Queensland Community Pharmacy Chronic Conditions Management Pilot

Cardiovascular Disease (CVD) Risk Reduction Program – Hypertension

Clinical Protocol – V2

Eligibility for the Program

Eligibility for participation in the CVD Risk Reduction Program: Hypertension (the Program) must be assessed at each consultation, as eligibility may change due to changes in health status or demographic factors. i.e. patients who were previously eligible may become ineligible and patients who were ineligible may become eligible.

Refer the patient to their usual healthcare provider (or emergency services, if required) with a comprehensive clinical handover if the patient is, or becomes, ineligible for management under the Program. Ineligibility for treatment as part of a Pilot service does not preclude a patient from accessing services provided as part of usual pharmacy care.

Patients who are ineligible for the Program:

Patients who:

- are aged <18 years or >79 years
- are planning a pregnancy or are pregnant
- have an existing diagnosis of:
  - stages 3-5 chronic kidney disease (CKD)
  - familial hypercholesterolaemia
  - type 1 diabetes
  - retinopathy, neuropathy or nephropathy (persistent albuminuria: urinary albumin-creatinine ratio (uACR) ≥3 mg/mmol or eGFR <60 mL/min/1.73m^2)
  - complex cardiovascular disease (CVD):
    - severe (Grade 3) hypertension (≥180 mmHg systolic and/or ≥110 mmHg diastolic)
    - congenital heart disease

- rheumatic heart disease
- heart failure
- arrythmias
- atrial fibrillation
- other conditions including peripheral arterial disease, heart block, pericarditis, valvular disease, pulmonary hypertension, angina, cardiomyopathy and cardiomegaly, aortic aneurysm

- have poorly controlled asthma, moderate or severe chronic obstructive pulmonary disease (COPD), severe obstructive sleep apnoea (OSA) or another serious respiratory illness.
- have a history of:
  - cardiothoracic surgery
  - acute coronary syndrome (e.g. myocardial infarction)
  - stroke or other cerebrovascular disease
  - hypertensive urgency or emergency.
- have a current deep vein thrombosis (diagnosed by a medical practitioner)
- have a current pulmonary embolism (diagnosed by a medical practitioner) or a history of pulmonary embolism
- are currently prescribed anticoagulant therapy
- are currently receiving, or have received within the past 12 months, specialist treatment from a cardiologist, endocrinologist or nephrologist, unless they have a written referral from their treating specialist or general practitioner to participate in the Program
- are suspected to have hypertension with a secondary cause (e.g. renal disease, hyperaldosteronism, thyroid disease, medicines such as a NSAID or corticosteroid)
- have:
  - unexplained fluctuations in blood pressure (BP)
  - total cholesterol ≥7.5 mmol/L, LDL-C ≥5.0 mmol/L or triglycerides ≥6 mmol/L
  - severe hyperglycaemia (glycated haemoglobin (HbA1c) ≥10% or, blood glucose level (BGL) ≥20.0 mmol/L), or hypoglycaemia (BGL <4.0 mmol/L)
  - another high risk or abnormal pathology result (e.g., proteinuria, raised CK) that cannot be managed in the Program.
- do not reach (and stabilise) at their blood pressure clinical target after 4-6 weeks of treatment with 2 first line antihypertensives at maximum tolerated doses.

Treat (if clinically indicated) and concurrently refer

Provide treatment (if clinically indicated) and concurrently refer the patient to an appropriate healthcare provider for further review if they:

- have type 2 diabetes managed with insulin
- have a history of deep vein thrombosis but are not currently on any antithrombotic therapy.

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When applying the information contained within this clinical protocol, pharmacists should exercise professional discretion and judgement. The protocol supports, but does not replace, the pharmacist's responsibility to make decisions appropriate to the circumstances of the individual, in consultation with the patient and/or their caregiver.

How to use this document

The purpose of the CVD Risk Reduction Program (the Program) is to provide an accessible, community-based healthcare service to identify and improve outcomes for patients at high risk of CVD.

This clinical protocol details how patients in the CVD Risk Reduction Program should be managed, including referral to other health services and medical practitioners, pharmacological and non-pharmacological measures, and protocol-based/structured prescribing of medicines for the **management of hypertension.**

This clinical protocol forms part of the CVD Risk Reduction Program and should be considered in conjunction with the Clinical Protocol: Lipid Modification and/or the Clinical Protocol: Blood Glucose Management, as required by the patient presentation.

Overview of the CVD Risk Reduction Program: CVD risk assessment and hypertension management

Assess the CVD risk of patients entering the CVD Risk Reduction Program (see CVD risk assessment section).

Reassess CVD risk every 5 years for patients at low CVD risk, or every 2 years for patients at intermediate CVD risk (or sooner where there is a significant change to risk factors) [1].

For patients already receiving pharmacological therapy to reduce their cardiovascular risk, or who have previously been assessed as high-risk, review individual risk factors. Formal reassessment of overall CVD risk is not recommended for these patients [1].

After the patient's CVD risk has been assessed, there are two entry points for patients who are appropriate for enrolment in the Program:

Entry point 1:

- Patients **without a previous diagnosis** of hypertension, who do not meet any ineligibility criteria, may be enrolled in the Program and **commence management** (with non-pharmacological measures and pharmacotherapy, if indicated) **concurrent to referral** to an appropriate healthcare provider for further review and collaborative care.

Entry point 2:

- Patients **with an existing diagnosis** of hypertension, who do not meet any ineligibility criteria, may be enrolled in the Program and **commence ongoing monitoring and management** (with non-pharmacological measures and pharmacotherapy, if indicated)**. An update must be provided** to the patient's usual healthcare provider following each occasion of care.

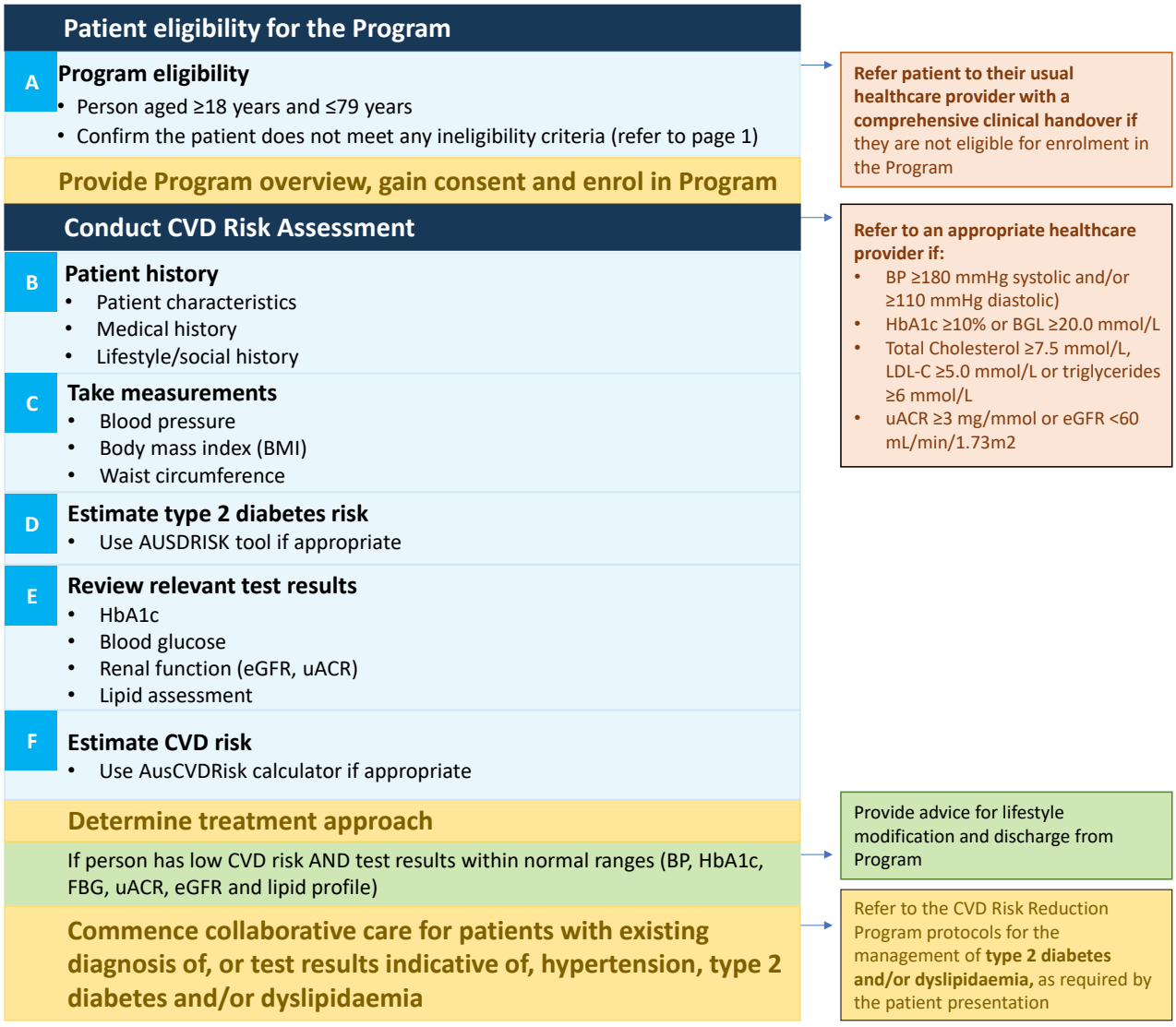
When a patient enters the Program:

- Provide an overview of the Program (see Figure 1), including the aims, expected outcomes, and what the Program may involve (which will vary between patients), including:
  - timeframes for management of the condition, such as the number of appointments and testing required, and the costs involved

- how the patient's medicines may be managed and how medicine costs may differ when prescribed by a pharmacist
- other interventions that may be recommended as part of the Program e.g., smoking cessation and weight management
- that the patient may leave the Program, including by opting out or becoming ineligible, at any time, and may be referred to an appropriate healthcare provider.

- Document informed consent from the patient for participation, as per the Pilot Handbook.

Figure 1: Overview of the CVD Risk Reduction Program: CVD risk assessment and hypertension



See page over

Develop and implement management plan (for hypertension)

G **Non-pharmacological measures**

- Smoking cessation
- Diet and nutrition
- Weight management
- Physical activity
- Alcohol consumption

H **Pharmacotherapy**

- Pharmacotherapy treatment options
  - ACE-inhibitors
  - Angiotensin II receptor blockers (ARBs)
  - Dihydropyridine calcium channel blockers
  - Thiazide and thiazide-like diuretics
- Modifying existing pharmacotherapy regimen for hypertension
- Pharmacotherapy in young patients

I **Monitoring and clinical targets**

- Monitor response after 4-6 weeks

J **Confirm management plan is appropriate**

K **Communicate agreed management plan**

L **Collaborative care**

Ongoing management and monitoring

M **Clinical review and ongoing collaboration**

- Prior to appointment, request laboratory testing (if applicable)

Review

- Patient history
- BP measurements
- Pathology testing
- Changes to CVD risk factors
- Lifestyle modification
- Update the CVD Risk Management Plan
- Consider the patient's ongoing eligibility

The patient's eligibility for the Program may change at any point. Refer the patient to their usual healthcare provider with a comprehensive clinical handover should the patient become ineligible for management under the Program or choose to exit the Program.

Refer patient to their usual healthcare provider with a comprehensive clinical handover their clinical targets have not been reached (and stable) after 3 months of treatment with 2 first line antihypertensives at maximum tolerated doses.

Key points

- CVD is mostly preventable. Most patients who experience a cardiovascular event or develop cardiovascular disease have at least one identifiable CVD risk factor. These risk factors can often be minimised through lifestyle modification and pharmacological interventions [2, 3].
- Decisions regarding the management approach for individual CVD risk factors, including non-pharmacological and pharmacological interventions should be made in the context of the individual's overall CVD risk as well as other comorbidities, personal preferences and psychosocial circumstances [2].
- Hypertension is a treatable cause of CVD and is an independent risk factor for chronic kidney disease, stroke, heart failure and myocardial infarction [4]. Lifestyle modification contributes to BP reduction and can reduce the need for antihypertensive therapy [4].

Program eligibility

A: Program eligibility

- Confirm eligibility to participate in the Program (see Eligibility).
- Consider program eligibility at every consultation, as eligibility can change at any time.
- Refer the patient to their usual healthcare provider with comprehensive clinical handover if the patient is, or becomes, ineligible for management under the Program.

CVD risk assessment

B: Patient history

Obtain sufficient information to assess the patient's condition, and the safety and appropriateness of any recommendations and medicines for the patient.

Consider:

- age
- ethnic or cultural background, including Aboriginal and/or Torres Strait Islander status
- lactation status
- history of hypertensive disorders of pregnancy (including pre-eclampsia) or gestational diabetes
- previous and current medical conditions, including the following conditions associated with increased CVD risk:
  - OSA
  - mental health conditions
  - thyroid and endocrine disorders
  - polycystic ovarian syndrome (PCOS)
  - menopause (especially if it was premature)
  - CKD
  - rheumatoid arthritis and other chronic autoimmune inflammatory conditions.
- alarm signs and symptoms that require further investigation e.g., unexplained weight loss or gain, frequent headache and dizziness, chronic nausea and vomiting, lethargy
- family history of CVD, particularly premature CVD (coronary heart disease or stroke in a first-degree female relative aged <65 years or a first degree male relative aged <55 years) [4]
- smoking status and history (consider tobacco, cannabis, vaping, passive smoking, or other exposure to smoke)
- all current and recently ceased treatments (including prescribed medicines, vitamins, herbs, other supplements and over-the-counter medicines)
- drug allergies and adverse drug reactions
- recent pathology results including eGFR and electrolytes
- diet/nutrition status (e.g., fruit and vegetable consumption, volume of processed carbohydrates and saturated fats) and weight
- levels of physical activity
- recreational or illicit drug use, and alcohol use
- specialist involvement in care.

Reminder

Pharmacists can access a range of clinical information in a patient's My Health Record, including details about current and past medication history, allergies and current medical conditions.

C: Take measurements

1) **BP**
   - In-pharmacy BP measurements are required for the purposes of calculating the CVD risk score[4].
   - Conduct all BP measurements in accordance with the National Heart Foundation of Australia - Guidelines for the diagnosis and management of hypertension in adults 2016 [4].
   - Take three measurements and average the last two. Where there is variation >10 mmHg systolic or >6 mmHg diastolic, have the patient rest quietly for 5 minutes then remeasure.
2) **Weight and height**
   - Take weight and heigh measurements to calculate the person's body mass index (BMI) (See BMI calculator: Heart Foundation - What's your body mass index (BMI)?) [5].
   - Refer to the Department of Health and Aging - BMI and waist measurement[6] for information about BMI ranges and exceptions.
3) **Waist circumference**
   - Measure waist (see Heart Foundation – What waist measurements mean for your heart [7]) and interpret in accordance with the Department of Health and Aging - BMI and waist measurement[6].

D: Estimate type 2 diabetes risk (if applicable)

Assess the patient's risk of developing type 2 diabetes (in the next 5 years) for non-Indigenous adults aged >40 years who do not have an existing diagnosis of diabetes using the validated Australian type 2 Diabetes Risk Assessment Tool (AUSDRISK) [8,9]. Reassess the risk every 3 years. Aboriginal and Torres Strait Islander peoples aged >18 years are considered high risk of developing type 2 diabetes[10].

E: Review test results

Relevant test results, based on the patient presentation are outlined in Table 1. Where recent test results are unavailable, undertake appropriate testing (point of care testing (PoCT) and/or laboratory testing). Guidance on the review of test results is included in Appendix 1.

Refer to the Pilot Handbook for further information regarding options for requesting laboratory testing.

Table 1. Recommended tests based on clinical circumstances	
Recommended test	**Who and when**
Glycated haemoglobin (HbA1c) or fasting blood glucose (FBG) Based on information in the RACGP - Management of type 2 diabetes: A handbook for General Practice (10).	• Patients with a current diagnosis of type 2 diabetes whose current FBG results are older than 1 month or HbA1c results are older than 3 months. • Patients who have not been diagnosed with type 2 diabetes and testing hasn't been performed in the previous 3 years (or results not available) and at least one of the following: – AUSDRISK score of ≥12 – Maori or Pacific Islander, Middle Eastern, Latin American, North African or Asian background – female with a history of gestational diabetes – female with a PCOS diagnosis – taking an antipsychotic drug – aged ≥40 and BMI in the overweight or obese range – history of impaired glucose tolerance or impaired fasting glucose – have a first degree relative with diabetes – one or more symptoms of diabetes (weight loss, polyuria, polydipsia, blurred vision). • Patients who have not been diagnosed with type 2 diabetes and testing hasn't been performed in the previous 12 months (or results not available) and at least one of the following: – Aboriginal and/or Torres Strait Islander person aged ≥18 years – previous FBG result was 5.5–6.9 mmol/L or HbA1c result was 6.0–6.4% (42–46 mmol/mol).
uACR and eGFR Based on information in the Kidney Health Australia - Chronic Kidney Disease (CKD) Management in Primary Care guideline (11).	• If testing has not been performed in the previous 12 months (or results are not available) for the following patients: – have a current diagnosis of type 2 diabetes (including those identified within the Program) – have hypertension – have a family history of CKD – have a history of acute kidney injury – Aboriginal and/or Torres Strait Islander person aged ≥ 18 years – BMI is in the obese range – current or past smoker or vaper – aged ≥60 years.
Full lipid assessment (fasting): total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), high-density	• If the person is >45 years or is an Aboriginal and/or Torres Strait Islander person aged >18 years and testing has not been performed in the previous 5 years* (or results are not available). • If testing has not been performed within the previous 12 months in patients with any of the following: – a diabetes diagnosis – a family history of high cholesterol

Table 1. Recommended tests based on clinical circumstances	
lipoprotein cholesterol (HDL-C) and triglycerides (TGs)*	– being treated for hypertension – current smoker – taking medication to manage dyslipidaemia – kidney disease. *testing has not been performed in the previous 2 years if previous CVD risk assessment identified intermediate risk of a cardiovascular event within 5 years.

*Based on information in the RACGP - Guidelines for preventive activities in general practice [12] and the Australian guideline for assessment and managing cardiovascular disease risk [1].

F: Estimate CVD risk

Assess CVD risk using the AusCVDRisk calculator in the following patient groups:

- all patients aged 45 – 79 years
- patients with diabetes aged 35 – 79 years
- Aboriginal and/or Torres Strait Islander people aged 30 – 79 years [1].

Consider modifiable and non-modifiable risk factors, related comorbidities (see Appendix 2) and test results (see Appendix 1) when estimating a patient's risk with the AusCVDRisk calculator. These may re-classify the patient to a lower or higher risk category [1].

Consider assessing individual risk factors (see Appendix 2) and test results (see Appendix 1) for patients ≥18 years where assessment of CVD risk using the AusCVDRisk calculator has not been validated (e.g., type 1 diabetes). All patients, regardless of their age, are considered high risk if they have a diagnosis of:

- moderate-to-severe chronic kidney disease
- familial hypercholesterolaemia.

Interpret CVD risk scores in accordance with the Australian Guideline for assessing and managing cardiovascular disease risk [1].

Consider the patients' health literacy, social and cultural background when discussing CVD risk and communicate CVD risk as either a percentage or a frequency (e.g., 15% or "15 out of 100 people like you will have a heart attack or stroke in the next 5 years") [1].

Reassess CVD risk at intervals recommended in the Australian Guideline for assessing and managing cardiovascular disease risk [1]. This takes into consideration the patient's initial CVD risk and the presence or development of CVD risk factors [1]. Patients previously assessed as being high risk or receiving pharmacological treatment to manage CVD risk generally do not require formal reassessment of CVD risk and should be managed according to clinical context.

Pharmacist resources

- Therapeutic Guidelines: Cardiovascular (Atherosclerotic cardiovascular disease risk estimation) [2]
- Australian guideline and calculator for assessing and managing cardiovascular disease risk [1]
- Australian Government Department of Health, Disability and Ageing - Australian type 2 diabetes risk assessment tool [8].

Determine treatment approach

After completion of CVD risk assessment for the patient, determine the appropriate treatment approach.

For patients estimated at low risk of CVD, who do not require further management for modifiable CVD risk factors, provide advice for lifestyle modification and discharge from the Program.

Where a patient has a previous diagnosis of, or test results indicative of, hypertension, type 2 diabetes and/or dyslipidaemia, these patients may be enrolled in the Program and managed in accordance with the relevant CVD Risk Reduction Program protocols.

The remainder of this protocol is relevant to the management of hypertension only.

- For the management of dyslipidaemia, refer to the Clinical Protocol: Lipid Modification.
- For the management of blood glucose, refer to the Clinical Protocol: Blood Glucose Management.

Develop and implement management plan (for hypertension)

Hypertension is a significant risk factor for CVD. Lowering BP can reduce cardiovascular morbidity and mortality [2]. A holistic approach to managing overall CVD risk is more effective than managing individual clinical risk factors (i.e., hypertension, dyslipidaemia and hyperglycaemia) in isolation [1, 2].

Each patient should have a CVD Risk Management Plan developed (see Appendix 3), which outlines BP targets and addresses each modifiable risk factor in accordance with the *Therapeutic Guidelines* [2] and other relevant Australian guidelines.

The CVD Risk Management Plan may include:

- appropriate clinical targets
- lifestyle modification and non-pharmacological measures
- pharmacotherapy
- plan for review.

Patients should be involved in shared decision-making and the development of their CVD Risk Management Plan, including setting of appropriate targets.

G: Non-pharmacological measures

Provide all patients with information about non-pharmacological measures, regardless of whether pharmacotherapy is prescribed.

The 5As Framework for behavioural risk modification may be used as the basis for identifying modifiable lifestyle risk factors and implementing lifestyle interventions in accordance with the Royal Australian College of General Practitioners - Smoking, nutrition, alcohol and physical activity (SNAP) guide [13].

Lifestyle modification can reduce BP and other CVD risk factors. Long-term adherence to lifestyle improvement may delay the onset of hypertension, reduce or eliminate the need for antihypertensive pharmacotherapy and assist with BP reduction in patients already taking antihypertensive pharmacotherapy [4].

Smoking and vaping cessation

Detailed guidance for pharmacists supporting smoking cessation is contained in the Smoking Cessation - Clinical Practice Guideline [14], and supporting vaping cessation is contained in the E-cigarette and Vaping Cessation Guide [15].

Weight management

Detailed guidance for pharmacists supporting weight management is contained in the Management for Overweight and Obesity - Clinical Practice Guideline [14].

Diet and nutrition

Nutritional management should focus on a balanced diet with foods from each of the five food groups in appropriate portions to maintain a healthy weight. Foods that are high in saturated and trans fats, sugar and sodium (e.g., highly processed foods) should be limited [12, 16, 17]. Nutritional recommendations and advice should be sourced from the Australian Dietary Guidelines [17].

Patients with hypertension should be advised to reduce salt intake to <4 g per day [4].

Encourage all patients with intermediate or high CVD risk to see a dietitian for individualised nutritional advice.

Physical activity

Encourage all patients to undertake regular physical activity in line with recommendations for their age group in the Physical activity and exercise guidelines for all Australians [18].

Consider the patient's ability to safely exercise, including current mobility and flexibility, and BP. Referral to an exercise physiologist and/or physiotherapist to develop an exercise plan may be required.

Alcohol consumption

Moderate or high alcohol consumption increases risk of hypertension, coronary heart disease and stroke. In people who drink more than 2 standard drinks per day, reducing alcohol intake can lower BP [1]. Recommendations and advice regarding alcohol consumption should be sourced from the Australian guidelines to reduce health risk from drinking alcohol [19].

Pharmacist resources

- National Heart Foundation of Australia - Guideline for the diagnosis and management of hypertension in adults [4]
- Royal Australian College of General Practitioners - The Handbook of Non-Drug Interventions (HANDI) [20]
- Royal Australian College of General Practitioners - Guidelines for preventive activities in general practice [12].

H: Pharmacotherapy

Pharmacotherapy for the Program involves the following components, where appropriate:

- initial management of hypertension
- maintenance management of hypertension (including adjusting pharmacotherapy as needed).

See Overview of the CVD Risk Reduction Program: Hypertension management for entry points to the Program.

Where pharmacotherapy is prescribed, the patient's prescription(s) (including repeats) should provide enough medicine for the period until the patient's next scheduled review.

Antihypertensive pharmacotherapy must be in accordance with the current online versions of Therapeutic Guidelines: Cardiovascular (Blood pressure reduction – Hypertension and blood pressure reduction) [2] and the Australian Medicines Handbook - Antihypertensives [21].

To determine whether pharmacotherapy for hypertension should be initiated (or modified), consider the patients:

- age
- renal function
- CVD risk
- current BP
- related comorbidities
- clinical targets relevant to the individual
- contraindications, adverse reactions and drug interactions
- response to previous interventions to reduce BP (non-pharmacological and pharmacological)
- patient preference (including cost).

Pharmacotherapy treatment options under the Program

Pharmacists may prescribe up to two agents (dual-therapy) from the following list in line with the current online version of Therapeutic Guidelines Cardiovascular: (Blood pressure reduction – Hypertension and blood pressure reduction) [2]:

- angiotensin converting enzyme inhibitors (ACE inhibitors)
- angiotensin receptor blockers (ARBs)
- dihydropyridine calcium channel blockers
- thiazide and thiazide-related diuretics.

Combination products can be prescribed if appropriate, however they must only include medicines able to be prescribed under the Program.

The decision to initiate antihypertensive pharmacotherapy is based on the individual patient presentation [1, 2, 4, 21, 22].

Base initial choice of antihypertensive on individual patient factors including whether the antihypertensive will have a favourable or unfavourable effect on any comorbidities (see Australian Medicines Handbook: Hypertension – Comorbidities affecting antihypertensive choice) [21].

Start the chosen antihypertensive at a low to moderate dose and titrate as required (see I: Monitoring and clinical targets).

For pharmacotherapy recommendations, see Table 2 for hypertension in patients aged ≥ 45 years (≥ 30 years for Aboriginal and/or Torres Strait Islander people) and Table 3 for hypertension in younger patients (aged <45 years/<30 years for Aboriginal and/or Torres Strait Islander people.

Table 2. Initiation of pharmacotherapy for hypertension in patients aged ≥ 45 years (≥ 30 years for Aboriginal and Torres Strait Islander people) [1, 2, 4, 12, 21]

BP	Recommendation
Low CVD Risk	
≥160/100 mmHg	Pharmacotherapy is recommended. Treat to a target of 140/90 mmHg (or lower if drug therapy is tolerated). Review 4–6 weeks after pharmacotherapy initiation.
≥140/90 mmHg but <160/100 mmHg	Reinforce lifestyle modification and repeat BP measurement in 2 months. • **If no reduction in BP after 2 months:** Consider initiating pharmacotherapy (in the context of other risk factors). • **If BP reduced after 2 months (but still >140/90 mmHg):** Reinforce lifestyle modification and repeat BP measurement in 4 months. • **If BP reduced to <140/90 mmHg:** Discharge patient if other risk factors have been managed or continue to monitor BP at future appointments.
Intermediate CVD Risk	
≥160/100 mmHg	Pharmacotherapy is recommended. Treat to a target of 140/90 mmHg (or lower if drug therapy is tolerated). Review 4–6 weeks after pharmacotherapy initiation.
≥140/90 mmHg but <160/100 mmHg	Reinforce lifestyle modification, review and repeat BP in 2 months. • **If no reduction in BP (BP >140/90 mmHg):** Consider initiating pharmacotherapy (in the context of other risk factors). • **If BP reduced (but still >140/90 mmHg):** Reinforce lifestyle modification and repeat BP measurement in 4 months. • **If BP reduced to < 140/90mmHg:** Discharge if all other risk factors have been managed or continue to monitor BP at future appointments. If the patient has a family history of premature CVD, pharmacotherapy is recommended initially with review 4–6 weeks after pharmacotherapy initiation.
High CVD Risk	
≥130/85 mmHg	Pharmacotherapy is recommended.

Table 2. Initiation of pharmacotherapy for hypertension in patients aged ≥ 45 years (≥ 30 years for Aboriginal and Torres Strait Islander people) [1, 2, 4, 12, 21]	
	Treat to a target of SBP 120 mmHg. Even if target is not reached, any sustained reduction in BP reduces the risk of morbidity and mortality due to CVD. Review 4–6 weeks after pharmacotherapy initiation.
<130/85 mmHg	Reinforce lifestyle modification and monitor BP at 6 monthly intervals.

Patients entering the program with an existing medicine regimen for hypertension

Consider whether the most recently prescribed treatment is:

- appropriate for the patient's symptoms and medical history
- optimised for the patient, including the therapeutic response and progression towards clinical targets
- tolerable, with minimal, or appropriate management of, adverse effects.

Pharmacists may modify or adjust existing hypertension pharmacotherapy, including if the:

- patient's response is inadequate (within appropriate clinical timeframes)
- patient is experiencing intolerable or unmanageable adverse effects.

When considering modification or adjustment to medicines prescribed, consider if the medicine is **also** used for the treatment of another condition (e.g., candesartan used for migraine prevention).

When modifying pharmacotherapy regimens for hypertension that have been prescribed by another healthcare provider, attempt to notify and make changes in collaboration with the original prescriber or the patient's usual healthcare provider (whichever is most appropriate).

Initiating antihypertensive pharmacotherapy in young patients

Higher BP in younger patients is associated with increased rates of left ventricular hypertrophy and adverse impacts on cardiovascular and brain health and is a predictor for secondary hypertension [23].

The presence of hypertension at a young age contributes to earlier onset CVD and CVD events in middle age. However, there is limited evidence showing reducing BP in younger patients with hypertension reduces the likelihood of poor cardiovascular outcomes later in life [22, 23].

Investigation of secondary hypertension is of considerable importance in younger patients; this may direct specific treatment strategies and is associated with better blood pressure control [23].

Table 3. Initiating pharmacotherapy for hypertension in younger patients (aged <45 years/<30 years for Aboriginal and/or Torres Strait Islander people [22, 23]	
BP	**Recommendation**
≥160/100 mmHg	Patient not suitable for Program, refer to an appropriate healthcare provider for investigation and ongoing management.
≥140/90 mmHg	Reinforce lifestyle modification and repeat BP measurement in 3 months. Consider ambulatory monitoring (refer to Guidelines for the diagnosis and management of hypertension in adults) [4]. • **If no reduction in BP after 3 months:** Refer to an appropriate healthcare provider for investigation and ongoing management. • **If BP reduced after 3 months (but still >140/90 mmHg):** Consider initiating pharmacotherapy (in the context of other risk factors). Repeat BP measurement in 4–6 weeks. If BP remains >140/90 mmHg: Refer to an appropriate healthcare provider for investigation and ongoing management. • **If BP reduced to <140/90 mmHg:** Consider discharge if all other risk factors have been managed. Otherwise, continue to monitor BP at subsequent appointments.

Pathology testing that is required before pharmacotherapy is initiated or modified, and during treatment, is summarised in Table 4.

Table 4. Monitoring for antihypertensive pharmacotherapy [2, 4, 21]	
Drug class	**Test**
ACE Inhibitors	• Check renal function (eGFR) and electrolytes before commencing and 1–2 weeks later. – A small rise in serum creatinine (up to 25%) or serum potassium (within the normal range) should not necessarily prompt dose reduction or cessation.
ARBs (sartans)	• Check renal function (eGFR) and electrolytes before commencing and 1–2 weeks later. – A small rise in serum creatinine (up to 25%) or serum potassium (within the normal range) should not necessarily prompt dose reduction or cessation.
Dihydropyridine calcium channel blockers	• Monitor for vasodilatory adverse effects – may require dose reduction.
Thiazide and thiazide-related diuretics	• Electrolytes, specifically plasma sodium and potassium concentration should be reviewed 3–6 weeks after commencing. • Patients with sodium and potassium outside of normal ranges/reference intervals should be referred to an appropriate healthcare provider for comprehensive management. • The Royal College of Pathologists of Australasia (RCPA) reference interval for sodium is 135–145 mmol/L; potassium reference interval is 3.5–5.2 mmol/L [24].

I: Monitoring and clinical targets

Monitor response to new or changed pharmacotherapy by checking **BP after 4–6 weeks** [2].

If the response to new or changed pharmacotherapy is inadequate or the medicine is not tolerated [2]:

- review adherence and address any issues

- consider adding a second medicine from a different class from the above list (noting ACE-inhibitors and ARBs should not be used in combination unless under specialist supervision)
- change the medicine class.

If the patient is already taking two medicines from different classes but the BP target has still not been reached and the medicines are well tolerated, increase the dose of one of the medicines incrementally to the maximum tolerated dose, then increase the dose of the second medicine, if required [1].

If BP still remains above target 4–6 weeks after treatment with two first line antihypertensives at maximum tolerated doses, refer the patient to an appropriate healthcare provider for ongoing management. If after three months of treatment the BP target has been reached and is stable, continue monitoring response to therapy.

J: Confirm management plan is appropriate

Consult the *Therapeutic Guidelines* [2], the *Australian Medicines Handbook* [21] and other relevant references to confirm that management is appropriate, including:

- contraindications and precautions
- drug and disease interactions
- lactation status.

K: Communicate agreed management plan

Provide comprehensive advice (including supporting written information) to the patient regarding:

- individual product and medicine use
- non-pharmacological measures
- how to manage adverse effects
- when to seek further care and/or treatment
- when to return for clinical review.

Document the agreed management plan and individualised clinical targets within the patient's CVD Risk Management Plan.

It is the pharmacist's responsibility to ensure the suitability and accuracy of any resources provided to patients (and/or caregivers if applicable) and that they comply with all copyright conditions.

L: Collaborative care

Provide a copy of the patient's CVD Risk Management Plan to the patient's usual healthcare provider (and any other relevant health professionals involved in the patients care). The communication should also include (if relevant):

- relevant medical history and pathology/PoCT results
- changes to existing pharmacotherapy or new pharmacotherapy prescribed
- a summary of advice provided to the patient including recommendations for multidisciplinary care and referrals
- the next scheduled review appointment.

Ongoing management and monitoring

M: Clinical review and ongoing collaboration

All patients should undergo regular clinical review to participate in the Program. Review patients **4–6 weeks** after initiating or modifying the treatment regimen, or sooner, if required or as recommended [(2)].

Prior to each periodic review, arrange any relevant laboratory tests (that are not performed by PoCT) required for monitoring.

At each appointment (scheduled or unscheduled), review:

- the patient's ongoing eligibility for the Program
- patient history to reflect changes in the preceding period
- BP measurements
- pathology or undertake any required PoCT (as applicable)
- changes to CVD risk factors
- patient's response to current management and adherence to lifestyle modification
- prescribed pharmacotherapy and modify the treatment regimen in line with Therapeutic Guidelines or consider other medicine-related issues (e.g., adherence)
- CVD Risk Management Plan, document and update clinical targets, if required.

Provide an update to the patient's usual healthcare provider following each occasion of care including when any changes are made to the patient's management plan. Proactive, planned and/or unplanned review may also occur with the patient's usual healthcare provider at any time while the patient is enrolled in the Program.

Patients may continue to participate in the Program providing:

- their condition remains eligible to be managed in the Program
- they wish to remain in the Program and continue to consent
- they attend scheduled reviews.

Patients are not eligible for ongoing participation in the Program if their clinical targets have not been reached (and stable) after 4-6 weeks of treatment with 2 first line antihypertensives at maximum tolerated doses.

Refer all patients (with their consent) who are no longer eligible for management within the Program, or who do not wish to continue in the Program, to an appropriate healthcare provider.

Appendices

Appendix 1 – Guidance for reviewing test results

Blood pressure

The Guidelines for the diagnosis and management of hypertension in adults outline in-clinic, ambulatory and home BP ranges to aid in the diagnosis, management and treatment decisions for hypertension [4]. In-pharmacy BP measurements form the basis of treatment decisions in the Program. Refer to Table 5.

Ambulatory and/or home BP monitoring is only required to confirm the BP for atypical cases e.g., if the patient has marked fluctuations between in-pharmacy BP measurements, suspected white-coat, masked hypertension or suspected nocturnal hypertension [2, 4]. A comprehensive assessment of BP should be based on multiple measurements taken on separate occasions, at least twice, one or more weeks apart, or sooner if hypertension is severe.

Table 5. Classification of BP using in-pharmacy measurements [4, 25]

Category	Range (systolic (mmHg), diastolic (mmHg))
Optimal	<120 and <80
Normal	120–129 and/or 80–84
High-normal	130–139 and/or 85–89
Mild hypertension (grade 1)	140–159 and/or 90–99
Moderate hypertension (grade 2)	160–179 and/or 100–109
Severe hypertension (grade 3)	≥180 and/or ≥110
Isolated systolic hypertension	>140 and <90

Secondary hypertension

- Consider the possibility of a secondary aetiology.
  - Refer to the Therapeutic Guidelines: Cardiovascular (Blood pressure reduction – Secondary hypertension) for secondary causes of hypertension [2].
  - Medicines and other substances that may impact on BP are listed in the National Heart Foundation of Australia Guidelines for the diagnosis and management of hypertension in adults [4].

Glycated haemoglobin and/or fasting blood glucose

- HbA1c is the preferred diagnostic method for diabetes. However, a diagnosis of diabetes can be made using FBG and/or oral glucose tolerance test (OGTT) [10].
- HbA1c, FBG results and/or OGTT results (if required) should be interpreted in accordance with the Therapeutic Guidelines: Diabetes (Tests to diagnose diabetes) [9], and the RACGP Management of type 2 diabetes: A handbook for General Practice [10]. See Table 6.

Table 6. Interpretation of HbA1c, FBG and/or OGTT results [9, 10]			
HbA1c (non-fasting)	**FBG**	**OGTT (2-hour BGL)**	**Interpretation**
<6.0% (42 mmol/mol)	<5.5 mmol/L	<7.8 mmol/L	• Normal levels [9]. • Diabetes is unlikely – re-test in 3 years [10].
6.0–6.4% (42–46 mmol/mol)	5.5–6.9 mmol/L	≥7.8 and <11.1 mmol/L	• FBG 6.1–6.9 mmol/L = pre-diabetes (impaired glucose tolerance) [9]. • Diabetes is possible – re-test in 1 year. • Patients with an FBG in this range may undergo OGTT to confirm diagnosis [10].
≥6.5% (48 mmol/mol)	≥7.0 mmol/L	≥11.1 mmol/L	• Diagnostic of diabetes [9]. • Do not use point of care capillary (finger-prick) testing to diagnose diabetes [9]. • FBG and HbA1c must be repeated in asymptomatic patients to confirm diagnosis [10].
≥10% (86 mmol/mol)	Any BGL ≥20.0 mmol/L		• Severe hyperglycaemia [9] – urgent referral to an appropriate healthcare provider required. Unwell patients with signs of ketosis, dehydration, vomiting, infection, altered consciousness, confusion or delirium, or suspicion of type 1 diabetes require immediate transport to closest emergency medical care.

Secondary hyperglycaemia

- Consider the possibility of a secondary aetiology i.e., medication causing raised blood glucose concentration. Refer to the Therapeutic Guidelines: Diabetes (Drug-induced hyperglycaemia) for information about drug-induced hyperglycaemia [9].

Blood lipids

- Cholesterol reference levels are included in Table 7.
- Target cholesterol levels for patients taking lipid modifying therapy depend on their AUSCVD risk estimate. Refer to the CVD Risk Reduction Program Clinical Protocol: Lipid modification for target cholesterol level recommendations.
- Abnormal lipid levels should be confirmed with a second test on a different day before commencement of lipid modifying pharmacotherapy [12].

Table 7. Cholesterol reference levels [2, 24, 26]	
Cholesterol type	**Reference levels**
Total Cholesterol	<5.5 mmol/L
LDL-C	<3.0 mmol/L
Non-HDL-C	<4.0 mmol/L
HDL-C	>1.0 mmol/L (males) >1.2 mmol/L (females)
Triglycerides	<2.0 mmol/L

Secondary dyslipidaemia

- Consider the possibility of a secondary aetiology.

- Refer to the Therapeutic Guidelines: Cardiovascular (Lipid modification – Secondary dyslipidaemia) for secondary causes of dyslipidaemia [2].
- Familial hypercholesterolaemia should be considered in adults with a total cholesterol level ≥7.5 mmol/L or LDL-C ≥5.0 mmol/L, particularly in patients with a family history of coronary heart disease [27].

uACR and eGFR

- Normal eGFR is considered to be ≥60 mL/min/1.73m^2 and normal uACR is <3 mg/mmol [11].

Appendix 2 – Non-modifiable and modifiable CVD risk factors and related comorbidities

Table 8. Considerations for CVD risk assessment [1, 2, 28, 29]	
Risk factor	**Explanatory notes**
Non-modifiable risk factors and related comorbidities	
Age	• The risk of CVD and prevalence of CVD risk factors increases with age. • Calculate absolute CVD risk if aged ≥45 years (≥30 for Aboriginal and/or Torres Strait Islander people, ≥35 years for people with diabetes).
Sex	• CVD is a major issue for both sexes. However, there are differences between men and women in the experience of heart disease. Cardiovascular events are more common in men than women. Women have similar CVD risk incidence to men, manifesting approximately 10 years later. Menopause or perimenopause can be an opportune time to assess CVD disease risk in women. Women's risk of heart disease increases after menopause, due partly to changes caused by low oestrogen on cholesterol, blood pressure and metabolism.
History of pregnancy complications	• Patients with a history of hypertension during pregnancy, pre-eclampsia or gestational diabetes have a higher risk of developing CVD.
Ethnicity	• Aboriginal and Torres Strait Islander people may experience a faster disease progression and have a higher prevalence of CVD risk factors. Consider reclassification of the calculated AusCVDRisk to a higher risk category after assessing the person's clinical, psychological and socioeconomic circumstances, and community CVD prevalence. • The risk of a CVD is higher for: – Māori people – Pacific Islander people – people of South Asian ethnicity (Indian, Pakistani, Bangladeshi, Sri Lankan, Nepali, Bhutanese or Maldivian ethnicities). • Consider reclassification of the calculated AusCVDRisk to a higher risk category where this is close to the threshold. • The risk of a CVD is lower for: – people of East Asian ethnicity (Chinese, Japanese, Korean, Taiwanese or Mongolian ethnicities). • Consider reclassification of the calculated AusCVDRisk to a lower risk category where this is close to the threshold. • See Australian Guideline for assessing and managing cardiovascular disease risk [1].
Socio-economic status	• Socioeconomic deprivation is an independent risk factor. • The AusCVDRisk calculator uses Socio-economic Indexes for Areas (SEIFA) quintiles obtained from residential postcodes. • Absolute CVD risk may underestimate CVD risk in socioeconomically deprived groups.
Family history of CVD	• Premature CVD in a 1st degree relative (coronary heart disease or stroke in females <65 years of age or males <55 years of age when first diagnosed) increases personal CVD risk. Consider reclassification of calculated AusCVDRisk to a higher risk category where this is close to the threshold. • See Australian Guideline for assessing and managing cardiovascular disease risk [1]. • Familial hypercholesterolaemia affects 50% of first-degree relatives [27].
Diabetes	• Type 2 diabetes is independently associated with double the risk of developing CVD. The risk is also higher in people with longstanding diabetes, microvascular complications and suboptimal glycaemic control.

	• The same key risk factors (including diabetes duration, presence of kidney disease, glycaemic control) influence CVD risk for type 1 diabetes however, the Aus CVD Risk Calculator is not validated for type 1 diabetes.
Chronic kidney disease	• Patients without diabetes with sustained eGFR 45 – 59 mL/min/1.73m^2 or with or persistent uACR 2.5 – 25 mg/mmol (men)/ 3.5 – 35 mg/mmol (women): consider reclassification of calculated AusCVDRisk to a higher risk category where this is close to the threshold. • See Australian Guideline for assessing and managing cardiovascular disease risk [1].
Coronary artery calcium (CAC) score	• Where a CAC measurement has been performed, consider reclassification of the calculated AusCVDRisk to a higher or lower risk category based on the patient's CAC score. A CAC score from the last 5 years can be used. • See Australian Guideline for assessing and managing cardiovascular disease risk [1].
Severe mental illness	• CVD is a leading cause of illness and premature death in patients living with severe mental illness. Consider reclassification to a higher risk category of the calculated AusCVDRisk where this is close to the threshold. • See Australian Guideline for assessing and managing cardiovascular disease risk [1]. • Treatment with second-generation (atypical) antipsychotic agents is associated with an increased CVD risk.
Modifiable risk factors	
Elevated BP	• BP is a major independent determinant of the risk of atherosclerotic disease.
Dyslipidaemia	• Familial hypercholesterolaemia should be considered in adults with a total cholesterol ≥7.5 mmol/L or LDL-C ≥5.0 mmol/L, particularly in patients with a family history of coronary heart disease [27].
BMI and waist circumference	• Waist circumference (indicating presence of central adiposity) is a better indicator of CVD risk than BMI.
Smoking	• There is a dose-dependent association between smoking and CVD events.
Physical activity	• All forms of exercise have a positive effect on reducing multiple CVD risk factors including LDL-C, HDL-C, TGs, insulin sensitivity, adipose tissue and BP.
Alcohol consumption	• Excessive alcohol consumption (>10 standard drinks per week and >4 standard drinks per day) is a risk factor for elevated BP and impacts on other CVD risk factors.
Nutrition and diet	• Diet is a risk factor for atherosclerosis and coronary heart disease [16]. • Food/diet related risk factors include obesity, hypertension, hyperglycaemia/uncontrolled diabetes and high cholesterol
Sleep disorders	• Insomnia and shift-work related sleep disorder can increase an individual's CVD risk [30].
Drugs that worsen CVD risk factors	• Drugs that worsen CVD risk factors include those that affect BP, lipids and weight (e.g., antipsychotics, some antidepressants).
Obstructive sleep apnoea (OSA)	• OSA is associated with hypertension, arrhythmias, cardiovascular and cerebrovascular mortality [31]. • Consider using a screening tool such as the STOP-Bang questionnaire for patients with suspected OSA [32].

Appendix 3 – CVD Risk Management Plan

For an editable version, see CVD Risk Management Plan - editable.

Page 1

Queensland Community Pharmacy Chronic Conditions Management Pilot

Cardiovascular Disease (CVD) Risk Management Plan

Plan date:

Name:		Date of birth:	
Date of enrolment in the CVD Risk Reduction Program:			
Patient support person and/or caregiver:			

Program pharmacy details

Pharmacist name		Phone number	
Pharmacy name and address		Opening hours	

My CVD Risk

Estimated CVD risk (AusCVDRisk):	Low (%), Intermediate (%), High (%)
My CVD risk factors	Insert applicable risk factors e.g., • high blood pressure • type 2 diabetes (hyperglycaemia) • above healthy weight range • smoking/vaping • waist circumference • dyslipidaemia, specifically high levels of 'bad' cholesterol and/or low levels of 'good' cholesterol • family history of premature CVD etc.
My risk of type 2 diabetes	Low (score), Moderate (score), High (score) (delete if already diagnosed with T2DM)

My clinical targets and test results

Blood pressure			
Current blood pressure		Blood pressure target (insert individualised target)	
Systolic blood pressure (SBP):	mmHg	SBP:	mmHg
Diastolic blood pressure (DBP):	mmHg	DBP:	mmHg

Page 2

My lifestyle prescription

Physical activity	• Enter recommendations for physical activity for the patient's age and capability based on the national guidelines:
	  ○ Informal activity e.g., everyday activities i.e., housework, gardening
	  ○ Formal activity e.g., walking (moderate intensity) for 30 minutes 5 days of the week, strength building 2 days per week
	  ○ Individualised guidance based on patient preference and affordability
	  ○ Incorporate pacing by building up to recommendations
	• If required: Refer to a GP, exercise physiologist, physiotherapist or other supports for safe exercise

Weight management and diet and nutrition	• Recommendation for weight loss (if applicable)
	• Recommendations for eating for health
	• Summary of nutritional advice for a balanced diet
	  ○ more of/ increase…
	  ○ less of/ limit…
	• Specific advice and food recommendations tailored for individual's risk factors
	• If required: Refer to Management for Overweight and Obesity - Clinical Practice Guideline and/or other supports e.g., dietitian

Other lifestyle modification strategies	• If required: Smoking (or vaping) cessation ○ Refer to Smoking Cessation - Clinical practice guideline, E-cigarette and Vaping Cessation Guideline and/or other supports e.g. Quitline or GP • If required: Refer to a GP, psychologist or other mental health clinician for mental health support • If required: Summary of advice regarding alcohol consumption • If required: Sleep hygiene education

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Version 1.0	01.02.2024	
Version 1.1	11.11.2024	Administrative update.
Version 1.2	01.07.2025	Administrative updates across sections to improve useability of the CVD protocols.
Version 2.0	07.04.2026	Updates across sections to reflect contemporary guidance and improve usability.

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