



This guideline provides recommendations regarding perioperative antibiotic prophylaxis for neonates undergoing typical neurosurgical procedures (CSF diversion and myelomeningocele repair).

Background

- Few neonatal- or pediatric-specific data exist to guide antibiotic prophylaxis for neurosurgical procedures, so evidence-based guidelines are generally derived from adult and/or non-neurosurgical populations
- High-quality evidence suggests there is no benefit to continuing antibiotics after intraoperative closure in most procedures (neurosurgical procedures were not evaluated)¹
- General practice guidelines suggest that if antibiotic prophylaxis is continued post-operatively, duration should not exceed 24 hours²⁻⁶
 - A single dose of intraoperative antibiotics is likely sufficient for patients undergoing clean neurosurgical procedures
 - Even in contaminated neonatal gastrointestinal operations, giving >24 hours of antibiotics postoperatively may not decrease surgical site infection rates⁷
 - Prolonged (>24 hr) post-operative antibiotics increase the risk for development of resistant bacteria⁸
 - Given high-risk nature of the neonatal population, up to 24 hours of post-operative antibiotics for clean procedures would be reasonable
- The most common pediatric neurosurgical site infection pathogen is *Staph aureus* (28% of surgical site infections) followed by coagulase-negative staphylococci (21%)⁹
 - Ampicillin and gentamicin should be considered for procedures in the first 72 hours of life due to increased risk for GBS, enteric gram negatives, and enterococci¹⁰
 - Cefazolin should be used as first line for most clean neurosurgical procedures outside the first 72 hours of life¹⁰
 - Vancomycin should be reserved for patients with history of MRSA infection,¹⁰ and its use has not been shown to improve post-operative outcomes in neurosurgical procedures¹¹

Specific Neurosurgical Interventions

Myelomeningocele Repair

- Skin covered neural tube defects should have antibiotics administered only if determined to be necessary due to maternal/newborn risk factors (use sepsis calculator if appropriate)
- For lesions without skin covering, the infant should be started at delivery on prophylactic ampicillin and gentamicin
- Ampicillin and gentamicin should continue until 48 hours (due to presumed pre-operative contamination) after surgical closure of the sac unless otherwise instructed by neurosurgery

CSF Diversion

- Intraoperative antibiotics should be discussed with neurosurgery prior to procedure and made on call to the OR (AAHP/IDSA/SIS suggest cefazolin for perioperative prophylaxis³)
- Cefazolin should continue for 24 hours post-operatively
- In patients with an external ventricular drain (EVD) in place, antibiotic duration should be discussed with the neurosurgical team. Reasonable options include:¹²
 - 3-day course
 - Continuing for the duration of the EVD
 - Studies have failed to demonstrate superiority of one regimen over the other,¹³ though concerns for development of bacterial resistance would favor the shorter course

Possible Exceptions to the Guidelines

- Infants considered at especially high risk for surgical site infection and therefore may require alterations in these guidelines include:
 - Infants with existing preoperative infections
 - Concern for CSF leak from incision site

References

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