Clinicians should prescribe antibiotics promptly for patients with septic shock or sepsis-associated organ dysfunction (respiratory failure, hemodynamic instability, or dysfunction of two other organ systems; see pediatric sepsis CPG for full definitions), ideally after obtaining appropriate cultures. This guideline applies to patients with undifferentiated sepsis (defined as sepsis in which the site of infection is not yet known) who present with organ dysfunction or shock. For patients with sepsis secondary to a known infectious etiology (e.g. pneumonia), condition-specific guidelines should be followed instead. Empiric therapy for Neonatal Intensive Care Unit (NICU) patients, except for febrile young infants admitted from home, should be guided by NICU early/late-onset sepsis pathways.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Empiric Therapy</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy infant 0 – 60 days, admitted from home within last 72 hrs</td>
<td>See Febrile Young Infant guideline</td>
<td>Follow febrile young infant guideline, even if NICU patient</td>
</tr>
</tbody>
</table>
| Patients 61 days or older WITHOUT Increased multi-drug resistant gram-negative (MDR-GN) risk | The patient must meet the following:  
- Immunocompetent  
- No at risk\(^2\) or low-risk\(^3\) implantation or indwelling devices  
- No more than 72 hours of hospitalization in past 90 days (including current hospitalization) | ***Empiric regimen may require adjustment for patients with infection or colonization with multidrug-resistant organisms in past 12 months*** |
| **1**\(^{st}\) line therapy:  
**Vancomycin IV**  
- **Ceftriaxone** 100 mg/kg IV once, then 50 mg/kg/DOSE IV q12h (max: 2 g/DOSE)  
- **Ampicillin** or **Ceftaxime**  
- **Flucloxacillin** or **Clindamycin**  
- **Metronidazole**  
- **Aztreonam** or **Cefepime**  
- **Kefoxacin**  
- **Ceftazidime**  
- **Cefotaxime**  
- **Ceftriaxone**  
- **Cephaloridine**  
- **Cephalothin**  | Order all antibiotics for sepsis STAT |
| Low-risk\(^2\) allergy to ceftriaxone or ceftazidime w/similar side chains (see above), high-risk\(^1\) cephalosporin allergy, or contraindication\(^4\) to beta-lactams:  
**Vancomycin IV**  
- **Ampicillin**  
- **Ceftaxime**  
- **Flucloxacillin** or **Clindamycin**  
- **Metronidazole**  
- **Aztreonam** or **Cefepime**  
- **Kefoxacin**  
- **Ceftazidime**  
- **Cefotaxime**  
- **Ceftriaxone**  
- **Cephaloridine**  
- **Cephalothin**  | For most patients, if antibiotics cannot be administered simultaneously, the cephalosporin or aztreonam should be given first. However, if there is strong suspicion for *Staphylococcus aureus* as the cause of sepsis, and in particular, methicillin-resistant *S. aureus* (MRSA), administer vancomycin first.  
Antibiotics should be de-escalated if cultures are negative at 36-48 hours and no bacterial infection is identified, or if results indicate that narrower therapy is sufficient.  
Consider Infectious Diseases consult, especially if:  
- significant prior antibiotic exposure  
- positive blood or CSF cultures  
- complicated infection (see separate condition-specific guidelines when available)  
- need for extensive infectious evaluation  
- unusual exposure history |
| Suspected intra-abdominal or oropharyngeal source:  
ADD **Metronidazole** 30 mg/kg/DOSE IV q24h (max: 1.5 g/DOSE)  |  |
| Concern for toxic shock syndrome:  
ADD **Clindamycin** 13 mg/kg/DOSE IV q8h (max: 900 mg/DOSE)  |  |
| Patient of any age, excluding those in NICU AND Increased MDR-GN risk:  
- Immunocompromised  
- At risk\(^2\) or low-risk\(^3\) implantation or indwelling device  
- Greater than 72 hours hospitalization in past 90 days (including current hospitalization) |  |
| **1**\(^{st}\) line therapy:  
**Vancomycin IV**  
- **Ceftuzidime** 50 mg/kg/DOSE IV q8h (max: 2 g/DOSE)  
- **Ampicillin**  
- **Ceftaxime**  
- **Flucloxacillin** or **Clindamycin**  
- **Metronidazole**  
- **Aztreonam** or **Cefepime**  
- **Kefoxacin**  
- **Ceftazidime**  
- **Cefotaxime**  
- **Ceftriaxone**  
- **Cephaloridine**  
- **Cephalothin**  |  |
| Low-risk\(^2\) allergy to ceftriaxone or ceftaxidime w/similar side chains (see above), high-risk\(^1\) cephalosporin allergy, or contraindication\(^4\) to beta-lactams:  
**Vancomycin IV**  
- **Ampicillin**  
- **Ceftaxime**  
- **Flucloxacillin** or **Clindamycin**  
- **Metronidazole**  
- **Aztreonam** or **Cefepime**  
- **Kefoxacin**  
- **Ceftazidime**  
- **Cefotaxime**  
- **Ceftriaxone**  
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- **Cephalothin**  |  |
| Suspected intra-abdominal or oropharyngeal source:  
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ADD **Clindamycin** 13 mg/kg/DOSE IV q8h (max: 900 mg/DOSE)  |  |
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| Concern for toxic shock syndrome:  
ADD **Clindamycin** 13 mg/kg/DOSE IV q8h (max: 900 mg/DOSE)  |  |

\(^{*}\) Renal adjustment may be necessary. See Pediatric Renal Dosing Guidelines.
Confirm the information contained within them through an independent source.

Infectious Diseases consultation when necessary. As a result of ongoing research, practice guidelines may from time to time change. The recommendations in this guide are meant to serve as treatment guidelines for use at Michigan Medicine facilities. If you obtain the document from a source other than med.umich.edu/asp, please visit the webpage for the most up-to-date information. "P&T Approval:

Footnotes:

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, nephro/stomy/suprapubic catheter, percutaneous biliary catheter)

2. Low-risk allergies include: remote (>10 years) unknown reaction, patient denies allergy but is on record, pruritus without rash, urticaria/hives with no other symptoms, or mild to severe rash with no other symptoms (if severe rash, screen for contraindications in footnote 4).

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

4. Previous reactions that are contraindications to further beta-lactam use (except aztreonam, which can be used unless the reaction was to ceftazidime, ceferoloc, 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. Risk factors for Candida infection:
   1. Invasive Candida infection in the past 12 months or
   2. ICU-level patient with one of the following AND not receiving systemic antifungal prophylaxis:
      a. short bowel syndrome and TPN-dependence
      b. liver transplantation in the past 30 days
      c. prolonged (>7 days) neutropenia due to chemotherapy
      d. immunosuppression for GVHD

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References:


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Revision History:

09/2020: Updated allergy wording
02/2021: Revised Candida risk factors, revised comments
07/2023: Updated sepsis definitions, MDRO history duration, and allergy wording

C&W Operations Subcommittee Approval: 03/2018
C&W Executive Committee Approval: 04/2018

The recommendations in this guide are meant to serve as treatment guidelines for use at Michigan Medicine facilities. If you are an individual experiencing a medical emergency, call 911 immediately. These guidelines should not replace a provider’s professional medical advice based on clinical judgment or be used in lieu of an Infectious Diseases consultation when necessary. As a result of ongoing research, practice guidelines may from time to time change. The authors of these guidelines have made all attempts to ensure the accuracy based on current information, however, due to ongoing research, users of these guidelines are strongly encouraged to confirm the information contained within them through an independent source.

If obtained from a source other than med.umich.edu/asp, please visit the webpage for the most up-to-date document. "P&T Approval: