

ACUTE AORTIC SYNDROME

1 WHAT COUNTS AS ACUTE AORTIC SYNDROME?

Acute aortic syndrome is not one disease, but a cluster of life threatening pathologies caused by acute disruption of the aortic wall.

Dissection is the most common, but not the only one.

Major Types of AAS

1. Aortic Dissection (≈85–95% of AAS)
2. Intramural Haematoma (IMH)
3. Penetrating Aortic Ulcer (PAU)
4. Traumatic Aortic Injury (blunt trauma)

All are managed initially with the same ED principles:

Anti impulse therapy + early surgical decision making.

2 AORTIC DISSECTION — CLASSIFICATION THAT MATTERS IN THE ED

Stanford Classification (ED Relevant)

- **Type A** → **Ascending aorta involved**
Always a surgical emergency
- **Type B** → **Descending aorta only**
Often initially medical, unless complicated

This classification is preferred in emergency care because it directly determines disposition and urgency

3 NON DISSECTION AAS (OFTEN MISSED)

Intramural Haematoma (IMH)

- Haemorrhage within the aortic wall
- No clear intimal flap initially
- Often progresses to classic dissection
- Managed exactly like dissection in the ED
- Classified as Stanford A or B for disposition

Penetrating Aortic Ulcer (PAU)

- Rupture of atherosclerotic plaque into media
- Elderly, hypertensive, heavy smokers
- Can rupture without warning
- ED management = anti impulse + urgent imaging

4 PATHOPHYSIOLOGY (WHY IMPULSE CONTROL IS EVERYTHING)

The unifying mechanism in AAS:

- **Shear stress on the aortic wall**
- **Driven by:**
 - Heart rate
 - Systolic blood pressure
 - Left ventricular contractility

Every sympathetic surge worsens the tear/hematoma

Therefore:

Heart rate control comes BEFORE blood pressure reduction to avoid reflex tachycardia and worsening dissection

5 HEMODYNAMIC TARGETS (PRACTICAL, NOT IDEAL)

Targets (ED Phase)

- **Heart rate:** ≤60 bpm (≤80 acceptable if limited resources)
- **SBP:** 100–120 mmHg
- **Avoid hypotension** unless rupture/shock

These targets are guideline supported but must be individualised for perfusion (mentation, urine output)



CHECKLIST

ACUTE AORTIC SYNDROME

IMMEDIATE STABILISATION (ABCDE)

Airway

- Assess airway patency
- Intubate only if indicated (\downarrow GCS, respiratory failure, shock)
- Avoid hypertensive response during laryngoscopy (pre oxygenate, adequate sedation)

Breathing

- Oxygen only if hypoxic (target $SpO_2 > 94\%$)
- Monitor respiratory rate and work of breathing

Circulation

- 2 large bore IV lines
- Cardiac monitoring
- Measure BP in both arms (document higher value)
- Treat shock carefully (blood products if rupture suspected)

Disability

- GCS
- Pupils
- Look for focal neurology / stroke symptoms

Exposure

- Examine chest, back, abdomen
- Look for pulse deficits, limb ischaemia
- Maintain normothermia

DIAGNOSTIC IMAGING (DO NOT DELAY STABILISATION)

- CT angiography (chest \pm abdomen \pm pelvis) if stable
- Bedside ultrasound (echo / aorta) if unstable or CT unable
- CXR if no CT / US available
- Do not delay treatment for imaging if suspicion is high

CLASSIFY ONCE DIAGNOSIS CONFIRMED

- Stanford Type A (ascending aorta involved)
- Stanford Type B (descending aorta only)
- Consider IMH or PAU (managed like dissection acutely)

DISPOSITION

- Stanford Type A \rightarrow Emergency surgical transfer
- Stanford Type B (uncomplicated) \rightarrow ICU medical management
- Stanford Type B (complicated) \rightarrow Urgent intervention / transfer

ANTI IMPULSE THERAPY (START IMMEDIATELY)

STEP 1 — HEART RATE CONTROL (FIRST ALWAYS)

- Preferred Esmolol IV infusion
 OR Labetalol IV bolus / infusion

- If unavailable Metoprolol IV
 Propranolol IV

- If β blockers contraindicated Diltiazem IV
 Verapamil IV

Do NOT start vasodilators before HR is controlled

STEP 2 — BLOOD PRESSURE CONTROL (AFTER HR CONTROL)

- Target SBP 100–120 mmHg (avoid hypotension)

- Preferred Nitroprusside infusion
 Nicardipine infusion

- If not available Nitroglycerin infusion
 Hydralazine ONLY if β blocked

STEP 3 — PAIN CONTROL (ESSENTIAL)

- Treat pain aggressively (reduces catecholamine surge)

- Preferred Morphine IV

- If morphine unavailable Fentanyl IV

- Pethidine (meperidine) IV
- Tramadol IV
- Low dose ketamine ONLY with β blockade
- Reassess pain frequently

WHAT TO AVOID (CRITICAL)

- Anticoagulation
- Thrombolysis
- Antiplatelets (unless diagnosis confirmed otherwise)
- Vasodilators without HR control
- Excess IV fluids (unless frank shock)
- Delays to surgical discussion

COMPLICATION CHECK

- Cardiac tamponade
- Acute aortic regurgitation
- Stroke
- Limb ischaemia
- Renal failure
- Mesenteric ischaemia

EARLY SPECIALIST / REFERRAL ACTION

- Immediate cardiothoracic / vascular surgery notification if available or organise transfer
- Early ICU involvement
- Arrange urgent transfer if no local surgical capability
- Communicate:
 - Time of symptom onset
 - Hemodynamics
 - Drugs given (and response)
 - Imaging findings (if available)