

Creatinine Clearance not Creatinine Clairvoyance: Cautious Interpretation of Inpatient Renal Function

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WMSHP Spring Seminar

- Interpreting the estimated creatinine clearance as determined by the Cockcroft-Gault equation
 - Concerns of the Cockcroft and Gault study when applied to a hospitalized patient
 - Majority male
 - Majority white
 - Below average body weight
 - Steady state renal function
 - Unknown past medical history
 - Variations made to the Cockcroft-Gault equation since publication
 - Serum creatinine rounding
 - Body weight adjustments
 - Downfalls of using serum creatinine for hospitalized patients
 - Inaccuracy in:

Extremes of age	Female patients	Non-black patients
Critical illness	Severe organ dysfunction	Extremes of weight

- Changes that may occur regarding renal function in a critically ill patient
 - Absorption
 - GI motility disruptions
 - Decreased GI perfusion
 - Tube feed interactions
 - Distribution
 - Third spacing
 - Changes in protein binding
 - Metabolism
 - Changes in hepatic function and blood flow
 - Excretion
 - Unknown GFR estimation
 - Renal replacement therapy
 - Augmented renal clearance
- Management strategies for medication dosing in acutely ill patients
 1. Individualize based on the medication being dosed
 2. Determine a range of renal function from multiple equations
 3. Take all patient specific factors into consideration
 4. Evaluate risks and benefits of the medication

Noteworthy references:

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Lew AK, Crass RL, Eschenauer G. Evolution of equations for estimating renal function and their application to the design of new antimicrobials. *Ann Pharmacother.* 2020 May;54(5):496-503.

Smith BS, Yogaratnam D, Levasseur-Franklin KE, Forni A, Fong J. Introduction to drug pharmacokinetics in the critically ill patient. *Chest.* 2012 May;141(5):1327-1336.