



# Protecting Kidneys GP Clinical Module 2018-19

*Every patient, every time*



*Adapted with permission*



## Contents

Contents .....	2
1.1 Background .....	3
1.2 Aim .....	3
1.3 Equity .....	4
1.4 Measures.....	5
2.1 Collect your baseline data.....	7
2.1.1 Identify patients.....	7
2.1.2 Randomise .....	7
2.1.3 Audit.....	8
2.1.4 Complete the spread sheet.....	9
2.1.5 Submit .....	10
2.2 Plan.....	11
2.3 Do .....	12
2.4 Study .....	12
2.5 Act .....	12
Glossary.....	13
Resources .....	15

# Section 1: Introduction

## 1.1 Background

Acute Kidney Injury (AKI) is a clinical syndrome with multiple heterogeneous aetiologies that is associated with significant morbidity and mortality.<sup>i</sup> There is not specific treatment to reverse AKI and therefore prevention, early recognition and management is paramount. 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>

A study from March 2018 among 384,869 adults receiving primary care who were followed for an average of 5.3 years, outpatient AKI was more prevalent than inpatient AKI and was associated with a 90% increased risk of death and a 33% increased risk of renal events compared with the absence of AKI.<sup>iv</sup> Patients in this study who recovered from outpatient AKI had a 2.1-fold increased risk of death and a 73% increased risk of a renal event compared with patients who had no AKI.

Most people who experience acute kidney injury have some degree of pre-existing chronic kidney disease (CKD).<sup>v</sup> Diabetes, hypertension, obesity, proteinuria, older age and polypharmacy are independent risk factors for AKI, and people with several of these co-existing are at even greater risk.<sup>vi</sup>

Medicines are reported to contribute to AKI in approximately 20% of cases.<sup>vii</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 currently will have a focus on the prevention of AKI for a group of patients recognised as being higher risk i.e. having pre-existing CKD. Optimising the appropriate monitoring, management and safe prescribing for this group would have the aim of reducing the risk of acute on chronic kidney injury.

Development work is being undertaken with a view to being able to recognise and identify AKI earlier in the community setting along with optimising its early management.

## 1.2 Aim

**“By June 2019 practices 100 % of patients with Chronic Kidney Disease will be monitored and managed according to guidelines to reduce their risk of Acute Kidney Injury”**

## 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>viii</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.

General Practices can produce clinically significant improvements in outcomes for patients at high risk of progressing to kidney failure by instigating relatively simple complementary nurse-led interventions.<sup>ix</sup> The DEFEND trial involving Maori and Pacific patients with diabetes, moderate CKD and hypertension showed clinically significant reductions in systolic BP and proteinuria as well as delaying progression of LVH and diastolic dysfunction through providing culturally appropriate care with more frequent follow-up and frequent prompting for patients to take medicines, and reduced costs to patients because of home visits by Maori and Pacific health-care assistants.<sup>x</sup> This highlights a number of factors important, including culturally appropriate, accessible, frequent follow-up.

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 safe monitoring and 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 the audits 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 monitoring and prescribing related to CKD and risk of AKI.

## 1.4 Measures

**Measure 1: Prior to this current result, has the patient had their renal function checked within the last 7 months?**

**Measure 2 Has the patient had ACR measured within the last 7 months?**

**Measure 3 Has the patient had their BP measured within the last 7 months?**

### Rationale

- Regular monitoring of patients will help to detect deterioration in CKD and give a baseline trend which facilitates the recognition of changes that could represent AKI
- Patients with CKD 3 (eGFR 30-59 ml/min) are recommended to be reviewed every 3-6 months with
  - laboratory assessment of creatinine, electrolytes, urea, eGFR, HbA1c (if diabetes) FBC, calcium and phosphate, along with urine test for ACR
  - clinical assessment with BP, weight, medication review, lifestyle factor review e.g. smoking

### Sources

- Auckland Regional Health Pathways Chronic Kidney Disease(CKD) in adults – ongoing monitoring frequency of CKD
- BPAC 2015 “The detection and management of patients with chronic kidney disease in primary care” Best Practice Journal 66 <https://bpac.org.nz/BPJ/2015/February/docs/BPJ66-ckd.pdf>

**Measure 4 Is their most recent clinic BP less than 140/90?**

### Rationale

- Controlling blood pressure is one of the most important aspects of CKD management as it delays the progression of CKD
- Target BPP is <140/90 (or 130/80 if the patient has diabetes, or ACR>30, or long standing hypertension with ACR >3.5). In patients aged>75 yrs, BP of <150/90 may be a more reasonable target and this should be reached gently.

### Sources

- BPAC 2015 “The detection and management of patients with chronic kidney disease in primary care” Best Practice Journal 66 <https://bpac.org.nz/BPJ/2015/February/docs/BPJ66-ckd.pdf>
- Auckland Regional Health Pathways Chronic Kidney Disease(CKD) in adults – ongoing monitoring frequency of CKD

**Measure 5 If the patient's ACR >30 and they have hypertensive disease OR if their ACR >70 even without hypertensive disease, is the patient on an ACEI/ARB?**

**Rationale**

- Use of ACE inhibitors or ARBs in people with CKD reduces the risk for kidney failure and cardiovascular events<sup>xi</sup>
- In the absence of diabetes, ACR>30 indicates clinically significant proteinuria which is an established risk factor for renal disease progression for which ACE/ARB are recognised as protective particularly if they have existing hypertensive disease.

- **Target blood pressure as per ARHP**

- First line ACEI or ARB
- < 130/80 if:
  - diabetes, or
  - ACR > 30, or
  - long-standing hypertension with ACR >3.5.

In patients aged >75 years, blood pressure of < 150/90 may be a more reasonable target. This should be reached gently.

**Sources**

- Auckland Regional Health Pathways Chronic Kidney Disease(CKD) in adults – management
- NICE Guidelines Chronic Kidney Disease in Adults -: Assessment and Management – Pharmacotherapy 1.6.3

**Measure 6 The patient has NOT been prescribed an NSAID within the past year?**

**Rationale**

- Increased risk of acute kidney injury, especially if unwell or hypovolaemic.<sup>xii</sup>
- The risk is greatest at the start of treatment: even short courses are associated with risk.<sup>xiii</sup>

**Sources**

- Non-steroidal Anti-inflammatory Drugs NSAID – Making safer treatment choices. 2013  
<https://bpac.org.nz/BPJ/2013/October/docs/BPJ55-pages8-19.pdf>

**Measure 7 Is it recorded that the patient has received written information about their renal disease, including how to take appropriate action if they become unwell?**

**Rationale**

- Patients' being educated around the factors that can put their kidneys at increased risk enables them to be active participants in their care and avoid risky medicines also that are available Over the Counter at supermarkets and pharmacies
- "Sick Day Rules" are not encouraged, however, giving written advice about protecting their kidneys and reducing the risk of AKI should include the advice to seek medical assessment early if they are unwell.

**Sources**

- Health Navigator "Kidney Protection – How to protect your kidneys"  
<https://www.healthnavigator.org.nz/health-a-z/k/kidney-protection/>

# Section 2: Instructions

## 2.1 Collect your baseline data



### 2.1.1 Identify patients

On the day of the data collection each month, run the query related to your module, available to download from <http://www.safetyinpractice.co.nz> in the Resources section.

### 2.1.2 Randomise

From the list generated in step 2.1.1 it is important to select a **random sample of 10 patients to audit**.

#### For sample sizes up to 10

1. Audit all 10 patients.

#### For sample sizes of 11 - 28

1. Select a random number between 1 and 10 by picking pieces of paper out of a hat.
2. If you select an odd number audit every other patient starting at 1 e.g. 1st, 3rd, 5th, 7<sup>th</sup> etc.  
If you select an even number audit every other patient starting with the second patient e.g. 2nd, 4th, 6th, 8<sup>th</sup> etc.

#### For sample sizes 29+

1. Select a random number between 1 and 10 by picking pieces of paper out of a hat.
2. Audit every other patient starting at this number e.g. if 6 is drawn audit the 6<sup>th</sup>, 8<sup>th</sup>, 10<sup>th</sup> patient etc.



## 2.1.3 Audit

Review each of your 10 selected records against the measures in Section 1.4.

### Measure 1: Prior to this current result, has the patient had their renal function checked within the last 7 months?

#### Guidance

Not counting the result from the audit, if the patients had their renal function checked with creatinine and eGFR in the last 7 months then record YES.  
If not then record NO.

### Measure 2 Has the patient had ACR measured within the last 7 months?

#### Guidance

If the patient has had an ACR done in the last 7 months then record YES.  
If not then record NO.

### Measure 3 Has the patient had their BP measured within the last 7 months?

#### Guidance

If the patient has had their BP recorded in the last 7 months then record YES.  
If not then record NO.

### Measure 4 Is their most recent clinic BP less than 140/90?

#### Guidance

Record YES if the last BP is <140/90.  
Record NO if it is not.  
Record N/A if there is no BP recorded.

### Measure 5 If the patient's ACR >30 and they have hypertensive disease OR if their ACR >70 even without hypertensive disease, is the patient on an ACEI/ARB?

#### Guidance

If they are on an ACEI/ARB then record YES  
If they are not on this then record NO  
(The timeframe for a prescription verifying that the patient is on the medication might usually be considered having been prescribed in the last 4 months to provide some leeway for updating prescriptions. If it is apparent from the notes that despite this the patient is actually regularly on the medication then record YES)  
If they have not had an ACR done or if ACR 31-70 but BP<130/80 without medication or if ACEI/ARB are contra-indicated then record N/A

### Measure 6 The patient has NOT been prescribed an NSAID within the past year?

#### Guidance

If the patient has NOT had any NSAID prescribed in the last year then record YES.  
If the patient has been prescribed any NSAID in the last year then record NO.

**Measure 7** Is it recorded that the patient has received written information in the last year about their renal disease, including how to take appropriate action if they become unwell?

**Guidance**

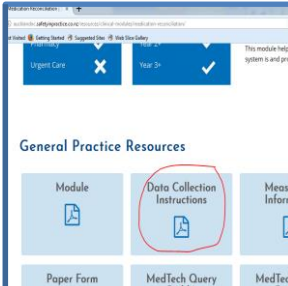
Record YES if this is clearly documented.

Record NO if this is not clearly recorded.

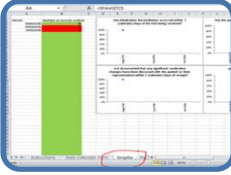
See resources.

## 2.1.4 Complete the spread sheet

**Tip:** Your first set of data is relating to the month of August so this is due on September 10<sup>th</sup>. For this data set record "August" in the first column.

	<p>Review Date: please type date beside each individual record for current month</p> <p>01/08/2018</p>	<p>Has Medication Reconciliation occurred within 7 (calendar) days of the LRS being received?</p> <p>Has the patient's regular medication list been updated?</p>	<p>Has Medication Reconciliation occurred within 7 (calendar) days of the LRS being received?</p> <p>Has the patient's regular medication list been updated?</p>	<p>Is it documented that any significant medication changes have been discussed with the patient or their representative within 7 (calendar) days of receipt?</p>	<p>Overall Compliance</p>
<p>Download the spread sheet for your module in the Resources section of <a href="http://www.safetyinpractice.co.nz">www.safetyinpractice.co.nz</a></p>	<p>Record the month <b>the data relates to</b> in a DD/MM/YY format left column. For your first data set collected in September this is 1/8/18,</p>	<p>Mark y, n or n/a against for each measure and each patient according to your findings in the previous section.</p>			<p>The final measure "Overall compliance" will auto-populate.</p>

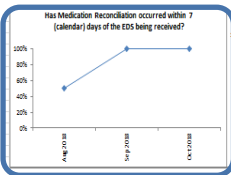
**Tip:** Please don't audit more than 10 patients for a given month or add or remove rows from the spread sheet as this will disrupt the formulas and cause the graphs to break.



Graphs will be automatically generated in the next tab in the spreadsheet.

Referral type (from service) Each individual provided for current month	Has Medication Reconciliation occurred within 7 (calendar) days of the EDs being received?	Has the patient received the medication by expected date?
01/08/2018	n	n
01/08/2018	n	n
01/08/2018	n	n
01/08/2018	n	n
01/08/2018	n	n
01/08/2018	n	n
01/08/2018	y	y
01/08/2018	y	y
01/08/2018	y	y
01/08/2018	y	y

Next month add your data to the same spreadsheet.



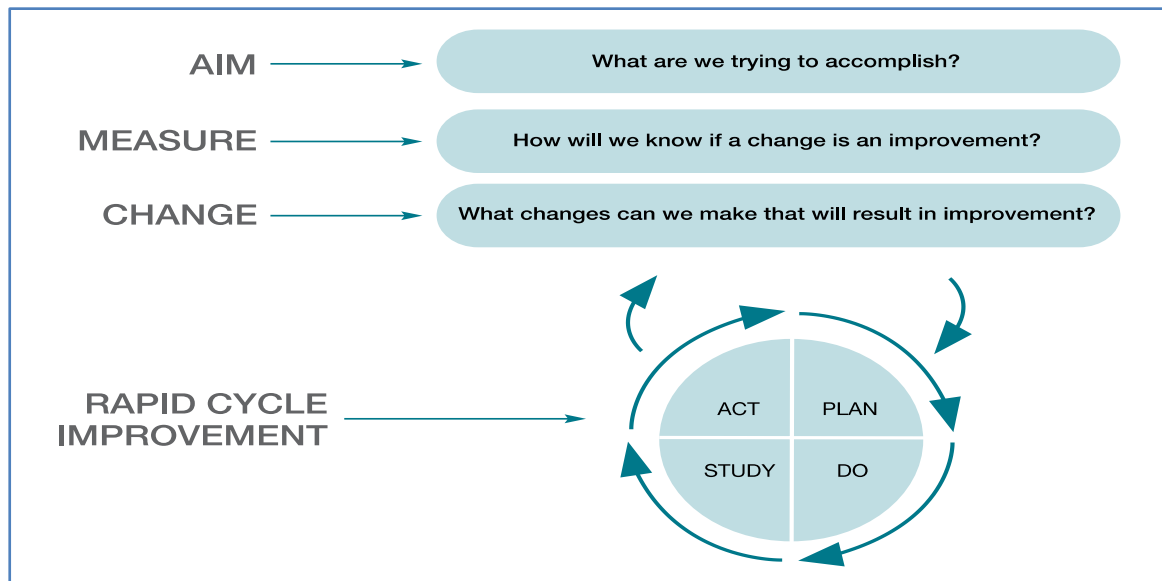
This means you can track your progress over time.

## 2.1.5 Submit

Submit your data on the 10<sup>th</sup> of each month to [audit@safetyinpractice.co.nz](mailto:audit@safetyinpractice.co.nz)

**Tip:** Please ensure all data sent to Safety in Practice is anonymized

## Creating Change – Getting started



Before you start your plan phase:

- Bring together your team – these people will work with you to plan and carry out the test of change
- Select the process you wish to change

As a team answer the 3 questions above:

1. What are we trying to accomplish? (write an objective for this PDSA cycle)
2. How will we know if a change is an improvement?
3. What changes can we make that will result in improvement?

## 2.2 Plan

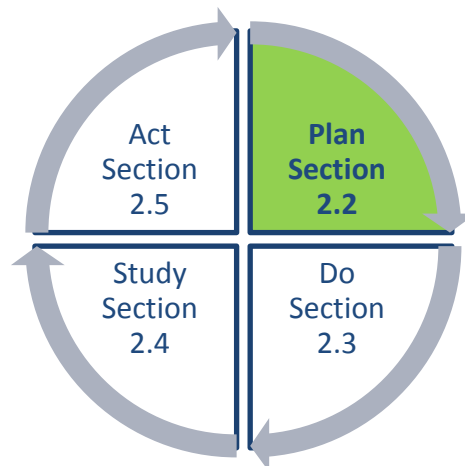
Plan how the changes will happen – ask yourselves and write down the following:

- What will we do?
- Who will carry out the plan?
- When will it take place?
- Where will it happen
- What data and information will we collect – i.e. what will help us determine if the change is an improvement?
- Do we need training or materials?

Make predictions –what do you think will happen when you test the change and why?

Ask yourself:

- What do we hope to learn by

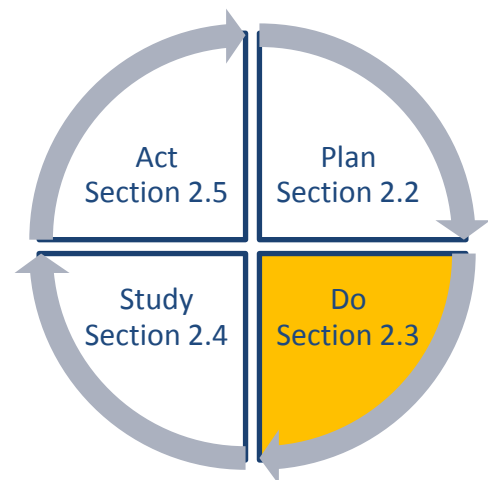


testing the change?

- What will happen when we test the change?
- How will the change be carried out?

## 2.3 Do

- Prepare to test; gather resources
- Try out your change idea – it's usually best to try it out on a small sample or area of your practice. Starting on a small scale might mean 1 or 2 patients – that way if it doesn't work it's easier to remove the step or process
- While you are testing keep track of what happens in real time – don't wait to write it up



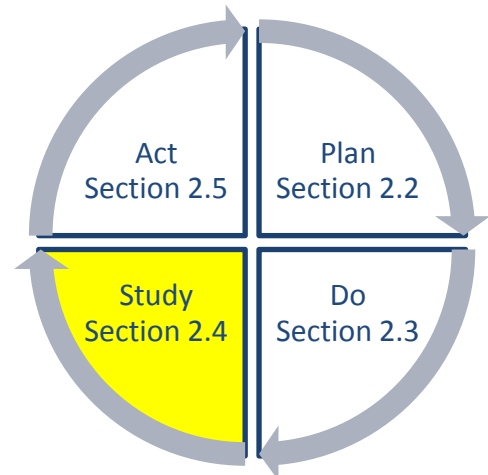
## 2.4 Study

Complete the analysis of the data.

Ask yourself:

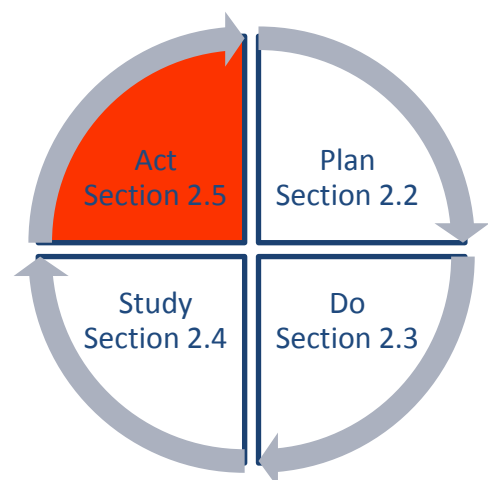
- What has changed
- Who was affected
- Are the effects positive or negative
- Are they worth keeping or removing, adapting or developing

Compare the data to your predictions.



## 2.5 Act

- Summarise and reflect on what was learned.
- Refine the change based on what was learned.
- Are you going to adopt the change, adapt and retest, or abandon?
- Prepare a plan for your next PDSA cycle – back to step 2.2 Plan for your next cycle!



## 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

## Resources

### Health Navigator

- “Kidney Protection – How to protect your kidneys”  
<https://www.healthnavigator.org.nz/health-a-z/k/kidney-protection/>
- “Acute Kidney Injury”  
<https://www.healthnavigator.org.nz/health-a-z/k/kidney-acute-kidney-injury/>

### BPAC Articles

- Non-steroidal Anti-inflammatory Drugs NSAID – Making safer treatment choices. 2013  
<https://bpac.org.nz/BPJ/2013/October/docs/BPJ55-pages8-19.pdf>
- Acute-on-chronic kidney disease: Prevention, diagnosis, management and referral in primary care. 2012 Best Practice Journal Issue 46  
<https://bpac.org.nz/BPJ/2012/September/ckd.aspx>
- BPAC 2015 “The detection and management of patients with chronic kidney disease in primary care” Best Practice Journal 66  
<https://bpac.org.nz/BPJ/2015/February/docs/BPJ66-ckd.pdf>

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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/>

<sup>ii</sup> Wang HE et al. Acute Kidney Injury and Mortality in Hospitalised patients. Am J Nephrol 2012;35:349-355

<sup>iii</sup> Selby NM et al. Use of electronic results reporting to diagnose and monitor AKI in hospitalised patients. CJASN 2012 Apr;7(4):533-40

<sup>iv</sup> Leither MD, Murphy DP, Bicknese L et al The impact of outpatient acute kidney injury on mortality and chronic kidney disease: a retrospective cohort study. Nephrology Dialysis Transplantation 22 March 2018  
<https://doi.org/10.1093/ndt/gfy036>

<sup>v</sup> Hsu CY, Ordonez JD, Chertow GM, et al. The risk of acute renal failure in patients with chronic kidney disease. Kidney Int 2008;74(1):101–7.

<sup>vi</sup> Acute-on-chronic kidney disease: Prevention, diagnosis, management and referral in primary care. 2012 Best Practice Journal Issue 46 <https://bpac.org.nz/BPJ/2012/September/ckd.aspx>

<sup>vii</sup> Bellomo R, Kellum JA, Ronco C. Acute kidney injury. Lancet 2012;380(9843):756-66.

<sup>viii</sup> Waitemata and Auckland DHB 2017/18 Annual Plan

<sup>ix</sup> BPAC 2015 “The detection and management of patients with chronic kidney disease in primary care” Best Practice Journal 66 <https://bpac.org.nz/BPJ/2015/February/docs/BPJ66-ckd.pdf>

<sup>x</sup> Hotu C, Bagg W, Collins J, et al. A community-based model of care improves blood pressure control and delays progression of proteinuria, left ventricular hypertrophy and diastolic dysfunction in Māori and Pacific patients with type 2 diabetes and chronic kidney disease: a randomized controlled trial. Nephrol Dial Transplant 2010;25:3260–6.

<sup>xi</sup> Xinfang X et al 2015 Renin-Angiotensin System Inhibitors and Kidney and Cardiovascular Outcomes in Patients With CKD: A Bayesian Network Meta-analysis of Randomized Clinical Trials  
<https://www.sciencedirect.com/science/article/pii/S0272638615013128>

<sup>xii</sup> Non-steroidal Anti-inflammatory Drugs NSAID – Making safer treatment choices. 2013  
<https://bpac.org.nz/BPJ/2013/October/docs/BPJ55-pages8-19.pdf>

<sup>xiii</sup> Lapi F, Azoulay L, Yin H, et al. Concurrent use of diuretics, angiotensin converting enzyme inhibitors, and angiotensin receptor blockers with non-steroidal anti-inflammatory drugs and risk of acute kidney injury: nested case-control study. BMJ. 2013;346:e8525