

Stanford Medication Usage Guide Polymyxin B & Colistin

What: Polymyxin B is preferred over Colistin (polymyxin E) for infections due to multidrug resistant gram-negative bacilli at Stanford Health Care.

SHC formulary restriction criteria – **Polymyxin B**

1. Infectious Disease Consultation and ID recommendation for use
2. Cystic Fibrosis team

SHC formulary restriction criteria – **Colistin**

1. Treatment of urinary tract infections
2. Inhalation route

Why: Polymyxin B and Colistin have the same spectrum of activity. However, Polymyxin B has favorable clinical pharmacologic properties compared to Colistin

- Polymyxin B is an active drug, whereas Colistin is administered as the prodrug colistimethate sodium (CMS) and has variable and slow (hours) conversion to the active moiety
- Polymyxin B may be less nephrotoxic

How: Polymyxin B and Colistin dosing is **NOT interchangeable**

- Polymyxin B is usually dosed by “unit”, not “mg”
- Note that with Polymyxin B, each 500,000 units is diluted in 300-500mL: a typical dose may result in 1L of fluid
- Consult ID pharmacists if MIC ≥ 2 for alternative dosing strategies

Monitoring: Neurotoxicity

- May occur in 1st few days of therapy and may be dose or infusion-rate dependent. May include dizziness, muscle weakness, confusion, headache, visual disturbances, ataxia, paresthesias.
- Mild ADEs are usually benign and reversible upon discontinuing polymyxin
- Management: slow the infusion, lower the dose

Dosing

	Route	≥ 80 mL/min	50-79 mL/min	30-49 mL/min	10-29 mL/min	IHD CRRT
Polymyxin B <small>Use actual body weight; adjusted body wt for obese</small>	IV	7,500 – 12,500 units/kg Q12H				No Data; Consult ID pharmacist
Colistin <small>Use ideal body weight</small> <small>Doses expressed in colistin base activity</small>	IV	5 mg/kg/day in 2-3 divided doses	1.25–1.9 mg/kg Q12H	2.5 mg/kg Q24H -OR- 1.25 mg/kg Q12h	1.5 mg/kg Q36H	1.5 mg/kg Q24-48h 2.5 mg/kg Q12-24H
	Inhalation	150 mg inhalation Q12H				

Conversions:

Colistimethate sodium 1 mg = ~12,500 units of colistimethate sodium
Colistimethate sodium ~2.67 mg = 1 mg of colistin base activity
1 mg colistin base activity (CBA) = 30,000 IU colistin
1 mg polymyxin B = 10,000 IU polymyxin B

Document Information:

- A.** Original Author/Date: Lina Meng, PharmD, BCPS, BCCCP, Emily Mui, PharmD, BCPS, Stan Deresinski, MD, 02/2015
- B.** Gatekeeper: Antimicrobial Stewardship Program
- C.** Review and Renewal Requirement
This document will be reviewed every three years and as required by change of law or practice
- D.** Revision/Review History: 11/2017 Lina Meng, PharmD
- E.** Approvals
 - 1. Antimicrobial Subcommittee: 11/2017
 - 2. P&T: 12/2017 (pending)

References:

1. Micromedex online, accessed 2/17/2016
2. Falagas ME, Kasiakou SK. Toxicity of polymyxins: a systematic review of the evidence from old and recent studies. *Critical care*. 2006 Feb 13;10(1):R27.
3. Nelson, Brian C., et al. "Clinical outcomes associated with polymyxin B dose in patients with bloodstream infections due to carbapenem-resistant Gram-negative rods." *Antimicrobial agents and chemotherapy* 59.11 (2015): 7000-7006.
4. Pai MP. Polymyxin B dosing in obese and underweight adults. *Clin Infect Dis* 2013;57:1785.
5. Rigatto, Maria Helena, et al. "Renal failure in patients treated with colistin versus polymyxin B: a multicenter prospective cohort study." *Antimicrobial Agents and Chemotherapy* (2016): AAC-02634.
6. Rigatto, Maria Helena, et al. "Clinical features and mortality of patients on renal replacement therapy receiving polymyxin B." *International journal of antimicrobial agents* (2015).
7. Rigatto, Maria Helena, et al. "Risk factors for acute kidney injury (AKI) in patients treated with polymyxin B and influence of AKI on mortality: a multicentre prospective cohort study." *Journal of Antimicrobial Chemotherapy* (2015): dku561.
8. Sandri, Ana M., et al. "Population pharmacokinetics of intravenous polymyxin B in critically ill patients: implications for selection of dosage regimens." *Clinical infectious diseases* 57.4 (2013): 524-531.
9. Sandri, Ana M., et al. "Pharmacokinetics of polymyxin B in patients on continuous venovenous haemodialysis." *Journal of Antimicrobial Chemotherapy* (2012): dks437.
10. Zavaski, Alexandre P., et al. "Pharmacokinetics of intravenous polymyxin B in critically ill patients." *Clinical infectious diseases* 47.10 (2008): 1298-1304.