



Kitchen Sink: Syndromes Not Covered Elsewhere (online content)

Stacey R. Rose, MD, FACP, FIDSA
Associate Professor of Medicine, Infectious Diseases
Director, Center for Professionalism
Baylor College of Medicine

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Disclosures of Financial Relationships with Relevant Commercial Interests

- List of disclosures or “None”

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Session Plan

- Case-based discussions of topics not extensively covered in other sessions
- Highlight points likely to be assessed on ID Boards (rather than comprehensive overview)

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Question #1



- A 23-year-old female presents with a non-productive cough for 2 weeks. She describes spells during which she coughs repeatedly for several minutes. On two occasions she vomited after coughing.
- She reports episodes of sweating but has had no fever or other constitutional symptoms.
- She has tried several cough medicines, but nothing seems to help.
- PCR respiratory panel was positive for *Bordetella pertussis*.
- She works as a nurse in a pediatric intensive care unit and would like guidance for when she can return to work.

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OL15 Kitchen Sink: Syndromes Not Covered Elsewhere – Bonus Cases

Speaker: Stacey Rose, MD

Question #1



<https://www.youtube.com/watch?v=31tnXPIhA7w> (NEJMvideo)

Which of the following would you recommend for this patient?

- Azithromycin, with return to work after 5 days
- Azithromycin, with return to work after first dose
- No treatment, with return to work after 5 days
- No treatment; can return to work immediately

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Whooping cough cases surge as vaccine rates fall

The U.S. has tallied 8,077 cases of whooping cough in 2025, compared with 3,847 cases in the same period last year, federal data shows.

April 22, 2025

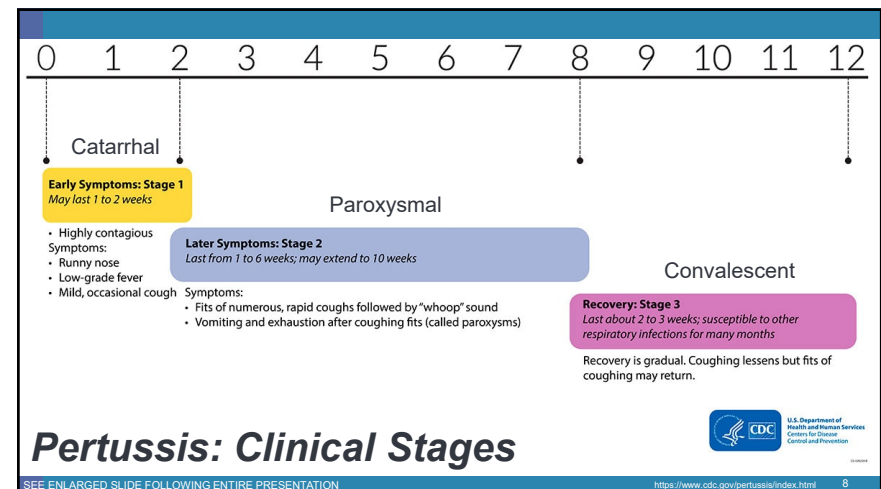
5 min



An infant receives a vaccination in Fayetteville, Georgia, in 2021. (Angie Wang/AP)

<https://www.washingtonpost.com/health/2025/04/22/whooping-cough-pertussis-cases-rise/>

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Pertussis Diagnosis – Requires Clinical Suspicion

Clinical case criteria (in absence of alternate dx):

- Cough illness lasting ≥ 2 weeks, with at least one of the following:
 - Paroxysms of coughing; **OR**
 - Inspiratory whoop; **OR**
 - Post-tussive vomiting; **OR**
 - Apnea (with or without cyanosis)

Polymerase chain reaction (PCR) is most sensitive and specific

- Nasopharyngeal swab / aspirate
- Best if sent within first 3 weeks of illness

<https://ndc.services.cdc.gov/case-definitions/pertussis-2020/>
https://www.cdc.gov/pertussis/about-bacteriology/CDC_AARF_Val-https://www.cdc.gov/pertussis/clinical/diagnostic-testing/diagnosis-pcr-bacteriology.html
 Clinical evaluation and validation of laboratory methods for the diagnosis of Bordetella pertussis infection: Culture, polymerase chain reaction (PCR) and anti-pertussis toxin IgG serology (IgG-PT). PLoS One. 2018;
 Evaluation of BioFire Respiratory Panel 2 plus for Detection of Bordetella pertussis in Nasopharyngeal Swab Specimens from Children with Clinically Suspected Pertussis. Microbiol Spectr. 2023.

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Treatment and Post Exposure Prophylaxis

- TREAT with macrolide (e.g. azithromycin) if within 3 weeks of onset
- Treat within 6 weeks of onset for infants or pregnant women



- POST EXPOSURE PROPHYLAXIS (PEP) given to household members and contacts at risk of severe infection (within 3 weeks of exposure)

<https://www.cdc.gov/pertussis/index.html>
 Decker MD, Edwards KM. Pertussis (Whooping Cough). J Infect Dis. 2021.

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Pertussis: Recommendations for Health Care Workers (HCW)



Symptomatic infection: exclude from work for 21 days from onset of cough OR until 5 days after the start of effective antimicrobial therapy



Exposure: regardless of vaccination status, administer post-exposure prophylaxis OR exclude from work for 21 days (if HCW interacts with persons at increased risk of complications)

Recommended antimicrobial agents for the treatment and postexposure prophylaxis of pertussis. 2005 CDC Guidelines. MMWR Recomm Rep. 2005.
<https://www.cdc.gov/infection-control/hcp/healthcare-personnel-epidemiology-control/pertussis.html>

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People of all ages need WHOOPING COUGH VACCINES

DTaP for young children	Tdap for preteens	Tdap for pregnant women	Tdap for adults
✓ 2, 4, and 6 months ✓ 15 through 18 months ✓ 4 through 6 years	✓ 11 through 12 years	✓ During the 27-36th week of each pregnancy	✓ Anytime for those who have never received it

www.cdc.gov/whoopingcough

SEE ENLARGED SLIDE FOLLOWING ENTIRE PRESENTATION

<https://www.cdc.gov/pertussis/vaccines/index.html>

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OL15 Kitchen Sink: Syndromes Not Covered Elsewhere – Bonus Cases

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- **Epidemiology:** infants > adolescents
- **High risk for severe disease:** *infants, pregnant women*, lung disease
- **Clinical presentation:** cough lasting 2+ weeks plus paroxysmal cough, inspiratory whoop, post-tussive vomiting or apnea
- **Diagnosis:** clinical; PCR
- **Treat** with macrolide *within 3 wks* of onset (6 wks if high risk)
- **Post-exposure prophylaxis:** (within 3 wks of exposure) for *household contacts / high risk / HCW* likely to interact with high-risk patients
- **Symptomatic HCW** can return to work after 5 d of effective treatment or 21 d after cough onset

Bordetella pertussis

Take Home Points

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Question #2



- A 19-year-old male with no past medical history presents with acute onset of pain that started in the periumbilical region and moved to the lower region.
- Physical exam is notable for point tenderness in the right lower quadrant.
- Appendicitis is diagnosed based on clinical findings and imaging results, with no evidence of periappendiceal abscess.
- The patient wants to avoid surgery if at all possible.

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Question #2

You note that antibiotic therapy for uncomplicated appendicitis has become accepted practice by some physicians and offer to counsel him regarding risks and benefits.

Which of the following is a recognized disadvantage of this approach, when compared to immediate surgery?

- A. Risk of *C. difficile* within 30 days
- B. Risk of bowel obstruction in 1 year
- C. 20% risk of intra-abdominal abscess within 30 days
- D. 30-50% risk of subsequent appendectomy within 4 years

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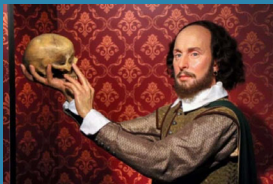
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- D. **30-50% risk of subsequent appendectomy within 4 years**

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Appendicitis: to cut or not to cut...



In several studies, non-operative management (antibiotics alone) was "non-inferior" to operative management for **acute, uncomplicated appendicitis**

Features that should prompt **OPERATIVE** management:

- Appendicolith (+/-)
- Perforation
- Abscess
- Suspicion of tumor
- Peritonitis
- Serious systemic illness

CODA: N Engl J Med. 2020; APPAC: JAMA. 2018; Pediatr Surg Int. 2020

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Risks and Benefits



30-50% of patients initially managed with antibiotics required appendectomy within 5 years

Long term follow up suggests overall equivalent patient satisfaction

For the ID Boards:
know when to recommend surgery

Quality of Life and Patient Satisfaction at 7-Year Follow-up of Antibiotic Therapy vs Appendectomy for Uncomplicated Acute Appendicitis: A Secondary Analysis of a Randomized Clinical Trial. JAMA Surg. 2020

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- Non-operative management of acute appendicitis may be considered if uncomplicated
 - Features which should prompt immediate surgery: perforation; abscess; suspected tumor; peritonitis; systemic illness
- Up to 50% will require subsequent appendectomy
- *ID board potential* – recognize when an operation is necessary

Appendicitis

Take Home Points

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Question #3

- A 38-year-old female travels to Bangladesh for a friend's (outdoor) wedding.
- She has never traveled to this region. In preparation for the trip, she received Typhoid vaccine and was started on malaria prophylaxis with doxycycline.
- Five days after returning home, she develops fever, headache and diffuse muscle and joint pain.
- Over the next few days, a rash develops – beginning on the dorsum of her hands and feet with spread to her arms, legs and torso.
- She presents to urgent care for evaluation.

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Question #3



Indian J Dermatol. 2010;55(1):79-85.

- Physical exam is notable for fever (101.2 degrees Fahrenheit) and a diffuse, morbilliform rash.
- CBC is as follows:
 - WBC $3.26 \times 10^9 / L$ (normal)
 - Hgb 12.9 g/dL (normal)
 - Platelets 113,000 / mcL (low)
- A comprehensive metabolic profile is normal including renal and liver function tests.

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Question #3

Which of the following tests is most likely to yield the diagnosis?

- A. *Dengue* real-time PCR
- B. Blood culture
- C. *Lyme* enzyme immunoassay (EIA)
- D. *Malaria* rapid diagnostic test (RDT)

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Question #3

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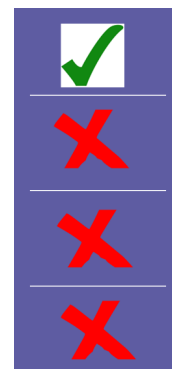
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- B. Blood culture
- C. *Lyme* enzyme immunoassay (EIA)
- D. *Malaria* rapid diagnostic test (RDT)

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Question #3 - Explained

Fever, headache, body pain, rash and low platelets in a returning traveler



Dengue – characteristic symptoms and epidemiology; PCR or NS1 antigen test recommended within first 7 days

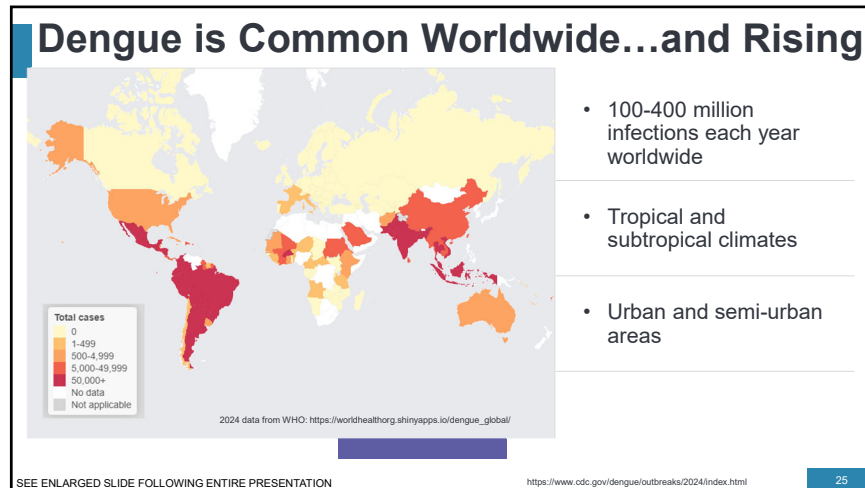
Blood culture – presumably looking for Typhoid fever, but rash is not characteristic and no gastrointestinal symptoms

Lyme – wrong epidemiology (no known exposure to ticks) and rash not typical for Lyme; low platelets does not fit

Malaria – RDT would be diagnostic, but no anemia and rash not typical with malaria; also was taking prophylaxis

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Dengue in Non-travelers

Texas public health officials announce first locally acquired case of dengue virus in 2024

CDC Morbidity and Mortality Weekly Report (MMWR)

Notes From the Field: First Evidence of Locally Acquired Dengue Virus Infection — Maricopa County, Arizona, November 2022

Weekly / March 17, 2023 / 72(11);290-291

Local transmission has been observed in US (Florida, Hawaii, Texas, Arizona, California)

Transmission: human-mosquito-human

NEWS RELEASE

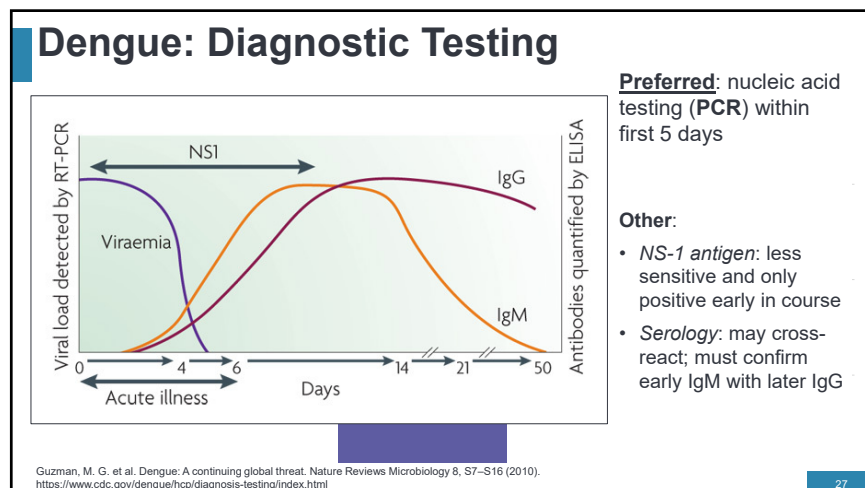
313 N. Figueroa Street, Room 806 | Los Angeles, CA 90012 | (213) 288-8144 | media@ph.lacounty.gov

For Immediate Release: September 18, 2024

Public Health Investigating Unprecedented Cluster of Locally Acquired Dengue Cases - Residents urged to take steps to prevent ongoing transmission

<https://www.cdc.gov/dengue/outbreaks/2024/index.html>

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Severe Dengue

- Symptoms typically improve in 1-2 weeks
- May progress to severe Dengue (as rash and fever disappear)
- Risk increased if prior infection (with another serovar)
- Signs of severe dengue:
 - Hypotension / shock
 - Hemorrhage (mucosal / GI bleeding)

Emergency

<https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue>
<https://www.cdc.gov/dengue/hcp/clinical-signs/index.html>

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Aedes aegypti mosquito, image from <https://www.cdc.gov/mosquitoes/about/life-cycle-of-aedes-mosquitoes.html>

Mosquito-borne Illnesses in a Returning Traveler

For the boards, know:

- Typical epidemiology
- Clinical presentation
- Vector
- Diagnostic approach

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Key Features of Mosquito-borne Illnesses

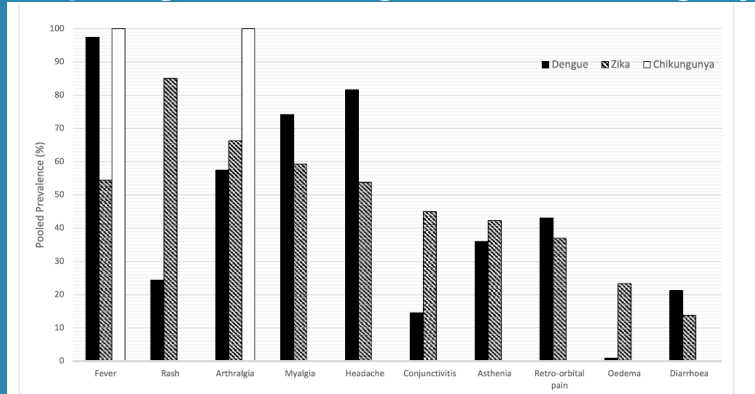
	Epidemiology	Vector	Clinical Features
Chikungunya	Africa, the Americas, Asia, Europe, islands in Indian and Pacific Oceans; prominent outbreak Caribbean 2013	<i>Aedes aegypti</i> (<i>A. albopictus</i> in Europe)	Fever and joint pain ; rash less common. Symptoms may last months.
Dengue	Worldwide in tropics / subtropics 4 serotypes; infection with a 2 nd serotype → severe illness	<i>Aedes aegypti</i> (or <i>A. albopictus</i>)	Fever, headache , rash , muscle and joint pain Severe: shock / hemorrhage
Zika	Prominent in Americas ~2017, then more widespread (Caribbean, Africa, India)	<i>Aedes aegypti</i> Also sexual transmission; maternal-fetal infection	Often asx; fever; rash (starts on face); conjunctivitis Fetal anomalies (microcephaly, blindness)

CDC, PPID 9th edition

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Comparing Sxs of Dengue, Zika, Chikungunya



Khanwadar S, Herath N. Clinical manifestations of dengue, Zika and chikungunya in the Pacific Islands: A systematic review and meta-analysis. Rev Med Virol. 2024 Mar.

SEE ENLARGED SLIDE FOLLOWING ENTIRE PRESENTATION

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A Comprehensive Review of the Neglected and Emerging Oropouche Virus. Viruses. 2025

(Not So) New and Notable: Oropouche Virus

- *Orthobunyavirus* genus
- Transmitted by *Culicoides paraensis* (midge) and possibly mosquitos
- Typically, in South and Central America → more recently Cuba, Dominican Republic, US (returned travelers)

<https://www.cdc.gov/oropouche/stories/meet-the-midge.html>

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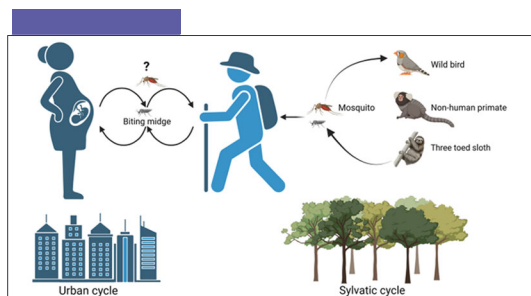
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OL15 Kitchen Sink: Syndromes Not Covered Elsewhere – Bonus Cases

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Oropouche Virus

- **Clinical features:** fever, headache, myalgia, arthralgia
 - Rash *not* common
 - Rarely, encephalitis
 - **Fetal anomalies** (microcephaly, fetal demise)
- **Diagnosis** – PCR within first 5 days



SEE ENLARGED SLIDE FOLLOWING ENTIRE PRESENTATION

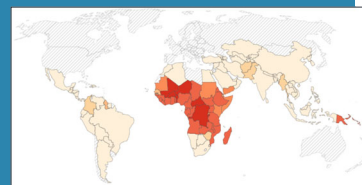
A Comprehensive Review of the Neglected and Emerging Oropouche Virus, Viruses, 2025

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Malaria

- **Epidemiology:** worldwide, tropics and subtropics
- **Vector:** *Anopheles* mosquito
- **Symptoms:** Fever, headache, N/V, diarrhea; severe: anemia, jaundice, splenomegaly, neurologic
- *Species-specific* features



<https://ourworldindata.org/malaria>

SEE ENLARGED SLIDE FOLLOWING ENTIRE PRESENTATION

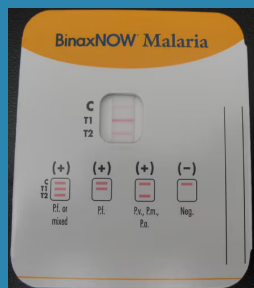
<https://www.cdc.gov/malaria/hcp/diagnosis-testing/malaria-diagnostic-tests.html>

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- **Vector:** *Anopheles* mosquito
- **Symptoms:** Fever, headache, N/V, diarrhea; severe: anemia, jaundice, splenomegaly, neurologic
- *Species-specific* features
- Microscopy (blood smear); RDT if microscopy not available



https://www.cdc.gov/malaria/diagnosis_treatment/diagnostic_tools.html

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An unusual surge in cases

In 2023, CDC received reports of 10 cases of locally acquired malaria in four states, with nine cases caused by *P. vivax* among people with no travel history in Florida, Texas, and Arkansas.

Florida	7 <i>P. vivax</i> cases
Texas	1 <i>P. vivax</i> case
Maryland	1 <i>P. falciparum</i> case
Arkansas	1 <i>P. vivax</i> case

<https://www.cdc.gov/advanced-molecular-detection/php/success-stories/malaria-parasite-2023.html>

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Vector borne illnesses have overlapping features; look for keywords

- Dengue, Zika, Chikungunya all spread via *Aedes* mosquitos
 - Dengue: headache, rash, "bone-break" pain, low platelets; infxn w/ 2nd serotype → severe dengue
 - Zika: may be asx; rash / conjunctivitis common; birth defects
 - Chikungunya: prominent joint pain; may become chronic
- Diagnosis:
 - PCR if < 7 d
 - Serology if > 7 d but beware of cross-reactivity
- Oropouche: midge; S. America; fever, birth defects; Diagnosis: PCR
- Malaria: *Anopheles* mosquito; fever, anemia, species-specific presentations (*P. falciparum* - severe; *P. vivax* / *ovale* - relapsing)
 - Diagnosis: blood smear or rapid detection test (RDT)

Vector-borne Illnesses in a Returning Traveler

Take Home Points

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Kitchen Sink Summary

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Kitchen Sink Summary - 1

Pertussis:

- Clinical diagnosis: 2+ weeks of cough plus paroxysms, inspiratory whoop, post-tussive emesis, apnea
- Macrolide if within 3 weeks of onset or as PEP for contacts at risk of severe disease



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Kitchen Sink Summary - 2



Appendicitis

- Non operative management may be reasonable for uncomplicated cases
- Identify features that should prompt surgery:
 - Appendicolith +/- perforation
 - Abscess
 - Suspicion of tumor
 - Peritonitis
 - Systemic illness

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OL15 Kitchen Sink: Syndromes Not Covered Elsewhere – Bonus Cases

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Kitchen Sink Summary - 3

Vector-borne illnesses in returning traveler

Chikungunya, Dengue, Zika all spread via Aedes mosquitos and can present with fever plus...

- Chikungunya – joint pain
- Dengue – headache, rash, muscle and joint pain; higher risk of severe / hemorrhagic Dengue with 2nd infection
- Zika – rash, conjunctivitis; fetal anomalies; sexual transmission
- PCR if < 7 d; serology cross-reacts

Oropouche: midge; S. America; fever, birth defects; DX: PCR

Malaria: *Anopheles* mosquito; fever, anemia; species-specific presentations; DX: smear or RDT



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Questions?

Stacey Rose, MD, FACP, FIDSA
srrose@bcm.edu

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