Fever Group Rickettsiosis including Rocky Mountain Spotted Fever

The decision to initiate antibiotic therapy for Rocky Mountain Spotted Fever (RMSF) should be made based on clinical signs and symptoms and a patient history, including a recent tick bite or exposure to areas with ticks. A confirmatory diagnosis can be established later using specialized laboratory tests. **Never delay or withhold treatment pending the receipt of laboratory test results, or on the basis of an initially negative test result.**

The optimal diagnostic testing for RMSF and other spotted fever group rickettsial (SFGR) species depends on the timing relative to symptom onset and the type of specimen(s) available for testing.

- For persons with non-specific tickborne disease symptoms, clinicians should consider ordering a **commercial tickborne disease panel or specific laboratory tests for tickborne diseases endemic in NJ** (Lyme disease, anaplasmosis, babesiosis, ehrlichiosis and SFGR). For anaplasmosis, ehrlichiosis and babesiosis, PCR testing early in the course of disease is very effective in pathogen identification.
- It is recommended to obtain **convalescent as well as acute serology specimens for all rickettsial disease testing**. A convalescent specimen collected 2-4 weeks after symptom onset can help determine if the infection is recent. A fourfold titer change would indicate recent infection versus low-level antibodies remaining from a prior infection.
- **Whenever possible, use rickettsial, species-specific PCR testing methods.** These methods can help determine whether *R. rickettsia*, the cause of the most severe SFGR, RMSF, or other generally milder species (i.e., *R. akari*, *R. parkeri*, *R.* 364D) are responsible for the patient's signs and symptoms.

The following species-specific rickettsial PCR testing is available at the New Jersey Public Health and Environmental Laboratory (PHEL):

- Whole blood PCR testing – collected between days 3 and 8 of symptom onset or from those with a severe clinical presentation
- Detection of DNA in rash biopsies and eschar swab specimens

To arrange for hospitalized or outpatient rickettsial PCR testing at PHEL:

1. Review the Specimen Collection Guidance for Rickettsia PCR Testing at PHEL/CDC (below) to determine if the specimen can be collected within the appropriate time frame for testing.

2. If the specimen can be collected within the appropriate time frame, complete the NJDOH Spotted Fever Group Rickettsiosis Testing Request Worksheet (below) and e-mail it to CDSVectorteam@doh.nj.gov. The CDS Vector Team will review and call the requesting healthcare provider to discuss testing.

Specimen Collection Guidance for Rickettsia PCR Testing at PHEL/CDC

ANTIBIOTIC THERAPY SHOULD NEVER BE DELAYED IN ORDER TO OBTAIN SPECIMENS

Whole Blood for PCR Testing (*Rickettsia rickettsii*, *R. prowazekii*, other species)

Timing of specimen collection:

- At 3 to 8 days after symptom onset and before or within 24 hours of initiation of antibiotic therapy
- In severely ill patients, before or within 24 hours of antibiotics being started
- Testing is most sensitive in 1st week of illness

Amount:

- Collect 3 ml of WHOLE blood
- Absolute minimum is 1 ml

Container:

- Lavender top (K2 EDTA) tube

Labelling:

- Affix a label to the specimen with: patient's full name, DOB, date/time of specimen collection and type of specimen

Swab of Eschar at Tick Bite Site for *Rickettsia* PCR Testing

Timing of specimen collection:

- Before or within 24 hours of initiation of antibiotic therapy
- Testing is most sensitive during 1st week of acute illness

Preparing site:

- Disinfect area; remove disinfectant with sterile gauze soaked in sterile saline.

Accessing the skin site:

- Use sterile tweezers to lift scab partially or completely. If the scab detaches, place it into the empty sterile container

Obtaining the swab specimen:

- Sample the ulcerated area with a dry sterile cotton swab. Rotate the swab vigorously on the area, while applying steady gentle pressure

Placing swab into the sterile container:

- Snap the swab stick at least 2 inches above cotton swab to fit in container
- **NOTE:** Swab should be sent dry; do not immerse swab in saline solution

Punch Biopsies of Rash or Eschar Lesions for *Rickettsia* Testing (by PCR, cell culture isolation, or IHC staining depending on size/state of tissue)

Timing of specimen collection:

- Before or within 24 hours of initiation of antibiotic therapy

Type of biopsy specimen:

- Skin biopsies should be taken from the site of rash or eschar
- Fresh, non-frozen tissue is preferred **NOTE:** formalin fixation may limit sensitivity of molecular detection
- Optimal tissue is a punch biopsy of skin ≥4 mm that includes the central aspect of the lesion (*i.e.,* macule, petechia or eschar)

Container

- Place the specimen on a sterile gauze pad that has been moistened lightly with sterile saline
- Place in a dry sterile specimen collection cup
- Do not immerse the tissue in saline

Collect acute-phase serum for serology testing at time of PCR specimen collection. Send to commercial lab.
Collect a convalescent serum 2-4 weeks later.

Supplies for specimen collection / shipping may be available from the NJ Public Health and Environmental Laboratory. Contact the NJDOH Vector Team.

NJDOH Vector-borne Disease Program E-mail: CDSVectorteam@doh.nj.gov Ph: 609-826-5964 Fax: 609-826-4874

NJDOH SPOTTED FEVER GROUP RICKETTSIOSIS TESTING REQUEST WORKSHEET CDRSS #: _____

****PCR testing is indicated for blood specimens collected 3-8 days after symptom onset, for patients with severe illness and for eschar or rash biopsy specimens. ****

Patient Last Name	**First Name**	**Middle Initial**	**DOB:** ____ / ____ / ____	**Gender** ☐ Male ☐ Female ☐ Unknown
Street Address	**City/State**	**Zip code**	**County**	**Phone**
Race ☐White ☐ Black ☐Asian ☐Pacific Islander ☐American Indian or Alaskan Native ☐Unknown				**Ethnicity** ☐ Hispanic ☐ Non-Hispanic ☐ Unknown
Occupation	**Industry / work setting**			**Illness onset date** _____ / _____ / _____

Was patient hospitalized because of this illness?
☐ Yes ☐ No ☐ Unknown

Hospital: _____ Admitted: _____ / _____ / _____ Discharged: _____ / _____ / _____

Signs & Symptoms

Anemia: Hgb_____	☐ Yes	☐ No	☐ Unk.	Fever reported by patient or HCP: _____F	☐ Yes	☐ No	☐ Unk.
Elevated liver enzymes: ALT _____ AST _____	☐ Yes	☐ No	☐ Unk.	Eschar (black, necrotic area at site of tick bite)	☐ Yes	☐ No	☐ Unk.
Thrombocytopenia: Platelet ct. _____	☐ Yes	☐ No	☐ Unk.	Head	☐ Yes	☐ No	☐ Unk.
Acute Respiratory Distress Syndrome (ARDS)	☐ Yes	☐ No	☐ Unk.	Myalgia	☐ Yes	☐ No	☐ Unk.
Disseminated intravascular coagulopathy	☐ Yes	☐ No	☐ Unk.	Rash	☐ Yes	☐ No	☐ Unk.
Meningitis	☐ Yes	☐ No	☐ Unk.	Renal failure	☐ Yes	☐ No	☐ Unk.
Encephalitis	☐ Yes	☐ No	☐ Unk				

Other symptoms:

Risk Factors

In the 14 days before illness onset or diagnosis, did the patient spend time outdoors in grassy or wooded areas?	☐ Yes	☐ No	☐ Unk.
In the 14 days prior to illness onset or diagnosis, did the patient notice a tick bite?	☐ Yes	☐ No	☐ Unk.
Was an immunosuppressive condition present? If yes, specify: _____	☐ Yes	☐ No	☐ Unk.

Diagnostic Testing

Was the patient tested for other tick-borne diseases as part of this illness?
☐ SFGR serology ☐ Anaplasmosis ☐ Ehrlichiosis ☐ Lyme ☐ Borrelia miyamotoi ☐ Babesiosis

If positive test results, specify:

Ordering Physician Contact Information	**Laboratory Contact Information**
Name: _____	Name: _____
Address: _____	Address: _____
Phone: _____ Fax: _____	Phone: _____ Fax: _____
E-mail: _____	E-mail: _____

Indicate specimens available for testing (select all that apply):

☐ Whole blood: collection date __/__/_____ ☐ Eschar swab: collection date __/___/____ ☐ Rash biopsy: collection date __/___/____

Treatment – Did the patient receive:

☐ Doxycycline	Start date: __ /___/___	End date: ___/___/___
☐ Other antibiotic: _____	Start date: __ /___/___	End date: ___/___/___

Comments:

Submit via encrypted email to CDSVectorTeam@doh.nj.gov or fax to 609-826-4874. Questions? Call 609-826-5964