CLINICAL AUDIT

Baseline testing before treatment **with ACE inhibitors/ARBs**

Valid to May 2026

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Audit focus

This audit focuses on baseline testing of patients before starting treatment with an angiotensin-converting enzyme (ACE) inhibitor or an angiotensin II receptor blocker (ARB). For the purposes of this audit, baseline is defined as three months before starting treatment. Baseline testing prior to initiating ARBs can also be included in this audit as the general principles applying to these medicines are the same as for ACE inhibitors. ARBs are now considered a first-line alternative to ACE inhibitors.

N.B. This is a revision of a previously published audit that only included patients on ACE inhibitors.

Background

ACE inhibitors and ARBs are commonly used and are indicated for a range of conditions including hypertension, heart failure, post myocardial infarction, diabetic nephropathy and chronic kidney disease. The pharmacological actions of ACE inhibitors and ARBs include reduced glomerular filtration, raised serum potassium and reduced blood pressure. In most patients these effects are an indicator of a beneficial effect and are not associated with adverse events. However, these medicines can cause clinically significant hyperkalaemia, renal impairment or hypotension in patients with pre-existing risk factors such as volume depletion, concurrent diuretics, renal impairment, heart failure, diabetes and concurrent use of medicines with the potential to interact (e.g. NSAIDs).

Baseline testing helps identify patients at risk of adverse effects before starting an ACE inhibitor or ARB. ACE inhibitors and ARBs are most likely to cause hypotension after the first dose or after a dose increase. Baseline values of electrolytes, creatinine and blood pressure also set a benchmark for ongoing monitoring of treatment effectiveness and safety.

Ongoing monitoring is also recommended during treatment to check for clinically significant changes in serum potassium and renal function from baseline but is not covered in this audit.

N.B. From 1 May, 2021, cilazapril will no longer be funded for new patients. Prescribers considering initiation of an ACE inhibitor will need to select an alternative ACE inhibitor or an ARB. This audit may also assist with identification of patients currently taking cilazapril who will need their prescriptions for cilazapril endorsed from 1 May, 2021, or to be changed to an alternative ACE inhibitor or an ARB.

For further information on prescribing ACE inhibitors and ARBs and the recent funding changes for cilazapril see: "Prescribing ACE inhibitors: time to reconsider old habits", available from **https://bpac.org.nz/2021/ace.aspx**

Cautions prior to use of ACE inhibitors

ACE inhibitors and ARBs should be used with caution in a range of situations due to the increased risk of adverse effects or interactions with a patient's existing medicines. Precautions include the following:

- Renal impairment and contraindicated in patients with bilateral renal artery stenosis
- Hyponatraemia, hypovolaemia and dehydration
- Concomitant high dose diuretics due to the risk of hypotension
- Peripheral vascular disease and renovascular disease
- Hyperkalaemia
- Hypotension
- Severe heart failure
- Concomitant use of NSAIDs due to the risk of renal impairment, potassium sparing agents due to the risk of hyperkalaemia. There is also potential for other medicine interactions including lithium.

For further information on avoiding the risk of acute kidney injury when prescribing ACE inhibitors or ARBs, see: "Avoiding the triple whammy in primary care: ACE inhibitor/ARB + diuretic + NSAID", available from: **www.bpac.org.nz/2018/triple-whammy.aspx**

Recommendations

For patients taking an ACE inhibitor or ARB there should be documented evidence of measurement of creatinine, electrolytes and blood pressure within the three months prior to starting treatment.*

* Three months is an arbitrary period suggested to capture most clinical situations. For example, for most patients it will be appropriate to measure blood pressure immediately before starting treatment whereas a less recent electrolyte or creatinine measurement may be appropriate, unless the patient is clinically unstable or at increased risk of an adverse effect.

Audit plan

Summary

This audit focuses on the measurement of serum creatinine (to estimate glomerular filtration), electrolytes and blood pressure prior to starting a patient on an ACE inhibitor or ARB.

Recommended audit standards

For the purposes of this audit, 80% of patients taking an ACE inhibitor or ARB should have documented values of serum creatinine and electrolytes and 100% for blood pressure within the three months prior to starting treatment.

Audit Data

Eligible people

Any patient that has received a prescription for an ACE inhibitor or ARB in the last 12 months is eligible for this audit.*

* In some cases where patients have been taking an ACE inhibitor or ARB for some years it may be difficult or too time consuming to search the clinical notes for the data required for the audit. However, it may help identify patients on cilazapril who can be flagged for review. Patients who were initiated on an ACE inhibitor or ARB in secondary care may also not have the monitoring requirements documented in their primary care clinical record.

Identifying patients

You will need to have a system in place that allows you to identify eligible patients who have been prescribed an ACE inhibitor or ARB and audit their clinical notes. Many practices will be able to identify patients by running a "query" through their PMS system.

Sample size

The number of eligible patients will vary according to your practice demographic. If you identify a large number of patients, take a random sample of 20–30 patients whose notes you will audit.

Criteria for a positive result

A positive audit result is for 80% of patients to have documented baseline serum creatinine (eGFR) and electrolytes, and 100% of patients have a documented baseline blood pressure.

Identifying opportunities for Audit of Medical Practice

The first step to improving medical practice is to identify the criteria where gaps exist between expected and actual performance and then to decide how to change practice.

Once a set of priorities for change have been decided on, an action plan should be developed to implement any changes.

Taking action

It may be useful to consider the following points when developing a plan for action (RNZCGP 2002).

Problem solving process

- What is the problem or underlying problem(s)?
- Change it to an aim
- What are the solutions or options?
- What are the barriers?
- How can you overcome them?

Overcoming barriers to promote change

- Identifying barriers can provide a basis for change
- What is achievable – find out what the external pressures on the practice are and discuss ways of dealing with them in the practice setting
- Identify the barriers
- Develop a priority list
- Choose one or two achievable goals

Effective interventions

- No single strategy or intervention is more effective than another, and sometimes a variety of methods are needed to bring about lasting change
- Interventions should be directed at existing barriers or problems, knowledge, skills and attitudes, as well as performance and behaviour

Review

Monitoring change and progress

It is important to review the action plan develop previously against the timeline at regular intervals. It may be helpful to review the following questions:

- Is the process working?
- Are the goals for improvement being achieved?
- Are the goals still appropriate?
- Do you need to develop new tools to achieve the goals you have set?

Following the completion of the first cycle, it is recommended that the doctor completes the first part of the Audit of Medical Practice summary sheet (Appendix 1).

Undertaking a second cycle

In addition to regular reviews of progress with the practice team, a second audit cycle should be completed in order to quantify progress on closing the gaps in performance.

It is recommended that the second cycle be completed within 12 months of completing the first cycle. The second cycle should begin at the data collection stage. Following the completion of the second cycle it is recommended that practices complete the remainder of the Audit of Medical Practice summary sheet.

The Royal New Zealand College of General Practitioners

Claiming credits for Continuing Professional Development (CPD)

This audit has been endorsed by The Royal New Zealand College of General Practitioners (RNZCGP) and has been approved for 10 CME credits for a first cycle and 10 CME credits for a second cycle for the General Practice Educational Programme (GPEP) and Continuing Professional Development (CPD) purposes. The second cycle is optional and only two cycles are permissible.

To claim points go to the RNZCGP website: **www.rnzcgp.org.nz**

Record your completion of the audit on the CPD Online Dashboard, under the Audit of Medical Practice section. From the drop down menu select "Approved practice/PHO audit" and record the audit name.

General practitioners are encouraged to discuss the outcomes of the audit with their peer group or practice.

As the RNZCGP frequently audit claims you should retain the following documentation, in order to provide adequate evidence of participation in this audit:

1. A summary of the data collected
2. An Audit of Medical Practice (CQI) Activity summary sheet (included as Appendix 1).

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Data sheet – cycle 1

Baseline testing before treatment with ACE inhibitors/ARBs

Patient	Before starting an ACE inhibitor/ARBs do patient records document evidence of:			
	Baseline serum creatinine and electrolytes?		Baseline blood pressure?	
	Yes	No	Yes	No
1				
2				
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22				
23				
24				
25				
26				
27				
28				
29				
30				
Total				
%				

Please retain this sheet for your records to provide evidence of participation in this audit.

Data sheet – cycle 2

Baseline testing before treatment with ACE inhibitors/ARBs

Patient	Before starting an ACE inhibitor/ARBs do patient records document evidence of:			
	Baseline serum creatinine and electrolytes?		Baseline blood pressure?	
	Yes	No	Yes	No
1				
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28				
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30				
Total				
%				

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The Royal New Zealand College of General Practitioners
Te Whare Tohu Rata o Aotearoa

APPENDIX 1

SUMMARY SHEET
Audit of medical practice (CQI activity)

Topic:
Baseline testing before treatment with ACE inhibitors/ARBs

Date:

Activity designed by (name of organisation, if relevant):
Bpac^{nz}

Doctor's name:

Results discussed with peer group or colleagues?
☐ Yes ☐ No

Date:

FIRST CYCLE

DATA: Date of data collection:

CHECK: Describe any areas targeted for improvement as a result of analysing the data collected. (If the findings have any implications for health equity, please include this.)

ACTION: Describe how these improvements will be implemented.

MONITOR: Describe how well the process is working. When will you undertake a second cycle?

AUGUST 2016

SECOND CYCLE

DATA: Date of data collection:

CHECK: Describe any areas targeted for improvement as a result of analysing the data collected. (If the findings have any implications for health equity, please include this.)

ACTION: Describe how these improvements will be implemented.

MONITOR: Describe how well the process is working.

COMMENTS:

AUGUST 2016