## Recognition and Management of the Cardiac Patient with Necrotizing Enterocolitis (NEC) in the CICU & CACU

**Exclusion Criteria**
- Patient ≥ 6 months
- History of NEC as a premature infant

### Assessment for Indicators of NEC

#### Gastrointestinal
- ↑ Abdominal girth
- Abdominal tenderness
- Abdominal distension/cellulitis
- Change in stooling pattern
- Presence of emesis (bilious or non-bilious)
- Visible, grossly bloody stool

#### Respiratory
- Apnea
- Desaturation
- ↑ Need or change in respiratory support
- Changes in hemodynamics

#### Systemic
- Temperature instability
- HR instability
- Increased need for sedation
- Irritability

#### Labs/Imaging
- ↑ CRP
- Changes in WBC
- Acidosis
- Thrombocytopenia
- Concerning radiographic findings

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### Clinical Considerations
- Abd girth should be measured at the umbilicus q 12hr.
- Heme testing on stool is not recommended
- Presence or absence of bowel sounds is not a core indicator used by surgeons for diagnosis
- Feeds should NOT be diluted
- Draw Blood Cultures prior to starting antibiotics

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### Diagnosis

**Radiology**
- KUB – 2 view with left lateral decubitus

**Labs**
- CBC
- CRP
- Blood Gas
- Lactate

If CRP & WBC’s are elevated draw blood cultures (prior to starting antibiotics)

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### Staging

<table>
<thead>
<tr>
<th>Isoalted Pneumatosis</th>
<th>Isolated Pneumatosis</th>
<th>None</th>
<th>None</th>
</tr>
</thead>
</table>

**Stage I (Suspect)**
- Normal Intestinal dilation Ileus
- ↑ Abdominal girth
- Abdominal distension
- Presence of emesis (bilious or non-bilious)
- Visible grossly bloody stool

**Stage II (Definite)**
- Intestinal dilation
- Ileus
- Presence of emesis (bilious or non-bilious)
- Portal venous gas

**Stage III (Advanced)**
- Same as Stage II

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### Feeding Plan - start 24 hrs after KUB is normalized & antibiotics have been completed

**Start**
- Initiate feeds of BM or Formula 20 Cal/ounce at 30 mL/kg/day NG/NJ/PO

**Advance**
- By 30 mL/kg/day as tolerated to a goal of 150 mL/kg/day

**TPN**
- Do not wean TPN until enteral feeds reach 80 mL/kg/day (half of goal). Then wean mL/mL with each increase in feed

**Fortification**
- 24 hrs after full volume feeds reached, add Fortification to reach 22 Cal/ounce

**Oral Medications**
- Oral medications not used until feeds reach 100 mL/kg/day

**Guideline Completed**
- Tolerating full volume feeds x 24hrs

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### Intervention

**Radiographic**
- KUB (2view) q 12hr x 48 hrs and/or change in clinical status

**NPO/Feeding**
- Consider NPO 24-48 hrs with Anderson tube if NPO

**Antibiotics**
- None

**Surgical**
- None

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**Update 5.8.20**

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### Empiric Treatment for the Cardiac Patient with Necrotizing Enterocolitis (NEC)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Indicator</th>
<th>Antibiotic</th>
<th>Dose &amp; Schedule*</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage I NEC (Suspect)</strong></td>
<td>Piperacillin/tazobactam (Zosyn)</td>
<td>100mg/kg q 8hr</td>
<td>48 hrs or determined by patient condition and clinician judgement</td>
<td></td>
</tr>
<tr>
<td><strong>Stage II NEC (Definite)</strong></td>
<td>Piperacillin/tazobactam (Zosyn) ±/−</td>
<td>100mg/kg q 8hr</td>
<td>4 days from onset</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vancomycin¹</td>
<td></td>
<td>Vancomycin should be discontinued if no Gram positive organisms identified on culture at 48 hrs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Premature (&lt;2kg)</td>
<td>15mg/kg q 24hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fullterm (&lt;4wks)</td>
<td>15mg/kg q 12hr</td>
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<td>Fullterm (≥4wks)</td>
<td>15mg/kg q 8hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any age, ≤14 days post-bypass</td>
<td>10mg/kg q 12hr</td>
<td></td>
</tr>
<tr>
<td><strong>Stage III NEC (Advanced)</strong></td>
<td>Piperacillin/tazobactam (Zosyn) +</td>
<td>100mg/kg q 8hr</td>
<td>10 -14 days</td>
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*Vancomycin levels and dosing adjustments to be managed by Pharmacokinetics Service

¹ Vancomycin recommended in NEC Stage II if Gram positive organism identified on culture, hemodynamic instability, and/or clinical sepsis