Hot Topics in ID 2025

Chris Baliga, MD

NW Region Medical Director of Infection Prevention and Employee Health

CommonSpirit Health

Infectious Diseases Physician

Virginia Mason Medical Center

Objectives

- Understand the risk factors, clinical features, diagnosis, treatment, and screening for Chaga's disease
- Understand the risk factors, clinical features, diagnosis, and treatment of Legionnaire's disease
- Understand the clinical features, diagnosis, and prevention of measles
- Understand the risk factors, clinical features, diagnosis, treatment of *Vibrio vulnificus*

Disclosures

- None

Case 1

45 year-old from Port Townsend presents with fever, malaise, rhinorrhea and a rash

Case 1

- Recent trip to the Philippines
- Or recent trip to Texas
- Or recent trip to Ontario

Tri-County Tribune

Kansas health officials proclaim measles ou

Kansas health secretary Janet Stanek, pictured here Feb. 13, 2
state's first measles outbreak in nearly two decades over.

2 hours ago

ABC News

Measles outbreak that sickened more than 700 declared over in Texas

Measles outbreak that sickened more than 700 declared over
led to the deaths of two school-aged children. ... How...

1 month ago

The Guardian

A huge outbreak has made Ontario the measles centre of the western hemisphere

A huge outbreak has made Ontario the measles centre of the western hemisphere. Three-quarters of cases are in unvaccinated children, and this week saw the...

Jun 6, 2025

The New York Times

Canada's Measles Outbreak Exceeds Cases in the U.S.

Alberta, which has low measles vaccine rates, has recorded about 1,600 cases. The largely conservative province has a deep and vocal level of...

1 month ago

The Media Line

Israel Reports Surge in Measles Cases Since April Outbreak

stry announced Monday that 481 new measles cases have been
he total number of infections to 1,251...

l Sentinel

s now at 36 in Wisconsin as Oconto County eads

All 36 cases of measles are among unvaccinated people, according to health officials. The cases remain in Oconto County where the outbreak...

4 days ago

https://doh.wa.gov/sites/default/files/2025-07/ProviderAlert-MeaslesTesting-06-25.pdf

Provider Alert: Measles Cases in Washington; New Assessment and Testing Resources

Date: June 27, 2025

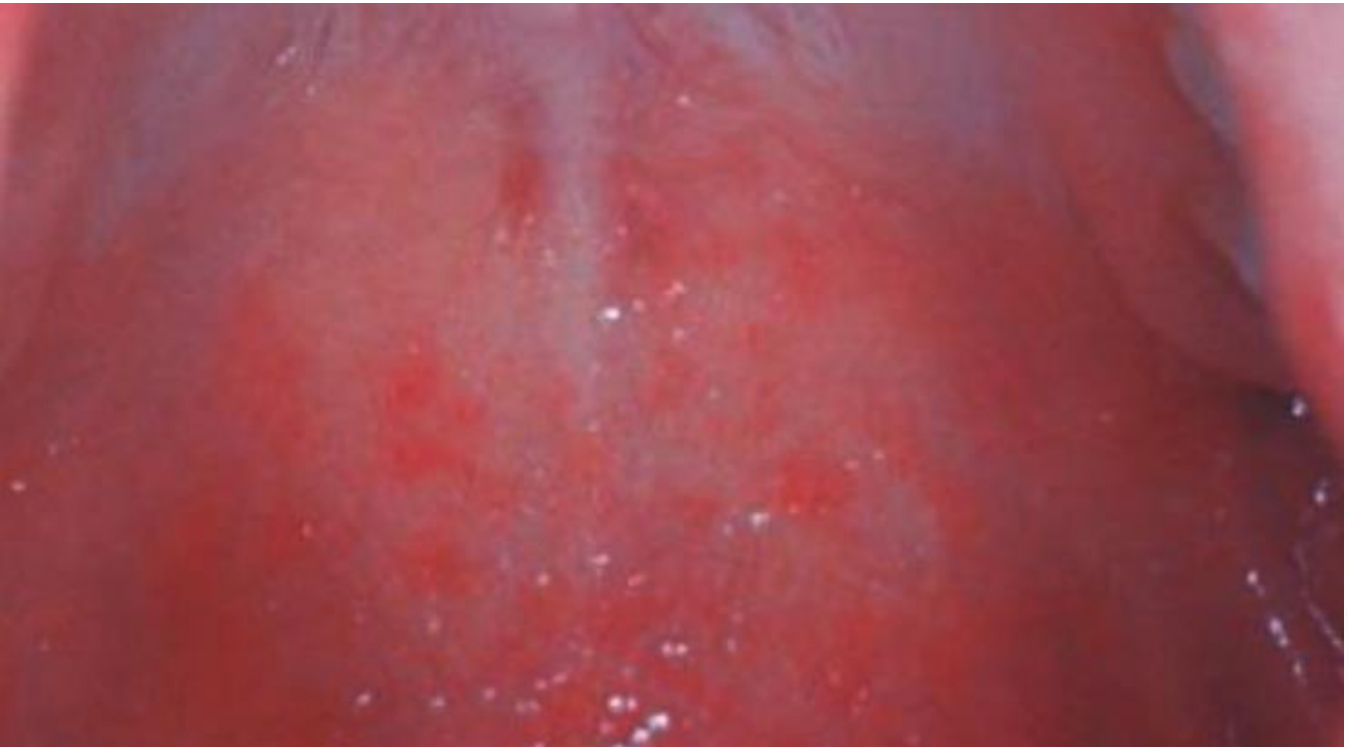
Measles also known as Rubeola

- Humans are the only natural host
- One of the most infectious diseases known
- 9:10 susceptible hosts exposed will contract it
- Droplet spread or airborne
- Measles can remain in the air for up to 2 hours
- In the pre-vaccine era, it was estimated there were 3-4 million cases in the US annually. 48,000 were hospitalized annually and 1,000 developed chronic disability from encephalitis

Clinical Features

- 3 Cs - Cough, Coryza, Conjunctivitis
- High fever
- Koplik spots
- Maculopapular rash – develops 2-4 days after initial symptoms, starting on the hairline then spreading downwards. It may become confluent

Koplik spots



Rash

Complications of measles

- Otitis media, bronchopneumonia, croup, diarrhea
- 1:1000 develop acute encephalitis with permanent brain damage
- 1-3:1000 die from respiratory and neurologic complications
- Subacute sclerosing pan-encephalitis – behavioral and intellectual deterioration, seizures developing 7-10 years after measles infection
- Risks for complications: infants and kids <5, adults over 20, pregnant women, immunodeficiency

What to do if you suspect

- Immediately isolate and mask any suspected patients
- Wear N95 or respirator and place in a negative pressure room if available
- Immediately notify your local public health
- If approved by the state, they will ask for NP swab for measles PCR and Culture, urine for measles PCR and culture, serum for measles IgM and IgG

Prevention

- Ensure everyone is up to date with their MMR vaccine
- Ensure all patients traveling internationally are fully vaccinated 2 weeks prior to departure
- Infants under 12 months who are travelling internationally should receive an early dose at 6-11 months and another dose at 12-15 months, and a final dose at least 28 days later (typically 4-6 years)
- Post-exposure prophylaxis is an option with MMR (within 72 hours of exposure) and measles immune globulin (within 6 days of exposure)

Case 2

- 62 year old with a past medical history of COPD presents to the hospital with worsening cough, shortness of breath, after having been prescribed amoxicillin-clavulanate for pneumonia 3 days prior.

Case 2

- Recent vacation to New England where he stayed in hotels in New York City, New Haven, and with family in Maine

- Or recent travel on a cruise ship

Another person dies in NYC's largest Legionnaires' disease outbreak in a decade

Without proper maintenance, cooling towers and other water systems can emit mist containing the Legionella bacteria.

Eduardo Cuevas
USA TODAY

Aug. 29, 2025, 12:22 p.m. ET

The Guardian

New York City declares Harlem legionnaire's disease outbreak over

New York City declares Harlem legionnaire's disease outbreak over ... New York City has declared the deadly legionnaires' disease outbreak in...

2 weeks ago

Another perso Legionnaires' decade

Without proper maintenance, mist containing the Legionell

Eduardo Cuevas

News 12 - Westchester

About 12 cooling towers in Yonkers to be tested as Legionnaire's disease outbreak continues

Dr. Amler says scientists will be looking for organisms in the cooling towers that have the same DNA as what has been found in Legionnaire's...

24 hours ago

KCRG

Legionnaires' disease cases rise to 61 in Marshall County, officials say

The Iowa Department of Health and Human Services says there are now at least 61 cases of Legionnaires' disease in Marshall County.

6 hours ago

ease cases expand to 54

nosed with Legionnaires' disease continues

erts...

Legionnaire's Disease

- Caused by *Legionella*, especially *Legionella pneumophila*
- Exposure risks: exposure to hot tubs, care at healthcare facilities, travel with an overnight stay outside the home, use of respiratory therapy equipment
- Medical Risks: age over 50, chronic lung diseases, immunodeficiency, smoking (even history of), malignancy, diabetes, kidney disease, hepatic disease

How it spreads?

- Is usually found in natural freshwater environments, but not usually in large enough amounts to cause disease
- In human-made water systems, it can grow and be transmitted via aerosolization (showers or hot tub jets). It can also be transmitted by drinking (and aspirating) contaminated drinking water
- Cooling towers are the most common mode of largescale transmission, but shower heads, faucets most common in hotels, hospitals. Decorative fountains and water features are also implicated.

Signs and symptoms

- Legionnaire's disease – shortness of breath, myalgia, headache, chest pain, nausea, diarrhea, altered mental status. Pneumonia. Often hospitalized, 10% mortality for community acquisition, but 25% for hospital acquired

- Pontiac fever – milder, chills, fatigue, fever, headaches, malaise, myalgia, nausea/vomiting. Not usually hospitalized

When to suspect Legionnaire's

- Patients who have failed outpatient antibiotic therapy for CAP
- Severe pneumonia, especially when in the ICU
- Immunocompromised patients with pneumonia
- Travel history (stay away from their home within past 14 days, especially hotels and cruise ships)
- Pneumonia in setting of a known Legionnaire's outbreak
- HCAP

Diagnosis of *Legionella*

- Legionella Urinary Antigen (good for serogroup 1 which is usually 70-80% of cases)
- PCR of respiratory samples (usually off a bronchoscopy)
- Special culture methods are available, but rarely used

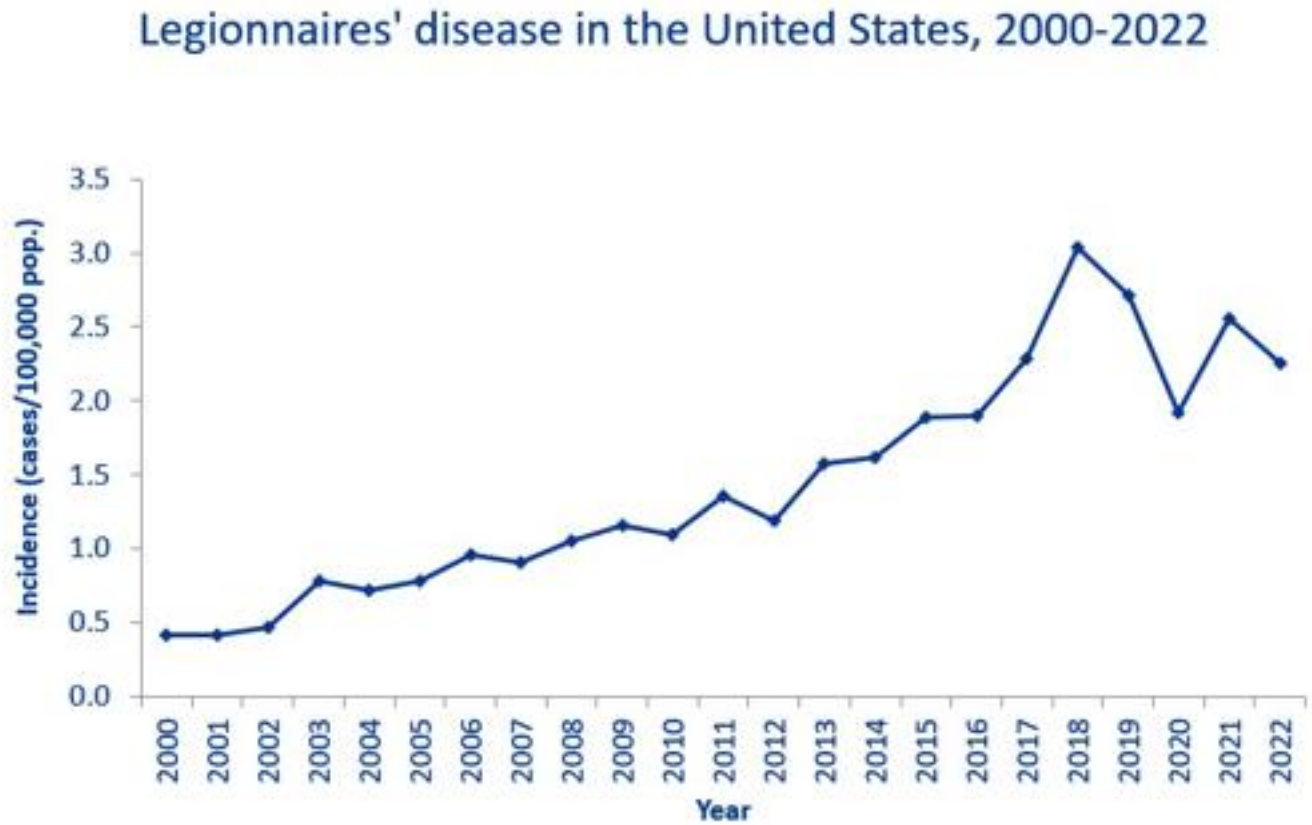
Treatment

- Macrolides
- Respiratory fluroquinolones
- Doxycycline

- Pontiac fever is self-limiting and doesn’t require antibiotics

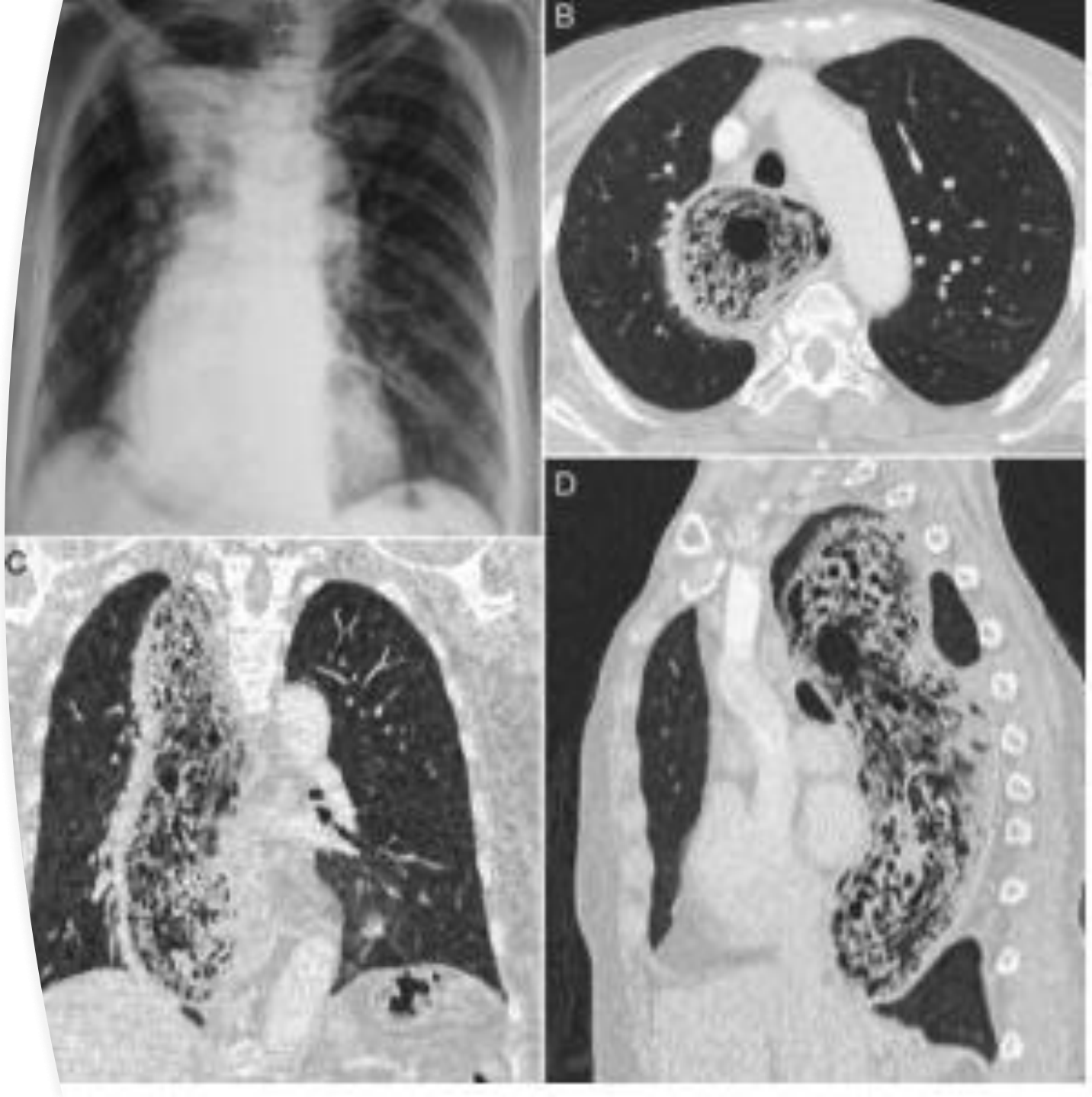
Prevention

- Treatment of cooling towers, hot tubs
- CDC and the Joint Commission require healthcare facilities to have a water management plan, which is mostly aimed at preventing Legionella infections
- Focus on keeping water flowing


Legionnaires' disease in the United States, 2000-2022
Incidence (cases/100,000 pop.)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Year

Case 3

- 55 year-old gentleman presents to the hospital for dysphagia and weight loss
- He notes this has been progressive over the past several months, to the point he has now lost 50 pounds of weight
- Imaging shows:



Arch Bronconeumol. 2017;53:450

Case 4

- 44 year-old presents with a 6 month history of progressive leg swelling, shortness of breath

- Imaging shows

Case 3 and 4

- Born in rural Mexico, where he lived in a mud brick house with a thatched roof
- Was recently denied donating blood due to a positive serology result

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HEALTH • 5 MIN READ

‘Kissing bug’ disease is here to stay in the US, experts say. Here’s why it’s spreading

13 HR AGO

Chagas disease, or deadly "kissing bug" disease, has spread in the U.S. Here's what to know.

CBS NEWS HEALTH WATCH

By **Sara Moniuszko**
Edited By **Sarah Lynch Baldwin**
Updated on: September 9, 2025 / 2:55 PM EDT / CBS News

The New York Times

What To Know About the ‘Kissing Bug’ Disease: Symptoms, Risks and More

1 day ago

'Kissing bug' disease is endemic in US, researchers say. What to know about condition

Since 2013, "kissing bugs" have been reported in 31 states. In eight of these states, humans were reported to have locally-contracted Chagas disease.

Greta Cross
USA TODAY

Sept. 8, 2025 | Updated Sept. 10, 2025, 9:13 a.m. ET

Provider Alert: Low Screening Coverage for Chagas Disease in Washington – Screening Recommendations

Date: July 28, 2025

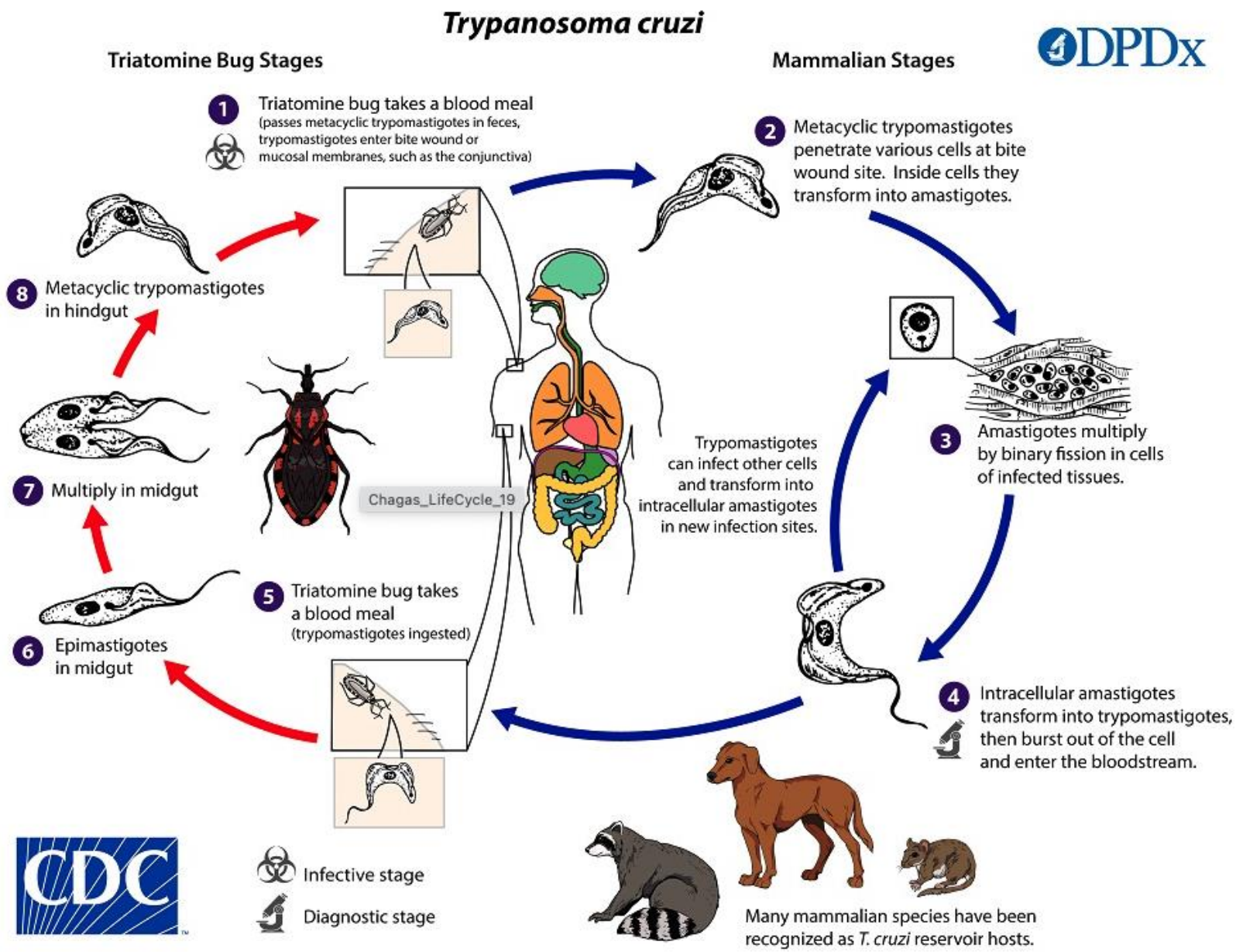
https://doh.wa.gov/sites/default/files/2025-07/ProviderAlert-ChagasScreening-07-2025.pdf

Chaga’s disease or American Trypanosomiasis

- Named after Carlos Chagas, a Brazilian physician who first described the disease in 1909
- Caused by the parasite *Trypanosoma* cruzi
- Spread by infected triatomine bug
- 8 million thought to be infected globally, with 280,000 in the US
- WA state thought to have 2,500 infected patients

Routes of transmission

- Vectorborne (i.e. Triatomine bugs)
- Congenital transmission
- Transfusion of contaminated blood products
- Transplantation of an organ from an infected donor
- Lab accidents (rare)
- Foodborne transmission (rare)



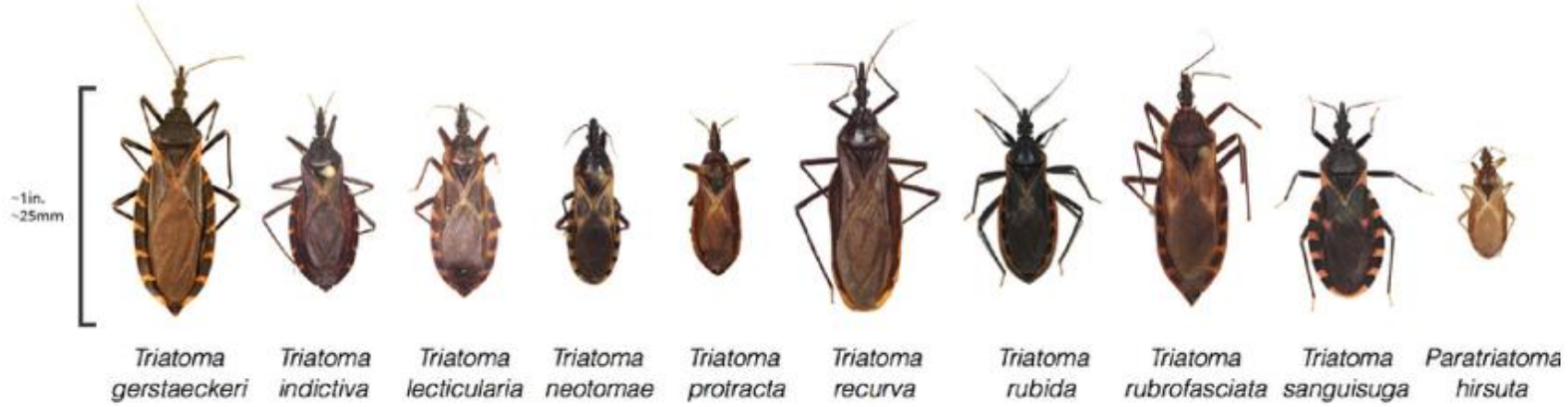
- https://www.cdc.gov/dpdx/trypanosomiasisamerican/index.html

Triatomine bugs

Figure A: Triatomine bug, *Trypanosoma cruzi* vector.

Figure B: Triatomine bugs, the vector of *Trypanosoma cruzi* vectors.

Figure C: Triatomine bug, *Trypanosoma cruzi* vector, defecating on the wound after taking a blood meal.



- https://www.cdc.gov/dpdx/trypanosomiasisamerican/index.html
- https://kissingbug.tamu.edu

Housing risk factors

- Poorly constructed homes
- Thatched roofs
- Cracked mud walls

A house in southern Peru with unmortared brick is susceptible to triatomine infestation. Photo: C.Bern, CDC

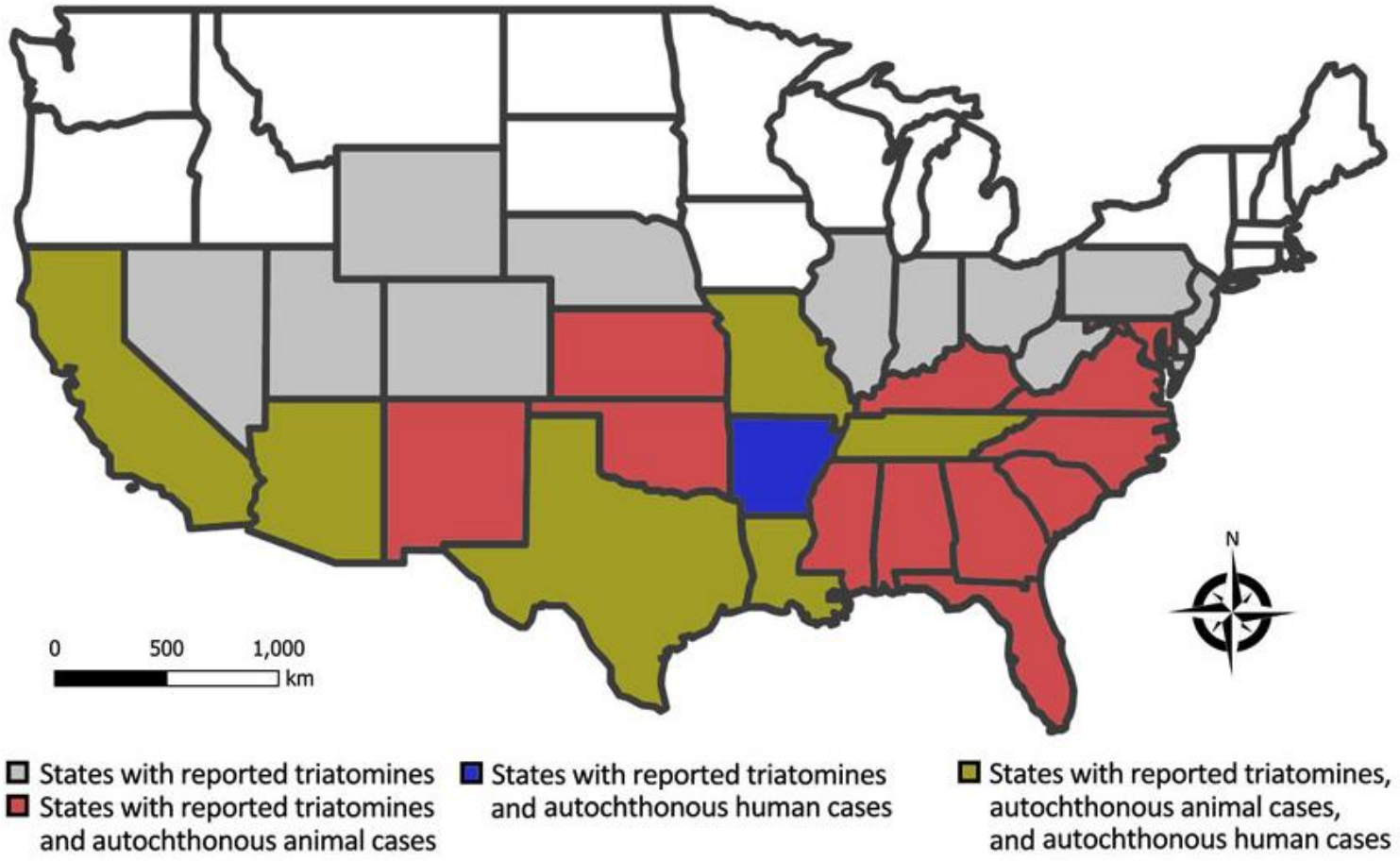
A house in an endemic area with cracked mud walls. Photo courtesy of WHO/TDR/Mark Edwards, Brazil, 1992.

Chagas's traditional endemicity map

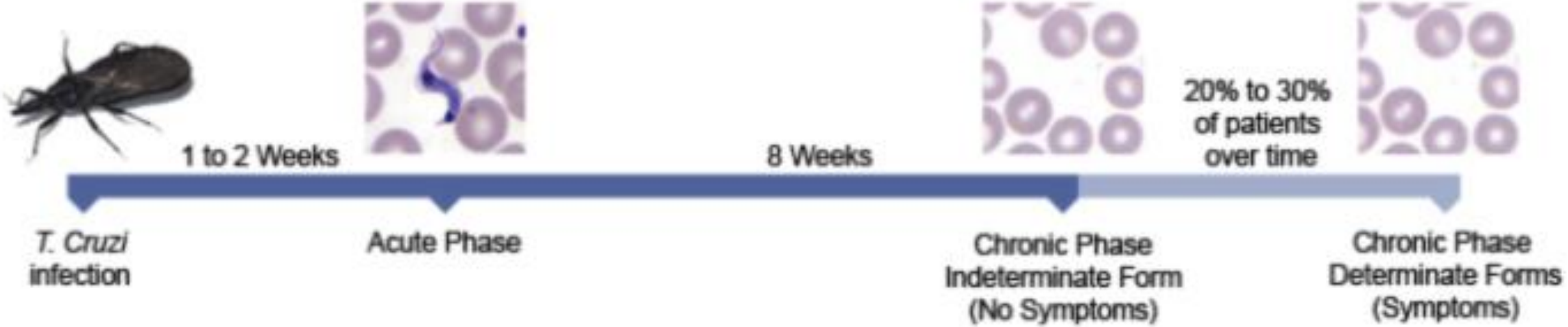
https://commons.wikimedia.org/wiki/File:Distribution_of_Chagas%27_disease.svg

https://www.cdc.gov/chagas/hcp/chagas-clinicians/course1.html

Chaga's more recent US map



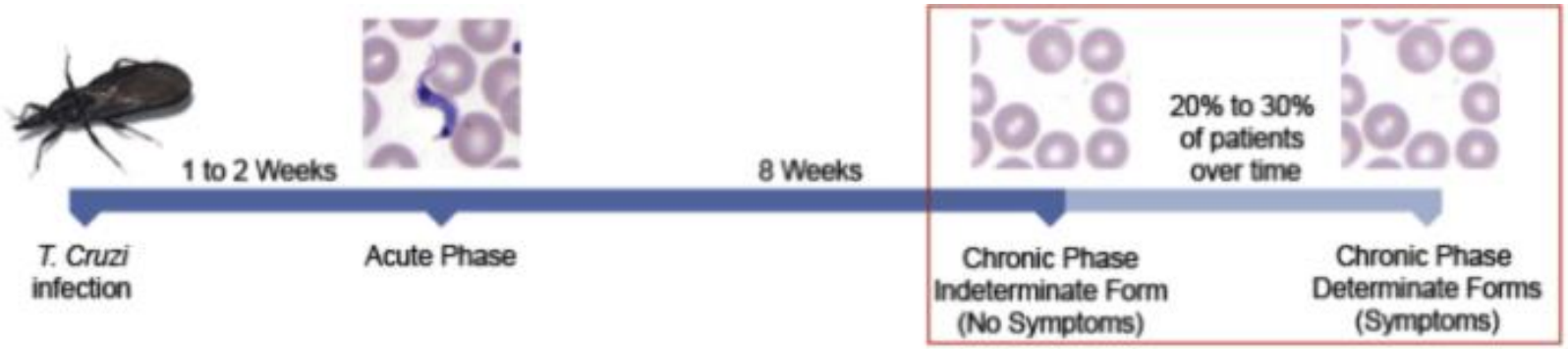
- Beatty NL, Hamer GL, Moreno-Peniche B, Mayes B, Hamer SA. Chagas Disease, an Endemic Disease in the United States. Emerg Infect Dis. 2025;31(9):1691-1697



- Incubation period usually 1-2 weeks, but has been reported to be up to 120 days when from blood or transplantation
- Acute phase lasts for 8 weeks, usually with no or mild symptoms like fever, lymphadenopathy. Rarely can have acute myocarditis and encephalitis, with high mortality
- Acute phase is characterized by high-grade parasitemia, often seen by peripheral smear or buffy coat exam

Chagomas

- Inflammatory swelling at the site of infection
- When the trypomastigotes enter via the conjunctiva gives Romaña's sign



- Majority of patients in the US are in the chronic phase, which has two presentations: Indeterminate (asymptomatic), and Determinate (symptomatic)
- Parasite levels are low, but it can still be transmitted through bites, pregnancy, blood transfusion or organ donation
- 20-30% progress from the indeterminate to the determinate form
- 2 main presentations: Cardiomyopathy or Gastrointestinal disease

Chaga's Cardiomyopathy

- Thought to be caused by persistent myocardial infection and subsequent immune response to the parasites
- Initially presents with conduction abnormalities or segmental ventricular wall motion abnormalities
- Early conduction abnormalities include right bundle branch block and left anterior fascicular block
- Later presentations include
  Complex ventricular extrasystoles
  Non-sustained or sustained ventricular tachycardia
  Sinus node dysfunction with severe sinus bradycardia
  High degree AV blocks
  Apical aneurysm
  Pulmonary and systemic thromboembolisms
  Progressive dilated cardiomyopathy and heart failure
- High risk for sudden death

Gastrointestinal Chaga's

- Thought to be caused by damage to intramural neurons
- Primarily involves the esophagus and colon
- Esophagus can have motility disorders, achalasia, megaesophagus
- Colon can have constipation, fecal impaction, megacolon, volvulus and bowel ischemia
- Seen predominantly in patients infected in Argentina, Bolivia, Chile, Paraguay, Urugay, and southern Brazil, thought to be due to different genotypes of *T. cruzi*

. 2023 Oct 11;42:42–44

Reactivation Chaga's Disease

- Can occur when a chronic Chaga's patient becomes immunocompromised (AIDS, transplant, etc)
- Characterized by high level parasitemia (can see again in blood)
- Can manifest as heart rejection in heart transplant patients
- Often associated with skin lesions

JAAD Case Rep. 2023 Oct 11;42:42-44

An Bras Dermatol. 2018 Nov-Dec; 93(6): 890-892

Reactivation Chaga's Disease in AIDS

- CNS disease with meningoencephalitis or mass lesions resembling toxoplasmosis
- Myocarditis can be superimposed on chronic cardiomyopathy
- Poor prognosis

Diagnosis

- Testing available includes, microscopy, serology, PCR, and pathology
- In acute and reactivation disease, parasites can be seen in blood smears and buffy coats. PCR is positive
- In chronic disease, parasites are not seen in the blood, PCR may be positive, and serology is often used to diagnose
- 2 different serologic tests are required to diagnose Chaga's due to poor sensitivity and specificity
- Positive cases must be reported to local pubic health within 3 days

Who to screen? WA DOH Ask

Screen patients for Chaga's disease if any of the following screening criteria is met

- People who were born in Mexico, continental Central or South America (or who lived in these areas for 6 month or longer), in particular patients who are pregnant or immunocompromised
- Family members of people diagnosed with Chaga's disease if travel or residence exposures were shared
- Any person whose gestational parent was diagnosed with Chaga's disease (1-5% of children born to positive mothers will get congenital Chaga's)

Screening infants for congenital Chaga's

Infants <3 months of age with concern for congenital Chaga's or unknown mother's status

Congenital Chaga's often asymptomatic but can present with low birth weight, prematurity, low APGAR, hepatosplenomegaly, anemia, thrombocytopenia

- At time of birth, check cord blood or whole blood from infant for microscopic exam, PCR, serology (if mother not tested during pregnancy)
- If negative, repeat blood smear and PCR at 4-6 weeks
- If negative repeat serology when infant 9-12 months of age
- If negative at that point, no risk for congenital Chaga's

Screening infants for congenital Chaga's

Infants 3 months of age or older born to a known Chaga's mother

- Serology
- If negative no risk for congenital Chaga's
- If positive repeat when 9-12 months of age
- If negative no risk for congenital Chaga's

Evaluation of positive patients

- Counsel them not to give blood
- Get a history of possible exposures (locations, housing, mother's risk factors)
- Recommend screening for exposed family members
- Perform a history and exam including a 30-second rhythm strip, looking for any symptoms of cardiac or GI disease. Note WA DOH recommends an ECHO or CXR as well (CDC only if cardiac symptoms/signs along with ambulatory rhythm monitor)
- If normal exam, normal testing, repeat exam in 1 year

Treating Chaga's

- All acute or reactivation cases should be treated
- Chronic infections in children under 18 should be treated
- Adults up to 50 years of age who do not already have advanced cardiomyopathy should be treated due to data showing decreased progression of cardiomyopathy and lower mortality risk
- Adults over 50 should get an individualized treatment decision, mostly due to increased intolerance/toxicity of medications and uncertain benefit
- Treatment should not be given to pregnant or breastfeeding individuals

Drugs for Chaga's

Nifurtimox

- FDA approved for children from birth to younger than 18 years of age
- Anorexia, nausea, weight loss, tremors, insomnia, peripheral neuropathy

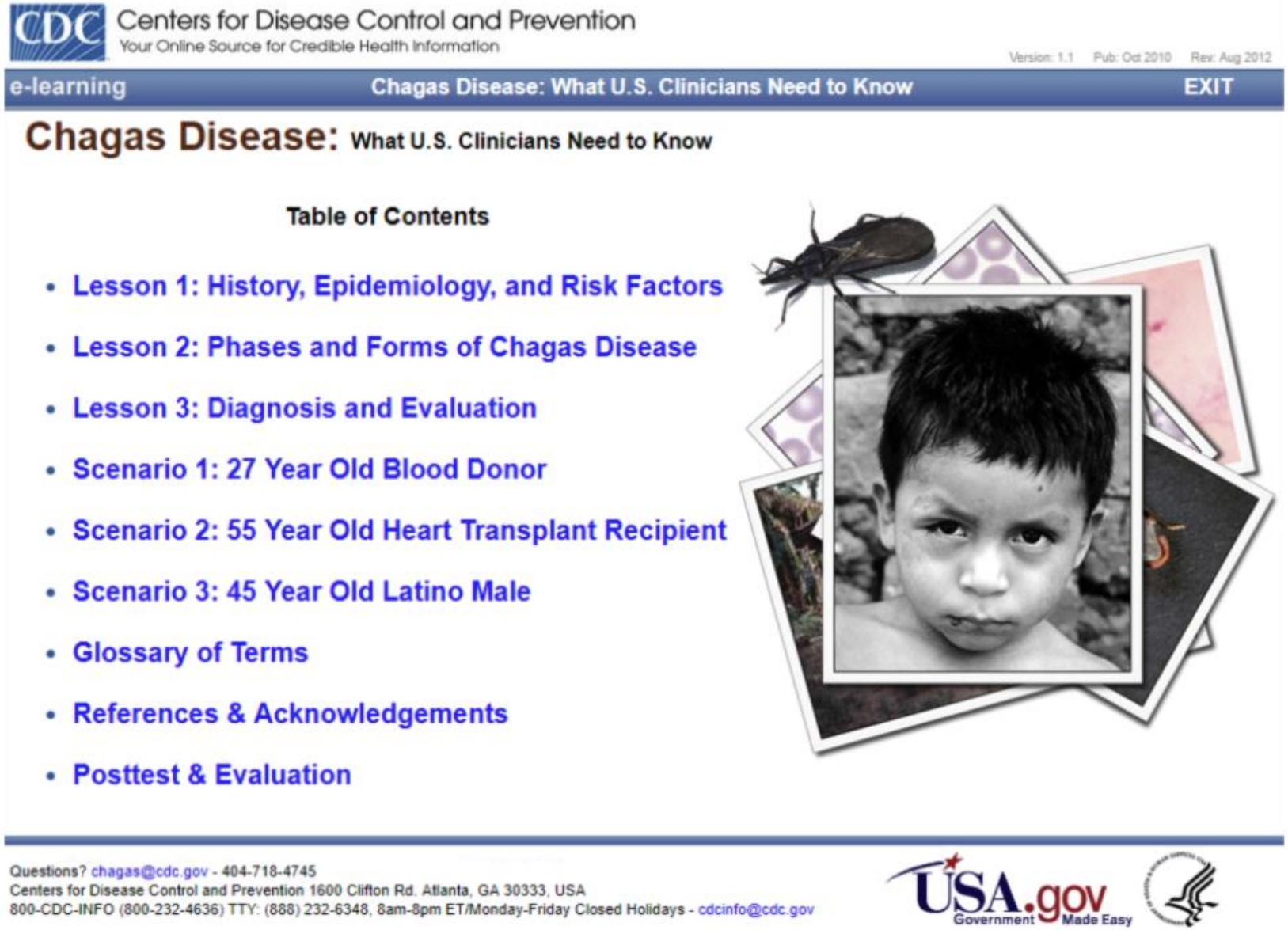
Benznidazole

- FDA approved for children 2-12 years of age
- Side effects: dermatitis, peripheral neuropathy, anorexia, bone marrow suppression

Drug	Age group	Dosage and duration
Benznidazole	2–12 years of age*	5–8 mg/kg per day orally in 2 divided doses for 60 days
Lampit® (nifurtimox)	Birth to younger than 18 years of age, weighing at least 2.5 kg**	Body weight greater than or equal to 40 kg: 8–10 mg/kg per day orally in 3 divided doses for 60 days
		Body weight less than 40 kg: 10–20 mg/kg per day orally in 3 divided doses for 60 days

* Benznidazole is FDA approved for the treatment of Chagas disease (American trypanosomiasis) caused by *Trypanosoma cruzi* in pediatric patients 2–12 years of age. Use of benznidazole to treat a patient outside of the FDA-approved age range of 2–12 years is based on clinical diagnosis and decision by the treating physician under practice of medicine.

** **Lampit®** (nifurtimox) is FDA approved for the treatment of Chagas disease (American trypanosomiasis) caused by *Trypanosoma cruzi* in pediatric patients from birth to younger than 18 years (weighing at least 2.5 kg). Use of nifurtimox to treat a patient outside of the FDA-approved age range of birth to younger than 18 years is based on clinical diagnosis and decision by the treating physician under practice of medicine.



- https://www.cdc.gov/chagas/hcp/chagas-clinicians/course1.html

Case 5

56 year old male with acute onset of leg pain, rash, fever, found to be in shock in the ED

lve hours after admission: Bullae and erythematous plaque in both lower legs

Case 5

- History of Alcoholic cirrhosis
- Recently ate raw oysters in Galveston
- Recently cut his leg on a crab pot in the water off Mobile

WV News

Fifth person in Louisiana dies of flesh-eating bacteria

6 hours ago

WBRZ

Fifth person dead in Louisiana from flesh-eating bacteria this year, LDH says

1 day ago

NOLA.com

'Flesh-eating' Vibrio kills fifth Louisiana resident, health officials warn

1 day ago

Louisiana Illuminator

Flesh-eating bacteria causes 5th Louisiana death this year

1 day ago

WWLTV.com

Fifth person in Louisiana dies of flesh-eating bacteria as cases rise

7 hours ago

Vibrio vulnificus

- Gram negative rod
- Found worldwide in warmer marine environments including salt water and brackish water (river estuaries and saltwater marshes/wetlands), especially during the summer and fall
- Extreme weather events that push coastal waters inland have also been associated with increased incidences of wound infections – coastal floods, hurricanes, storm surges
- Concentrated by filter-feeding shellfish – oysters may have *V. vulnificus* counts up to 2 logs higher than the surrounding sea water
- Most cases found in Gulf Coast states, but cases now found from all along the Eastern Seaboard.
- No cases associated from eating WA oysters so far, but 2 cases from handling farmed Tilapia

Transmission

- Consumption of raw or undercooked seafood, especially oysters
- Contact of an open wound with raw or undercooked seafood, salt water or brackish water – surgical wounds, skin piercing, tattoos, injuries while handling seafood or while swimming, or entering, exiting, or launching boats

Risk factors

- Alcoholic cirrhosis
- Chronic hepatitis due to alcohol or other causes
- Moderate to heavy alcohol use
- Hereditary hemochromatosis
- Diabetes, thalassemia, chronic renal failure, rheumatoid arthritis, cancer, lymphoma, or other immunocompromising conditions
- Males>Females, especially males over 40

3 disease presentations

- Primary septicemia
- Wound infection
- Diarrhea

Primary Septicemia

- *V. vulnificus* septicemia without clear localizing source/wound
- Associated with ingestion of raw or undercooked seafood
- May or may not have antecedent GI illness
- Nearly always has a risk factor (often cirrhosis)
- Rapid onset of shock (1/3 of patients present in shock or develop within 12 hours of hospital admit)
- Characteristic skin changes appear within 24 hours of sepsis onset – typically lower extremities and bilateral severe cellulitis with fluid-filled bullae, can become hemorrhagic. May progress to necrotic ulceration, gangrene, and necrotizing fasciitis with myonecrosis
- High mortality rate

Wound infection

- Can range from mild cellulitis to severe infection resulting in muscle involvement and widespread tissue destruction.
- Swelling, ecchymosis, blister formation, ulceration, hemorrhagic bullae, and abscess
- Rapidly progress to necrotizing fasciitis and myonecrosis, especially in individuals with risk factors
- Usually localized at site(s) of inoculation (although if they become septic from it, can present bilaterally later)
- Patients are at significant risk for going on to develop bacteremia, sepsis, and limb loss

Diarrhea

- More common with other *Vibrio* species, but has also been described with *V. vulnificus*
- Mild to moderate diarrhea, frequently associated with seafood consumption

Treatment of severe infection

- Sepsis suspected to be from *V. vulnificus* needs ICU care
- Soft tissue infection needs antibiotics and immediate surgical debridement

Combination antibiotics for severe disease

- 3rd or 4th gen cephalosporins PLUS
- Doxycyline or minocycline OR Ciprofloxacin or levofloxacin

- Carbapenems, tigecycline, aminoglycosides, and trimethoprim-sulfamethoxazole usually work
- Penicillins and first generation cephalosporins are not recommended, even if susceptible

- Duration is at least 2 weeks

Treatment of mild disease

- Presence of risk factors: same as for severe disease
- Absence of risk factors: local wound care and doxycycline or fluroquinolone.
- Diarrhea is usually self-limited, and no antibiotics are needed

Mortality rates

	Mortality rate
Primary septicemia	50%
Wound infection	15%
Hypotension at time of presentation	>90%
Advanced liver disease	64-fold increased odds of death

Antibiotics started within hours of illness onset	Mortality rate
<24 hours	33%
24-48 hours	53%
>72 hours	100%

Ann Intern Med. 1988;109(4):318.

44 year old woman, healthy, ate raw oysters 2 days prior, presented with fever, leg rash, and hypotension.

CMAJ April 08,
2024 196 (13) E446

Hurricane Katrina cases

- Patient A: 60 year-old man with history of alcohol abuse, after 3 days of wading in flood waters of New Orleans, presented to an ED with bilateral ankle wounds and diarrhea. Treated and released, but blood cultures grew *V. vulnificus*. He was found and readmitted but died the next day
- Patient B: 49 year-old woman with Hep C, rescued by boat from New Orleans, presented to hospital with bullae, septic shock, and necrotizing fasciitis.

- MMWR Sept 14, 2005/54(Dispatch); 1-4

Twelve hours after admission: Bullae and erythematous plaque in both lower legs

Fifteen hours after admission: Progression of the skin lesions in both legs

- 61 y/o male with Hep B, cirrhosis, HCC, ate shellfish 3 days prior, woke up morning of admission with leg pain, took NSAIDs, but presented in the evening with hypotension.
- Di, W., Cui, J., Yu, H. *et al. Vibrio vulnificus* necrotizing fasciitis with sepsis presenting with pain in the lower legs in winter: a case report. *BMC Infect Dis* **22**, 670 (2022).

Day 4 after admission: progression of tissue necrosis to the thigh

- 63 year-old female with uncontrolled diabetes, admitted with septic shock after shellfish ingestion
- November 2022; Medicina Interna de México 38(6):1283-1289

Thank you!