# Obstetric General Anaesthesia Guidelines

| Applicable to (please mark with an X) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Group-wide** | | **LUHFT-wide** | | | | **Liverpool Women's** | **x** |
| **Aintree Hospital** | | **Broadgreen Hospital** | | **LCL** | | **Royal Liverpool Hospital** | |

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| **Department/Division** | Anaesthetics, Gynaecology Division |
| **Version:** | 6.0 |
| **Approving Committee or Group:** | Gynaecology Divisional Governance Group |
| **Date Approved:** | 03/12/2025 |
| **Date for Review:** This document will be reviewed every 3 years or as and when changes or legislation which affects the document are introduced. | 08/10/2028 |
| **Target Audience** | Anaesthetics |
| **Key Words/Tags:** | Anaesthetic, anaesthetic machine |
| **Consulted with:** | Maternity Policies and Guidelines Meeting |
| **Associated Documents** | |
| **Evidence Base and References** e.g. Regional or National Guidelines such as NICE or Royal College. | |
| **Access to Information** | To access this document in another language or format please email ITS@liverpoolft.nhs.uk |

## What is new in this version?

| Latest Version | Page | Changes Made | Date |
|---|---|---|---|
| **6.0** | | Updated use of drugs for GA<br>Addition of TIVA option for GA and appendix for TIVA<br>High flow nasal oxygenation as therapeutic strategy for high BMI patients and muscle relaxant choices<br>Appendix for airway management. | **08/10/2025** |

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# 1 Guidance

## 1.1. PRIOR TO INDUCTION

1. A pre-use check of the anaesthetic machine must be carried out. The anaesthetist is responsible for ensuring the machine is safe and functional.
2. Site a peripheral infusion using a **14 #** or **16 #** cannula (unless already in situ)
3. **Pre-load with** i.v. **500 ml crystalloid.** Further fluid may be needed according to clinical picture. Care should be taken if known pre- eclampsia
4. Position patient in **left wedged**, or **lateral position**, and ensure **vena caval compression** is relieved. Optimal patient positioning (+/- Oxford pillow)
5. Pre-oxygenate

   Purpose : to replace nitrogen in alveoli with oxygen and increase reserve during apnoea.

   Method:

   a. nasal oxygenation 6L/min until intubated plus;

   b. 15L/min circuit flow oxygen via tight fitting face mask to achieve FEO2>90%

   c. For BMI 40 and above arrange for HFNO utilising Optiflow 40L/min 100% oxygen. If this is immediately unavailable for induction. Optiflow HFNO should be arranged for extubation for a 30 minute period during and after emergence from anaesthesia.

   d. Use gas analysis to confirm adequate de-nitrogenation by ensuring EtO2 > 90%. Also, confirm that CO2 monitor is working.

6. Ensure all **drugs** necessary are drawn up, and within easy reach.
7. Ensure all **airway management equipment** is present and within reach (a size 7.0 endotracheal tube is recommended).
8. Switch on, and place **suction** under pillow.
9. Make sure assistant can apply appropriate **cricoid pressure**
10. When surgical, neonatal, and midwifery staff are ready, **INDUCE** appropriate general anaesthesia.

**<u>We suggest, rapid sequence induction and intubation, with cricoid pressure</u>**

a. Induction with **Propofol** (**3mg/kg** lean body weight). Ketamine induction should be considered In a moribund or severe clinical shock, at a dose of 1.5mg/kg lean body mass (intention to treat dosing for all inductions).

Suxamethonium chloride (1.0 to 1.5 mg/kg actual bodyweight) or Rocuronium at a dose of 1.0 mg/kg. Sugammadex must be readily available if rocuronium is to be used with a dose pre-calculated and it represents the optimum method of muscle relaxation in obstetric RSI with the quickset reversal potential (3 minutes average with rocuronuim/ sugammadex versus 9 minutes for suxamethonium.

An opiate may be used as part of induction eg. Alfentanil 1mg. Alfentanil and remifentanil have been shown to be associated with less reduction in APGAR scores than fentanyl (antenatal administration). Inform neonatology of any antenatal opiates administered.

## 1.2. AFTER INTUBATION

a) Ventilation by IPPV - table of gaseous agents

| | |
|---|---|
| **Oxygen** | **50 % until delivery then 33% (SaO2>94%)** |
| Nitrous Oxide | Recommended by OAA currently |
| **Sevoflurane** | **et 1.77 to 2.10%** |
| **TIVA SOP (no Sevo/ N2O)** | |

Adjust ventilation to maintain **ET CO2 > 4kPa**

b). Additional relaxation may be by

- Atracurium
- Cisatracurium
- Vecuronium
- Rocuronium

c). Depth of anaesthesia monitoring with BIS should be used as standard and applied as soon as the clinical situation allows.

### 1.3. AFTER DELIVERY OF THE INFANT(S)

a. Slow i.v. bolus dose of five units (or repeated units of 3U) of **oxytocin**

b. Administer narcotic analgesia. Morphine or oxycodone should be administered, in dosage appropriate to maternal condition for post-operative analgesia. 5mg repeated for 2 or 3 doses is a routinely used clinical dosing.

c. If a patient has an epidural in-situ that was working during labour, then epidural diamorphine (2.5mg- 3.0mg) is an alternative to IV opiate. There is a requirement to have theatre and recovery monitoring for a total of 90 minutes after administration of epidural diamorphine.

d. Adjust ventilation control and titrated anaesthetic agents to the appropriate levels for maternal condition.

e. TAP blocks or local wound infiltration by the surgical team, up to 2 mg/kg levobupivacaine, max dose 150mg forms part of standard analgesic regime.

### 1.4. AT END OF PROCEDURE

Ensure full reversal of relaxant (may require sugammadex), and full return of laryngeal reflexes before extubation.

a. Appropriate oxygen therapy - high flow nasal oxygenation with Optiflow for BMI 40 and above
b. Consider placement of orogastric tube to empty gastric contents
c. PCA morphine or oxycodone as part of post-op analgesia

## 2 Auditable Standards

Standards for anaesthetic practice are set out in guidelines for provision of anaesthetic services document (Royal College of Anaesthetists GPAS 2022 – in conjuction with Obstetric Anaesthesia Association).

Contained here are up to date best practice provision of general anaesthesia and optimal safe care for obstetric patients. No KPI's are linked to this document or indeed general anaesthesia for obstetric patients, however monthly data for rate of general anaesthesia for obstetric patients appears on the data collected via microsoft power BI.

## 3 Monitoring Compliance

| Audit outcomes | Target | How will the audit outcomes be Monitored? | Responsible committee for monitoring audit outcomes and action plans | Frequency of guideline monitoring | Frequency of action plan monitoring | Lead |
|---|---|---|---|---|---|---|
| Monthly rates of GA for obstetric anaesthesia, this is not an audit | No target is appropriate | Monthly power BI data | Department of anaesthesia | 3 monthly during induction of anaesthetic trainees | Annual | M.Entwistle |
| Follow up data is collected for all anaesthetic procedures; this is not an audit. | No target appropriate | Monthly power BI data | Department of anaesthesia | 3 monthly during induction of anaesthetic trainees | Annual | M.Entwistle |
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# Appendix 1: Management of Post-Caesarean Section Pain

In 2021, the PROSPECT working group published evidence-based recommendations for the management of post-caesarean section pain. To update the recommendations, the PROSPECT group performed a literature search on 13 February 2023 to include studies that were published from 15 October 2020 to 12 February 2023 and identified 287 trials.

Updated recommendations for pain management in patients undergoing elective caesarean section.

**Pre-operatively**

Intrathecal long-acting opioid (e.g. morphine 50–100 µg or diamorphine up to 300 µg). Epidural morphine 2–3 mg or diamorphine up to 2–3 mg may be used as an alternative, for example, when an epidural catheter is used as part of a combined spinal–epidural technique

Oral paracetamol

**Intra-operative/ after delivery**

Intravenous paracetamol if not administered pre-operatively

Intravenous non-steroidal anti-inflammatory drugs at the end of surgery

Intravenous dexamethasone

***If intrathecal morphine is not used, local anaesthetic wound infiltration (single shot) and/or continuous wound infusion and/or fascial plane blocks such as transversus abdominis plane blocks, erector spinae plane blocks and quadratus lumborum blocks***

**Postoperative**

Oral or intravenous paracetamol

Oral or intravenous non-steroidal anti-inflammatory drugs

Opioid for rescue or when other recommended strategies are not possible (e.g. contraindications to regional anaesthesia)

Analgesic adjuncts include transcutaneous electrical nerve stimulation

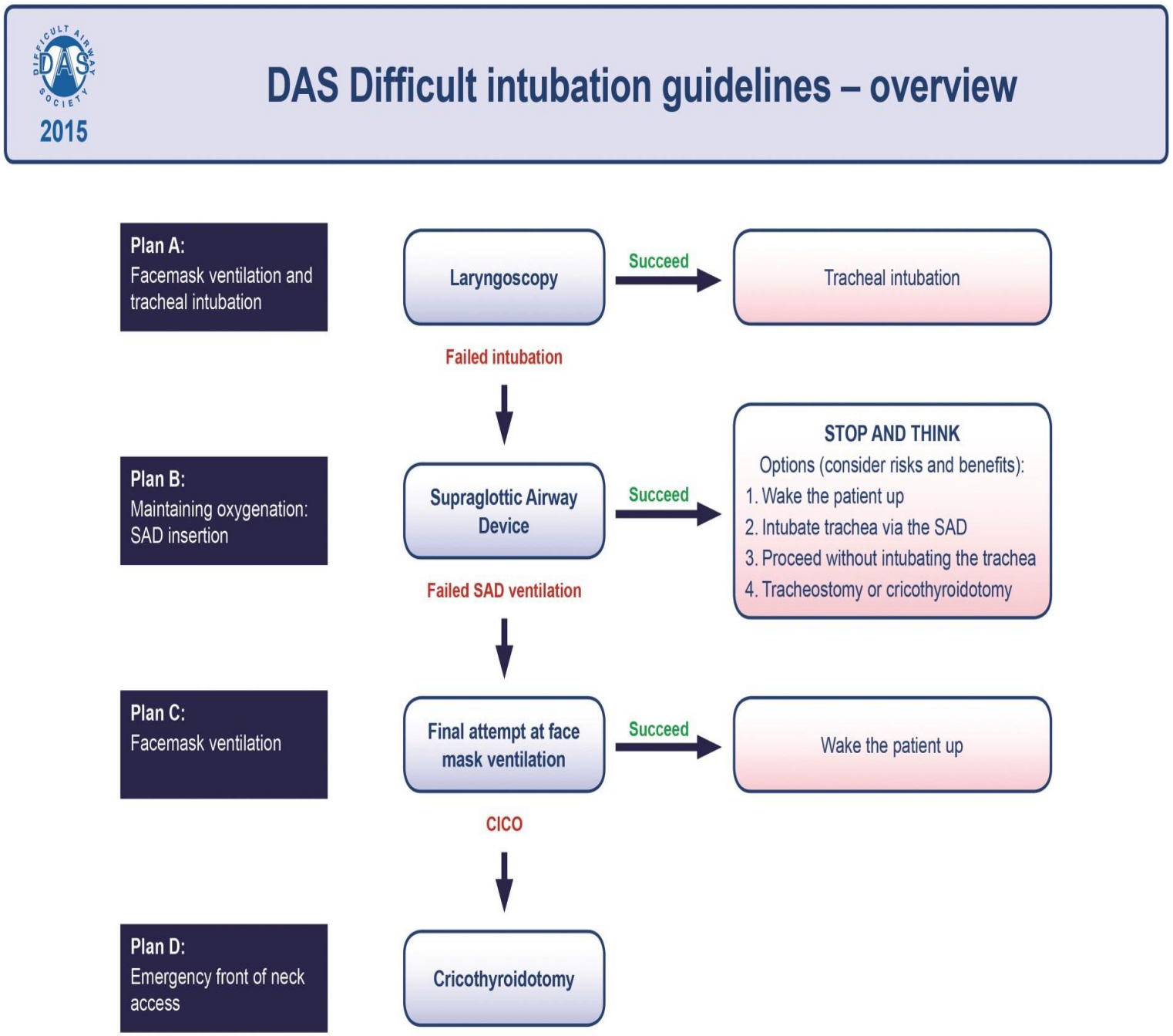
**Surgical technique**

Joel-Cohen incision

Non-closure of peritoneum

Abdominal binders

## Appendix 2: DAS Difficult Intubation Guidelines




This flowchart forms part of the DAS Guidelines for unanticipated difficult intubation in adults 2015 and should be used in conjunction with the text.

# Appendix 3: Stable patient Obstetric TIVA SOP

**Stable patient Obstetric TIVA SOP** - can also be used for pre-ecamptic/ hypertensive patients.

**STRATEGY** - Use standard hand held syringe **Bolus,** TCI **Background, Muscle** relaxation induction and have an

**Analgesic** plan **- BBMA**

**Adjusted body weight** (height in cm – 105 = Ideal body weight, add 40% of difference of actual body - IBW. Underweight mums use actual weight)

Propofol TCI – **Marsh plasma model, 6mcg/ml** plasma target (check TCI bolus dose on screen)

*Remifentanil TCI **Minto effect** site model **2ng/ml** (or alfentanil 1-2mg) Consider no opiate if neonatal risk – e.g. <36 weeks

Rapid acting muscle relaxant

## PREP

Pre-oxygenation/ Pumps with power/ BIS monitoring mandatory

## Go – *2,6, birth - 5,5 and 5

1. *Start Remi 2 ng/ml target with pre-oxygenation
2. Start propofol TCI 6 mcg/ml TCI - once the initial 1200ml/hr phase has slowed…
3. Hand bolus appropriate inducton agent/ muscle relaxant as per intention to treat
4. Observe BIS while conducting airway interventions
5. Titrate propofol TCI to BIS, usually 20 to 40 at this early stage.

## LAST UMBILICAL CORD CLAMPED

1. Remi TCI to 5ng/ml,
2. Propofol TCI to 5mcg/ml
3. *Morphine 5mg (5 and 5)

## Emerge

Titrate to effect should have given you a ‘feel’ of the patient’s anaesthetic requirements. ‘Sedation breaks’ offer BIS reactivity feedback towards the end of the case.

First patient breath represents remifentanil ‘off switch’ if no further muscle relaxant given Multimodal analgesia (IV, LA, PR)

*Opiate strategy may change if already has neuraxial block

## Unstable patients

**Strategy** - Use standard hand **Bolus,** TCI **Background, Muscle** relaxation induction and have an

**Analgesic** plan **- BBMA**

| **Adjusted body weight** (height in cm – 105 = Ideal body weight, add 40% of difference of actual body - IBW. Underweight mums use actual weight) |
|---|

Propofol TCI – **Marsh plasma model, 4mcg/ml** plasma target (check TCI bolus dose on screen)

Hand syringe bolus - -choice of appropriate induction agent (e.g. ketamine/ propofol) Rapid acting muscle relaxant

## Prep

Pre-oxygenation/ Pumps with power/ BIS monitoring mandatory

## Go – 4, stable induction

1. Start propofol TCI 4 mcg/ml TCI - once the initial 1200ml/hr phase has slowed…
2. Hand bolus appropriate inducton agent/ muscle relaxant as per situation.
3. Observe BIS while conducting airway interventions
4. Titrate propofol TCI to BIS, usually 20 to 40 at this early stage.

## Last cord clamped

1. Multimodal analgesia/ neuraxial analgesia (e.g.epidural diamorphine)
2. Choice of therapies appropriate to comorbidity

## Emerge

Titrate to effect should have given you a ‘feel’ of the patient’s anaesthetic requirements. ‘Sedation breaks’ offer BIS reactivity feedback towards the end of the case.

First patient breath represents remifentanil ‘off switch’ if no further muscle relaxant given.

## Appendix 4: Document History and Version Control

| Version | Date | Comments | Author/Job Title |
|---|---|---|---|
| 1 | | Created | Dr W Wilkes |
| 2 | 2015 | Reviewed | Dr C Chevannes Consultant Anaesthetist |
| 3 | 2018 | Minor Update | Consultant Anaesthetist |
| 4 | 2021 | Drug and monitoring updates | Consultant Anaesthetists |
| 5 | Dec 2023 | Major revision –<br>Updated use of drugs for GA<br>Addition of TIVA option for GA and appendix for TIVA<br>High flow nasal oxygenation as therapeutic strategy for high BMI patients and muscle relaxant choices<br>Appendix for airway management. | Consultant Anaesthetists |
| 6 | 08/10/25 | Major Revision | Grainne Garvey, Consultant Anaesthetist |
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