

Intraventricular & Intrathecal Antibiotic Dosing

Indications

- A. Multi-drug resistant (MDR) organisms necessitating treatment with antibiotics with poor CNS penetration.
- B. Enterococcus spp., Staphylococcus aureus, Pseudomonas aeruginosa, Klebsiella pneumoniae, Acinetobacter baumannii, Enterobacter cloacae, Escherichia coli, and other MDR Gram-negative organisms.
- C. Failure to clear CSF despite systemic therapy for at least 5-7 days of active therapy.

Antibiotic Dose Protocol and Order Set

Antimicrobial Agent	Standard Daily Intraventricular Dose	High Dose-Daily Intraventricular Dose	Diluent (preservative-free)	Syringe Volume	Beyond-Use Date
Colistin (CMS)	10mg or 125,000 units	--	Normal Saline	3mL	3 hours
Polymyxin B	5mg or 50,000 units	--	Normal Saline	3 mL	3 hours
Amikacin	20mg	30mg	Normal Saline	3 mL	3 hours
Gentamicin	4mg	8mg	Normal Saline	3 mL	3 hours
Tobraycin	4mg	8mg	Normal Saline	3 mL	3 hours
Vancomycin	10mg	20mg	Normal Saline	3 mL	3 hours
Daptomycin	5mg	--	Normal Saline	5 mL	3 hours

Operative

Antimicrobial Dose Preparation

- A. Preservative-free drug will be utilized unless unavailable and the risk of untreated infection outweighs the risk.
- B. The dispensing pharmacist will prioritize obtaining preservative-free product if available but should not delay preparation for timely administration in cases where such products are not readily available.
- C. Drugs will be diluted in preservative-free normal saline when possible.
- D. Intraventricular medications must be picked up at the pharmacy window by a physician, nurse, or clinical pharmacist given the short beyond-use dating.

Antimicrobial Dosing and Administration

- A. An order set will be created in Cerner PowerChart searchable by "Intraventricular Antimicrobials" or "Intrathecal Antimicrobials" with options to order each of the above antibiotics.
- B. Patients should be initially treated with the standard daily intraventricular dose.
- C. Utilization of the high daily intraventricular dose must be evaluated in conjunction with a NSICU pharmacist (1-8069) or ID pharmacist (5-5955).
- D. Intraventricular or intrathecal antibiotic doses may be administered through an external ventricular drain (EVD) or lumbar drain, or possibly via an Ommaya reservoir.
 - 1. Intraventricular or intrathecal doses must be administered by a Neurosurgery physician (resident, fellow, or attending), however, when dose administration is to be through an Ommaya reservoir, the ID Service will consult with the Neurosurgery Service to work out administration responsibilities.
- E. The intraventricular device must be clamped for at least 1 hour or as long as possible after administration.
- F. The bedside nurse will chart when medication doses have been given in the electronic medical record, specifying the name of the physician who administered the dose in the comments field.

Intraventricular/Intrathecal Amphotericin B

- A. Amphotericin B is rarely described in literature for the treatment of cryptococcal meningitis, coccidioidomycosis, or invasive CNS fungal infections that would otherwise likely fail with systemic therapy.
- B. Consensus intrathecal/intraventricular amphotericin B dosing is lacking in human patients.
- C. Please page an infectious diseases pharmacist to discuss appropriate dose titration at 5-5955.

Therapeutic Drug Monitoring -If CSF antibiotic concentrations are desired please page