



The 10 P's of Rapid Sequence Intubation

Chapter 6

Now that we have explored so many aspects of airway management in detail, let's go back and expand on these ten critical steps first introduced in Chapter 2. Recall that the "P's" are a useful clinical and teaching mnemonic to recall the critical steps of RSI. Other sources may break RSI down into only 5 or 7 steps.

1. Pre-oxygenate

- Tight-fitting non-rebreather mask at 10 – 15 liters/minute.
 - Requires at least 3 minutes.
- No positive pressure unless patient is hypoxic.
- Ideally with at least 20 degrees of head elevation.
- CPAP/BiPAP or assisted ventilations may be used in the hypoxic patient.
- Patients then categorized as having "adequate", "limited" or "no" reserve.

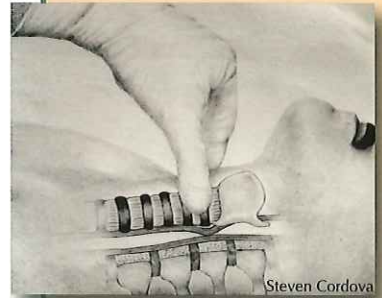
2. Protect the C-spine

- Whenever the mechanism of injury suggests a possible cervical spine injury maintain cervical spine immobilization during the entirety of the intubation process.
- You MUST remove the front of the cervical collar so that the mandible can be displaced anteriorly to allow visualization of the vocal cords.
- Have an assistant provide in-line stabilization and a jaw thrust.
- Consider gentle relaxation of cervical precautions if absolutely necessary to facilitate intubation.



3. Pressure to the Cricoid

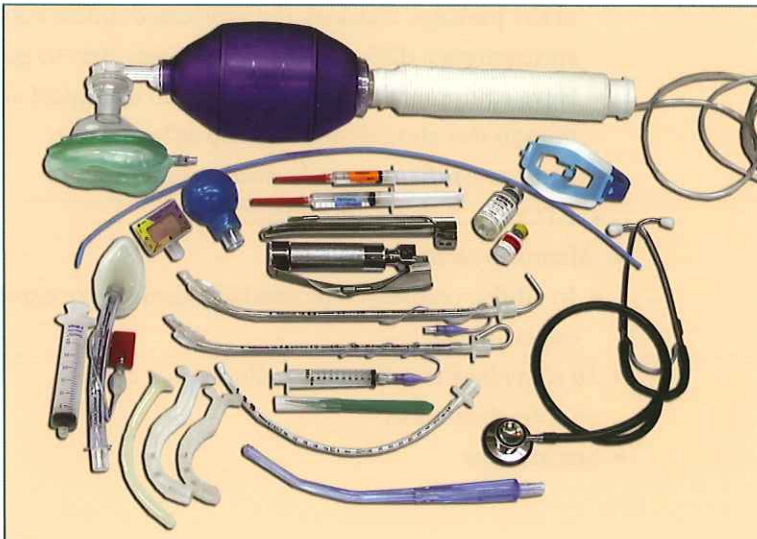
- Applied from time RSI meds given until tube confirmed in trachea.
- Applied during any BVMV.
- Avoid over-compressing the larynx and obstructing the airway.
- Pressure should be reduced/released in the event of difficult laryngoscopy.



4. Ponder

- Equivalent to the JCAHO “time-out”.
- Assess LEMONS.
- Is RSI really the best option for this patient?
- How much reserve does this patient have?
- Is this likely to be a difficult intubation?
- What is your back-up plan in case of a difficult or missed intubation?

5. Prepare Equipment and People



- **Equipment**

- **Medications** to perform the procedure AND maintain sedation, analgesia and paralysis after the procedure should all be drawn up, labeled and ready to go.
- ♦ Labeling is critical to avoid drug errors in hectic environments.
- ♦ Paralysis after RSI is maintained on a case-by-case basis and best avoided whenever possible.
- **Nasal and Oral Pharyngeal Airways** appropriately sized for the patient.
- **Laryngoscope** checked, with choice of blades.
- **Self-inflating bag/mask** sized for patient with reservoir & oxygen connected.
- **Suction**
- **Endotracheal tubes**
 - ♦ At least one size smaller in adults and one size smaller and larger in pediatrics readily available.
 - ♦ The recommended starting shape in adults is “straight-to-cuff” then bent < 35 degrees.
- **Gum-elastic bougie/Endotracheal Tube Introducer.**
- **Back-up extraglottic airway device.**
 - ♦ The device does not necessarily need to be taken out of the package, checked and lubricated unless you are anticipating a difficult airway or things start to go awry.
 - ♦ Have equipment available to perform a surgical airway, though this should be a back-up of last resort.
- **Means to confirm the tube placement .**
 - ♦ ETCO_2 is first-line in RSI/RSA.
- **Means to secure the tube.**
 - ♦ In adults, commercially available devices are usually the easiest to use.
- **10 cc syringe** to inflate the balloon on a cuffed endotracheal tube.
- **Stethoscope**

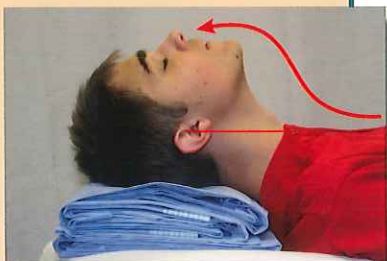
- **People** should be assigned appropriate tasks before the procedure begins.
 - Administer medications.
 - Watch the oxygen saturation and report any drop.
 - Maintain in-line cervical immobilization and jaw-thrust.
 - Maintain cricoid pressure/assist with ELM with one hand and hold the tube and corner of the mouth with the other.
 - ♦ The intubator should never take their eyes off the vocal cords.

6. Pre-Medicate

- The first medications given should ideally help reduce the patient's adverse physiologic responses to the subsequent medications and laryngoscopy.
- No premedication should be considered mandatory or standard-of-care.
- All premedications require at least 3 minutes to work before laryngoscopy.
- Consider fentanyl 3 micrograms/kg for patients with critically high ICP.
- Consider lidocaine 1.5 mg/kg for unstable asthmatics.



7. Position the Patient Optimally



- The optimal head position in older children and adults is the sniffing position - head flexion with neck extension.
 - The goal is to put the ear canal and sternal notch at the same level.
 - In infants airway position may be optimized with a towel roll behind the shoulders and in small children no padding at all.
- In some cases additional or hyper-elevation of the head may be beneficial and in the morbidly obese the “ramped position” is preferred.
- These positions are contraindicated in the patient with potential cervical spine injury.

8. Paralyze and Induce



- The induction agent renders the patient unconscious and unresponsive.
 - Options: etomidate, midazolam, ketamine, propofol, thiopental.
- The paralytic eliminates muscle tone to optimize laryngoscopy and prevent vomiting.
 - Options: rocuronium, succinylcholine.

9. Pass the Tube

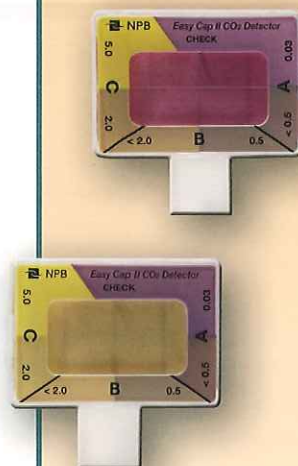
- You must wait until the patient is fully paralyzed or risk vomiting and aspiration.
 - 60 seconds from administration of rocuronium 1 mg/kg.
 - 45 seconds from administration of succinylcholine 2 mg/kg.

10. Post-Intubation Management: Confirm, Secure, Sedate, Ventilate

- Tube placement should be confirmed objectively, ideally with end-tidal CO_2 .
- As soon as the tube is confirmed in the trachea cricoid pressure may be released.
- The tube should be secured with tape or a commercial device.
- The patient should receive sedation and analgesia as soon as possible.
- Patient should be placed on a ventilator in almost all circumstances.
- Ongoing paralysis is an option at this time.

This is a nice learning tool but you don't really expect me to go through all this at the bedside during a real intubation, do you?

Until recently I thought this was just a learning tool as well. Then one day I was doing a flight shift with our helicopter program and watched our pilot, who has probably done hundreds if not thousands of take-offs in this very same aircraft, get out his checklist and go through each and every step. At that moment it occurred to me that RSI is far riskier than a routine take-off, and we do them far less often, yet we are prepared to "wing it". With the stakes this high why would we not go through a checklist too?



Case Scenario

Difficult intubation

The hypotensive & hypoxic patient

A patient arrives in the ED with fever, hypoxemia and altered mental status. The patient is brought to the resuscitation area where she is noted to be cyanotic, awake but lethargic and in severe respiratory distress. Her pulse is 140, her blood pressure is 90/60, her respirations are 40 and shallow, her temperature is 38.5 and her oxygen saturation on room air is 66%. After placement on a non-rebreather her sat improves to 77%. Her lung exam reveals bilateral crackles without wheezing and there is no evidence of CHF. What is your assessment and plan?

LEMONS: Most likely the patient has pneumonia and has become septic. Based on the LEMONs mnemonic we know that the “S” for saturations indicates a difficult intubation regardless of any anatomic impairment. She falls into the category of “no-reserve”. Given this and her hyperdynamic state we can anticipate that the patient will desaturate very quickly and will clearly require positive-pressure ventilation.

PREOXYGENATE: My first goal would be to improve pre-oxygenation with a combination of positioning (at least 20 degrees of head elevation) and BVM assist with PEEP valve or CPAP/BiPAP if tolerated.

PROTECT C-SPINE: Not indicated.

PRESSURE TO CRICOID: Will be used, but very gently, from the time induction medication is given until the tube is confirmed in the trachea, unless the intubation proves difficult.

PONDER: It is possible that the patient might respond to non-invasive ventilation well enough to avert the need for intubation but I would be simultaneously preparing for RSI. My plan for the RSI would be to keep the patient in her position of comfort until the last possible moment. I would have everything prepared to place her in a sniffing position after medication. I would be planning on immediate positive pressure ventilation with either BVMV or an EAD after medications. There does not appear to be any other viable alternatives.

PREPARE EQUIPMENT AND PEOPLE: I would call for help if available. All assignments, including who will assist with the BVM and who will perform cricoid pressure/ELM, will be made in advance. All equipment will be prepared for intubation including post-intubation sedation and analgesia before any RSI medications are given. An EAD that generates high-pressures will be sized, taken out of the package, and prepared for insertion. Two sizes of endotracheal tube with straight-to-cuff stylet shape, both straight and curved blades and a bougie will be at the bedside. It would also be prudent to have supplies available for a surgical airway.

PREMEDICATE: Not indicated.

POSITION THE PATIENT OPTIMALLY: This patient should be in a perfect sniffing position for the procedure.

PARALYZE AND INDUCE: I would induce with etomidate or ketamine and paralyze with succinylcholine or rocuronium.

PASS THE TUBE: Gentle “rule-of-twos” BVMV will be performed as the medications are administered. If the saturations are not markedly improving by the time the paralytic has taken effect (45 seconds for succinylcholine and 60 seconds for rocuronium) an EAD will be placed and positive pressure ventilation continued. In almost all cases the saturations will improve with this technique. Once the saturations have reached a plateau, hopefully in the 90s, an optimal attempt at laryngoscopy will be made. If the saturations start to fall rapidly the EAD will be replaced and the patient re-oxygenated until a plateau is again reached before further attempts at laryngoscopy. If long delays are encountered the patient may be given additional analgesia, sedation and paralysis during the procedure.

POST-INTUBATION MANAGEMENT: Once the patient is intubated the tube will be secured in place and the patient placed on continuous capnography. Sedation and analgesia will be provided based on the patient’s blood pressure. Ketamine would be an excellent choice if available and the patient remains hypotensive. A chest x-ray will be obtained to confirm appropriate tube depth only. If etomidate were used for induction I would notify the ICU team so they can monitor for adrenal suppression.