

Louth: Antimicrobial Guidelines - Louth Hospitals: Antimicrobial Guidelines: Assessing Renal Function

Published information on the effects of renal impairment on drug elimination is usually stated in terms of creatinine clearance (CrCl), calculated using the Cockcroft and Gault Equation.

In some cases, renal function may be reported on the basis of estimated glomerular filtration rate (eGFR) using the Modification of Diet in Renal Disease (MDRD) formula.

The two equations are NOT interchangeable, however there is relatively good correlation between them for adult patients of average build and height, and either could be used for the majority of drugs.

- Creatinine clearance using the Cockcroft and Gault Equation should be calculated for drugs with a **narrow therapeutic index**, such as gentamicin and vancomycin, and for dose reduction of all drugs in patients **at extremes of body weight** ($\text{BMI} < 18\text{kg/m}^2$ or $\geq 40\text{kg/m}^2$).
- **N.B. Estimates of GFR will not be accurate when the patient has an acute kidney injury (AKI), i.e. if the creatinine is rising or falling. The full clinical picture should always be taken into account.**
- During AKI, serum creatinine levels lag behind the development of the injury and progress of recovery. As creatinine rises, estimates of GFR will overestimate renal function and as creatinine falls and kidney function improves, estimates of GFR will underestimate renal function.

Cockcroft and Gault Equation:

K = 1.23 for males and 1.04 for females

Which weight to use for CrCl calculation?

If Body Mass Index (BMI) $< 30\text{kg/m}^2$, use actual weight to calculate CrCl

If BMI $\geq 30\text{kg/m}^2$, use Obese Dosing Weight (ODW) to calculate CrCl

$$\text{BMI} = \text{Weight(kg)} / \text{Height(m)}^2$$

Ideal Body Weight (IBW) (kg) = R + 2.3kg for every inch over 5ft

R = 50 for males and 45.5 for females

$$\text{ODW (kg)} = \text{IBW} + 0.4(\text{Actual weight} - \text{IBW})$$