

UAMS MEDICAL CENTER
TRAUMA and CRITICAL CARE SERVICES MANUAL

SUBJECT: Antibiotic Stewardship in UAMS ECMO Patients

SUPERSEDES: New

PAGE: 1 of 2

RECOMMENDATION(S): Ryan Dare, MD

APPROVAL: 4/1/2021

CONCURRENCE(S): Jay Bhama, MD & Benjamin Davis, MD

EFFECTIVE: 4/1/2021

UAMS Pre-Operative Antibiotic Prophylaxis
VA or VV Extracorporeal Membrane Oxygenation (ECMO) Cannulation

Surgery	Preferred	Preferred If known to be MRSA Colonized	Alternative for severe Beta Lactam Allergy ²
Percutaneous cannulation	None	None	None
Femoral cut-down cannulation	1. Cefazolin	1. Cefazolin +Vancomycin [*]	1. Vancomycin [*] 2. Clindamycin
Axillary cut-down cannulation	1. Cefazolin	1. Cefazolin +Vancomycin [*]	1. Vancomycin [*] 2. Clindamycin
Intra-thoracic cannulation	1. Cefazolin	1. Cefazolin +Vancomycin [*]	1. Vancomycin [*] 2. Clindamycin

²Severe Beta lactam allergy: History suggestive of high risk (eg. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS, SJS, TEN)

^{*}Clindamycin can be substituted for vancomycin in patients with severe vancomycin allergy (eg. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS, SJS, TEN)

ECMO Considerations:

- Peri-operative antimicrobial prophylaxis at time of cannulation is reasonable for invasive cannulation (see table above)¹
- There is no evidence to support prolonged antimicrobial prophylaxis in ECMO patients and it is not recommended by the Extracorporeal Life Support Organization (ELSO)^{2,3}
- ID consultation recommended for ECMO patients being treated for infections⁴
- Cultures should be collected as dictated by the patient's clinical condition⁴

References:

1. Bratzler DW, Dellinger EP, Olsen KM, et al. Clinical practice guidelines for antimicrobial prophylaxis in surgery. *Am J Health Syst Pharm.* 2013;70:195-283.
2. Extracorporeal Life Support Organization (ELSO) ID Task Force Recommendation Summary, Ann Arbor, MI 2012. <https://www.else.org/Portals/0/Files/ELSO-ID-Task-Force-Recommendations-Summary.pdf>.
3. Hsu MS, Chiu KM, Huang YT, Koa KL, Shu SH, Liao CH. Risk Factors for nosocomial infection during extracorporeal membrane oxygenation. *J Hosp Infect* 73: 210-216, 2009
4. Shah A, Priya S, Stevens RW, Bohman JK, Lahr BD, Dhungana P, Vashistha K, O'Horo JC. Reducing Broad Spectrum Antimicrobial Use in Extracorporeal Membrane Oxygenation (ECMO): Reduce AMMO Study. *Clin Infect Dis.* 2021 Feb 21; online ahead of print.

These guidelines were prepared by the UAMS SICU. They are intended to serve only as a guideline based on current review of the medical literature and practice. They are neither policies nor protocols. Their use is at the discretion of the managing physician.

UAMS MEDICAL CENTER
TRAUMA and CRITICAL CARE SERVICES MANUAL

SUBJECT: Antibiotic Stewardship in UAMS ECMO Patients

SUPERSEDES: New

PAGE: 2 of 2

RECOMMENDATION(S): Ryan Dare, MD

APPROVAL: 4/1/2021

CONCURRENCE(S): Jay Bhama, MD & Benjamin Davis, MD

EFFECTIVE: 4/1/2021

Adult Surgical Prophylaxis Antibiotics PRE-OP and INTRA-OP Dosing & Timing^x

Antibiotic	Dose	Dose in Obesity ²⁻⁵	Administration ⁶	PRE-Op Timing	PRE-Op Delay		INTRA-Op Redosing ^{#7}		
					CrCl >30 mL/min	CrCl <30 mL/min	CrCl > 50 mL/min	CrCl 20-50 mL/min	CrCl < 20 mL/min
Amp/Sulbactam (Unasyn)	3 g	3 g	15-30 min infusion	≤ 1 hr	1-2 hr: 1.5 g >2 hr: 3 g	> 3 hr: 1.5 g	2 hours	4 hours	8 hours
Ampicillin	2 g	2 g	15-30 min infusion	≤ 1 hr	>2 hr: 2 g	>3 hr: 2 g	2 hours	4 hours	8 hours
Azithromycin (Zithromax)	500 mg	500 mg	60 minute infusion	=1 hr	No re-dose	No re-dose	No re-dose	No re-dose	No re-dose
Cefazolin (Ancef)	<80kg: 2 g	80-119 kg: 2 g ≥ 120 kg: 3 g	3-5 min push or 30 min infusion	≤ 1 hr	1-2 hr: ½ pre-op dose >2 hr: full pre-op dose	2-3 hr: 500 mg (80+kg AND CrCl>10) OR >6 hr: ½ pre-op dose (CrCl >10)	4 hours	8 hours	16 hours
Cefoxitin (Mefoxin)	<80kg: 1 g	80-119 kg: 2 g ≥ 120 kg: 3 g	3-5 min push or 30 min infusion	≤ 1 hr	1-2 hr: ½ pre-op dose >2 hr: full pre-op dose	>3 hr: ½ pre-op dose (80+ kg)	2 hours	4 hours	8 hours
Ceftriaxone (Rocephin)	2 g	2 g	30 minute infusion	≤ 1 hr	No re-dose	No re-dose	No re-dose	No re-dose	No re-dose
Cefuroxime (Zinacef)	1.5 g	1.5 g	15-60 min infusion	≤ 1 hr	1-4 hr: ½ pre-op dose >4 hr: full pre-op dose	>3 hr: ½ pre-op dose (CrCl 20-<50) >6 hr: ½ pre-op dose (CrCl <20)	4 hours	8 hours	16 hours
Clindamycin (Cleocin)	900 mg	900 mg	10-60 minute infusion	≤ 1 hr	1-3 hr: ½ pre-op dose >3 hr: full pre-op dose	1-3 hr: ½ pre-op dose >3 hr: full pre-op dose	6 hours	6 hours	6 hours
Ertapenem (Invanz)	1 g	1 g	30 minute infusion	≤ 1 hr	No re-dose	No re-dose	No re-dose	No re-dose	No re-dose
Gentamicin	5 mg/kg (IBW)	5 mg/kg (if wt >20% of IBW use ABW)	30-60 minute infusion	≤ 1 hr	1-3 hr: 2.5 mg/kg >3 hr: 5 mg/kg	No re-dose	Consider at 8 hours	Call Pharmacy	None
Levofloxacin (Levaquin)	500 mg	Consider 750mg*	500 mg: 60 min 750 mg: 90 min	≤ 2 hr	2-6 hr: 250-500 mg >6 hr: 500-750 mg	No re-dose	No re-dose	No re-dose	No re-dose
Metronidazole (Flagyl)	500 mg	500 mg	500 mg: 60 min 1 g: 60 min	≤ 1 hr	1-6 hr: ½ pre-op dose >6 hr: full pre-op dose	4-6 hours: 500 mg	8 hours	8 hours	8 hours
Piperacillin/tazo bactam (Zosyn)	3.375 g	Consider 4.5 g	30 minute infusion	≤ 1 hr	1-2 hr: ½ pre-op dose >2 hr: full pre-op dose	2-4 hr: ½ pre-op dose >4 hr: full pre-op dose	2 hours	4 hours	8 hours
Vancomycin (Vancocin)	<70kg: 1 g	70-99 kg: 1.25 g ≥ 100 kg: 1.5 g	30 minutes for every 500 mg	≤ 2 hr	2-6 hr: 500 mg >6 hr: 1000 mg	No re-dose	8 hours	16 hours	None

OBESITY Dosing: where data is available specific weight is defined; IBW= ideal body weight; ABW=adjusted body weight; Adjusted wt = IBW + 0.4(Actual BW – IBW).

^x Post-operative antibiotic dosing is NOT recommended.

* No data to define patient weight/BMI for higher dosing for surgical prophylaxis. Use clinical judgment. Consider obese as BMI 30 or greater.

Redose individual antibiotics for prolonged procedures at designated times or if there is excessive intra-operative blood loss (>1.5L) after fluid resuscitation

Antibiotic Dosing References

1. Bratler DW, Dellinger EP, Olsen KM, et al. Clinical practice guidelines for antimicrobial prophylaxis in surgery. *Am J Health Syst Pharm.* 2013;70:195-283.
2. Ho VP, Nicolau DP, et al. Cefazolin Dosing for Surgical Prophylaxis in Morbidly Obese Patients. *Surgical Infections.* 2012; 13(1):33-37. Referenced 11 Feb. 2016. DOI: 10.1089/sur.2010.097
3. Janson, Brett, and Karin Thursky. Dosing of Antibiotics in Obesity. *Current Opinion in Infectious Diseases* 25.6 2012; 25(6):634-49. Referenced 11 Feb. 2016. DOI: 10.1097/QCO.0b013e328359a4c1
4. Tucker CE, Lockwood AM, and Nguyen NH. Antibiotic dosing in obesity: the search for optimum dosing strategies. *World Obesity.* 2014; 4:287-95. Referenced 11, Feb. 2016. DOI: 10.1111/cob.12076
5. Chopra T, Zhao JJ, Alangaden G et al. Preventing surgical site infections after bariatric surgery: value of perioperative antibiotic regimens. *Expert Rev Pharmacoecon Outcomes Res.* 2010;10(3):317-28. doi:10.1586/erp.10.26.
6. Handbook on Injectable Drugs, 16th edition. Trissel, LA. Maryland: American Society of Health-Systems Pharmacists; 2011.
7. Alexander JW, Solomkin JS, Edwards MJ. Updated recommendations for control of surgical site infections. *Ann Surg.* 2011;253:1082-1093

These guidelines were prepared by the UAMS SICU. They are intended to serve only as a guideline based on current review of the medical literature and practice. They are neither policies nor protocols. Their use is at the discretion of the managing physician.