

Antibiotic Prophylaxis in Cranio-Facial Trauma

Rationale: The purpose of antibiotic prophylaxis following cranio-facial trauma is to reduce the risks of meningitis, endophthalmitis, invasive device related colonization, and infectious complications of the head and neck including hardware infection and abscesses.

1. **ICP monitors and ventriculostomies (antibiotic impregnated EVD catheters):** Cefazolin 2 gm IV 30 minutes prior to insertion. No further dosing is needed.

2. **Ventriculostomies (non-antibiotic impregnated catheters):** Cefazolin 2 gm IV q8h x 24 hours (with first dose 30 minutes prior to insertion).

3. **Open-facial fractures:** For blunt or penetrating open facial fractures, recommend ampicillin/sulbactam 3 grams IV pre-operatively 30 minutes prior to incision and continued for 3 doses post-operatively. **Antibiotics should not be continued for >24 hours post-operatively.**

- **If the patient does not immediately go to the operating room, recommend administering ampicillin/sulbactam 3 grams IV q6h for 24 hours.** Administer routine perioperative antibiotics on day of operation. Antibiotics should not be continued for >24 hours post-operatively.

4. **Closed facial fractures:** For non-operative closed facial fractures, no prophylactic antibiotics are recommended. For operative closed facial fractures, the patient should only receive perioperative antibiotics.

5. **Open skull fractures (blunt or penetrating):** Ampicillin/sulbactam 3g IV q6h for 24 hours is recommended.

6. **Nasal packing:** No prophylactic antibiotics recommended while nasal packing is in place.

7. **CSF leak:** No prophylactic antibiotics recommended.

- For patients with a CSF leak, pneumococcal vaccination is recommended- 1 dose of pneumococcal 21-valent conjugate vaccine (Pneumovax 21 - Capvaxine)– *if the patient has previously received a pneumococcal vaccine, visit the [CDC website](#) for details regarding appropriate vaccine administration schedule).*

8. **Pneumocephalus:** No prophylactic antibiotics recommended.

9. **Open Globe Injuries:** Vancomycin (use dosing advisor in Epic) and cefepime **for 48 hours post admission** is recommended. Ceftazidime can be used as an alternative to cefepime depending on ID restrictions and drug shortages.

- Renal dosing for Cefepime:
 - CrCl >60: 2gm q8h
 - CrCl 30-60: 2gm q12h
 - CrCl 11-29: gm q12h
 - CrCl <10 or HD: 1gm q24h
 - CRRT: 1gm q8h

References

1. Zosa, BM, Elliott CW, et al. Facing the facts on prophylactic antibiotics for facial fractures: 1 day or less. *J Trauma Acute Care Surg*. 2018 Sep; 85(3) 444-450.
2. Lange JL, Peeden EH, and Stringer SP. Are prophylactic systemic antibiotics necessary with nasal packing? A systematic review. *Am J Rhinol Allergy*. 2017; 31(4): 240-47.
3. Andreoli CM, Andreoli MR, et al. Low Rate of Endophthalmitis in a Large Series of Open Globe Injuries. *Am J Ophthalmol*. 2009; 147(4): 601-8
4. Lorch A, Sobrin L. Prophylactic Antibiotics in Posttraumatic Endophthalmitis. *Int Ophthalmol Clinics*. 2013; 53(4): 167-76.
5. Ratilal BO, Costa J, Pappamikail, et al. Antibiotic prophylaxis for preventing meningitis in patient with basilar skull fractures. *Cochrane Database Sys Rev*. 2015 Apr 28;(4): CD004884.
6. May AK, Fleming SB, Carpenter RO, et al. Influence of broad-spectrum antibiotic prophylaxis on intracranial pressure monitor infections and subsequent infectious complications in head-injured patients. *Surg Infect (Larchmt)*. 2006; 7:409-417.
7. Stoikes NF, Magnotti LJ, Hodges TM, et al. Impact of intracranial pressure monitor prophylaxis on central nervous system infections and bacterial multi-drug resistance. *Surg Infect (Larchmt)*. 2008; 9:503-508.
8. Lauder A, Jalisi S, Spiegel J, et al. Antibiotic prophylaxis in the management of complex midface and frontal sinus trauma. *Laryngoscope*. 2010; 120:1940-1945.
9. Villalobos T, Arango C, Kubilis P, et al. Antibiotic prophylaxis after basilar skull fractures: a meta-analysis. *Clin Infect Dis*. 1998; 27:364-369.
10. Forrester JD, Wolff CJ, et al. Surgical Infection Society Guidelines for antibiotic use in patients with traumatic facial fractures. *Surg Infect (Larchmt)*. 2021; 22(3); 274-282.
11. Tunkel AR, Hasbun R, et al. 2017 Infectious Diseases Society of America's Clinical Practice Guidelines for Healthcare-Associated Ventriculitis and Meningitis. *Clin Infect Dis*. 2017;64(6);e34-e65.
12. Bayston R, de Louvois J, Brown EM, Johnston RA, Lees P, Pople IK. Use of antibiotics in penetrating craniocerebral injuries. "Infection in neurosurgery" working party of British society for antimicrobial chemotherapy. *Lancet*. 2000;355(9217):1813-7.
13. Dunn LT, Foy PM. Anticonvulsant and antibiotic prophylaxis in head injury. *Ann R Coll Surg Engl*. 1994;76:147-149.
14. Bayston R, de Louvois J, Brown EM, et al. Use of antibiotics in penetrating craniocerebral injuries. *Lancet*. 2000;355:1813-17.
15. Marut D, Shammassian B, McKenzie C, et al. Evaluation of prophylactic antibiotics in penetrating brain injuries at an academic level 1 trauma center. *Clin Neurol Neurosurg*. 2020;193:105777.

Authors:

Jennifer Beavers, PharmD, BCPS
Chelsea Tasaka, PharmD, BCCCP
Jennifer Emerson, PharmD
Jill Streams, MD
Brad Dennis, MD

Revised: 1292F s/p GLF into a window sill. PMHx: A-fib (Eliquis), AICD, HTN, prior CVA. OSH diagnosed with multiple R rib fxs and c/f flail chest, ETT for transport. Txx to VUH as Lvl 1. Problems: R ribs 4-9 fxs, R htx, pneumomediastinum, extensive subQ emphysema. She was admitted to TICU and a R CT was placed. Extubated on 11/29 and reintubated on 11/30 for hypercarbia. TEC placed and empiric abx after bronch/BAL, septic shock. GOC discussion with family: determined that prolonged mechanical ventilation was not within her goals, she was made DNR/DNI. She was optimized for extubation which was completed on 12/4 at 1300. She was unable to maintain adequate O2 saturations and was transitioned to comfort focused care. TOD
1526./2024