



# Kidneys

## GP Prescribing Indicator

### Module

### 2018-19

*Every patient, every time*



*Adapted with permission*



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# Section 1: Introduction

## 1.1 Background

A key aim of the Safety in Practice programme is to reduce the harm experienced by patients from medication use. Adverse events related to medications are a significant cause of patient morbidity and mortality, and a source of substantial costs for both organisations and patients.

Acute Kidney Injury (AKI) is a clinical syndrome with multiple heterogeneous aetiologies that is associated with significant morbidity and mortality.<sup>i</sup> It occurs in over 20% of hospitalisations and is associated with more than x4 likelihood of death.<sup>ii</sup> Estimates are that at least 60% start in the community.<sup>iii</sup> Medicines are reported to contribute to AKI in approximately 20% of cases.<sup>iv</sup> Medicines which affect renal blood flow or can contribute to hypovolaemia or hypotension, especially when a patient has an acute illness, are recognised as increasing risk.

This module focuses on a selection of medications that are recognised as being of higher risk of acute kidney injury if they are not prescribed and monitored appropriately.

Evidence shows that when practices review their prescribing, that is recognised as high-risk, and that it can be reduced by at least a third. This work was initially done looking at high risk prescribing of NSAIDs and showed improvement was associated with reductions in related emergency hospital admissions with adverse events such as gastrointestinal bleeding.<sup>v vi</sup> Similar work in all practices in Scotland has shown reductions of up to 50% in high-risk prescribing of NSAID. We know that when GPs specifically review this prescribing, they judge a significant proportion of it to be potentially inappropriate and take steps to improve their prescribing safety.

Through easily accessible monthly reports, practices can quickly identify patients for whom higher risk prescribing or inadequate monitoring may have occurred. This gives practitioners insights into their prescribing practices, and information to consider alternatives for these patients to reduce the risk of adverse events. It also allows practices to focus on their systems for ensuring that appropriate monitoring is occurring.

## 1.2 Aim

**“To reduce harm to patients from high-risk prescribing, and inadequate monitoring, of medications associated with acute kidney injury in primary care”**

## 1.3 Equity

Reducing inequalities in outcomes between Maori and other high needs groups compared to the general population is a priority at all levels of the health system, including Auckland and Waitemata DHB's<sup>vii</sup>.

Maori and Pacific peoples experience higher rates of Chronic Kidney Disease than other groups, and this is even higher if they have diabetes. They also experience a greater burden of gout for which NSAID are often prescribed. These combinations contribute to these groups being at higher risk also of AKI.

While Safety in Practice is not a programme specifically focused on equity issues, it is well recognised that for those groups who are already experiencing poorer health outcomes, the very reasons that contribute to this also could make them more at risk of errors, oversights, miscommunications and receiving care that is less able to meet their needs. Working on safer prescribing to improve patient safety overall would be expected to have particular benefit for reducing risk for these groups, which would contribute to reducing inequity.

Practices can focus on specific groups using an equity lens.

Some examples might be:

- In using the information from these reports in your practice, focus as a priority on Maori and other high needs patients. Both Dr Info and Mohio both allow either selection by Maori, or by high needs, or ordering them according to ethnicity.
- Specifically seeking input from patients from these groups on their experiences of prescribing and monitoring of medicines that are higher risk for kidneys.

## 1.4 Measures & rationale

### Measure 1 Prescription of metformin in the last month to a patient with renal impairment where the eGFR < 30 ml/min

#### Rationale – Risk Identified

- Because metformin is not metabolised but is excreted by the kidney, metformin is associated with an increased risk of lactic acidosis when renal function is significantly impaired. Although not common, this condition has a mortality as high as 25-50%<sup>viii</sup>
- Doses need to be adjusted according to renal function

#### Recommended Actions

- Review the use and dose of metformin in relation to the patients renal function
- Arrange review with a renal physician if not already done

#### Comments

- The level at which metformin has been considered contra-indicated has been reducing over time in guidelines. While some guidelines including NICE have gone with contra-indication for eGFR<30ml/min, more recent studies have further reduced this level. Medsafe has adjusted its data sheet to suggest doses maximum of 500 mg/day for eGFR 15-30 ml/min.<sup>ix</sup>
- Patients at this level of renal function should be referred for renal assessment and management guided by their advice.<sup>x</sup>

### Measure 2 TRIPLE WHAMMY - Prescription of oral NSAID in the last month with an ACE /ARB Diuretic combination within the last 4 months

#### Rationale – Risk Identified

- Substantially increased risk of acute renal failure and death.<sup>xi xii</sup>
- Patients with pre-existing CKD have an increased risk of acute renal failure with the triple whammy.
- Patients with heart failure have additional risks of heart failure exacerbation.
- These risks are greatest in the first 30 days of use.<sup>xiii</sup>

#### Recommended Action

- Review the need for NSAID at all, particularly in those with CKD or heart failure and try to use alternative treatment.

#### Comments

- If NSAIDs are essential, then monitor renal function, advise patients to seek professional advice if at risk of dehydration and consider additional renal function monitoring if the patient is at risk of dehydration or unwell.
- The safest course of action is always to avoid the NSAID where possible.

### Measure 3 Prescription of an oral NSAID in the last month in a patient with CKD 3,4 or 5

|  |  |
|--|--|
| <b>(eGFR&lt;60ml/min)</b>  |  |
| <b>Rationale – Risk Identified</b>   |  |
| <ul style="list-style-type: none"> <li>Increased risk of acute kidney injury, especially if unwell or hypovolaemic. <sup>15</sup></li> <li>The risk is greatest at the start of treatment: even short courses are associated with risk. <sup>21</sup></li> </ul>   |  |
| <b>Recommended Action</b>  | <b>Comments</b>  |
| <ul style="list-style-type: none"> <li>Review the need for an NSAID.</li> <li>Advise patients to discontinue NSAID if they become unwell or dehydrated.</li> <li>Measure renal function 1-2 weeks after treatment and then monitoring regularly. <sup>xiv</sup></li> </ul>   | <ul style="list-style-type: none"> <li>See patient information hand-outs Health Navigator for those at risk of acute kidney injury.</li> <li>The safest course of action is always to avoid the NSAID where possible.</li> </ul> |
| <b>Measure 4 Patients prescribed metformin in the last month without a serum creatinine in the previous 15 months</b>  |  |
| <b>Rationale – Risk Identified</b>   |  |
| <ul style="list-style-type: none"> <li>As per risks in measure 1</li> <li>Without regular monitoring of renal function the safe and appropriate dose of metformin cannot be determined.</li> </ul>   |  |
| <b>Recommended Actions</b>   | <b>Comments</b>  |
| <ul style="list-style-type: none"> <li>Review the appropriate frequency of renal function testing for the patient's situation</li> </ul>   | <ul style="list-style-type: none"> <li>Guidelines for frequency of testing depend on the background renal function – see Auckland Region Health Pathways – but would not be expected to be longer than 1 year</li> </ul>         |
| <b>Measure 5 Patients prescribed an ACE inhibitor or angiotensin II receptor antagonist in the last month who have not had a creatinine and electrolytes in the previous 15 months</b>   |  |
| <b>Rationale – Risk Identified</b>   |  |
| <ul style="list-style-type: none"> <li>Hyperkalaemia or increased serum potassium levels are a recognised risk with these medications, particularly if patients with CKD, diabetes and on multiple medications <sup>xv</sup></li> <li>AKI for patients if they develop significant hypotension or hypovolaemia <sup>xvi</sup></li> </ul> |  |
| <b>Recommended Actions</b>   | <b>Comments</b>  |
| <ul style="list-style-type: none"> <li>Ensure that patients on these medications are having their renal function and electrolytes monitored at an appropriate interval to their medical situation – but no longer than annual</li> </ul>   | <ul style="list-style-type: none"> <li>Dosage of ACEI may also need to be adjusted according to renal function – see Auckland Region Health Pathways – ACEI dosing in renal impairment</li> </ul>                                |
| <b>Measure 6 Patients aged ≥75 years prescribed a diuretic in the last month who have not had a creatinine and electrolytes in the previous 15 months</b>  |  |
| <b>Rationale – Risk Identified</b>   |  |
| <ul style="list-style-type: none"> <li>Hyponatraemia (low sodium), hyperkalaemia (elevated potassium) and decline in renal function are recognised and significant side effects of diuretic use in elderly <sup>xvii</sup></li> </ul>  |  |

| <ul style="list-style-type: none"> <li>Suboptimal monitoring of older people taking medicines may be a more significant problem than inappropriate prescribing<sup>xviii</sup></li> </ul>                        |  |
|--|--|
| Recommended Actions  | Comments   |
| <ul style="list-style-type: none"> <li>Ensure patients are having regular monitoring of electrolytes and renal function appropriate to their clinical situation, but this should be at least annually</li> </ul> | <ul style="list-style-type: none"> <li>It is increasingly recognised that health care for older people is improved when one prescriber takes responsibility for all of a patient's medicines. Multiple prescribers are associated with increasing polypharmacy, and are also an independent risk factor for adverse drug reactions in older populations<sup>xix</sup></li> </ul> |

# Section 2: Instructions



## 2.1. Finding patients

Practices are to identify patients in high-risk groups using searches developed for Dr Info or Mohio on a monthly basis.

This will only take a few minutes to do using the audits provided by these programmes. Practices do not need to develop any Medtech or MyPractice queries.

Practices do not need to run the audit – they just need to look up the report in Dr Info or Mohio.

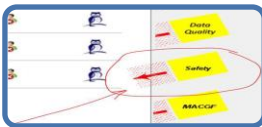
## 2.1.1 Finding patients using Dr Info



1. Login to DrInfo using your DrInfo key



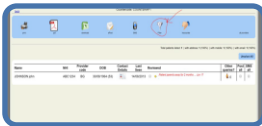
2. Access the latest audit available, check the word “published” under each folder.



3. Click on the “Safety tab”. This is seen at the bottom of the tabs on the right hand side



4. Select any of the safety patient lists, you are able to access this list by clicking on the “Patients” icon.



5. Once you have the list, you can download to excel, send bulk mail or SMS to all patients or filter the list further using the filter button. If you wish to filter by provider, you can do so by finding any patient where the Provider-Code is your code and click on that Provider-Code. You can also filter by ethnicity and 'high needs'.

## 2.1.2 Finding patient using Mohio

Login

- Log in to Mohio
- Click reports > Clinical Reports > Safety in Practice.

View report

- On the right hand side click ‘download’ this which brings up ‘Safety in Practice – Audit Report (Prescribing indicator name)’.
- There are six tabs along the bottom with a separate spread sheet for each of the five groups of risk prescribing.
- Each sheet is ordered from the top to bottom for the date of the prescription

View patient record

- Click on the NHI which takes you directly through to that patient’s notes in Medtech.
- Information shown includes NHI, Surname, First name, Ethnicity, Provider and Date of script.

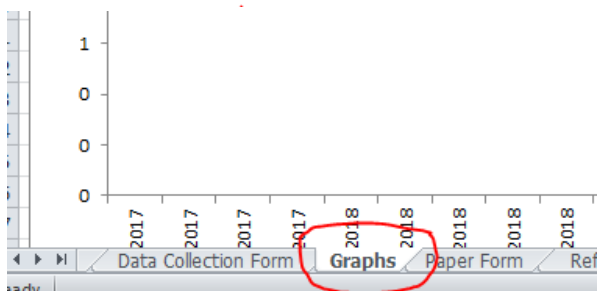
## 2.2 Completing the spread sheet

Download the spread sheet for your prescribing indicator module from the Resources section of [www.safetyinpractice.co.nz](http://www.safetyinpractice.co.nz).

Put the total number of patients in each category for each month in the spread sheet.

|   |              |   |  |  |
|---|--------------|---|--|--|
| 1 |              |   |  |  |
| 2 | Review Month | Number of patients prescribed NSAID(s), aged ≥65 years and without gastroprotection | Number of patients prescribed NSAID(s), with peptic ulcer, not prescribed gastroprotection | Number of patients prescribed with CKD |
| 3 | Aug-17       |   |  |  |
| 4 | Sep-17       |   |  |  |
| 5 | Oct-17       |   |  |  |
| 6 | Nov-17       |   |  |  |

In this example, data for high risk prescribing in the month of August should go in the top row. This data should be collected in early September and submitted by September 10<sup>th</sup>.



There are formulas embedded within the spreadsheet so that the graphs in the third tab auto-populate. Use these to track your progress over the coming months.

## 2.3 Submit your data

**Remember:** Please submit your data to [audit@safetyinpractice.co.nz](mailto:audit@safetyinpractice.co.nz) by the 10<sup>th</sup> of each month

## 2.4 Taking appropriate action

**Review the records of identified patients, and take appropriate action for each individual**

For example:

- Reviewing the medication may require a clinical review.
- Discussing the benefits and risks with the patient.
- Advising high-risk patient to get blood test done at agreed interval.
- Using patient information leaflets as appropriate).

What you do with this information is up to you. There is no expectation that every patient is reviewed – that is a practice decision as to what happens next, as is who does the review of notes or patients.

**Discuss the results with your clinical team**

- What insights does the data provide?
- What aspects of safe prescribing and monitoring of medications that can affect the kidney in your clinic does it highlight?
- What aspect of prescribing and monitoring in your clinic could make patients more at risk of harm?
- How could your prescribing and monitoring of medicines that can affect the kidney be made safer?

**Decide what actions need to be taken in your practice**

Embed systems within practices to reduce high-risk prescribing and inadequate monitoring of medications that can affect the kidney on a long-term basis. The aim is to reduce the risk of harm from in the future i.e. develop your own PDSA

**Collect and review your data again in a month to assess progress and decide on further changes as required.**

## Glossary

|                           |  |
|---------------------------|--|
| ACE-inhibitor             | Angiotensin converting enzyme inhibitor such as lisinopril. An anti-hypertensive medication.   |
| ADE                       | Adverse Drug Event   |
| ADHB                      | Auckland District Health Board   |
| AKI                       | Acute Kidney Injury  |
| ALT                       | Alanine aminotransferase, a marker of liver function.  |
| AST                       | Aspartate aminotransferase, a marker of liver function.  |
| ARB                       | Angiotensin receptor blocker such as candesartan. An anti-hypertensive.  |
| Bundle                    | Each of the areas identified as presenting the highest risk to patients within the community have been developed into modules. Each module is structured to include a change package and a bundle.   |
| CARM                      | Centre for Adverse Reaction Monitoring New Zealand   |
| CoX-2 inhibitors          | A form of NSAID that, unlike e.g. ibuprofen, only works on the CoX-2 enzyme.   |
| CPAMS                     | Community Pharmacy Anticoagulation Monitoring Service  |
| CKD                       | Chronic kidney disease   |
| Change package            | A collection of change ideas known to produce a desired outcome in a process or system.  |
| Cytotoxic                 | A drug that is toxic to living cells.  |
| Dr Info                   | A clinical information platform used by general practices. Data is extracted and analysed from practices PMS'.   |
| DMARDs                    | Disease modifying anti-rheumatic drugs. These medications are used in autoimmune diseases such as rheumatoid arthritis.  |
| EDS                       | Electronic Discharge Summary   |
| eGFR                      | Estimated glomerular filtration rate, renal function test  |
| FBC                       | Full blood count   |
| GI                        | Gastro-intestinal  |
| IHI                       | Institute of Health Improvement  |
| INR                       | International Normalised Ratio. This is a marker of coagulability in the blood used to guide warfarin dosage.  |
| H2 antagonists            | Gastro-intestinal protective medication  |
| HQSC                      | Health Quality & Safety Commission of New Zealand  |
| LFTs                      | Liver function tests   |
| Medication Reconciliation | The process of collecting, comparing, and communicating the 'most accurate' list of medicines that a patient is taking, together with details of any allergies and/or adverse drug reactions (ADRs), with the outcome of providing correct medicines for a given time period |
| Module                    | A structured way of improving the processes around patient care: a small, straightforward set of evidence-based practices, generally three to five, that, when performed collectively and reliably, have been proven to improve outcomes.                                    |

|         |   |
|---------|---|
| Mohio   | A clinical information platform used by general practices. Data is extracted and analysed from practices PMS'.  |
| NSAIDs  | Non-steroidal anti-inflammatory drugs used for pain and inflammation. Examples include ibuprofen, naproxen and diclofenac.                                  |
| Opioids | Strong pain medications such as codeine, morphine and fentanyl.   |
| OTC     | Over the counter  |
| PPI     | Proton pump inhibitor such as omeprazole. These medicines reduce stomach acid.  |
| PMS     | Patient management system e.g. MedTech, MyPractice, ToniQ   |
| PHO     | Primary health Organisation e.g Auckland, Alliance Health Plus, Comprehensive Care, East Health Trust, Total Healthcare, National Hauora Coalition, Procure |
| TFTs    | Thyroid function tests  |
| RNZCGP  | Royal New Zealand College of General Practitioners  |
| WBC     | White blood cells. Used as a marker of infection and immune system functioning.   |
| WDHB    | Waitemata District Health Board   |
| SIP     | Safety in Practice  |

## References

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- <sup>i</sup> Kidney Disease: Improving Global Outcomes (KDIGO) Acute Kidney Injury Work Group. KDIGO Clinical Practice Guidelines for Acute Kidney Injury. *Kidney Int Suppl* 2012 <https://kdigo.org/guidelines/acute-kidney-injury/>
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- <sup>xiv</sup> Day RO, Graham GG. Non-steroidal anti-inflammatory drugs (NSAIDs). *BMJ*. 2013;346:f3195
- <sup>xv</sup> Up to Date <https://www.uptodate.com/contents/major-side-effects-of-angiotensin-converting-enzyme-inhibitors-and-angiotensin-ii-receptor-blockers>
- <sup>xvi</sup> Up to Date <https://www.uptodate.com/contents/major-side-effects-of-angiotensin-converting-enzyme-inhibitors-and-angiotensin-ii-receptor-blockers>
- <sup>xvii</sup> Allan S. Brett, MD reviewing Makam AN et al. *J Am Geriatr Soc* 2014 Jun
- <sup>xviii</sup> Elliott R. Problems with medication use in the elderly: An Australian perspective. *J Pharm Pract* 2006;36(1):58-66 cited in BPAC Managing Medicines in Older People 2012 BPJ 47
- <sup>xix</sup> BPAC Managing Medicines in Older People 2012 BPJ 47