# Kent Surrey and Sussex Neonatal Operational Delivery Network

| KSS Neonatal airway management and Intubation guideline | |
|---|---|
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| **Implications of race, equality & other diversity duties for this document** | This guideline must be implemented fairly and without prejudice whether on the grounds of race, gender, sexual orientation or religion. |

# Content

## 1. Background/Rationale

Endotracheal intubation is a procedure that can be used to secure a definite airway in a newborn infant. The procedure requires a skilled operator and effective teamwork. Though endotracheal intubation can be lifesaving, it may also be associated with significant complications.

Therefore, it is important that when the procedure is being undertaken, anticipated difficulties are considered, equipment checked and senior support sought early if required. Regular airway management training, intubation training and up to date UK Resuscitation Council certification (1) are important and should be part of neonatal unit and neonatal network training programs.

Some examples of where neonatal intubation may be necessary include:

• The emergency resuscitation of a newborn infant in the delivery room, if ventilation via a facemask has been unsuccessful and/or if stabilisation with non-invasive support is not successful.

• A method of delivering surfactant therapy.

• To deliver intermittent positive pressure ventilation to the infant with respiratory failure in the neonatal unit.

• In special circumstances, such as a congenital diaphragmatic hernia, in extremely preterm infants or in respiratory failure secondary to muscle disorders.

Although intubation is an important method of establishing an airway, simpler methods can be used as an interim measure to achieve stability and when preparing for intubation, or while waiting for senior help to arrive. This includes using intermittent positive pressure ventilation (IPPV) with a correctly fitted and applied mask, airway manoeuvres such as a jaw thrust, a two person technique or use of airway adjuncts e.g. IGel, Guedel airway.

The aim of this guideline is to provide advice to neonatal units regarding safe neonatal intubation and airway management practises whilst also recognising areas of uncertain clinical practice where there may be legitimate variation in practice at local unit level. Note that this guideline and advice contained within in does NOT refer to the practice of Less invasive surfactant administration (LISA).

## 2. Pre-medication Drugs for intubation

The combination of Fentanyl and Suxamethonium as outlined in Table 1 is recommended as first line pre-medication for intubation. It is recommended that neonatal units explore the use of pre-filled syringes for administration of pre-medication as a method to improve safety and reduce drug preparation time (2,3).

| | **DOSE** | **ORDER OF ADMINISTRATION** | **NOTES** |
|---|---|---|---|
| **FENTANYL** | **2-4mcg/kg** | 1 | 2mcg/kg- preterm infants, concerns re myocardial function<br>4mcg/kg- Term infants.<br>Titrate to effect and give slowly (over 2-3 minutes) followed by a 0.9% saline flush |
| **SUXAMETHONIUM** | **2 mg/kg** | 2 | If contraindicated, use another agent e.g. Rocuronium (see notes below). |
| **ATROPINE** | **10 micrograms/kg** | **3 (if used)** | **Optional** |

**Table 1. Recommended pre-medication drugs for neonatal intubation.**

**Rationale for choice of pre-medications in this guideline**

Intubation without drugs is associated with hypoxia, vagal bradycardia and hypertension, with secondary effects on intra-cerebral perfusion in the preterm baby (4). Premedication for intubation makes the procedure easier, safer and better tolerated by the baby and should be used if time permits. Using a combination of a sedative and muscle relaxant has been shown to shorten time to successful intubation and lessen the physiological unwanted effects (5).

Therefore, it is recommended that pre-medication is used for neonatal intubation on neonatal units for non-emergency intubations. The use of pre-medication drugs for babies on delivery suite during initial resuscitation (e.g. emergency intubation) is not routinely recommended. However, there may be circumstances (e.g. difficult intubation) where vascular access is obtained and pre-medication drugs given prior to intubation.

The optimal combination of pre-medication drugs has not been established. It is important for practitioners to develop familiarity with the combination of pre-medication drugs they are using. The combination of Fentanyl and Suxamethonium as pre-medication drugs are recommended as this is widely used both in the UK (6) and worldwide and provides good intubating conditions (7,8) (Table 1).

**Atropine:** Atropine, as an anti-muscarinic agent may also be used as an addition but it is important to note that the commonest reason for bradycardia during intubation is hypoxia and that Atropine does not treat hypoxia. It is also recommended that pre-medication drugs are available in pre-filled syringes to help reduce time delays prior to intubation.

**Fentanyl:** is a synthetic opioid that is used for neonatal intubation in doses ranging from 2-10micrograms/kg. It has a relatively short time to peak analgesic effect and rapid termination of action after small bolus doses. It has the properties of a potent analgesic, sedative and anaesthetic and maintains hemodynamic stability, blocks endocrine stress responses, and prevents pain-induced and increased pulmonary vascular resistance. Available data indicates that administration of fentanyl bolus for procedural pain and sedation does not significantly affect cerebral oxygenation, cerebral tissue oxygen extraction or cardiac output in stable preterm infants (9). Though there is a risk of chest wall rigidity, this is rare and can be mitigated by slow IV administration of Fentanyl over 2-3 minutes. Suxamethonium and/or Naloxone can also help reverse chest wall rigidity.

**Suxamethonium:** Suxamethonium is a depolarising muscle relaxant that has rapid onset and clearance and is the most commonly used neonatal muscle relaxant. It should not be used in cases of suspected congenital muscle disorders or in hyperkalaemia .

**Rocuronium:** Rocuronium is a non depolarising muscle relaxant that is an alternative to suxamethonium if there are contraindications to the use of suxamethonium. However, it displays slower clearance (20-40 minutes). If used, it is recommended that Suggamadex is available in the event that muscle relaxation needs to be reversed.

**Propofol:** Though Propofol has been used as a single agent for neonatal intubation, the data to support its use are more limited than with opioids. In addition, recent data indicate variable and unpredictable side effects (including arterial hypotension) and unpredictable sedation along with known significant differences by gestation and postnatal age (10). We would therefore recommend that Propofol is used with caution, particularly in preterm born infants.

## 3. Endotracheal Tube size, type & insertion depth

Prior to intubation, the correct size endotracheal tube should be selected. ETT sizes one below and one bigger should also be readily available (Appendix 1). In the majority of cases, use of an uncuffed ETT (e.g. Vygon or Portex) is appropriate. Cuffed tubes may be used for post term or larger infants with appropriate training of staff. If cuffed ETTs are used, the cuff pressure must be monitored once every 6-8 hours.

An introducer maybe used to facilitate intubation of the neonatal airway and can be helpful because of the relatively anterior and cephalad neonatal larynx. However, there is no robust evidence to support this practice (11,12). The introducer must not project beyond the tip of the endotracheal tube as this can damage the lining of the trachea. Please note that many endotracheal tube introducers will not pass through a size 2.0mm endotracheal tube.

Endotracheal tube insertion depth guidance is provided in Appendix 2 (13). However, confirmation of satisfactory position should also be made clinically and radiographically (X ray) with the optimal position of the endotracheal tube being between thoracic vertebrae 1 and 2.

## 4. The intubation procedure

The overwhelming majority of neonatal intubations will be oral intubations. However, there may be some circumstances where nasal intubation may be performed by an experienced operator.

Prior to commencing the procedure perform an intubation pause and complete the neonatal intubation checklist (Appendix 3). Appendix 3 contains versions of an intubation checklist that can be localised and used on the neonatal unit and in the delivery room.

Ensure respiratory support is optimised with CPAP, humidified HFNC, neopuff or bag and mask. Recent data (14) suggest that use of nasal high flow oxygen during intubation improves successful intubation on first attempt without physiological instability (50% in high flow group versus 31% in standard group- number needed to treat=6). Therefore, where possible, this practise is recommended. However, please ensure that the presence of nasal cannula does not interfere with achieving a good facemask seal for the baby if facemask ventilation is required.

Aim to maintain oxygen saturations appropriate for gestation and to take care not to over-oxygenate the preterm infant.

When the team is ready and the person intubating has confirmed it is safe to proceed, give pre-medication drugs. The person intubating should hold the laryngoscope in the left hand. Once the baby is sedated/muscle relaxed, the laryngoscope blade should be gently placed in the centre of the mouth, aiming backwards towards the uvula to ensure you are in the midline.

Lift the laryngoscope handle upwards and forwards to lift the tongue and jaw as shown below. This will, bring the posterior larynx and vocal cords into view. If the above view is not seen, consider slowly pulling the laryngoscope handle back to enable the vocal cords to be visualised. If an orogastric or nasogastric tube is seen, this can be used as an anatomical landmark to indicate that the vocal cords are anterior. Consider the use of cricoid pressure (this can be applied by the intubator or by another designated member of the team).

Use suction only if secretions are occluding the view (NOT required routinely) (15). Insert ETT (with or without introducer) through the cords, using the black marker near the tip of the tube as a guide to depth of insertion initially. Confirm correct depth of ET. (Appendix 2) Confirm correct ETT position (see guidance below.

Secure ET with an appropriate neonatal fixation device (see guidance below).

Connect baby to ventilator and adjust settings as required.

## 5. Securing neonatal endotracheal tubes

There is limited evidence of the optimal method of securing endotracheal tubes but a balance needs to be struck between the ETT being secure whilst being able to be repositioned along with ensuring that the fragile skin of the newborn baby is as protected from potential device related injury. However, it is recommended that neonatal units should secure oral ETTs with a device manufactured specifically for the purpose of neonatal ETT fixation. Fixation with stitching of the ETT to a plastic flange with a suture is no longer recommended. Nasal ETT and IGels may be secured with Elastoplast trouser legs. Guidance on how to do this can be either taken from clinicians experienced in securing ETTs using this method (neonatologists/paediatricians/anaesthetist's) or alternatively from:

(i) the clinical guidelines section of the South Thames Retrieval service available online at:

https://www.evelinalondon.nhs.uk/our-services/hospital/south-thames-retrieval-service/clinical-guidelines.aspx

(ii) The instructional video section (nasal tube taping) of the Paediatric Critical Care Society:

https://pccsociety.uk/picu-procedure-training-videos/

## 6. Elective replacement of endotracheal tubes

It is recommended that indwelling ETTs are not removed and the baby facemask ventilated unless the ETT is displaced or this is deemed an emergency- this results in loss of the airway. Instead when electively replacing or upsizing neonatal endotracheal tubes, it is good practice to first visualise the indwelling endotracheal tube with a laryngoscope and obtain a view of the vocal cords. Once this view is obtained, the indwelling ETT can be removed and the new ETT inserted with the correct laryngoscopy view already achieved.

## 7. Using a supraglottic airway device e.g. IGel

As recommended in the UK Neonatal Resuscitation Council guidance (1), use of a supraglottic airway device (SAD),such as an IGel may be helpful in establishing an airway if neonatal intubation is not successful in either the delivery room or neonatal unit setting (16). They are easy to insert and can be used in spontaneously breathing patients. The IGel is a second generation supraglottic airway which is PVC and latex free. It is made from a thermoplastic elastomer.

It is recommended that a supraglottic airway such as an IGel is stocked on neonatal resuscitation trolleys and that medical and nursing staff receiving training in both indications for their use and in how to insert them. A size 1 IGel is appropriate from neonatal patients from 2-5kg. Though the manufacturer recommendation on lower weight limit for these devices is 2kg, there is evidence to support their use in smaller babies (>1.2kg) (17)

Potential contraindications to using an IGel include:

- Imminent need for intubation.
- Maxillofacial, tracheal or known pulmonary malformations.
- Major congenital malformations (e.g. confirmed/suspected congenital heart disease).

**Insertion technique**

- Consider whether you need additional or senior support

- Lubricate the back and sides of the IGel.
- Tilt babies head back slightly, open the mouth and apply jaw thrust.
- Insert the IGel into the mouth following the hard palate with the open side of the IGel facing the tongue. It is not necessary to use a laryngoscope but this may be helpful in some babies.
- Continue until resistance is felt. At this point the tip of the IGel will be sitting on the oesophagus. You may feel a slight 'bounce' backward. This is normal.
- The mask of the IGel should now be situated in the hypopharynx covering the laryngeal opening and occluding the oesophagus with a low-pressure seal.

Connect neopuff or bag valve device to Igel and provide respiratory support.

## 8. Capnography

It is recommended that colour capnography (e.g. PediaCAP or NEoSTAT devices) is used to initially confirm correct endotracheal tube placement and in conjunction with other clinical parameters (Table 2). However, operators should be aware of the specific limitations of these devices to confirm correct ET placement and should also use their clinical judgement and experience and clinical information (see below) to confirm correct ET placement.

| |
|---|
| Visual inspection of the ET tube passing through the larynx |
| Bilateral chest wall movement with each inflation |
| Symmetrical air entry over lung fields |
| Improvement in Heart rate* |
| Improvement of colour and oxygen saturation* |
| Position of ETT on Chest X ray (ideally T1-T2) |

**Table 2. Confirmation of correct ET placement-clinical cues** (* in extremely preterm infants or critically unwell babies these parameters may not improve immediately after successful intubation)

Though there is limited evidence to support the use of continuous waveform capnography, it is suggested that neonatal units explore the use of continuous waveform capnography and adopt the 'no trace/wrong place' ethos to ensure continued correct position of the ET tube. Though there are known limitations to the use of waveform capnography such as fast ventilator rates and short expiratory time used in babies, routine use of uncuffed ET tubes and the relatively large dead space in the small preterm infants, its use alongside ventilator pulmonary graphics may assist with detection of neonatal lung problems, accidental extubation and enable a correlation with blood gas pCO2 which in turn may help reduce blood sampling frequency in neonatal patients.

## 9. Video laryngoscopy

The use of video laryngoscopy to (i) support the training of practitioners learning to intubate (18) and (ii) assist with difficult intubations is recommended. The use of video laryngoscopy for routine intubations may be considered but there is limited evidence to support this practice.

## 10. Individual airway plans

The on-call consultant should be called to attend prior to intubation if difficulty is anticipated e.g. micrognathia, cystic hygroma, preterm infants < 28 weeks gestation or < 750g, previous history of difficult intubation, known laryngeal oedema, previous complications with pre-medication administration, multiple preterm delivery or if out of hours. Airway cards placed at the baby's cot side with intubation details (previous difficult intubation, ET size, ET length) may be helpful to ensure teams working in a shift pattern are aware of a specific baby's airway issues.

## 11. Difficult airway

Please see Appendix 4. It is recommended that Appendix 4 is printed out and placed in the difficult airway kit. Please also refer to the British Association of Perinatal Medicine Framework-Managing the difficult airway in the Neonate (19). Staff know where to locate the neonatal difficult airway kit. The difficult airway kit should include:

- KSS difficult airway guidance (Appendix 4)
- Oropharyngeal airways (Guedel)
- Nasopharyngeal airways
- Supraglottic airway device e.g. IGel of appropriate size for use in neonate
- Introducers / stylets
- Endotracheal tubes (uncuffed) size 2.0 – 4.5
- Miller and Mackintosh Laryngoscope blades of appropriate size for use in neonate
- Bougies / tracheal tube guides – size 5 ch (minimum ETT size is 2.5 mm)
- ET CO2 detector – (such as Pedicap colorimeter)
- Magill's forceps

Individual provider Trusts and neonatal units may also choose to have more advanced items within their individual difficult airway kits. This may include Cuffed ET tubes, an Airtraq device or a Quicktrach 1. Advice on whether these items should be included beyond the remit of this guideline.

## 12. Training/Airway lead

All neonatal units should appoint a neonatal airway lead who should oversee implementation of the contents of this guideline and ensure that neonatal airway/difficult airway training is incorporated into training and simulation scenarios.

## 13. Extubation

Data suggest that approximately 40-50% of extremely preterm (EP) babies require re-intubation within 72 hours following elective extubation (20). It is suggested that units consider developing and implementing an extubation decision making tool to

provide documentation of decision to extubate and rationale behind decision. The extubation decision making tool in Appendix 5 can be localised and used for this purpose.

## 14. Neonatal airway management/intubation training

Any person involved in managing a neonatal airway:

- Should be aware of the local policy and difficult airway guidance, and local equipment.
- Should receive training on airway management relevant to their role and skills.

Clinical neonatal staff (doctors, ANNPs, neonatal nurses) involved in airway management should receive training on:

  - Airway management
  - Intubation
  - Pre-medications
  - Extubation
  - Use of laryngeal mask airways
  - Difficult airway plans

- Any member of staff who may attend emergency deliveries or be involved in neonatal resuscitation should receive and be up to date with RCUK NLS training.

Each neonatal unit should have allocated Neonatal Airway Medical and Nursing Leads, and along with the multidisciplinary clinical team, these should have oversight of the following:

- team knowledge and training on relevant airway equipment (including management of the difficult airway)
- Ensuring that regular skills teaching and simulation occur.
- Teams should aspire to develop a process where MDT simulation is in place for neonatal airway skills/management–it is recommended that these should be at least 6 monthly.

In line with practice recommendations around debriefing from life support organisations such as the Resuscitation Council (UK), Advanced Life Support Group, and the Difficult Airways Society, any situation in which a difficult airway is declared/experienced should be debriefed appropriately and formally reviewed. This is key to ensuring that the process in place locally worked and was followed,

any learning from the event is shared and appropriate changes to process implemented.

With appropriate funding, the KSS Neonatal ODN will aim to support the delivery of annual/biannual neonatal airway education events.

**APPENDIX 1 – ET tube size and length recommendations**

**(i) Guide for endotracheal tube size (based on weight)**

| Weight (grams) | ET Tube Size (Diameter in mm) |
|---|---|
| <1000 | 2.5 (Prepare 2.0mm also) |
| 1000 - 1999 | 3.0 (Prepare 2.5mm also) |
| 2000 - 3000 | 3.5 (Prepare 3.0mm also) |
| >3000 | 4.0 (Prepare 3.5mm also) |

**(ii) Guide for endotracheal tube size (based on gestational age)**

| Gestation (weeks) | ET Tube Size (Diameter in mm) |
|---|---|
| <28 | 2.5 (Prepare 2.0mm also) |
| 28-34 | 3.0(Prepare 2.5mm also) |
| $34^{+}$ – Term | 3.5 (Prepare 3.0mm also) |
| $Term^{+}$ | 4.0 (Prepare 3.5mm also) |

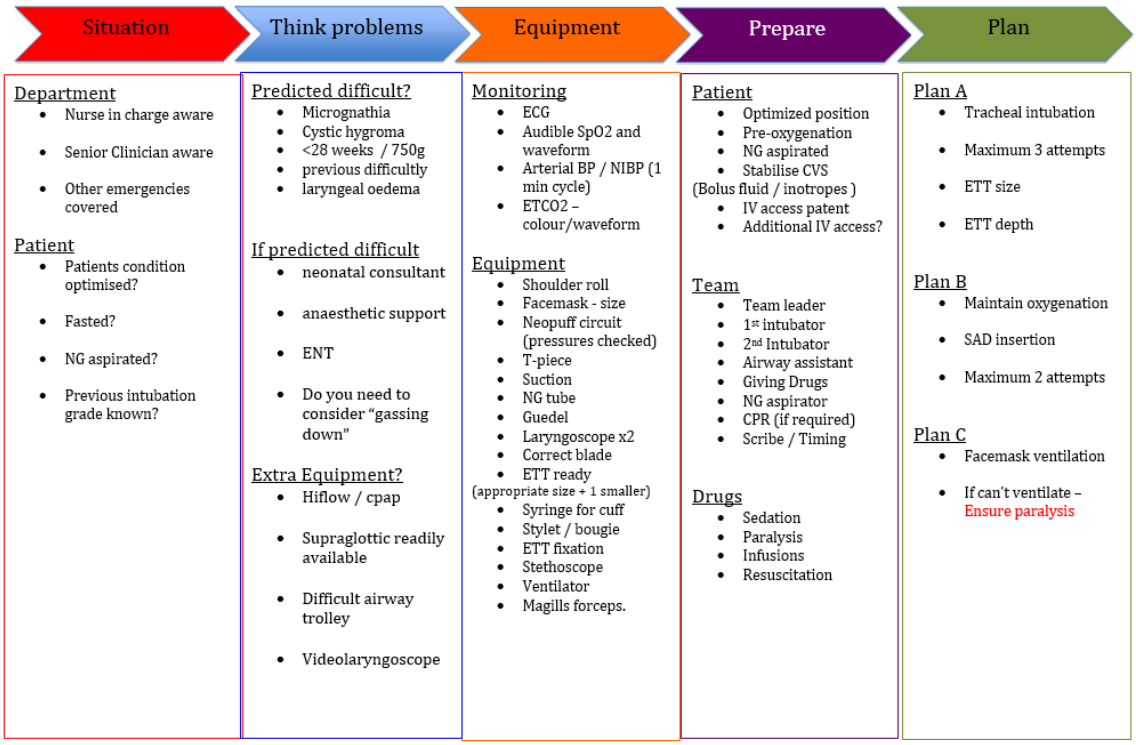
**APPENDIX 2. Guide for endotracheal tube depth (based on gestational age)- Adapted from reference**

| Gestation at birth (weeks) | Weight (kg) | Guide for ETT insertion depth (cm) |
|---|---|---|
| **23-24** | **0.5-0.6** | **5.5** |
| **25-26** | **0.7-0.8** | **6.0** |
| **27-29** | **0.9-1.0** | **6.5** |
| **30-32** | **1.1-1.4** | **7.0** |
| **33-34** | **1.5-1.8** | **7.5** |
| **35-37** | **1.9-2.4** | **8.0** |
| **38-40** | **2.5-3.1** | **8.5** |
| **41-43** | **3.2-4.2** | **9.0** |

**Alternatively the formula of patient weight (kg) + 6cm can be used**

## APPENDIX 3. NEONATAL INTUBATION CHECKLIST

S.T.E.P.P - Neonatal intubation checklist – To be read aloud for all intubations



**APPENDIX 4. Neonatal difficult airway (please print out this page and place in difficult airway kit)**

# NEONATAL DIFFICULT AIRWAY

Read all text in **BOLD** aloud to the team:
VERBALISE AS CHALLENGE AND RESPONSE.
Yes/No responses required from team leader

## Immediate actions**:** **We have a difficult airway situation**

1) **Has someone called for expert help? YES or NO**
Send a specific team member to call for help (numbers below):

Tell them to state**:**
**'We have a difficult airway situation in (state your location). Please attend immediately'**

□ 1) Neonatal consultant

□ 2) ENT consultant contact:

Working hours - ext.

Out of hours - call the switchboard and ask for ENT consultant on call

□ 3) Anaesthetist consultant contact

Inform the theatre team and ask for ENT scopes.

Working hours – ext. ……

Out of hours - call the switchboard and ask for Anaesthetist consultant on call

## 2) Has the Difficult Airway box been located and retrieved?

If Not: Retrieve and Open the Difficult Airway Box: Located at
……

*NOW TURN OVER THIS SHEET AND READ FROM 'PLAN A'*
Other information:

Medication for sedation/paralysis:
Current
Fentanil ……mcg/kg
Atropin ……..mcg/kg
Suxametonium …...mg/kg

**Medication for reversal of sedation/paralysis**
Opioid reversal - Naloxone 100mcg/kg

Location of specific equipment:
ENT scopes ……..

# KSS NEONATAL DIFFICULT AIRWAY

Declare difficult airway after two attempts by experienced operator
Call for expert help
Retrieve Difficult Airway box location:
Verbalise as questions and answers

## Plan A - Failed intubation but able to oxygenate

| **Priority: Mask ventilation and oxygenation** | **Actions:** |
|---|---|
| Is the mask appropriate size?<br>Is head at Neutral position<br>Is T-Piece/BMV/Ayres circuit pressure high enough?<br>Is 2 person technique effective ? | Align, roll and check seal<br>Smaller or larger mask size<br>Reposition the head (neutral position)<br>Increase PIP/PEEP/ Use longer Ti<br>Try oropharyngeal airway<br>Note: babies with small jaws may oxygenate better when prone |

Is the chest moving (and has the heart rate increased?)

**YES** → Continue mask ventilation until help arrives and plan for definitive airway (see plan C/D)

**NO**

## Plan B – Failed intubation and worsening hypoxia

| **Priority: Oxygenation and ventilation** | **Actions:** |
|---|---|
| Is oxygen set to 100%?<br>Is NG tube in situ?<br>Is a supraglottic airway e.g. IGel available or Nasopharyngeal airway?<br>Have you got IV access ? | Increase O2 to 100%<br>Pass NG tube to decompress stomach<br>Insert IGel for babies above 2kg.<br>ETCO2 detector in circuit<br>IV access (UVC/IO) |

Able to oxygenate and ventilate?

**YES** → Continue with effective method until help arrives and plan for definitive airway (see plan C/D)
Consider ( transfer to theatre for definitive airway after discussion with ENT/Anaesthetic team )

**NO**

## Plan C – Difficulty ventilating and oxygenating

| **Priority: Optimise oxygenation** | **Action:** |
|---|---|
| Is Oxygen 100%?<br><br>Did you use sedation and paralysis?<br><br>Is there access to videolaryngoscopy of advanced airway adjuncts (e.g. bougie) | Apply HHFNC with FiO2 100% or nasal cannula low flow<br><br>When help available:<br>Sedate and paralyse<br><br>Use Video laryngoscopy in cases with difficult views - Grade 3 or 4 Cormack and Lehane scale<br>Use BOUGIE in presence of narrow airway |

Has a definitive airway been established?

**YES** → Confirm with ETCO2 detection
Secure ETT
Consider optimising space and teams

**NO**

## Plan D – Can't intubate, can't oxygenate

**Plan D – Can't intubate, can't oxygenate**

Imminant demise requiring rescue techniques. This is a rare situation with limited evidence to support practise. It is unlikely that any one individual will have had regular experience of the options listed. Available options include percutaneous tracheal puncture with a cannula or QuickTrach, retrograde intubation or a tracheostomy. The option chosen will be dependent on expertise available locally.

## APPENDIX 5. Extubation decision making tool example

Decision making tool
for neonatal extubatic

## Scope of Guideline Framework

The guideline applies to all Neonatal Units covered by Kent Surrey and Sussex Neonatal ODN. This includes the following hospitals:

| **Kent, Surrey and Sussex** | |
|---|---|
| Medway Hospital NHSFT | -Medway Maritime Hospital, Gillingham |
| East Kent Hospitals University NHSFT | - William Harvey Hospital, Ashford<br>-Queen Elizabeth the Queen Mother, Margate |
| Ashford and St Peter's NHSFT | -St Peter's Hospital, Chertsey |
| University Hospitals Sussex | -Royal Sussex County Hospital, Brighton<br>-Princess Royal Hospital, Haywards Heath<br>- Worthing Hospital |
| Frimley Health NHSFT | -Frimley Park Hospital |
| Surrey and Sussex Healthcare NHST | - East Surrey Hospital, Redhill |
| Maidstone and Tunbridge Wells NHST | - Tunbridge Wells Hospital, Pembury |
| Dartford and Gravesham NHST | - Darent Valley Hospital, Dartford |
| East Sussex Healthcare NHST | - Conquest Hospital, Hastings |
| Royal Surrey NHSFT Guildford | - Royal Surrey County Hospital, |

## Recommendations:

## Auditable Standards:

## References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| KSS Airway Group Member | Job Title |
|---|---|
| Vimal Vasu (Chairperson) | Consultant Neonatologist |
| Richard Newton | Consultant Anaesthetist |
| Nikolay Drenchev | Consultant Neonatologist |
| Hemant Ambulkar | Consultant Neonatologist |
| Sarah Newman | Lead Nurse for Neonatal Transport |
| Annamma Binu | Senior Nurse |
| Sumiah Al-Azeib | Lead Pharmacist |
| Agnieszka Cedro-Sogliani | Lead Pharmacist |
| Jennifer Lomas | Network Manager |
| Louise Proffitt | Network Lead Nurse |
| Tamsyn Crane | Network Practice Educator |
| Jacqui Bobby | Data Analyst |
| Joanne Macleod | Consultant Neonatal Nurse |
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## Version Control:

| Version | Date | Details | Author(s) | Comments |
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