Internal Medicine Clerkship
Case Discussions

Fever
Student Guide

Objectives:

1. Identify characteristics and relevant review of systems that define fever including duration and associated constitutional symptoms.
2. Assess past medical history for risk factors and predisposing conditions including recent invasive procedures, immunocompromised state, and causative medications.
3. Assess for familial risk factors including inherited conditions (e.g. inflammatory bowel disease and colon cancer).
4. Assess for social risk factors including travel and intravenous drug use.
5. Identify key physical exam findings that evaluate for an underlying etiology including abdominal tenderness, murmurs, and oropharyngeal erythema.
6. Identify and interpret key laboratory and imaging tests and list indications, benefits, test characteristics, risks, and costs of testing that determine cause and are recommended in most patients (including complete blood count, urinalysis, and blood cultures) and determine cause but are recommended in selected patients (including HIV test, ANA, CT scans, and echocardiogram).
7. Develop and prioritize a differential diagnosis including common diagnoses (e.g. influenza, pneumonia, pharyngitis) and non-to-miss diagnoses and fever-related emergencies (including neutropenic fever, sepsis, and septic shock).
8. Describe a rational and evidence-based approach to treating a patient with fever:
    a. Utilize risk scores when appropriate including SOFA/qSOFA.
    b. Identify treatments based on etiology including broad-spectrum antibiotics for sepsis/septic shock and neutropenic fever.

Clinical Case 1:

28yo presents to the emergency room with two weeks of intermittent subjective fevers, chills, fatigue, and myalgias. He reports he regularly injects heroin, often using needles repeatedly. He has been homeless and living in and out of shelters around the city for the last three months. He reports a history of asthma as a child and denies a past surgical history. His family history is notable for his father who has Chron's disease and his mother who has hypothyroidism. He has poor social support and is currently estranged from his family due to his injection drug use. He reports also smoking ten to fifteen cigarettes per day and will drink alcohol when he has access to it.

Physical Exam:

Vitals:	100.6 F, HR 104, BP 102/74, RR 20, pulse oximetry 98% on room air
Gen:	Thin male with an unkempt appearance and soiled clothing
HEENT:	Poor dentition
Resp:	Clear to auscultation bilaterally
CV:	Tachycardic, regular, 3/6 systolic murmur in the left 5th midclavicular line radiating to the axilla

Abd: NABS, soft, NTND
Ext: Trace lower extremity edema bilaterally, track marks noted on both arms

Questions:

1. When evaluating a patient with fever what additional questions in the history would you ask and what physical exam findings would you likely look for? What additional specific physical exam findings would you look for in this patient? What would be highest on your differential diagnosis?

2. What laboratory and diagnostic tests would you consider sending in a patient with fever, and what tests would you specifically order in this patient?

His labs are notable for a wbc of 13,000 with 76% neutrophils, hgb 10.2, and platelets 405k. His chemistry is only notable for AST 89 and ALT 102. His urine drug screen is positive for opiates. His chest x-ray is normal. His echo shows a small vegetation on his mitral valve. His blood cultures are pending at this time.

Questions:

3. What would be your next steps in managing this patient?

48 hours later the patient's blood cultures grown methicillin sensitive staph aureus.

Questions:

4. Based on this data and using the Duke Criteria, does he meet criteria for the diagnosis of infective endocarditis?

5. How would you tailor his antibiotic treatment?

Clinical Case 2:

A 29 year old presents to the clinic for evaluation of a "flu like illness" for the last week. She has been having fever, chills, sore throat, and a new onset rash. On exam, she has cervical and axillary lymphadenopathy and a diffuse papular rash on her chest, back, arms, and legs. The remainder of her exam is unremarkable. She admits to multiple sexual partners without regular use of contraception. Her HIV Ag/Ab test comes back positive.

Updated 4/12/24 MRE

Questions:

1. How is HIV transmitted? Who should be tested for HIV infection? Who is considered high-risk?

2. What are the recommendations for consent for HIV testing?

3. What testing is performed for HIV?

4. What initial laboratory work-up is recommended for patients newly-diagnosed with HIV infection?

5. Who should be offered treatment for HIV infection?

6. What classes of HIV medications are available?

She is referred to the Infectious disease clinic for further treatment. However, she misses her appointment and is lost to follow-up. One year later, she presents to the emergency room with shortness of breath, non-productive and progressively worsening cough, night sweats, and fever for two weeks.

On exam, she has a temperature of 101.3 F, blood pressure 90/40, pulse 120 and respiratory rate of 30. She is a bit confused in conversation but able to answer questions and obeys all commands but is dyspneic with speech. Her pharynx reveals friable white material on the soft palate, pulmonary exam is remarkable for diffuse crackles, and the cardiac exam reveals a normal S1 and S2 without S3 and no murmur.

Her CD4 count is 120 and HIV viral load is 84,000 copies/mL.
Labs are otherwise notable for wbc 3,000, platelets 100k, cr 1.5, bilirubin 1.0,
An ABG is obtained which reveals that her PaO2 is 58 mm Hg on room air.

Chest x-ray is normal, but CT chest reveals bilateral ground grass opacities.

Questions:

7. What are the SOFA and qSOFA scores, and would they be appropriate to use in this patient?

Updated 4/12/24 MRE

8. How do you differential sepsis, severe sepsis, and septic shock? Which does this patient have?

9. What is your differential diagnosis and workup for the above presentation in an HIV patient? Does this patient require isolation?

10. How would you treat this patient's hemodynamic compromise?

11. What is considered first line therapy for Pneumocystis pneumonia? What are some alternatives?

12. What are the indications for steroid use in management of pneumocystis pneumonia?

13. When should prophylaxis for PJP be started, what do you use for prophylaxis, and when can you stop it?

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Updated 4/12/24 MRE

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