



# Lyme Disease Updates and New Educational Tools for Clinicians

Clinician Outreach and Communication Activity (COCA) Webinar

Thursday, May 20, 2021

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Those who participate in today's COCA Call and wish to receive continuing education please complete the online evaluation by **June 21, 2021**, with the course code **WC2922-052021**. The access code is **COCA052021**. Those who will participate in the on-demand activity and wish to receive continuing education should complete the online evaluation between **June 22, 2021**, and **June 22, 2023**, and use course code **WD2922-052021**. The access code is **COCA052021**.

Continuing education certificates can be printed immediately upon completion of your online evaluation. A cumulative transcript of all CDC/ATSDR CEs obtained through the CDC Training & Continuing Education Online System will be maintained for each user.

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- Planners have reviewed content to ensure there is no bias.
- The presentation will not include any discussion of the unlabeled use of a product or a product under investigational use.
- CDC did not accept commercial support for this continuing education activity.

# Objectives

At the conclusion of today's session, the participant will be able to accomplish the following—

1. Describe populations at risk of contracting Lyme disease in the United States.
2. Describe early signs and symptoms of Lyme disease.
3. Identify the appropriate use of diagnostic tests for Lyme disease.
4. Cite the appropriate use of antibiotics to treat Lyme disease.
5. Effectively promote clinician and patient education on early signs and symptoms of Lyme disease, tick bite prevention, and post-exposure prophylaxis.

# To Ask a Question

- Using the Zoom Webinar System
  - Click on the “Q&A” button
  - Type your question in the “Q&A” box
  - Submit your question
- If you are a patient, please refer your question to your healthcare provider.
- If you are a member of the media, please direct your questions to CDC Media Relations at 404-639-3286 or email [media@cdc.gov](mailto:media@cdc.gov).

# Today's Presenter



## **Grace E Marx, MD, MPH**

LCDR, U.S. Public Health Service  
Medical Epidemiologist, Bacterial Diseases Branch  
Division of Vector-Borne Diseases  
Centers for Disease Control and Prevention

# Lyme Disease Updates & New Educational Tools for Clinicians

**Grace E. Marx, MD, MPH**

LCDR, U.S. Public Health Service

Medical Epidemiologist, Bacterial Diseases Branch

Division of Vector-Borne Diseases, CDC

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- Describe early signs and symptoms of Lyme disease.
- Identify the appropriate use of diagnostic tests for Lyme disease.
- Cite the appropriate use of antibiotics to treat Lyme disease.
- Promote clinician and patient education on early signs and symptoms of Lyme disease, tick bite prevention, and post-exposure prophylaxis.

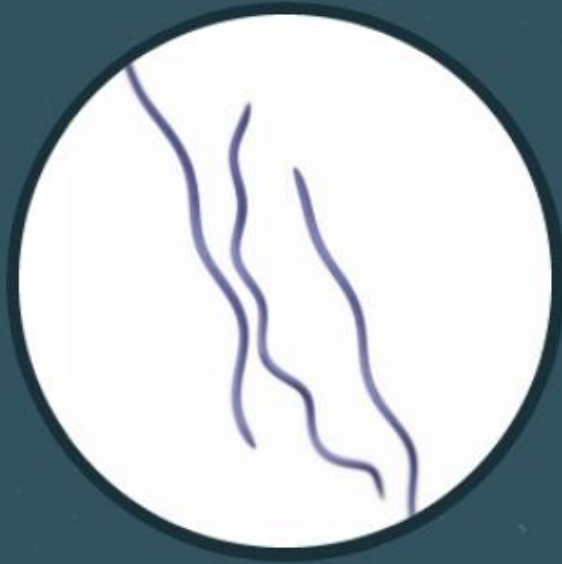




# Background

Lyme Disease & Populations At Risk

# Lyme Disease Pathogen: *Borrelia* species



Lyme disease is caused by a bacterial infection with certain *Borrelia* species.

- Motile, spiral shaped bacteria (spirochete)

# Lyme Disease Transmission

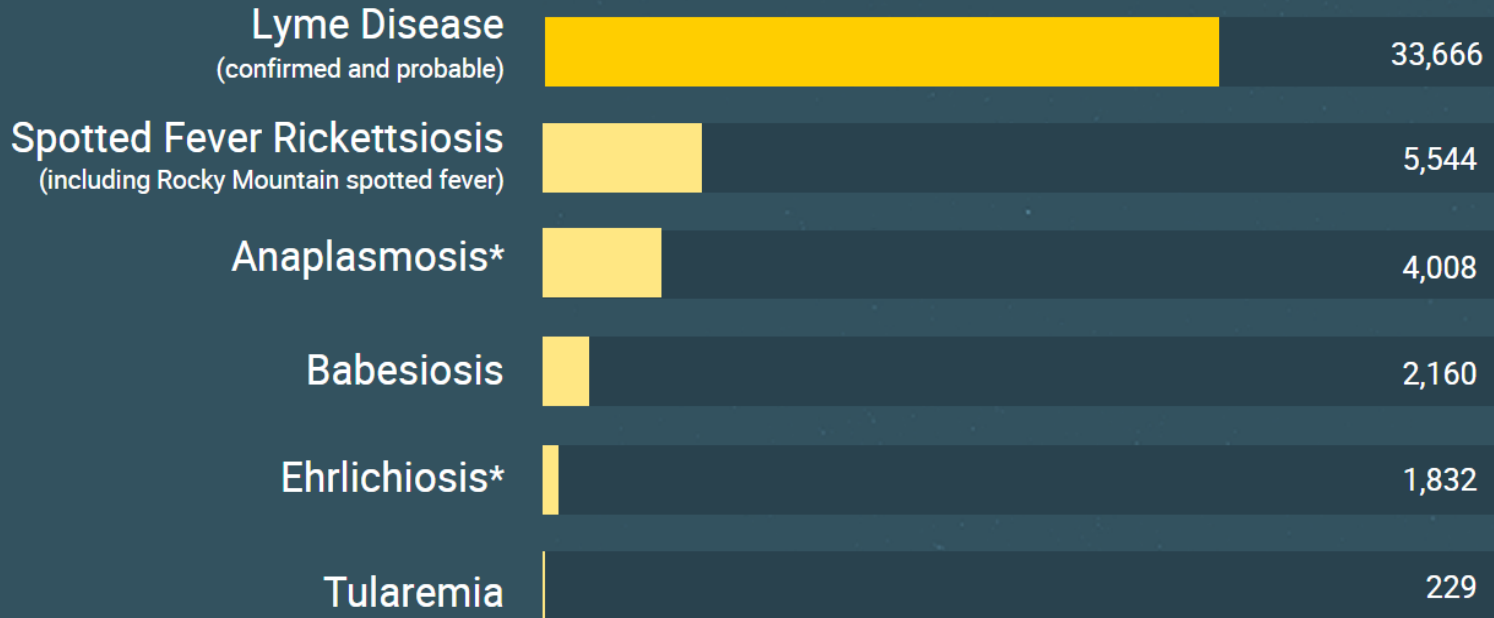
Lyme disease is transmitted by the bite of a tick infected with *Borrelia spp.*

*Transmission occurs:*

- After an infected tick has been attached for at least 24 hours.
- Most transmission occurs after 36 hours of attachment.



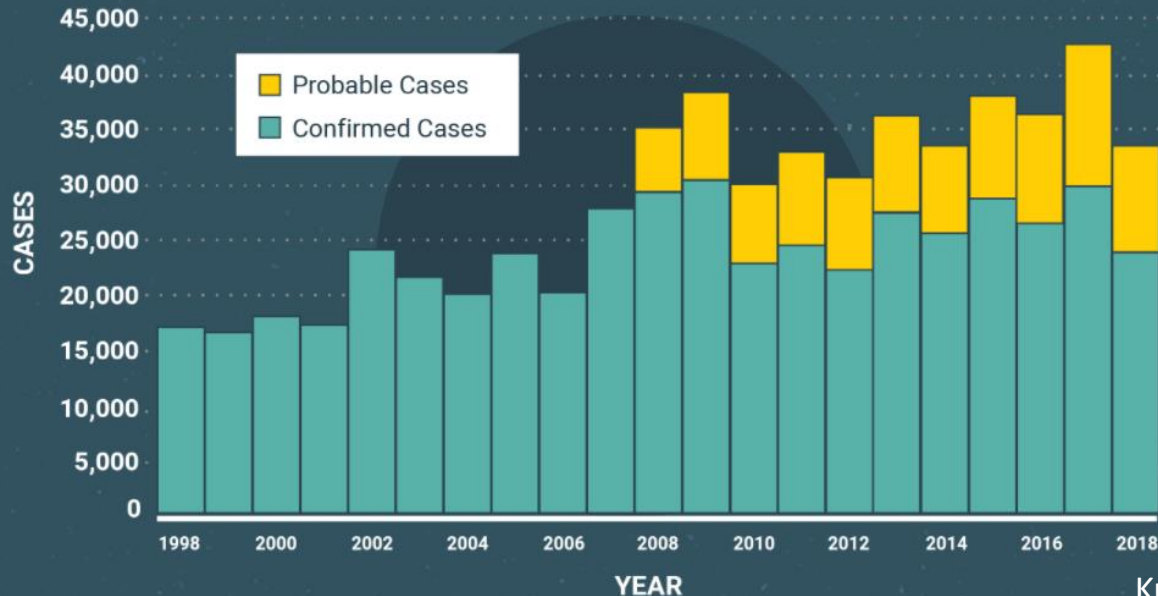
# Most Common Reported Tickborne Diseases, 2018



*\*An additional 283 cases were reported that were undetermined ehrlichiosis/anaplasmosis.*

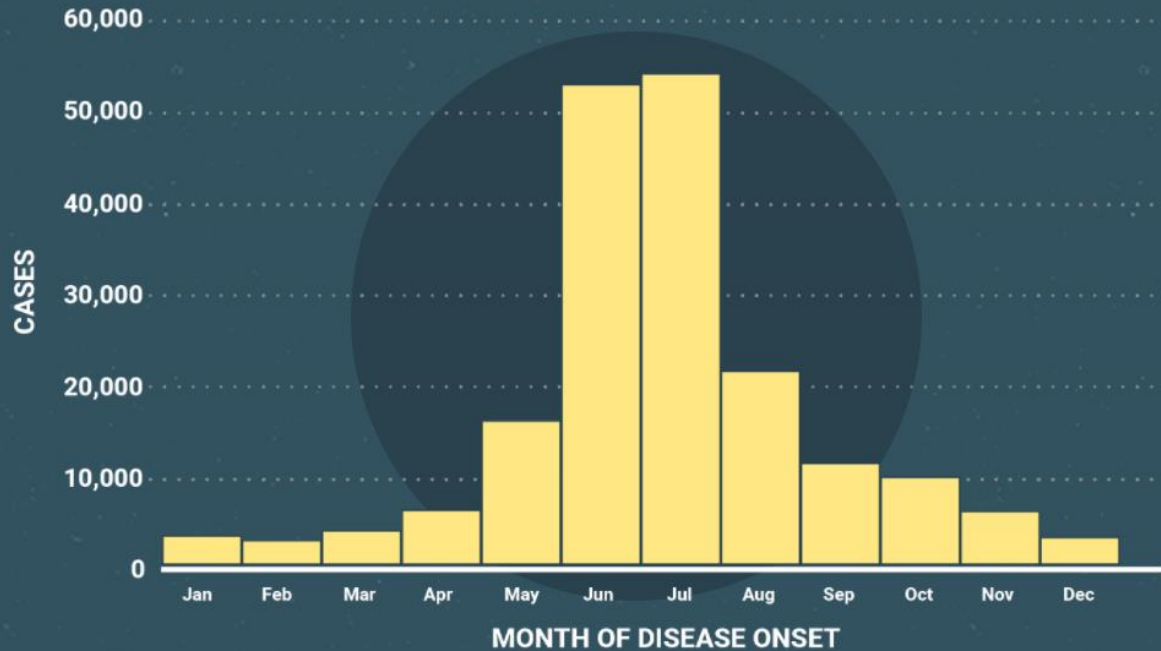
# Lyme Disease Reported Cases

- Each year, approximately 30,000–40,000 cases of Lyme disease are reported to CDC.
- Approximately 500,000 people per year are diagnosed and treated for Lyme disease.



# Lyme Disease Seasonal Risk

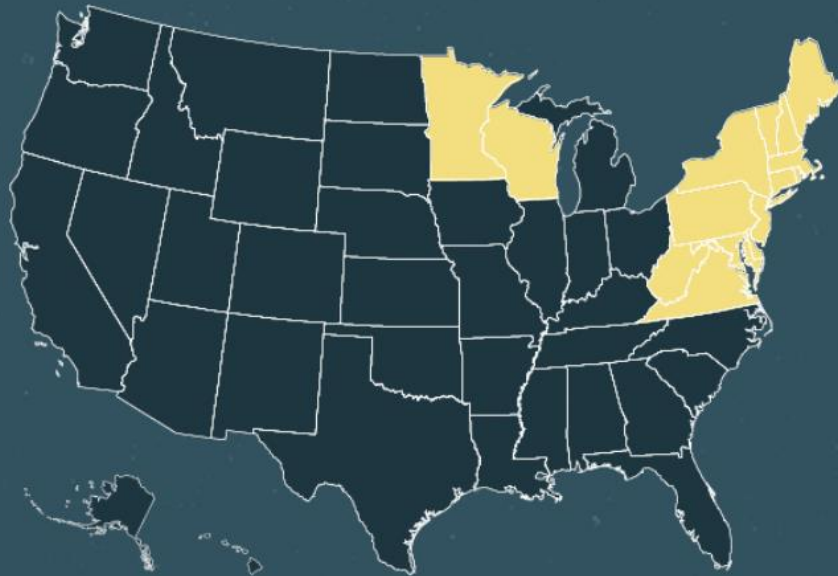
Confirmed cases by month of disease onset, 2008–2018



- Most cases occur in the summer months.
- Infection is possible year-round.

# Lyme Disease: Geographic Distribution

95% of reported Lyme disease cases are from 15 states and D.C.



*Connecticut*

*Delaware*

*D.C.*

*Maine*

*Maryland*

*Massachusetts*

*Minnesota*

*New Hampshire*

*New Jersey*

*New York*

*Pennsylvania*

*Rhode Island*

*Vermont*

*Virginia*

*West Virginia*

*Wisconsin*

# Lyme Disease Vector

- Ticks do not jump, fly, or drop from trees.
- Ticks wait for a host, resting on the tips of grasses and shrubs.
  - When a person brushes against a tick, it quickly climbs on.
  - It then finds a suitable place to attach itself.





# Lyme Disease Vector

Relative sizes of the blacklegged tick and  
Western blacklegged tick life stages:



# Emergency Department Visits for Tick Bite are **Common**

During 2017 – 2019:  
149,364 total ED visits  
(49 per 100,000 ED visits)



# CDC's New Tick Bite Data Tracker

FILTER BY YEAR

All



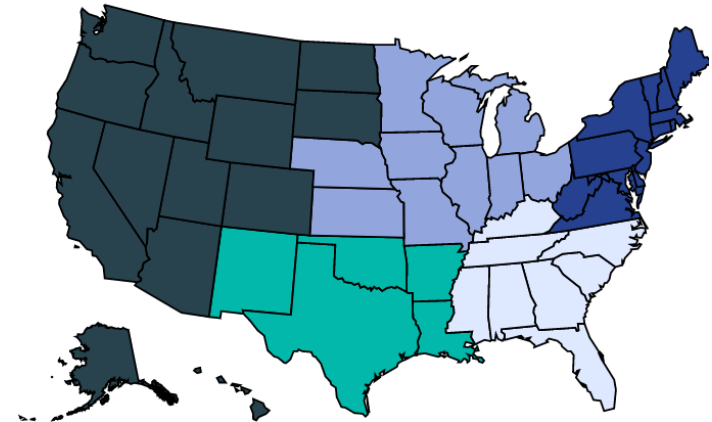
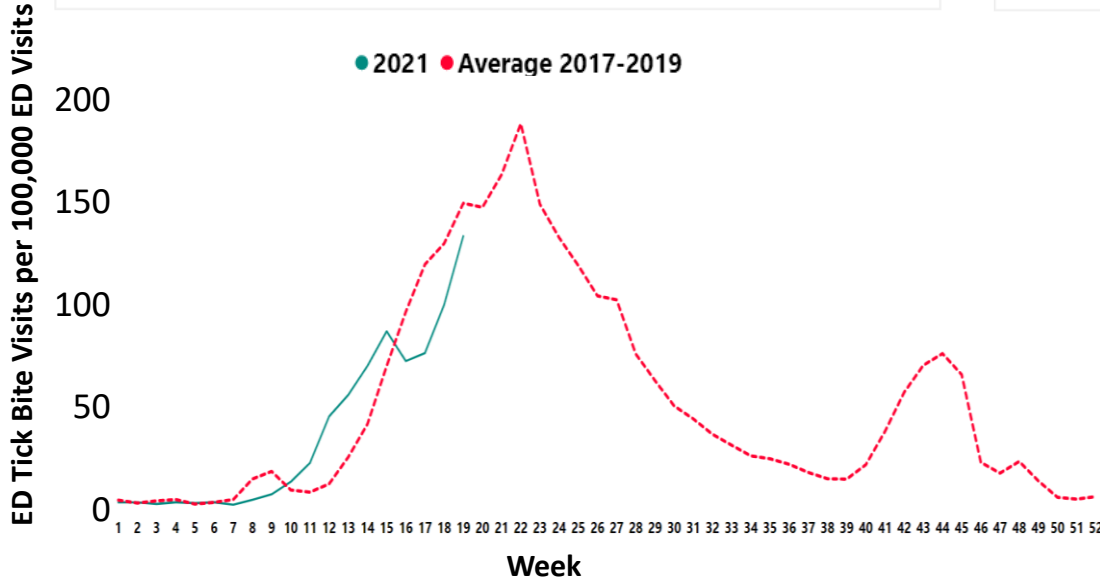
FILTER BY REGION

All



● 2021 ● Average 2017-2019

● West ● South Central ● Midwest ● Northeast ● Southeast





# Clinical Management of Tick Bites

Tick Removal & Lyme Disease Prophylaxis

# Guidance for Clinicians

## Recommendations for Patients after a Tick Bite

When a patient seeks care after a tick bite, topics to discuss should include:



Tick removal



Lyme disease prophylaxis



Symptom watch

# Tick Removal



Use fine-tipped tweezers to grasp the tick as close as possible to the skin's surface.

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Pull upward with steady, even pressure. Do not twist or jerk the tick.



# Tick Removal



Use fine-tipped tweezers to grasp the tick as close as possible to the skin's surface.



Pull upward with steady, even pressure. Do not twist or jerk the tick.



After removing the tick completely, thoroughly clean the bite area and your hands with rubbing alcohol or soap and water.



# Post-Exposure Prophylaxis (PEP) to Prevent Lyme Disease

*Most tick bites do **NOT** transmit disease,  
so antimicrobial PEP is not routinely recommended.*

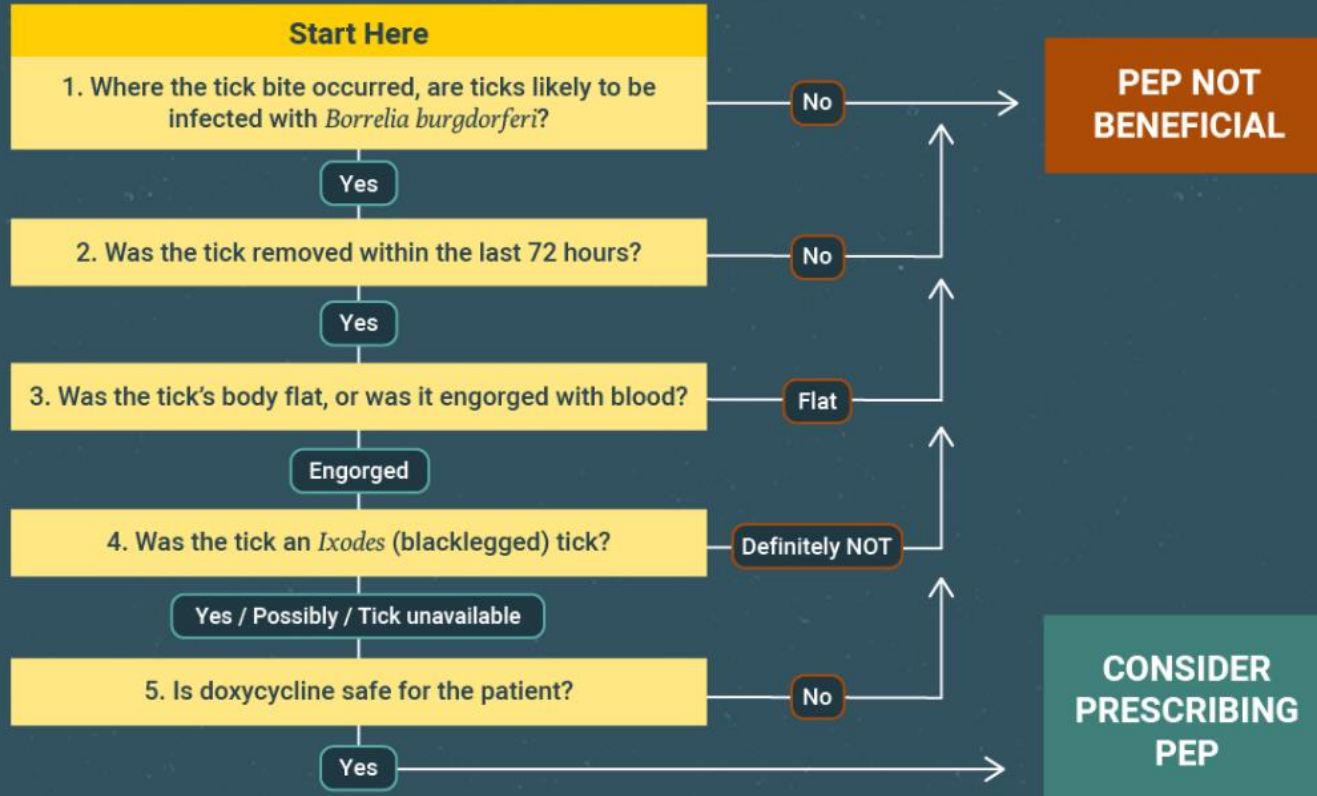
*However, PEP can be appropriate after high-risk tick bites.*

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# Questions to Determine if Lyme Disease PEP is Appropriate

1. Where the tick bite occurred, are ticks likely to be infected with *Borrelia burgdorferi*?
2. Was the tick removed within the last 72 hours?
3. Was the tick's body flat, or was it engorged with blood?
4. Was the tick an *Ixodes* (blacklegged) tick?
5. Is doxycycline safe for the patient?

# Lyme Disease PEP: Clinical Decision-Making Aid



# Post-Exposure Prophylaxis (PEP) to Prevent Lyme Disease

Age Category	Drug	Dosage	Maximum	Duration
Adults	Doxycycline	200 mg orally	N/A	Once
Children weighing less than 45 kg	Doxycycline	4.4 mg/kg orally	200 mg	Once

Doxycycline safety among children:

- Short courses (<21 days) are safe to use in children of **ALL** ages.

# After a Tick Bite

- Advise the patient to return immediately for clinical evaluation if symptoms occur.
- It is possible that a patient may still be in the incubation period for a tickborne disease when they present for care.

## *Symptoms to watch for:*

- Fever.
- Rash.
- Malaise.

# Should Removed Ticks Be Tested for Pathogens?

- Tick testing is NOT recommended as a diagnostic tool.
- Results should not be used as a proxy for tickborne disease testing in patients.
  - Results can lead to decisions about antibiotic treatment without conclusive evidence of patient infection.

# Tick Bite Prevention Counseling

- Use EPA-registered insect repellents.
- Perform daily tick checks.
- Bathe within 2 hours after coming indoors.
- Put clothes in dryer on high heat after coming indoors to kill ticks.
- Avoid tick habitat.
- Prevent tick bites in pets.
- Reduce tick habitat through yard management.



# Lyme Disease Vaccination

- No vaccine currently available.
- The LYMERix vaccine was available between 1998 and 2002.
  - Safe and effective.
  - Pulled from the market in 2002.
- New vaccines are in development and may be available soon.
  - The vaccine will only be effective against Lyme disease, not against other tickborne diseases.





# Lyme Disease

## Early Signs & Symptoms

# Lyme Disease: Clinical Overview

*Lyme disease is a multiphase, multisystem disease.*

Untreated Lyme disease can progress from:

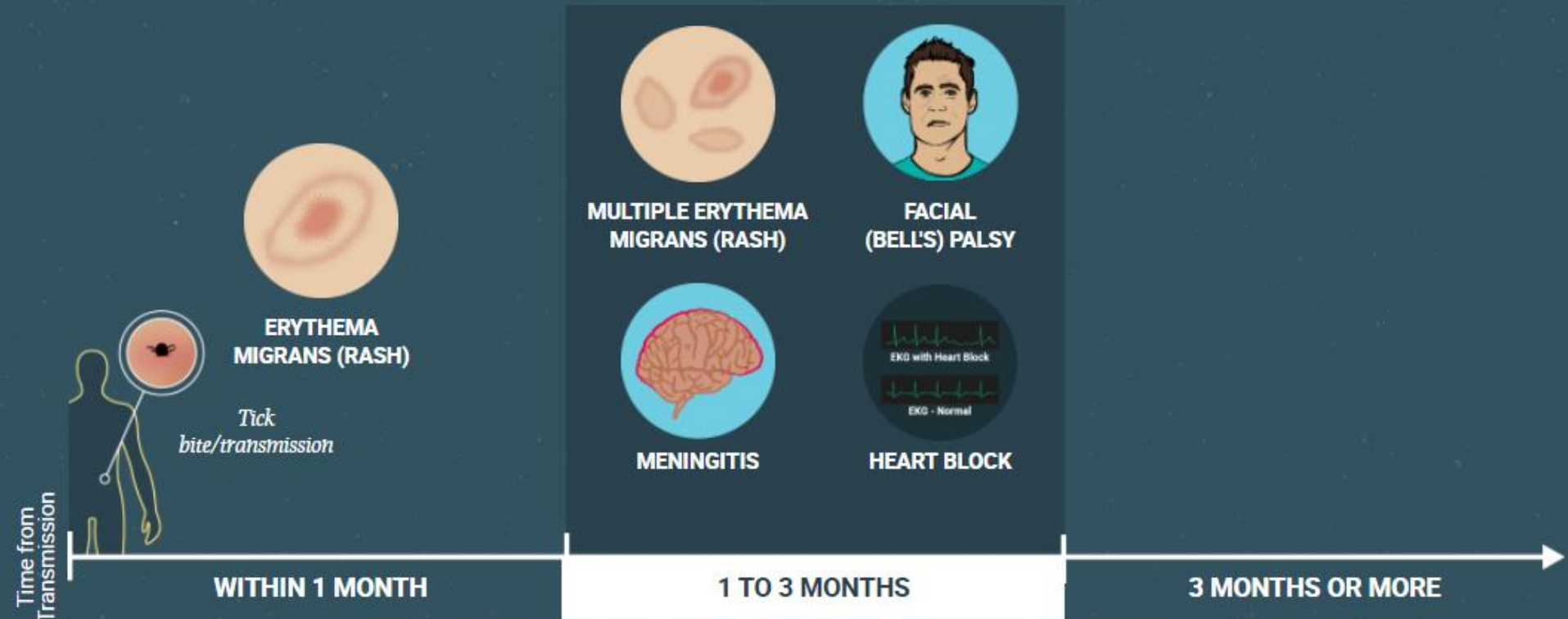


# Typical Lyme Disease Manifestations



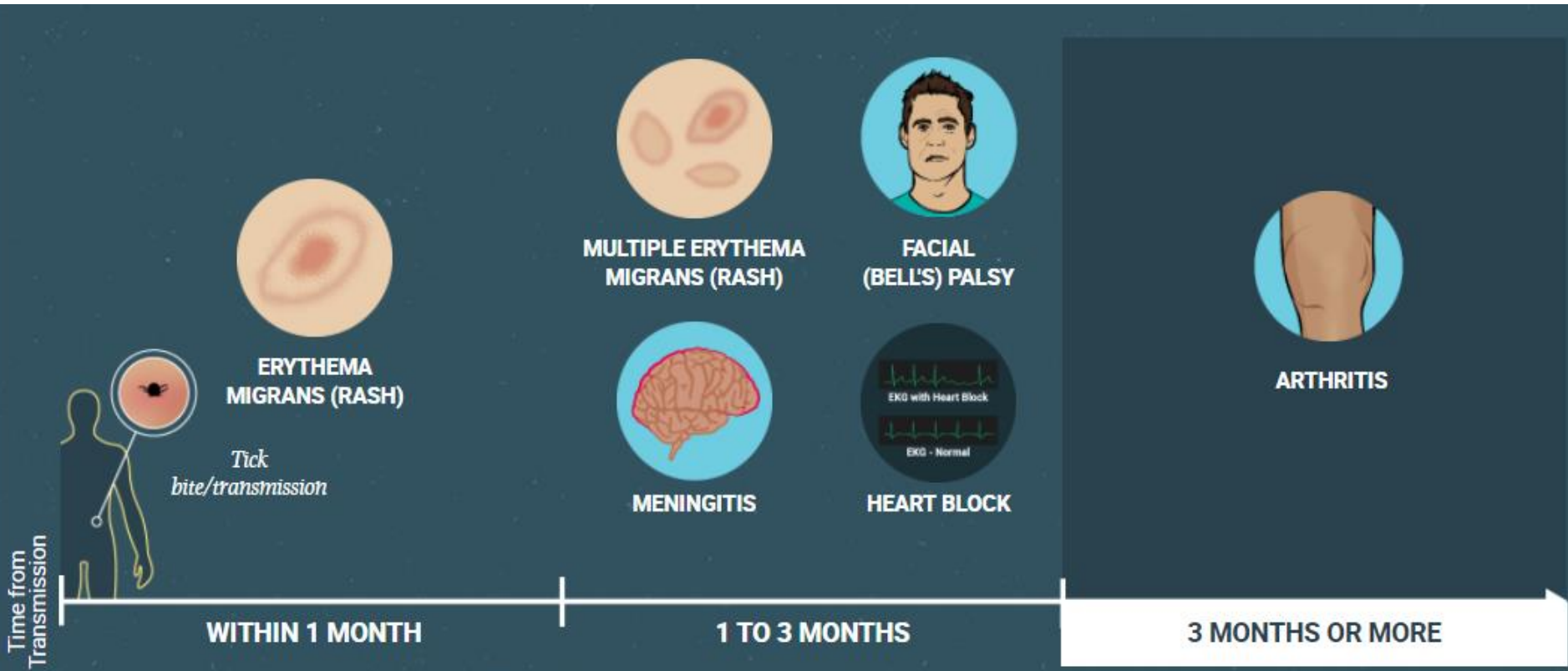
*Please note: This timeline is a generalization. Disease manifestations and onset can vary from person to person.*

# Typical Lyme Disease Manifestations



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# Typical Lyme Disease Manifestations

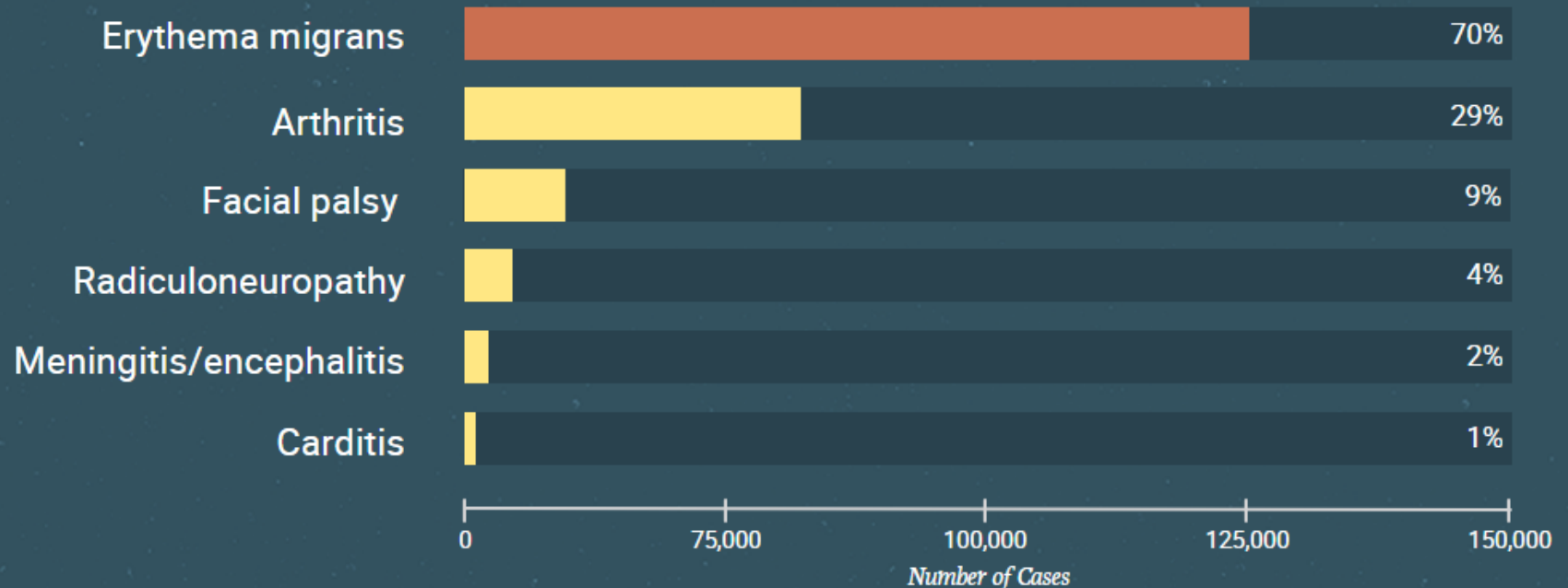


Please note: This timeline is a generalization. Disease manifestations and onset can vary from person to person.

# Frequency of Lyme Disease Manifestations

Manifestations among Confirmed Lyme Disease Cases  
with Clinical Information – U.S., 2008–2018

*N=177,367*



# Erythema Migrans



Incubation Period:

**3** to **30**  
days

*7 to 14 days on average*

# Disseminated Lyme Disease

- Some patients develop disseminated Lyme disease with *no history* of a preceding EM rash.

Up to  
**1/2** *of patients*

.....  
may not be aware of  
a prior tick bite.



# Erythema Migrans



- Typical patch is round and erythematous.
  - *Can be warm*
  - *Rarely painful or itchy*
- Expands slowly over multiple days.
  - *Usually >5 cm in diameter*
  - *May be up to 30 cm in diameter*
- Central clearing can occur as the rash enlarges.
  - *Sometimes results in a bull's-eye appearance*

# Erythema Migrans in People with Darker Skin Tones



Darker, expanding lesion



Typically circular



Can have central clearing

# Disseminated Lyme Disease

## Cutaneous

- *Multiple EM rashes*



## Neurologic

- *Cranial neuropathy*
  - *(most commonly facial nerve palsy)*
- *Radiculoneuritis*
- *Lymphocytic meningitis*



## Cardiac

- *Carditis*



## Musculoskeletal

- *Arthritis*



# Lyme Disease Reinfection

- Reinfection can occur when a patient is bitten by another infected tick.
- Counsel your patients on the risk of reinfection.
- Educating patients with Lyme disease about tickborne disease prevention is important!



# Lyme Disease Coinfection with other Tickborne Diseases



Blacklegged ticks may also transmit pathogens that cause:

- Anaplasmosis
- Babesiosis
- Ehrlichiosis
- *Borrelia miyamotoi* disease
- *Borrelia mayonii* (Lyme disease)
- Powassan virus disease

Risk of coinfection is geographically localized. If you are concerned that your patient might have a coinfection, talk to your local public health department to learn about the risk in your area.

# Lyme Disease Coinfection with other Tickborne Diseases

Consider coinfection when a patient presents with unusual or more severe symptoms including:



*High Fever*



*Gastrointestinal complaints*



*Laboratory abnormalities suggesting hemolysis*

Anemia, elevated LDH, elevated indirect bilirubin

- *Might suggest babesiosis.*
- *Different medications may be needed.*



*Specific cytopenias*

Neutropenia, leukopenia, thrombocytopenia

- *Might suggest anaplasmosis.*



# Lyme Disease

## Diagnosis & Testing

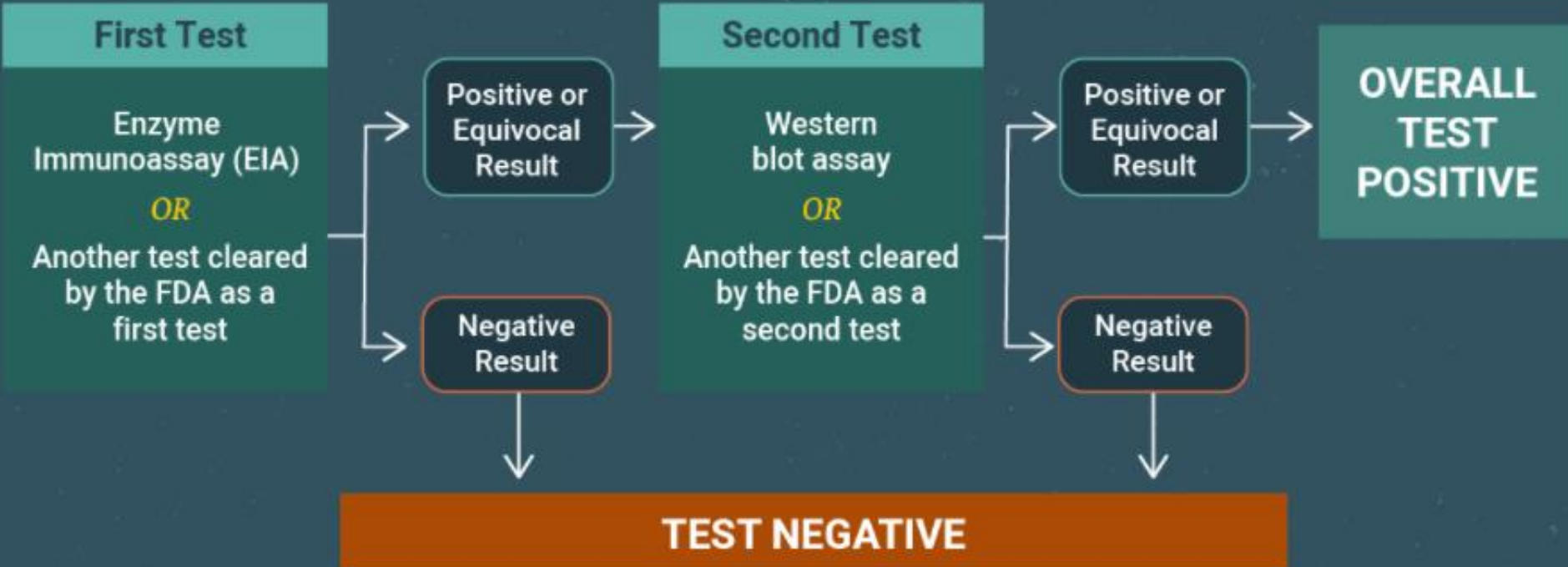
# Interpretation of Lyme Disease Serologic Test Results



- CDC recommends diagnostic tests for Lyme disease that have been evaluated and cleared by the FDA.
- Two-step serologic tests are the only FDA-cleared test for Lyme disease.
- APHL provides suggested laboratory reporting and provider interpretation for Lyme disease serologic test results.



# Two-Step Lyme Disease Serologic Testing

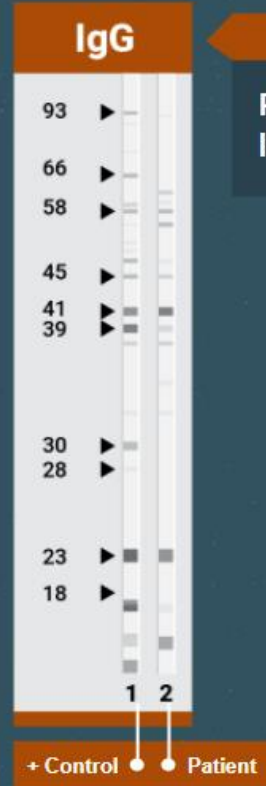


# Western Blot for Lyme Disease

Positive test requires at least *2 out of 3* bands.

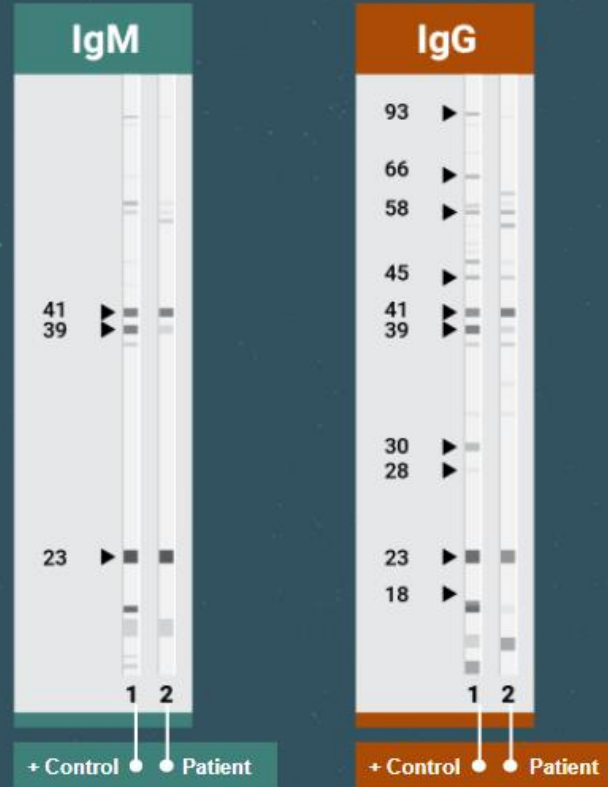


Positive test requires at least *5 out of 10* bands.

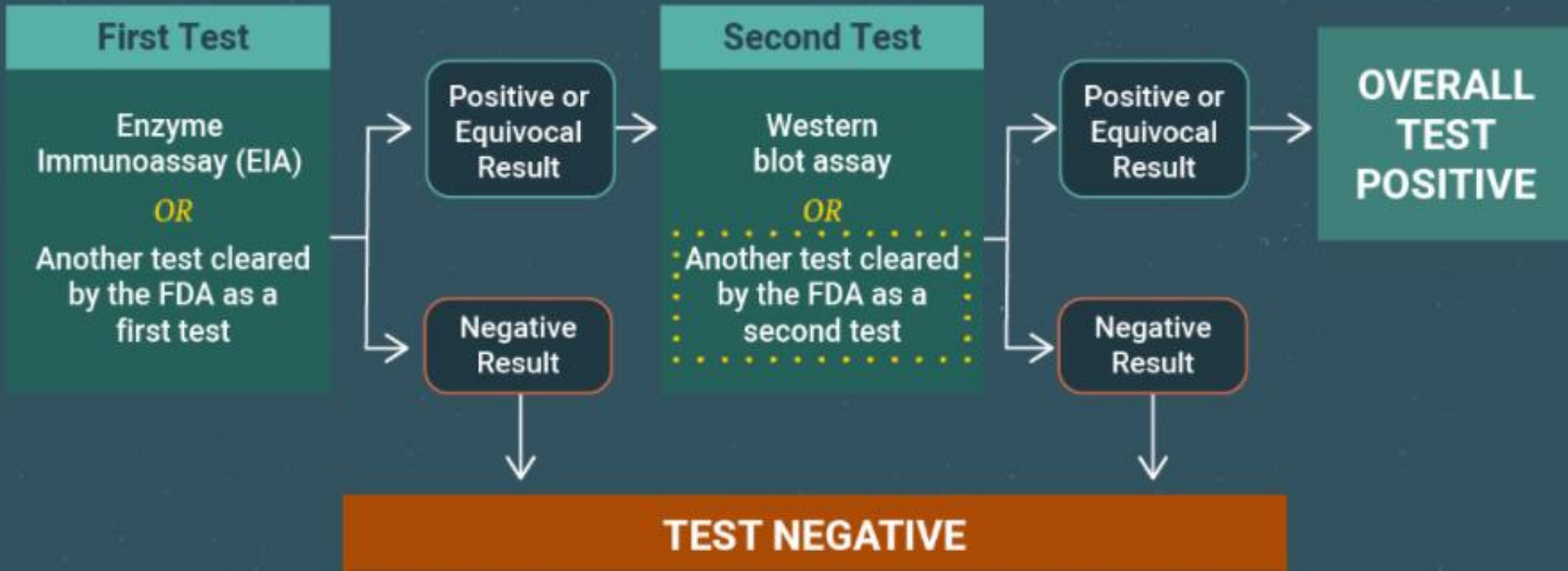


# Western Blot for Lyme Disease

IgM should only be considered during the *first month* of symptoms.



# Modified Two-Step Serology Protocol



# Modified Two-Step Serology Protocol

*EIA tests can be  
conducted sequentially  
or simultaneously*

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## Advantages of using an EIA:

- ✓ Greater objectivity of test result interpretation.
- ✓ Lower burden on laboratory personnel (less time-intensive).

## *Should I test my patient for Lyme disease?*

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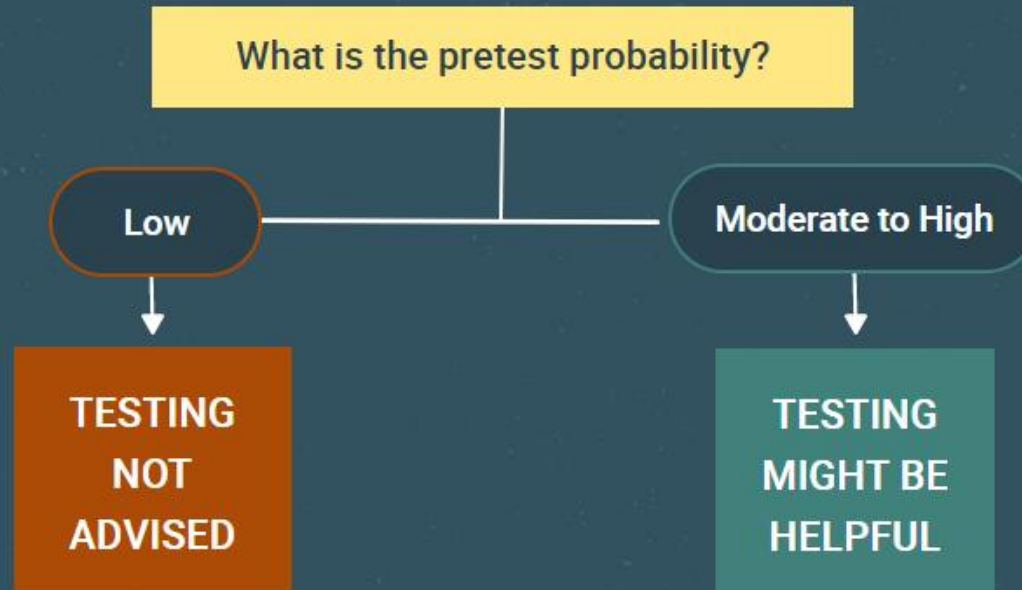
1. What is the pretest probability?
2. What is the disease stage?

# Should I Test My Patient for Lyme Disease?

## Clinical Questions to Determine Pretest Probability

1. Has the patient been in an area where Lyme disease is common?
2. Was the patient likely exposed to ticks?
3. Does the patient have symptoms that are characteristic of Lyme disease?

# Should I Test My Patient for Lyme Disease?





# Should I Test My Patient for Lyme Disease?

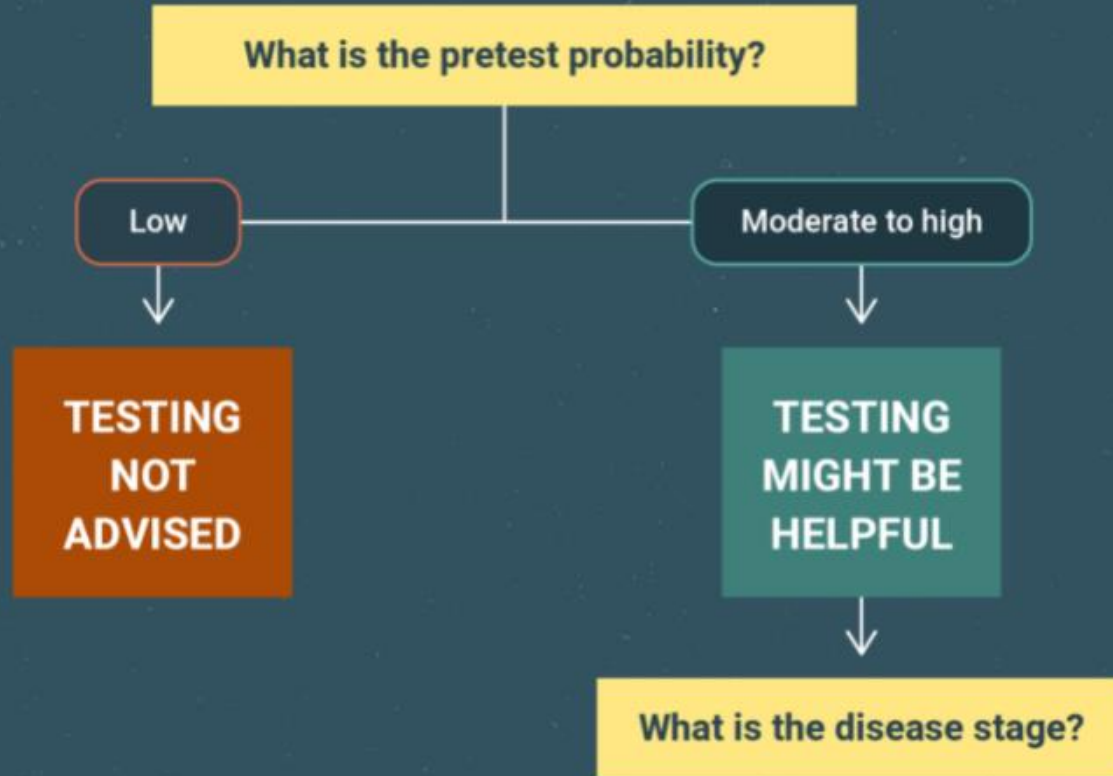
*Why **NOT** test when pretest probability is **LOW**?*

Low pretest probability increases the risk of false positive test results.

**Misdiagnosis can result in:**

- Unnecessary treatment
- Patient anxiety
- Failure to treat the true cause of illness

# Should I Test My Patient for Lyme Disease?



# Should I Test My Patient for Lyme Disease?

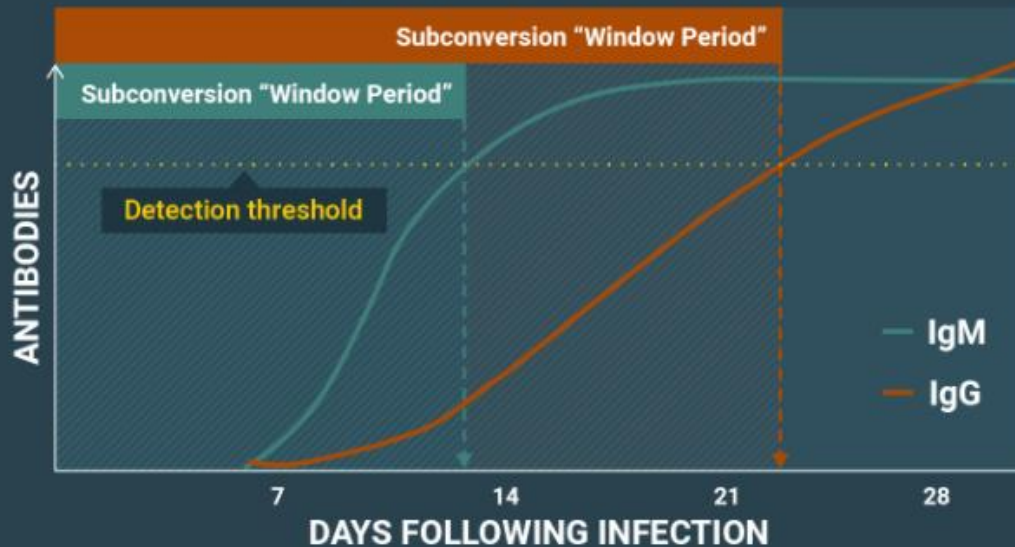
## Test Sensitivity by Manifestation of Lyme Disease

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Lyme Disease Stage	Test Sensitivity
<b>Early Localized</b> (erythema migrans (EM) rash)	<b>Poor</b>
<b>Early Disseminated</b> (multiple EM rashes; facial palsy; carditis)	<b>Very Good</b>
<b>Late Disseminated</b> (arthritis)	<b>Excellent</b>

# Should I Test My Patient for Lyme Disease?

## Antibody response following infection



## Understanding the Window Period

- Serologic testing is based on antibody detection.
- Can take several weeks for antibodies to develop after initial infection with Lyme disease.
- Low serologic test sensitivity at early stage Lyme disease is due to lack of antibodies during *the window period*.

# Lyme Disease Test of Cure?

*Serial Lyme disease serology tests to monitor or establish adequate response to treatment is **NOT** clinically helpful.*



# Lyme Disease

## Clinical Management & Treatment

# Lyme Disease Treatment Overview



- Lyme disease can be treated effectively with antibiotics.
- Recommended antibiotic regimens range in duration from 10 days to 4 weeks.
- Most patients have complete resolution of illness following treatment, but sequelae are possible, especially when patients are diagnosed and treated at later stages of disease.

# Treatment for Erythema Migrans

Age Category	Drug	Dosage	Maximum	Duration (days)
Adults	Doxycycline OR	100 mg, twice per day orally	N/A	10-14
	Amoxicillin OR	500 mg, three times per day orally	N/A	14
	Cefuroxime axetil	500 mg, twice per day orally	N/A	14
Children	Doxycycline OR	4.4 mg/kg per day orally, divided into 2 doses	100 mg per dose	10-14
	Amoxicillin OR	50 mg/kg per day orally, divided into 3 doses	500 mg per dose	14
	Cefuroxime axetil	30 mg/kg per day orally, divided into 2 doses	500 mg per dose	14



# Lyme Disease Treatment Considerations



## Doxycycline safety in children

- Short courses are safe to use in children of all ages
- No evidence that  $\leq 21$  days of doxycycline causes tooth staining in children

# Treatment for Neurologic Lyme Disease

	Age Category	Drug	Dosage	Maximum	Duration (days)
Facial palsy	Adults	Doxycycline	100 mg, twice per day orally	N/A	14-21
	Children (any age)	Doxycycline	4.4 mg/kg per day orally, divided into 2 doses	100 mg per dose	14-21
Meningitis or Radiculoneuritis	Adults	Doxycycline	200 mg per day orally, divided into 1 or 2 doses	N/A	14-21
		<b>OR</b>			
	Children (any age)	Ceftriaxone†	2 grams intravenously, once a day	N/A	14-21
		<b>OR</b>			
Children (any age)	Doxycycline	4.4 mg/kg per day orally, divided into 1 or 2 doses	100 mg per dose	14-21	
	Ceftriaxone†	50-75 mg/kg intravenously, once a day	2 grams per day	14-21	

† Oral therapy can be substituted when the patient is stabilized or discharged to complete the course.


# Treatment for Lyme Carditis

.....

*Patients presenting with suspected Lyme carditis should receive **IMMEDIATE** care and treatment.*

*Do **NOT** wait for Lyme serology results.*

.....



# Treatment for Lyme Carditis

**Mild** = 1st degree AV block with PR interval <300 milliseconds

**Severe** = symptomatic; 1st degree AV block with PR interval >300 milliseconds; 2nd or 3rd degree AV block

	Age Category	Drug	Dosage	Maximum	Duration (days)
Mild	Adults	Doxycycline <b>OR</b>	100 mg, twice per day orally	N/A	14-21
		Amoxicillin <b>OR</b>	500 mg, three times per day orally	N/A	14-21
		Cefuroxime	500 mg, twice per day orally	N/A	14-21
	Children (any age)	Doxycycline <b>OR</b>	4.4 mg/kg per day orally, divided into 2 doses	100 mg per dose	14-21
		Amoxicillin <b>OR</b>	50 mg/kg per day orally, divided into 3 doses	500 mg per dose	14-21
		Cefuroxime	30 mg/kg per day orally, divided into 2 doses	500 mg per dose	14-21
Severe	Adults	Ceftriaxone†	2 grams intravenously, once a day	N/A	14-21
	Children (any age)	Ceftriaxone†	50-75 mg/kg intravenously, once a day	2 grams per day	14-21

† Oral therapy (using an agent as for erythema migrans) can be substituted when the patient is stabilized or discharged to complete the course.

# Treatment for an *Initial Episode* of Lyme Arthritis

Age Category	Drug	Dosage	Maximum	Duration (days)
Adults	Doxycycline OR	100 mg, twice per day orally	N/A	28
	Amoxicillin OR	500 mg, three times per day orally	N/A	28
	Cefuroxime	500 mg, twice per day orally	N/A	28
Children ≥8 years old	Doxycycline OR	4.4 mg/kg per day orally, divided into 2 doses	100 mg per dose	28
	Amoxicillin OR	50 mg/kg per day orally, divided into 3 doses	500 mg per dose	28
	Cefuroxime	30 mg/kg per day orally, divided into 2 doses	500 mg per dose	28
Children <8 years old*	Amoxicillin OR	50 mg/kg per day orally, divided into 3 doses	500 mg per dose	28
	Cefuroxime	30 mg/kg per day orally, divided into 2 doses	500 mg per dose	28

\* There are limited safety data for use of doxycycline for more than 21 days in children under the age of 8 years.

# Treatment for Lyme Arthritis

.....

*For patients with Lyme arthritis who have an **incomplete** response after the first course of antibiotics, a second course of antibiotics can be considered.*

.....

# Lyme Disease Treatment Considerations

- Factors to consider when selecting which antibiotic to prescribe (doxycycline, amoxicillin, or cefuroxime):
  - *Dosing*
  - *Side effects*
  - *Patient's allergy profile*
- Doxycycline is also effective treatment for other tickborne diseases including anaplasmosis, ehrlichiosis, Rocky Mountain spotted fever, and *Borrelia miyamotoi*

# Lyme Disease Treatment Considerations



## Pregnant or breastfeeding patients:

- Doxycycline in pregnant or breastfeeding women has not been thoroughly studied
- Amoxicillin, cefuroxime, and azithromycin are generally considered safe for use



# Post-Treatment Considerations

.....

*Most patients with Lyme disease recover completely within  
**WEEKS** to **MONTHS** after a course of antibiotic treatment.*

.....

# Post-Treatment Considerations

About **1** in **20**

---

treated patients may experience pain, fatigue, or difficulty thinking that lasts for more than six months after finishing treatment.

# Post-Treatment Considerations

There is no proven treatment for post-treatment symptoms:

- Additional prolonged antibiotics have not been shown to improve long-term outcomes

Long-term antibiotic therapy has the potential to cause serious side-effects, including:

- Infectious diarrhea
- Antibiotic resistance
- Line-associated infections

*More than **two** courses of antibiotics are **NOT** recommended for the treatment of Lyme disease.*

# *How can I care for my patients who are receiving treatments that are not recommended for Lyme disease?*

---

Listen

Ask

Review  
Diagnostic History

Review  
Treatment Course

Examine

Evaluate Risk for  
Lyme Disease

- Listen to the patient's story.
- Ask about the Lyme disease diagnostic history, and review treatment course.
- Conduct a thorough physical exam.
- Together, review risks and benefits of treatment.
- Explain about any potential adverse effects of treatments that are not recommended for Lyme disease.
- Evaluate risk of Lyme disease and consider alternate diagnoses.



# CDC Clinician Tools & Patient Education

- Online Lyme disease modules with CE – **COMING SOON!**  
[www.train.org/cdctrain](http://www.train.org/cdctrain)
- Tick Bite Data Tracker  
[www.cdc.gov/ticks/tickEDvisits](http://www.cdc.gov/ticks/tickEDvisits)
- What to do after a tick bite  
[www.cdc.gov/lyme/resources/FS-Guidance-for-Clinicians-Patients-after-TickBite-508.pdf](http://www.cdc.gov/lyme/resources/FS-Guidance-for-Clinicians-Patients-after-TickBite-508.pdf)
- Ticks & Tickborne Diseases Manual  
<https://www.cdc.gov/ticks/tickbornediseases/index.html>

# Questions?



# To Ask a Question

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  - Click on the “Q&A” button
  - Type your question in the “Q&A” box
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# Today's COCA Call Will Be Available On-Demand

- **When:** A few hours after the live call
- **What:** Video recording
- **Where:** On the COCA Call webpage at [https://emergency.cdc.gov/coca/calls/2021/callinfo\\_052021.asp](https://emergency.cdc.gov/coca/calls/2021/callinfo_052021.asp)

# Upcoming COCA Calls / Additional COVID-19 Resources

## *Next Scheduled COCA Calls*

- Thursday, May 27 (2-3 PM ET): Underlying Medical Conditions and Severe COVID-19 ([https://emergency.cdc.gov/coca/calls/2021/callinfo\\_052721.asp](https://emergency.cdc.gov/coca/calls/2021/callinfo_052721.asp))
  - Thursday, June 3 (2-3PM ET): Evaluating and Caring for Patients with Suspected Long COVID ([https://emergency.cdc.gov/coca/calls/2021/callinfo\\_060321.asp](https://emergency.cdc.gov/coca/calls/2021/callinfo_060321.asp))
  - Free CE will be offered
- 
- Subscribe to receive notifications about upcoming COCA calls and other COCA products and services at [emergency.cdc.gov/coca/subscribe.asp](https://emergency.cdc.gov/coca/subscribe.asp)
  - Sign up to receive weekly ***COVID-19 Science Updates*** by visiting [cdc.gov/library/covid19/scienceupdates.html?Sort=Date%3A%3Adesc](https://cdc.gov/library/covid19/scienceupdates.html?Sort=Date%3A%3Adesc)

# COCA Products & Services



The logo for COCA Call features a blue horizontal bar with the text "COCA Call" in white. To the left of the bar are four square icons: a white eye in a blue circle, a white stethoscope in a red circle, a white syringe in a green circle, and a white biohazard symbol in an orange circle.

**COCA Call**  
CDC Clinician Outreach  
and Communication Activity

COCA Call Announcements contain all information subscribers need to participate in COCA Calls. COCA Calls are held as needed.



The logo for COCA Learn features a green horizontal bar with the text "COCA Learn" in white. To the left of the bar are four square icons: a white eye in a blue circle, a white stethoscope in a red circle, a white syringe in a green circle, and a white biohazard symbol in an orange circle.

**COCA Learn**  
CDC Clinician Outreach  
and Communication Activity

Monthly newsletter that provides information on CDC training opportunities, conference and training resources, the COCA Partner Spotlight, and the Clinician Corner.



The logo for Clinical Action features a red horizontal bar with the text "Clinical Action" in white. To the left of the bar are four square icons: a white eye in a blue circle, a white stethoscope in a red circle, a white syringe in a green circle, and a white biohazard symbol in an orange circle.

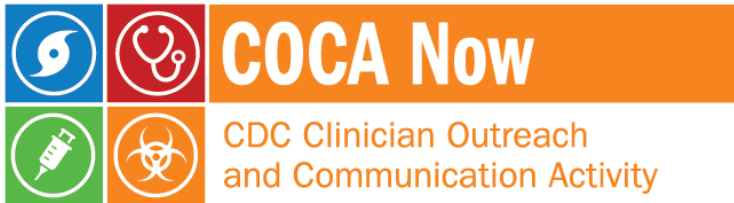
**Clinical Action**  
CDC Clinician Outreach  
and Communication Activity

As-needed messages that provide specific, immediate action clinicians should take. Contains comprehensive CDC guidance so clinicians can easily follow recommended actions.

# COCA Products & Services



Monthly newsletter providing updates on emergency preparedness and response topics, emerging public health threat literature, resources for health professionals, and additional information important during public health emergencies and disasters.



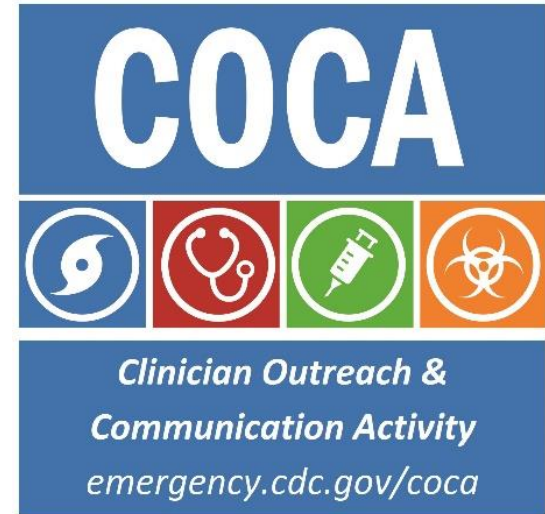
Informs clinicians of new CDC resources and guidance related to emergency preparedness and response. This email is sent as soon as possible after CDC publishes new content.



CDC's primary method of sharing information about urgent public health incidents with public information officers; federal, state, territorial, and local public health practitioners; clinicians; and public health laboratories.

# Join COCA's Mailing List

- **Receive information about:**
  - Upcoming COCA Calls
  - Health Alert Network (HAN) messages
  - CDC emergency response activations
  - Emerging public health threats
  - Emergency preparedness and response conferences
  - Training opportunities



[emergency.cdc.gov/coca/subscribe.asp](https://emergency.cdc.gov/coca/subscribe.asp)

# Join Us On Facebook!



The screenshot shows the Facebook profile for COCA (CDC Clinician Outreach and Communication Activity). The profile picture features a group of six diverse healthcare professionals. The cover photo shows a group of healthcare workers, including a woman in a white lab coat holding a clipboard. The page name is "CDC Clinician Outreach and Communication Activity - COCA" with a verified badge and the handle "@CDCClinicianOutreachAndCommunicationActivity". The page is categorized as a "Government Organization in Atlanta, Georgia" and has 21,420 likes and 21,217 followers. A recent post from October 31, 2017, at 1:18pm, announces a free CE event for a COCA Call on November 7, 2017, at 2:00PM. The page also includes navigation tabs for Home, About, Posts, Photos, Events, and Community, and a "Create a Page" button.

**COCA**

CDC Clinician Outreach and Communication Activity - COCA ✓  
@CDCClinicianOutreachAndCommunicationActivity

Home  
About  
Posts  
Photos  
Events  
Community

Create a Page

Government Organization in Atlanta, Georgia

Community  
21,420 people like this  
21,217 people follow this

About  
See All

Posts

**COCA** CDC Clinician Outreach and Communication Activity - COCA shared their event.  
October 31 at 1:18pm · 🌐

Clinicians, you can earn FREE CE with this COCA Call! Join us for this COCA Call November 7, 2017 at 2:00PM.

**Thank you for joining us today!**



[emergency.cdc.gov/coca](https://emergency.cdc.gov/coca)