

Antimicrobial Dose Rounding

Background:

Many antimicrobial medications are dosed based on the patient's weight. Computer generated doses based on weight are precise but are not always practical nor do they allow for judicious use of resources. Standardizing doses has shown to reduce errors^{1,2} and standardization allows for preparation and dispensation efficiencies. Dose rounding or dose standardization has been used on a variety of medications from chemotherapy to antimicrobial agents and in a wide patient population ranging from neonates to adults.³⁻⁵

Policy:

An Antimicrobial Dose Rounding Policy has been developed that defines the standardized dose rounding approach for weight-based antimicrobials. The policy (MP 48) can be found on the Nebraska Medicine intranet in Compliance 360.

The chart below displays the medications that will be rounded at the time of electronic order entry; it also details how the medications will be rounded. In situations where dose rounding within 10% of the original dose is appropriate but is not automatically completed during electronic order entry and the provider has not specified "no dose rounding", the pharmacist may round the ordered dose to the appropriate rounding increment upon order verification. This policy only pertains to intravenously administered antimicrobial medications.

Anti-Infective	Rounding Increment	Dose at Which Automatic Rounding Occurs
Acyclovir	50 mg	200 mg
Amikacin	50 mg	200 mg
Amphotericin B deoxycholate	5 mg	24 mg
Amphotericin B liposomal	25 mg	120 mg
Cidofovir	50 mg	200 mg
Colistin base	25 mg	100 mg
Daptomycin	50 mg	200 mg
Fluconazole	50 mg	200 mg
Foscarnet	300 mg	1000 mg
Ganciclovir	50 mg	200 mg
Gentamicin	Traditional: 10 mg High dose extended interval: 40 mg	Traditional: 40 mg High dose extended interval: 200 mg
Pentamidine	25 mg	120 mg
TMP-SMX	40 mg	200 mg
Tobramycin	Traditional: 10 mg High dose extended interval: 40 mg	Traditional: 40 mg High dose extended interval: 200 mg
Vancomycin	Doses < 1000 mg: 5 mg Doses > 1000 mg: 250 mg	All doses
Voriconazole	50 mg	200 mg

Functionality:

Figure 1 below provides an example of how dose rounding will work with daptomycin as an example.

- The dose is ordered in **mg/kg** (i.e., 6mg/kg)
- The final dose for administration is rounded from the calculated dose based on the pre-specified rounding increment (50 mg) that is specified in the table within the policy
 - The calculated dose is 576 mg
 - The final rounded dose is 600 mg
- If the rounded dose deviates more than 10% from the original mg/kg dose, a warning will **not** be displayed to the pharmacist or the provider

Figure 1 – Order Composer

DAPTOMycin (CUBICIN) 600 mg in sodium chloride 0.9 % 50 mL IV Accept Cancel

Order Inst: [Uses other than for SSTI or Staph aureus bacteremia require ID services approval. See Lexicomp for additional details.](#)

Reference: 1. [Link to Lexicomp](#)

Links:

Dose: mg/kg 4 mg/kg 6 mg/kg

Weight Type: Actual Ideal Adjusted Dosing Order-Specific

Weight: 96 kg 96 kg 96 kg 90 kg

Actual weight: 96 kg (recorded in the last hour)

Administer Dose: **600 mg** $6 \text{ mg/kg} \times 96 \text{ kg (Weight as of Tue Nov 10, 2015 1400)}$
 $= 600 \text{ mg (rounded to the nearest 50 mg from 576 mg)}$
 $= 600 \text{ mg} \times 10 \text{ mL}/500 \text{ mg}$
 $= 12 \text{ mL} \times 500 \text{ mg}/10 \text{ mL}$
 $= 600 \text{ mg}$

Administer Amount: **600 mg**

Route: Intravenous

Prepared By: Kiri M. Rolek, PharmD, BCPS; Emily Kreikemeier, PharmD, BCPS
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2. MacKay MW, Cash J, Farr F, Holley M, Jones K, Boehme S. Improving Pediatric Outcomes through Intravenous and Oral Medication Standardization. *J Pediatr Pharmacol Ther.* 2009 Oct-Dec; 14(4): 226–35.
3. Robinson CA, Siu A, Meyers R, Lee BH, Cash J. Standard dose development for medications commonly used in the neonatal intensive care unit. *J Pediatr Pharmacol Ther.* 2014 Apr;19(2):118-26.
4. Johnson KB, Lee CK, Spooner SA, Davison CL, Helmke JS, Weinberg ST. Automated dose-rounding recommendations for pediatric medications. *Pediatrics.* 2011 Aug;128(2):e422-8.
5. Sklarin NT, Granovsky S, et al. Electronic Chemotherapy Order Entry: A Major Cancer Center's Implementation. *Journal of Oncology Practice.* 2011 Jul;7(4):213-8.