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# **Zoonotic Disease Scenarios: Malaria, Arboviruses, Chagas Disease, Lyme Disease, and Rickettsial Diseases**

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**ELC Meeting – September 2019**

**Zoonosis Control Branch**

# Malaria Case Scenario

A new ELR appears in the DRR queue for a blood smear, with a positive result for malaria.

## Resulted Tests and Results

**Resulted Test:** MICROSCOPIC OBSERVATION:PRID:PT:BLD:NOM:MALARIA SMEAR(Malaria Smear)  
**Result(s):** Positive(SNOMED)

**Reference Range:** Negative  
**Interpretation:** Normal  
**Result Method:**

**Date/Time:** 2019-02-09 12:09:00.0  
**Performing Facility:** University Med Ctr  
**Facility ID:** 45D0660741  
(FI)

**Status:** Final  
**Test Code(s):** 32700-7 (LN LOINC) /278 (L LOCAL)  
**Result Code(s):** 10828004 (SNM SNOMED) /  
**Result Comments:**



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# Malaria Case Scenario (continued)

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The species has not been determined yet. Upon reviewing the medical record, you learn that the patient is a 62-year-old female who is a resident of Nigeria and returning home next month.

Q: Is this a reportable Texas malaria case?

**YES!**

# Malaria Reporting Guidelines

## Texas Residents

For malaria cases who reside in Texas, but are diagnosed in another Texas jurisdiction, please **report by the case patient's residence**.

## Out of Country Residents

For malaria cases who reside in another country, but are diagnosed in Texas, please **report by the location where the patient was diagnosed**.

## Out of State Residents

For malaria cases who reside in another state, but are diagnosed in Texas, please **communicate with the Regional Zoonosis Control (ZC) office** so we can work with the other state to determine which state will count it as a case to prevent dual reporting.



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# Follow-up for Indeterminate/Discrepant Labs

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- During the investigation, you obtain the hospital lab report for the blood smear and discover that the result did not identify the infecting *Plasmodium* species for this patient's sample
- What would be the next steps?
  - Inquire whether any further testing is pending (microscopy or PCR test)
  - If no pending tests and the hospital lab is willing to forward samples, DSHS welcomes slides and/or EDTA blood submissions to identify infecting *Plasmodium* species
  - Coordination between LHD, Regional ZC, and Zoonosis Control Branch (ZCB)

# Malaria studies at DSHS (G-2B Form)



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## Microscopy (Prepared slides or EDTA tube blood)

Section 4. PARASITOLOGY	
<input type="checkbox"/> Cryptosporidium/Cyclospora Exam	<input type="checkbox"/> Microfilaria Exam @
<input type="checkbox"/> Fecal Ova and Parasite Exam	<input type="checkbox"/> Microsporidia Exam
<input type="checkbox"/> Malaria/Blood Parasite Exam @	<input type="checkbox"/> Worm Identification @
<input type="checkbox"/> Schistosoma/Urine Parasite Exam @	<input type="checkbox"/> Other:

**Note: "@" symbol indicates brief clinical/travel history is needed with submission**

## PCR (EDTA tube blood)

Section 8. MOLECULAR STUDIES	
<input type="checkbox"/> <u>PCR:</u> Bordetella Pertussis, Parapertussis, and Bordetella holmesii detection, real-time	<input type="checkbox"/> PFGE for:
<input type="checkbox"/> <del>Cyclospora</del> Identification	<input type="checkbox"/> Other:
<input type="checkbox"/> Malaria identification	
<input type="checkbox"/> Norovirus	



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# Lab Confirmation Tests

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## 1) Blood Smear Microscopy

- Typically the infecting *Plasmodium* species will be identified or at least favored (*P. falciparum*, *P. vivax*, *P. ovale*, *P. malariae*)
- Record peak parasitemia

## 2) Nucleic Acid Testing by PCR – typically ordered to identify infecting species when microscopy alone cannot

**DSHS Austin lab offers both types of specimen analysis and can coordinate with CDC as needed**

# Chemoprophylaxis vs. Therapy



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- Chemoprophylaxis

Was malaria chemoprophylaxis taken?  Yes  No  Unknown

If yes, which drugs were taken?  Chloroquine  Mefloquine  Doxycycline  Primaquine  Atovaquone/proguanil  
 Other: \_\_\_\_\_  Unknown

- Typically prescribed to person traveling from non-malaria endemic country to a malaria endemic country
- Preventative

- Therapy

Therapy for this attack (check all that apply):

Chloroquine  Tetracycline  Doxycycline  Mefloquine  Exchange transfusion  Artesunate  Artemether/lumefantrine  Unknown  
 Primaquine  Quinine  Quinidine  Clindamycin  Atovaquone/proguanil  Other (specify): \_\_\_\_\_

- If patient took chemoprophylactic antimalarial medicine during travel, the treatment drug(s) will be different.






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# Malaria Resources

- General information
  - <https://www.cdc.gov/parasites/malaria/index.html>
- Malaria travel information and prophylaxis
  - [https://www.cdc.gov/malaria/travelers/country\\_table/a.html](https://www.cdc.gov/malaria/travelers/country_table/a.html)

Country	Areas with Malaria	Drug Resistance <sup>2</sup>	Malaria Species <sup>3</sup>	Recommended Chemoprophylaxis <sup>4</sup>	Key Information Needed and Helpful Links to Assess Need for Prophylaxis for Select Countries
Afghanistan	April–December in all areas at altitudes below 2,500 m (8,202 ft).	Chloroquine	<i>P. vivax</i> 95%, <i>P. falciparum</i> 5%	Atovaquone-proguanil, doxycycline, mefloquine, or tafenoquine <sup>5</sup>	1) Month(s) of travel 2) City(ies) of travel 3) Altitude of city(ies) of travel <a href="#">Altitude information</a>  for Afghanistan

- Guidelines for treatment in United States
  - [https://www.cdc.gov/malaria/diagnosis\\_treatment/treatment.html](https://www.cdc.gov/malaria/diagnosis_treatment/treatment.html)

# Arboviruses: Things to Consider

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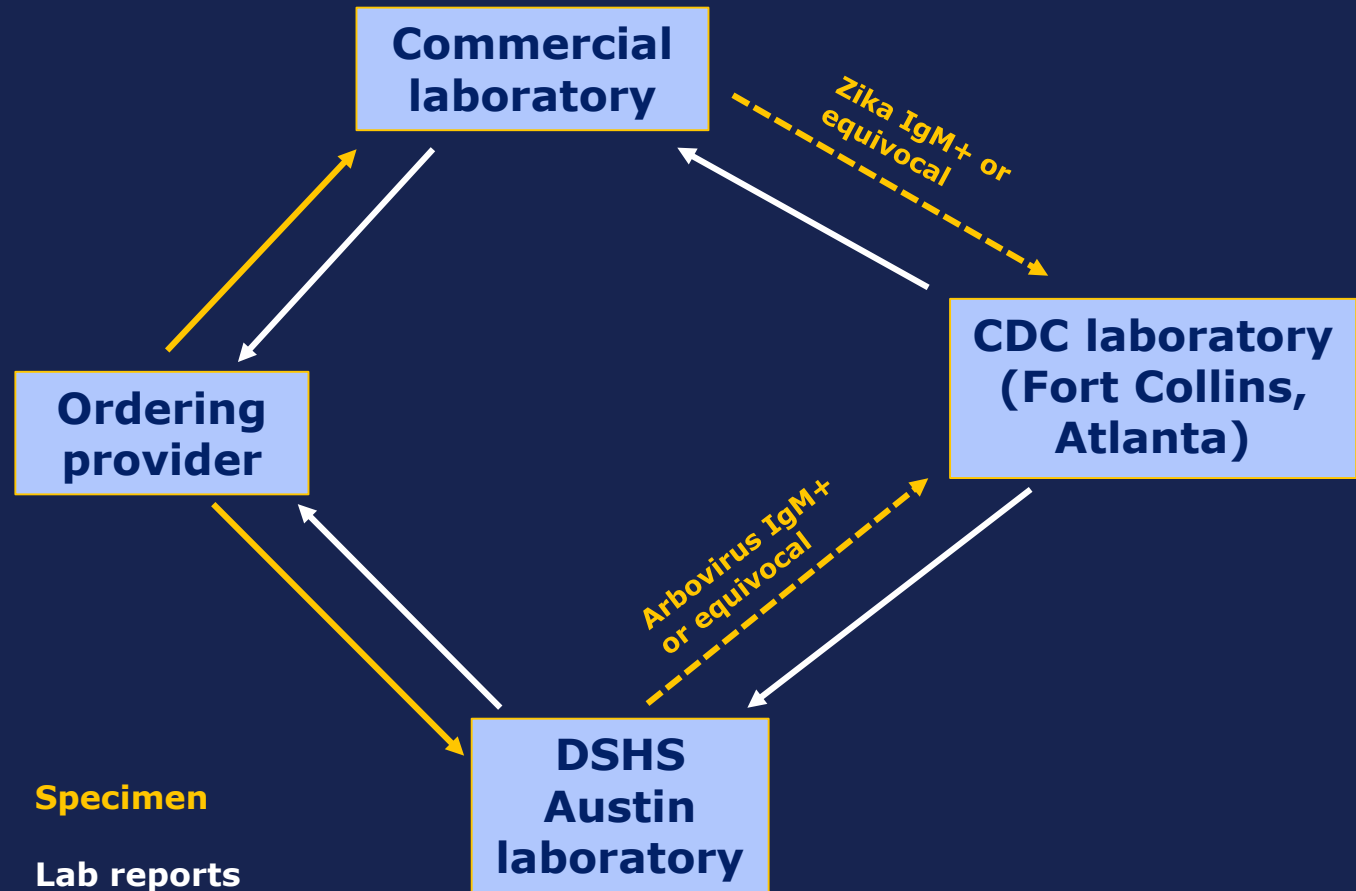
- Cross-reactivity among related viruses
- Overlap of risk areas globally and common clinical manifestations of infection
- Previous history of infection with the same or a related arbovirus can affect immune response in recent infection
- For DSHS disease reporting, multiple case definitions: **arbovirus**, **dengue** (three types), **Zika** (four types), **yellow fever**



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# Zika & PRNT: Tracking Testing Progress



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# Arbo Scenario #1: Traveler

- The following test result appears in the DRR queue for a 35-year-old female resident of Bexar county

Reporting Facility: ViraCor	11/09/2018	Dengue virus antibody, IgG: positive - (Final) =7.91 ISR Reference Range: (<1.65) - (Final)
		Dengue virus antibody, IgM: positive - (Final) =4.52 ISR Reference Range: (<1.65) - (Final)

- After requesting more information from the ordering provider, you discover the patient:
  - Traveled to Thailand for two weeks, returning 11/4/18, and spent a lot of time outdoors while there
  - She has visited Thailand multiples times previously
  - No other infectious disease testing was ordered besides dengue IgM and IgG



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# Arbo Scenario #1 (continued)

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- **Clinical information:** Onset of illness was 11/5/18 (one day after returning from Thailand) with fever, headache, retro-orbital pain, rash, and myalgia
  - **How would this case be classified?**
    - **Probable dengue**, based on the IgM result, travel history, and symptoms.
  - **What additional arbovirus testing should the physician have considered ordering?**
    - Given the date of collection of 4 days after onset, PCR should have been used as well as IgM and IgG for dengue. Additionally, Zika, chikungunya at minimum should have been considered as other arboviral diseases endemic to Thailand.



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# Arbo Scenario #1 (continued)

→ If the dengue IgM had been negative, how would this be classified? Any other action you might have taken in this case?

Description
DENGUE VIRUS AB.IGG: POSITIVE Reference Range: (NEGATIVE) - (Final)
DENGUE VIRUS AB.IGM: NEGATIVE Reference Range: (NEGATIVE) - (Final)

- Suspect dengue, based on the clinical symptoms and exposure alone. The positive IgG does *not* make this a probable case.
- With a previous history of travel to a dengue-endemic area and a day 4 sample, it is possible she may be a **secondary dengue case** with viremia but a hard-to-catch window of low IgM detectability.
  - Consider forwarding the sample to DSHS for Trioplex PCR testing; if positive, she could be a confirmed dengue case.

# West Nile Virus Case Scenario

A new West Nile Virus IgM positive (in CSF) ELR appears in the DRR queue, with a collection date of 6/25/18:

Ordered Test:	WEST NILE VIRUS AB.IGM
<b>Resulted Tests and Results</b>	
Resulted Test: WEST NILE VIRUS AB.IGM	
Result(s): positive CSF	
Reference Range:	
Status:	
Result Comments:	



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# WNV Case Scenario (continued)

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Information obtained after investigation:

- 62-year-old female from Dallas County
- No recent travel history
- Illness onset date: 6/20/2018
- Reported symptoms: fever, chills, arthralgia, and myalgia

Is this a case, either of WNF or WNND?

**NO!**



# Arbovirus Epi Case Criteria Guide



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## *Neuroinvasive:*

*Confirmed:* A clinically compatible case (meets neuroinvasive clinical evidence criteria) with laboratory confirmation

*Probable:* A clinically compatible case (meets neuroinvasive clinical evidence criteria) with virus-specific IgM antibodies in CSF or serum but no other testing OR with lower levels of neutralizing antibodies for potentially cross-reactive\* arboviruses endemic to the region where exposure occurred\*.

## *Non-neuroinvasive:*

*Confirmed:* A clinically compatible case (meets non-neuroinvasive clinical evidence criteria) with laboratory confirmation

*Probable:* A clinically compatible case (meets non-neuroinvasive clinical evidence criteria) with virus-specific IgM antibodies in serum but no other testing OR with lower levels of neutralizing antibodies for potentially cross-reactive\* arboviruses endemic to the region where exposure occurred

# WNV Case Scenario (continued)

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## What can be done next?

- Check with provider to see if there are any additional test results that were not reported
- Check with provider to see if there are additional tests pending
- If no tests pending, check with provider for possibility of additional testing (serum)
- Review medical records for other potential neurological symptoms (CSF pleocytosis)
- If patient was still hospitalized during initial investigation, obtain updated medical records

# DSHS Chagas Disease Webpage



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## Chagas Disease

[Data](#) [Guidance](#) [Information](#) [Medical Providers](#) [Submission and Testing](#) [Resources](#)

Chagas disease, also called American trypanosomiasis, is caused by infection with *Trypanosoma cruzi*, a single-celled parasite naturally transmitted by several species of triatomine bugs ("kissing bugs," "cone-nose bug," "vinchuca"). Humans, dogs, and many other species of domestic and wild animals are susceptible to infection. The insect vectors of Chagas disease and the *T. cruzi* parasite are found in all regions of Texas.

- [General Information about Chagas Disease](#)
  - [Chagas Disease Data and Map of Geographic Distribution for Texas](#)
- [Chagas Disease Information for Medical Providers](#)
  - [Laboratory Diagnosis of Chagas Disease in Humans](#)
- [Triatomine Bug/Kissing Bug/Cone-Nose Bug/Vinchuca Submission and Testing](#)  
Instructions and form for submitting bugs for identification and testing for *T. cruzi*
- Downloadable Information Guide – "Kissing Bugs and Chagas Disease: What You Need to Know"
  - [English](#) (PDF, 2.3 MB)
  - [Spanish](#) (PDF, 1.7 MB)
- [Additional Resources](#)



<https://www.dshs.texas.gov/IDCU/disease/Chagas-Disease.aspx>

# Chagas Disease in Humans Testing Guidance for Providers

Serologic screening tests for chronic Chagas disease are available at several commercial laboratories. Confirmatory serologic testing for chronic Chagas disease and molecular testing (PCR) for acute Chagas disease are available at the CDC. If you wish to test a patient for Chagas disease, please note the following:

1. CDC will not accept serologic specimens for initial screening for chronic Chagas disease. Serologic screening should first be performed at a commercial laboratory. Patients testing positive are eligible for confirmatory testing at CDC.
2. All specimens to be tested at CDC must be submitted to the DSHS laboratory and not directly to CDC. The DSHS laboratory will forward all specimens to CDC.
3. Providers wishing to submit samples to CDC must consult with the DSHS Regional Zoonosis Control (ZC) program prior to sample submission.



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# DSHS Chagas Disease (*Trypanosoma cruzi*) Exposure Assessment and Testing Guidance

Rev. 7-19

1

Person exposed or potentially exposed to a triatomine bug and the bug or photo of the bug is available for identification

- Email the digital photo(s) to DSHS at [bonny.maves@dshs.texas.gov](mailto:bonny.maves@dshs.texas.gov), [whitney.qualls@dshs.texas.gov](mailto:whitney.qualls@dshs.texas.gov) and [the.vet@dshs.texas.gov](mailto:the.vet@dshs.texas.gov)
- If bug appears to be a triatomine or no photo is available, send the bug to DSHS for identification and testing (instructions and submission form are available on the DSHS Chagas [page](#)).
  - If the bug is not a triatomine, the person is NOT at risk for Chagas disease
  - If the bug tests **positive** for *T. cruzi*, go to process 2 or 3, depending on timeframe
  - If the bug tests **negative** for *T. cruzi*, the person is NOT at risk for Chagas disease
- If the bug appears to be a triatomine, but is not available for testing and you wish to pursue clinical testing, go to process 2

- If the person is confirmed **positive** at the CDC, consult with CDC staff regarding clinical evaluation, management, and treatment\* of Chagas disease
- If the person tests **negative** at CDC, the person does NOT have Chagas disease

\* Benznidazole approved by FDA for use in children 2-12 years of age; Nifurtimox is available as an investigational drug through CDC

2

Person tests positive at a blood bank  
 OR  
 Person exposed or potentially exposed to a *T. cruzi* positive triatomine bug >8 weeks prior  
 OR  
 Person with onset of cardiac disease compatible with chronic Chagas disease  
 OR  
 Person with Chagas-positive mother or sibling  
 OR  
 Person potentially exposed to blood or tissue from an infected person or animal >8 weeks prior (e.g. needlestick injury, tissue transplant)

- Perform serology at a commercial lab

**Negative** serology – person does NOT have Chagas disease

**Positive** serology – request that any remaining sample be forwarded to the DSHS lab or collect a new sample and send to DSHS lab for routing to CDC (select “Chagas Disease” in Section 9: CDC Reference Tests on the G2A submission form)

3

Person exposed or potentially exposed to a *T. cruzi* positive triatomine bug ≤8 weeks prior  
 OR  
 Person traveled to a Chagas-endemic area and has acute symptoms  
 OR  
 Person potentially exposed to blood or tissue from an infected person or animal ≤8 weeks prior (e.g. needlestick injury, tissue transplant)

- Prior to sample submission, consult with Regional DSHS Zoonosis Control staff to 1) determine if PCR testing is warranted, and 2) to discuss other testing options
- If CDC agrees to test by PCR, submit the appropriate sample to the DSHS Lab for routing to CDC (select “Chagas Disease” in Section 9: CDC Reference Tests on the G-2A submission form)
- If CDC recommends serologic testing instead of PCR testing, the sample should be sent to a commercial lab (follow process 2)



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# Commercial Laboratory Testing

- **Mayo Medical Lab**
  - **ELISA for *T. cruzi* IgG**
- **ARUP**
  - **ELISA for *T. cruzi* IgG**
  - IFA for *T. cruzi* IgM
    - ONLY appropriate if current or recent infection suspected
    - Should be used in conjunction with a blood parasite screen
    - False positives are very common with this test
- **Quest / Focus Diagnostics**
  - ***Trypanosoma cruzi* Antibody, IgG**

Disclaimer of Endorsement: Reference herein to any specific commercial laboratory or test does not necessarily constitute or imply its endorsement, recommendation, or favoring by the Texas Department of State Health Services.



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# Chagas Disease Scenario 1

- A healthy 45-year-old male that resides in Dallas County donates blood
- The blood collection agency faxed abnormal *T. cruzi* screening test results to ZCB and sent a letter to the donor - Lab Results:
  - reactive for *T. cruzi* screen at blood collection agency
  - positive for supplemental (confirmatory) *T. cruzi* test at blood collection agency
- The DSHS lab receives a serum sample from the donor's physician – the form indicates that the physician is requesting Chagas Disease Serology at CDC.
- **What actions should be taken at ZCB, Region 2/3 ZC, Dallas County, and the DSHS laboratory?**



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# Chagas Disease Scenario 1 (continued)

- The lab notifies ZCB for approval after any Chagas specimen is received
  - if unfamiliar with the patient, ZCB checks to see if the patient is in NBS (has a positive *T. cruzi* IgG ELISA)
- Only *T. cruzi* blood donor screening tests were performed
  - the supplemental or confirmatory test is not a diagnostic test
- The physician needs to order a ***T. cruzi* IgG ELISA** test
  - see list of labs/tests on DSHS Chagas page
    - The IgM IFA is not appropriate for this!



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# Chagas Disease Scenario 2

- A 24-year-old female wakes up to find an engorged kissing bug in bed with her
- The following day, she mails (priority mail express) the bug to DSHS for testing at CDC — ZCB forwards the bug to CDC immediately after receipt
- Two days after mailing the bug, submitter contacts the Regional ZC office to find out how long testing will take and is told it may take a month or more —submitter is concerned and states that she wants to be tested for Chagas disease
- **How would you handle this?**



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# Chagas Disease Scenario 2 (continued)

- Testing will not accomplish anything this early!
  - bug may not be *T. cruzi* positive
  - even if it is, bug may not have defecated on submitter
  - even if bug defecated on submitter, infected feces may not have been rubbed into a break in the skin, mucus membrane, etc.
  - even if exposed to parasite, not enough time has passed for there to be a measurable antibody response!
- Provide information on testing options
  - if nonspecific acute symptoms develop, *T. cruzi* IgM IFA and/or blood smears (PCR an option if acute Chagas suspected by HCP)
  - *T. cruzi* IgG testing at commercial lab if bug tests positive and ~8 weeks has passed since exposed



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# Chagas Disease Case Investigation

- Follow up with patient – provide testing recommendations
  - *T. cruzi* IgG testing for positive blood donors, CDC serology for those with positive *T. cruzi* IgG testing, etc.
- Get detailed information regarding where patient and mother were born, where patient resided, complete travel history, exposure to triatomines, etc.
- Make sure all lab reports, including blood donor screening, are in NEDSS
  - include hard copy labs if no ELR
- Follow up on testing
  - case status will change based upon commercial lab and/or CDC test results (NAC if negative, confirmed if positive at CDC)



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# Lyme Disease Testing Issues

- Sensitivity low during first two weeks of infection (<50%)
- False positive screens are common – several possible causes:
  - syphilis, periodontal disease, acute EBV, lupus, RA, tickborne relapsing fever (TBRF)
- IgM Immunoblots (IB) (Western Blot – WB)
  - irrelevant if no screen performed first (or if screen/screens negative)
  - only need two of three bands to be “detected”
  - interpretation subjective
  - only relevant up to 30 days after symptom onset
- When pretest probability of Lyme disease is low, a positive test is more likely to be falsely positive
  - i.e. exposure in low incidence area and no symptoms or only nonspecific symptoms



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# Lyme Disease Scenario 1

- **Patient** is a 39-year-old male that resides in Travis County
- **Exposure History** - traveled to Indiana for a wedding June 6-12; no tick attachment or outdoor activities noted
- **Clinical Information** – symptom onset July 1; fever/sweats/chills, arthralgias, myalgias, neck pain, fatigue, adenopathy, confusion, Bell’s palsy, radiculoneuropathy
- **Lab Results**
  - Lyme EIA screen positive / IgM WB positive
    - DOC 19 days after symptom onset
  - WNV IgM positive at CPL (6.85 acute, 1.95 conval)
  - Dengue IgM negative
- **Physician Diagnosis** - subacute disseminated Lyme disease
- **Any follow-up questions or testing recommendations? How would you classify this case?**



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# Lyme Disease Scenario 1 (continued)

- ZCB requested follow up testing at CDC
  - PRNT at CDC - negative for DEN, SLE, WNV, ZIKV
  - Tick-borne Relapsing Fever - EIA & WB **Positive!**
- Classified as "Not a Case" for Lyme Disease & Confirmed for TBRF
- Follow up interview – patient mentioned that he went to a local park with his wife and new dog ~one week prior to symptom onset



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# Lyme Disease Scenario 2

- **Patient** is a 12-year-old male that resides in South Texas
- **Exposure History** - no recent travel outside of county of residence
- **Clinical Information** - arthralgias, fatigue, muscle weakness, myalgia, shortness of breath; symptom onset gradual, followed tick bite months prior
- **Lab results**
  - Lyme EIA screen equivocal / IgM WB positive (IgG WB negative)
  - DOC in March (onset in late fall of prior year)
- **Physician Diagnosis** - early disseminated Lyme disease (med records state “previously negative for Lyme disease and is IgG and IgM positive and confirmed by reflex testing”)
- **Any follow-up questions or testing recommendations? How would you classify this case?**

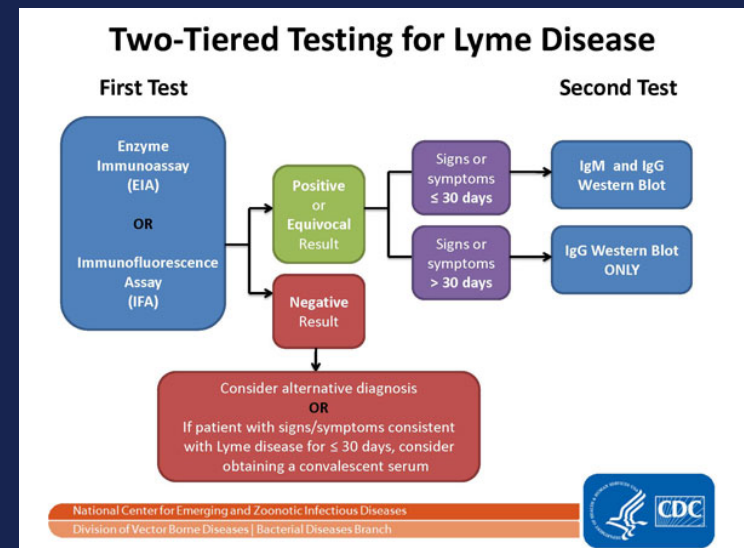


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# Lyme Disease Scenario 2 (continued)

- Classified as **Not a Case**
- The IgM WB is not relevant if onset is more than 30 days prior to DOC!
- How would this be classified if the patient had an IgG positive WB but no screen?
- What if the patient had a negative screen and IgG positive WB?



[https://www.cdc.gov/lyme/healthcare/clinician\\_twotier.html](https://www.cdc.gov/lyme/healthcare/clinician_twotier.html)





# Lyme Disease Case Investigation

- IgM positive blot is only relevant if screen(s) performed and was equivocal or positive
- If screen(s) negative, blot should not be run— therefore, positive WB(s) preceded by negative screen(s) should be ruled out
- Onset date important!
  - IgM positive blot only relevant if specimen collected  $\leq 30$  days after symptom onset
- Make sure all lab reports are in NEDSS
  - Include hard copy labs if no ELR
- Physician does not have to definitively diagnose patient with Lyme (“will not be considered cases if the medical provider specifically states this is *not* a case of Lyme disease”)
- Inquire about travel history!
- Provide records for cases where there is a physician diagnosed EM or late manifestation
- Consider “alternate explanation”: Rickettsial illness, rheumatoid arthritis, lupus, etc.



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# Rickettsial Testing Issues

- An antibody response is not expected until ~7 days after symptom onset
  - many HCPs collect too early and fail to collect a convalescent sample
- Following infection, rickettsial IgM titers persist for months and IgG titers persist for years!
  - does titer reflect current infection or past?
- Rickettsial IgM titers are not reliable – need IgG!
  - IgM rises at approximately the same time as IgG
- Seroprevalence studies on healthy blood donors indicate that up to 6% of US residents have IgG antibodies reactive with *R. rickettsii* when tested by IFA
  - really need that convalescent sample, especially if acute titer is very low



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# Rickettsial Testing Issues (continued)

- Due to antibody cross-reactivity, need to perform rickettsial **panel** testing
  - often tested for only typhus or only SF
- Due to antibody cross-reactivity, a single acute specimen cannot be used to differentiate between SFGR and flea-borne typhus with confidence (need to see rise in IgG titer)
  - very few HCPs collect a convalescent sample
  - HCPs need to collect **both** acute and convalescent serum specimens, **ideally drawn at least 2 weeks apart**
- PCR testing at CDC can differentiate between *R. rickettsii* and *R. typhi*
  - blood or serum sample must be collected during the acute phase of illness no more than two days after doxycycline treatment begins
    - blood – higher sensitivity!
  - sample must be routed through state lab, clinical info must be provided
  - turnaround time is ~6 weeks



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# Rickettsial Disease

## Scenario 1

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- **Patient** is a 24-year-old female that resides in Bexar County
- **Exposure History** – no known tick or flea exposure, no exposure to wild animals, dogs are present at residence
- **Clinical Information** – symptom onset mid-September; fever/chills, headache, anorexia, photophobia, malaise, myalgia, thrombocytopenia, elevated liver function tests, rash (spread from arms/legs to trunk)
- **Lab Results**
  - RMSF IgG 1:128 / RMSF IgM 1:256
  - DOC October 1
- **Classified as probable SFGR**
- **Any follow-up questions or testing recommendations? How would you classify this case?**



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# Rickettsial Disease Scenario 1 (continued)

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- No typhus testing done ☹️
- ZCB requested that the serum be forwarded from commercial lab to DSHS for rickettsial panel testing - results:
  - *R. rickettsii* IgG 1:128
  - ***R. typhi* IgG 1:1024**
- Changed condition to probable flea-borne typhus
- Ideal if request to forward is initiated ASAP before sample is discarded



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# Rickettsial Disease

## Scenario 2

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- **Patient** is a 35-year-old male that resides in Dallas County and did not travel within last 30 days
- **Exposure History** – does not report exposure to fleas or ticks but recently took in a feral kitten and has had issues with opossums in his back yard; has one dog
- **Clinical Information** – onset date May 15; fever, headache, nausea/vomiting, malaise, thrombocytopenia
- **Lab Results**
  - Typhus group IgM 1:128 / Typhus group IgG 1:128
  - SFGR IgM 1:256 / SFGR IgG 1:128
  - DOC May 24
- **Classified as probable SFGR**
- **Any follow-up questions or testing recommendations? How would you classify this case?**



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# Rickettsial Disease

## Scenario 2 (continued)

- Exposure history and recent increase in flea-borne typhus cases in North Texas points to typhus as the more likely etiologic agent
- Request a convalescent sample - if unable to get convalescent testing, classify as "Rickettsiosis, unspecified"
- **Update to 2019 Case definition** – removed requirement that titers be equal:
  - Clinically compatible case (meets clinical evidence criteria) with serological evidence of elevated IgG and/or IgM antibody reactive with spotted fever and typhus group antigens by IFA (serologic titers of  $\geq 1:128$ ) that cannot be classified as either flea-borne typhus or SFGR and does not have a more likely clinical explanation.



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# Rickettsial Case Investigation

- Is further testing warranted? If so:
  - forward to DSHS for rickettsial panel testing
  - request convalescent testing
- Is there an alternate explanation?
  - need to further investigate some cases to ensure that incident cases are being reported rather than patients with past infections
    - early symptoms of both typhus and SFGR (fever, headache) are non-specific
  - “Not a Case” the investigation if rickettsial disease seems unlikely and there is an alternate explanation for the signs/symptoms
- Do NOT report cases that have previously been reported
  - long duration of immunity against re-infection
  - some cross-immunity within groups



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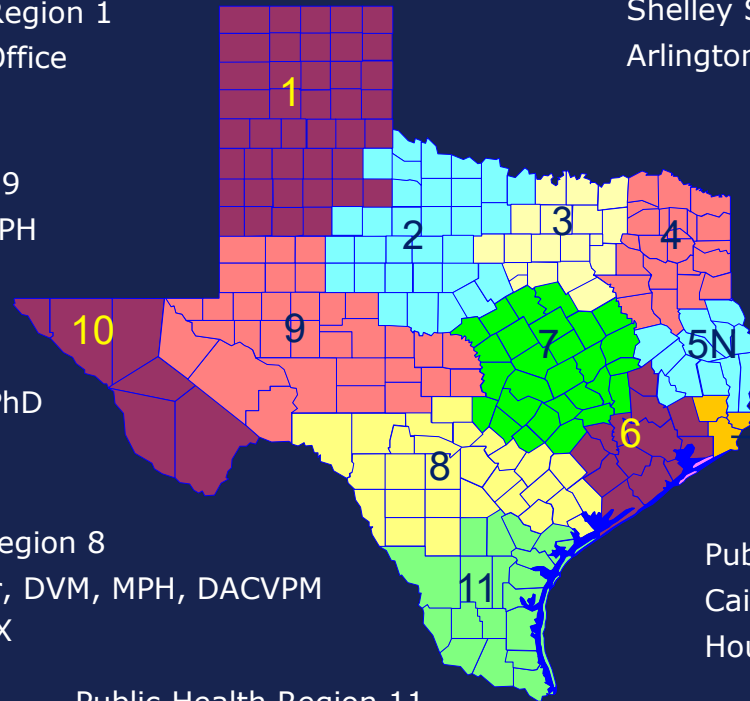
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# Thank you!

## Questions?

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