MICHIGAN MEDICINE
UNIVERSITY OF MICHIGAN

GUIDELINES FOR TREATMENT OF INTRA-ABDOMINAL INFECTIONS IN ADULTS

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Appendicitis

Empiric Therapy

Community Acquired, No Severe Sepsis/Shock

1st line:

Cefuroxime* 1.5 g IV q8h
+ M**etronidazole** 500 mg PO/IV q8h

High-risk allergy[3]/contraindications[4] to beta-lactams:

Ciprofloxacin* 400 mg IV q8h
+ **Metronidazole** 500 mg PO/IV q8h

Community Acquired with Severe Sepsis/Shock OR MDR-GNR Risk:

1st line:

Piperacillin-tazobactam*4.5 g IV q6h

Low/medium-risk allergy[2] to penicillins:

Cefepime* 2 g IV q8h
+ **Metronidazole** 500 mg PO/IV q8h
Consider the addition of **vancomycin** to cefepime for Enterococcus coverage in *critically ill* patients *with risk factors defined in comments*.

High-risk allergy[3]/contraindication[4] to beta-lactams:

Vancomycin*
+ **Aztreonam*** 2 g IV q8h
+ **Metronidazole** 500 mg PO/IV q8h

Step-down oral therapy if tolerating orals and susceptibilities (if available) do not demonstrate resistance

Amoxicillin-clavulanic acid* 875 mg PO BID
OR
Cefuroxime* 500 mg PO BID
+ **Metronidazole** 500mg PO TID

High-risk allergy[3]/contraindications[4] to beta-lactams OR MDR-GNR risk:

Ciprofloxacin 750 mg PO BID
+ **Metronidazole** 500 mg PO TID

MDR-GN risk:

- History of cefuroxime-resistant infection or colonization in prior year
- History of hospitalization >48 hours in prior 90 days
- Current hospitalization > 48 hours
- Intravenous antibiotic or quinolone use within prior 90 days
- Significant immunocompromise
- Presence of an at-risk device[1]

Duration

Non-perforated:

Discontinue after appendectomy. If no appendectomy performed a 10-day duration is recommended [ref1]

Perforated:

4 full days after source control [ref 3]

Duration of therapy may be extended with inadequate source control or persistent clinical symptoms or signs of infection.

Patients with bacteremia:

7-14 days

For patients with secondary gram-negative bacteremia, a 7-day duration of IV therapy (or oral quinolone at discharge) may be appropriate [ref5] in conjunction with ID consultation for patients *with source control* and:

- Transient bacteremia (single day) and rapid clinical improvement within 72 hours
- Not polymicrobial or bacteremic with *Pseudomonas*
- Not neutropenic, HCST/SOT, HIV with CD4 <200
- Remains hemodynamically stable at day 7
- Been afebrile ≥48 hours (at day 7)

Comments

- Ciprofloxacin use is not preferred unless necessary due to allergy or need for *Pseudomonas* coverage due to increasing resistance amongst *E. coli*.[ref4] UMHS susceptibility in 2019 was only 74%.
- Enterococcus coverage:
  - Risk factors in ICU patients include septic shock, recent complex abdominal surgery, prosthetic valve, and recent cephalosporin or quinolone use.
- Adjust antibiotics based on organism and susceptibilities
- Patients with low/medium-risk allergy[2] to penicillins and cephalosporins other than cefepime, ceftriaxone, cefpodoxime, and cefotaxime can receive cefepime

Cholangitis and Cholecystitis

Empiric Therapy

Community Acquired, No Severe Sepsis/Shock

1st line:

Cefuroxime* 1.5 g IV q8h

± **Metronidazole** 500 mg PO/IV q8h (# see comments)

High-risk allergy[3]/contraindications[4] to beta-lactams:

Ciprofloxacin* 400 mg IV q8h

± **Metronidazole** 500 mg PO/IV q8h (#See comments)

Community Acquired with Severe Sepsis/Shock OR MDR-GNR Risk

1st line:

Piperacillin-tazobactam*4.5 g IV q6h

Low/medium-risk allergy[2] to penicillins:

Cefepime* 2 g IV q8h

+ **Metronidazole** 500 mg PO/IV q8h

Consider the addition of **vancomycin** to cefepime for Enterococcus coverage in critically ill patients with risk factors defined in comments.

High-risk allergy[3]/contraindication[4] to beta-lactams:

Vancomycin*

+ **Aztreonam*** 2 g IV q8h

+ **Metronidazole** 500 mg PO/IV q8h

Step-down oral therapy if tolerating orals and susceptibilities (if available) do not demonstrate resistance

Amoxicillin-clavulanic acid* 875 mg PO BID

OR

Cefuroxime* 500 mg PO BID

± **Metronidazole** 500mg PO TID (#See comments)

High-risk allergy[3]/contraindications[4] to beta-lactams OR MDR-GNR risk:

Ciprofloxacin 750 mg PO BID

± **Metronidazole** 500 mg PO TID (#See comments)

MDR-GN risk:

- History of cefuroxime-resistant infection or colonization in prior year
- History of hospitalization >48 hours in prior 90 days
- Current hospitalization > 48 hours
- Intravenous antibiotic or quinolone use within prior 90 days
- Significant immunocompromise
- Presence of an at-risk device[1]

Duration

General:

4-7 days[ref 3]

Cholecystectomy:

Discontinue within 24 hours unless evidence of infection outside the gallbladder wall

Successful ERCP:

4 days post-procedure

Duration of therapy may be extended with inadequate source control (such as percutaneous cholecystostomy) or persistent clinical symptoms or signs of infection.

Patients with bacteremia:

7-14 days

For patients with secondary gram-negative bacteremia, a 7-day duration of IV therapy (or oral quinolone at discharge) may be appropriate [ref5] in conjunction with ID consultation for patients *with source control* and:

- Transient bacteremia (single day) and rapid clinical improvement within 72 hours
- Not polymicrobial or bacteremic with *Pseudomonas*
- Not neutropenic, HCST/SOT, HIV with CD4 <200
- Remains hemodynamically stable at day 7
- Been afebrile ≥48 hours (at day 7)

Comments

- Ciprofloxacin use is not preferred unless necessary due to allergy or need for *Pseudomonas* coverage due to increasing resistance amongst *E. coli*.[ref4] UMHS susceptibility in 2019 was only 74%.
- Enterococcus coverage:
  - Risk factors in ICU patients include septic shock, recent complex abdominal surgery, prosthetic valve, and recent cephalosporin or quinolone use. Empiric antimicrobial coverage for VRE is not recommended except in critically ill liver transplant recipients, patients with a previous history of VRE intra-abdominal infection, or patients with septic shock who are colonized with VRE.
- *# Anaerobic coverage (**metronidazole**) is not necessary for patients with community-acquired cholecystitis/cholangitis of mild-moderate severity, unless a biliary-enteric anastomosis or emphysematous cholecystitis is present.*
- Adjust antimicrobial coverage based on organism identification and antimicrobial susceptibilities
- Patients with low/medium-risk allergy[2] to penicillins and cephalosporins other than cefepime, ceftriaxone, cefpodoxime, and cefotaxime can receive cefepime

Acute Uncomplicated Diverticulitis

Empiric Therapy

Uncomplicated Infection (no abscess, perforation, severe sepsis/shock)

- *If no fever or leukocytosis, immunocompetent, CT findings consistent with acute uncomplicated diverticulitis, observe without antibiotics*
- *Patients not meeting above criteria for observation:*

1st line:

Cefuroxime* 1.5 g IV q8h
+ **Metronidazole** 500 mg PO/IV q8h

High-risk allergy[3]/contraindications[4] to beta-lactams:

Ciprofloxacin* 400 mg IV q8h
+ **Metronidazole** 500 mg PO/IV q8h

Step-down oral therapy if tolerating orals and susceptibilities (if available) do not demonstrate resistance

Amoxicillin-clavulanic acid* 875 mg PO BID
OR
Cefuroxime* 500 mg PO BID
+ **Metronidazole** 500mg PO TID#

High-risk allergy[3]/contraindications[4] to beta-lactams:

Ciprofloxacin 750 mg PO BID
+ **Metronidazole** 500 mg PO TID

For Complicated Infection (abscess or perforation), or patients with severe sepsis/shock, see Secondary Peritonitis Recommendations

Duration

If patient is a candidate for antibiotic therapy:
5-7 days (including all IV and PO doses)

Comments

- Ciprofloxacin use is not preferred unless necessary due to allergy or need for *Pseudomonas* coverage due to increasing resistance amongst *E. coli*.[ref4] UMHS susceptibility in 2019 was only 74%.
- Antifungal therapy is not necessary for patients with acute uncomplicated diverticulitis.

Esophageal Perforation

Empiric Therapy	Duration
Infectious Diseases Consult strongly recommended *1st line:* **Piperacillin-tazobactam***4.5 g IV q6h + **Fluconazole*** 800 mg x1, then 400 mg q24h *Low/medium-risk allergy[2] to penicillins:* **Cefepime*** 2 g IV q8h + **Metronidazole** 500 mg PO/IV q8h + **Fluconazole*** 800 mg x1, then 400 mg q24h *High-risk allergy[3]/contraindication[4] to beta-lactams:* **Vancomycin*** + **Aztreonam*** 2 g IV q8h + **Metronidazole** 500 mg PO/IV q8h + **Fluconazole*** 800 mg x1, then 400 mg q24h *In patients with candidemia or who are in shock, fluconazole should be substituted with* ***Micafungin*** *100 mg IV q24h*	Recommend ID consult Duration of therapy dependent on adequate source control, presence of persistent clinical symptoms or signs of infection. **Comments** • Adjust antimicrobial coverage based on organism identification and antimicrobial susceptibilities. Ampicillin-sulbactam empiric step-down may be appropriate in select patients, given reliable coverage of odontogenic microbial flora. • *Candida* coverage: ○ Limited data suggests that empiric *Candida* coverage should be considered in patients with esophageal perforation. Antifungal therapy can be considered empirically but should be discontinued if *Candida* is not identified on culture. • Patients with low/medium-risk allergy[2] to penicillins and cephalosporins other than cefepime, ceftriaxone, cefpodoxime, and cefotaxime can receive cefepime

Secondary Peritonitis (infection associated with perforation or spillage of GI pathogens into the peritoneal cavity)

Empiric Therapy

Community Acquired, No Severe Sepsis/Shock

1st line:

Cefuroxime* 1.5 g IV q8h
+ **Metronidazole** 500 mg PO/IV q8h

High-risk allergy[3]/contraindications[4] to beta-lactams:

Ciprofloxacin* 400 mg IV q8h
+ **Metronidazole** 500 mg PO/IV q8h

Community Acquired with Severe Sepsis/Shock OR MDR-GNR Risk

1st line:

Piperacillin-tazobactam*4.5 g IV q6h

Low/medium-risk allergy[2] to penicillins:

Cefepime* 2 g IV q8h
+ **Metronidazole** 500 mg PO/IV q8h
Consider the addition of vancomycin to cefepime for Enterococcus coverage in *critically ill* patients *with risk factors* defined in comments.

High-risk allergy[3]/contraindication[4] to beta-lactams:

Vancomycin*
+ **Aztreonam*** 2 g IV q8h
+ **Metronidazole** 500 mg PO/IV q8h

Step-down oral therapy if tolerating orals and susceptibilities (if available) do not demonstrate resistance

Amoxicillin-clavulanic acid* 875 mg PO BID
OR
Cefuroxime* 500 mg PO BID
+ **Metronidazole** 500mg PO TID

High-risk allergy[3]/contraindications[4] to beta-lactams OR MDR-GNR risk:

Ciprofloxacin 750 mg PO BID
+ **Metronidazole** 500 mg PO TID

MDR-GN risk:

- History of cefuroxime-resistant infection or colonization in prior year
- History of hospitalization >48 hours in prior 90 days
- Current hospitalization > 48 hours
- Intravenous antibiotic or quinolone use within prior 90 days
- Significant immunocompromise
- Presence of an at-risk device[1]

Duration

General:

4 days after adequate[5] source control (see below for exceptions) [ref 3]

Duration of therapy may be extended with inadequate source control or persistent clinical symptoms or signs of infection.

Acute stomach and proximal small bowel perforation:

Discontinue in 24 hours when source control is achieved & patients are not on acid reducing therapy or have a malignancy

Bowel injuries from penetrating, blunt, or iatrogenic trauma, or intraoperative contamination that are repaired within 12 hrs, and any other intra-operative contamination of the operative field by enteric contents:

Discontinue within 24 hours

Patients with bacteremia:

7-14 days

For patients with secondary gram-negative bacteremia, a 7-day duration of IV therapy (or oral quinolone at discharge) may be appropriate [ref5] in conjunction with ID consultation for patients *with source control* and:

- Transient bacteremia (single day) and rapid clinical improvement within 72 hours
- Not polymicrobial or bacteremic with *Pseudomonas*
- Not neutropenic, HCST/SOT, HIV with CD4 <200
- Remains hemodynamically stable at day 7
- Been afebrile ≥48 hours (at day 7)

Comments

- Ciprofloxacin use is not preferred unless necessary due to allergy or need for *Pseudomonas* coverage due to increasing resistance amongst *E. coli*.
- Adjust antimicrobial coverage based on organism identification and antimicrobial susceptibilities
- *Enterococcus* coverage:
  - Risk factors in ICU patients include septic shock, recent complex abdominal surgery, prosthetic valve, and recent cephalosporin or quinolone use. Empiric antimicrobial coverage for VRE is not recommended except in critically ill liver transplant recipients, patients with a previous history of VRE intra-abdominal infection, or patients with septic shock who are colonized with VRE.
- Empiric coverage for *Candida* is not recommended
- For diverticular abscess, consult surgery or interventional radiology for aspiration and drainage
- Patients with low/medium-risk allergy[2] to penicillins and cephalosporins other than cefepime, ceftriaxone, cefpodoxime, and cefotaxime can receive cefepime

Tertiary Peritonitis

(Persistent infection associated with recurring GI perforation and/or anastomotic leakage after initial treatment for secondary peritonitis)

Empiric Therapy

1st line:

Piperacillin-tazobactam*4.5 g IV q6h

Low/medium-risk allergy[2] to penicillins:

Cefepime* 2 g IV q8h
+ **Metronidazole** 500 mg PO/IV q8h

Consider the addition of vancomycin to cefepime for enterococcus coverage in *critically ill* patients *with risk factors defined in comments.*

High-risk allergy[3]/contraindication[4] to beta-lactams:

Vancomycin*
+ **Aztreonam*** 2 g IV q8h
+ **Metronidazole** 500 mg PO/IV q8h

Notes:

- Empiric therapy should consider prior cultures and severity of presentation (especially presence of severe sepsis/shock). Both factors may dictate alternative empiric therapies from the above.
- Pre-existing drains are often colonized and should not be cultured.

Step-down oral therapy if tolerating orals and susceptibilities (if available) do not demonstrate resistance

Amoxicillin-clavulanic acid* 875 mg PO BID
OR
Cefuroxime* 500 mg PO BID
+ **Metronidazole** 500mg PO TID

High-risk allergy[3]/contraindications[4] to beta-lactams OR MDR-GNR risk:

Ciprofloxacin 750 mg PO BID
+ **Metronidazole** 500 mg PO TID

Duration

General:

4 days after adequate[5] source control (see below for exceptions) [ref 3]

Duration of therapy may be extended with inadequate source control or persistent clinical symptoms or signs of infection.

Patients with bacteremia:

7-14 days

For patients with secondary gram-negative bacteremia, a 7-day duration of IV therapy (or oral quinolone at discharge) may be appropriate [ref5] in conjunction with ID consultation for patients *with source control* and:

- Transient bacteremia (single day) and rapid clinical improvement within 72 hours
- Not polymicrobial or bacteremic with *Pseudomonas*
- Not neutropenic, HCST/SOT, HIV with CD4 <200
- Remains hemodynamically stable at day 7
- Been afebrile ≥48 hours (at day 7)

Comments

- Ciprofloxacin use is not preferred unless necessary due to allergy or need for *Pseudomonas* coverage due to increasing resistance amongst *E. coli*.
- Adjust antimicrobial coverage based on organism and susceptibilities
- MRSA coverage:
  - Empiric MRSA coverage should only be provided to patients with post-operative peritonitis who are known to be colonized with MRSA and discontinued if MRSA is not recovered in culture
- *Enterococcus* coverage:
  - Risk factors in ICU patients include septic shock, recent complex abdominal surgery, prosthetic valve, and recent cephalosporin or quinolone use. Empiric antimicrobial coverage for vancomycin resistant Enterococcus (VRE) is not recommended except in critically ill liver transplant recipients, patients with a previous history of VRE intra-abdominal infection, or patients with septic shock who are colonized with VRE.
- *Candida* coverage:
  - Empiric coverage should be considered in patients with recurrent gastrointestinal perforations (i.e., tertiary peritonitis). **Fluconazole*** 800 mg X 1, then 400 mg IV/PO q24h (or **Micafungin** 100 mg IV q24h if candidemic or in shock) can be considered empirically but should be discontinued if Candida is not identified on culture.
- Patients with low/medium-risk allergy[2] to penicillins and cephalosporins other than cefepime, ceftriaxone, cefpodoxime, and cefotaxime can receive cefepime

Spontaneous Bacterial Peritonitis			
Clinical Setting	**Empiric Therapy**	**Duration**	**Comments**
Spontaneous Bacterial Peritonitis (SBP)	1st line: **Ceftriaxone** 2 g IV q24h Alternative in patients with high-risk allergy[3]/contraindication[4] to beta-lactams receiving fluoroquinolone prophylaxis: **Aztreonam*** 2 g IV q8h + **Vancomycin*** Alternative in patients with high-risk allergy[3]/contraindication[4] to beta-lactams NOT receiving fluoroquinolone prophylaxis: **Ciprofloxacin*** 400 mg IV q8h See comments for oral step-down options	5-7 Days	Oral step-down is appropriate for the following populations: - Culture positive and clinically improving after 48-72 hours of intravenous therapy with oral antibiotic options feasible per culture and susceptibility results - Patients with culture-negative SBP who are hemodynamically stable and responding (exam, lab parameters, and repeat paracentesis if performed) after 48 hours of empiric therapy Oral step-down therapy options for patients with culture-negative SBP (as per above criteria): 1st line: **Amoxicillin-clavulanate** 875 mg PO q12h* Alternative in patients with low/medium-risk allergy[2] to penicillins: **Cefuroxime** 500 mg PO BID* OR **Cefpodoxime** 200-400 mg PO q12h* Alternative in patients with high-risk allergy[3]/contraindication[4] to beta-lactams: **Ciprofloxacin** 750 mg PO q12h* More aggressive empiric dosing should be considered for critically ill patients.
Prophylaxis in Patients with Cirrhosis and GI Bleeds	1st line: **Ceftriaxone** 1 g IV q24h Alternative in patients with high-risk allergy[3]/contraindication[4] to beta-lactams receiving fluoroquinolone prophylaxis: **Aztreonam*** 1 g IV q8h + **Vancomycin*** Alternative in patients with high-risk allergy[3]/contraindication[4] to beta-lactams NOT receiving fluoroquinolone prophylaxis: **Ciprofloxacin*** 400 mg IV q12h See comments for oral step-down options	5 days (total duration, including IV and PO- see comments)	Oral step-down is appropriate for the following population: - Patients who are hemodynamically stable and whose bleeding is controlled (no further procedures or transfusions needed in past 24 hours) after 48 hours of prophylaxis Oral step-down therapy: 1st line: **Amoxicillin-clavulanate** 500 mg PO q12h* Alternative in patients with low/medium-risk allergy[2] to penicillins: **Cefuroxime** 250 mg PO BID* Or **Cefpodoxime** 200 mg PO q24h* Alternative in patients with high-risk allergy[3]/contraindication[4] to beta-lactams: **Ciprofloxacin** 500 mg PO q24h*
Prophylaxis in Patients at High Risk for Spontaneous Bacterial Peritonitis	**Ciprofloxacin** 500 mg PO q24h* OR IF SCr <1 mg/dL **TMP-SMX** 1 DS PO three times weekly OR 1 SS PO daily	Chronic	SBP Prophylaxis is warranted in patients with prior SBP (secondary prophylaxis). SBP Prophylaxis may be warranted in the following situations: - Ascitic protein levels <1.5 g/dL, diuretic- refractory ascites (requires paracentesis), or Child-Pugh C Choice of agent should be reviewed and adjusted based on previous ascitic culture results in patients with breakthrough or previous SBP. Options besides those listed may be considered in such scenarios.

Pancreatitis			
Clinical Setting	**Empiric Therapy**	**Duration**	**Comments**
Acute Pancreatitis without Necrosis or Abscess	Antibiotics not recommended	N/A	• Confirmation of infected pancreatic necrosis should be sought whenever possible by fine-needle aspiration or drainage procedure • In patients with pancreatic necrosis findings such as the presence of gas in the fluid collection on contrast-enhanced CT, fevers, leukocytosis, persistent sepsis, or progressive clinical deterioration should raise concern for infected pancreatic necrosis. • After debridement, consider addition of empiric fluconazole for *Candida* coverage. Fluconazole should be discontinued if *Candida spp* is not isolated from fluid, tissue or blood cultures. • Adjust antimicrobial coverage based on organism identification and antimicrobial susceptibilities. • Patients with low/medium-risk allergy[2] to penicillins and cephalosporins other than cefepime, ceftriaxone, cefpodoxime, and cefotaxime can receive cefepime
Acute Necrotizing Pancreatitis with Sterile Necrosis	Prophylaxis for sterile necrosis is not indicated	N/A	
Acute Necrotizing Pancreatitis in patients with hemodynamic instability	Empiric Regimen: **Piperacillin-tazobactam***4.5 g IV q6h Low/medium-risk allergy[2] to penicillins: **Cefepime*** 2 g IV q8h + **Metronidazole** 500 mg PO/IV q8h Consider the addition of **vancomycin** for Enterococcus coverage in *critically ill* patients with non-life- threatening PCN allergy High-risk allergy[3]/contraindication[4] to beta-lactams: **Vancomycin*** + **Aztreonam*** 2 g IV q8h + **Metronidazole** 500 mg PO/IV q8h	Short term antibiotic treatment is recommended while investigation for possible sepsis or secondary infection of pancreatic necrosis is underway	
Persistent/worsening SIRS criteria after 7-10 days off antibiotic therapy		Obtain culture if persistent SIRS and tailor antibiotic therapy accordingly. Duration of therapy will depend on results of culture and resolution of symptoms and fluid collections.	
Acute Necrotizing Pancreatitis with Proven Infection	Empiric Regimen **Piperacillin-tazobactam***4.5 g IV q6h Low/medium-risk allergy[2] to penicillins **Cefepime*** 2 g IV q8h + **Metronidazole** 500 mg PO/IV q8h Consider the addition of vancomycin for enterococcus coverage in *critically ill* patients with non-life- threatening PCN allergy High-risk allergy[3]/contraindication[4] to beta-lactams **Vancomycin*** + **Aztreonam*** 2 g IV q8h + **Metronidazole** 500 mg PO/IV q8h	Duration of treatment depends on timing of operative debridement, percutaneous drainage, radiographic resolution of infected fluid collection or necrosis, and improvement in clinical signs and symptoms of infection	

FOOTNOTES and DEFINITIONS

*Adjust based on renal function

[1] At risk implanted or indwelling devices are those deemed by the clinician to have a high risk of colonization or infection with resistant gram-negative organisms, including but not limited to Pseudomonas aeruginosa (e.g., central venous catheter, tracheostomy, nephrostomy/suprapubic catheter, percutaneous biliary catheter)

[2] Low-risk allergies include: pruritus without rash, remote (>10 years) unknown reaction, patient denies allergy but is on record, mild rash with no other symptoms (mild rash: non-urticarial rash that resolves without medical intervention). Medium-risk allergies include: urticaria/hives with no other symptoms, severe rash with no other symptoms (severe rash: requires medical intervention [corticosteroids, anti-histamines] and/or ER visit or hospitalization).

[3] High-risk allergies include: respiratory symptoms (chest tightness, bronchospasm, wheezing, cough), angioedema (swelling, throat tightness), cardiovascular symptoms (hypotension, dizzy/lightheadedness, syncope/passing out, arrhythmia), anaphylaxis.

[4] Previous reactions that are contraindications to further beta-lactam use (**except aztreonam, which can be used unless the reaction was to ceftazidime, cefiderocol, or aztreonam**) unless approved by Allergy: organ damage (kidney, liver), drug-induced immune-mediated anemia/thrombocytopenia/leukopenia, rash with mucosal lesions (Stevens Johnson Syndrome/Toxic Epidermal Necrosis), rash with pustules (acute generalized exanthematous pustulosis), rash with eosinophils and organ injury (DRESS – drug rash eosinophilia and systemic symptoms), rash with joint pain, fever, and myalgia (Serum Sickness).
See β-lactam allergy evaluation and empiric guidance for further information

[5] Adequate Source control: Is defined as any procedure that stops the ongoing contamination of the peritoneal cavity and removes the majority of the contaminated intraperitoneal contents to the extent that no further acute interventions are felt to be necessary.

Severe Sepsis: Sepsis PLUS at least 1 organ dysfunction

- Sepsis: ≥ 2 SIRS criteria (heart rate greater than 90 bpm, respiratory rate greater than 20 breaths per minute, temperature less than 36°C, white blood count less than 4,000 cells/mm^3, temperature greater than 38°C, white blood count greater than 12,000 cells/mm^3)
- Organ dysfunction: CV: SBP <90 mmHg or MAP <70 mmHg or require vasopressor support; Respiratory: PaO2/FiO2 <250 or mechanical ventilation; Renal: decreased urine output <0.5 mg/kg/hr for 1 hour, increased SCr (>50% from baseline); Hematologic: platelet <100,000 or increase aPTT; Metabolic: pH <7.3 increased lactate; Hepatic: liver enzymes >2x upper limit of normal; CNS: altered consciousness

Shock: Sepsis induced hypotension persisting despite adequate fluid resuscitation (Systolic blood pressure (SBP) <90 mmHg; MAP <70 mmHg; SBP decrease >40 mmHg)

References:

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3. Sawyer RG, Claridge JA, Nathens AB, et al. NEJM 2015;372:1996.
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5. Yahav D, et al. Clin Infect Dis. 2019 Sep 13;69(7):1091-1098.

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10/2020: Updated E. coli resistance rates, updated Cholangitis/cholecystitis comments.
12/2022: Revised duration for cirrhosis with GI bleed.