Guideline For Remifentanil Patient Controlled Analgesia (PCA) For Labour

Originator:	Anaesthetics Dept / Labour Ward Forum
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1.0 INTRODUCTION

Remifentanil has been identified as safe and effective analgesia for use in the intrapartum period. Acting within 1-2 minutes and suited to patient controlled administration, this offers another analgesia choice for women in labour at Singleton Hospital.

In common with other opiods it may cause respiratory depression, pruritis, nausea and vomiting. It crosses the placenta but has no clinically significant neonatal depressant effects at commonly used doses.

2.0 INDICATIONS FOR REMIFENTANIL PCA

Remifentanil PCA is used as an analgesic for labour as an alternative to pethidine or epidural in patients who do not want, or cannot have an epidural.

Remifentanil is currently not licensed for use via PCA and so must be prescribed by an anaesthetist.

Only midwives who have undergone a period of training and have been assessed as competent may monitor a patient using a remifentanil PCA.

3.0 CRITERIA FOR USE

Only for use on central delivery suite

In general, any woman being offered remifentanil PCA should be more than 36 weeks' gestation and be in established labour. It can be used at<36 weeks if analgesia is required for IUD or termination.

Remifentanil can be considered for use at a gestation of less than 36 weeks if there is a clinical need and the woman cannot have an epidural.

- The anaesthetist should discuss its use in these rare circumstances with senior obstetricians and the Consultant Anaesthetist.

Entonox may be used in addition.

SpO_2 monitoring must be established before the woman starts using the PCA and must be monitored continuously while the remifentanil PCA is being used.

A Remifentanil observation chart must be completed while the PCA is in-situ.

A midwife must be assigned to give one to one care. If the midwife is required to leave the room for <u>any period at all</u>, she must ensure that the woman <u>cannot use</u> the PCA during this time.

4.0 CONTRAINDICATIONS FOR REMIFENTANIL PCA

- Other parenteral opioid administration within preceding four hours
- No PCA trained midwife to administer 1:1 care
- Allergy to opiods (some opiod allergies may still allow remifentanil to be used)

Relative contraindications:

- Multiple pregnancy
- Pre-eclampsia
- Increased BMI >45
  (epidural better in these cases as has other benefits besides analgesia)

5.0 PROFESSIONAL ROLES

5.1 <u>Patient preparation</u>:-

- The patient should be issued with, and have read, the remifentanil PCA patient information leaflet.

- The patient should be informed of the possible side-effects including drowsiness, nausea, dizziness, requiring oxygen and respiratory depression (very rare).

- In particular, the woman should be informed that approximately one woman in ten using Remifentanil PCA will experience transient lowered oxygen saturation levels requiring the administration of additional oxygen via nasal specs.

- A <u>dedicated</u> intravenous cannula (22g Blue or 20g Pink) is required. Do not administer any other drugs or fluids via this cannula. Can use hartmanns / normal saline to drip in slowly to flush remifentanil through the cannula.

- 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 **only the patient can press the button.**

- A pulse oximeter (oxygen saturation) probe must be attached before the PCA is started.

- Continuous CTG monitoring is required whilst the remifentanil PCA is in use

- If an epidural is requested the Remifentanil PCA should be discontinued when the epidural is established.

- If the patient needs surgical delivery the PCA can be continued into theatre to aid with keeping the patient comfortable for the anaesthetic. The Remifentanil PCA should be stopped as soon as the regional technique is sited.

5.2 Equipment required:-

Equipment required
- Remifentanil PCA pump
- 50 ml bag saline
- 2 mg ampoule of Remifentanil
- 50ml syringe
- Drawing up needle
- PCA giving set
- Saline flush
- Remifentanil chart
- Drug additive label
- PCA key
- Cannulation equipment (for dedicated cannula)

Equipment in room
- Nasal cannula
- Non re-breathing face mask
- Self-inflating bag, valve and mask (Ambubag)

5.3 Drawing up and dose

The remifentanil syringe must be drawn up by the anaesthetist

Draw up 50ml NaCl 0.9% into 50ml syringe. Inject into 2mg remifentanil, ensure all dissolved and aspirate into syringe. Label syringe with patient details, drug and diluent, including batch numbers, date and time of being drawn up. Sign syringe and ensure countersigned. Sign controlled drug book.

Final solution concentration to be 40 microgrammes/ml of Remifentanil

Open remifentanil PCA pump. Flush side arm of PCA giving set with saline. Flush main PCA line with remifentanil solution in 50ml syringe. Insert syringe into PCA. Turn PCA to position 1. Choose correct PCA protocol depending on patient's weight.

Initial dose of Remifentanil will depend on patient's weight:

If ≥50Kg (STANDARD): 40 microgrammes bolus – PROGRAMME A
If <50Kg (LOW DOSE): 28 microgrammes bolus – PROGRAMME B

At time of writing, Remifentanil PCA pumps are being re-programmed to have the following dosing regimens available:

Programme A

- Standard dose: 40 microgramme bolus (1ml) over 10 seconds with 2 minute lockout

Programme B

- Low dose: 28 microgramme bolus (0.7ml) over 10 seconds with 2 minute lockout

Irrespective of programme used, final solution should be 40 mcg / ml

Note: some remifentanil PCA pumps will not have been modified to offer Low Dose remifentanil. The protocol on these will have to be manually amended (see 5.4 below)

Once Programme A or B selected then turn key to position 2. Confirm protocol dosing regimen. Press "Ok" to confirm syringe that is being used i.e. BD worldwide. Flush PCA line by depressing both flush buttons simultaneously.

Close barrel of PCA. Press green "go" button and connect to patient.

Anaesthetist MUST stay in room for first 4 PCA presses.

Ensure midwife knows not to leave patient alone with PCA

*N.B. Remifentanil is stable for 24 hours at room temperature after reconstitution

5.4 <u>To modify protocol in pump that does not have updated software</u>

If patient is less than 50Kg but there is no remifentanil pump available that has had its software updated to include Low Dose remifentanil then it is possible to modify the standard protocol by following the following instructions:

- Press modify protocol
- Use arrow buttons to highlight PCA dose then press alter
- Use minus button to reduce dose to 28 microgrammes, then press confirm
- Confirm PCA settings are:

  Drug Name: Remifentanil
  Drug concentration: 40microgrammes/ml
  PCA dose: 28 microgrammes
  Lockout period: 2 minutes
  Occlusion level: 6
- If all correct press ok
- Turn key to position 2
- Continue setup as described in 5.3 above
- Ensure low dose is prescribed on remifentanil PCA chart

5.5 Audit

Anaesthetist should fill in our follow up / general audit form.

The Remifentanil PCA usage will be audited for effectiveness, side effects and outcomes.

Adverse reactions or incidents should be reported by the usual clinical incident reporting mechanism. These can be reported by any member of staff.

6.0 OBSERVATIONS

- Remifentanil PCA observation sheet to be completed for all women using Remifentanil PCA including completion of "anaesthetist to ensure" and side-effect section.
- Baseline observations of maternal pulse, BP, respiratory rate, saturations, sickness, pain and sedations scores should be recorded.
- A sedation score is to be recorded every 30 minutes (see sedation scale below)
- Continuous SpO_2 monitoring must be established prior to starting PCA and recorded on obs sheet
- CTG monitoring is required

NOTE: Sedation score is recorded on a scale from AVPU

A = Awake and alert

V = Drowsy, responds to voice

P = very drowsy, responds to pain / shaking only

U = Unrousable, unresponsive to pain / shaking

6.1 Indications for Oxygen therapy

If saturations <90% for 15 seconds give 2 litres /min of oxygen via nasal cannula.

If saturations <90% despite oxygen contact anaesthetist urgently (extension 25857) and remove the PCA button from patient.

6.2 Indications for contacting the anaesthetist:-

- A sedation score of P or U
- Respiratory rate of less than 8 breaths per minute
- SpO_2 remaining below 90% despite oxygen via nasal specs
- Any other concerns

Obstetric anaesthetist (junior)	25857
2nd on call anaesthetist	25854
Obstetric anaesthetic consultant (8AM till 5PM, weekdays	25858

6.2 POINTS OF SAFETY:-

- **Always use a dedicated cannula**
- **Patient needs constant 1 to 1 midwifery care when using PCA, if midwife leaves room, then PCA must be removed from patient.**
- **Always flush the cannula after the PCA is removed with 5 ml saline**
- **Do not give any other drugs via the PCA cannula.**
- **Only the patient is to use the PCA button**
- **The PCA button is not to be pressed by midwifery staff or the patient's relatives**
- **The anaesthetist must be present observing the woman for the first 4 boluses**

6.3 APNOEA

Either Apnoea lasting > 10 seconds or Resp rate <8

- **Remove PCA button from patient**
- **Encourage to breathe**

If there is still no respiratory response despite strong verbal encouragement (e.g. by 20 seconds) emergency help should be sought (pull emergency buzzer).

- **Lie flat with full left lateral tilt**
- **Administer 100% oxygen with non re-breather face mask**
- **If no respiratory effort then ensure patient's airway is open and attempt ventilation with ambubag until arrival of the emergency team (including anaesthetist) to determine optimum airway management.**

2 more occasions that patient requires verbal encouragement to breathe

- **Withold remifentanil PCA**
- **Urgent anaesthetic review and consideration of alternative pain relief options**
- **If using standard dose (40 microgramme) remifentanil then can try patient with low dose (28 microgramme) remifentanil**
- **If reducing dose is done then anaesthetist must stay in the room for first 4 presses at new dose.**

7.0 TROUBLESHOOTING (also to be found on Remifentanil PCA chart)

Respiratory rate <8 and / or sedation score P or U

- Urgent medical review from on call anaesthetist (ext 25857)
- Remove PCA handset from patient
- Stimulate patient
- Administer 15L oxygen via non re-breathing bag
- Give naloxone as per remifentanil PCA chart
- If no breathing then pull emergency buzzer and put out obstetric cardiac arrest call.
- Once improving continue to monitor closely as per medical emergency team instructions (minimum ¼ hourly) till resp rate >12/minute.

Unrelieved pain with a pain score of 3 (severe)

- Check the infusion system is functioning and the IV access is patent.
- Check syringe is not empty.
- Check PCA demand button is attached to pump.
- Does the patient understand how to use the demand button?
- Contact on-call anaesthetist for labour ward (CISCO 25857)
- Discuss with patient options for further analgesia i.e.
    - If using low dose remifentanil then can increase to standard dose.
    - Epidural analgesia

Indications for Oxygen therapy

- If saturations <90% for 15 seconds give 2 litres /min of oxygen via nasal cannula.
- If saturations <90% despite oxygen contact anaesthetist urgently (extension 25857) and remove the PCA button from patient.

Indications for contacting the anaesthetist:-

- A sedation score of V, P or U
- Respiratory rate of less than 8 breaths per minute
- SpO_2 remaining below 90% despite oxygen via nasal specs
- Any other concerns

Nausea and Vomiting (PONV):

- Ondansetron prescribed on PRN section of remifentanil PCA chart.
- If persistent nausea or any vomiting then give anti-emetic and consider giving regularly in labour.

- If ineffective then contact anaesthetist to review

Itching:

- If problematic consider IV naloxone 50mcg PRN or chlorphenamine 4mg PRN.
- If no improvement, seek advice from the Anaesthetist on labour ward [CDS].

8.0 OTHER CARE ISSUES

Eating. It is not recommended to eat whilst using the remifentanil PCA though the woman can drink clear fluids. Ensure omeprazole is prescribed.

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.

Guideline written by

Obstetric anaesthetic team, in particular:
Dr Nigel Jenkins (Lead Obstetric Anaesthetist)
Dr Martin Garry
Dr Eleanor Lewis

Acknowledgement to the Royal Ulster hospital

Dr. D. Hill
Consultant Anaesthetist

Appendix A: Remi chart

VERSION 2 – AUGUST 2021

REMIFENTANIL PCA (Patient Controlled Analgesia) SUPPLEMENTARY ADMINISTRATION RECORD

GIG CYMRU NHS WALES — Bwrdd Iechyd Prifysgol Bae Abertawe / Swansea Bay University Health Board

HOSPITAL: Singleton Hospital

WARD: Central Delivery Suite [CDS]

CONSULTANT: _____

HOSPITAL NO: _____

SURNAME: _____

FIRST NAMES: _____

ADDRESS: _____ ADDRESSOGRAPH

_____

DATE OF BIRTH: _____

REMIFENTANIL requires dilution to a 40 mcg/ml solution:
Dilute 1 x 2 mg ampoule with 50ml NaCl 0.9% in a 50 ml syringe

ANAESTHETIST MUST ENSURE:

- Patient has read information leaflet → Y / N
- Dedicated Intravenous access → Y / N
- Prescribed on PRN section of drug chart Y / N

CONSENTED FOR SIDE-EFFECTS (Please tick):

- Itching ☐
- Drowsiness ☐
- Dizziness and nausea ☐
- Requiring nasal oxygen (Common) ☐
- Needing help with breathing (V rare) ☐

Anaesthetist must be present for first 4 x PCA administration doses

Pump identity: IVAC PCAM Number: _____

Pump set up and program confirmed as per prescription chart. Controlled drug book completed:

Set up by: (Name) _____ (Signature) _____

Checked by: (Name) _____ (Signature) _____

PATIENT CONTROLLED ANALGESIA		Cross out the dose/ prescription not in use	DATE	TIME GIVEN	DOSE	GIVEN BY	DATE	TIME GIVEN	DOSE	GIVEN BY	DATE	TIME GIVEN	DOSE	GIVEN BY
Date	MEDICINE (Approved Name) **REMIFENTANIL**	MEDICINE **REMIFENTANIL (Low dose)**												
Route IV	Total Dose 2 mg Bolus Dose 40 mcg Lockout 2 min	Total Dose 2 mg Bolus Dose 28mcg Lockout 2 min												
DOCTOR'S SIGNATURE CISCO Phone 26857 / 26864		PHARMACIST SUPPLY	Special instructions/comments: Only to be prescribed & set up by Anaesthetists on CDS											
DATE	MEDICINE (Approved Name) **Ondansetron**	PHARMACIST SUPPLY												
DOSE 4-8 mg	ROUTE IM / IV	FREQUENCY Every 8 hours as required Give slowly over 2-5 minutes												
DOCTOR'S SIGNATURE CISCO Phone 26857/26864		INDICATION Nausea / Vomiting												
DATE	MEDICINE (Approved Name) **Naloxone**	PHARMACIST SUPPLY	ANTIDOTE NOTES FOR USE If sedation score P or U OR Resp. rate less than 8 / min. – then: 1. Stop PCA 2. Give Oxygen at 15L / min 3. Give Naloxone 4. Call Anaesthetist CISCO Phone 26857 / 26864											
DOSE 100mcg	ROUTE IV	DILUTION: one amp (400mcg) to 4ml with 0.9% NaCl (normal saline) 100mcg = 1ml												
DOCTOR'S SIGNATURE CISCO Phone 26857 / 26864		Give 100mcg at 5 minute intervals until rousable and respiratory rate greater than 12 per minute. Maximum of 4 doses (400mcg)												

PATIENT & PCA Pump Assessment / Observations Monitoring for Labour ward / CDS

Routine Observations	Routine Observations as follows:
Half-hourly	Pulse, blood pressure, respiratory rate, oxygen saturations, pain, sedation and nausea & vomiting scores.

Patient Observations

Date																				
Time																				
O_2 Saturations																				
Oxygen L/min																				
Respiratory Rate																				
Sedation Score																				
Pain score																				
Nausea / Vomiting score																				

Pump Monitoring

PCA Programme check																				
PCA Demands Total / Good																				
Total drug infused [mg]																				
Balance in syringe [mls]																				
IV Access - OK																				
Red/tracking																				
Leaking																				
IV Resited																				
Sign as checked all the above																				

Pain Assessment Score	Sedation Score	Nausea and Vomiting Score	PCA discontinued ····Date:·····Time:
0 = No pain. 1 = Slight pain. 2 = Moderate pain. 3 = Severe pain.	A = Awake and alert. → V = Drowsy, responds to voice. P = Very drowsy. Responds to pain / shaking only. U = Unrousable, unresponsive to pain / shaking.	0 = No nausea or vomiting. 1 = Intermittent nausea. 2 = Persistent nausea. 3 = Vomiting.	**Reason:** [···] Patient request. ···[···] IV Tissued. ·····[···] Pump Failure. [···] No Longer required. ····[···] Changed to epidural. [···] Patient unable to use. ···[···] Side effects.

MIDWIFE CARE – recommendations for the management of REMIFENTANIL PCA (Patient Controlled Analgesia) following patient assessment

TROUBLESHOOTING

1. **ALARM:**

a) **Respiratory rate <8 and / or sedation score P or U:**

- **Seek urgent medical advice:**
  - Contact on-call anaesthetist labour ward [CDS] immediately (CISCO 25857).
  - **Stop PCA** by removing the PCA handset out of patient's reach.
  - Stimulate the patient.
  - Administer oxygen at 15 litres per minute.
  - Administer **NALOXONE** as per instructions on PCA prescription.
  - Monitor respiratory rate ¼ hourly until **>12 per minute.**
  - **If in respiratory arrest summon help and commence ALS.**
  - **OBSTETRIC CRASH CALL.**

b) **Unrelieved Pain with a pain score of 3 (severe)**

- Check the infusion system is functioning and the IV access is patent.
- Check syringe is not empty.
- Check PCA demand button is attached to pump.
- Does the patient understand how to use the demand button?
- Contact on-call anaesthetist for labour ward [CDS] (CISCO 25857).
- Consider if epidural may be appropriate.

2. **Indications for Oxygen therapy:**

- If saturations <90% for 15 seconds give 2 litres / min of oxygen via nasal cannula.
- If saturations <90% despite oxygen contact anaesthetist (CISCO 25857) and remove PCA button from patient. Any respiratory depression will pass in a minute so naloxon not indicated.

3. **Indications for contacting the anaesthetist:**

- A sedation score of P or U.
- Respiratory rate of less than 8 breaths per minute.
- SpO_2 remaining below 90% despite oxygen via nasal cannula.
- Any other concerns.

4. **Nausea and Vomiting (PONV):**

- Give anti-emetic on a regular basis if patient has persistent nausea.
- Give anti-emetic on a regular basis if patient is actively vomiting.

5. **Itching:**

- If problematic consider IV naloxone 50mcg PRN or chlorphenamine 4mg PRN.
- If no improvement, seek advice from the Anaesthetist on labour ward [CDS].