(ix) Difficult & Failed Intubation Queen Charlotte's Hospital

Pre-operative Assessment

Clinical assessment of airway and risk of difficult intubation: (can be performed in a matter of seconds):

1. Mouth opening (should be greater than 5 cm or three fingerbreadths).
2. Mallampati view (pharynx should be visible).
3. Jaw slide (should be able to push the lower incisors anterior to the upper incisors).
4. Neck movement (full, unhindered range of at least 90°).
5. Weight (original 'booking' weight less than 90 kg but current weight should be sought if possible).
6. Evidence or possibility of laryngeal swelling (severe pre-eclampsia or URTI).
7. History of previous problems.
8. Large protruding incisors.

If two or more of the above are abnormal - avoid general anaesthesia and/or summon senior help. The findings should be recorded on the anaesthetic procedure chart.

Equipment that should be immediately available:

1. Selection of laryngoscopes (long and standard blade, short-handled or polio blade, McCoy).
2. Selection of tracheal tubes (size 5.0mm upward).
3. Gum elastic bougie - with selected tracheal tube already threaded on.
4. Selection of oral and airways.
5. Laryngeal mask airway (size 3).
6. Airtraq optical laryngoscope, (only to be used by those with prior experience)
7. Cricothyrotomy kit (or equipment for transtracheal ventilation and suitable connectors).

Standard precautions at induction of anaesthesia:

1. Ensure adequate pre-oxygenation (this 'buys' time if a problem is encountered).
2. Ensure proper positioning of patient (head in best position, breasts not pushed into midline by folded-up arms). Ensure adequate **skilled** assistance.
3. Ensure adequate equipment (see above).
4. Rapid sequence induction.

"PATIENTS DO NOT DIE FROM FAILURE TO INTUBATE, THEY DIE FROM FAILURE TO OXYGENATE."
"IF IN DOUBT, TAKE IT OUT"
"STICK TO THE FAILED INTUBATION DRILL"

General Hints:

1. A smaller ETT is often needed in obstetrics, especially if there is a history of URTI or PET. Both of which predispose to laryngeal oedema.
2. Many anaesthetists prefer to have the ETT pre-stiffened by the insertion of a stylet. Remember to have the stylet well lubricated, and not to over-flex it, otherwise removal can be difficult.
3. An unexpectedly invisible larynx is often due to incorrectly applied cricoid pressure, particularly if the ODA has not allowed for the fact that the patient is tilted when calculating the direction of the pressure. Careful readjustment can transform the picture.
4. Obstruction to the insertion of the laryngoscope by the patient's breasts or the ODA's hand can be overcome by using the polio blade or inserting the ordinary blade before attaching the handle.
5. Don't forget the *gum elastic bougie* for the anterior larynx just out of reach of the ETT. When railroading the ETT, rotate the ETT 90 degrees anti-clockwise. This often helps to overcome resistance.

Difficult Intubation Protocol

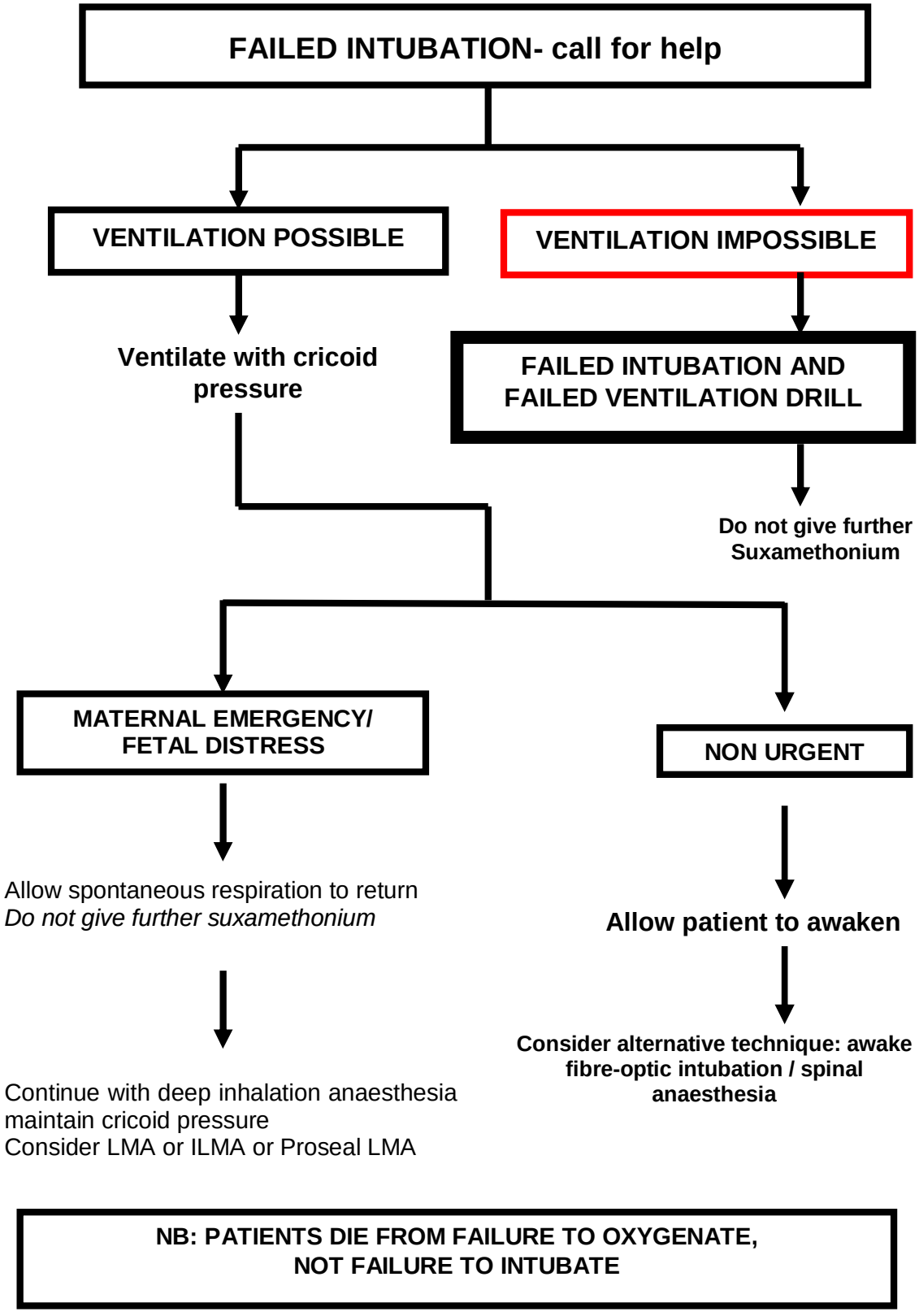
Unable to Insert Laryngoscope:

Breasts in the way	- Retract breasts - Try polio blade	Nothing works or Muscle rigidity or Anatomical abnormality		**FAILED INTUBATION DRILL**
Relaxant not working	- Wait			
Cricoid pr hand in way	- Reposition whilst maintaining pressure - Check hand & neck position			

Laryngoscopy possible:

Grade 1 (all glottis visible) Grade 2 (part of glottis visible) Grade 3 (only epiglottis seen) Grade 4 (can't see anything)	unable to intubate	try bougie	still unable to intubate	**FAILED INTUBATION DRILL**

Failed Intubation Protocol



Failed Intubation & Ventilation Protocol

Face mask
Oxygenate and Ventilate patient
Maximum head extension
Maximum jaw thrust
Assistance with mask seal
Oral ± 6mm nasal airway
Reduce cricoid force - if necessary

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STILL CAN'T VENTILATE

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Try Laryngeal mask
Maximum 2 attempts at insertion
Reduce any cricoid force during insertion

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STILL CAN'T VENTILATE

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Needle cricothyrotomy*

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STILL CAN'T VENTILATE

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Surgical cricothyrotomy**
(LAST RESORT)

Summary

If difficulty anticipated and surgery not urgent, Consultant Anaesthetist should be present.

Consider

1. Intrathecal anaesthesia (not epidural; because of the risk of total spinal with high epidural doses)
2. Awake fibre-optic intubation: A scope will have to be borrowed from Hammersmith general theatres
3. Have appropriate equipment ready;
   Suction
   Spare laryngoscope with long blade
   McCoy laryngoscope and/or polio blade
   Smaller E.T. tubes
   Laryngeal mask
   Bougies
   Cricothyroidotomy set
4. A difficult intubation if possible requires two anaesthetists to allow the O.D.A. to use a two handed technique for cricoid pressure.
5. Difficult Laryngoscope insertion – see difficult intubation drill
6. Failed intubation – see failed intubation drill

***** Needle cricothyrotomy, must be attempted by the anaesthetist. All anaesthetists have a copy of guidelines for the procedure and will have familiarised themselves with the sets available.

** Definitive (surgical) cricothyrotomy is a LAST RESORT. (Please note remarks by Professor Harmer included below). There can be *no* hard and fast guidelines about who should attempt this: obviously anyone with experience of the technique or failing that, the individual present most used to surgical incision may be the one to attempt it.

Harmer M (Treasurer of the Obstetric Anesthetists Association), *IJOA* 1997; 6: 25-31

"If all these methods have failed to allow oxygenation, the final option is to perform a tracheostomy. However, performing a tracheostomy on a grossly hypoxic woman would present a challenge to even the most skilled ENT surgeon. It is certainly beyond the scope of the majority of obstetricians and anaesthetists and is likely to lead to uncontrollable haemorrhage. If it is performed successfully, surgery can proceed".

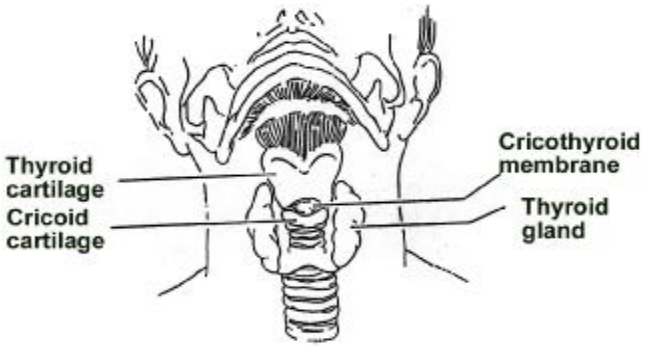
Surgical Cricothyroidotomy

1. Place the patient in a supine position
2. Consider extending the neck to improve access. Otherwise, maintain a neutral alignment.
3. Identify the cricothyroid membrane
4. Prepare the skin and, if the patient is conscious, infiltrate with local anaesthetic.
5. Place your left hand on the neck to stabilise the cricothyroid membrane, and to protect the lateral vascular structures from injury.
6. Make a small vertical incision in the skin, and press the lateral edges of the incision outwards, to minimise bleeding.
7. Make a transverse incision through the cricothyroid membrane, being careful not to damage the cricoid cartilage.
8. Insert tracheal spreader, or use the handle of the scalpel by inserting it through the incision and twisting it through 90° to open the airway.
9. Insert an appropriately sized endotracheal or tracheostomy tube. It is advisable to use a slightly smaller size than would have been used for an oral or nasal tube.
10. Ventilate the patient and check that this is effective
11. Secure the tube to prevent dislodgement.

Complications of Cricothyroidotomy

These include:

1. Asphyxia
2. Aspiration of blood or secretions
3. Haemorrhage or haematoma
4. Creation of false passage into the tissues
5. Surgical emphysema (subcutaneous or mediastinal)
6. Pulmonary barotrauma
7. Subglottic oedema or stenosis
8. Oesophageal perforation
9. Cellulitis



Relevant anatomy - for cricothyrotomy airway