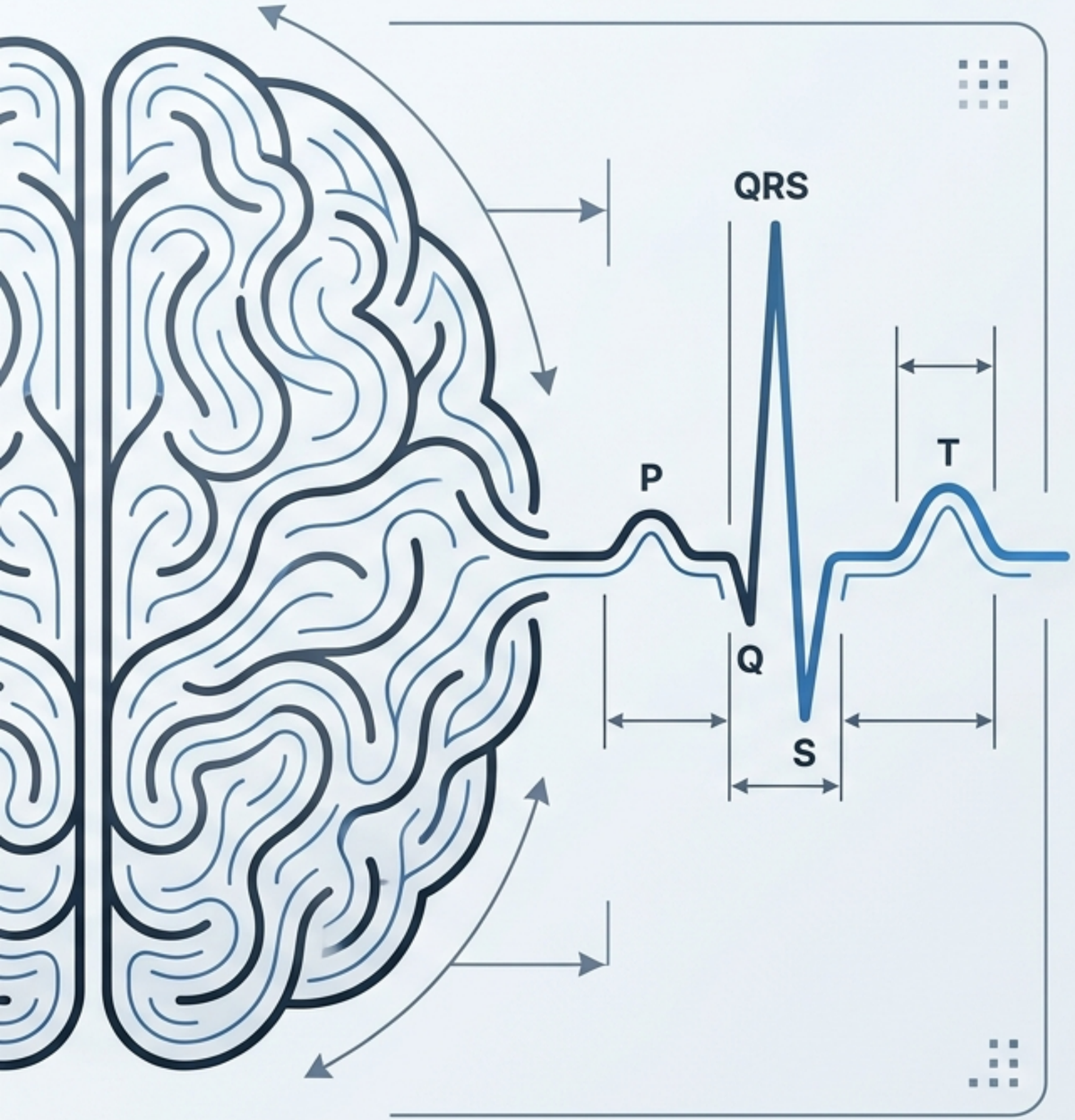


Neurologic Emergencies: The Primary Care Playbook

A rapid-triage and stabilization reference for Australian clinicians.

ACTION PROTOCOLS:
Time is Brain, Spine, and Life.

The urgency of early recognition: 1.9 million neurons lost per minute.

The Stakes

1.9 Million Neurons
Lost Per Untreated Minute

38,000
strokes annually in Australia

~40%
reach hospital in the 4.5h 4.5h window

250,000
living with epilepsy

The Golden Rule

Call 000 First, Investigate Second.

If a patient presents with an acute focal deficit, new seizure, severe headache with neck stiffness, or rapidly progressive weakness, do not delay transfer for imaging or blood tests.

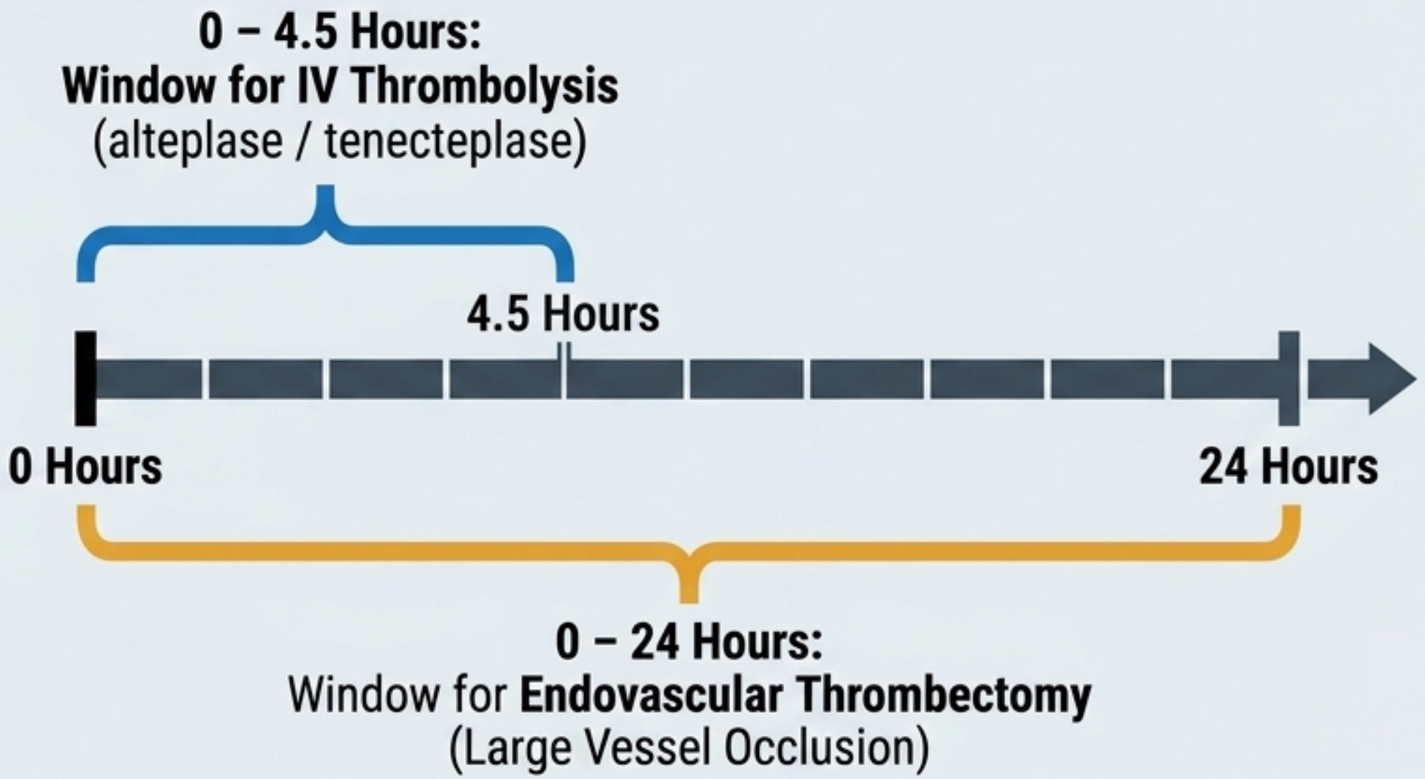
The Neurologic Emergency Master Matrix

Emergency	Primary Red Flags	Immediate GP Action	Critical DO NOT DO
Ischaemic Stroke	BE-FAST signs, <4.5h onset.	Note exact last-known-well time, NBM, 30° head tilt.	**DO NOT** give aspirin, **DO NOT** acutely lower BP.
Status Epilepticus	Seizure ≥5 min or recurrent.	Buccal/IM Midazolam, Recovery position, check BSL.	**DO NOT** insert objects in mouth.
Spinal Compression	Bilateral weakness, sensory level, retention.	IV access, maintain MAP ≥85 mmHg.	**DO NOT** allow patient to mobilize, **DO NOT** wait for GP MRI.
Meningitis/Sepsis	Fever, neck stiffness, petechial rash.	IM Benzylpenicillin or Ceftriaxone.	**DO NOT** delay transfer for Lumbar Puncture.
Progressive Weakness	Ascending areflexia, bulbar weakness.	Sit upright, bedside FVC monitoring.	**DO NOT** administer aminoglycosides (myasthenia).

Acute Stroke: Expanding the diagnostic net with BE-FAST

- **B - Balance:** Ataxia / Vertigo
- **E - Eyes:** Visual loss / Diplopia
- **F - Face:** Droop
- **A - Arms:** Drift
- **S - Speech:** Slurred
- **T - Time:** Last-known-well

Hypoglycemia - Always check BSL immediately. (Primary Stroke Mimic)



Status Epilepticus: Activating the 5-minute threshold

The ILAE Definition:
Seizure ≥5 minutes OR ≥2 seizures without return to baseline.

Immediate 000

Generalized Convulsive (GCSE)

Cyanosis, rhythmic jerking.

Immediate 000

Focal Status

Rhythmic jerking of one limb, preserved consciousness.

Urgent 000

Non-Convulsive (NCSE)

Prolonged altered consciousness, subtle eye blinking.

000 Escalation Triggers

- First-ever seizure
- Pregnant patient (suspect eclampsia)
- Seizure with head trauma / fever
- Post-ictal period >30 mins

Acute Paraplegia: Recognizing the spinal cord emergency

Sensory Level: Use pin-prick testing to identify dermatome.

Bilateral upgoing plantars: Babinski sign.

Saddle anaesthesia & urinary retention: Cauda equina syndrome.

Metastatic compression is an oncologic emergency. If motor deficits exist for <24-48 hours, emergency decompression may restore function. Do not delay for primary care MRI.

Meningococcal Sepsis & Meningitis: Act before the rash appears

CLINICAL TRIGGERS

The **Classic Triad** (Fever, Neck Stiffness, Altered Consciousness) is only present in ~45% of cases.

Act before the rash: Leg pain, cold peripheries, and malaise in a febrile young adult require immediate treatment.

Do not delay hospital transfer for a lumbar puncture.

PRESCRIPTION CARDS

Benzylpenicillin (Crystapen)

PBS General Benefit

Route:	IV / IM
Adult:	2.4 g single dose
Paeds:	300 mg (<1 yr) or 600 mg (≥1 yr)
Renal adjustment:	Not required for single dose

Ceftriaxone (Rocephin)

PBS General Benefit

Route:	IV / IM
Adult:	2 g single dose
Paeds:	50-100 mg/kg (max 2g)

Progressive Weakness: Anticipating rapid respiratory decline

Guillain-Barré Syndrome

Ascending areflexic weakness, typically 1-4 weeks post-infection.

Myasthenic Crisis

Bulbar weakness, ptosis, precipitated by infection or medication.

Bedside forced vital capacity is essential. **Inability to count to 20 on a single breath** indicates imminent respiratory failure.

FVC <20 mL/kg

ICU-level transfer required via 000

Sit patient upright immediately

NBM (Nil by mouth) if bulbar weakness is present

Pre-transfer Stabilization: Airway & Breathing protocols

A - AIRWAY

If GCS <9 → Recovery position (left lateral decubitus, head dependent).

If Bulbar weakness → Sit upright, manage secretions aggressively.

If Cervical trauma → Manual in-line stabilization immediately.

B - BREATHING

Target SpO2 ≥94% (avoid hyperoxia in suspected stroke).

Respiratory Pattern Identification Table

Pattern	Neuro-Anatomy
Cheyne-Stokes	Bilateral hemispheric dysfunction
Central neurogenic hyperventilation	Brainstem lesion
Ataxic / Biot's breathing	Medullary compression **(pre-terminal)**
Paradoxical breathing	Diaphragmatic weakness (e.g., GBS)

DO NOT acutely lower blood pressure in suspected stroke in primary care. Permissive hypertension maintains cerebral perfusion to the ischemic penumbra.

CIRCULATION TARGETS: ACUTE BLOOD PRESSURE MANAGEMENT ACROSS CONDITIONS

Ischemic Stroke (Pre-thrombolysis)	**<185/110 mmHg** (Managed by stroke team at hospital, do NOT lower in GP).
Ischemic Stroke (No thrombolysis)	Treat only if **>220/120 mmHg**.
Intracerebral Hemorrhage	**<140 mmHg systolic** (Avoid excessive BP, manage at hospital).
Spinal Cord Compression	**MAP ≥85 mmHg** (Requires fluids ± vasopressors).

ACTION: Insert 18G/16G IV cannula. Commence 0.9% NaCl (avoid hypotonic solutions)

Disability assessment & the critical blood glucose rule

Assessment Dashboard

GCS Scoring Baseline:
Eye 4, Verbal 5, Motor 6

Pupil Symmetry & Reactivity

MRC Limb Strength Grading (0-5)

Dermatomal Sensory Levels

The Hypoglycemia Protocol

Always check BSL first. BSL <4.0 mmol/L is the most common stroke/seizure mimic.

Glucose 50% (IV Dextrose)

- **Adult: 50 mL** (25 g) IV bolus.
- **Paeds:** 2-5 mL/kg 10% dextrose.
- **Caution:** Extravasation risk. Ensure IV patency.

Glucagon

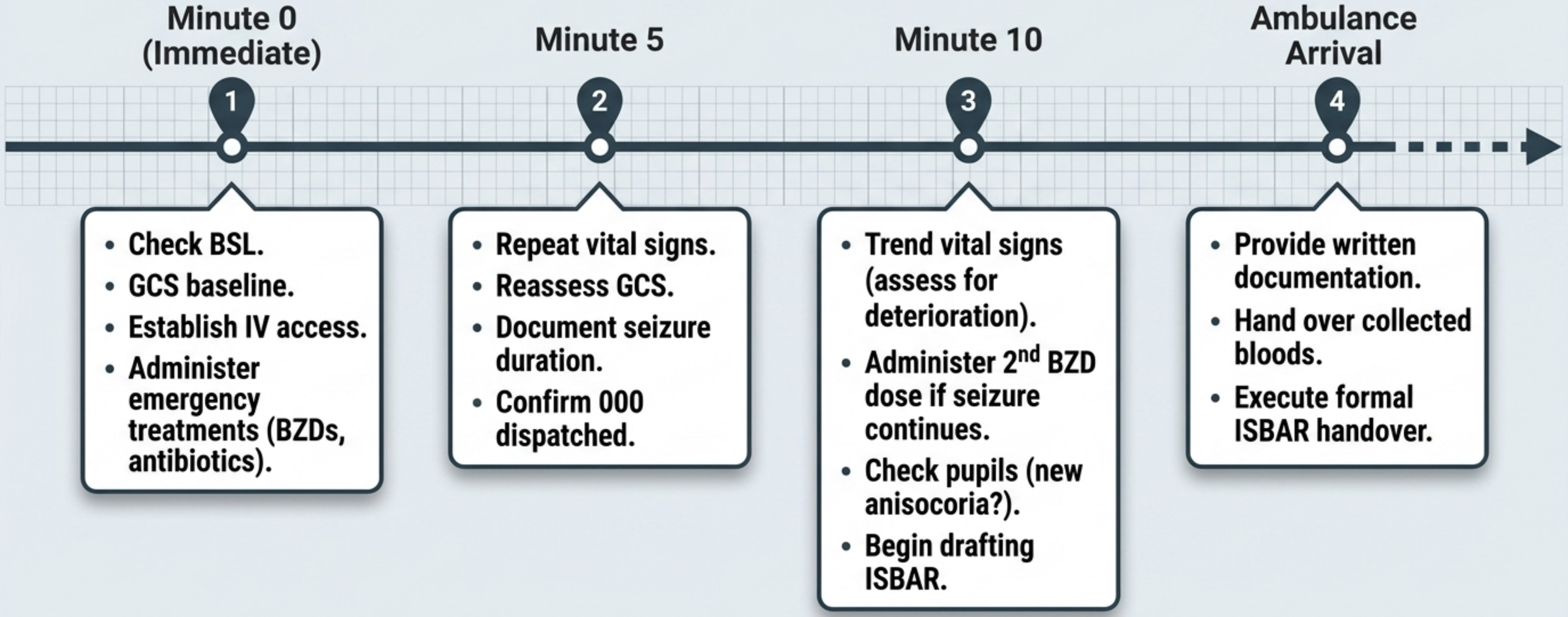
- **Adult:** 1 mg IM/SC.
- **Paeds:** 0.5 mg if <25 kg.
- Onset: 10-15 min.

Active Seizure Control: First-line pre-hospital benzodiazepines

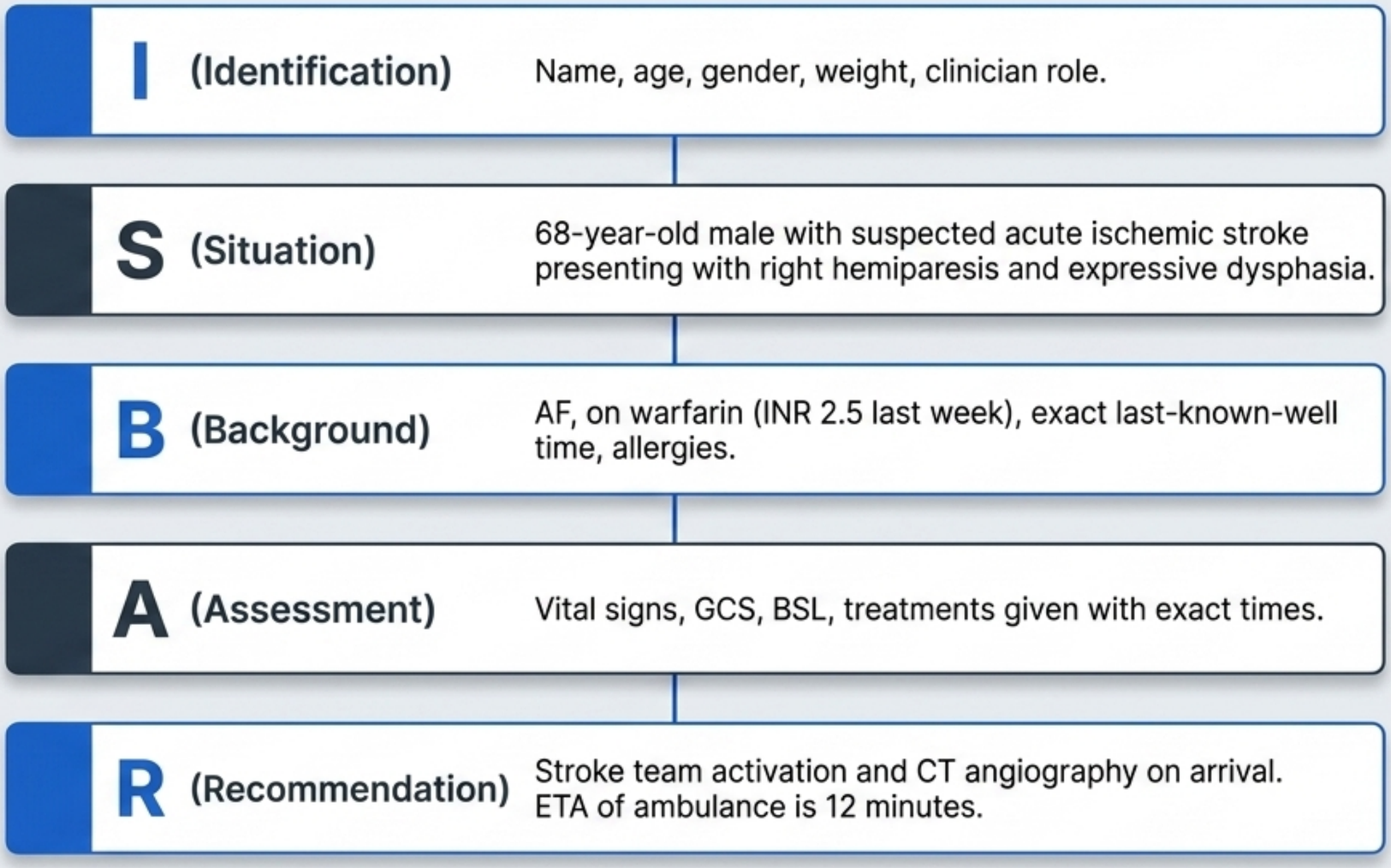
Midazolam (Hypnovel)
Routes: Buccal / IM / IV
Adult Dose: 10 mg (>40 kg). (Buccal: 2x5mg syringes; IM in deltoid; IV over 2 min)
Paediatric Dose: Buccal: 5mg (10-25kg), 10mg (>25kg). IM: 0.2 mg/kg
Notes: May repeat once after 5-10 min. Lower dose in renal impairment.

Diazepam (Diazemuls)
Routes: Rectal / IV
Adult Dose: Rectal 10-20 mg; IV 5-10 mg
Paediatric Dose: Rectal 5 mg (1-2 yrs), 5-10 mg (2-12 yrs)
Notes: May repeat once after 5-10 min.

The Pre-Transfer Timeline: Minute 0 to Paramedic Handover



The ISBAR Handover: Structuring the clinical transfer



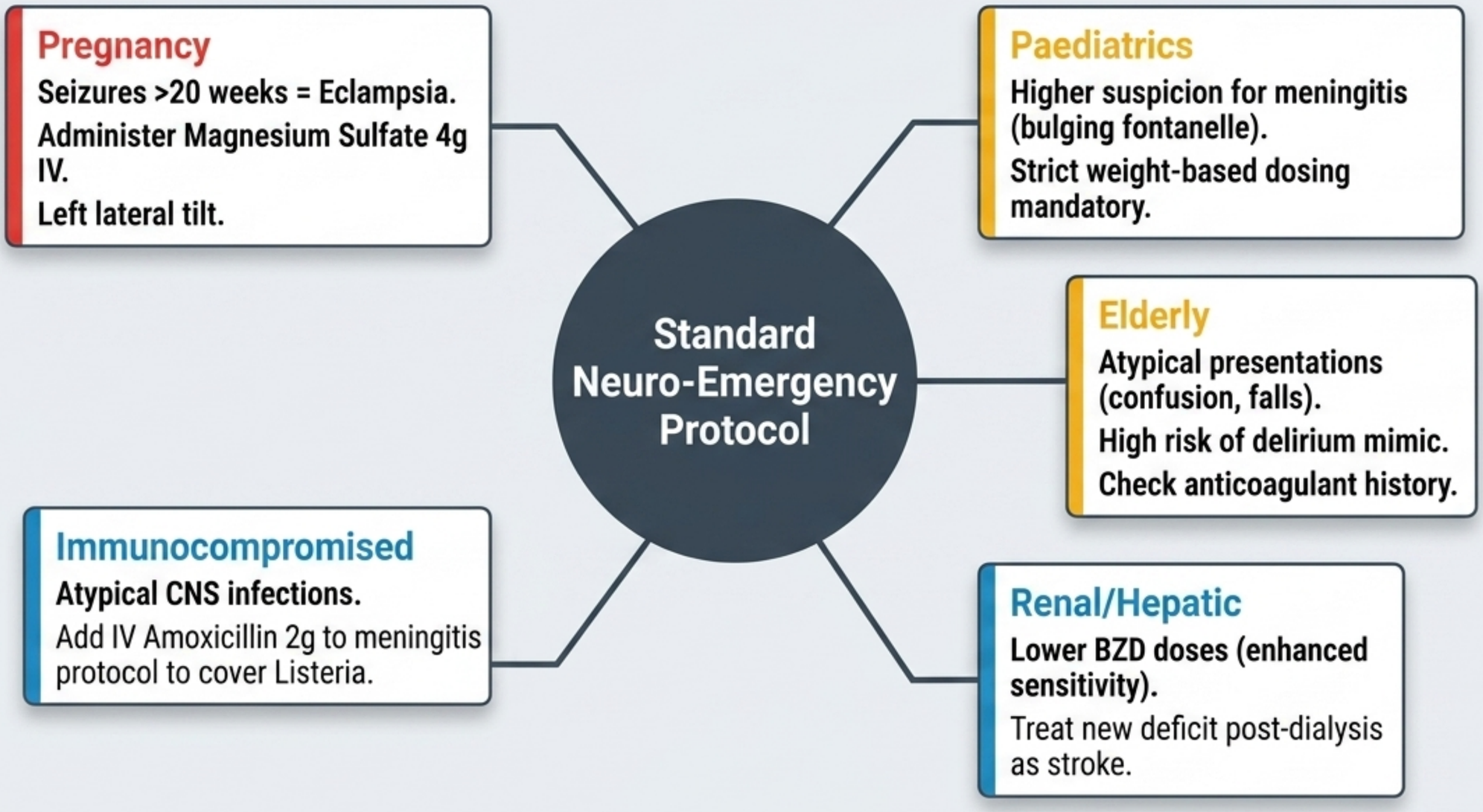
Risk Stratification & Transport Destination Protocol

Time-Critical: Thrombolysis-Eligible Stroke (<4.5h)	Nearest Stroke Centre. If >60 min by road -> Activate Aeromedical Retrieval.
Time-Critical: Large Vessel Occlusion	Comprehensive Stroke Centre (Interventional Neuroradiology capability).
Urgent: Meningitis / GBS / Spinal Cord Compression	Nearest ED with ICU/Neurosurgery capability.

Regional Retrieval Activation

- Key Australian retrieval contacts: RFDS (1800 625 800), CareFlight, NETS, MedSTAR.
- **Activate** as soon as emergency is identified — do not wait for ambulance.

Clinical Modifiers: Adapting protocols for special populations



First Nations Context: Closing the neuro-emergency gap

Elevated Risk Profile

- Stroke incidence is 1.5–3x higher, occurring at a significantly younger age (mean ~55 yrs vs 73 yrs).
- High prevalence of rheumatic heart disease (RHD) and AF elevates cardioembolic stroke risk.

Geographic Access & Pathogens

- Remote communities face prolonged transfer times (>1-2 hours), making pre-hospital antibiotics critical.
- Higher rates of Serogroup A and W meningococcal disease.

Cultural Safety & Coordination

- Use plain language. Involve Aboriginal Health Practitioners (AHPs) and ACCHOs early for care coordination.
- Respect community involvement in decision-making and culturally safe communication.