

## Necrotizing Enterocolitis (NEC) & Antibiotic Selection with Duration of Therapy

Neonate with suspected or definite NEC

- Clinical assessment
- Blood culture, UA/urine culture
- Abdominal X-ray
- Other clinically directed evaluation
- Review prior cultures and antibiotic use

Modified Bell staging criteria for NEC					Management			
Stage	Classification	Systemic Signs	Abdominal Signs	Radiographic Signs	Antibiotic selection	Antibiotic duration & NPO days	Surgery Consult	ID consult
<b>IA</b>	Suspected NEC	Temperature instability, apnea, bradycardia, lethargy	Gastric retention, abdominal distention, emesis, heme-positive stool	Normal or intestinal dilation, mild ileus	Ampicillin + Gentamicin	2	No	No
<b>IB</b>	Suspected NEC	Same as above	Grossly bloody stool	Same as above		2	No	No
<b>IIA</b>	Definite NEC - Mildly ill	Same as above	Same as above + absent bowel sounds +/- abdominal tenderness	Intestinal dilation, ileus, pneumatosis intestinalis	Ampicillin + Gentamicin + Metronidazole	7	<b>Yes</b>	No
<b>IIB</b>	Definite NEC - Moderately ill	Same as above + mild metabolic acidosis and thrombocytopenia	Same as above + absent bowel sounds, definite tenderness +/- abdominal cellulitis or RLQ mass	Same as IIA + portal venous gas +/- ascites		7	<b>Yes</b>	No
<b>IIIA</b>	Advanced NEC - Severely ill, intact bowel	Same as IIB + hypotension, severe apnea, combined respiratory and metabolic acidosis, DIC, neutropenia	Same as above + signs of peritonitis, marked tenderness and abdominal distention	Same as IIB + portal venous gas + definite ascites	Piperacillin - Tazobactam (Zosyn)	7-10	<b>Yes</b>	<b>Yes</b>
<b>IIIB</b>	Advanced NEC - Severely ill, perforated bowel	Same as IIIA	Same as IIIA	Same as IIIA + pneumoperitoneum		7-10	<b>Yes</b>	<b>Yes</b>

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### Duration of Bowel Rest:

- NPO for duration of antibiotic therapy
- Duration of bowel rest may be longer than antibiotic duration depending on clinical assessment of infant's feeding readiness, as evaluated by neonatology and surgical team

### Spontaneous Intestinal Perforation:

- A distinct entity from necrotizing enterocolitis
- Antibiotic therapy include anaerobic coverage (ampicillin + gentamicin + metronidazole)
- Typical duration of 7 days; reassess as needed

### Additional Notes:

- Start antibiotics immediately after cultures are drawn
- If renal impairment or oliguria, consider alternative therapy
- If history of MRSA, consider addition of vancomycin
- If cultures from blood or other sterile site(s) are positive, consider ID consult
- If significant antibiotic exposure or history of multidrug-resistant organism, consult ID and consider alternative antibiotic therapy
- Consider central access if suspected antibiotic and NPO duration is more than 48 hours
- After resolution of NEC restart feeds with breast milk (MBM or PDM). Once tolerating full feeds for 48-72 hours, may transition to formula per unit guidelines/parental preference if MBM is unavailable
- Consider starting OPT 48-72 hrs after the resolution of pneumatosis for clinically stable neonates

### Intravenous (IV) Antibiotic Dosing

Antimicrobial	Age or Weight	Postnatal Age (days)	Dose (mg/kg)	Interval (hours)
Ampicillin	GA <sup>1</sup> ≤ 34 weeks	≤ 7	50	12
		8-28	75	
	GA <sup>1</sup> > 34 weeks	≤ 28	50	8
Gentamicin <sup>2</sup>	< 1 kg	≤ 14	5	48
		> 14		36
	1 – 2 kg	≤ 7	5	48
		> 7		36
	> 2 kg	≤ 7	4	24
		> 7		
Metronidazole	≤ 2 kg	≤ 28	7.5	12
	> 2 kg	≤ 7	7.5	8
		8-28	10	
Piperacillin-tazobactam	PMA <sup>3</sup> ≤ 30 weeks	N/A	100	8
	PMA <sup>3</sup> > 30 weeks		80	6
Vancomycin	See AAH Neonatal and Pediatric Vancomycin Guidelines			

<sup>1</sup> Gestational Age

<sup>2</sup> See AAH Neonatal and Pediatric Aminoglycoside Guidelines for monitoring recommendations

<sup>3</sup> Postmenstrual Age

### References:

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