Appendix B. Selecting Appropriate Dosing Weight for Antimicrobial Medications

From: Renal Function-Based Dose Adjustments – Adult – Inpatient/Ambulatory – Consensus Care Model
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Definitions and Equations:

- TBW = Total body weight (also called "Actual Body Weight")
- IBW = ideal body weight
  - $\text{IBW in kg (male)} = 50\ kg + 2.3 \times [Height\ (inches) - 60]$
  - $\text{IBW in kg (female)} = 45.5\ kg + 2.3 \times [Height\ (inches) - 60]$
- AdjBW = adjusted body weight
  - $\text{AdjBW in kg} = IBW(kg) + 0.4 \times [ABW(kg) - IBW(kg)]$

Appendix B: Selecting appropriate dosing weight for antimicrobial dosing (all recommendations are *UW Health GRADE Low-moderate quality evidence, conditional recommendation*)

	If patient TBW less than IBW, use this column	If patient is non-obese and TBW is greater than IBW, use this column	If patient is obese (BMI >30 kg/m^2), use this column
Aminoglycosides	TBW	IBW	AdjBW[1]
Colistin		IBW	IBW[2,3]
Daptomycin		IBW	IBW[4]
Polymyxin B		TBW	AdjBW[5-9]
Trimethoprim/Sulfamethoxazole		TBW	AdjBW[10]
Vancomycin		TBW	TBW[11,12]
Acyclovir	TBW	IBW	IBW[10]
Ganciclovir		TBW	AdjBW[10]
Foscarnet		TBW	AdjBW[10]; see footnote A
Liposomal amphotericin	TBW	TBW	AdjBW[13]; see footnote B
Flucytosine		IBW	IBW[14,15]
Voriconazole		TBW	AdjBW[16,17]
Bezlotoxumab	TBW	TBW	TBW[13]
Ethambutol		IBW	IBW[14]
Pyrazinamide		IBW	IBW[14,15]

[A] Use TBW for the indication of ganciclovir-resistant cytomegalovirus
[B] Consider IBW if risk of nephrotoxicity outweighs risk of infection

Appendix B References

1. Bauer LA, Edwards WA, Dellinger EP, Simonowitz DA. Influence of weight on aminoglycoside pharmacokinetics in normal weight and morbidly obese patients. *European journal of clinical pharmacology*. 1983;24(5):643-647.
2. Garonzik SM, Li J, Thamlikitkul V, et al. Population pharmacokinetics of colistin methanesulfonate and formed colistin in critically ill patients from a multicenter study provide dosing suggestions for various categories of patients. *Antimicrobial agents and chemotherapy*. 2011;55(7):3284-3294.
3. Ortwine JK, Kaye KS, Li J, Pogue JM. Colistin: understanding and applying recent pharmacokinetic advances. *Pharmacotherapy*. 2015;35(1):11-16.
4. Ng JK, Schulz LT, Rose WE, et al. Daptomycin dosing based on ideal body weight versus actual body weight: comparison of clinical outcomes. *Antimicrobial agents and chemotherapy*. 2014;58(1):88-93.
5. Sandri AM, Landersdorfer CB, Jacob J, et al. Population pharmacokinetics of intravenous polymyxin B in critically ill patients: implications for selection of dosage regimens. *Clin Infect Dis*. 2013;57(4):524-531.
6. Pai MP. Polymyxin B dosing in obese and underweight adults. In: *Clin Infect Dis*. Vol 57. United States2013:1785.
7. Onufrak NJ, Rao GG, Forrest A, et al. Critical Need for Clarity in Polymyxin B Dosing. *Antimicrob Agents Chemother*. 2017;61(5).
8. Pogue JM, Ortwine JK, Kaye KS. Are there any ways around the exposure-limiting nephrotoxicity of the polymyxins? *Int J Antimicrob Agents*. 2016;48(6):622-626.
9. Pogue JM, Ortwine JK, Kaye KS. Clinical considerations for optimal use of the polymyxins: A focus on agent selection and dosing. *Clin Microbiol Infect*. 2017;23(4):229-233.
10. Polso AK, Lassiter JL, Nagel JL. Impact of hospital guideline for weight-based antimicrobial dosing in morbidly obese adults and comprehensive literature review. *Journal of clinical pharmacy and therapeutics*. 2014;39(6):584-608.
11. Rybak MJ, Lomaestro BM, Rotschafer JC, et al. Therapeutic monitoring of vancomycin in adults summary of consensus recommendations from the American Society of Health-System Pharmacists, the Infectious Diseases Society of America, and the Society of Infectious Diseases Pharmacists. *Pharmacotherapy*. 2009;29(11):1275-1279.
12. Srinivas NR. Influence of Morbidly Obesity on the Clinical Pharmacokinetics of Various Anti-Infective Drugs: Reappraisal Using Recent Case Studies-Issues, Dosing Implications, and Considerations. *American journal of therapeutics*. 2016.
13. Amsden JR, Slain D. Antifungal Dosing in Obesity: A Review of the Literature. *Current Fungal Infection Reports*. 2011;5(2):83.
14. Vermes A, Guchelaar HJ, Dankert J. Flucytosine: a review of its pharmacology, clinical indications, pharmacokinetics, toxicity and drug interactions. *The Journal of antimicrobial chemotherapy*. 2000;46(2):171-179.
15. Tucker CE, Lockwood AM, Nguyen NH. Antibiotic dosing in obesity: the search for optimum dosing strategies. *Clinical obesity*. 2014;4(6):287-295.
16. Koselke E, Kraft S, Smith J, Nagel J. Evaluation of the effect of obesity on voriconazole serum concentrations. *The Journal of antimicrobial chemotherapy*. 2012;67(12):2957-2962.
17. Sebaaly JC, MacVane SH, Hassig TB. Voriconazole concentration monitoring at an academic medical center. *American journal of health-system pharmacy : AJHP : official journal of the American Society of Health-System Pharmacists*. 2016;73(5 Suppl 1):S14-21.