

Estimation of glomerular filtration according to Cockroft and Gault

Endogenous creatinine clearance can be estimated from serum creatinine concentration without the need for urine collection by calculation using the Cocroft and Gault formula:

for men:

$$Cl_{Kr} \text{ (ml/s)} = \frac{(140 - \text{age [years]}) \cdot \text{body weight [kg]}}{44,5 \cdot \text{serum creatinine } [\mu\text{mol/l}]}$$

for women:

$$Cl_{Kr} \text{ (ml/s)} = 0,85 \cdot \frac{(140 - \text{age [years]}) \cdot \text{body weight [kg]}}{44,5 \cdot \text{serum creatinine } [\mu\text{mol/l}]}$$

Explanation of the calculation principle

Renal endogenous creatinine clearance is defined as the ratio of urinary creatinine waste (ie, the product of diuresis and urinary creatinine concentration) to serum creatinine concentration. Determination of creatinine waste is difficult, time-consuming and often error-prone. It is therefore replaced by an estimate.

Because creatinine is no longer metabolised in humans, its urinary losses must be the same as its production. The rate of creatinine production is almost constant and depends practically only on the total weight of skeletal muscle. It can therefore be estimated using anthropometric data (gender, age, body weight).

Estimation of creatinine clearance is mainly used to classify a patient with renal failure within a range of severity of failure, eg. when a reduced dose of a drug excreted by kidney needs to be determined. Suitable only for patients with moderate or severe renal insufficiency.

Currently, the Cockroft and Gault clearance estimate is gradually being replaced by the MDRD equation estimate.

Links

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