**Executive Summary**

This guideline is to facilitate safe practice in the use of remifentanil PCA for analgesia in labour.
1. Introduction, Scope and Purpose

1.1. Introduction
Remifentanil has been identified as a safe and effective analgesic option for use in the intrapartum period. Acting within 1-2 minutes and suited to patient controlled administration (PCA), this offers another analgesia choice for women in labour. It has been shown to have provided higher patient satisfaction compared with pethidine with a similar degree of adverse events (Shnabel, A. 2012)

1.2. Scope
These guidelines apply to all women requiring analgesia during labour who do not want, or cannot have, an epidural.

1.3. Guideline aim
To ensure staff have understanding of those that are eligible for remifentanil PCA in labour and safe commencement of a remifentanil PCA

1.4. Guideline objectives
This guidelines are to support safe clinical practice when offering remifentanil PCA to women in labour.

2. Abbreviations
PCA - patient controlled analgesia
SpO2 – oxygen saturations
CS - Caesarean section
BMI - Body mass index
CTG – cardiotocogram
CPAP – continuous positive airway pressure

3. Indications for Remifentanil PCA
Remifentanil PCA is an alternative form of analgesia for use in labour. Remifentanil is a potent opioid and a controlled drug and usage should comply with the requirements stated in Appendix H (Controlled Drugs-procedures and guidelines for good practice) of the Trust’s Medicines- prescribing, acquisition, storage and administration policy.

Remifentanil is currently not licensed for use via PCA and must be prescribed by an anaesthetist prior to setting up.
4. **Criteria for use**

4.1. In general, any woman being offered remifentanil PCA should be more than 36 weeks’ gestation and be in established labour.

4.2. If remifentanil is being considered for use at a gestation of less than 36 weeks this must be agreed by the team, including the obstetrician, anaesthetist and the midwife caring for the woman.

4.3. Entonox may be used in addition to remifentanil.

4.4. SpO₂ monitoring must be established before the woman starts using the PCA and must be monitored continuously while the remifentanil PCA is being used.

4.5. Remifentanil observations must be completed on the K2 system. This includes sedation score, respiratory rate, pain score and oxygen saturations. Once the anaesthetist has inputted the start of remifentanil there will be a reminder to complete observations.

4.6. A midwife, who has undergone local training in the use of remifentanil, must be assigned to give one to one care. The patient should under no circumstances have access to the PCA if the midwife is not present.

5. **Absolute contraindications for Remifentanil PCA**

- Allergy to opioid drugs
- Other opioid administration within preceding four hours (primarily morphine (Oromorph) and pethidine). Oral dihydrocodeine/ DF118 would not be a contraindication
- If they have had an epidural which has failed, subsequent use of remifentanil would need to be discussed with a senior anaesthetist due to the infusion of fentanyl.
- Intrauterine death - due to presumed potential pharmacodynamic changes in the woman; a morphine PCA would be the alternative drug of choice.
- Inability to consent/ explain how to use PCA secondary to language barrier
- Proven history of sleep apnoea – consider use of the STOPBANG questionnaire if suspect sleep apnoea but not proven by sleep studies or use of home CPAP machine

5.1. **Relative contraindications for Remifentanil PCA**

- Any condition when an epidural is advantageous for medical/obstetric reasons, including but not limited to: pre-eclampsia, multiple pregnancy, cardiac or pulmonary pathology. In these circumstances decision to commence remifentanil PCA should be discussed as tripartite agreement with the anaesthetic team, obstetric team and midwifery staff.
- Morbid obesity (BMI>45) – in such woman an early epidural would be considered highly advantageous due to the difficulties with obtaining prompt regional anaesthesia should an emergency CS be declared and the hazards associated with general anaesthesia.
6. **Patient preparation**

- The patient should be issued with, and have read the remifentanil PCA patient information leaflet and had the opportunity to ask questions. (Staffnet- patient information- Pain relief in labour Epidurals and Remifentanil explained).
- The patient should be informed of the possible side-effects including drowsiness, itching, nausea and dizziness (see BNF for complete list).
- In particular the woman should be informed that at least one woman in ten using remifentanil PCA will experience transient lowered oxygen saturation levels requiring the administration of additional oxygen via nasal specs.
- A dedicated intravenous cannula (20g Pink) is required.
- Any other intravenous cannulae on the same arm should have an anti-reflux valve and any infusions delivered via a volumetric pump.
- The patient should be shown how to use the PCA and should be told to press the button just before or at the start of a contraction.
- A pulse oximeter (oxygen saturation) probe must be attached before the PCA is started.
- Alarms for the pulse oximeter should be checked and set to function if SpO2 falls below 95%

6.1. **Equipment required**

- 50 ml bag 0.9% sodium chloride w/v
- 50ml BD plastipak syringe (luer lock)
- 2 mg ampoule of remifentanil (checked by two health professionals from the following list: registered midwives, anaesthetist or operating dept practitioner)
- **Dedicated PCA pump set to deliver 1ml (40 microgram) bolus with a 2 min lockout; “standard dose”** OR 0.5ml (20 microgram) bolus with a 2 minute lockout; “low dose”.
- anti-syphon extension set
- dedicated pink (20G) IV cannula
- nasal O₂ cannula 'specs'
- Naloxone 400 micrograms

6.2. **Syringe preparations**

1. Remifentanil solution to be reconstituted as per attached schedule by an appropriately trained anaesthetist /midwife.

2. Mix 2mgs remifentanil with 50mls 0.9% sodium chloride w/v to make solution of 40microgram/ml remifentanil.

   If the BMI is <20 at booking then a “low-dose” protocol may be considered. This is a mix of 2mgs in 50mls but utilises a protocol of 0.5ml bolus with 2-minute lockout. The “low dose” regimen may be started first line after consultation with a senior anaesthetist.
7. Observations

The anaesthetist will initially document the remifentanil PCA on the K2 Guardian system and prescribe the PCA on JACS prior to leaving the room. Half hourly observations are then to be completed on this system. The system will remind you to complete the observations every 30 minutes and this must include pain score, sedation score, respiratory rate and SpO2. The total number of boluses and drug given is also recorded on this page.

If there is a fault with the K2 system then Remifentanil PCA observations can be completed on the remifentanil PCA chart. (See appendix 1) This is in addition to observations recorded on the MEOWS chart.

- Continuous SpO2 monitoring must be established prior to starting PCA and recorded on observation sheet
- Commence O₂ via nasal specs if SpO₂ below 95%
- CTG monitoring is not required unless otherwise indicated as per ‘Electronic Fetal Heart Rate Monitoring & Fetal Blood Sampling in Labour’ Guideline

NOTE: Sedation score is recorded on a modified AVPU scale

- Alert: Or slightly Drowsy
- Voice: Eyes closed but responds to Voice
- Pain /Unresponsive: Eyes closed but rousable by physical stimulus/ Pain/ Unresponsive

7.1. Indications for contacting the anaesthetist (bleep 2410) and withholding (i.e. stopping) Remifentanil PCA until reviewed

- A sedation score where there is no response to voice, response only to pain/ physical stimulus or patient unresponsive
- Respiratory rate of less than 8 breaths per minute
- SpO₂ remaining below 90% despite oxygen via nasal specs (max 2l/min)
- Stopping of PCA for over 30 minutes and request to recommence it

7.2. Points of safety

- Always use a dedicated cannula. (Do not use Y connectors)
- Do not give any other drugs via the PCA cannula
- Only the patient is to press the PCA button
- The PCA button is not to be pressed by midwifery staff or the patient's relatives
• The PCA can be used during delivery and for the repair of tears and episiotomies. (Postnatal use is only as a continuation of a labour remifentanil PCA. If commencement is just for perineal repair then this needs to be assessed on a case by case basis by the consultant anaesthetist)
• The remifentanil syringe should not be connected to the patient unless it remains fully engaged in the syringe driver/pump
• Remove cannula on completion of the PCA
• Unless required for alternative risk factors, a CTG is not required.

7.2.1 Transfer to theatre
If a woman is using remifentanil and is transferred to theatre, they may continue remifentanil once in theatre. Do not allow the woman to press the PCA during transit until she arrives in theatre as portable SpO2 monitoring will not be available. The midwife must continue to observe the woman if she is continuing to use the PCA whilst the anaesthetist and ODP prepare for regional anaesthesia. The oxygen saturations must be monitored once in theatre.

7.3. Apnoea
• If there is a period of apnoea lasting > 10 seconds or respiratory rate < 8 then the patient should be verbally encouraged to breathe and the remifentanil bolus control removed from the patient.
• If there is still no respiratory response despite strong verbal encouragement (e.g. by 20 seconds) help should be sought (pull emergency buzzer). The patient should be laid flat in full left lateral position and 100% oxygen administered (via a self-inflating bag, valve, facemask until return of spontaneous respiration or by non-rebreath mask at 15L oxygen if making respiratory effort) until the arrival of the emergency team (including anaesthetist) to determine optimum airway management.
• If there is thought to be the need for verbal encouragement for the patient to breathe on 2 or more occasions then the remifentanil PCA must be withheld until the patient has been reviewed by the Anaesthetic team with consideration of alternative pain relief options. They may consider whether to switch protocols to a “low dose” protocol if ongoing concern regarding apnoeas/oxygen saturations.
• SpO2 91-95% Commence 2l O2 via nasal specs consider whether to switch protocols to a “low dose” protocol if ongoing concern regarding oxygen saturations.
• SpO2 below 90% (despite O2) STOP PCA, Call for help, left lateral position and 15l O2 (via non rebreathe mask when available)
• Respiratory rate below 8 or apnoea for greater than 10 seconds STOP PCA, verbally encourage to breathe, Call for help, left lateral position and 15l O2 (via non rebreathe mask when available)
8. Other care issues
Eating. It is not recommended to eat whilst using the remifentanil PCA though the woman can drink clear fluids. Consider use of ranitidine if the woman is likely to be on remifentanil for more than 4 hours.

Mobility. Women should be risk assessed as to whether it is appropriate for them to mobilise, turn on all fours etc. Consider waiting for at least 30 minutes of using remifentanil or if adding entonox, to allow a period of adjustment, before making any such risk assessment.

9. Completion of use of Remifentanil PCA
On completion of the PCA it is the responsibility of the midwife to dispose of any remaining drug in the syringe as per controlled drug policy (UHS).

- The pink (20g) i.v. cannula should be removed and not flushed.
- Please complete the Remi PCA SAFE network© form (see appendix 2)

10. Roles and Responsibilities

This guideline applies to all clinical staff employed or contracted by University Hospital Southampton (UHS) Foundation Trust who provide care to women. Staff have a responsibility to ensure that they are aware of this guideline and its contents. They should clearly document their rationale if they have not complied with the recommendations detailed in this guideline. It is the responsibility of department managers, consultants, team leaders and education leaders to ensure staff are aware of this guideline.

| Anaesthetist | The Anaesthetist should be aware of all requests for remifentanil PCA and be present at the commencement of any remifentanil PCA as indicated in these guidelines and provide support to the midwife when requested. The anaesthetist should observe the effects for the first 4-5 presses of the PCA button (up to 10 minutes after commencement) as this is the point desaturation is most likely to occur. |
| Labour Ward Coordinator / Shift Leader | Should be made aware of any women requesting remifentanil PCA and ensure there is an appropriate level of midwifery staff if remifentanil PCA is provided. |
| Midwife | Should ensure that the Labour Ward Coordinator and Anaesthetist are aware of the request for remifentanil PCA. Should be familiar with guidance for remifentanil use including monitoring, record keeping and dealing with potential remifentanil problems and ensure one to one care for any woman receiving remifentanil PCA. |

11. Related Trust Policies
None
12. Implementation

The guideline will be displayed on the Staffnet, and sent to the relevant Care Group clinical teams. The team leaders will be expected to cascade to all relevant staff groups. All medical, nursing and midwifery staff caring for women and newborns should have support and training in implementing the contents of the guideline. In addition, the guidelines will be included in local induction programmes for all new staff members.

13. Process for Monitoring Compliance/Effectiveness

The purpose of monitoring is to provide assurance that the agreed approach in the guidance is being followed to ensure we get things right for patients, use resources well and protect our reputation. Our monitoring will therefore be proportionate, achievable and deal with specifics that can be assessed or measured.

Audit results will be circulated and presented at the multidisciplinary audit meetings, identified in the monitoring table. Any areas of non compliance or gaps in assurance that arise from the monitoring of this guideline will result in an action plan detailing recommendations and proposals to address areas of non compliance and/or embed learning. Monitoring of these plans will be coordinated by the group/committee identified in the monitoring table.

Those responsible for instigating the resulting actions will be identified in the audit meeting minutes and the action plans and results will also reviewed by W&N Multidisciplinary Audit Meeting.

The resulting actions will be reviewed or followed up at the subsequent multidisciplinary audit meeting(s).

Key aspects of the procedural document that will be monitored:

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<th>What will be reviewed to evidence this</th>
<th>How often will this be done</th>
<th>Detail sample size (if applicable)</th>
<th>Who will co-ordinate and report findings (1)</th>
<th>Which group or report will receive findings</th>
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<td>Anually</td>
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<td>Labour ward manager</td>
<td>W&amp;N Multidisciplinary audit meeting</td>
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<td>Analysis of the Audit forms completed by delivering midwife.</td>
<td>Annually</td>
<td>All audit forms</td>
<td>Intrapartum Care Committee</td>
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Record Adverse Incidents related to Remifentanil (nil in last guideline period) | Analysis of all adverse event forms and the corresponding audit forms | Continuous as cases occur. | All | Labour Ward Manager and Lead Obstetric Anaesthetist for remifentanil in labour

(1) State post not person.

Where monitoring identifies deficiencies actions plans will be developed to address them.

14. Arrangements for Review of the Policy

Guideline to be reviewed after three years or sooner as a result of audit findings or as any changes to practice occurs.

15. References


Appendix 1 – Observational chart for PCA Remifentanil (to be used if fault in K2 system)

PCA Chart for Remifentanil PCA in labour

Patient Addressograph:

Date commenced: ___________________ Anaesthetist: ___________________

Protocol Summary: Remifentanil 2mgs in 50mls 0.9% sodium chloride w/v

PCAM Pump settings: Remifentanil 40micrograms in 1ml. 1ml bolus with 2 minute lockout.

PCAM Asset number: (found on blue strip) ___________________

Troubleshooting: Contact Labour Ward anaesthetist (bleep 2410) and labour ward coordinator /shift leader

Any parenteral opioids given in previous 4 hours? Y N (circle) Details ___________________

Observations:

Continuous SpO2 monitoring BASELINE SPO2 _____________

½ hourly: Record Pain/sedation scores, Respirations, SpO2 (including amount of Oxygen if required), cannula site and nausea and vomiting

Pump observations:

½ hourly: Record Volume remaining/ total infused
PCA Date

Patient Name
Date of Birth
Hospital Number

Time

SpO2
Air/ Entonox/ O₂ 2l/min
Resp Rate
Pain score
Sedation score
Nausea (Y / N)
Pump Total Infused
Volume remaining in syringe

Any of:
Respiratory rate of 8 or below
SpO2 of 90% or less
Unresponsive or only responding to pain
then:
STOP infusion and
Give supplementary O2 and
Inform anaesthetist

Sedation Score
A  Alert or slightly drowsy
V  Voice responds to voice
P/U  Responds to painful stimuli or unresponsive

Pain Score
0  No pain at height of contraction
1  Mild pain
2  Significant Pain
3  Severe Pain

Other opioids only to be given on advice of anaesthetic staff

Remifentanil Patient Controlled Analgesia for Labour Guideline
Issued: Sept 2018
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Appendix 2: Remifentanil audit form (Remi PCA SAFE Network©)

**Basic Data**
Patient ID: _______________ Date of starting PCA: __________

**Medical Data**
Gestation (/40): _____/_____ BMI: __________
Primipara: ☐ yes ☐ no Number of previous births: __________
Previous delivery with PCA: ☐ yes ☐ no
Previous delivery with EDA: ☐ yes ☐ no
Previous Caesarean section: ☐ yes ☐ no

**Opioids and Other Drugs Previous to PCA**
Opioids previous to PCA: ☐ yes ☐ no
Which opioid:
☐ Oramorph
☐ Diamorphine
☐ Pethidine
☐ Tramadol
☐ ********
How many hours previous to PCA: ___h ___m
Gas and Air (Entonox®) during PCA: ☐ yes ☐ no
Oxytocin (Syntocinon®) during PCA: ☐ yes ☐ no
Other drugs previous to or during PCA: ______________________________

**Parameters of the PCA**

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<tr>
<td>☐ Recommendation of the midwife</td>
<td>☐ Cervix 1 - 4 cm</td>
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<tr>
<td>☐ Anaesthetist not available</td>
<td>☐ Cervix 4 - 8 cm</td>
</tr>
<tr>
<td>☐ Epidural not possible</td>
<td>☐ Cervix fully dilated</td>
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Overall amount of Remifentanil used: __________ mcg
Number of boli requested: ______________
Number of boli received: ________________
Bolus (highest bolus dose in microgram): __________ mcg (e.g. 20 mcg)
PCA used before expulsion phase: ☐ yes ☐ no
PCA used during expulsion phase: ☐ yes ☐ no
PCA used after delivery: ☐ yes ☐ no
PCA stopped for instrumental or CS delivery: ☐ yes ☐ no

**Pain (VAS)**
Maximum VAS before PCA: 0 1 2 3 4 5 6 7 8 9 10
Maximum VAS during PCA: 0 1 2 3 4 5 6 7 8 9 10
Maximum VAS ~3 Stunden after starting PCA (only if not delivered): 0 1 2 3 4 5 6 7 8 9 10
Conversion into Epidural (EDA)
Conversion into Epidural: □ yes □ no
Conversion into Epidural after: ___ h ___ m
If other reasons for conversion into Epidural, which? ______________________________

Side Effects Mother

Lowest oxygen saturation during PCA: ________
Oxygen given for sat < 94%: □ yes □ no
Sat 94 % or higher on oxygen: □ yes □ no
Despite oxygen sat < 94% and
PCA stopped: □ yes □ no
Mask ventilation (mother): □ yes □ no

Reason for Conversion into Epidural (EDA):
□ Pain
□ Hypoxia
□ Nausea and/or vomiting
□ Sedation
□ Pruritus
□ Dizziness/vertigo
□ Memory loss
□ Obstructed labour/firm cervix exhaustion of mother

Neonatal Data
APGAR after 1 minute: 0 1 2 3 4 5 6 7 8 9 10
APGAR after 5 minutes: 0 1 2 3 4 5 6 7 8 9 10
APGAR after 10 minutes: 0 1 2 3 4 5 6 7 8 9 10
Umbilical cord pH venous: __________
Umbilical cord pH arterial: __________
CTG trace: not used/ normal / suspicious / pathological

Side Effects Neonate
Administration of oxygen (neonate): □ yes □ no
Mask ventilation (neonate): □ yes □ no
CPR (neonate): □ yes □ no
Transfer of neonate to neonatal unit (SCBU/ITU): □ yes □ no

Satisfaction
Satisfaction of mother with PCA:
□ Very satisfied
□ Satisfied
□ Undesided
□ Unsatisfied
□ Very unsatisfied

Satisfaction of midwife with PCA:
□ Very satisfied
□ Satisfied
□ Undesided
□ Unsatisfied
□ Very unsatisfied

General remarks:
Would the mother use Remi PCA again? □ yes □ no
Would the midwife use Remi PCA again? □ yes □ no

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