Infectious Disease Pearls

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No disclosures

Learning Objectives

Describe updates in

- hepatitis C infection,
- skin/soft tissue infections,
- infectious diarrhea
- urinary tract infections, and
- sexually transmitted infections

Case 1

A 58 year old man with hepatitis C virus infection is treated with oral therapy using two direct-acting antivirals for 12 weeks. He tolerated the regimen well and his HCV viral loads at weeks 4 and 12 of therapy were undetectable. They remain undetectable 12 and 24 weeks after completion of therapy.

- CBC: platelets 110,000/mcL, otherwise normal.
- Chemistries: albumin 3.4 g/dL, alkaline phos 140 U/L, AST 60 U/L, ALT 85 U/L
- INR 1.2
- Serum alpha-fetoprotein: 8 ng/mL [<10]
- Prior to treatment, an abdominal ultrasound showed a nodular liver and splenomegaly. An upper endoscopy showed no varices. He is now seen in follow up.

Which of the following is most appropriate for this patient at this time?

A. HCV viral load testing every year for the next five years
B. Hepatic ultrasound every six months
C. Hepatic ultrasound plus serum alpha-fetoprotein every six months
D. Upper endoscopy every year
E. No further testing

Answer

B. Hepatic ultrasound every six months

Cured Hepatitis C and Cirrhosis

- Sustained virologic response at 12 and 24 weeks = cured of HCV
- Cirrhosis suggested by low platelets, albumin and elevated INR
- Screening for HCC recommended for patients with cured HCV and cirrhosis
- Serum AFP is not recommended due to higher false-positive rates and higher costs

Bruix J, Sherman M. AASLD Practice Guideline. Management of hepatocellular carcinoma: An update. Hepatology 2011;53(3):1020-1022.

Clinical Pearl

Routine hepatocellular carcinoma surveillance with hepatic ultrasound every 6 months is recommended in patients with cured hepatitis C and cirrhosis.

Case 2

A 50 year old man presents to clinic 12 hours after sustaining a bite on his hand from his pet dog while attempting to coax him into the garage while vacationing at a family lake house in northern Wisconsin. He immediately rinsed the wound with well water and placed gauze to the area. He has noticed some mild swelling and redness around the site of his bite for the past 6 hours. There is no joint pain in his hand. He is otherwise healthy and takes no medications. His dog is also healthy and up to date on rabies vaccination.

Physical examination reveals a gentleman in no acute distress. T 37 degrees C, P 85, BP 112/68. There is a 3 cm laceration on the dorsal aspect of his right hand with a 2 cm border of surrounding erythema and mild swelling. There is no fluctuance, crepitus, or synovitis.

Which of the following is the best management of this patient?

A. Trimethoprim-sulfamethoxazole

B. Amoxicillin-clavulanate

C. Clindamycin

D. Doxycycline

E. Continue wound care, no antimicrobials

Answer

B. Amoxicillin-clavulanate

Bite Wounds at Increased Risk for Infection
Immunocompromise
Asplenia
Advanced liver disease
Preexisting or resultant edema
Moderate-severe injuries, hand or face
Penetration into periosteum or joint capsule

Stevens DL, et al. Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society of America. Clinical Infectious Diseases; 2014;1 -4.

Antimicrobial therapy for bite wounds

- First line:
  - Amoxicillin-clavulanate
- Alternative:
  - Cephalosporins (such as cefuroxime) + clindamycin or metronidazole

Stevens DL, et al. Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society of America. Clinical Infectious Diseases; 2014;1 -4.

Clinical Pearl

Preemptive antimicrobial therapy is indicated for animal bites that have a “high risk” of infection.

Case 3

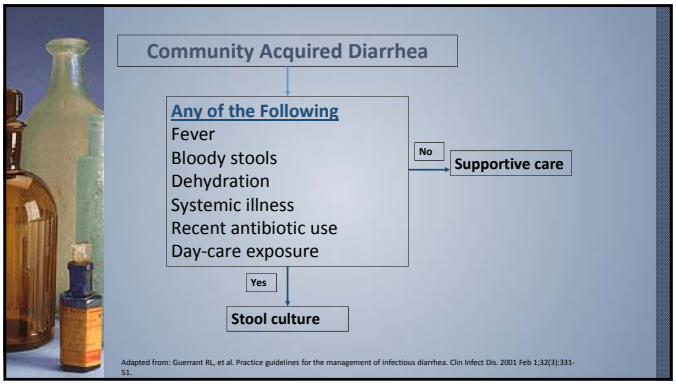
A 42-year-old woman comes to urgent care for crampy abdominal pain, fevers, fatigue, and diarrhea for 2 days. She has been having non-bloody, watery diarrhea every 2-3 hours. She denies sick contacts and is otherwise healthy. Her LMP was 1 week ago. Her physical examination is notable for temperature of 38.2, pulse 90, BP 102/56. She has mild tenderness to palpation in both lower quadrants without rebound. Rehydration is initiated. A stool culture is obtained and positive for Shigella species.

Which of the following is the next best step in management?

A. Oral ciprofloxacin
B. Oral azithromycin
C. Oral trimethoprim-sulfamethoxazole
D. IV ceftriaxone
E. No antimicrobial is indicated

Answer

A. Oral ciprofloxacin



Shigella Treatment

- First line: Pending susceptibilities
  - Ciprofloxacin 500 mg BID x 3 days
  - Levofloxacin 500 mg daily x 3 days
- Alternatives
  - Azithromycin 500 mg orally daily x 3 days
  - Trimethoprim-sulfamethoxazole 160/800 mg BID x 5 days

Clinical Pearl

Fluoroquinolones are the antibiotic of choice for diarrhea due to shigella.

Case 3 continued

You double check the patient's other medications as you write the prescription for Levofloxacin. Her other outpatient medications include atorvastatin, escitalopram, aspirin, pantoprazole, and calcium carbonate + vitamin D.

Which of the following should be discontinued during her antimicrobial course?

A. Atorvastatin

B. Escitalopram

C. Aspirin

D. Pantoprazole

E. Calcium carbonate + vitamin D

Answer

E. Calcium carbonate + vitamin D

Fluoroquinolones

- Oral absorption inhibited by divalent cations (magnesium, calcium, aluminum- containing antacids)
- Proton-pump inhibitors and H2-receptor antagonists do not have important effects on absorption of quinolones

Radandt JM, Marchbanks CR, and Dudley MN: Interactions of fluoroquinolones with other drugs: mechanisms, variability, clinical significance, and management. Clin Infect Dis 1992; 14: pp. 272-284

Clinical Pearl

Calcium-containing medications markedly reduce bioavailability of fluoroquinolones and should be held.

Case 4

A 65 year old woman presents with dysuria and urinary frequency. She is allergic to sulfa. A urine dipstick test is positive for leukocytes and nitrites. Her creatinine is 2.0.

Which antimicrobial agent is first-line for uncomplicated urinary tract treatment in this patient?

A. Trimethoprim-sulfamethoxazole
B. Cephalexin
C. Nitrofurantoin
D. Ciprofloxacin
E. Fosfomycin

Answer

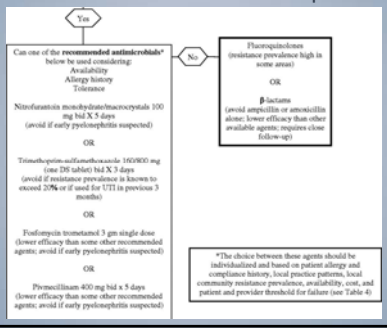
E. Fosfomycin

IDSA GUIDELINES

International Clinical Practice Guidelines for the Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women: A 2010 Update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases

Clinical Practice Guidelines, CID 2011; 52:e103-20

Empiric treatment of acute uncomplicated cystitis



Uncomplicated UTI

- First-line regimens:
  - Good efficacy
  - Minimal "collateral" damage to normal gut microflora (↓ antimicrobial resistance)
- Fluoroquinolones and beta-lactams have more collateral damage to the normal microflora

FDA Drug Safety Communication: FDA advises restricting fluoroquinolone antibiotic use for certain uncomplicated infections; warns about disabling side effects that can occur together

- Risks outweigh benefits for patients with
  - Uncomplicated acute sinusitis
  - Acute bronchitis
  - Urinary tract infections
- Due to MSK and CNS side effects

http://www.fda.gov/Drugs/DrugSafety/ucm500143.htm May 12, 2016

Clinical Pearl

Avoid use of fluoroquinolones when other options are available due to musculoskeletal and central nervous system side effects.

Case 5

A 24 year old male graduate student presents with 4 days of dysuria and penile discharge. He denies other symptoms. He is sexually active with women and reports 4 partners in the past 12 months. He has past medical history of urethritis due to chlamydia infection treated with one dose of oral azithromycin 1 year ago. His physical examination is notable for mucopurulent discharge at the urethral meatus.

You perform testing for sexually transmitted diseases:

- Rapid HIV screen: negative
- Hepatitis C antibody screen: negative
- Syphilis screen: negative
- Urine gonorrhea probe: positive
- Urine chlamydia probe: negative

Which of the following is the best antimicrobial regimen for this patient?

A. Levofloxacin 500 mg orally once daily for 7 days

B. Ceftriaxone 250 mg IM in a single dose

C. Azithromycin 1g orally in a single dose

D. Azithromycin 1g orally in a single dose plus Ceftriaxone 250 mg IM

E. Doxycycline 100 mg orally twice daily for seven days

Answer

D. Azithromycin 1g orally in a single dose plus Ceftriaxone 250 mg IM

Workowski KA, Bolan GA. Sexually transmitted diseases treatment guidelines, 2015. MMWR Recomm Rep. 2015 Jun 5;64(RR-03):1-137.

Clinical Pearl

Ceftriaxone and azithromycin should be administered together on the same day for genital gonococcal infections due to increased antimicrobial resistance.

Case 6

A 68 year old man with diabetes and peripheral arterial disease presents with 4 weeks of left foot pain, redness and swelling. He has a history of a poorly healing left plantar foot ulcer. A foot x ray 3 weeks ago showed nonspecific degenerative. At that time he was prescribed cephalexin for cellulitis and acetaminophen for pain. His pain and redness mildly improved. His physical examination is notable for temperature of 37.2, BP 102/60, P 98. He has a 0.5 by 0.1 cm plantar foot ulcer with mildly erythematous borders and dusky granulation tissue. The ulcer probes to bone.

Due to concern for osteomyelitis, an MRI is performed and shows periosteal reaction of the 2nd metatarsal and phalangeal bones adjacent to his ulcer. His CBC shows a WBC of 9,900 with 72% neutrophils. His ESR is elevated at 102 mm/hr. A swab of his ulcer is sent and gram stain shows 1+ gram negative rods and rare gram positive cocci in clusters. Blood cultures are preliminarily negative.

Which of the following is the next best step in management for this patient?

A. Admit to the hospital to start IV antibiotics
B. Obtain a radiolabeled WBC scan
C. Start oral levofloxacin
D. Start oral levofloxacin and trimethoprim-sulfamethoxazole
E. Obtain a bone biopsy

Answer

E. Obtain a bone biopsy

Osteomyelitis

› Antimicrobial regimen best directed by bone biopsy
› Swab of soft tissue not reliable
› Rarely causes sepsis
› Antimicrobials best held until after tissue is obtained to improve the yield of isolating an organism

Lipsky BA. Osteomyelitis of the foot in diabetic patients. Clin Infect Dis. 1997 Dec;25(6):1318-26.

Clinical Pearl

Unless the patient is septic, antimicrobials should be held in osteomyelitis until after a bone biopsy is obtained to guide antimicrobial therapy.

Case 7

› A 35 year old otherwise healthy man presents to clinic with fever, and fluctuant area in his right axilla.
› Temperature 37.5, BP 120/60, HR 90, RR 18
› Exam: 3 x 3 cm area of fluctuance under the right axilla with mild soft tissue erythema adjacent to the area of fluctuance

What is the best next step in management?

A. Incision and drainage
B. Incision and drainage, send fluid for cultures
C. Incision and drainage, send fluid for cultures, and start oral trimethoprim-sulfamethoxazole
D. Incision and drainage, send fluid for cultures, and start IV vancomycin

Answer

C. Incision and drainage, send fluid for cultures, and start oral trimethoprim-sulfamethoxazole

Skin Abscess management

- Cutaneous abscess
  - I & D only (A-II)
- Adjunctive antibiotics
  - Severe, extensive
  - Progressive
  - Systemic symptoms
  - Immunosuppression
  - Failure to respond to I&D
- Oral options
  - Trimethoprim-sulfamethoxazole
  - Clindamycin
  - Tetracyclines
  - Linezolid

Stevens DL, et al. CID. 2014.

Skin Abscess Management

- RCT of 1220 patients with drained skin abscess (≥2 cm in diameter) comparing cure rate of TMP-SMX with placebo

Table 3. Cure Rates among Patients with a Drained Cutaneous Abscess in Three Trial Populations.*

Trial Population	Cure of Abscess		Difference (95% CI)	P Value†
	Trimethoprim–Sulfamethoxazole	Placebo		
	no./total no. (%)		percentage points	
Modified intention-to-treat 1	507/630 (80.5)	454/617 (73.6)	6.9 (2.1 to 11.7)	0.005
Per-protocol‡	487/524 (92.9)	457/533 (85.7)	7.2 (3.2 to 11.2)	<0.001
FDAGEEP	218/601 (36.3)	204/605 (33.7)	2.6 (−3.0 to 8.1)	0.38

- Wound cultures positive for MRSA in 45%
- Similar adverse event rates, slightly higher mild GI symptoms

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- Abscess size ≥2 cm in diameter is may be a useful threshold for guiding use of antibiotic therapy for adjunctive treatment of skin abscess.

Case 8

A 69 year old woman with a prior history of splenectomy is admitted for decompensated heart failure and altered mental status, with no localizing symptoms for infection. Physical examination reveals a woman who is oriented to person and place. She can barely finish a full sentence. T 37.6 degrees C, P 102, BP 98/52. Her JVP is 23 cm of water. She has rales half way up both bases. Her extremities show 2+ pitting edema to the knees. A bladder catheter is placed to measure strict input and output. Over the next day she notes some bladder urgency, and a urine specimen is obtained.

- WBC is 13,000 with normal differential
- Creatine 1.9 (baseline 1.3)
- Urine microscopy: 11-20 WBC/HPF, gram stain negative, few yeast.

She diureses 4 liters over the next 2 days and her mental status improves. On hospital day 3, her urine culture grows Candida albicans.

Which of the following is the best management for this patient's candiduria?

A. Fluconazole

B. Amphotericin B bladder irrigation

C. Remove the bladder catheter

D. Check fungal blood cultures and start caspofungin

E. No treatment necessary

Answer

C. Remove the bladder catheter

Predisposing Factors for Candiduria	
Urinary tract devices	Older age
ICU admission	Female sex
Prolonged hospitalization	Diabetes mellitus
Concomitant bacteriuria	Nephrolithiasis
Broad-spectrum antimicrobials	Urinary Stasis
Urinary tract instrumentation	Bladder dysfunction

Candiduria: Indications for treatment

- Asymptomatic candiduria:
  - neutropenia
  - urological procedure
- Symptomatic
  - FIRST: Manage predisposing condition (removal of the bladder catheter)

Clinical Pearl

Discontinuation of bladder catheters is the first step in managing hospitalized patients with candiduria.

Case 9

A 50 year old man is hospitalized for alcohol withdrawal. On Hospital day 1, a PICC line is placed given difficulty obtaining intravenous access. He is initiated on a benzodiazepine taper. On hospital day 5, he develops fever and dysuria. On physical examination, his temperature is 39.0, blood pressure 98/55, pulse 102. His right sided PICC line entry site is clean, dry and intact without tenderness. He has mild right sided costovertebral angle tenderness. A UA is notable for 20-50 WBC; gram stain is notable for gram positive cocci in clusters. A urine culture is positive for S. aureus and susceptibilities are pending.

What is the best next step in management?

A. Oral trimethoprim/sulfamethoxazole

B. Oral levofloxacin

C. Intravenous vancomycin, then switch to oral agent based on susceptibilities

D. Intravenous vancomycin, remove PICC, obtain blood cultures

E. No antibiotics, as this is likely a contaminate

Answer

D. Intravenous vancomycin, remove PICC, obtain blood cultures

Staphylococcal Bacteriuria

- Causes of *S. aureus* in the urine:
  - *S. aureus* bacteremia "from above"
  - Nidus: bladder catheter, nephrostomy tube
  - Obstructive disease of urinary tract
- Management:
  - Eliminate source (lines, lines, lines!)
  - IV Vancomycin

1. Grill AK, Domb S. Case report: Staphylococcus aureus bacteriuria. Important indicator of coexistent bacteremia? Can Fam Physician. 2004 Jun;50:879-80.
2. Arpi M, Renneberg J. The clinical significance of Staphylococcus aureus bacteriuria. J Urol 1984;132:697-700.

Clinical Pearl

Urinary tract infections with *S. aureus* warrant investigation for a hematogenous source.

For Your Reference

- Sanchez JL, Litin SC, Bundrick JB. Clinical Pearls in Infectious Diseases. Disease-a-Month. 2016 Jul;62(7):223-30. PMID: 27296763 06/15/2016

Thank you!

Questions?

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