



Standard Operating Procedure: Emergency Department Rapid Sequence Induction (ED RSI)

Emergency Department: University Hospitals of Leicester

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Section 1: Background

- 1.1 Emergency airway management is a core skill of the Emergency Physician.
- 1.2 Emergency Physicians have a range of backgrounds and a significant proportion consider RSI as a core part of their role, for example they may perform RSI regularly as part of another job.
- 1.3 The procedure of RSI is a high risk intervention which should be performed within a well governed system to reduce this risk.

Section 2: Scope

- 2.1 Patients presenting to the ED that require RSI as part of their emergency care and management.

Section 3: Introduction

- 3.1 RSI is the process of rendering a patient unconscious with muscle relaxation to intubate the trachea of a patient in a short a time as possible.
- 3.2 This will reduce the risk of significant complications such as aspiration which is elevated in the emergent unfasted patient.
- 3.3 As the procedure is potentially dangerous to the patient it should be performed by an individual with the necessary skills, knowledge and experience to ensure maximum safety.

Section 4: Who can perform RSI?

- 4.1 The procedure should only be performed by an ED Consultant or registrar determined as competent to perform the procedure or an Anaesthetic Consultant or registrar.
- 4.2 There must be a minimum number of medical staff present as described below:
 - a) ED Consultant plus a further ED Consultant or registrar of which both must be competent as described.
 - b) ED Consultant or registrar or an Anaesthetic Consultant or registrar.
- 4.3 ED RSI Competency is defined by possessing the below:
 - a) A minimum of 6 months training in anaesthetics and intensive care.
 - b) A maintenance of appropriate RSI CPD (Continuous Professional Development) and logbook reviewed annually.

- c) Assessed and certified as competent by the ED RSI lead in RSI, failed intubation drill, BVM (Bag Valve Mask) ventilation, surgical airway and drug familiarity.

Section 5: Indications

- 5.1 The indications for ED RSI are based on clinical need as opposed to a set list of presentations.
- 5.2 The actual or perceived need for ED RSI must be weighed up against the potential risk to the patient of performing the procedure.
- 5.3 The decision to proceed to ED RSI in the absence of anaesthetic presence is to be made by the ED Consultant only.
- 5.4 In general the following are indications for ED RSI:
- Failure to maintain own airway.
 - Failure to protect own airway.
 - Failure of ventilation/oxygenation.
 - Neuroprotection and prevention of secondary brain injury.
 - Anticipated clinical course.
- 5.4.1 **Failure to maintain own airway**
Initially, simple airway manoeuvres and adjuncts may suffice in re-establishing a patent airway. As this is only a temporising measure ED RSI may be considered necessary if the situation is unlikely to resolve in an acceptable timeframe.
- 5.4.2 **Failure to protect own airway**
A patient with a significantly depressed conscious level may be at risk of airway compromise. Despite the ability to easily maintain airway patency they remain at high risk of passive regurgitation and aspiration. There is no absolute method of determining loss of airway protection and this must be based on clinical judgement.
- 5.4.3 **Failure of ventilation/oxygenation**
Those patients that are unable to maintain adequate ventilation or oxygenation may require ED RSI. It is important to consider the cause of the failure and optimally manage with appropriate treatment such as supplemental oxygen, analgesia and positioning.
- 5.4.4 **Neuroprotection and prevention of secondary brain injury**

Patients who have sustained a significant neurological insult such as from trauma or a hypoxic injury will require intervention to ensure maintenance of oxygenation and normocarbida.

5.4.5 Anticipated clinical course

There are often reasons to perform ED RSI related to specifics of a presentation despite not truly meeting the above indications. Examples include combative head injured patients or those with burns involving the airway.

Section 6: ED RSI Procedure

6.1 RSI can be divided into 9 conceptual and practical stages

- Preparation.
- Positioning.
- Pre-oxygenation.
- Pre-treatment.
- Paralysis and Induction.
- Placement and Proof.
- Plan for difficult intubation.
- Post intubation management.
- Packaging and transfer.

6.2 Preparation

6.2.1 Pre-anaesthetic assessment.

- a) Focused anaesthetic history, past medical history and allergies.
- b) Look for features predictive of a difficult airway and/or BVM ventilation.
- c) Look for features that may cause rapid desaturation when apnoeic such as obesity, respiratory disease, chest injury.
- d) Look for features to suggest cardiovascular instability such as tachycardia, hypotension, and causes of hypovolaemia.

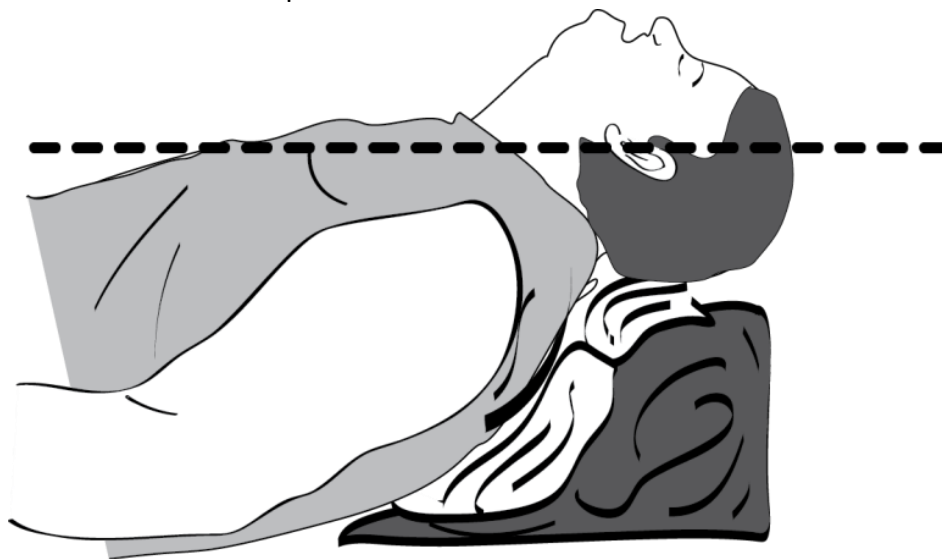
6.2.2 Setting Up

- a) Intubation equipment laid out and checked:
 - i. Laryngoscope + spare.
 - ii. Endotracheal tube + alternative spare available.
 - iii. Bougie.
 - iv. Catheter mount with HME filter.
 - v. Lubricant.

- vi. Syringe for balloon inflation.
- vii. Tube tie.
- b) etCO₂ connected in circuit and tested.
- c) Oxylog ventilator checked and initial settings set.
- d) Suction checked, switched on and placed into position.
- e) Drugs – drawn up and labelled.
- f) IV access x 2 secured with IV fluid connected.
- g) Monitoring
 - i. ECG – 3 lead.
 - ii. SpO₂
 - iii. NIBP – Set at 3 minute cycle (opposite side to primary IV).
 - iv. etCO₂ – Waveform set and working.
- h) Equipment for difficult airway available including surgical equipment for Front of Neck Access.

6.3 Patient and Team Positioning

- a) Ensure 360° access.
- b) Place a pillow under the head to flex the neck forward and extend the head (if no concern for C-Spine injury).
- c) Aim to achieve a line parallel to the bed for the ear to sternal notch.



- d) Removal of collar and blocks and replace with MILS (Manual Inline Stabilisation) if required.
- e) Operator.
- f) Assistant.

6.4 Pre-oxygenation

- a) Pre-oxygenate for 3-5 minutes with 100% oxygen via a closed circuit

- b) Alternatively consider using a tight fitting reservoir bag mask but this will achieve a lower FiO₂.
- c) Consider the use of nasal cannula for apnoeic oxygenation. Apnoeic oxygenation is used to extend the 'safe apnoea time' beyond that which can be achieved by pre-oxygenation alone. Apnoeic oxygenation is most commonly provided using nasal cannula in addition to a face mask
- d) If O₂ saturations remain low then consider assisted ventilations and/or increased PEEP (Positive End Expiratory Pressure).
- e) Sedation may be required to facilitate pre-oxygenation. It is imperative this step is aggressively managed to provide adequate apnoeic time for safe RSI.
- f) Perform the RSI checklist during pre-oxygenation. This is a final check at the point just prior to drug administration and not a recipe card for performing ED RSI!
- g) Ensure all team members stop and listen for the checklist. This should be a challenge and response process (team member asks a question of the operator who will answer).
- g) Assistant

6.5 Pre-treatment

- a) Consider the requirement of pre-treatments before RSI drug administration such as vasopressors/opioids/etc.

6.6 Paralysis and Induction

- a) IV Induction agent (See Appendix A).
- b) IV Rocuronium (dosing 1-1.5mg/kg).
- c) Rapid flush of all medications.

6.7 Placement and Proof

- a) Laryngoscopy should be performed approximately 45-60 seconds following administration of Rocuronium.
- b) Intubate assisted by a bougie as the primary method.
- c) Attempt to visualise the tube passing through the cords.
- d) Positioning should be confirmed by etCO₂ waveform which is maintained beyond 6 ventilations. **This is mandatory.**
- e) Other methods can be used only in **conjunction** with etco₂ positive waveform:
 - i. Visualising the passage of the tube through the cords.
 - ii. Misting of the ETT (Endotracheal Tube).
 - iii. Auscultation of equal breath sounds.
 - iv. Observing equal chest movement.

6.8 Plan for Difficult Intubation

- a) All ED RSI should be presumed to be difficult and therefore have the same standardised approach.
- b) Up to 2 attempts should be made at primary laryngoscopy.
- c) Only commit to a 2nd attempt if something has changed.
 - i. Change operator.
 - ii. Change position (operator/patient).
 - iii. External laryngeal manipulation and/or BURP (Backward, Upward, Rightward Pressure).
 - iv. Video laryngoscopy.
 - v. Removal of MILS (Manual Inline Stabilisation).
- d) A further attempt without changing any variable will achieve only the same view.
- e) If Plan A fails then call for immediate further help and move through the failed airway algorithm (Section 7).

6.9 Post intubation management

- a) Anticipate and look for post intubation complications such as hypotension and ventilation difficulties.
- b) Continue full monitoring (ECG, NIBP (non-invasive Blood Pressure), etCO₂ (End Tidal CO₂) and O₂ saturations).
- c) Commence appropriate sedation strategy.
- d) Commence appropriate analgesia strategy.
- e) Consider requirement of further neuromuscular blockade.
- f) Gastric decompression with a NG (Nasogastric)/OG (Orogastric) tube should be considered.
- g) Consider invasive blood pressure monitoring.
- h) Continue 1 to 1 bedside nursing care.

6.10 Packaging and transfer

- a) Secure all tubes and lines.
- b) All intubated patients must be accompanied by an airway competent doctor (ST4 or equivalent).
- c) Full monitoring to continue throughout transfer.
- d) Take emergency grab bag during transfer.

Section 7: Failed Airway Algorithm

7.1 Plan A

- a) Standard RSI approach as described above.
- b) Failure occurs if 2 attempts or 1 attempt and unable to maintain adequate

oxygenation.

- c) ASK FOR FURTHER HELP!
 - a. Further ED airway expertise.
 - b. Call for senior anaesthetic support if not already present.

7.2 Plan B - Rescue Ventilation Plan

- a) Place an appropriately sized iGel.
- b) Assess efficacy via etCO₂, O₂ sats and clinical findings (leak, chest movement).
- c) Failure occurs if not possible to maintain adequate oxygenation.

7.3 Plan C – Rescue Oxygenation Plan

- d) Revert to BVM (Bag Valve Mask) ventilation using a two person technique with optimal airway adjuncts and jaw thrust.
- e) Failure occurs if not possible to maintain adequate oxygenation.

7.4 Plan D – Front of Neck Access

- f) Perform surgical FONA (Front Of Neck Access).
 - a. Hyperextend the neck if possible.
 - b. Perform a 'laryngeal handshake' to stabilise and identify the structures.
 - c. If structures palpable perform a deep horizontal incision over the cricothyroid membrane puncturing the membrane.
 - d. Extend the incision the full width of the trachea and replace the scalpel with a finger or tracheal dilators.
 - e. Place a Size 10Ch bougie into the tracheal.
 - f. Railroad a Size 6.0 ETT over the bougie.
 - g. Confirm correct tube placement via etCO₂ waveform.

Section 8: ED RSI Airway Registry and Review

8.1 ED Airway Registry

- a) All ED RSIs are logged on a central ED RSI registry. This is to enable audit of the procedure and use for service development going forward.

8.2 ED RSI Reviews

- a) Regular clinical reviews and M&M (Mortality & Morbidity) will occur to aid learning and development.
- b) All clinicians involved in performing ED RSI will be expected to contribute to meetings going forward.

8.3 ED RSI Complications

- a) Any complication resulting in potential patient safety concerns or patient harm should be reported in the standard way using the Datix system.
- b) The ED COTD (Consultant of the Day) will take the lead for investigation but will want to liaise with the ED RSI Lead to help ensure the investigation has the required expertise.

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APPENDIX

APPENDIX A

Induction Agents

- Ketamine 1-2 mg/kg IBW (Ideal Body Weight)
- Fentanyl 1-3 mcg/kg IBW (Ideal Body Weight)

Paralysing Agent

- Rocuronium 1-1.5mg/Kg IBW (Ideal Body Weight)

APPENDIX B

RSI Checklist

RSI Checklist

Preparation

- Pre-oxygenation in progress with NRB mask?
- BVM available?
- Nasal O2 in situ?
- Has operator and patient position been optimised?
- Adequate vascular access?
- Fluids connected and running easily?

Equipment

- Which blade and size?
- What tube sizes?
- Which lgel size?
- Bougie size appropriate?
- HEPA filter and End Tidal connected?
- Spare oxygen cylinder?
- Suction ready?
- Ventilator ready?

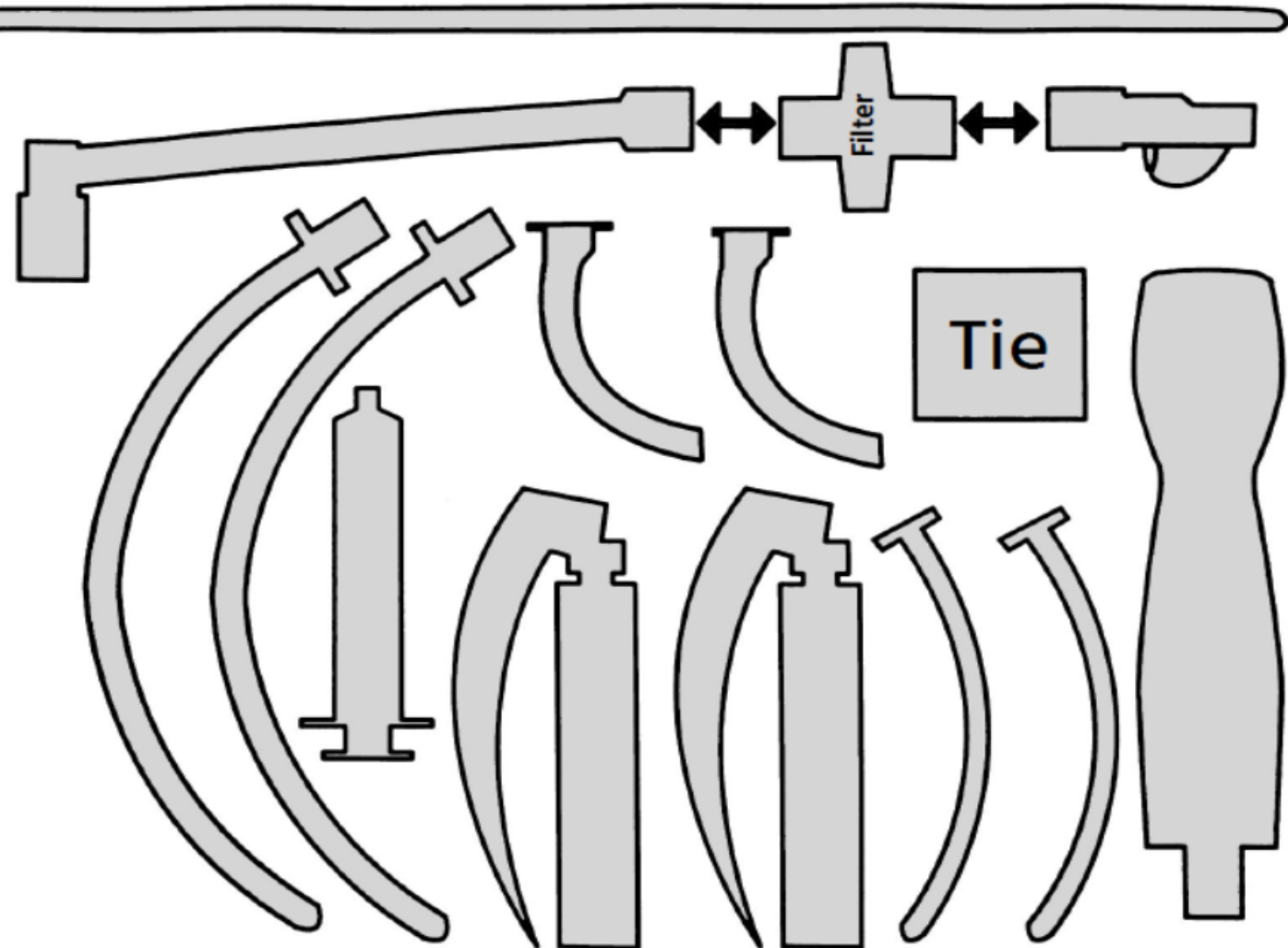
Monitoring

- Can oxygen saturations be improved?
- Can heart rate be improved?
- Can blood pressure be improved?
- Fluid bolus required?
- Is a vasopressor required?

Prepare the Staff

- Fentanyl dose?
- Ketamine dose?
- ROC dose?

Checks Complete !!



All items must be present prior to induction