Initial empiric antibiotic guidelines May 2021
NICU review points

- **<u>Suspected early-onset sepsis</u>**
  - if hospitalized in the NICU, or for patients < 4 weeks of age with community-acquired infections, including suspected community-acquired pneumonia and urinary tract infection
  - Most likely organisms: Group B strep, Enterobacteriaceae, Enterococcus spp, Listeria, HSV
- **First line: ampicillin + tobramycin**
- If suspicion of **meningitis**: replace **tobramycin** with **cefotaxime**
  - IF **CSF gram stain** shows **gram positive** cocci or gram positive rods, **add gentamicin** 1 mg/kg/dose IV q8h, for synergy in case of GBS or Listeria.
- if suspicion of **HSV**, add **acyclovir**; or add it if presence of 1 or more of following:
  - Ill-appearing
  - Altered mental status
  - Hypothermia
  - Seizures
  - Presence of vesicles
  - Exposure to maternal genital HSV lesions
  - Elevated ALT
  - CSF pleocytosis (using standard neonatal reference ranges) with a negative gram stain + leukopenia or thrombocytopenia

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NICU review points

- **Suspected late-onset sepsis**
    - In patients with more than 3 days of hospitalization in NICU
    - Most likely organisms: Group B strep, Staph aureus, Enterobacteriaceae, P. aeruginosa, Enterococcus spp, Listeria, C. albicans
- **First-line: cefazolin + tobramycin**
- Replace **cefazolin** by **vancomycin**, as per NICU Prescription Guide, in following situations:
    - Proven infection with a methicillin-resistant gram positive bacteria
    - Colonization with MRSA
    - Unstable neonates (hypotension, increase in apneas and bradycardias requiring intubation, significant metabolic acidosis)
    - Neonates less than 34 weeks corrected gestational age in presence of a central line
    - Neonates with intracranial devices (VP shunt, subgaleal shunt, external ventricular shunt)
- IF **VAP** or **NEC** also suspected, use **piperacillin-tazobactam** instead
- If **meningitis** suspected, use **meropenem** instead
- If **invasive candidiasis** suspected, add **amphotericin B deoxycholate**, or consider adding it in presence of following clinical clues:
    - If persistent hypoglycemia and thrombocytopenia
    - If multi-organ involvement
    - If no response to broad-spectrum antibiotics
- if suspicion of **HSV**, add **acyclovir**; or add it if presence of 1 or more of following:
    - Ill-appearing
    - Altered mental status
    - Hypothermia
    - Seizures
    - Presence of vesicles
    - Exposure to maternal genital HSV lesions
    - Elevated ALT
    - CSF pleocytosis (using standard neonatal reference ranges) with a negative gram stain + leukopenia or thrombocytopenia

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- **Necrotizing enterocolitis**
  - Most likely organisms: Enterobacteriaceae, Bacteroides spp., Other anaerobes, Enterococus spp
- **Stage 1** (suspected): **piperacillin-tazobactam**
- **stage 2** (definite) : **piperacillin-tazobactam**
  - If ***meningitis*** suspected, use ***meropenem*** instead
- **Stage 3** (advanced), with septic shock and/or meningitis suspected: **meropenem**
  - If above considerations no longer present, narrow down agent spectrum to piperacillin/tazobactam

- **Suspected central-line associated bloodstream infection (CLABSI):**
  - For patients hospitalized in NICU
  - Most likely organisms: CoNS, Staph aureus, Enterobacteriaceae, Enterococcus spp, P. aeruginosa
- **First line: cefazolin + tobramycin**
- Replace **cefazolin** by **vancomycin** as per NICU Prescription Guide, in following situations:
  - Proven infection with a methicillin-resistant gram positive bacteria
  - Colonization with MRSA
  - Unstable neonates (hypotension, increase in apneas and bradycardias requiring intubation, significant metabolic acidosis)
  - Neonates less than 34 weeks corrected gestational age in presence of a central line
  - Neonates with intracranial devices (VP shunt, subgaleal shunt, external ventricular shunt)

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- **Hospital-acquired pneumonia**
  - including **ventilator-associated pneumonia** and **aspiration pneumonia** in hospitalized patient
  - **refer to late-onset sepsis for other pneumonia indications in patients hospitalized for more than 3 days**
  - Most likely organisms: Staph aureus, Enterobacteriaceae, Pseudomonas, A. baumannii
  - **First line: piperacillin-tazobactam**
  - If **severe**: replace by **meropenem**

- **Healthcare-associated intra-abdominal infection**
  - Including surgical site infection, peritonitis, and **spontaneous intestinal perforation** in NICU
  - Most likely organisms: Enterobacteriaceae, Bacteroides spp., Other anaerobes, Enterococus spp., Pseudomonas spp.
  - **Mild-moderate disease: Piperacillin/tazobactam**
  - **Severe** (e.g. concomitant sepsis, septic shock): **Meropenem**

- **Healthcare-associated urinary tract infection**
  - e.g. catheter-associated, procedure-related
  - **refer to late-onset sepsis for other UTI indications in patients hospitalized for more than 3 days**
  - Most likely organisms: Enterobacteriaceae, Pseudomonas, Enterocococcus spp,
    - Rarely: Staph aureus, Candida spp
  - **First-line: piperacillin-tazobactam**
  - Empiric antifungal therapy is not recommended as catheter-associated UTI due to Candida usually resolves with urinary catheter removal

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- **<u>Surgical site infections: head, neck, trunk, extremity wound</u>**
    - Most likely organisms: Group A strep, Staph aureus, Clostridium spp.
    - **First line: cefazolin**
    - **Suspected MRSA**: replace **cefazolin** by **vancomycin** if mild or moderate; add vancomycin if severe

- **<u>Surgical site infections: GI tract, perineum, genital tract wound</u>**
    - Most likely organisms: Staph aureus, Streptococci, Enterobacteriaceae, Anaerobes
    - **First line: piperacillin-tazobactam**

- **<u>Healthcare-associated meningitis (e.g. CSF shunt infection, post-neurosurgery):</u>**
    - Most likely organisms: Staph aureus, CoNS, P. acnes, Enterobacteriaceae, Pseudomonas
    - **First line: meropenem + vancomycin**
    - May switch to cloxacillin if oxacillin-sensitive staph isolated.