Necrotizing Enterocolitis: Antibiotic Selection and Duration of Therapy

If cultures from blood or other sterile site(s) are positive, therapy should be broadened if necessary to treat the isolated organism(s).

- Clinical assessment
- Cultures
- X-rays
- Other clinically directed evaluation

**Neonate with Suspected or Definite NEC**

Suspected vs. Definite NEC?

**Suspected (Bell Stage IA or IB)**

Vancomycin + Gentamicin (≥48h until cultures negative for Gram positive organism)

Duration: based on clinical evolution/suspcion for infection - at ≥48h either discontinue, or transition to Ampicillin + Gentamicin if treating empirically for sepsis

Definite (Bell Stage IIA-IIIB)

Renal Impairment/ Oliguria?

No

Perforation and/or Critical Illness? (Bell Stage IIB, IIA, IIIB) or worsening on Ampicillin & Gentamicin?

No

Ampicillin + Gentamicin (Stage IIA only)

Yes

Ampicillin + Gentamicin + Metronidazole (Stage IIB, IIA, IIIB)

Yes

Piperacillin tazobactam (Zosyn)


<table>
<thead>
<tr>
<th>Stage</th>
<th>Classification</th>
<th>Systemic Signs</th>
<th>Abdominal Signs</th>
<th>Radiographic Signs</th>
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</thead>
<tbody>
<tr>
<td>IA</td>
<td>Suspected</td>
<td>Temperature instability, apnea, bradycardia, lethargy</td>
<td>Gastric retention, abdominal distension, emesis, heme-positive stool</td>
<td>Normal or intestinal dilatation, mild ileus</td>
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<tr>
<td>IB</td>
<td>Suspected</td>
<td>Same as above</td>
<td>Grossly bloody stool</td>
<td>Same as above</td>
</tr>
<tr>
<td>IIA</td>
<td>Definite, Mildly Ill</td>
<td>Same as above</td>
<td>Same as above + absent bowel sounds, +/- abdominal tenderness</td>
<td>Intestinal dilatation, ileus, pneumatosis intestinalis</td>
</tr>
<tr>
<td>IIB</td>
<td>Definite, Moderately Ill</td>
<td>Above + mild metabolic acidosis and thrombocytopenia</td>
<td>Same as above + absent bowel sounds, definite tenderness +/- abdominal cellulitis or RLQ mass</td>
<td>Same as IIA, + ascites</td>
</tr>
<tr>
<td>IIIA</td>
<td>Advanced, Severe Ill, Intact Bowel</td>
<td>Same as IIB + hypotension, bradycardia, severe apnea, combined respiratory and metabolic acidosis, DIC, neutropenia</td>
<td>Same as above + signs of peritonitis, marked tenderness, and abdominal distension</td>
<td>Same as IIA, + ascites</td>
</tr>
<tr>
<td>IIIB</td>
<td>Advanced, Severe Ill, Perforated Bowel</td>
<td>Same as IIIA</td>
<td>Same as IIIA</td>
<td>Same as above + pneumoperitoneum</td>
</tr>
</tbody>
</table>

**Spontaneous Intestinal Perforation:**

- This is a distinct entity from necrotizing enterocolitis
- Antibiotic therapy including anaerobic activity (Ampicillin + Gentamicin + Metronidazole)
- Duration of therapy 7 days for most, unless clinical illness is prolonged

**Duration of Bowel Rest:**

- NPO for duration of antibiotic therapy
- **Duration of bowel rest may be longer than duration of antibiotic therapy** depending on clinical assessment of patient's readiness to feed, as evaluated by Neonatology and Pediatric Surgery teams

These guidelines reflect consensus of Neonatology, Pediatric Surgery and Antimicrobial Stewardship services based on available evidence. Refer to Neonatal Dosing Guidelines for antibiotic doses. UCSF Pharmacy & Therapeutics Committee Approved 06/2016