SESLHD GUIDELINE COVER SHEET

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SUMMARY	The scope of this document is to provide a guideline for the assessment and management of severe hypertension in ADULTS without acute end organ damage (*excluding* pregnant females and patients <18 years old) in the inpatient ward setting (*excluding* ICU/ED) across the SESLHD. This DOES NOT include the management of patients with severe hypertension with associated acute end organ dysfunction.

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SESLHD GUIDELINE
COVER SHEET

Assessment and management of hypertension in ADULTS in the inpatient ward setting

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Section 1 – Background

Hypertension is increasingly common in the Australian adult population. According to the 2017-18 Australian Bureau of Statistics National Health Survey, 1 in 3 people aged over 18 have hypertension with 23% have uncontrolled hypertension (1). Unsurprisingly, hypertension and its management is a common problem encountered in patients admitted to hospital. Whilst strongly associated with poor long-term health outcomes, severe hypertension can cause acute complications related to end organ damage. This typically occurs when blood pressure exceeds >180/110mmHg, however, it may occur at a lower level if there has been an abrupt increase in blood pressure in a previously normotensive patient.

Severe hypertension carries a risk of acute and chronic end organ damage and should always warrant an urgent medical review. Organs commonly affected by severe hypertension include the brain, kidney, heart, large vessels (aorta) and microvasculature (including the retina). When acute organ dysfunction is present, this characterises a medical emergency and warrants directed treatment by a physician and consideration of intensive care support. In the absence of acute end organ damage, there is no clear association with severe hypertension and short-term adverse outcomes (2). Aggressive treatment of severe hypertension can lead to significant harm.

Treatment should be initiated to aim for an appropriate blood pressure target individualised for the patient, aiming to achieve normotension over a period of months. This minimises the adverse effects associated with anti-hypertensives and reduces the long-term outcomes associated with uncontrolled hypertension. This includes the development of coronary artery disease, cerebrovascular disease, chronic renal impairment and heart failure.

The scope of this document is to provide a guideline for the assessment and management of severe hypertension in ADULTS without acute end organ damage (*excluding* pregnant females and patients <18 years old) in the inpatient ward setting (*excluding* ICU/ED) across the SESLHD**.** This DOES NOT include the management of patients with severe hypertension with associated acute end organ dysfunction.

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Section 2 – Principles

2.1 Summary of management

1. Severe hypertension (BP >180/110mmHg) warrants an urgent medical review for the assessment of acute end organ damage
2. In the absence of acute end organ damage, severe hypertension does not require aggressive management
3. The presence of acute end organ damage is a medical emergency that requires hospitalisation and may require treatment in a HDU/ICU environment
4. Severe hypertension can commonly present with headache or 'non-specific' symptoms. This does not reflect end-organ damage
5. Patients with severe hypertension and NO high risk features should not be managed with rapidly acting anti-hypertensive drugs. They are more likely to cause harm without a clear benefit
6. The presence of severe hypertension with high-risk features may warrant consideration of rapid acting oral anti-hypertensive drugs
7. If a patient has missed their regular antihypertensive medications, prescribing their usual medication that has been missed is an appropriate strategy
8. *Screen for reversible causes of hypertension including: Stress, pain, drug withdrawal (including nicotine), stimulant use (including caffeine)*
9. Document a blood pressure goal and treatment time frame. This is likely to occur over a period of weeks-months due to the adaptions that occur from chronic hypertension
10. Aim for a reduction in systolic blood pressure of 10mmHg in the first 24 hours
11. Appropriate management involves the use of long-acting antihypertensive medications that can be continued upon discharge from hospital
12. An altered calling criteria in eMR is often required, after discussion with a senior registrar
13. The ideal long-term blood pressure target should be achieved over a period of weeks-months
14. A BP >220/120mmHg requires discussion with the treating physician on-call
15. This guide is not applicable to all patient groups, who may have different BP targets and management strategies. This includes patients with intracranial pathology and pregnancy

2.2 Common mistakes

1. Prescribe intravenous medicines or fast acting agents for asymptomatic hypertension
2. Prescribe excessive doses of antihypertensives to normalise blood pressure rapidly in asymptomatic patients. This is likely to lead to iatrogenic hypotension which may need emergency management

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3. Prescribe Glyceryl trinitrate (GTN) patches to manage asymptomatic hypertension. This is likely to cause rapid and often dramatic reductions in BP, causing iatrogenic injury (such as falls)
4. Aim to achieve a blood pressure <130/80mmHg in a patient with severe hypertension without acute end organ dysfunction over a period of hours – days
5. *Prescribe rapidly acting anti-hypertensive agents in patients with dialysis dependent renal failure 4-6 hours prior to haemodialysis.*

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Section 3 – Definitions

3.1 Severe hypertension without acute end organ dysfunction:

- Blood pressure greater than 180/110mmHg with no symptoms of hypertension and no evidence of acute target organ damage. This can be associated with headache and non-specific symptoms, which do not constitute acute end organ damage.

3.2 Hypertensive emergency:

- Severe hypertension (typically with a BP >180/110mmHg) with associated end-organ dysfunction. This may occur at a lower blood pressure if there has been an abrupt rise from a previously lower baseline. Acute end organ involvement includes:
    - Neurological emergencies = Ischaemic stroke, haemorrhagic stroke, head trauma or hypertensive encephalopathy
    - Cardiac emergencies = Acute heart failure, acute coronary syndrome
    - Vascular emergencies = Acute aortic dissection
    - Renal emergencies = Acute hypertensive kidney injury

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Section 4 – Responsibilities

4.1 Medical officers are responsible for:

- Assessment of patients identified by nursing staff in accordance with NSW Health Policy Directive PD2020_018 - Recognition and Management of Patients who are Clinically Deteriorating
- Assessment and management of hypertension
- Prescription of anti-hypertensives as required
- Junior medical officers should escalate and consult with senior medical officers to ensure the appropriate management and monitoring of patients with hypertensive emergencies (i.e. senior registrars, consultants, ICU registrars)

4.2 Registered/Enrolled Nurses responsible for:

- Assessment and escalation of hypertension in accordance with NSW Health Policy Directive PD2020_018 - Recognition and Management of Patients who are Clinically Deteriorating
- Provision of prescribed anti-hypertensives
- Assessment and ongoing monitoring of patients with elevated blood pressures

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Section 5 – Severe hypertension without acute end organ dysfunction

5.1 Definition

Blood pressure greater than 180/110mmHg with no evidence of acute end organ damage

5.2 Assessment

- Confirm the presence of severe asymptomatic hypertension by verifying the SBP is greater than 180 mmHg or the DBP is greater than 110 mmHg in both arms
- Verify if there is end-organ dysfunction on history and examination (Box 1). Note that severe hypertension can be symptomatic with headache, epistaxis and non-specific symptoms. These are not manifestations of acute end organ dysfunction

Box 1: Symptoms and signs of acute end organ dysfunction

1. Neurological emergency = Focal neurological deficits, change in GCS, nausea/vomiting, visual disturbance
2. Cardiac emergency = Chest pain, dyspnoea, diaphoresis
3. Vascular emergency = Dizziness, acute severe back pain
4. Renal emergency = Acute kidney injury **(eGFR <60),** microscopic haematuria

- Screen for possible causes of elevated blood pressure (Box 2).

Box 2: Correctable causes for severe asymptomatic hypertension

1. History of poorly controlled blood pressure or untreated hypertension
2. Withheld medications or nonadherence to medications
3. Uncontrolled pain/stress/anxiety
4. Fluid overload
5. Recent initiation of medications associated with hypertension (ie. Systemic corticosteroids)
6. Treatment withdrawal
7. Secondary conditions associated with hypertension: acute glomerulonephritis, preeclampsia, pheochromocytoma, scleroderma renal crisis
8. Use of narcotics

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- Assess for high-risk features associated with severe hypertension (Box 3)

Box 3: High risk features with severe hypertension

1. Untreated aortic aneurysm
2. Previous intracranial haemorrhage
3. Previous severe hypertension with end-organ damage
4. Heart failure
5. Untreated coronary artery disease
6. Acute head injury, trauma or patients with intracranial disease
7. Reduced renal function

- Assess for conditions which may have individualised BP goals and treatments which are outside the scope of this document

Box 4: Conditions that this document is not applicable to

1. Intracranial surgery
2. Intracranial haemorrhage
3. Pregnancy
4. Patients with high risks of bleeding complications (ie. Ruptured aortic aneurysm)

5.3 Initial Investigations

- ECG
- Urinalysis
- EUC
- Troponin (if concerns of silent acute myocardial infarct)

5.4 Management Principles

Severe asymptomatic hypertension without acute end organ damage is associated with poor long-term outcomes and a higher mortality rate (3). However, no study has demonstrated a benefit in rapidly lowering blood pressure in the absence of acute end organ damage (4). Rapid lowering of blood pressure poses a significant risk to patients due to the risk of ensuing hypotension from an unpredictable response seen with short-acting antihypertensive medications. For this reason, whilst it is imperative to recognise that this patient cohort represents a higher risk of mortality, treatment goals should reflect obtaining a target blood pressure over the coming weeks-months.

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If the patient has symptoms associated with severe hypertension, this should be assessed for the possibility of end-organ involvement (i.e. dyspnoea secondary to pulmonary oedema from acute heart failure). It is important to recognise that severe hypertension is commonly associated with symptoms that do not represent end-organ damage. In a study examining patients presenting to ED with severe hypertension with no end-organ damage, 22% had a headache and 48% had non-specific symptoms (4). Risk factors for complications associated with severe hypertension should also be assessed as this may necessitate more rapid correction of blood pressure than what is usually targeted.

Initial treatment should be to correct the underlying reversible causes of elevated blood pressure (e.g., pain, anxiety, missed anti-hypertensives or drug withdrawal). Secondary treatment options include increasing the dose of existing antihypertensive medications or adding on additional antihypertensive mediations.

Initiating antihypertensive therapy in treatment naïve patients should be performed slowly with reference to the suggested therapies below. If there are no features to suggest acute end-organ damage, first line therapy should be oral agents which are appropriate to continue long-term following discharge from hospital (see suggested oral medications below). Following a dose change or introduction of a new antihypertensive agent, effects on blood pressure reduction may take days to weeks to see a peak effect. As such, it is advised to avoid escalating treatment doses or prescribing additional antihypertensive medications prior to this time. An acceptance of a temporary higher blood pressure should be made. This is reflected in clinical practice where severe hypertension is commonly managed in the community.

Caution is advised when managing patients with high risk features due to the risk of acute complications associated with brief periods of severe hypertension. They should always be discussed with a senior medical officer prior to initiating treatment. It may be appropriate to consider short acting oral antihypertensive medications. An additional instance to consider short acting oral antihypertensives is severe hypertension with a significant symptom burden that IS NOT associated with acute end organ damage (i.e. Severe headache that is poorly managed with analgesia).

No upper limit of severe hypertension has been recorded that is associated with absolute harm. The greatest risk of acute end organ damage is seen with acute elevations from a patient's baseline blood pressure. To ensure patient safety during hospitalisation, a blood pressure >220/120mmHg would

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warrant discussion with the treating physician for senior clinician input. This recommendation is based off consensus expert opinion to minimise the risk of patient harm.

5.5 Treatment

Treatment may be instituted prior to completion of investigations. Given the risks associated with rapid reduction with no adverse short-term effects of severe hypertension, blood pressure reduction is best achieved over a period of weeks. For this reason, the most appropriate antihypertensive agents are those which are long-acting and can be continued in the community for long-term management of hypertension. In an after-hours inpatient hospital setting, the goal should be to reduce BP by 10-20mmHg in the first 24 hours after commencement of anti-hypertensives. For this reason, recommended first line antihypertensives include dihydropyridine calcium channel blockers, angiotensin converting enzyme inhibitors (ACEi) and thiazide diuretics.

Prior to choosing an agent, it is important to consider the patients acute medical issues and underlying comorbidities. Whilst some agents may be appropriate in the community, they should be avoided in an inpatient setting. For example, patients with proteinuric kidney disease are commonly prescribed ACEi/ARB antihypertensive due to renal protective effects. These may be inappropriate in an inpatient setting due to a concurrent acute kidney injury. A senior medical registrar should be contacted if there is concern regarding choosing an appropriate agent. Any medications commenced afterhours should be charted on an ad hoc basis to allow the treating team to consider the suitability of this agent and if a more appropriate antihypertensive may be considered.

5.6 Suggested oral medications that can be used after-hours:

- Amlodipine 5 – 10mg daily
    - Peak onset time between 6-12 hours
- Perindopril 2.5 – 5mg daily (if no acute decline in kidney function)
    - Peak onset occurs after 4-6 hours
- Hydrochlorothiazide 12.5 – 25mg daily
    - Peak onset after 4 hours, diuretic activity lasts 6-12 hours
    - Best for use in oedematous patients and those with normal electrolytes

5.7 Suggested rapid acting oral medications that can be used after hours:

- Prazosin 0.5mg as a stat dose
    - Peak onset after 1-2 hours

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- Monitor closely for first dose effect with risk of hypotension. Patients should be in bed or seated for the first 2 hours

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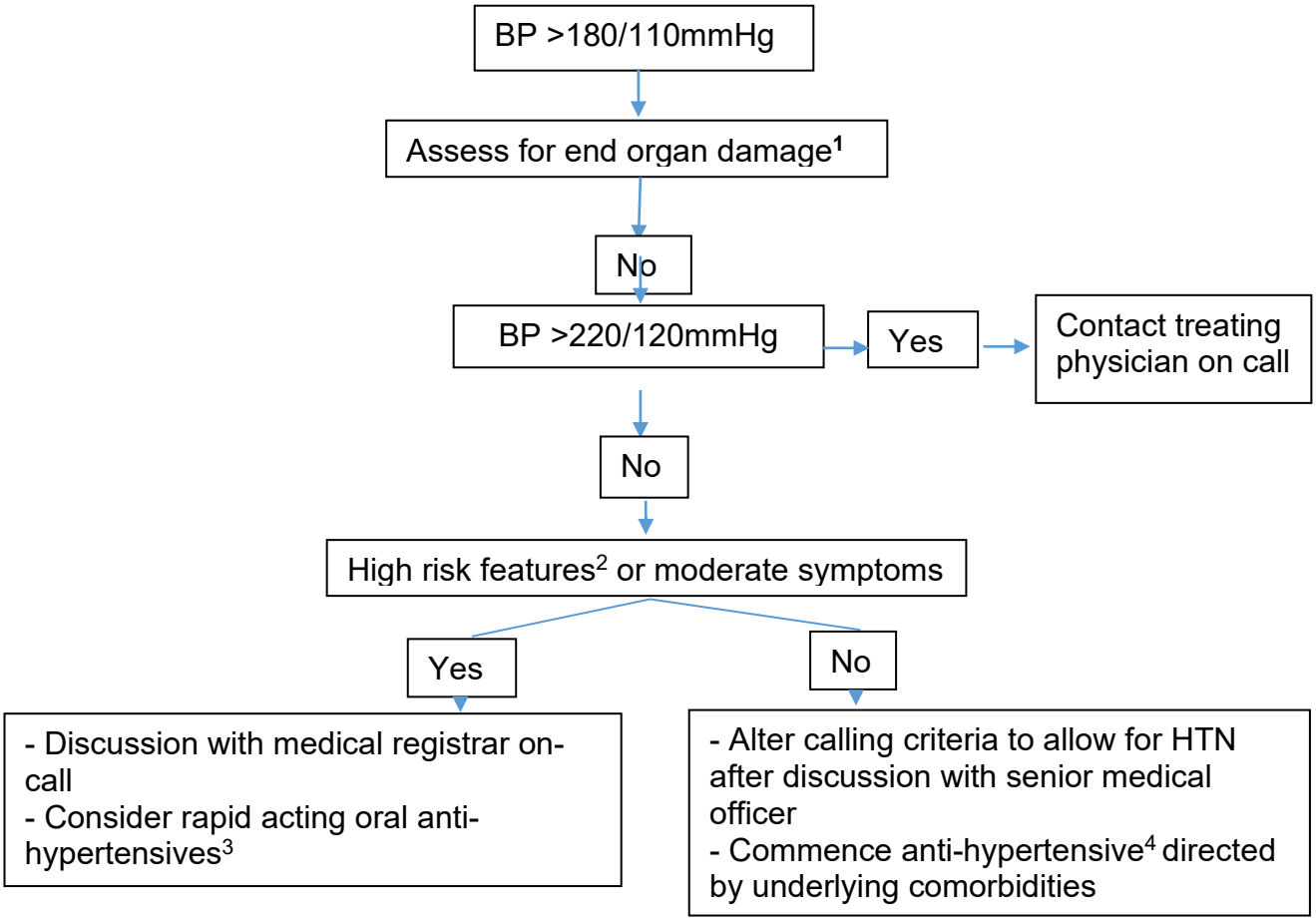
Section 6 – Chart 1: Flowchart for severe asymptomatic hypertension



1. Symptoms and signs of acute end organ dysfunction

Neurological emergency = Focal neurological deficits, change in GCS, nausea/vomiting, visual disturbance
Cardiac emergency = Chest pain, dyspnoea, diaphoresis
Vascular emergency = Dizziness, acute severe back pain
Renal emergency = Acute kidney injury (eGFR <60), microscopic haematuria

2. High risk features

- Untreated aortic aneurysm
- Previous intracranial haemorrhage
- Previous severe hypertension with end-organ damage
- Heart failure
- Untreated coronary artery disease
- Acute head injury or trauma
- Chronic kidney disease (eGFR <60)

3. Long acting antihypertensives:

- Amlodipine 5-10mg daily
- Hydrochlorothiazide 12.5 – 25mg daily
- Perindopril 2.5 – 5mg daily

4. Rapid acting antihypertensive:

- Prazosin 0.5mg stat dose

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Section 7 – Hypertensive Emergency

7.1 Definition

Blood pressure greater than 180/110mmHg, or an abrupt increase from a previous lower baseline, with associated acute end organ damage.

7.2 Management Principles

Severe hypertension with acute end organ dysfunction is considered a medical emergency. This is related to adverse outcomes that are contributed to by the duration of ongoing severe hypertension. Treatment will often require the use of IV antihypertensive medications to allow for rapid changes in blood pressure. This often requires treatment within a HDU/ICU environment to ensure close monitoring, use of intravenous antihypertensives and appropriate treatment of complications associated with rapidly acting antihypertensives (i.e. symptomatic hypotension).

It is imperative that hypertensive emergencies are escalated to the appropriate medical teams to ensure timely and appropriate management. Target blood pressures and antihypertensives used vary according to the organ that is affected. This is beyond the scope of this protocol.

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Section 8 – References

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Section 9 – Version and approval History

Date	Version	Version and approval notes
June 2018	Draft	Hypertension Working Party
July 2018	Draft	Draft for Comment
August 2018	Draft	Processed by Executive Services prior to SESLHD Quality Use of Medicine Committee
August 2018	Draft	Approved by SESLHD Quality Use of Medicine Committee with two minor amendments
September 2018	0	Approved by SESLHD Clinical and Quality Council for publishing
1 May 2024	1.0	Major review. Approved by SESLHD Drug and Therapeutics Committee and SESLHD Clinical and Quality Council.

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