

COVID-19 Care in the Community - Case Management in Pharmacy Operational Guide

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Medication Management Consult: SADMAN(S-DOG)

Eligibility Criteria

Clients in COVID-19 mandatory isolation due to being COVID-19 positive, taking medicines from the following classes:

- SGLT-2 inhibitors
- ACE Inhibitors
- Diuretics
- Metformin
- ARBs
- NSAIDs
- Sulfonylureas
- Direct-Acting Oral Anticoagulants
- Opioids
- Gabapentin/ Pregabalin

Referrals for this service may come from:

- Prescriber via email or phone or noted on prescription.
- Welfare or other agencies such as Tihei Mauri Ora and the local hubs who provide support.
- Health Hawke's Bay.
- General Practice.
- DHB services.

Background

Patients with COVID-19 are at increased risk of Acute Kidney Injury (AKI) due to the SARS-COV2 virus damage to the kidney, dehydration from gastrointestinal manifestations and/or fever, and immune mediated response causing multiorgan damage. Adverse events from medications contribute significantly to the development of AKI in patients with COVID-19 infection.

Few medications truly have direct toxic effects on the kidneys, but several have the potential to impair renal function if used under certain circumstances, such as in the severely unwell or dehydrated patient. Underlying conditions also influence the risk of a patient experiencing AKI and adverse event from medication.

In addition, since the kidneys are one of the major excretory pathways for the removal of drugs from the body, the sudden loss of kidney function can have major implications for a patient's prescribed medication regime. The many medications that are cleared via the kidneys have the potential to accumulate during an episode of AKI. The result of this may be a further deterioration in kidney function or other adverse effects such as bone marrow or CNS toxicity.

Sick Day rules, including stopping medicines which increase the risk of AKI can help prevent adverse outcomes in patients with COVID-19 infections.

Patient factors to consider when stopping medicines

What AKI risk factors does this patient have?

Underlying conditions which influence the risk of a patient experiencing AKI and adverse event from medication include:

- Chronic kidney disease eGFR <60ml/min/1.73m² OR urinary tract obstruction
- Cardiac conditions e.g. Heart Failure
- Diabetes
- Liver disease
- Malignancy
- Major surgery or trauma or medical procedure (e.g. contrast based imaging)
- Age over 65 years (likely younger for Māori and Pacific)

What are the risks to the patient and medical conditions if the medicine is stopped?

Check the 'How to' guides for Heart Failure and Diabetes. In these conditions there may be severe consequences if a medication is stopped.

Chronic Kidney Disease is complex and medication management requires advice from a renal physician. Contact the prescriber for transplant or dialysis patients or those with an eGFR of less than 30mL/min/1.73m².

Specific medications

Medications which can cause adverse events either by direct cause of AKI or accumulation are identified using the SADMANS-DOG acronym:

1. **Non-steroidal anti-inflammatory drugs (NSAIDs)** impair kidney function by inhibiting prostaglandin-mediated vasodilatation of the afferent arteriole and may increase the risk of AKI.
2. Drugs that lower blood pressure, or cause volume contraction, e.g. ACE-inhibitors (**ACEIs**), Angiotensin Receptor Blockers (**ARBs**) **SGLT-2** inhibitors, other antihypertensives and diuretics might increase the risk of AKI by reducing glomerular perfusion.
3. Drugs might accumulate because of reduced kidney function in AKI, increasing the risks of adverse effects. These drugs include:
 - **Metformin** which is associated with an increased risk of lactic acidosis in high-risk patients.
 - **Sulfonylurea** drugs which may have an increased risk of hypoglycaemia (see more information in 'How to' guide Diabetes).
 - **Direct acting oral anticoagulants** (e.g. dabigatran and rivaroxaban)
 - **Opioids** (e.g. morphine and oxycodone) may accumulate increasing CNS and Respiratory Depression.
 - **Gabapentin** and pregabalin may accumulate increasing CNS side effects (e.g. confusion and sedation).

Factors to discuss with your patient

If this happens...	...then do this
Patient needing analgesia and/or antipyretic and has risk factors for AKI.	Use Paracetamol, AVOID NSAIDs
Patient has vomiting and diarrhoea or fever over 38 °C and sweating, reduced oral intake of fluids and nutrition.	Advise the patient to increase fluid intake and give rehydration fluids where appropriate.

	<p>No risk factors for AKI: Stop NSAIDs Stop empagliflozin</p> <p>Risk factors for AKI – NOT for Heart failure patients (see 'How to' guide Heart Failure): Stop ACE-I, ARB Stop diuretics Stop metformin Stop NSAIDs Stop empagliflozin Medicines can be restarted 48 hours after feeling better and eating and drinking normally.</p> <p>If patients are on anticoagulants; discuss signs and symptoms of bleeding and to contact GP immediately if concerned. Alternatively, pharmacist to send ISBAR.</p>
Patient is developing confusion, is over sedated or restless and taking gabapentin/pregabalin or opioids.	Patient to contact GP. Alternatively, pharmacist to send ISBAR to GP to recommend dose reduction of gabapentin/pregabalin or opioid while the patient is unwell.

Tools available:

- **Patient fact sheet: COVID-19 Seeking medical help – when and how**
- **Patient fact sheet: Managing Insulin when you are sick**
- **ISBAR communication framework between health care workers.**

References:

The Renal Association. Renal Association Clinical Practice Guideline Acute Kidney Injury (AKI). August 2019, accessed online 12th March 2022, from:
<https://ukkidney.org/sites/renal.org/files/FINAL-AKI-Guideline.pdf>

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Appendix 1: SADMAN(S-DOG) Wall chart

Medication	Risk in dehydration	Advice to patient if they have vomiting and diarrhoea or fever over 38 ^o C and sweating, reduced oral intake of fluids and nutrition		
		No Risk factors for AKI*	Risk factors for AKI – No Heart Failure	Risk factors for AKI – <u>Heart Failure</u>
SGLT2 inhibitors	Increased risk of dehydration, particularly when taken with diuretics. Increased risk of euglycaemic ketoacidosis if a patient is unwell and not eating and drinking normally.	Stop while unwell and restart 48 hours after feeling better and eating and drinking normally. See Operational Guide Diabetes for further information.		
ACE-inhibitors/ Angiotensin-II Receptor Blockers/ Entresto®	Increase the risk of AKI by reducing glomerular perfusion	N/A	Stop while unwell and restart 48 hours after feeling better and eating and drinking normally.	Continue in mild disease. If patient is becoming dehydrated (signs such as lightheaded on standing): Call GP or Heart failure nurse for advice on management
Diuretics	increase the risk of AKI by reducing glomerular perfusion	N/A	Stop while unwell and restart 48 hours after feeling better and eating and drinking normally.	Stop spironolactone. See Operational Guide Heart failure for further information.
Metformin	Accumulates in renal impairment. Combined with dehydration and inflammatory response to infection, increased risk of lactic acidosis. .	Stop while unwell and restart 48 hours after feeling better and eating and drinking normally.		
Non-steroidal anti-inflammatory drugs (NSAIDs)	May impair kidney function by inhibiting prostaglandin-mediated vasodilatation of the afferent arteriole and may increase the risk of AKI.	Stop while unwell and restart 48 hours after feeling better and eating and drinking normally. Do not use NSAIDs for pain or fever relief, use paracetamol as an alternative		
Sulfonylureas	Risk of accumulation for glibenclamide and significant hypoglycaemia. Risk of hypoglycaemia if the patient is not eating.	N/A	Monitor for hypoglycaemia ⁺ but DO NOT ROUTINELY STOP. If the patient is on Glibenclamide, contact GP to recommend an alternative agent such as Gliclazide or Insulin. See Operational Guide Diabetes for further information.	
Direct-Acting Oral Anticoagulants	Might accumulate because of reduced kidney function in AKI, increasing the risks of adverse effects.	Monitor for bleeding ⁺ but DO NOT ROUTINELY STOP.		
Opioids		Monitor for respiratory depression or CNS depression (confusion, over sedated or restless) ⁺ but DO NOT ROUTINELY STOP.		
Gabapentinoids		Monitor for confusion, over sedated or restless ⁺ but DO NOT ROUTINELY STOP.		

* See Operational guide for SADMAN(S-DOG) for risk factors

⁺ Patient to contact GP. Alternatively, pharmacist to send ISBAR to GP