

County Durham & Tees Valley APC Position Statement on Calculating Creatinine Clearance(CrCl) for Direct Oral Anticoagulants (DOACs)

County Durham & Tees Valley APC recognises that current CrCl calculators embedded within GP IT systems do not give a reliable estimate of CrCl for the adjustment of DOAC doses and should not be used

THE APC recommends the use of the MD+CALC Cockcroft-Gault equation

SystemOne users, the inbuilt calculation will incorrectly calculate renal function please use the MD+CALC Cockcroft-Gault equation. EMIS users, the inbuilt CrCl calculator will correctly calculate renal function using actual bodyweight for patients on DOACs (but may not be accurate for initiating a DOAC).

- Use **ACTUAL** bodyweight to calculate CrCl.¹
- Ideal body weight (IBW) should not be used as it can result in inappropriate dose reductions and can increased risk of stroke/systemic embolus.
- Estimated glomerular filtration rate (eGFR) should not be used in place of creatinine clearance when determining renal function for the purpose of dose adjustment.² Data suggests this can lead to inappropriate dosing in up to 50% of patients.³

Seek specialist advice from specialist (cardiology/ haematology) for:

- extremes of bodyweight **less than 50kg or greater than 120kg** as drug level monitoring may be required (at initiation of treatment and if clinically indicated)

NB. When calculating CrCl for these patients in primary care use ideal BW for greater than 120kg and actual BW for patients less than 50kg unless advised otherwise by specialist (cardiology/ haematology).

- patients on dialysis and patients with a CrCl less than 15ml/min as DOACs are contraindicated
- heart failure patients with fluid overload- use dry weight/ euvolaemic estimate
- patients with extensive amputations, or neurological diseases (eg spina bifida, multiple sclerosis) and myopathy that may result in profound muscle loss

Bottom line what does this mean in practice?

- **Do not use** CrCl calculators embedded within GP IT systems for DOAC dosing
- Use MD+CALC Cockcroft-Gault equation

Quick reference guide:

- Underweight (BMI less than 18.5 kg/m²) individuals:** estimate CrCL using **ACTUAL** bodyweight (**box 1 in appendix 1**)
- Normal or overweight (BMI greater than or equal to 18.5 kg/m² and less than 30 kg/m²) individuals:** estimate CrCl using **ACTUAL** bodyweight (**box 1 in appendix 1**)
- Obese or morbidly obese (BMI greater than or equal to 30 kg/m²) individuals:** estimate a CrCl range using ideal bodyweight and adjusted bodyweight that define the lower and upper boundaries (**box 2 in appendix 1**). If the difference crosses over a DOAC dosing threshold, then assess bleeding and thrombosis risk to decide on suitable dose

Appendix 1:

Creatinine Clearance (Cockcroft-Gault Equation) ☆

Calculates CrCl according to the Cockcroft-Gault equation.

INSTRUCTIONS

For use in patients with stable renal function to estimate creatinine clearance.

When to Use ▾

Pearls/Pitfalls ▾

Why Use ▾

Sex	<div style="display: flex; justify-content: space-between; border: 1px solid #ccc; padding: 2px;"> Female Male </div>
Age	<input style="width: 80%;" type="text" value="87"/> years
Weight	<input style="width: 80%;" type="text" value="74"/> kg ↕
Creatinine	<input style="width: 80%;" type="text" value="86"/> µmol/L ↕

The Cockcroft-Gault Equation may be inaccurate depending on a patient's body weight and BMI; by providing additional height, we can calculate **BMI** and provide a modified estimate and range.

Height	<input style="width: 80%;" type="text" value="160"/> cm ↕
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BOX 1

56 mL/min

Creatinine clearance, original Cockcroft-Gault

BOX 2

48 mL/min

Creatinine clearance modified for overweight patient, using adjusted body weight of 64 kg (140 lbs).

BOX 2

43.0–48.2 mL/min

Note: This range uses IBW and adjusted body weight. Controversy exists over which form of weight to use.

Copy Results 📄

Next Steps »»

Further information:

[SPS: Direct Acting Oral Anticoagulants \(DOACs\) in Renal Impairment: Practice Guide to Dosing Issues.](#)

References

- John Fanikos, RPh, MBA, Allison E. Burnett, PharmD, Charles E. Mahan, PharmD, Paul P. Dobesh, PharmD. Renal Function Considerations for Stroke Prevention in Atrial Fibrillation. The American Journal of Medicine 2017
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- Wood et al. Assessing Kidney Function in Oral Anticoagulant Prescribing an aid for Safer drug and Dose Choices. The British Journal of Cardiology. 2013. 20:61-4 Accessed via: <http://bjcardio.co.uk/2013/06/assessing-kidney-function-in-oral-anticoagulant-prescribing-an-aid-for-safer-drug-and-dose-choices/>