



Prescribing Tip No. 201 Date: 3rd May 2018

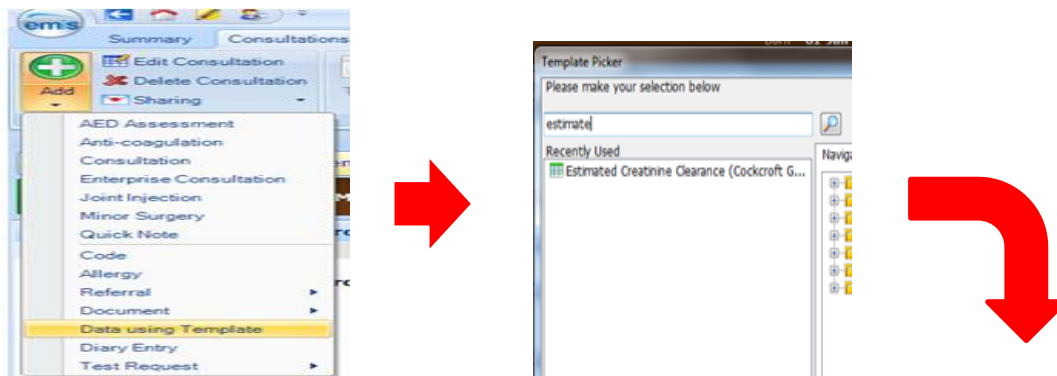
Calculating Creatinine Clearance (CrCl) in adults using EMIS

Estimated creatinine clearance using the Cockcroft and Gault formula is the preferred method for estimating renal function or calculating drug doses in patients with renal impairment who are elderly (aged 75 years and over) or at extremes of BMI (< 18kg/m² or > 40kg/m²). It provides an estimate of CrCl (which is not equivalent to eGFR).¹ Creatinine clearance, rather than eGFR, must also be used when deciding upon the correct dose of novel oral anticoagulant (NOAC) to prescribe for stroke risk reduction in patients with non-valvular AF.

For further information on estimating renal function in patients at extremes of muscle mass see the “**Prescribing in renal impairment**” section within the BNF.

EMIS has created a template which allows prescribers to calculate CrCl (using the Cockcroft and Gault equation) and save this information in a patient’s medical records. The template can be located in: **Template Manager/Templates and Protocols/EMIS Library/Primary Care Templates/History and Exam.**

Alternatively the template can be launched whilst in consultations as depicted below.



Estimated Creatinine Clearance (Cockcroft Gault formula)

The following template provides the data entry/review fields to calculate an Estimated Creatinine Clearance using the Cockcroft Gault formula.

The Cockcroft Gault equation is recommended as the standard for drug dosing adjustments. The alternative eGFR should **not** be used as an estimate of renal function for prescribing potentially toxic drugs with a narrow therapeutic index such as gentamicin and vancomycin or in patients at both extremes of weight.

The Cockcroft Gault equation may underestimate creatinine clearance in overweight patients and caution should be used when DOAC adjustment is being considered

Height	<input type="text"/>	cm	05-Oct-2016	160.020 cm	»
Weight	<input type="text"/>	kg	21-Mar-2017	62 kg	»
Body Mass Index	<input type="text"/>	<input type="button" value="Calculate"/>	05-Oct-2016	23 kg/m ²	»
Serum creatinine	<input type="text"/>	umol/L	05-Apr-2018	70 umol/L	»
Estimated Creatinine Clearance (Using Cockcroft Gault formula)	99.911	<input type="button" value="Calculate"/>	05-Apr-2018	99.911 mL/min	»

Cockcroft and Gault creatinine clearance (CrCl):

$$CrCl (mL/min) = \frac{N \times [140 - age (years)] \times weight^* (kg)}{Serum\ creatinine (micromol/L)}$$
 Where N = 1.23 males, 1.04 females
 *Use ideal body weight (IBW) if actual weight is greater than 120% IBW
 IBW (kg) = (number of inches over 5ft x 2.3) + 50 (males) or 45.5 (females)

If the patient has a previously recorded height, weight and serum creatinine then Estimated Creatinine Clearance can be calculated and the result saved directly into the patient’s consultation. To ensure the calculated CrCl is accurate please check that the patient’s weight and serum creatinine are up to date.

For prescribers who prefer to use an online tool, **MDCalc** is a reliable source for medical equations, scores and algorithms and can be accessed at the following link <https://www.mdcalc.com/creatinine-clearance-cockcroft-gault-equation>

References: 1. BNF 74. Prescribing in renal impairment Pg 20

To contact the Medicines Optimisation Team please phone 01772 214302