Guidelines for the treatment of acute coronary syndromes in patients with chronic kidney disease

Scope of this guidance:

Many medications, including those used to treat acute coronary syndromes, are either contraindicated or need dose adjustment when patients have impaired renal function. This guideline has been produced to supplement the NHS Lothian ACS protocol and is to be used for patients with renal impairment.

Immediate management of acute coronary syndromes and decisions as to whether interventional management is required should still be taken in conjunction with the cardiology team as they would be for the general population.

Medications for immediate management of acute coronary syndromes in chronic kidney disease patients:

These tables show which medications are recommended for usage in the treatment of acute coronary syndromes based on a patient's degree of renal impairment:

<table>
<tr><th></th><th>Aspirin</th><th>Additional anti-platelet</th><th>ACEi – see note 3 below</th><th>Beta-blocker</th><th>Statin</th></tr>
<tr><td>eGFR 30-60</td><td rowspan="4">Aspirin 300mg stat.
75mg once daily thereafter unless contraindications develop</td><td rowspan="4">Clopidogrel 300mg stat.
75mg once daily for 3 months
See note 1 below</td><td rowspan="2">Start ramipril 1.25mg daily if blood pressure allows and K+ not >5.5. Monitor to ensure creat does not rise >30% and K+ is safe.</td><td rowspan="4">Metoprolol 25mg oral stat as test dose.
If tolerated start long acting beta-blocker to aim for HR <70/min.
Formulary advises bisoprolol as first choice.</td><td rowspan="4">Start atorvastatin 20mg and check baseline CK + LFTs.

If these tests are not adversely affected by the statin increase to 80mg.</td></tr>
<tr><td>eGFR 20-29</td></tr>
<tr><td>eGFR 10-19</td><td>Likely avoid – see note 3 below</td></tr>
<tr><td>Dialysis</td><td>Start if potassium well controlled</td></tr>
</table>

Guideline written by Matthew Sayer, Elizabeth Hird and Maggie Davidson (April 2021).

Creatinine clearance (ml/min)	Anticoagulant
20 or greater	Fondaparinux 2.5mg sub cut daily
Below 20	Dalteparin. Dosing as per note 2 below.

1) Guidelines for usage of second antiplatelet: Risk of bleeding increases and the benefit derived from dual antiplatelets decreases as degree of renal impairment worsens. It is unclear what the optimum time course for dual antiplatelets is, especially in those with chronic kidney disease. It is possible for many patients the risks of continuing the medication for longer than 3 months outweigh the benefits. The decision as to whether to continue beyond 3 months should be made on an individual patient's risk of bleeding.

2) Guidelines for anticoagulant therapy: Fondaparinux is not licensed below a creatinine clearance of 20ml/min. Bleeding risk also increases with anticoagulants as degree of renal impairment worsens. Where patients are at high risk of bleeding, it may be preferable to avoid anticoagulants. For those patients who are not at high risk of bleeding we recommend using dalteparin when creatinine clearance is below 20ml/min. The dose of dalteparin is calculated based on weight as per the table below and factor Xa level monitoring should be performed.

Dose calculation	Anti-factor Xa level monitoring
Dalteparin sub cut once daily **130units/kg** **Please round to nearest available syringe:** • **5,000units** • **7,500units** • **10,000units** • **12,500units** • **15,000units** • **18,000units**	**Ordered as LMW heparin assay.** **Collect sample in green tube.** **Perform after 3rd dose** **This must be done 3-4hours after dose administration to achieve an accurate peak level.** **Target 0.5-1.0units/ml**

The medication should be continued for 8 days, until percutaneous coronary intervention or until discharge (whichever occurs sooner). Where factor Xa levels are out with the target range the result should be discussed with the haematology registrar on call for advice on dose adjustment.

3) Guidelines for starting ACEi: According to NICE guidelines renal function should be checked 1-2 weeks after starting treatment and after each dose increase. Dose should be titrated up to the maximum tolerated dose in the community. Blood pressure should be checked 4 weeks after a dose titration.
Caution should be taken when starting an ACEi in all patients with renal failure. Particular caution should be exercised in those patients with an eGFR below 20 who are not yet on dialysis. They are especially prone to hyperkalaemia and introduction of an ACEi may lead to rapid deterioration of renal function and development of end stage renal failure. It is, therefore, generally not advisable to commence ACEi therapy for patients with an eGFR below 20.

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Where patients were on an ACEi prior to the acute coronary syndrome the medication should be reintroduced after being withheld over the period they were unwell or underwent any contrast based investigations.

Further management:

For all dialysis patients: Dialysis may put the heart under strain and following a confirmed MI all patients who are on dialysis should have their first dialysis session after the event done in monitored conditions. Once an MI has been confirmed and the cardiology team are satisfied no further immediate interventions are required by themselves, please contact the renal registrar on call to arrange for a monitored dialysis. Before you contact renal please ensure you know what day the patient would routinely be due to dialyse next and have an up to date serum potassium result.

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