

[HOSPITAL / HEALTH AUTHORITY NAME]

# ANAPHYLAXIS AND SEVERE ALLERGIC REACTIONS PATHWAY

## Protocol 30: Rapid Recognition, Intramuscular Adrenaline, Airway and Shock Stabilization, Refractory-Anaphylaxis Rescue, Observation, and Safe Disposition

DRAFT FOR EMERGENCY MEDICINE, INTERNAL MEDICINE, CRITICAL CARE, PAEDIATRICS, ANAESTHESIA, OBSTETRICS, ALLERGY / IMMUNOLOGY, PHARMACY, NURSING, EMS, LABORATORY, TRANSFER, PRIMARY CARE, PUBLIC HEALTH, AND CLINICAL-GOVERNANCE REVIEW

**STATUS:** This is a draft clinical-governance document. Adrenaline products and concentrations, paediatric dosing, infusion preparation, airway capability, observation periods, auto-injector availability, tryptase sampling, allergy referral, discharge prescriptions, beta-blocker rescue, bradykinin-mediated angioedema treatment, peri-operative pathways, and transfer arrangements must be reconciled with current national guidance, local formulary, pharmacy monographs, specialist availability, and approved linked protocols before implementation.

**IMMEDIATE SAFETY RULE:** Suspected anaphylaxis with Airway, Breathing, or Circulation compromise is treated immediately with intramuscular adrenaline into the anterolateral thigh. Do not wait for rash, IV access, laboratory tests, antihistamines, corticosteroids, or diagnostic certainty. Repeat after 5 minutes if life-threatening features persist, give oxygen and rapid crystalloid for shock, and escalate after two appropriate IM doses to the refractory-anaphylaxis pathway.

Document control	Details
Document owner	Emergency Department / Medical Services Directorate / Nursing Services / Clinical Governance
Clinical leads	Emergency Medicine; Internal Medicine; Critical Care; Allergy / Immunology; Anaesthesia
Supporting departments	Paediatrics; Obstetrics; Pharmacy; Laboratory; EMS; Primary Care; Respiratory Medicine; Cardiology; Transfer Coordination; Public Health
Applies to	Adults, adolescents, children, and pregnant or postpartum patients with suspected anaphylaxis, severe systemic allergic reaction, acute angioedema with possible allergic mechanism, or recurrent symptoms after initial treatment
Linked protocols	Resuscitation; Acute Respiratory Distress; Shock; Arrhythmias; Altered Mental Status; Asthma; Poisoning; Procedural Sedation; Obstetric Emergencies; Paediatric Emergency Assessment; Mental-Health Crisis; Transfer; Medication Safety
Version / status	Draft 1.0 for local multidisciplinary validation
Effective date	[Insert after approval]
Review date	[Insert according to governance cycle]
Supersedes	[Insert previous document or state new protocol]
Approval	[Emergency Department / Medical Executive / Medicines Committee / Pharmacy and Therapeutics / Clinical Governance]

## 1. Purpose

To provide a standardized emergency-department pathway for rapid recognition and treatment of anaphylaxis and severe allergic reactions, prioritizing early intramuscular adrenaline, structured ABCDE stabilization, timely escalation for refractory disease, risk-based observation, recurrence prevention, and safe discharge, admission, or transfer.

## 2. Scope

This protocol applies to patients with sudden systemic hypersensitivity symptoms after a known, probable, or unknown trigger, including food, medicines, contrast, biologics, blood products, insect venom, latex, exercise-associated reactions, peri-operative exposure, and idiopathic events. It also guides differentiation from isolated urticaria, non-allergic angioedema, asthma, vasovagal events, sepsis, panic, and other mimics. It does not replace specialist peri-operative, transfusion, contrast-media, or hereditary-angioedema protocols where these exist.

## 3. Core policy statements

- Anaphylaxis is a clinical diagnosis. Sudden airway, breathing, or circulation compromise after a likely trigger is sufficient to justify treatment even when skin findings are absent.
- Intramuscular adrenaline (epinephrine) is first-line treatment. Use adrenaline 1 mg/mL (1:1000) in the anterolateral thigh and document dose, concentration, route, site, and time.
- If in doubt in a patient with evolving systemic symptoms, give IM adrenaline. A correctly administered IM dose is safer than delayed treatment of true anaphylaxis.

- Repeat IM adrenaline after 5 minutes if airway, breathing, or circulation compromise persists. Activate senior, resuscitation, anaesthetic, and critical-care support early.
- Do not use subcutaneous adrenaline. Do not give IV adrenaline boluses to a patient with spontaneous circulation except in a specialist setting by an experienced clinician using continuous monitoring and an approved protocol.
- Position the patient safely: usually supine with legs elevated; semi-recumbent only when needed for breathing; left lateral in pregnancy; recovery position if unconscious but breathing. Do not allow sudden sitting, standing, or walking.
- Give high-concentration oxygen for hypoxaemia or severe reactions, establish IV or IO access, and give rapid isotonic crystalloid for hypotension or shock. Severe vasoplegia may require several litres in adults with frequent reassessment.
- After two appropriate IM adrenaline doses without improvement in respiratory or cardiovascular compromise, treat as refractory anaphylaxis and start an adrenaline infusion under expert supervision while continuing fluids and organ support.
- Antihistamines relieve skin symptoms only and must never delay adrenaline. Prefer a non-sedating oral H1 antihistamine after initial stabilization when urticaria or pruritus persists.
- Corticosteroids are not routine emergency treatment and do not reliably prevent biphasic reactions. Consider them only for specific coexisting indications such as refractory asthma or shock after initial resuscitation.
- Nebulized bronchodilator may treat persistent bronchospasm, and nebulized adrenaline may be an adjunct for upper-airway oedema; neither replaces IM or infused adrenaline.
- Serum tryptase may support later diagnosis but must never delay treatment. A normal result does not exclude anaphylaxis, especially after food-triggered reactions.
- Observation duration is individualized according to severity, treatment required, comorbidity, trigger, access to care, time of day, and risk of recurrent or biphasic symptoms.
- Before discharge, provide trigger-avoidance advice, an emergency action plan, auto-injector prescription and hands-on training when indicated, allergy referral, return precautions, and communication with primary care.
- All medication errors, iatrogenic reactions, delayed adrenaline, severe reactions, resuscitation events, and unexpected deterioration require incident reporting, multidisciplinary review, and learning without blame.

## 4. Definitions and diagnostic framework

Term	Operational definition
Anaphylaxis	A serious systemic hypersensitivity reaction, usually rapid in onset, that may cause death. Severe anaphylaxis is characterized by potentially life-threatening airway, breathing, and/or circulation compromise and may occur without rash or shock.
Severe allergic reaction	A rapidly evolving reaction with multisystem symptoms that has not yet produced definite airway, breathing, or circulation compromise but requires close reassessment because progression may be abrupt.
Refractory anaphylaxis	Persistent respiratory or cardiovascular compromise requiring ongoing treatment despite two appropriate doses of IM adrenaline.
Biphasic anaphylaxis	Recurrence of anaphylaxis after complete resolution of the initial event without re-exposure to the trigger.
Persistent / protracted anaphylaxis	Symptoms continue or recur without a clear symptom-free interval, sometimes because of ongoing absorption or severe mediator release.
Allergic angioedema	Histamine-mediated swelling, often with urticaria or other allergic symptoms, that may accompany anaphylaxis.
Bradykinin-mediated angioedema	Angioedema typically without urticaria or pruritus, including hereditary, acquired, or ACE-inhibitor-associated disease; it often responds poorly to adrenaline, antihistamines, and corticosteroids, although airway compromise must still be managed urgently.
Resolved reaction	Airway, breathing, circulation, neurological, gastrointestinal, and skin symptoms have returned to baseline without ongoing rescue treatment and vital signs remain stable.

Anaphylaxis is highly likely when either pattern is present	Examples
Pattern 1: acute illness involving skin or mucosa plus significant respiratory compromise, reduced blood pressure, end-organ symptoms, or severe gastrointestinal symptoms	Generalized hives with wheeze; flushing with stridor; angioedema with hypotension; hives with repeated vomiting and respiratory symptoms.
Pattern 2: acute hypotension, bronchospasm, or laryngeal involvement after exposure to a known or highly probable allergen, even without skin involvement	Collapse after insect sting; sudden bronchospasm during IV antibiotic; stridor after food exposure; hypotension during anaesthesia.

**DO NOT MISS: Skin or mucosal findings may be absent in 10-20% of anaphylaxis. Isolated urticaria does not equal anaphylaxis, but respiratory compromise, laryngeal symptoms, hypotension, collapse, or rapidly progressive multisystem disease requires immediate adrenaline.**

## 5. Roles and accountability

Role	Minimum responsibility
Triage / first-contact clinician	Recognize possible anaphylaxis, move the patient to resuscitation, call for help, position safely, and ensure immediate IM adrenaline when indicated.
Lead ED clinician	Direct diagnosis, ABCDE stabilization, repeat adrenaline, fluid resuscitation, investigations, observation, trigger assessment, disposition, and documentation.
Resuscitation / critical-care / anaesthetic team	Manage difficult airway, refractory bronchospasm, shock, adrenaline infusion, invasive monitoring, ventilation, and ICU-level care.
Nursing team	Immediate medication preparation and double-check; continuous monitoring; repeated observations; IV/IO access; fluids; symptom timeline; auto-injector teaching; discharge checks.
Pharmacy	Standardize adrenaline products and labeling; prepare infusion guidance; maintain anaphylaxis kits and auto-injector stock; advise compatibility, dose, and discharge supply.
Paediatrics / obstetrics	Provide age-, weight-, pregnancy-, fetal-, and postpartum-specific management and disposition support.
Laboratory	Support timed tryptase sampling, specimen handling, and urgent testing when clinically indicated; explain local turnaround and limitations.
Allergy / immunology or designated referral service	Investigate trigger and cofactors; interpret tryptase; assess mast-cell disorders; provide prevention, immunotherapy, challenge, and long-term action planning.
Transfer coordinator / EMS	Arrange receiving acceptance and transport with the airway, infusion, monitoring, medications, and trained escort required.

## 6. Pathway activation and triage

Category	Operational criteria
RED / immediate resuscitation	Stridor, hoarse voice, rapidly increasing tongue or pharyngeal swelling, severe wheeze, silent chest, hypoxaemia, cyanosis, hypotension, collapse, altered consciousness, shock, arrhythmia, repeated IM adrenaline, or rapid progression after a likely trigger.
ORANGE / very urgent	Systemic allergic symptoms involving more than one organ system; persistent vomiting after likely allergen; facial or oral swelling; asthma symptoms after food or venom; previous severe anaphylaxis; beta-blocker use; pregnancy; infant; mast-cell disorder; uncertain progression.
YELLOW / urgent	Isolated urticaria, pruritus, or localized angioedema without airway, breathing, circulation, or severe gastrointestinal features, after screening for progression and risk factors.
GREEN / lower acuity only after screening	Minor localized reaction with stable observations, no systemic symptoms, no high-risk history, and reliable reassessment and follow-up. Deterioration triggers immediate escalation.

## 7. First 10 minutes: parallel action

1. Move the patient to a monitored resuscitation area, call for senior and resuscitation support, and identify the likely trigger while removing or stopping ongoing exposure when safe.
2. Position supine with legs elevated unless breathing is easier semi-recumbent; use left lateral positioning in pregnancy. Do not allow the patient to stand or walk.
3. Assess Airway, Breathing, and Circulation immediately. If anaphylaxis is suspected with ABC compromise, give IM adrenaline without waiting for a complete history or rash.
4. Use adrenaline 1 mg/mL (1:1000) IM in the anterolateral thigh. Record the exact time and start a 5-minute reassessment clock.
5. Give high-concentration oxygen when hypoxaemic or severely unwell. Attach ECG, pulse oximetry, non-invasive BP cycling, and capnography when ventilation is impaired.
6. Obtain IV access; use IO access if necessary. Give rapid isotonic crystalloid for hypotension or shock and reassess after each bolus.
7. Repeat IM adrenaline at 5 minutes if airway, breathing, or circulation compromise persists. After two appropriate doses, activate the refractory-anaphylaxis pathway and prepare an adrenaline infusion.

8. Treat persistent bronchospasm with inhaled beta-2 agonist after adrenaline. Prepare advanced airway support early for progressive laryngeal oedema or exhaustion.
9. Document onset, suspected trigger, dose and timing of every treatment, response, prior reactions, asthma, cardiovascular disease, beta-blocker / ACE-inhibitor use, pregnancy, and auto-injector availability.
10. Once stabilized, plan tryptase sampling, observation duration, allergy referral, discharge education, auto-injector supply, and incident reporting when the reaction was healthcare-associated.

## 8. Immediate stabilization: ABCDE

### 8.1 Airway and breathing

- Look and listen for voice change, stridor, drooling, dysphagia, tongue or uvular swelling, laryngeal oedema, wheeze, silent chest, exhaustion, and falling oxygen saturation.
- Call anaesthesia / critical care early for progressive airway swelling. Prepare a difficult-airway plan with surgical-airway backup; repeated traumatic attempts may worsen oedema.
- Give high-concentration oxygen through a reservoir mask for severe reactions, titrating after stabilization to the appropriate target saturation.
- IM adrenaline is the treatment for both upper- and lower-airway anaphylaxis. Nebulized adrenaline may be used as an adjunct for stridor or laryngeal oedema but must not replace systemic adrenaline.
- Give inhaled or nebulized salbutamol for persistent bronchospasm after adrenaline; add ipratropium for severe obstructive physiology according to local asthma practice.
- Use capnography with assisted ventilation or reduced consciousness. Intubate for worsening obstruction, fatigue, refractory hypoxaemia, or inability to protect the airway; anticipate haemodynamic collapse during induction.

### 8.2 Circulation

- Assess pulse, BP, perfusion, mental status, urine output, ECG, and bedside ultrasound where available. Anaphylactic shock combines vasodilation, capillary leak, and sometimes myocardial dysfunction.
- Give rapid isotonic crystalloid: adults commonly 500-1000 mL initially; children 10 mL/kg with reassessment. Repeat as required while watching for pulmonary oedema or cardiac limitation.
- Use IV or IO access; do not delay IM adrenaline while obtaining access. Severe shock may require large cumulative fluid volumes and early vasopressor infusion.
- Continue IM adrenaline every 5 minutes until a safe adrenaline infusion is established if life-threatening features persist and infusion capability is delayed.
- Treat arrhythmias by correcting hypoxia, shock, electrolyte disturbance, and adrenaline dosing errors. Severe hypertension, chest pain, or ventricular arrhythmia after adrenaline requires senior review and careful distinction from ongoing anaphylaxis.

### 8.3 Disability and exposure

- Record GCS / AVPU and glucose. Confusion, collapse, or reduced consciousness may reflect cerebral hypoperfusion, hypoxaemia, or an alternative diagnosis.
- Expose sufficiently to examine for flushing, urticaria, angioedema, injection or sting site, medical patches, and ongoing allergen exposure while maintaining dignity and temperature.
- Record gastrointestinal symptoms, including cramping, repeated vomiting, and diarrhoea. Severe gastrointestinal symptoms after a likely trigger may support anaphylaxis, especially with skin or cardiovascular features.
- Remove an insect stinger promptly by any practical method. Stop suspected IV drugs, infusions, blood products, or contrast while preserving lines for resuscitation and investigation.

## 9. Intramuscular adrenaline: first-line treatment

Patient	IM adrenaline dose using 1 mg/mL (1:1000)	Operational note
Adult and most patients >12 years	500 micrograms = 0.5 mL	Give into anterolateral thigh; a small or prepubertal child >12 years may receive 300 micrograms.
Child 6-12 years	300 micrograms = 0.3 mL	Weight-based 0.01 mg/kg may be used within approved paediatric policy, maximum 0.5 mg.
Child 6 months-6 years	150 micrograms = 0.15 mL	Use an appropriately sized syringe and needle; verify concentration aloud.
Infant <6 months	100-150 micrograms = 0.10-0.15 mL	Immediate senior paediatric support; weight-based dosing may be preferable under local policy.

- Use the middle third of the anterolateral thigh. Inject through clothing only when immediate access is otherwise delayed and there is no risk from objects in pockets.
- Repeat the same age- or weight-appropriate dose after 5 minutes if airway, breathing, or circulation compromise has not resolved.
- Write doses in both micrograms and mL, and state the concentration. Avoid ambiguous ratio-only prescribing.
- A healthcare facility should use ampoule-and-syringe IM adrenaline or an approved auto-injector according to local policy. Staff must be competent with both systems.

- Do not give IM adrenaline solely for isolated stable urticaria without systemic or ABC features; reassess frequently for progression.

**MEDICATION SAFETY:** Adrenaline 1 mg/mL (1:1000) is used for IM treatment. Dilute preparations used for IV infusion are different. Separate storage, distinctive labeling, read-back, independent double-check, and smart-pump guardrails are required to prevent ten-fold or route errors.

## 10. Positioning, oxygen, fluids, and supportive treatment

Intervention	Minimum operational standard
Position	Supine with legs elevated when tolerated. Semi-recumbent for severe dyspnoea, but avoid sudden upright posture. Left lateral in pregnancy. Recovery position if unconscious and breathing. CPR position if pulseless.
Oxygen	High concentration for severe anaphylaxis, hypoxaemia, shock, respiratory distress, or reduced consciousness. Titrate after stabilization.
Monitoring	Continuous ECG and pulse oximetry; frequent BP; respiratory rate and mental status; capnography when ventilatory failure, sedation, or intubation is possible.
Fluids	Rapid isotonic crystalloid for hypotension or poor perfusion; adult 500-1000 mL boluses, child 10 mL/kg boluses, repeated according to response and comorbidity.
Trigger removal	Stop suspect infusion or medicine, remove stinger, stop exercise, and avoid further exposure. Do not delay life-saving treatment to identify the exact trigger.
Temperature / comfort	Prevent hypothermia, protect privacy, relieve anxiety through clear communication, and keep a responsible staff member continuously present during unstable disease.

## 11. Refractory anaphylaxis

Refractory anaphylaxis is present when respiratory or cardiovascular compromise persists despite two appropriate IM adrenaline doses. It is uncommon but requires immediate expert-led escalation.

- Call critical care / anaesthesia / resuscitation and the most senior available clinician. Continue ABCDE treatment and confirm that IM doses, concentration, timing, route, and injection site were correct.
- Give rapid crystalloid and reassess preload, perfusion, lung findings, and response. Severe shock may require repeated boluses and invasive monitoring.
- Start a low-dose IV adrenaline infusion using the approved local critical-care or refractory-anaphylaxis monograph. Use a dedicated line, infusion pump, continuous ECG and BP monitoring, and frequent titration to clinical response.
- Continue IM adrenaline every 5 minutes if the infusion cannot yet be established safely and life-threatening features persist.
- For persistent bronchospasm, continue inhaled bronchodilator and ventilatory support; for upper-airway oedema, use nebulized adrenaline as an adjunct and secure the airway early.
- If shock remains refractory, use specialist-directed additional vasopressor or inotrope therapy. Consider glucagon in a patient taking a beta-blocker with persistent hypotension or bradycardia, with antiemetic and aspiration precautions.
- Consider extracorporeal life support in a capable centre for refractory peri-arrest or cardiac-arrest anaphylaxis after early discussion and transfer activation.
- Search for ongoing allergen absorption, delayed drug administration, an alternative diagnosis, tension pneumothorax, severe asthma, pulmonary embolism, myocardial infarction, sepsis, occult haemorrhage, or medication error.

Refractory feature	Escalation focus
Persistent hypotension / shock	Adrenaline infusion, rapid crystalloid, bedside ultrasound, invasive monitoring where available, additional vasopressor, glucagon if beta-blocked, ICU.
Persistent wheeze / poor ventilation	Adrenaline infusion, inhaled beta-2 agonist, ipratropium, early intubation, mechanical ventilation strategy for severe airflow obstruction.
Stridor / progressive airway swelling	Adrenaline infusion, nebulized adrenaline adjunct, senior airway operator, smaller tube readiness, front-of-neck airway plan.
Cardiac ischaemia or arrhythmia	Correct hypoxia and shock, verify adrenaline dose, continuous ECG, cardiology / critical-care input; do not withhold necessary anaphylaxis treatment solely because of coronary risk.

## 12. Adjunctive treatment and treatments that must not delay adrenaline

Therapy	Role	Safety statement
H1 antihistamine	Persistent urticaria, flushing, or pruritus after ABC stabilization	Third-line for skin symptoms. Prefer a non-sedating oral agent when the patient can swallow. It does not treat airway obstruction or shock.
Corticosteroid	Selected refractory asthma, protracted reaction, or shock after initial resuscitation	Not routine and not proven to prevent biphasic reactions. Never delay adrenaline, fluids, bronchodilator, or airway care.
Inhaled beta-2 agonist	Persistent lower-airway bronchospasm	Adjunct only. Hypotension, laryngeal oedema, and systemic anaphylaxis require adrenaline.
Nebulized adrenaline	Severe upper-airway oedema / stridor	Adjunct while preparing definitive airway and systemic treatment; not a substitute for IM or infused adrenaline.
Glucagon	Refractory hypotension or bradycardia in beta-blocked patient	Use local critical-care dose and monitoring; may cause vomiting, hyperglycaemia, and electrolyte disturbance.
H2 antagonist	No routine emergency role	May be considered only under local specialist policy for skin symptoms; must not delay effective treatment.

## 13. Cardiac arrest and peri-arrest anaphylaxis

- Start high-quality CPR and standard adult or paediatric advanced life support immediately. Treat anaphylaxis as a reversible cause with early airway management and aggressive isotonic-fluid resuscitation.
- Use IV/IO adrenaline according to the cardiac-arrest algorithm rather than standard IM anaphylaxis dosing once pulseless cardiac arrest is confirmed.
- Consider prolonged resuscitation when the trigger is reversible and high-quality organ support is available. Early extracorporeal CPR discussion is reasonable in selected refractory cases at capable centres.
- After return of spontaneous circulation, continue treatment of vasoplegia, capillary leak, bronchospasm, airway swelling, myocardial dysfunction, and recurrent symptoms in critical care.

## 14. Differential diagnoses and mimics

Possible mimic	Features that may help distinguish it
Vasovagal episode	Bradycardia, pallor, nausea, rapid improvement supine, no urticaria, wheeze, stridor, or persistent hypotension.
Acute severe asthma	Wheeze and respiratory distress without hypotension, urticaria, angioedema, or clear allergen-related multisystem symptoms; asthma and anaphylaxis may coexist.
Panic / hyperventilation	Tingling, carpopedal spasm, normal oxygenation and BP; diagnosis only after dangerous respiratory and cardiovascular causes are excluded.
Sepsis / other distributive shock	Fever or infection features, slower evolution, no clear exposure; rash and hypotension can overlap, so treat both when uncertain.
Pulmonary embolism / ACS / arrhythmia	Chest pain, risk factors, ECG or ultrasound findings; may coexist with allergic coronary syndrome or severe anaphylaxis.
Hereditary / ACE-inhibitor angioedema	Swelling without urticaria or pruritus, slower onset, poor response to antihistamine; airway compromise remains an emergency.
Vocal-cord dysfunction / inducible laryngeal obstruction	Inspiratory noise, voice symptoms, preserved oxygenation, recurrent episodes; do not assume until anaphylaxis and structural airway obstruction are excluded.
Scombroid or other toxic reaction	Multiple people affected after same food, flushing, headache, palpitations; severe cases may still require supportive treatment and diagnostic caution.

## 15. Investigations and serum tryptase

- Do not delay adrenaline or resuscitation for tests. Most uncomplicated reactions require no broad laboratory panel.
- Use targeted tests for severe or uncertain disease: ECG, blood gas, glucose, electrolytes, renal function, lactate, troponin, full blood count, and imaging according to the clinical problem.
- Obtain timed mast-cell tryptase when the diagnosis is uncertain, the reaction is severe, the trigger is drug, venom, or peri-operative exposure, or a mast-cell disorder is possible.



- Ideal tryptase sequence: sample as soon as feasible without delaying treatment; a second sample 1-2 hours after symptom onset and no later than 4 hours; a baseline sample at least 24 hours after complete resolution or during follow-up.
- Record the exact symptom-onset and sample times. A normal tryptase does not exclude anaphylaxis; interpretation should compare acute and baseline levels and consider the laboratory reference range.
- For healthcare-associated reactions, preserve the medication record, batch / lot information, infusion sequence, anaesthetic chart, contrast or blood-product identifiers, and a precise timeline.

## 16. Monitoring, observation, and biphasic risk

Observation begins after complete resolution, not after the last adrenaline dose alone. The senior clinician must individualize duration and document the rationale.

Suggested pathway after complete symptom resolution	Minimum criteria / examples
Consider fast-track discharge after at least 2 hours	Rapid response within 5-10 minutes to one early IM dose; complete resolution; reliable patient; already has in-date auto-injectors and demonstrated competence; adequate adult supervision; rapid return access; no severe asthma, ongoing absorption, or high-risk comorbidity.
Observe at least 6 hours	Two IM adrenaline doses; delayed first adrenaline; previous biphasic reaction; uncertain trigger; moderate respiratory or cardiovascular features; comorbidity or limited confidence in early discharge.
Observe at least 12 hours or admit	More than two IM doses or adrenaline infusion; severe respiratory compromise; severe asthma; shock; ongoing or slow allergen absorption; protracted symptoms; pregnancy with concern; late-night presentation; remote residence or difficult emergency access; significant cardiac disease; clinician concern.
ICU / high-dependency admission	Intubation, refractory shock, infusion treatment, recurrent anaphylaxis, significant arrhythmia / myocardial injury, or need for invasive monitoring.

- Repeat full observations and symptom review at clinically appropriate intervals. Any recurrence of ABC compromise is treated immediately with IM adrenaline and pathway reactivation.
- Before discharge, ensure the patient is ambulatory without dizziness, tolerating oral intake when relevant, and has no progressive airway swelling, recurrent vomiting, or bronchospasm.
- Explain that recurrence may occur after initial recovery and that new breathing difficulty, throat symptoms, collapse, or rapidly progressive systemic symptoms require immediate auto-injector use and emergency activation.

## 17. Trigger-specific considerations

### 17.1 Food, exercise, and cofactors

- Food is a common trigger, particularly in children and young adults. Asthma, delayed adrenaline, exercise, alcohol, NSAIDs, infection, sleep deprivation, and menstruation may increase severity in susceptible patients.
- Do not give oral food or medicine challenges in the ED. Document all foods, ingredients, timing, exercise, alcohol, NSAIDs, and cofactor exposure for later specialist assessment.

### 17.2 Medicines, contrast, biologics, and blood products

- Stop the suspected agent but maintain IV access with a new compatible line if needed. Record the exact sequence, dose, route, timing, batch, and all co-administered substances.
- Do not apply a broad lifelong drug-allergy label without specialist evaluation. Document the observed phenotype and suspected agent precisely.
- Follow transfusion-reaction, contrast-reaction, and peri-operative-anaphylaxis investigation protocols in parallel, including notification and specimen requirements.

### 17.3 Insect venom and environmental exposure

- Remove an embedded stinger promptly, treat systemic reactions identically, and refer systemic venom reactions for allergy assessment and consideration of venom immunotherapy.
- Consider baseline tryptase and mast-cell disease evaluation after severe, recurrent, or hypotensive sting reactions according to specialist guidance.

## 18. Isolated urticaria, angioedema, and bradykinin-mediated disease

- Isolated urticaria or pruritus with normal airway, breathing, circulation, and observations is usually treated with a non-sedating oral H1 antihistamine, trigger avoidance, and reassessment for progression.
- Facial or lip swelling requires careful oral and airway examination, serial review, and explicit return advice. Tongue, floor-of-mouth, voice, swallowing, stridor, or respiratory symptoms trigger immediate airway escalation.
- Suspect bradykinin-mediated angioedema when swelling occurs without hives or itch, especially with ACE-inhibitor exposure, family history, recurrent abdominal attacks, or poor response to allergy treatment.
- In uncertain or rapidly progressive airway swelling, treat possible anaphylaxis while simultaneously activating the difficult-airway pathway. Use locally approved specific bradykinin-targeted therapy when indicated and available.

- Patients with ACE-inhibitor-associated angioedema should not restart the implicated ACE inhibitor; communicate this clearly at discharge and to primary care.

## 19. Special populations

Population	Key modifications
Children and infants	Use weight- or age-appropriate IM adrenaline; obtain weight without delaying treatment; recognize pallor, sudden quietness, limpness, persistent crying, vomiting, or behavioural change; involve paediatrics early; ensure caregiver auto-injector training.
Pregnancy and postpartum	Use the same life-saving IM adrenaline principles. Position left lateral or manually displace the uterus after mid-pregnancy, optimize maternal oxygenation and BP, involve obstetrics early, and monitor the fetus when feasible after maternal stabilization.
Older adults / cardiovascular disease	Do not withhold IM adrenaline when anaphylaxis threatens life. Use close ECG and haemodynamic monitoring, cautious repeated fluid assessment, and early critical-care support.
Asthma	Poorly controlled asthma increases risk and may mask anaphylaxis. Treat anaphylaxis first with adrenaline, then persistent bronchospasm with inhaled therapy and ventilatory support.
Beta-blocker therapy	Response to adrenaline may be reduced and bradycardia more prominent. Escalate early; consider specialist-directed glucagon for refractory shock.
Mast-cell disorder / elevated baseline tryptase	Higher risk of severe or recurrent reactions in some patients. Arrange allergy / haematology evaluation and ensure a robust emergency plan.
Remote or resource-limited setting	Give IM adrenaline immediately, repeat at 5 minutes if needed, activate transfer early, continue IM dosing and fluids while awaiting expert support, and transport with monitoring and additional adrenaline available.

## 20. Disposition

Disposition	Criteria
Discharge after appropriate observation	Complete resolution; stable observations; low recurrence risk; reliable supervision and return access; emergency action plan; auto-injector supply and demonstrated technique when indicated; allergy and primary-care follow-up arranged.
Observation unit / ward	Need for extended monitoring, two doses of IM adrenaline, comorbidity, uncertain recurrence risk, delayed access to specialist review, or social / geographical concern.
High-dependency / ICU	Adrenaline infusion, airway intervention, severe bronchospasm, shock, recurrent symptoms, cardiac complication, or invasive monitoring.
Transfer	Required airway, critical-care, paediatric, obstetric, allergy, or other capability is unavailable locally. Stabilize before movement and continue treatment during transport.

## 21. Discharge and recurrence-prevention plan

- Review the event with the patient and family using plain language. State the suspected trigger and the degree of certainty; avoid unsupported allergy labels.
- Provide a written emergency action plan describing symptoms that require immediate auto-injector use, emergency activation, positioning, and use of a second dose if symptoms persist according to the device and local plan.
- Prescribe and supply the locally recommended number of in-date adrenaline auto-injectors when indicated, commonly two, and demonstrate the exact device using a trainer. The patient or caregiver must return-demonstrate correctly.
- Advise the patient to carry devices at all times, check expiry dates, protect them from temperature extremes, and replace used or expired devices promptly.
- Refer all suspected anaphylaxis for specialist allergy assessment. Provide primary care with the ED record, trigger details, treatment times, tryptase plan, and medication changes.
- Provide avoidance advice that is practical and proportionate. For food reactions include label reading and cross-contact awareness; for medicines include written phenotype and exact suspect drug; for venom consider environmental precautions.
- Optimize asthma control and review beta-blockers, ACE inhibitors, and other cofactors with the appropriate clinician. Do not stop essential chronic treatment without a documented risk-benefit plan.
- Give explicit return precautions for recurrent throat tightness, voice change, breathing difficulty, wheeze, collapse, generalized hives with systemic symptoms, or repeated vomiting after re-exposure.



## 22. Transfer and handover

- Obtain receiving-clinician acceptance before departure whenever possible. State whether the patient is stable, refractory, intubated, pregnant, paediatric, or receiving an adrenaline infusion.
- Transport unstable patients with continuous ECG, pulse oximetry, frequent BP, airway equipment, oxygen, IV/IO access, fluids, sufficient adrenaline, infusion pump, and staff competent to manage recurrence and cardiac arrest.
- Provide onset time, trigger, clinical criteria, every adrenaline dose and response, fluid total, adjuncts, tryptase samples, comorbidities, medication risks, recurrence, current observations, and reason for transfer.
- Do not discontinue a necessary adrenaline infusion for transport unless an equivalent safe treatment plan is agreed by sending and receiving senior clinicians.

## 23. Documentation and handover

- Document the exact onset and progression of skin, airway, breathing, circulation, neurological, and gastrointestinal findings.
- Record suspected trigger, route, dose, exposure time, cofactors, prior reactions, known allergies, asthma control, mast-cell disease, pregnancy, and relevant medicines.
- Record adrenaline concentration, dose in micrograms, volume in mL, route, site, time, response, and adverse effects for every administration.
- Record positioning, oxygen, fluid type and volume, monitoring, airway interventions, bronchodilators, infusion details, consultation, observation period, recurrence assessment, and disposition rationale.
- Record auto-injector device, number supplied, expiry where feasible, teaching and return demonstration, written plan, allergy referral, and communication with primary care.

## 24. Quality indicators and audit

Indicator	Suggested standard
IM adrenaline given promptly when anaphylaxis with ABC compromise is recognized	At least 90%, with local target toward 95%
Adrenaline concentration, dose, route, site, and time documented	At least 95%
Repeat assessment documented within 5 minutes after IM adrenaline in unstable patients	At least 90%
Appropriate repeat adrenaline or refractory escalation when ABC compromise persists	At least 90%
No antihistamine or corticosteroid documented as substitute for adrenaline	100%
Safe positioning and continuous monitoring documented in severe reactions	At least 95%
Risk-based observation and rationale documented	At least 90%
Auto-injector teaching and written emergency plan completed when indicated	At least 90%
Allergy referral completed for suspected anaphylaxis	At least 90%
Healthcare-associated severe reactions reported through incident system	100%

## 25. Training and implementation

- All ED, triage, nursing, pharmacy, paediatric, obstetric, anaesthetic, and EMS staff should receive recurring simulation on recognition, IM adrenaline, refractory escalation, infusion safety, and biphasic-risk discharge.
- Anaphylaxis kits should be standardized, sealed, checked, immediately accessible, and include adrenaline 1 mg/mL, syringes, needles, dosing card, airway and oxygen access, IV equipment, fluids, and the refractory pathway.
- Medication safety training must include concentration and route differentiation, microgram-to-mL conversion, independent double-checks, and management of adrenaline adverse effects or dosing errors.
- Audit delayed or omitted adrenaline, wrong-route or concentration errors, unplanned ICU transfer, recurrence after discharge, and failures of auto-injector supply or allergy referral.
- Review the protocol after major guideline updates, formulary changes, sentinel events, new auto-injector products, or changes in local critical-care and transfer capability.

## ANNEX A. One-page anaphylaxis workflow

Step	Action
1. Recognize	Sudden illness after likely trigger with airway, breathing, or circulation compromise; skin signs may be absent.

Step	Action
2. Call / position	Call resuscitation support. Supine with legs elevated; semi-recumbent only for breathing; left lateral in pregnancy.
3. Adrenaline	Give IM adrenaline 1 mg/mL into anterolateral thigh: adult 500 micrograms; age/weight-adjust child dose.
4. Support	Oxygen, monitoring, IV/IO access, rapid crystalloid for shock, prepare airway support.
5. Reassess at 5 minutes	Repeat IM adrenaline if ABC compromise persists.
6. Refractory after 2 doses	Expert help, adrenaline infusion, further fluids, airway / ventilation, additional vasopressor or glucagon when indicated.
7. After stabilization	Targeted tests and tryptase, risk-based observation, trigger documentation.
8. Disposition	Action plan, auto-injectors and training when indicated, allergy referral, primary-care communication, return precautions.

## ANNEX B. Diagnostic quick card

Finding	Interpretation / action
Sudden stridor, wheeze, hypoxaemia, hypotension, or collapse after likely allergen	Treat as anaphylaxis immediately, even without rash.
Skin / mucosal symptoms plus respiratory compromise, hypotension, or severe GI symptoms	Anaphylaxis highly likely.
Isolated hives or itch with normal ABC	Not anaphylaxis at present; antihistamine and serial reassessment.
Angioedema without hives / itch, ACE inhibitor or family history	Consider bradykinin-mediated disease; airway-first management and specific pathway.
Bradycardia, pallor, rapid recovery supine	Consider vasovagal event, but exclude anaphylaxis if trigger and systemic symptoms exist.

## ANNEX C. IM adrenaline dosing and safety card

Group	Dose of 1 mg/mL adrenaline	Repeat
Adult / most >12 years	0.5 mg = 500 micrograms = 0.5 mL IM	After 5 minutes if ABC compromise persists
6-12 years	0.3 mg = 300 micrograms = 0.3 mL IM	After 5 minutes if needed
6 months-6 years	0.15 mg = 150 micrograms = 0.15 mL IM	After 5 minutes if needed
<6 months	0.10-0.15 mg = 100-150 micrograms = 0.10-0.15 mL IM	After 5 minutes if needed with senior paediatric support

**CHECK BEFORE INJECTION:** patient, indication, adrenaline 1 mg/mL, IM route, correct microgram dose, correct mL volume, anterolateral thigh, time recorded. Do not delay life-saving treatment for a second checker when none is immediately available.

## ANNEX D. Refractory-anaphylaxis card

- Definition: persistent respiratory or cardiovascular compromise despite two appropriate IM adrenaline doses.
- Call senior resuscitation, anaesthesia, and critical care. Confirm diagnosis and dose delivery.
- Continue high-concentration oxygen, airway preparation, rapid crystalloid, ECG / BP / SpO<sub>2</sub> / capnography.
- Start approved low-dose IV adrenaline infusion through a dedicated pump line; titrate to response.
- Continue IM adrenaline every 5 minutes if infusion is delayed and life-threatening features persist.
- Treat bronchospasm, consider nebulized adrenaline for upper-airway oedema, and consider glucagon if beta-blocked.
- Escalate to additional vasopressor, invasive monitoring, ICU, and extracorporeal support where appropriate.

## ANNEX E. Paediatric safety card

- Treat based on clinical severity; do not wait for hypotension, which may be late in children.
- Use age or weight dose from approved chart. Maximum IM dose is generally 0.5 mg.
- Fluid bolus for shock: isotonic crystalloid 10 mL/kg, reassess, and repeat as required.
- Watch for sudden quietness, limpness, pallor, persistent crying, vomiting, wheeze, voice change, or collapse.
- Involve caregivers while maintaining rapid treatment. Provide device-specific trainer practice before discharge.

## ANNEX F. Pregnancy and postpartum card

- Maternal resuscitation is the priority; do not withhold IM adrenaline.
- Use left lateral tilt or manual uterine displacement after mid-pregnancy.
- Optimize maternal oxygenation and perfusion; involve obstetrics and anaesthesia early.
- Begin fetal assessment after maternal stabilization when gestation and resources permit.
- Admit or extend observation when the reaction was severe, fetal concern exists, or additional obstetric risk is present.

## ANNEX G. Observation and biphasic-risk card

Risk level	Examples	Suggested minimum after resolution
Lower	One early IM dose, rapid complete response, reliable supervision and return access, trained with in-date devices	At least 2 hours may be considered by senior clinician
Intermediate	Two IM doses, delayed treatment, prior biphasic event, uncertain trigger, moderate respiratory or cardiovascular features	At least 6 hours
Higher	>2 doses, infusion, shock, severe asthma / respiratory compromise, ongoing absorption, protracted symptoms, remote access, late night	At least 12 hours or admission

## ANNEX H. Tryptase sampling card

Sample	Timing	Purpose
Acute 1	As soon as feasible after stabilization	May capture early mediator rise; never delay treatment.
Acute 2	Ideally 1-2 hours after onset; no later than 4 hours	Usually best acute comparison sample.
Baseline	At least 24 hours after complete resolution or at follow-up	Comparison for event-related rise and assessment of elevated baseline.

## ANNEX I. Auto-injector teaching checklist

Teaching item	Completed
Patient / caregiver knows when to use the device	
Correct device and dose identified	
Outer-thigh placement and activation demonstrated	
Patient / caregiver return-demonstrated with trainer	
Emergency call and safe positioning explained	
Second-dose plan explained	
Number of devices supplied / prescribed recorded	
Expiry, storage, travel, school / workplace plan discussed	

## ANNEX J. Discharge checklist

Requirement	Met / not met / N/A
Complete symptom resolution and stable observations	
Observation duration and rationale documented	
Trigger and uncertainty explained	
Written emergency action plan provided	
Auto-injectors supplied / prescribed when indicated	
Device teaching and return demonstration completed	
Allergy referral completed	

Requirement	Met / not met / N/A
Primary-care communication completed	
Medication changes and avoidance advice documented	
Biphasic warning and return precautions understood	
Safe supervision and transport home confirmed	

## ANNEX K. Anaphylaxis-kit readiness checklist

Item	Local specification / check
Adrenaline 1 mg/mL ampoules or approved prefilled product	Stock level, expiry, separate from IV infusion preparation
1 mL syringes and appropriate IM needles	Adult and paediatric sizes
Laminated IM dose card	Micrograms and mL, adult and paediatric
Oxygen and delivery devices	Reservoir mask, paediatric sizes
Airway and ventilation equipment	Suction, bag-mask, difficult-airway access
IV / IO access and isotonic crystalloid	Rapid infusion capability
Adrenaline-infusion monograph and pump	Dedicated line and double-check process
Auto-injector trainers and discharge devices	Locally stocked brands and doses

## ANNEX L. Transfer and handover minimum dataset

Field	Required information
Patient / event	Identity, age, weight, pregnancy, onset time, suspected trigger, exposure route and time
Clinical phenotype	Airway, breathing, circulation, skin, GI, neurological findings; severity and recurrence
Treatment	Every adrenaline dose and time, infusion details, oxygen, airway, fluids, bronchodilators, adjuncts
Response / current status	Latest observations, airway risk, oxygen / ventilation, haemodynamics, mental status, urine output
Investigations	ECG, blood gas, lactate, tryptase sample times, relevant laboratory and imaging results
Risk factors	Asthma, cardiac disease, beta-blocker / ACE inhibitor, mast-cell disease, previous biphasic reaction
Logistics	Receiving clinician, transport team, monitoring, medications and fluid remaining, contingency plan

## ANNEX M. Audit tool

Audit item	Met / not met / N/A
Anaphylaxis criteria or clinical rationale documented	
IM adrenaline administered without avoidable delay	
Correct concentration, dose, route, site, and time documented	
Five-minute reassessment documented	
Repeat dose / refractory escalation appropriate	
Safe positioning documented	
Oxygen, monitoring, IV/IO, and fluids appropriate	
Antihistamine / steroid did not delay adrenaline	
Tryptase sampling appropriate and timed	
Risk-based observation rationale documented	

Audit item	Met / not met / N/A
Auto-injector and action-plan requirements completed	
Allergy referral and primary-care communication completed	
Incident report completed when indicated	

## ANNEX N. Local configuration checklist

Local decision required	Approved arrangement
Adrenaline IM product, storage, and dose chart	
Paediatric weight-based policy and maximum dose	
Refractory adrenaline infusion concentration and titration	
Glucagon and additional vasopressor protocol	
Critical-care / anaesthesia activation criteria	
Airway and front-of-neck access pathway	
Tryptase tubes, timing, storage, and laboratory request	
Observation-unit and admission criteria	
Auto-injector brands, doses, stock, and prescribing process	
Allergy referral route and expected timeframe	
Hereditary / ACE-inhibitor angioedema pathway	
Peri-operative, contrast, transfusion, and venom pathways	
Inter-island / overseas transfer pathway if applicable	

## ANNEX O. References and source tools

- Resuscitation Council UK. Emergency Treatment of Anaphylaxis: Guidelines for Healthcare Providers. May 2021; current RCUK anaphylaxis resource set accessed 2026.
- Golden DBK, Wang J, Waserman S, et al. Anaphylaxis: A 2023 Practice Parameter Update. *Ann Allergy Asthma Immunol.* 2024;132:124-176.
- Cardona V, Ansotegui IJ, Ebisawa M, et al. World Allergy Organization Anaphylaxis Guidance 2020. *World Allergy Organ J.* 2020;13:100472.
- Muraro A, Worm M, Alviani C, et al. EAACI Guidelines: Anaphylaxis (2021 Update). *Allergy.* 2022;77:357-377.
- American Heart Association. 2025 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care: Adult and Pediatric Special Circumstances of Resuscitation.
- Local formulary, pharmacy monographs, paediatric dosing references, auto-injector product information, allergy-referral standards, and critical-care infusion protocols must be used for final implementation.