

[HOSPITAL / HEALTH AUTHORITY NAME]

# SEVERE HYPERTENSION AND HYPERTENSIVE EMERGENCY PATHWAY

## Protocol 23: Accurate Measurement, Target-Organ-Damage Recognition, Controlled Blood-Pressure Reduction, Cause-Specific Treatment, Monitoring, and Safe Disposition

DRAFT FOR EMERGENCY MEDICINE, INTERNAL MEDICINE, CARDIOLOGY, NEUROLOGY, STROKE, NEPHROLOGY, OBSTETRICS, PAEDIATRICS, ANAESTHESIA, CRITICAL CARE, PHARMACY, LABORATORY, RADIOLOGY, EMS, TRANSFER, AND CLINICAL-GOVERNANCE REVIEW

**STATUS:** This is a draft clinical-governance document. Exact triage categories, blood-pressure thresholds, target ranges, drug selection, doses, infusion concentrations, monitoring intervals, arterial-line requirements, pregnancy regimens, paediatric targets, specialty contacts, transfer criteria, and follow-up intervals must be reconciled with current national guidance, local formulary, available monitoring, specialist capability, and approved linked pathways before implementation.

**IMMEDIATE SAFETY RULE:** A high number alone does not define a hypertensive emergency. Confirm the measurement, identify acute target-organ damage, and lower blood pressure with a titratable cause-specific plan. Do not rapidly normalize blood pressure in an asymptomatic patient or use an uncontrolled short-acting treatment that can cause cerebral, coronary, renal, or placental hypoperfusion.

Document control	Details
Document owner	Emergency Department / Medical Services Directorate / Nursing Services / Clinical Governance
Clinical leads	Emergency Medicine; Internal Medicine; Cardiology; Neurology / Stroke; Nephrology; Obstetrics; Anaesthesia / Critical Care
Supporting departments	Paediatrics; Pharmacy; Laboratory; Radiology; Ophthalmology; EMS; Patient Transport / Transfer Coordination
Applies to	All staff involved in recognition, triage, measurement, stabilization, investigation, treatment, monitoring, referral, transfer, admission, discharge, and follow-up of patients with markedly elevated blood pressure.
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Related protocols	Protocol 3 Chest Pain / ACS; Protocol 6 Acute Dyspnoea; Protocol 17 Altered Mental Status; Protocol 18 Stroke / TIA; Protocol 20 Severe Headache / Intracranial Emergency; Protocol 22 Arrhythmias; Protocol 38 Obstetric Emergencies; Protocol 28 AKI / Electrolytes; Protocol 29 Poisoning / Intoxication.

## 1. Purpose

To provide a standardized emergency-department pathway for patients with severe or markedly elevated blood pressure, emphasizing accurate measurement, rapid detection of acute target-organ damage, safe cause-specific blood-pressure reduction, treatment of the precipitating illness, and reliable disposition from first contact through discharge, admission, critical care, or transfer.

## 2. Scope

This protocol applies to adults presenting with severe hypertension, suspected hypertensive emergency, or an acute illness in which blood-pressure control is central to treatment. It provides escalation principles for pregnancy, postpartum patients, children, adolescents, older adults, renal failure, transplant recipients, and toxicological or autonomic crises. It does not replace linked stroke, intracranial haemorrhage, aortic, acute coronary syndrome, heart failure, obstetric, paediatric, renal, or toxicology pathways.

## 3. Core policy statements

- Hypertensive emergency is defined by new or worsening acute target-organ damage attributable to severe blood-pressure elevation, not by a blood-pressure threshold alone. It can occur below 180/120 mmHg when the rise is abrupt, especially in pregnancy, children, or previously normotensive patients.

- Every markedly elevated reading must be interpreted after rapid validation of cuff size, technique, device reliability, patient position, pulse regularity, and clinical context. Measurement confirmation must not delay resuscitation or treatment of obvious organ damage.
- A patient with acute neurological deficit, encephalopathy, intracranial haemorrhage, aortic syndrome, myocardial ischaemia, acute pulmonary oedema, eclampsia, severe renal injury, microangiopathy, or catecholamine crisis requires immediate disease-specific management and monitored titratable therapy.
- Most hypertensive emergencies require a controlled initial reduction, commonly no more than 20-25% of mean arterial pressure in the first hour, followed by gradual reduction. Aortic syndromes, stroke, intracranial haemorrhage, pregnancy, and catecholamine crises have different targets and override the generic rule.
- Asymptomatic markedly elevated blood pressure without acute target-organ damage usually does not require IV treatment, emergency normalization, or admission solely for the number. Address reversible contributors, restart or adjust appropriate oral therapy, and secure timely follow-up.
- Immediate-release sublingual or bitten nifedipine must not be used for routine non-obstetric rapid blood-pressure reduction. Immediate-release oral nifedipine in pregnancy is a distinct evidence-based obstetric regimen and must follow the approved maternity pathway.
- Pain, urinary retention, hypoxia, agitation, withdrawal, medication omission, iatrogenic fluid overload, and acute illness may drive blood pressure and must be treated without assuming every high reading is the primary disease.
- Disposition must reflect the affected organ, treatment response, monitoring needs, baseline risk, medication access and adherence, social safety, follow-up reliability, and ownership of pending results.

## 4. Definitions

Term	Operational definition
Severe / markedly elevated blood pressure	A substantially elevated reading, commonly SBP at or above 180 mmHg and/or DBP at or above 120 mmHg in adults. This is a screening threshold, not a diagnosis of emergency.
Hypertensive emergency	Severe blood-pressure elevation with acute new or worsening target-organ damage requiring prompt, controlled, usually IV treatment in a monitored setting.
Asymptomatic markedly elevated blood pressure	Markedly elevated blood pressure without symptoms or objective evidence of acute target-organ damage. Chronic injury or cardiovascular risk may still be present.
Acute target-organ damage	Acute brain, retinal, aortic, cardiac, pulmonary, renal, haematological, or placental injury attributable to hypertension.
Hypertensive encephalopathy	Diffuse cerebral dysfunction from failure of autoregulation, producing headache, visual disturbance, confusion, seizures, or reduced consciousness, often with reversible posterior-predominant oedema on imaging.
Malignant hypertension	Severe hypertension with advanced hypertensive retinopathy, often accompanied by microangiopathy and renal injury. Terminology varies; describe the actual organ findings.
Mean arterial pressure	An estimate of average arterial pressure, commonly DBP + one-third of pulse pressure. It supports percentage-reduction calculations but does not replace clinical perfusion assessment.
Compelling condition	An emergency in which the diagnosis determines a distinct blood-pressure and heart-rate target, such as aortic syndrome, stroke, intracranial haemorrhage, eclampsia, or catecholamine crisis.
Pseudo-resistance / pseudo-elevation	An apparently high reading due to poor technique, wrong cuff size, device error, pain, agitation, white-coat effect, nonadherence, or interfering substances rather than treatment-resistant hypertension.

## 5. Roles and accountability

Role	Minimum responsibility
Triage / first-contact clinician	Recognize dangerous symptoms, obtain and validate blood pressure, identify pregnancy, perform rapid neurological and cardiopulmonary screening, prioritize monitored placement, and activate resuscitation or specialty pathways.
Lead ED clinician	Direct ABCDE care; determine whether acute target-organ damage exists; define the compelling condition and target; select titratable treatment; coordinate specialty advice; and own disposition.

Role	Minimum responsibility
Nursing team	Repeat measurements with correct technique, establish monitoring and IV access, administer high-risk medicines with required checks, document response, detect deterioration, and support transfer.
Critical care / anaesthesia	Support arterial-line monitoring, airway and ventilation, vasoactive infusions, refractory pulmonary oedema or shock, and ICU admission or transport.
Cardiology / vascular / cardiothoracic	Advise on aortic syndrome, ACS, acute heart failure, resistant emergency, myocardial injury, and definitive intervention.
Neurology / stroke / neurosurgery	Direct disease-specific targets for ischaemic stroke, ICH, SAH, PRES, raised intracranial pressure, and neurovascular transfer.
Nephrology	Advise on AKI, dialysis, glomerular disease, thrombotic microangiopathy, resistant hypertension, and renally appropriate treatment.
Obstetrics / maternal medicine	Direct severe hypertension in pregnancy or postpartum, pre-eclampsia/eclampsia management, magnesium sulfate, fetal assessment, and timing/location of delivery.
Paediatrics	Direct age/size-specific thresholds, gradual reduction, investigation of secondary causes, and transfer for children and adolescents.
Pharmacy / laboratory / radiology	Support infusion preparation, interaction and contraindication review, rapid critical results, disease-specific imaging, and protocolized access to emergency drugs.
Transfer coordinator / EMS	Secure receiving acceptance, monitored transport, trained escort, infusion/oxygen/battery capacity, and direct handover.

## 6. Pathway activation and triage

Category	Operational criteria
RED / immediate resuscitation	Severe BP with acute neurological deficit, seizure, coma, severe confusion, suspected ICH/SAH, tearing chest/back pain or pulse deficit, acute pulmonary oedema, ongoing myocardial ischaemia, shock, eclampsia, severe pre-eclampsia symptoms, aortic syndrome, or rapidly progressive organ failure.
ORANGE / very urgent	Persistent severe BP with severe headache or visual symptoms, AKI/oliguria, papilloedema/retinal haemorrhage, troponin-positive injury, haemolysis/thrombocytopenia, recent stimulant/MAOI exposure, abrupt medication withdrawal, postpartum state, or concerning but currently stable symptoms.
YELLOW / urgent	Markedly elevated BP without current organ-damage symptoms but with significant comorbidity, medication lapse, pregnancy possibility, renal disease, recent stroke/ACS, repeated readings, poor follow-up, or uncertainty about acute injury.
GREEN / routine	Only after clinician assessment confirms no acute target-organ damage, repeat measurements are reliable, serious contributors are addressed, and a safe oral-treatment and follow-up plan is established. Triage colour must follow the local system.
<b>DO NOT MISS:</b> A normal neurological examination does not exclude aortic syndrome, acute coronary syndrome, pulmonary oedema, retinal injury, renal emergency, pre-eclampsia, or catecholamine crisis. Conversely, headache or anxiety alone does not prove hypertensive encephalopathy.	

## 7. First 10 minutes: parallel action

Action	Required practice
Confirm immediate threats	ABCDE assessment; cardiac monitor and oximetry when symptomatic; glucose for neurological change; IV access; resuscitation and disease-specific pathway activation without waiting for full investigations.

Action	Required practice
Validate blood pressure	Repeat using correct cuff on a bare supported arm; use manual confirmation when device/rhythm is unreliable; compare both arms when aortic disease is possible; document position, arm, cuff, device, and repeat values.
Identify target-organ damage	Rapid neurological examination, GCS, pupils, speech and limbs; chest/back pain and pulses; dyspnoea and crepitations; ECG; urine output; pregnancy status; headache/vision/epigastric symptoms; fundoscopy when feasible.
Define the compelling condition	Stroke/ICH/SAH, hypertensive encephalopathy/PRES, aortic syndrome, ACS, pulmonary oedema, renal/microangiopathic emergency, pregnancy/eclampsia, or toxicological/catecholamine crisis.
Choose target before drug	Record the intended BP/heart-rate target, time window, agent, contraindications, reassessment interval, and escalation plan. Do not begin a potent infusion without a defined endpoint.
Treat contributors	Analgesia, oxygenation/ventilation, bladder decompression when indicated, seizure treatment, withdrawal management, medication reconciliation, and treatment of sepsis or volume overload.
Reassess continuously	Repeat BP, perfusion, symptoms, mental state, urine output, ECG/oxygenation, and organ-specific findings after every titration. Stop or reduce therapy if hypoperfusion develops.

## 8. Accurate blood-pressure measurement

- Use a validated device and an appropriately sized cuff: a cuff that is too small overestimates pressure. Remove constricting clothing and support the arm at heart level. Use the same arm and position for trending unless bilateral comparison is clinically required.
- When the patient is stable enough, allow brief quiet rest and repeat at least once. In a symptomatic emergency, obtain a reliable repeat promptly but do not delay treatment of clear organ damage.
- If atrial fibrillation, frequent ectopy, tremor, severe vasoconstriction, obesity, or device error makes automated readings unreliable, perform careful manual auscultation or use an approved alternative cuff/site. Consider an arterial line for rapidly titrated IV therapy.
- Measure both arms when acute aortic syndrome, subclavian disease, or an unexplained pressure discrepancy is suspected. Use the higher reliable arm for treatment decisions unless specialist guidance states otherwise.
- Review prior baseline values. A rapid rise from normal may be more dangerous than a chronically tolerated high reading. Document pain, agitation, recent activity, temperature, bladder fullness, and medication timing.

## 9. Immediate stabilization: ABCDE

### 9.1 Airway and breathing

- Protect the airway in coma, recurrent seizure, vomiting, or severe encephalopathy. Use oxygen for hypoxaemia and ventilatory support for pulmonary oedema or respiratory failure.
- Non-invasive ventilation and vasodilator therapy may be urgently required in hypertensive acute pulmonary oedema. Intubation can cause abrupt haemodynamic swings; use an experienced airway plan with pre-induction targets and post-intubation reassessment.
- Avoid unnecessary hyperventilation in neurological emergencies except as a temporary rescue for impending herniation under the linked protocol.

### 9.2 Circulation

- Assess pulses, perfusion, jugular venous pressure, heart sounds, lung fields, oedema, urine output, and signs of aortic regurgitation or heart failure. Severe hypertension can coexist with intravascular depletion, especially in pressure natriuresis or pre-eclampsia.
- Establish IV access; use an infusion pump for titratable agents. Place an arterial line when rapid beat-to-beat control, repeated boluses, aortic syndrome, refractory emergency, or unreliable non-invasive measurement makes it necessary and available.
- Do not give routine fluid boluses solely because antihypertensive therapy is planned. Treat documented hypovolaemia cautiously and avoid worsening pulmonary oedema.

### 9.3 Disability and exposure

- Document GCS, pupils, visual symptoms, speech, focal deficit, coordination when safe, seizure activity, and glucose. Activate Protocol 17 for altered consciousness, Protocol 18 for focal deficit, and Protocol 20 for severe headache/meningism/intracranial concern.
- Assess pregnancy/postpartum status, epigastric or right-upper-quadrant pain, oedema, hyperreflexia/clonus, rash, stimulant patches or ingestion, autonomic features, dialysis access, transplant status, and medication containers.

- Perform fundoscopy when feasible without delaying imaging or treatment. Papilloedema, flame haemorrhages, cotton-wool spots, or severe retinopathy support acute vascular injury and require escalation.

## 10. Distinguishing emergency from asymptomatic elevation

Question	Interpretation
Is the reading reliable?	Repeat with correct technique and cuff. Check device error, arrhythmia, tremor, movement, and position. Treat obvious organ damage while confirming.
Are symptoms new and compatible?	Neurological deficit, confusion, seizure, visual loss, chest/back pain, dyspnoea, oliguria, pregnancy symptoms, or severe autonomic/toxic features raise concern. Nonspecific headache or anxiety requires evaluation but is not diagnostic.
Is there objective acute injury?	Look for acute imaging, ECG/troponin, pulmonary oedema, creatinine/urine change, retinal findings, haemolysis/thrombocytopenia, or placental/maternal complications.
Is another disease driving the BP?	Pain, sepsis, hypoxia, urinary retention, withdrawal, medication omission, intracranial disease, stimulant exposure, endocrine crisis, or iatrogenic factors may be primary.
Would rapid reduction cause harm?	Chronic severe hypertension shifts autoregulation. Uncontrolled falls can cause watershed cerebral infarction, myocardial ischaemia, AKI, syncope, or fetal compromise.
Is there a compelling condition?	If yes, use the condition-specific target. If no acute injury is found, avoid IV therapy and emergency normalization.

## 11. Focused history and examination

Domain	Essential questions / findings
Timeline and baseline	Onset and peak readings; prior hypertension; usual BP; recent control; previous emergencies; abrupt versus gradual rise; home readings and device validity.
Symptoms	Headache, vision change, confusion, weakness, speech change, seizure, syncope, chest/back/abdominal pain, dyspnoea, orthopnoea, palpitations, nausea/vomiting, oliguria, haematuria, epigastric pain.
Medication	Current agents, doses, last taken, recent change, nonadherence, clonidine or beta-blocker withdrawal, NSAIDs, steroids, decongestants, stimulants, hormonal therapy, calcineurin inhibitors, erythropoietin, herbal products.
Substances / toxins	Cocaine, amphetamines, synthetic stimulants, MDMA, MAOI interaction, tyramine, alcohol or sedative withdrawal, sympathomimetics, nicotine, liquorice, contaminated supplements.
Secondary causes	Renal disease, renal artery disease, endocrine symptoms, sleep apnoea, pheochromocytoma history, coarctation, pregnancy, autoimmune disease, transplant, dialysis, recent surgery.
Neurological / eye	GCS, orientation, focal deficit, pupils, visual fields, gait if safe, clonus, seizure, fundal changes.
Cardiovascular / vascular	Both-arm BP, pulse symmetry, new murmur, gallop, JVP, perfusion, bruits, chest/back tenderness, signs of aortic regurgitation.
Respiratory / renal / pregnancy	Crepitations, work of breathing, oedema, urine output, bladder distension; gestation/postpartum interval, fetal movement, bleeding, contractions, pre-eclampsia symptoms.

## 12. Targeted investigations

Investigation	Indication / interpretation
12-lead ECG and monitoring	All suspected emergencies and symptomatic patients; identify ischaemia, strain, arrhythmia, electrolyte/toxic patterns. Serial ECG/troponin if ACS or myocardial injury is possible.

Investigation	Indication / interpretation
CBC, electrolytes, urea/creatinine, glucose	Assess anaemia, thrombocytopenia, renal injury, potassium/sodium disturbance, haemoconcentration, and treatment safety.
Urinalysis and urine protein	Blood/protein and pregnancy-related proteinuria; compare creatinine and urine output with baseline. Urine microscopy when glomerular disease is suspected.
Troponin / BNP or NT-proBNP	When chest pain, dyspnoea, pulmonary oedema, ECG change, or myocardial injury is suspected. Interpret in renal disease and clinical context.
Haemolysis / microangiopathy panel	Blood film, LDH, bilirubin, haptoglobin, platelets, coagulation as indicated for malignant hypertension, TMA, HELLP, or DIC. Do not assume all TMA is hypertension-mediated.
Pregnancy testing and obstetric labs	All patients with pregnancy possibility when relevant; include platelets, creatinine, transaminases, urine protein assessment, fetal evaluation, and other tests under the obstetric pathway.
Chest radiograph / point-of-care ultrasound	Pulmonary oedema, cardiomegaly, alternative respiratory diagnosis, gross aortic concern; POCUS may support heart failure but does not exclude dissection.
CT/CTA/MRI brain	Acute neurological deficit, altered consciousness, seizure, severe headache, visual loss, suspected ICH/SAH/PRES or other intracranial emergency. Follow linked protocols.
CTA aorta	Abrupt severe chest/back/abdominal pain, pulse/BP differential, new aortic regurgitation, neurological deficit with pain, known aneurysm, or other high-risk acute aortic features.
Other cause-specific tests	Toxicology/ethanol, thyroid studies, metanephrines only when appropriate after stabilization, renal imaging, echocardiography, transplant drug levels, or infection studies according to presentation.

### 13. General principles of emergency blood-pressure reduction

**BEFORE THE FIRST DOSE:** Document the diagnosis, starting BP, target and time window, preferred agent, contraindications, monitoring frequency, and rescue plan for overshoot hypotension.

- Use a short-acting, titratable IV agent in a monitored environment for most hypertensive emergencies. Match the drug to the affected organ and comorbidity rather than choosing solely from availability.
- In a general hypertensive emergency without a compelling alternative target, reduce mean arterial pressure by no more than about 20-25% during the first hour, then toward approximately 160/100-110 mmHg over the next 2-6 hours if stable, followed by cautious normalization over 24-48 hours.
- Avoid rapid uncontrolled bolus stacking. Allow time for each intervention to act, trend symptoms and perfusion, and use an infusion pump. Smooth sustained control is preferable to oscillation.
- If neurological deterioration, chest pain, oliguria, rising lactate, new ECG change, syncope, or other hypoperfusion occurs, stop or reduce treatment, reassess the diagnosis and measurement, support perfusion, and obtain senior/specialist help.
- Treat the cause and the pressure together: anti-impulse therapy for dissection, reperfusion pathway for stroke/ACS, nitrates and ventilation for pulmonary oedema, magnesium and obstetric therapy for eclampsia, alpha-directed therapy for catecholamine excess.
- Transition from IV to oral therapy only after the emergency is controlled, organ status is stable, oral absorption is reliable, and overlap/monitoring prevents rebound.

### 14. Condition-specific blood-pressure targets

Clinical condition	Operational target / caution
General hypertensive emergency	Lower MAP by no more than 20-25% in the first hour; then toward about 160/100-110 over 2-6 hours if stable; gradual further control over 24-48 hours.
Acute aortic syndrome	Begin anti-impulse therapy immediately. Target SBP below 120 mmHg or the lowest pressure that maintains organ perfusion, with heart rate 60-80/min. Give beta-blockade before an added vasodilator unless contraindicated.
Acute ischaemic stroke - thrombolysis	Follow the stroke protocol: BP below 185/110 mmHg before IV thrombolysis and below 180/105 mmHg during the first 24 hours after treatment, with smooth control.



Clinical condition	Operational target / caution
Acute ischaemic stroke - no reperfusion	Do not routinely lower unless BP is extreme (commonly above 220/120) or another emergency exists. When treatment is required, a cautious reduction of about 15% in the first 24 hours is commonly used; follow Protocol 18.
Spontaneous intracerebral haemorrhage	For selected mild-to-moderate ICH presenting with SBP 150-220, smooth reduction toward 140 and maintenance around 130-150 may be reasonable; avoid lowering below 130. Individualize severe/large ICH and follow Protocol 20/stroke guidance.
Aneurysmal subarachnoid haemorrhage	Avoid severe hypertension, hypotension, and variability; use short-acting therapy and an agreed neurovascular target that preserves cerebral perfusion until the aneurysm is secured.
Acute pulmonary oedema / ACS	Relieve pulmonary congestion or ischaemia with titratable vasodilator and disease-specific therapy; reduce pressure promptly but avoid excessive fall, especially low diastolic pressure in coronary disease.
Pre-eclampsia / eclampsia	Treat persistent SBP at or above 160 and/or DBP at or above 110 urgently under the obstetric pathway, usually aiming below the severe range while preserving maternal and fetal perfusion. Magnesium sulfate treats seizure risk, not BP.
Catecholamine / sympathomimetic crisis	Control agitation and hyperthermia; use alpha-directed or vasodilator therapy as indicated. Do not give isolated beta-blockade before adequate alpha control in pheochromocytoma.
Paediatric emergency	Use age/sex/height thresholds and paediatric specialist targets. Avoid adult targets; commonly no more than 25% of the planned reduction in the first 8 hours, then gradual control over 24-48 hours.

## 15. Hypertensive encephalopathy and PRES

- Suspect with severe hypertension plus diffuse headache, confusion, visual disturbance, nausea/vomiting, seizure, or reduced consciousness without a better immediate explanation. Focal deficits, sudden maximal headache, fever, or trauma require parallel exclusion of stroke, ICH, SAH, infection, venous thrombosis, and other intracranial disease.
- Perform urgent brain imaging. MRI is more sensitive for PRES but CT may identify haemorrhage or alternative emergencies. Do not delay initial controlled treatment in a critically ill patient.
- Use titratable IV therapy and controlled reduction, generally following the 20-25% MAP first-hour rule unless another neurovascular diagnosis dictates a different target. Treat seizures and airway compromise promptly.
- Identify precipitants such as renal failure, eclampsia, autoimmune disease, cytotoxic or immunosuppressive therapy, transplant medication, and abrupt hypertension. Admit to a monitored setting and involve neurology/critical care.

## 16. Acute ischaemic stroke, ICH, and SAH

- Activate the stroke or intracranial-emergency pathway immediately. Record last-known-well time, anticoagulants, neurological score, glucose, and exact BP timeline. Blood-pressure treatment must not delay non-contrast CT or vascular imaging.
- For thrombolysis candidates, use approved short-acting agents to reach and maintain the reperfusion threshold without excessive variability. Repeated failure to control BP may alter eligibility and requires stroke-team direction.
- For patients not receiving reperfusion, permissive hypertension is often appropriate unless BP is extreme or another emergency such as aortic syndrome, ACS, pulmonary oedema, encephalopathy, or eclampsia exists.
- In ICH, prioritize smooth early control, anticoagulant reversal, neurosurgical/stroke assessment, and avoidance of hypotension. In SAH, avoid large swings and preserve cerebral perfusion while arranging aneurysm-directed care.

## 17. Acute aortic syndrome

**TIME-CRITICAL: Abrupt severe chest, back, or abdominal pain with pulse/BP differential, neurological deficit, shock, new aortic regurgitation, known aneurysm, connective-tissue disease, or recent aortic procedure requires immediate aortic imaging and specialist transfer planning.**

- Place in resuscitation, establish large-bore IV access, apply continuous monitoring, provide strong analgesia, and obtain urgent cardiothoracic/vascular and critical-care input. Do not allow investigation or transfer logistics to postpone anti-impulse therapy.
- Use IV esmolol or labetalol, according to local formulary and contraindications, to reduce heart rate and aortic shear. If SBP remains above target after rate control, add a titratable vasodilator such as nicardipine or clevidipine.
- Avoid starting a pure vasodilator before rate control because reflex tachycardia may increase aortic wall stress. If beta-blockade is contraindicated, obtain immediate specialist advice for an alternative rate-control strategy.
- Target SBP below 120 mmHg or the lowest maintaining adequate organ perfusion and HR 60-80/min. Arrange arterial-line monitoring and definitive transfer/intervention.

## 18. Acute coronary syndrome and hypertensive pulmonary oedema

- Treat ACS under the chest-pain/reperfusion pathway. Hypertension may increase myocardial oxygen demand, but aggressive lowering can reduce coronary perfusion, particularly when diastolic pressure falls.
- In hypertensive acute pulmonary oedema, prioritize upright positioning, oxygen for hypoxaemia, early non-invasive ventilation when indicated, and rapidly titrated IV nitroglycerin when not contraindicated. Diuretics are appropriate for volume overload but act less rapidly than ventilation and vasodilation in abrupt afterload-driven oedema.
- Avoid routine beta-blocker initiation during acute decompensated pulmonary oedema. Select an alternative agent if tachycardia/ACS does not justify beta-blockade or if perfusion is marginal.
- Use serial ECG, troponin, oxygenation, lung examination/POCUS, urine output, and symptom response. Escalate to critical care for refractory distress, hypoxaemia, ischaemia, arrhythmia, or shock.

## 19. Acute kidney injury, malignant hypertension, and microangiopathy

- Assess baseline renal function, urine output, urinalysis/protein, haemolysis and platelet count. Severe hypertension can cause AKI and microangiopathy, but primary thrombotic thrombocytopenic purpura, haemolytic uraemic syndrome, glomerulonephritis, scleroderma renal crisis, and pregnancy-related disease require distinct treatment.
- Use titratable IV therapy with frequent creatinine, potassium, fluid balance, and perfusion assessment. Avoid abrupt pressure reduction and nephrotoxic contrast unless the diagnostic benefit outweighs risk.
- Contact nephrology early for rapidly worsening renal function, oliguria/anuria, dialysis requirement, severe electrolyte disorder, suspected TMA/glomerular disease, transplant involvement, or resistant emergency.
- Dialysis patients may present with volume overload, missed treatment, hyperkalaemia, medication omission, or access complications. Coordinate urgent dialysis when indicated rather than relying on antihypertensive drugs alone.

## 20. Pregnancy and postpartum severe hypertension

- Any pregnant or recently postpartum patient with persistent BP at or above 160/110 mmHg, severe headache, visual symptoms, epigastric/right-upper-quadrant pain, dyspnoea, neurological symptoms, seizure, thrombocytopenia, renal/liver dysfunction, or fetal concern requires immediate obstetric assessment and monitored care.
- Confirm severe BP promptly, but do not create prolonged delay through repeated measurements. Use the locally approved acute regimen: IV labetalol, IV hydralazine, or immediate-release oral nifedipine are commonly accepted first-line options when appropriate.
- Give magnesium sulfate for eclampsia and for seizure prophylaxis when indicated by the obstetric pathway. Magnesium is not an antihypertensive; respiratory rate, reflexes, renal function, and toxicity rescue must be monitored.
- Avoid ACE inhibitors, ARBs, renin inhibitors, and nitroprusside during pregnancy unless an exceptional specialist-directed rescue indication exists. Position to reduce aortocaval compression when appropriate and involve anaesthesia/neonatal teams early.
- Postpartum pre-eclampsia can first present after delivery. Continue surveillance for pulmonary oedema, stroke, cardiomyopathy, renal/liver injury, and recurrent seizure. Discharge only with a written BP, medication, symptom, and follow-up plan.

## 21. Catecholamine, toxicological, and autonomic crises

Situation	Immediate management principle
Cocaine / amphetamine / sympathomimetic	Treat agitation, seizure, and hyperthermia; use benzodiazepines and vasodilator/alpha-directed therapy under toxicology guidance. Evaluate ACS, aortic disease, rhabdomyolysis, and sodium disturbance.
Pheochromocytoma crisis	Urgent endocrinology/critical-care input. Use alpha blockade or phentolamine/vasodilator under protocol; add beta-blockade only after adequate alpha control when tachyarrhythmia persists.
MAOI / tyramine or drug interaction	Stop offending agents, control hyperthermia/agitation, and obtain poison-centre advice. Avoid agents that worsen the interaction.
Clonidine withdrawal	Restart clonidine when safe and use controlled adjunctive therapy; watch for agitation, tachycardia, and rebound. Avoid unopposed beta-blockade in a catecholamine-dominant state.
Beta-blocker withdrawal / thyrotoxicosis	Treat the underlying syndrome and use specialist-directed rate/BP control. Screen for ACS and heart failure.
Autonomic dysreflexia	In spinal cord injury, sit upright, loosen constriction, search immediately for bladder/bowel/skin trigger, and use short-acting therapy if pressure remains dangerous.



## 22. Emergency IV antihypertensive selection

Agent	Typical adult use and key cautions
Nicardipine infusion	Broadly useful for neurological and renal emergencies; titratable. Use caution in acute heart failure and monitor for tachycardia, headache, and phlebitis. Follow local concentration and titration chart.
Clevidipine infusion	Very rapid titration and short offset; useful when minute-to-minute control is needed. Follow product restrictions and lipid-emulsion precautions; not universally available.
Labetalol bolus/infusion	Useful in many neurological and pregnancy settings and in aortic syndrome. Avoid or use extreme caution in asthma/bronchospasm, bradycardia, high-grade block, cardiogenic shock, and acute decompensated heart failure.
Esmolol infusion	Preferred short-acting anti-impulse beta-blocker for aortic syndrome and selected catecholamine/tachycardic states. Requires close HR/BP monitoring.
Nitroglycerin infusion	Preferred for ACS and hypertensive pulmonary oedema; limited as sole therapy for encephalopathy. Avoid with recent PDE-5 inhibitor use, severe right-ventricular/preload-dependent states, or marked hypotension.
Sodium nitroprusside	Potent balanced vasodilator for selected refractory emergencies. Requires intensive monitoring; avoid/caution in pregnancy, raised intracranial pressure, renal/hepatic failure, and prolonged/high-dose use because of cyanide/thiocyanate toxicity.
Hydralazine IV	Accepted in pregnancy pathways; response can be variable and prolonged. Generally not preferred for routine non-obstetric titration.
Phentolamine IV	For catecholamine excess such as pheochromocytoma or selected sympathomimetic crises. Monitor for tachycardia and hypotension; follow corrected current monograph.
Enalaprilat IV	Occasional role in high-renin states or selected heart failure; less titratable and can worsen AKI/hyperkalaemia. Contraindicated in pregnancy and bilateral renal artery stenosis.
Fenoldopam infusion	Titrated arterial vasodilator with renal blood-flow effects; may cause tachycardia, headache, flushing, and increased intraocular pressure; availability varies.

Medication doses, preparation, line compatibility, titration limits, contraindications, and independent-check requirements must be supplied in a locally approved high-risk infusion chart. The patient-specific order must state the desired target and titration interval.

## 23. Children and adolescents

- Use paediatric percentiles and the child's age, sex, height, clinical state, and baseline. Severe hypertension may reflect renal, endocrine, vascular, neurological, medication, toxin, or pain-related causes and requires early paediatric/nephrology involvement.
- Treat acute encephalopathy, seizure, heart failure, AKI, or retinal injury in a monitored setting with weight-based titratable therapy. Avoid adult thresholds, adult dose cards, and abrupt normalization.
- Document the planned percentage reduction and time course. A common principle is no more than 25% of the intended reduction during the first 8 hours and gradual normalization over 24-48 hours, individualized by the specialist team.
- Consider safeguarding, accidental/intentional ingestion, stimulant products, renal disease, coarctation, and adherence. Transfer early when paediatric critical care or subspecialty capability is limited.

## 24. Older adults, frailty, renal disease, and special circumstances

- Older adults and patients with chronic severe hypertension may be particularly vulnerable to orthostatic, cerebral, coronary, and renal hypoperfusion. Use smaller titration steps, frequent neurological and mobility assessment, and medication reconciliation.
- In frailty, dementia, or limited physiological reserve, establish baseline cognition/function, goals of care, and acceptable monitoring burden while still treating reversible life-threatening organ damage.
- In advanced CKD or dialysis, account for volume status, potassium, medication clearance, and dialysis timing. In transplant recipients, check calcineurin-inhibitor interactions/levels and consider PRES.
- In acute spinal cord injury or autonomic failure, BP behaviour and treatment response may be atypical. Seek specialist input and correct the trigger.
- In suspected scleroderma renal crisis, obtain urgent nephrology/rheumatology input; ACE-inhibitor treatment is disease-specific and should not be delayed by generic concerns when the diagnosis is credible.

## 25. Asymptomatic markedly elevated blood pressure

- Repeat and validate the measurement, obtain a focused symptom and organ-damage assessment, review medications/substances, and compare baseline. Routine extensive testing is not required for every asymptomatic patient; tailor investigations to risk and follow-up reliability.
- Do not use IV medication or attempt rapid normalization solely to improve the number before discharge. Rest, analgesia, treatment of urinary retention or withdrawal, and resumption of missed chronic medication may substantially lower BP.
- Start, restart, or intensify oral therapy when clinically appropriate, considering renal function, potassium, pregnancy, interactions, previous intolerance, and access. Avoid giving multiple unfamiliar long-acting drugs without a follow-up and laboratory plan.
- Address adherence barriers, cost, health literacy, home BP technique, supply, primary-care access, and social determinants. Provide a written plan and timely reassessment, sooner for very high persistent readings, comorbidity, medication changes, or unreliable follow-up.
- Admission may still be needed for another illness, inability to take medication, severe social risk, pregnancy, progressive renal abnormality, or inability to exclude organ damage; it should not be automatic for the BP value alone.

## 26. Monitoring, observation, and reassessment

Situation	Minimum monitoring / reassessment
IV antihypertensive infusion	Continuous ECG and oximetry when clinically indicated, frequent non-invasive BP or arterial-line monitoring, defined target and titration interval, urine output, and symptom/perfusion checks.
Neurological emergency	Serial GCS/neurological score, pupils, headache/vision, glucose, BP variability, and repeat imaging or specialist reassessment as indicated.
Aortic syndrome	Continuous monitoring, arterial line where available, HR and SBP target, pain, pulses, neurological status, urine output, lactate/perfusion, and definitive-transfer timeline.
Pulmonary oedema / ACS	Continuous ECG/oximetry, frequent BP, respiratory effort, NIV response, chest pain, serial ECG/troponin, urine output, and signs of shock.
Pregnancy / postpartum	Frequent BP, symptoms, reflexes/respiratory monitoring if magnesium, fluid balance, labs, fetal assessment when applicable, and direct obstetric oversight.
Asymptomatic severe BP	Repeat reliable readings after rest/intervention, medication review, selected labs when indicated, oral-treatment response if observed, and confirmed follow-up/return advice.
All patients	Explicit reassessment after every medication dose/titration and before disposition. Record both BP and evidence that cerebral, coronary, renal, peripheral, and placental perfusion remain adequate.

## 27. Consultation, escalation, and transfer

Urgency	Examples
Immediate critical-care / specialty activation	Aortic syndrome; ICH/SAH; thrombolysis/thrombectomy candidate; eclampsia; refractory encephalopathy; acute pulmonary oedema requiring NIV/intubation; ongoing ACS; shock; rapidly progressive AKI/TMA; paediatric emergency.
Urgent specialist review	PRES, malignant retinopathy, persistent severe BP despite initial titration, pregnancy/postpartum concern, transplant/immunosuppressant toxicity, dialysis requirement, suspected secondary crisis, or uncertain target-organ damage.
Transfer standard	Receiving clinician acceptance; defined diagnosis and BP/HR target; functioning monitored transport; infusion pumps with adequate drug/oxygen/battery; trained escort able to titrate and manage deterioration; copies of imaging, ECGs, labs, medication timeline, and resuscitation status.
Do not delay transfer	Do not postpone definitive neurovascular, aortic, cardiac, obstetric, renal, or paediatric transfer merely to achieve a normal BP. Stabilize toward the agreed safe target and continue controlled treatment en route.

## 28. Disposition

Disposition	Typical criteria
Resuscitation / ICU / high-dependency / monitored transfer	Any active hypertensive emergency, IV infusion, neurological deterioration, aortic syndrome, pulmonary oedema, ongoing ischaemia, eclampsia, severe renal/microangiopathic injury, refractory BP, or need for invasive monitoring/organ support.
Monitored admission	Organ injury stabilized but ongoing titration, serial testing, specialist assessment, recurrent symptoms, medication transition, dialysis, or high risk of deterioration.
Observation / short stay	Selected uncertain cases requiring serial BP, ECG/troponin, renal testing, symptom reassessment, oral medication initiation, or expedited specialist plan, with explicit time and exit criteria.
Discharge	No acute target-organ damage; reliable repeated measurement; serious cause excluded or safely addressed; stable clinical state; appropriate oral plan; medication supply; laboratory monitoring when needed; timely follow-up; clear return precautions; patient/carer understanding.
Do not discharge solely because BP fell	A numerical response does not exclude dissection, stroke, ACS, pulmonary oedema, pre-eclampsia, AKI, or toxicological disease. Disposition must be diagnosis- and risk-based.

## 29. Discharge information and safety

- Explain whether this was hypertensive emergency, severe hypertension without acute organ damage, or elevated BP secondary to another illness. Provide the actual repeat values and the intended outpatient target.
- Give a written medication list showing what to start, stop, continue, or restart; timing of the next dose; laboratory tests; common adverse effects; and what to do after a missed dose. Avoid abrupt clonidine or beta-blocker discontinuation.
- Provide home-monitoring instructions: validated upper-arm device, correct cuff, seated rest, arm support, two readings, record symptoms and medicines, and bring the log/device to follow-up.
- Arrange named follow-up and laboratory ownership. A very high persistent reading, new medication, CKD, pregnancy/postpartum state, or poor access requires earlier review than routine chronic hypertension.
- Return immediately for chest/back pain, breathlessness, weakness/numbness, speech or vision change, confusion, seizure, syncope, severe/worsening headache, reduced urine, pregnancy warning symptoms, or medication reaction.

## 30. Documentation and handover

- [ ] All BP readings with time, arm, position, cuff/device, manual confirmation when used, and pre/post treatment values.
- [ ] Symptoms, baseline BP, medication adherence, recent changes/withdrawal, substances, pregnancy/postpartum status, and relevant secondary causes.
- [ ] Objective target-organ assessment: neurological, cardiac, pulmonary, aortic, renal, retinal, haematological, and obstetric findings.
- [ ] Working diagnosis and compelling condition; relevant linked protocol activation and specialist discussions.
- [ ] Starting MAP when percentage reduction is used; desired BP/HR target and time window; rationale for any deviation.
- [ ] Drug, dose, route, concentration, infusion rate, titration, independent check, contraindications, response, overshoot, and adverse effects.
- [ ] Monitoring frequency, perfusion/urine output, neurological status, oxygenation, ECG, and explicit reassessment after each intervention.
- [ ] Investigations and imaging, critical results, pending tests, and named owner.
- [ ] Disposition rationale, receiving service/clinician, transport capability, medication transition, follow-up, and patient understanding.

## 31. Quality indicators and audit

Indicator	Suggested measure
Measurement quality	Percentage with repeat BP documented using correct cuff/technique and arm/position recorded.
Target-organ screening	Percentage of severe-BP presentations with documented neurological, cardiopulmonary, renal, medication, and pregnancy assessment as applicable.
Emergency classification	Percentage correctly classified as hypertensive emergency versus asymptomatic elevation, with organ damage specified.

Indicator	Suggested measure
Defined treatment target	Percentage of IV-treated cases with documented BP/HR goal and time window before or at therapy initiation.
Safe rate of reduction	Percentage without avoidable overshoot hypotension or reduction beyond protocol target; adverse hypoperfusion events reviewed.
Compelling-condition compliance	Stroke, ICH, aortic, ACS/pulmonary oedema, and pregnancy cases meeting disease-specific treatment and consultation standards.
Medication safety	No non-obstetric sublingual immediate-release nifedipine; independent checks and infusion documentation complete.
Transfer safety	Receiving acceptance, target, infusion, escort capability, and direct handover documented.
Discharge continuity	Medication reconciliation, home monitoring, laboratory/follow-up ownership, and return precautions documented.
Equity and access	Barriers to medication, devices, transport, follow-up, language, and health literacy identified and addressed.

## 32. Training and implementation

- All relevant staff must be trained in accurate BP measurement, recognition of target-organ damage, compelling-condition targets, infusion-pump use, and detection of hypoperfusion.
- Simulation should include aortic dissection, ICH, hypertensive pulmonary oedema, eclampsia, paediatric encephalopathy, stimulant crisis, and asymptomatic severe BP where overtreatment must be avoided.
- Approved drug charts, concentrations, titration ranges, contraindications, and line-compatibility information must be available at the bedside and reviewed by pharmacy.
- The protocol must be linked electronically and physically to stroke, aortic, ACS, heart failure, obstetric, renal, paediatric, toxicology, and transfer pathways.
- Serious incidents should examine measurement error, delay in recognizing organ damage, wrong target, drug selection, titration overshoot, monitoring gaps, transfer delay, and failed follow-up rather than focusing only on the final BP.

## ANNEX A. One-page severe-hypertension workflow

Step	Action
1. ABCDE and repeat BP	Treat airway/breathing/circulation threats. Repeat with correct cuff and technique; manual/both arms/arterial line when indicated.
2. Acute organ damage?	Brain/eye, aorta, heart/lung, kidney/blood, placenta. If yes: hypertensive emergency.
3. Identify compelling condition	Stroke/ICH/SAH, encephalopathy/PRES, aortic syndrome, ACS/pulmonary oedema, AKI/TMA, pregnancy/eclampsia, catecholamine crisis.
4. Define target	Write BP/HR goal and time window before titration. Use condition-specific target; otherwise MAP reduction no more than 20-25% in first hour.
5. Treat and monitor	Titrate IV therapy, infusion pump, frequent BP/arterial line, organ perfusion, symptoms, urine output, ECG/oxygenation, serial neuro checks.
6. No acute injury	No IV therapy or rapid normalization. Treat contributors, resume/adjust oral therapy, address adherence/access, arrange timely follow-up.
7. Disposition	Emergency -> monitored admission/transfer. Discharge only when no acute injury, repeat BP reliable, oral/follow-up plan complete, and return precautions understood.

## ANNEX B. Blood-pressure measurement checklist

- ☐ Validated device available and functioning; recent calibration/maintenance confirmed under local policy.
- ☐ Correct cuff bladder size; bare arm; no constricting clothing or IV line under cuff.
- ☐ Patient position documented; arm supported at heart level; legs/torso supported when feasible.
- ☐ Patient not talking or moving; brief rest provided when safe.
- ☐ Repeat measurement obtained; manual confirmation if rhythm/device/clinical picture is inconsistent.

- [ ] Both arms measured when aortic syndrome or vascular discrepancy is possible.
- [ ] Higher reliable arm used for trending unless specialist plan states otherwise.
- [ ] Arterial-line waveform levelled/zeroed and correlated with cuff when used.
- [ ] Pain, agitation, bladder fullness, recent activity, and medication timing recorded.

## ANNEX C. Acute target-organ-damage red-flag card

Organ system	Red flags
Brain / eye	Focal deficit, aphasia, confusion, seizure, reduced GCS, sudden severe headache, visual loss, papilloedema, retinal haemorrhage.
Aorta	Abrupt tearing chest/back/abdominal pain, pulse or BP differential, new aortic regurgitation, neurological deficit with pain, shock.
Heart / lung	Ongoing ischaemic chest pain, dynamic ECG/troponin, acute pulmonary oedema, severe dyspnoea/hypoxaemia, acute heart failure.
Kidney / blood	Rapid creatinine rise, oliguria/anuria, haematuria/proteinuria, haemolysis, schistocytes, thrombocytopenia, severe renin-driven crisis.
Pregnancy / placenta	Persistent 160/110 or higher, severe headache/vision, epigastric pain, clonus, seizure, HELLP features, pulmonary oedema, fetal concern.
Toxic / autonomic	Stimulant or MAOI exposure, hyperthermia/agitation, pheochromocytoma features, clonidine withdrawal, autonomic dysreflexia.

## ANNEX D. Initial investigation card

- [ ] ECG and cardiac monitoring when symptomatic or emergency suspected.
- [ ] CBC, electrolytes, urea/creatinine, glucose; compare baseline.
- [ ] Urinalysis and urine protein assessment when renal/pregnancy concern.
- [ ] Troponin and serial ECG for chest pain, dyspnoea, ECG change, or myocardial injury.
- [ ] Pregnancy test and obstetric labs/fetal assessment when relevant.
- [ ] Blood film, LDH, bilirubin, haptoglobin, platelets/coagulation for TMA/HELLP/malignant hypertension.
- [ ] CXR/POCUS for pulmonary oedema; CTA aorta for high-risk features.
- [ ] Urgent CT/CTA/MRI brain for neurological symptoms under linked protocols.
- [ ] Toxicology, drug levels, renal imaging, echo, or endocrine tests only when presentation supports them.

## ANNEX E. Condition-specific target card

Condition	Target summary
General emergency	MAP -20-25% maximum in first hour -> about 160/100-110 over 2-6 h -> gradual 24-48 h.
Aortic syndrome	SBP <120 or lowest maintaining perfusion; HR 60-80; beta-blocker first.
AIS + thrombolysis	<185/110 before; <180/105 for 24 h after.
AIS without reperfusion	Usually treat only if >220/120 or another emergency; if treated, cautious ~15% first 24 h.
ICH	Selected SBP 150-220: target 140, maintain 130-150; avoid <130.
SAH	Avoid severe hypertension, hypotension, and variability; local neurovascular target.
Pulmonary oedema / ACS	Prompt symptom-directed titration; avoid excessive DBP fall.
Pregnancy / eclampsia	Treat persistent ≥160/110 urgently; obstetric target and regimen.
Paediatric	Specialist percentile/weight-based plan; gradual reduction.

## ANNEX F. IV antihypertensive safety checklist

- [ ] Compelling condition and target documented.
- [ ] Starting BP/MAP and contraindications reviewed.

- [ ] Correct drug, concentration, line, pump, and independent check completed.
- [ ] Titration interval and maximum rate specified in approved chart.
- [ ] Monitoring frequency and arterial-line requirement defined.
- [ ] No pure vasodilator before rate control in aortic syndrome.
- [ ] No labetalol/esmolol in contraindicated bradycardia, block, shock, or severe bronchospasm without senior decision.
- [ ] No nitroprusside in pregnancy or high-risk renal/hepatic/ICP setting without specialist rescue rationale.
- [ ] No non-obstetric sublingual immediate-release nifedipine.
- [ ] Hypotension/hypoperfusion rescue plan and senior contact available.

## ANNEX G. Acute aortic syndrome card

- [ ] High-risk pain/features recognized and CTA/specialist pathway activated.
- [ ] Analgesia, monitoring, IV access, arterial line when available.
- [ ] Esmolol or labetalol initiated for anti-impulse therapy unless contraindicated.
- [ ] HR target 60-80/min; SBP <120 or lowest maintaining perfusion.
- [ ] Vasodilator added only after adequate rate control if still hypertensive.
- [ ] Pulses, neurology, urine output, lactate/perfusion reassessed.
- [ ] Receiving cardiothoracic/vascular service accepted; monitored transfer capable of titration.

## ANNEX H. Neurological emergency card

- [ ] Last-known-well / symptom onset documented; glucose and neurological score recorded.
- [ ] CT/CTA obtained without avoidable delay.
- [ ] Thrombolysis, thrombectomy, ICH, SAH, or PRES pathway identified.
- [ ] Correct disease-specific BP target written before treatment.
- [ ] Short-acting titratable agent used; BP variability minimized.
- [ ] Serial neurological observations and post-treatment imaging plan documented.
- [ ] Anticoagulant reversal, seizure care, airway, and neurosurgical/stroke transfer addressed.

## ANNEX I. Hypertensive pulmonary-oedema / ACS card

- [ ] Upright position, oxygen for hypoxaemia, NIV considered early.
- [ ] Continuous ECG/oximetry, IV access, serial ECG/troponin.
- [ ] IV nitroglycerin titrated when appropriate and contraindications excluded.
- [ ] Volume status assessed; diuretic given when overload is present.
- [ ] Avoided routine acute beta-blocker in decompensated pulmonary oedema.
- [ ] Coronary reperfusion / critical-care pathway activated when indicated.
- [ ] BP, symptoms, work of breathing, perfusion, and urine output reassessed frequently.

## ANNEX J. Pregnancy / postpartum severe-hypertension checklist

- [ ] Gestation and postpartum interval documented; obstetrics notified immediately.
- [ ] Persistent  $\geq 160/110$  confirmed promptly without treatment delay.
- [ ] Headache, vision, RUQ/epigastric pain, dyspnoea, clonus, seizure, bleeding, fetal movement assessed.
- [ ] CBC/platelets, creatinine, transaminases, urine protein, and fetal assessment arranged.
- [ ] Approved labetalol, hydralazine, or immediate-release oral nifedipine regimen selected.
- [ ] Magnesium sulfate given for eclampsia/prophylaxis when indicated with toxicity monitoring.
- [ ] Fluid balance controlled; pulmonary oedema and cardiomyopathy considered.
- [ ] Maternal transfer/delivery plan, neonatal/anaesthetic input, and postnatal follow-up documented.

## ANNEX K. Catecholamine / toxicology danger card

Finding	Response
Stimulant agitation/hyperthermia	Benzodiazepines, cooling, monitoring, toxicology advice; assess ACS/aorta/rhabdomyolysis.
Pheochromocytoma pattern	Alpha-directed therapy / phentolamine and critical-care/endocrine input; beta only after alpha control.



Finding	Response
MAOI interaction	Stop trigger, control agitation/hyperthermia, poison-centre advice, avoid interacting agents.
Clonidine withdrawal	Consider controlled restart plus adjunctive therapy; monitor rebound.
Autonomic dysreflexia	Sit upright, remove trigger, bladder/bowel/skin check, short-acting treatment if persistent.

## ANNEX L. Asymptomatic severe-BP discharge checklist

- ☐ Repeat reliable BP documented; no acute target-organ symptoms or findings.
- ☐ Focused neurological, cardiopulmonary, renal, medication/substance, and pregnancy assessment complete.
- ☐ No IV therapy or rapid normalization performed solely for the number.
- ☐ Pain, anxiety, retention, withdrawal, missed medication, and other contributors addressed.
- ☐ Oral medication plan reconciled for renal function, potassium, pregnancy, interactions, and access.
- ☐ Medication supply and ability to obtain/take treatment confirmed.
- ☐ Home BP technique and written log instructions provided.
- ☐ Named follow-up and required laboratory monitoring booked/communicated.
- ☐ Return precautions understood; pending-result ownership documented.

## ANNEX M. Transfer and handover minimum dataset

- ☐ Working diagnosis and acute organ damage / compelling condition.
- ☐ BP timeline with arm/position/cuff, current BP/HR, target and acceptable range.
- ☐ Neurological, respiratory, perfusion, urine-output, pregnancy/fetal, and pain status.
- ☐ All medications/infusions: concentration, rate, last titration, response, adverse effects, remaining volume.
- ☐ ECGs, imaging and reports, critical labs, anticoagulants, allergies, renal function, pregnancy status.
- ☐ Airway/oxygen/NIV, arterial line, vascular access, monitoring, and anticipated deterioration.
- ☐ Receiving clinician/service acceptance and contingency instructions during transport.
- ☐ Escort skill, pump/oxygen/battery/drug capacity, resuscitation status, and direct handover time.

## ANNEX N. Audit tool

Case review item	Yes / No / N/A / notes
Correct cuff and repeat BP documented	
Acute target-organ damage explicitly assessed	
Hypertensive emergency versus asymptomatic elevation correctly classified	
Compelling condition identified	
BP/HR target and time window documented	
Appropriate titratable agent selected	
Infusion and independent-check documentation complete	
Rate/extent of reduction remained within target	
No avoidable hypoperfusion or overshoot event	
Neurological / aortic / cardiac / obstetric linked pathway followed	
Specialist consultation and transfer timely	
Oral transition and medication reconciliation safe	
Follow-up, labs, home monitoring, and return advice documented	
Access/adherence barriers addressed	

## ANNEX O. Local configuration checklist

- [ ] Approved adult and paediatric BP measurement equipment, cuff range, validation, calibration, and arterial-line policy.
- [ ] Triage categories and time targets for severe BP with neurological, aortic, cardiac, renal, or obstetric red flags.
- [ ] Locally approved condition-specific target chart aligned with current stroke, ICH, SAH, aortic, ACS/HF, pregnancy, renal, and paediatric guidance.
- [ ] Standard concentrations, dose/titration charts, infusion pumps, independent checks, and antidote/rescue procedures for nicardipine, clevidipine, labetalol, esmolol, nitroglycerin, nitroprusside, hydralazine, phentolamine, and other formulary agents.
- [ ] Immediate access to CT/CTA brain and aorta, ECG/troponin, pregnancy/HELLP tests, haemolysis film, renal tests, fundoscopy/ophthalmology, and point-of-care ultrasound.
- [ ] 24-hour contacts for stroke/neurosurgery, cardiology/cardiothoracic/vascular, critical care, nephrology/dialysis, obstetrics/neonatology, paediatrics, toxicology/poison centre, pharmacy, and transfer services.
- [ ] Monitored-bed, arterial-line, NIV, transport-infusion, and escort competencies.
- [ ] Discharge medication supply, validated home-BP device access, primary-care/rapid hypertension clinic, laboratory follow-up, and social-support pathways.
- [ ] Simulation schedule, audit lead, adverse-event review, and protocol-review date.

## ANNEX P. References and source tools

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10. European Society of Cardiology. 2025 ESC Guidelines for the management of cardiovascular disease during pregnancy.
11. World Health Organization and International Committee of the Red Cross. Basic Emergency Care: Approach to the Acutely Ill and Injured. WHO; 2018.
12. Local source tools to attach before approval: BP measurement policy; adult and paediatric medication monographs; high-risk infusion charts; stroke/ICH/SAH, acute aortic syndrome, ACS, pulmonary oedema, pregnancy/eclampsia, renal/TMA, toxicology, critical-care, transfer, and discharge/follow-up pathways.