[HOSPITAL / HEALTH AUTHORITY NAME]

EMERGENCY AIRWAY MANAGEMENT AND VENTILATORY SUPPORT PATHWAY

Protocol 48: Airway Assessment, Preoxygenation, Rapid-Sequence Intubation, Difficult-Airway Rescue, Tube Confirmation, Post-Intubation Care, Non-Invasive Support, Mechanical Ventilation, and Transport Ventilation

DRAFT FOR EMERGENCY MEDICINE, ANAESTHESIA, CRITICAL CARE, RESPIRATORY MEDICINE, INTERNAL MEDICINE, PAEDIATRICS, NEONATOLOGY, OBSTETRICS, SURGERY, ENT, TRAUMA, PHARMACY, NURSING, RESPIRATORY THERAPY, AMBULANCE / TRANSFER SERVICES, BIOMEDICAL ENGINEERING, AND CLINICAL GOVERNANCE

STATUS: This is a draft clinical-governance document. It must be adapted to local airway competence, staffing, video-laryngoscopy and bronchoscopy availability, supraglottic and emergency front-of-neck equipment, medication formulary, ventilators and circuits, oxygen supply, capnography, paediatric and neonatal capability, anaesthesia / ENT / critical-care support, ambulance and inter-island transfer arrangements, infection-control requirements, and applicable professional standards before implementation.

AIRWAY SAFETY RULE: Oxygenation is the priority. Every emergency intubation must have a named airway lead, skilled assistant, explicit Plan A-B-C-D, functioning suction, waveform capnography, rescue supraglottic airway, immediately accessible emergency front-of-neck kit, post-intubation sedation, and a plan for peri-intubation cardiovascular collapse. If difficulty is encountered, call for help and declare failure early.

Document control	Details
Document owner	Emergency Department / Medical Services Directorate / Anaesthesia / Critical Care / Nursing Services / Clinical Governance
Clinical leads	Emergency Medicine; Anaesthesia; Critical Care; Respiratory Medicine; Internal Medicine; Paediatrics; Neonatology; Obstetrics; Surgery / ENT; Trauma; Pharmacy; Nursing; Respiratory Therapy; Ambulance / Transfer Services; Biomedical Engineering
Applies to	Children, adolescents, pregnant and recently pregnant patients, and adults requiring emergency airway support, tracheal intubation, non-invasive respiratory support, invasive ventilation, or transport ventilation in or from the emergency department. Neonatal resuscitation remains primarily under Protocol 41.
Interfaces	Protocol 1 Patient Journey; Protocol 2 Triage; Protocol 3 Resuscitation / Sepsis / Shock; Protocol 4 Assessment and Documentation; Protocol 6 Pain Management; Protocol 8 Medication Safety; Protocol 14 Fever / Sepsis; Protocol 15 Respiratory Distress; Protocol 17 Altered Mental Status; Protocol 19 Seizures; Protocol 22 Arrhythmias; Protocol 29 Poisoning; Protocol 30 Anaphylaxis; Protocol 31 Major Trauma; Protocol 32 Head / Spinal Injury; Protocol 33 Thoracic Trauma; Protocol 35 Burns; Protocol 36 Environmental Emergencies; Protocol 37 Eye / ENT / Dental Emergencies; Protocol 38 Obstetric Emergencies; Protocol 40 Paediatric Assessment; Protocol 41 Neonatal Emergencies; Protocol 42 Behavioural Emergency; Protocol 46 Immunocompromised / Oncology; Protocol 47 Renal / Dialysis; Protocol 49 Major Haemorrhage; Protocol 50 Procedural Sedation; Protocol 52 Palliative Emergencies; Protocol 56 Disaster Response; Protocol 57 Utility / Equipment Downtime.
Version / status	Draft 1.0 for local multidisciplinary validation
Review cycle	After every failed airway, emergency front-of-neck airway, unrecognized oesophageal intubation, peri-intubation cardiac arrest, unplanned extubation, severe ventilator incident, transport airway event, or serious medication error; otherwise at least every 2 years.
Approval date / next review	_____ / _____

1. Purpose

To provide a standardized emergency-department pathway for early recognition of airway or ventilatory failure; safe oxygenation, preoxygenation and physiological optimization; rapid-sequence or awake airway management; difficult-airway rescue; reliable tracheal-tube confirmation; post-intubation sedation and ventilation; non-invasive support; and safe transfer of ventilated patients.

2. Scope

- Applies from triage through resuscitation, airway intervention, ED stabilization, critical-care admission, operating-theatre transfer, inter-facility transport, or end-of-life care.
- Includes bag-mask ventilation, airway adjuncts, high-flow nasal oxygen, CPAP / BiPAP, supraglottic airway devices, tracheal intubation, emergency front-of-neck airway, initial invasive ventilation and transport ventilation.
- Does not authorize clinicians to perform techniques beyond their verified competence. The most experienced available airway clinician should lead, with early anaesthesia, critical-care, ENT, paediatric or neonatal support as appropriate.
- Does not replace condition-specific pathways. The physiological cause of respiratory failure, shock or reduced consciousness must be treated in parallel.

3. Core policy statements

1. Oxygenation and ventilation take priority over tracheal intubation. Effective two-person bag-mask ventilation or a supraglottic airway is an acceptable rescue while definitive plans are made.
2. Every emergency airway intervention uses a brief checklist, defined roles, Plans A-B-C-D, continuous oxygen delivery where feasible, immediately available suction, waveform capnography and a post-intubation plan.
3. Anticipated anatomical or physiological difficulty must trigger senior help and consideration of awake tracheal intubation, awake airway visualization, transfer to a more appropriate location, or another safer strategy before induction.
4. Preoxygenation and haemodynamic optimization are active treatments. Severe hypoxaemia may require non-invasive positive-pressure ventilation; agitation preventing preoxygenation may require medication-assisted preoxygenation by a skilled clinician.
5. A sedative-hypnotic must accompany neuromuscular blockade. Induction and paralytic choice and dose are individualized to physiology, contraindications, weight and local formulary. Post-intubation analgesia and sedation begin immediately.
6. Videolaryngoscopy is the default first-line device when available and the operator is trained. Attempts are limited, time-aware and separated by reoxygenation and a meaningful change in technique or operator.
7. Tracheal-tube placement is confirmed by a sustained waveform capnography trace plus visual confirmation of passage through the glottis whenever possible. If sustained exhaled carbon dioxide is absent, presume oesophageal placement unless an immediately reversible low-flow explanation is proven.

8. Failure must be declared early. For adults, Plan A permits a maximum of three attempts plus one by a more experienced operator; Plan B uses a second-generation supraglottic device with a maximum of three attempts; Plan C is a final optimized facemask-ventilation attempt; Plan D is emergency front-of-neck airway for cannot-intubate, cannot-oxygenate.
9. All intubated patients receive continuous waveform capnography, pulse oximetry, ECG and blood-pressure monitoring, secure tube fixation, lung-protective initial ventilation, immediate sedation / analgesia, and structured reassessment for peri-intubation complications.
10. Non-invasive support is a monitored, time-limited treatment trial and must never delay intubation when airway protection, oxygenation, ventilation, haemodynamics or mental status are worsening.
11. Ventilated transfer requires stabilization on the transport ventilator before departure, capnography, adequate oxygen and battery reserve, backup bag-mask ventilation and suction, trained escort, rescue medicines, and an explicit plan for deterioration.

4. Definitions and clinical framework

Term	Operational meaning
Anatomically difficult airway	Airway features, trauma, swelling, blood, vomit, tumour, restricted mouth opening or cervical-spine limitation that may make facemask ventilation, supraglottic placement, laryngoscopy, intubation or front-of-neck access difficult.
Physiologically difficult airway	Critical hypoxaemia, hypotension, severe acidosis, right-ventricular failure, raised intracranial pressure or other physiology that makes induction, apnoea or positive-pressure ventilation likely to cause collapse despite normal anatomy.
Peroxygenation	Continuous delivery of oxygen before, during and between airway attempts using facemask, nasal oxygen, HFNO or non-invasive ventilation as appropriate.
Rapid-sequence intubation (RSI)	Planned administration of an induction agent and neuromuscular blocker followed by prompt tracheal intubation, with aspiration-risk and rescue planning.
Medication-assisted preoxygenation	Carefully titrated sedation to permit effective preoxygenation in an agitated patient who cannot otherwise tolerate oxygen delivery; it is performed only with full monitoring and immediate airway rescue capability.
Awake tracheal intubation (ATI)	Tracheal intubation while spontaneous ventilation and airway tone are preserved, using topical anaesthesia and a skilled technique when anticipated difficulty makes induction hazardous.
Second-generation supraglottic airway device (SAD)	A rescue or conduit device with improved seal and gastric drainage features; waveform capnography is used to confirm ventilation.
Emergency front-of-neck airway (eFONA)	Emergency surgical access to the trachea for cannot-intubate, cannot-oxygenate. Adult default is a trained scalpel-bougie-tube technique under the approved local algorithm.
Two-point tube check	Confirmation using sustained waveform capnography and visual confirmation of tracheal placement. Clinical signs and ultrasound may support but do not replace capnography.
Non-invasive respiratory support	HFNO, CPAP or pressure-support ventilation delivered without a tracheal tube; it requires patient cooperation, airway patency and close monitoring.

5. Roles and accountability

Role	Minimum responsibility
Airway lead	Decide strategy; assess anatomical and physiological difficulty; lead briefing; choose drugs and devices; verbalize Plan A-B-C-D; perform or delegate the procedure; declare failure and eFONA.
Airway assistant	Prepare and check equipment; position patient; provide suction, external laryngeal manipulation, bougie / stylet, SAD and eFONA kit; count attempts and elapsed time; prompt transitions; secure tube.
Physiology / resuscitation lead	Treat hypoxaemia, shock, acidosis and cause; manage IV / IO access, vasopressors and fluids; monitor rhythm and blood pressure; prepare for peri-intubation arrest.
Medication nurse / pharmacist	Verify allergies, weight and doses; prepare induction, neuromuscular blocker, vasopressor, analgesia and sedation; label syringes; record administration; monitor medication safety.
Monitoring / documentation nurse	Apply ECG, SpO2, NIBP / invasive pressure and capnography; record baseline and interval observations, attempt number, device, drugs, tube depth, ETCO2, complications and reassessment.
Respiratory therapist / ventilator clinician	Prepare circuit, filters, humidification and ventilator; confirm settings, alarms, oxygen supply and backup; obtain and interpret gas; prepare transport ventilator.
Senior anaesthesia / critical-care / ENT / paediatric clinician	Attend anticipated or encountered difficulty, awake technique, failed airway, severe physiological risk, special population or eFONA; support definitive and post-airway care.
Clinical governance / biomedical engineering	Maintain standardized airway carts, equipment sizes, capnography, ventilator servicing, drug kits, checklists, simulation, competency records, audits and incident review.

6. Required readiness

Resource	Required local standard
Oxygenation and ventilation	Self-inflating bag with reservoir, appropriately sized masks, two-person technique, PEEP valve, oral and nasal airways, HFNO where available, NIV circuits and interfaces, and oxygen source with reserve.
Suction	At least two functioning suction systems for high-risk contamination, with rigid and flexible catheters; suction checked before drugs are given.
Intubation	Video and direct laryngoscopes with adult and paediatric blades, cuffed tracheal tubes, stylets, bougies, introducers, tube clamps, syringes, lubricant and fixation devices.
Rescue airway	Second-generation SADs in required sizes, flexible bronchoscope where available, airway-exchange / intubation-through-SAD capability and clear ENT / surgical airway access.
eFONA	Immediately accessible, standardized adult kit containing scalpel, bougie, cuffed 6.0-mm tube and suction; paediatric rescue equipment and age-specific algorithm separately defined.

Resource	Required local standard
Confirmation	Continuous waveform capnography for every tracheal tube and ventilated SAD, pulse oximetry, stethoscope, chest radiography and point-of-care ultrasound where available.
Drugs	Locally approved induction agents, neuromuscular blockers, vasopressor bolus / infusion options, analgesics, sedatives, reversal agents where applicable, and infusion pumps.
Ventilation	ED and transport ventilators with pressure and volume modes, paediatric capability where applicable, filters, circuits, humidification, oxygen cylinders, batteries, spare circuit and manual backup.
Special support	24/7 contact routes for anaesthesia, critical care, ENT / surgery, paediatrics / neonatology, obstetrics and regional transfer; immediate difficult-airway escalation plan when onsite expertise is limited.

7. Triage and immediate danger recognition

Finding	Immediate response
Complete or near-complete obstruction, silent airway, stridor with exhaustion, rapidly progressive facial / tongue / neck swelling, severe burns or expanding neck haematoma	Resuscitation area; call senior airway, anaesthesia and ENT help; 100% oxygen; prepare awake or controlled advanced airway and eFONA without delay; treat cause in parallel.
Apnoea, agonal breathing, respiratory arrest, severe bradypnoea, cyanosis or inability to protect airway	Open airway, suction, two-person bag-mask ventilation with adjuncts and 100% oxygen; attach capnography where possible; proceed to definitive airway according to competence and cause.
Severe hypoxaemia despite high-concentration oxygen, exhaustion, rising CO2, altered mental status or worsening work of breathing	Immediate monitored HFNO / NIV if appropriate and no contraindication, while preparing intubation. Do not allow a prolonged failing trial.
Shock, severe acidosis, massive PE / RV failure, severe asthma, pulmonary hypertension or post-arrest state requiring intubation	Treat as a physiologically difficult airway; senior lead; optimize circulation and oxygenation; prepare vasopressor and post-intubation ventilation before induction.
Blood, vomit, secretions, facial trauma or massive haemoptysis contaminating airway	Two suction systems; upright or lateral positioning when feasible; rapid oxygenation; plan for video laryngoscopy, bougie and contamination technique; early surgical help.
Known difficult airway, prior awake intubation, tracheal stenosis, head-and-neck cancer, radiation, limited mouth opening or cervical-spine injury	Retrieve records if this does not delay care; call expert help; assess cricothyroid membrane; consider awake technique or alternative location / strategy.
Intubated patient with sudden desaturation, hypotension, high pressure, absent ETCO2 or reduced air entry	Immediate DOPE check: Displacement, Obstruction, Pneumothorax, Equipment. Disconnect and hand-ventilate if needed; treat life-threatening cause immediately.

8. First 10 minutes: oxygenate, assess and mobilize

1. Call for help early and move to the resuscitation area. Assign airway lead, airway assistant, physiology lead, medication role and recorder.
2. Apply continuous ECG, SpO2 and frequent blood pressure. Obtain bedside glucose and establish reliable IV / IO access without delaying oxygenation.
3. Open the airway, suction, insert an appropriate oral / nasal airway and use two-person bag-mask ventilation with PEEP when needed. Give each breath slowly enough to achieve visible chest rise and avoid excessive volume or rate.
4. Identify the cause and urgency: obstruction, hypoxaemic failure, hypercapnic failure, depressed consciousness, seizure, toxicologic paralysis, shock, trauma, anaphylaxis, burns, neurological emergency or cardiac arrest.
5. Assess both anatomical and physiological difficulty, aspiration risk, previous airway history, dentition, mouth opening, neck movement, facial hair / obesity, airway contamination and feasibility of front-of-neck access.
6. Position head-up or ramped where possible; align external auditory meatus with sternal notch in obesity. Maintain cervical-spine precautions without sacrificing oxygenation.
7. Select the safest immediate support: facemask, HFNO, CPAP / BiPAP, SAD, awake technique or RSI. Explicitly state why intubation is required and whether delay for optimization is safe.
8. Check suction, oxygen, capnography, laryngoscope, tube, bougie / stylet, SAD, eFONA kit, drugs, vasopressor, ventilator and post-intubation infusions before paralysis.
9. Brief Plan A-B-C-D, attempt limits and trigger for eFONA. Mark or identify the cricothyroid membrane when difficulty or obesity is anticipated.
10. Begin treatment of shock, bronchospasm, anaphylaxis, pulmonary oedema, metabolic derangement, pneumothorax, poisoning or other reversible cause in parallel.

9. Airway assessment and decision to intubate

Domain	Questions and action
Indication	Can the patient protect the airway? Is oxygenation or ventilation failing? Is work of breathing unsustainable? Is controlled ventilation required for procedure, transport, severe neurological injury or expected deterioration?
Anatomical difficulty	Previous difficulty; mouth opening; dentition; facial / neck anatomy; obesity; beard; limited neck movement; airway swelling / tumour; trauma; burns; blood / vomit; anticipated SAD or eFONA difficulty.
Physiological difficulty	SpO2 and oxygen reserve; shock / vasopressor need; severe metabolic acidosis; pulmonary hypertension / RV failure; asthma / obstructive disease; raised ICP; pregnancy; severe anaemia; recent arrest.
Aspiration risk	Full stomach, bowel obstruction, pregnancy, GI bleed, vomiting, impaired consciousness, gastroparesis or recent enteral feed. Decompress the stomach only when benefit exceeds delay / procedural risk.
Awake option	Consider when both intubation and rescue oxygenation may be difficult, airway pathology may worsen after induction, cervical or facial anatomy is severely restricted, or loss of spontaneous breathing would be hazardous.
Non-invasive option	Appropriate when airway is patent and protected, patient can cooperate, secretions are manageable and improvement is expected with HFNO or NIV. Define failure criteria before starting.

Domain	Questions and action
Goals and ceiling	Clarify treatment ceiling where possible, but do not delay emergency stabilization. Intubation should be consistent with prognosis, reversible pathology and documented goals of care.

A normal-looking airway does not equal a safe airway. Severe hypoxaemia, shock, acidosis, pulmonary hypertension, right-ventricular failure and severe asthma can make an anatomically easy intubation physiologically lethal.

10. Team brief and equipment check

Brief element	Minimum verbalized content
Patient and indication	Identity, weight / predicted body weight, diagnosis, reason for airway, allergies, aspiration risk, cervical-spine status and treatment ceiling.
Difficulty	Anatomical risks, physiological risks, cricothyroid membrane assessment, anticipated mask / SAD / intubation / eFONA difficulty and need for awake technique.
Plan A	Operator, videolaryngoscope and blade, tube size, bougie / stylet, positioning, external laryngeal manipulation and maximum attempts.
Plan B	Second-generation SAD size, who inserts it, maximum attempts and whether it will be used as rescue, bridge, conduit or definitive airway.
Plan C	Final optimized two-person facemask ventilation with adjuncts, 100% oxygen, adequate neuromuscular block and senior decision.
Plan D	Trigger phrase: cannot intubate, cannot oxygenate; eFONA operator, kit location, preferred technique, roles and surgical / ENT support.
Physiology	Preoxygenation method, oxygen target, vasopressor / fluid plan, acceptable blood pressure, anticipated arrest mechanism and post-intubation ventilator plan.
Medicines	Induction agent and dose, neuromuscular blocker and dose, vasopressor, analgesia, sedation, infusion pumps and allergy / contraindication check.
Confirmation / aftercare	Waveform capnography, visual confirmation, tube fixation depth, cuff pressure, ventilator settings, ABG timing, CXR, sedation and destination.

11. Preoxygenation and physiological optimization

Problem	Preferred strategy
Most patients	Head-up position; tight-fitting facemask with 100% oxygen for adequate time; continuous nasal oxygen during laryngoscopy where feasible; monitor seal and end-tidal oxygen if available.
Severe hypoxaemia	Use non-invasive positive-pressure ventilation for preoxygenation when tolerated; HFNO may support peroxygenation and is useful when laryngoscopy is expected to be challenging.
Agitation / delirium	Medication-assisted preoxygenation may be used by an experienced clinician with full monitoring, suction, airway equipment and immediate readiness to proceed. Avoid deep sedation without a rescue plan.
Obesity / pregnancy	Ramped or head-elevated position, positive pressure / PEEP, meticulous seal and nasal oxygen. Expect rapid desaturation and plan early rescue.
Shock / hypotension	Treat reversible causes; prepare a vasopressor infusion or bolus strategy before induction; use only physiology-guided fluid. Reduce induction dose when appropriate and avoid unnecessary positive pressure.
Severe metabolic acidosis	Preserve spontaneous minute ventilation until the team can match it immediately after intubation. Avoid prolonged apnoea; prepare rapid ventilation, gas analysis and treatment of the cause.
Severe asthma / COPD	Bronchodilation, controlled preoxygenation and gentle ventilation; avoid high rate and breath stacking. Prepare for dynamic hyperinflation and post-intubation hypotension.
RV failure / pulmonary hypertension	Expert support; optimize oxygenation, acid-base status and preload; maintain systemic pressure; avoid abrupt high intrathoracic pressure and be ready for cardiovascular collapse.

12. RSI medicines and peri-intubation cardiovascular safety

- Use the locally approved RSI drug chart. Document actual weight, predicted / ideal body weight where relevant, drug, dose, route and time. Pharmacy should maintain standardized concentrations and labels.
- Choose an induction agent according to physiology. Ketamine, etomidate or propofol may each be appropriate in selected patients; none removes the need for haemodynamic preparation, dose adjustment and monitoring.
- Administer a neuromuscular blocker when a sedative-hypnotic is used for RSI. Rocuronium or succinylcholine may be used when locally approved and not contraindicated. Never give paralysis without adequate hypnosis.
- Prepare and start post-intubation analgesia and sedation before or immediately after tube placement; do not wait for movement, hypertension or awareness. Long-acting paralysis can conceal inadequate sedation.
- Have a vasopressor strategy ready before induction in patients with shock, sepsis, pulmonary hypertension, RV failure, major haemorrhage or marginal blood pressure. Routine large fluid boluses are not a substitute for assessment.
- Cricoid pressure is not mandatory. If applied by trained staff for aspiration risk, release it immediately if it impairs ventilation, laryngoscopy or SAD placement.
- Consider gastric decompression before RSI only when the expected reduction in regurgitation risk outweighs delay and insertion risk. Continue suction readiness throughout.

13. Plan A: tracheal intubation

1. Deliver facemask oxygen plus nasal oxygen where feasible. Ensure adequate neuromuscular blockade and time awareness.
2. Use videolaryngoscopy as first line when available and the operator is trained. The most experienced available operator should perform the first attempt when difficulty or rapid desaturation is expected.

3. Limit adult Plan A to a maximum of three attempts plus one by a more experienced operator. Oxygenate between attempts; an attempt ends when the device is removed from the mouth.
4. After an unsuccessful attempt, stop and change something meaningful: operator, position, blade / device, tube size, bougie / stylet, external laryngeal manipulation, suction strategy or release of cricoid pressure.
5. Avoid repeated traumatic laryngoscopy. Call for help as soon as difficulty is experienced and prime the team and equipment for eFONA.
6. After tube passage, inflate cuff, connect capnography and verify with the two-point check. If unsuccessful, declare failed intubation and move to Plan B without delay.

14. Confirmation, fixation and immediate tube safety

Check	Required standard
Waveform capnography	A sustained exhaled CO2 waveform over repeated breaths is mandatory. In arrest or very low flow, optimize circulation and verify equipment, but persistent absent CO2 means oesophageal placement should be presumed.
Visual confirmation	Whenever possible, confirm the tube is seen passing through the vocal cords. Record laryngoscopic view and device.
Clinical checks	Bilateral chest expansion and air entry, absence of gastric inflation, appropriate compliance and improving oxygenation. These support but do not replace capnography.
Tube depth / cuff	Record depth at teeth / gums / nares; inflate cuff to seal and measure pressure according to local standard, generally 20-30 cm H2O in adults. Recheck after movement.
Fixation	Secure with an approved device; protect skin and lips; use bite block when indicated; avoid fixation that obstructs venous drainage in neuro patients.
Imaging	Chest radiograph or ultrasound assesses depth, lung expansion and complications after stabilization. Imaging must not be used to delay correction of a suspected oesophageal tube.
Continuous monitoring	Maintain waveform capnography and SpO2 continuously until extubation or handover. Any waveform loss triggers immediate disconnection / airway assessment.

TUBE-CHECK RULE: No sustained waveform capnography = no confirmed tracheal tube. Remove a suspected oesophageal tube promptly unless a senior clinician identifies and corrects an exceptional low-flow or equipment explanation.

15. Failed intubation and difficult-airway rescue: Plans B-C-D

Plan	Action and transition
Plan B - SAD	Declare failed intubation. Ensure eFONA kit is immediately accessible. Insert a second-generation SAD; maximum three attempts, changing size or device if unsuccessful. Confirm ventilation by waveform capnography. Stop, think and communicate: wake patient if possible, intubate through SAD, proceed temporarily without intubation, or use a surgical airway.
Plan C - facemask	After failed SAD ventilation, open eFONA kit. Make one final optimized attempt at facemask ventilation with 100% oxygen, adequate neuromuscular block, optimal position, oral / nasal adjuncts and two-person technique. Confirm any ventilation with capnography.
Plan D - eFONA	Declare cannot intubate, cannot oxygenate. Continue 100% oxygen to upper airway. A trained clinician performs immediate eFONA using the approved adult scalpel-bougie-cuffed tube technique; default longitudinal skin incision when anatomy is difficult. Confirm ventilation with waveform capnography.
After rescue oxygenation	Stabilize physiology, secure airway, call definitive surgical / critical-care support, document attempts and complications, inform patient / family when appropriate, submit difficult-airway alert and conduct supportive team debrief.

- Do not allow pride, hierarchy or repeated laryngoscopy to delay transition. The airway assistant must count attempts and prompt declaration.
- Reversal of neuromuscular blockade is not a primary rescue for a deteriorating cannot-intubate, cannot-oxygenate emergency.
- Paediatric eFONA differs from the adult technique. Use the age-specific local paediatric difficult-airway algorithm and early ENT / paediatric anaesthesia support.

16. Special airway scenarios

Scenario	Key modifications
Upper-airway swelling / angioedema / epiglottitis	Treat cause; avoid upsetting a child or forcing airway examination; maintain spontaneous ventilation when possible; call anaesthesia and ENT early; consider awake technique; prepare surgical airway.
Burns / inhalation injury	Early expert intubation before progressive oedema when indicated; smaller tube may be needed; assess carbon monoxide / cyanide and associated trauma; avoid unnecessary prophylactic intubation without reassessment.
Massive haemoptysis / GI bleeding / vomit	Two suction systems, head-up or lateral positioning as physiology permits, larger tube when feasible, rapid contamination management, early bronchoscopy / surgery / interventional support. Position bleeding lung down when side is known and oxygenation allows.
Severe asthma	Maximize bronchodilation; anticipate high resistance, breath stacking and hypotension; use low rate, high inspiratory flow and long expiratory time after intubation; disconnect briefly if life-threatening dynamic hyperinflation occurs.
Severe metabolic acidosis / DKA	Avoid suppressing compensatory ventilation until ready; minimize apnoea; match high minute ventilation immediately; repeat blood gas promptly and treat underlying cause.
Shock / major haemorrhage	Control bleeding and activate transfusion; use reduced induction dose and vasopressor support; prevent hypothermia; anticipate arrest from loss of sympathetic tone and positive pressure.
Cervical-spine injury	Prioritize oxygenation; use jaw thrust and manual in-line stabilization; remove the anterior collar during laryngoscopy while maintaining stabilization; videolaryngoscopy is preferred when skilled.
Tracheostomy / laryngectomy emergency	Determine whether upper airway communicates with lungs; oxygenate both face and stoma until clarified; remove obstructing attachments, suction and follow the local tracheostomy / laryngectomy emergency algorithm.

Scenario	Key modifications
Cardiac arrest	Use bag-mask or SAD promptly. Intubation is attempted only by clinicians with high success, ideally more than 95% within two attempts, with less than 5 seconds interruption to compressions and continuous capnography.

17. Non-invasive respiratory support: HFNO, CPAP and BiPAP

Element	Standard
Likely indications	Acute hypercapnic respiratory failure from COPD / obesity hypoventilation; acute cardiogenic pulmonary oedema; selected acute hypoxaemic failure; selected immunocompromised patients; preoxygenation before intubation; post-extubation support in selected high-risk patients.
Contraindications / immediate intubation	Respiratory or cardiac arrest, inability to protect airway, rapidly worsening mental status, uncontrolled vomiting / haemorrhage, severe facial trauma, unmanageable secretions, refractory shock, severe agitation not safely managed, or a need for immediate definitive airway.
Before starting	Define indication, interface, settings, oxygen target, treatment ceiling, senior clinician, reassessment time and failure criteria. Ensure suction and intubation equipment are ready.
Monitoring	Continuous SpO2 and ECG; frequent BP, respiratory rate, work of breathing, mental status, synchrony, leak, skin pressure and gas analysis. Observe continuously during initiation.
Response	Improvement should be evident early in respiratory rate, distress, gas exchange, pH / CO2, oxygen requirement and mental status. Reassess at 15-30 minutes and again by 60 minutes or sooner if concern.
Failure	Rising oxygen requirement, persistent / worsening acidosis, exhaustion, haemodynamic instability, deteriorating consciousness or inability to tolerate interface requires prompt intubation unless inconsistent with goals of care.
Infection / fire safety	Use approved filters and PPE, place in an appropriate area, avoid oxygen-enriched fire hazards and ensure adequate oxygen-system capacity.

18. Initial invasive-ventilation strategy

Clinical pattern	Initial approach and target
General adult	Volume or pressure mode; tidal volume 6-8 mL/kg predicted body weight; rate adjusted to pH / CO2; PEEP about 5 cm H2O then individualized; FiO2 1.0 initially then rapidly titrated to the appropriate saturation target.
ARDS / severe hypoxaemia	Use lung-protective tidal volume near 6 mL/kg predicted body weight, appropriate PEEP, plateau-pressure limitation, conservative oxygen target and early critical-care / prone-positioning pathway.
COPD / asthma	Lower rate, high inspiratory flow, long expiratory time, tolerate moderate hypercapnia when safe, monitor flow returning to baseline and intrinsic PEEP; avoid excessive tidal volume and minute ventilation.
Severe metabolic acidosis	Set sufficient minute ventilation to approximate pre-intubation compensation while treating the cause; repeat gas quickly. Avoid abrupt normalization of CO2 that worsens pH.
Neurological injury / post-arrest	Avoid hypoxaemia and hypotension; target normocapnia unless a time-limited emergency indication exists; prevent excessive PEEP that impairs cerebral or systemic perfusion.
Cardiac arrest with advanced airway	During compressions, ventilate about 10 breaths/min with no pause; use volume control 6-8 mL/kg predicted body weight or visible chest rise, high FiO2 and low initial PEEP, confirming effectiveness.
Paediatric patient	Use weight- and age-appropriate ventilator, tube and circuit; tidal volume generally 6-8 mL/kg ideal body weight with age / disease-specific rate, PEEP and pressure limits under paediatric guidance.

Ventilator settings are a prescription, not a default. Reassess chest movement, pressure / volume waveforms, ETCO2, SpO2, haemodynamics and blood gas after every major setting change.

19. Post-intubation care bundle

1. Confirm tube with continuous waveform capnography and visual check; document depth and secure it. Recheck after every move or transfer.
2. Start analgesia and sedation immediately; set a target depth; reassess pain, awareness and synchrony. Give neuromuscular blockade only with adequate ongoing analgesia / sedation and monitoring.
3. Connect the ventilator using lung-protective settings matched to disease and predicted body weight. Set alarms and confirm they are audible and appropriate.
4. Reassess blood pressure immediately and repeatedly. Treat peri-intubation hypotension with cause-directed fluid, blood products and vasopressor support.
5. Complete a DOPE assessment if oxygenation, ETCO2, pressure or haemodynamics are abnormal. Exclude right-mainstem intubation, pneumothorax, bronchospasm and circuit problems.
6. Obtain blood gas after stabilization and after major changes; check glucose, temperature, electrolytes and condition-specific investigations.
7. Obtain chest imaging when stable to assess depth and complications. Place gastric tube, urinary catheter and invasive monitoring only when indicated.
8. Use head-up positioning, eye and skin protection, oral care, pressure-injury prevention, thrombosis / stress-ulcer prevention as indicated, and infection-control measures.
9. Document the difficult-airway plan, extubation risk, need for ENT / anaesthesia review, treatment ceiling and destination. Communicate with patient / family as soon as appropriate.

20. Sudden deterioration after intubation: DOPE plus physiology

Cause	Immediate check and action
Displacement	Look at tube depth and capnography; inspect mouth / stoma; consider oesophageal, pharyngeal or right-mainstem position. Remove and reoxygenate if oesophageal placement is suspected.
Obstruction	Pass suction catheter; inspect for biting, kink, secretions, clot, mucus plug or foreign body; consider tube exchange / bronchoscopy.

Cause	Immediate check and action
Pneumothorax / dynamic hyperinflation	Assess unilateral air entry, ultrasound, pressure and haemodynamics. Treat tension pneumothorax immediately. In severe asthma, disconnect briefly and allow exhalation if arrest / shock from auto-PEEP is suspected.
Equipment	Disconnect ventilator and hand-ventilate with 100% oxygen; check circuit, filter, valves, oxygen supply, ventilator, capnography sampling and alarms.
Patient physiology	Consider shock, haemorrhage, PE / RV failure, anaphylaxis, arrhythmia, seizure, acidosis, abdominal compartment or sedation problem. Treat cause while maintaining oxygenation.

21. Paediatric, neonatal, pregnancy, obesity and cervical-spine considerations

- Children have small oxygen reserves and rapidly desaturate. Use weight-based drugs and equipment, age-specific observations, early paediatric / anaesthesia help, cuffed tubes where locally standard, and continuous ETCO2 after advanced airway placement. Protocol 40 applies; newborn transition and neonatal resuscitation follow Protocol 41.
- In paediatric difficult airway, oxygenation remains the priority. Limit attempts, use age-appropriate SAD rescue and the locally approved paediatric cannot-intubate, cannot-oxygenate algorithm. Adult scalpel-bougie eFONA is not automatically transferable to small children.
- Pregnant patients desaturate rapidly and have increased aspiration risk. Use left uterine displacement when indicated, ramped head-up positioning, early expert support and smaller tube if oedema is expected. Maternal oxygenation and circulation are the primary fetal resuscitation.
- In obesity, ramp the patient, use positive-pressure preoxygenation and nasal oxygen, prefer videolaryngoscopy when trained, calculate tidal volume from predicted rather than actual body weight, and anticipate difficult facemask ventilation, rapid desaturation and transport challenges.
- For suspected cervical-spine injury, maintain neutral alignment and manual in-line stabilization, but never withhold jaw thrust, suction, bag-mask ventilation or life-saving airway access. Follow the local 2024 cervical-spine airway pathway.

22. Transport ventilation and inter-facility transfer

Requirement	Standard
Stabilization	Complete airway confirmation, fixation, sedation, haemodynamic support and required procedures before departure unless immediate transfer is the only life-saving option.
Transport ventilator	Establish the patient on the transport ventilator approximately 20-30 minutes before departure when possible; confirm tolerance and obtain a blood gas after about 10-15 minutes when clinically appropriate.
Monitoring	Continuous waveform capnography, SpO2 and ECG; regular or continuous BP; temperature as indicated. Use the same monitoring during internal, ambulance, air or marine transport.
Reserve	Calculate oxygen for expected journey plus delays, with independent reserve; verify charged batteries and backup power; carry self-inflating bag, mask, PEEP valve, suction and spare circuit.
Medicines	Adequate analgesia, sedation, neuromuscular blocker if required, vasopressor, emergency drugs and infusion-pump battery. Label and secure all lines.
Personnel	Escort competent in airway rescue, ventilator use, drug administration and deterioration management; higher-risk patients require appropriately senior critical-care / anaesthesia support.
Handover	Indication, airway grade / attempts, tube size / depth, capnography, ventilator settings, latest gas, sedation, haemodynamics, complications, difficult-airway plan, allergies and treatment ceiling.
Before movement	Perform a team pause: tube secure, ETCO2 present, oxygen and battery checked, alarms set, suction working, pumps charged, destination accepted, route / weather / delay plan confirmed.

23. Extubation, accidental tube loss and airway follow-up

- Extubation in the ED is uncommon and must be a planned senior decision with resolution of indication, adequate consciousness and ventilation, manageable secretions, haemodynamic stability, equipment and a reintubation strategy.
- High-risk or difficult-airway extubation should occur in a critical-care / operating-theatre environment with anaesthesia / ENT support and a staged plan. Do not remove a rescue airway simply because the patient appears improved.
- For accidental extubation or tube displacement, call for help, oxygenate with facemask or SAD, and follow the full difficult-airway pathway rather than attempting blind replacement.
- After difficult airway, document a clear alert in the record, inform the patient / family when appropriate, provide written difficult-airway information and arrange specialist follow-up.

24. Documentation and handover

Field	Required detail
Indication / decision	Reason for airway or NIV, alternatives considered, treatment ceiling, senior decision and time.
Assessment	Anatomical and physiological difficulty, aspiration risk, airway history, cricothyroid membrane, cervical-spine status and predicted body weight.
Preparation	Team roles, checklist, preoxygenation method, positioning, equipment, suction, capnography, vasopressor and Plans A-B-C-D.
Procedure	Operator; device / blade; tube / SAD size; attempt number; view; adjuncts; drugs and times; complications; transition and rescue actions.
Confirmation	Waveform capnography, visual confirmation, ETCO2, bilateral air entry, tube depth, cuff pressure, fixation and imaging.
Aftercare	Ventilator settings, ABG, sedation / analgesia, vasopressor, fluids / blood, response, DOPE assessment, destination and transfer readiness.

Field	Required detail
Handover	Difficult-airway alert, unresolved risks, next gas / imaging / sedation review, equipment needs, receiving clinician and transport team.

25. Quality indicators and audit

Indicator	Suggested measure
Checklist use	Percentage of non-arrest emergency intubations with completed airway checklist and documented Plans A-B-C-D.
First-pass success	First-attempt tracheal intubation success overall and by device, operator grade and patient group.
Capnography	Percentage of tracheal tubes and ventilated SADs with sustained waveform capnography documented immediately and continuously. Target 100%.
Adverse events	Severe hypoxaemia, hypotension, cardiac arrest, oesophageal intubation, aspiration, dental / airway trauma, pneumothorax, awareness, unplanned extubation and failed airway.
Attempt limits	Percentage of cases exceeding Plan A or Plan B attempt limits and reason.
Sedation safety	Time from tube confirmation to ongoing analgesia / sedation; paralysis without documented sedation incidents.
Ventilation	Percentage with predicted body weight and lung-protective initial tidal volume documented; early gas and setting reassessment.
Transport	Percentage with capnography, oxygen / battery calculation, pre-departure ventilator trial and structured handover.
Learning	All eFONA, failed airway, unrecognized oesophageal intubation and peri-intubation arrests reviewed through multidisciplinary serious-incident learning.

26. Training and implementation

- Annual competency and simulation for bag-mask ventilation, airway adjuncts, videolaryngoscopy, bougie use, SAD rescue, waveform interpretation, RSI roles, eFONA, ventilator initiation and transport.
- Low-frequency high-risk drills at least every 6 months for cannot-intubate, cannot-oxygenate, contaminated airway, paediatric difficult airway, tracheostomy emergency and peri-intubation cardiovascular collapse.
- Airway carts standardized across ED, theatre, ICU and ambulance interfaces; tamper seals and daily checks documented. Capnography and transport ventilators undergo scheduled maintenance and battery / oxygen drills.
- Team training must include speaking up, attempt counting, explicit failure declaration, shared mental models, emotional impact and supportive debrief after critical airway events.
- Clinicians who intubate independently must maintain a defined volume of practice, simulation and direct assessment appropriate to local credentialing.

27. Local configuration before approval

☐ Named 24/7 airway escalation contacts for anaesthesia, critical care, ENT / surgery, paediatrics, neonatology and obstetrics.
☐ Adult and paediatric difficult-airway algorithms, eFONA techniques and attempt limits formally approved and displayed.
☐ RSI drug chart with dosing by weight / physiology, contraindications, vasopressor plan and post-intubation sedation infusions approved.
☐ Standard airway-cart layout, video-laryngoscope blades, tube / SAD sizes, suction and eFONA kit agreed and checked daily.
☐ Waveform capnography available for every intubation, ventilated SAD, ED ventilator and transport ventilator.
☐ HFNO, CPAP / BiPAP inclusion, exclusion, starting settings, oxygen targets, reassessment and failure criteria approved.
☐ Initial ventilator settings for general, ARDS, obstructive, neuro, metabolic-acidosis, cardiac-arrest and paediatric scenarios approved.
☐ Transport ventilator, oxygen / battery reserve, escort competence, weather / inter-island delay and receiving-centre pathway validated.
☐ Difficult-airway alert, patient information, incident-reporting and post-event debrief process embedded.
☐ Equipment and oxygen-supply downtime plan integrated with Protocol 57.

28. Source guidance for local adaptation

Source	Key use in this protocol
Difficult Airway Society. Guidelines for Management of Unanticipated Difficult Tracheal Intubation in Adults. 2025.	Airway planning, videolaryngoscopy, two-point check, attempt limits, Plans A-B-C-D, early declaration and emergency front-of-neck airway.
Difficult Airway Society / Intensive Care Society and partners. Tracheal Intubation in Critically Ill Adults. 2017.	Team preparation, physiological optimization, difficult-airway management and post-intubation care outside theatre.
Society of Critical Care Medicine. Clinical Practice Guidelines for Rapid Sequence Intubation in the Critically Ill Adult Patient. 2023.	Positioning, HFNO / NIPPV preoxygenation, medication-assisted preoxygenation, gastric decompression, induction and neuromuscular blockade.
Resuscitation Council UK. Adult Advanced Life Support Guidelines. 2025.	Bag-mask ventilation, intubation competence, videolaryngoscopy, waveform capnography, ventilation during arrest and surgical cricothyroidotomy.
Resuscitation Council UK. Paediatric Life Support Guidelines and Emergency Algorithms. 2025-2026.	Paediatric oxygenation, advanced-airway confirmation, continuous ETCO2, age-specific ventilation and rescue principles.
DAS / Association of Anaesthetists / ICS / RCEM and partners. Airway Management in Suspected or Confirmed Cervical Spine Injury. 2024.	Positioning, manual in-line stabilization, airway manoeuvres and device selection in cervical-spine injury.
Society for Obesity and Bariatric Anaesthesia / Association of Anaesthetists. Airway Management in Patients Living with Obesity. 2025.	Ramped positioning, peroxygenation, videolaryngoscopy, predicted-body-weight ventilation and rescue planning.
European Respiratory Society. Clinical Practice Guideline: High-Flow Nasal Cannula in Acute Respiratory Failure. 2022.	HFNO selection, relationship to NIV and monitored escalation in acute respiratory failure.
Intensive Care Society. Guidance on the Transfer of the Critically Ill Adult. 5th edition, 2026.	Transport ventilator trial, capnography, gas reassessment, equipment, oxygen / battery reserve and escort standards.
Local protocols and formularies	RSI drug doses, paediatric / neonatal airway, obstetric airway, NIV settings, ventilator prescriptions, eFONA equipment, infection control, consent, scope of practice and transfer.

Annex A. One-page emergency-airway workflow

Stage	Action
1. Recognize	Airway obstruction, failure to protect airway, refractory hypoxaemia / hypercapnia, exhaustion, neurological indication or expected deterioration.
2. Oxygenate	Position, suction, adjuncts, two-person bag-mask ventilation, PEEP, HFNO / NIV as appropriate. Call for help.
3. Assess	Anatomical + physiological difficulty, aspiration, airway history, cervical spine, cricothyroid membrane, goals of care.
4. Brief	Roles; drugs; Plan A videolaryngoscopy; Plan B second-generation SAD; Plan C final facemask; Plan D eFONA.
5. Optimize	Preoxygenate, treat shock / acidosis / bronchospasm, prepare vasopressor, suction, capnography and ventilator.
6. Intubate	Sedative-hypnotic + NMBA; best operator; maximum 3+1 adult attempts; reoxygenate and change technique.
7. Confirm	Two-point check: sustained waveform capnography + visual confirmation. Secure depth and monitor continuously.
8. Rescue	Failed intubation -> SAD; failed SAD -> final facemask; cannot intubate, cannot oxygenate -> immediate eFONA.
9. Stabilize	Sedation / analgesia, ventilator, BP support, ABG, DOPE, imaging, treatment of cause.
10. Transfer	Capnography, transport-ventilator trial, oxygen / battery reserve, trained escort and structured handover.

Annex B. Emergency RSI checklist

☐ Identity / weight / predicted body weight / allergies / indication confirmed.
☐ Airway history, anatomical difficulty, physiological difficulty, aspiration risk and cervical-spine status assessed.
☐ Airway lead _____; assistant _____; physiology lead _____; medicines _____; recorder _____.
☐ Position optimized; cricothyroid membrane identified / marked when indicated.
☐ Preoxygenation method _____; SpO2 before induction _____%; nasal oxygen / NIV / HFNO plan confirmed.
☐ Suction x2 checked; facemask + adjuncts + bag + PEEP ready.
☐ Videolaryngoscope / blade _____; tube size _____; bougie / stylet ready.
☐ Plan B SAD size _____; Plan C final facemask; Plan D eFONA operator _____ and kit open / accessible.
☐ Induction agent / dose _____; NMBA / dose _____; vasopressor _____; post-intubation analgesia / sedation ready.
☐ Capnography connected and waveform visible; ventilator settings and alarms prepared.
☐ Attempt limits and failure declarations verbalized; receiving destination / transfer plan known.
☐ Time of induction _____; first attempt result _____; tube depth _____; ETCO2 _____; BP after intubation _____.

Annex C. Failed-airway cognitive aid: Plans A-B-C-D

Plan	Checklist
A - Intubation	Oxygenate continuously; call help if difficulty; video laryngoscope; adequate NMBA; maximum 3+1 attempts; change operator / position / blade / introducer / suction; verify with two-point check. If failed, declare and move on.
B - SAD	eFONA kit immediately accessible; second-generation SAD; maximum 3 attempts; change size / device; confirm waveform capnography. Stop, think, communicate. If failed ventilation, open eFONA kit.
C - Facemask	100% oxygen; adequate NMBA; optimize position; oral / nasal adjuncts; two-person technique; one final attempt. If oxygenation fails, declare cannot intubate, cannot oxygenate.
D - eFONA	Continue 100% oxygen to upper airway; ensure help present; adult scalpel-bougie-cuffed 6.0 tube technique by trained clinician; longitudinal incision if anatomy difficult; suction; confirm waveform capnography.

Annex D. Post-intubation bundle

☐ Sustained waveform capnography and visual confirmation documented.
☐ Tube size _____; depth _____; cuff pressure _____; fixation rechecked.
☐ SpO2 _____%; ETCO2 _____; BP _____; ECG rhythm _____ after intubation.
☐ Analgesia _____ and sedation _____ started at _____; target depth _____.
☐ Ventilator mode _____; tidal volume _____ mL (_____ mL/kg PBW); rate _____; PEEP _____; FiO2 _____.
☐ ABG / VBG due at _____; result and setting change documented.
☐ DOPE check completed; pneumothorax / right-mainstem / bronchospasm considered.
☐ Vasopressor / fluid / blood plan documented; glucose and temperature checked.
☐ Chest imaging / ultrasound completed or planned; gastric tube / urinary catheter only if indicated.
☐ Difficult-airway alert, treatment ceiling, destination and receiving clinician documented.

Annex E. Ventilator initiation and reassessment card

Item	Record
Predicted body weight	Sex / height or paediatric ideal body weight: _____
Mode and circuit	Mode _____ Filter / humidification _____ Leak test _____
Initial prescription	VT / pressure _____ RR _____ PEEP _____ FiO2 _____ I:E / flow _____
Targets	SpO2 _____ ETCO2 / PaCO2 _____ pH _____ plateau / peak pressure _____
Disease modification	ARDS / asthma-COPD / metabolic acidosis / neuro / post-arrest / pregnancy / paediatric / other: _____

Item	Record
Reassessment	Chest rise; bilateral air entry; waveform; exhaled volume; auto-PEEP; BP; SpO2; ETCO2; gas at _____
Alarm settings	High pressure _____ Low volume / minute ventilation _____ Apnoea _____ FiO2 / PEEP _____
Change and response	_____

Annex F. Ventilated-patient transfer checklist

☐ Receiving clinician / facility accepted patient; destination and route confirmed.
☐ Tube confirmation, depth, fixation and difficult-airway plan checked immediately before movement.
☐ Patient stable on transport ventilator for _____ minutes; latest gas at _____ reviewed.
☐ Continuous ETCO2, SpO2, ECG and BP monitoring available and functioning.
☐ Oxygen calculation completed for journey plus delay; cylinders full and independent reserve present.
☐ Battery and spare battery checked; manual bag-mask + PEEP, spare circuit, filters and suction present.
☐ Analgesia, sedation, vasopressor and emergency drugs sufficient; pumps charged and lines secured.
☐ Airway-trained escort identified; deterioration / reintubation / eFONA plan discussed.
☐ Documents, imaging, airway record, drugs, ventilator settings, latest gas and treatment ceiling handed over.
☐ Final team pause completed at _____; ETCO2 waveform present on departure.

END OF PROTOCOL 48 - DRAFT 1.0 FOR LOCAL MULTIDISCIPLINARY VALIDATION