NHS
Liverpool Women's
NHS Foundation Trust

# PATIENT CONTROLLED ANALGESIA GUIDELINE

**THIS IS A CONTROLLED DOCUMENT**
The only Valid Version is stored in the Policies, Procedures and Guidelines Intranet Site

| | |
|---|---|
| **Version** | 4.0 |
| **Grade of Change** | Major Revision |
| **Summary of Changes** | Drug used.<br>Documentation and Prescribing Equipment |

| | |
|---|---|
| **Document Type** | Clinical Guideline |
| **Coverage** | Anaesthetics; Gynaecology; Maternity |
| **Designation of Guideline Sponsor** | Anaesthetics |
| **Responsible Committee** | Anaesthetic Department |
| **Approval obtained at/when** | CSS Governance meeting |

| | |
|---|---|
| **Date ratified** | 10/06/2024 |
| **Date issued** | 13/05/2024 |
| **Review date** | June 27 |

## Contents



## Introduction

Intravenous Patient Controlled Analgesia (IV PCA) refers to a method of pain relief that allows a patient to self-administer limited doses of analgesic medication as required, delivered by a programmable pump. This technique is commonly used following major elective or emergency surgery.

Morphine is the most commonly used opioid for intravenous Patient Controlled Analgesia. However, within this guideline other opioids are identified which may be used if patients are intolerant or sensitive to Morphine.

## Purpose and Scope of Guideline

The purpose of this document is to provide standards of care for the management of ward, or high dependency unit, gynaecology and obstetrics patients receiving medication through an intravenous Patient Controlled Analgesia infusion for the purpose of pain management.

The aim of this guideline is to ensure:

- Patients achieve a level of pain relief that is acceptable to them from IV PCA.
- Patients achieve acceptable nausea score.
- Staff use IV PCA devices safely and competently.

The guideline is to be used by all staff involved in the management of patients using analgesia via IV PCA within The Liverpool Women's NHS Foundation Trust.

## Definitions

Patient Controlled Analgesia refers to a method of pain control that allows a patient to self-administer a pre-programmed amount of intravenous drug (bolus dose) after a set period of time. The infusion bag is contained in a lockable pump to prevent unauthorised access.

At the Liverpool Women's Hospital, the term patient-controlled analgesia (PCA) is used to describe self-administration of a predetermined dose of intravenous analgesia via the Smiths medical CADD Solis ambulatory infusion pump for Morphine, Oxycodone, or Remifentanil.

Multimodal (Balanced) Analgesia refers to the use of various drugs and modalities to achieve balanced analgesia. By taking advantage of the synergistic effects of the drugs with the differing modes of action we avoid the side effects of using opioids excessively.

## Lead Person Responsible for Guideline

The designated lead person with overall responsibility for this guideline is the Anaesthetic Clinical Director.

## General Guideline Guidance Development

This document complies with the guidance provided by the guideline on policies framework.

## Consultation

The original guidelines document was circulated to the consultant anaesthetists, and ratified within the Anaesthetic Meeting and Maternity Clinical Meeting

## Managers Responsibility

Line Managers

1. Line managers have a duty to cascade information on new and revised policies and all associated relevant documents to the staff they manage.

2. Staff must be informed that a new guideline is available for reference and where it can be located.

3. Line managers have a duty to ensure the staff they manage are aware of guideline audit results and associated action plans.

## Training Plan

1. Nursing and midwifery staff must attend an update session once a year.

2. Nursing and midwifery staff must comply with the competency requirements and annually complete the competency document (see appendix A).

3. Training Needs Analysis – There is specific training for the groups of staff shown in Appendix B.

## Guideline Audit

Any recommendations and changes in practice will be implemented and monitored by the Gynae & Surgical Services Guideline, Audit and Patient Information Group.

## Guideline Distribution, Storage and Archive

The latest version of this guideline is available on the Staff Intranet

## Indications

PCA has been shown to be a very effective method of pain control for post operative and acute pain management that can be individually tailored to patient need providing the patient with control and avoiding delays in administration of analgesia.

It is useful following several different surgical procedures as well as for patients who experience moderate to severe pain and are unable to tolerate oral analgesia. Patients must be able to comprehend the relationship between the use of the demand button and delivery of analgesia.

## Equipment Needed For PCA

- Smiths CADD Solis infusion pump
- Smiths CADD Solis  bolus button Smiths CADD Solis Lockbox + Pole clamp
- PCA extension line

Please note that both the Smiths medical CADD Solis pump and PCA extension lines have integral anti-siphoning devices and anti-reflux valves.

Instructions on how to manage the pumps is available with each pump although full training is always provided.

## Dedicated Cannula For PCA

PCAs requires a dedicated peripheral cannula through which only simple fluids and anti-emetics are also allowed to be administered.

Any patient requiring blood products, IV antibiotics, or other IV medication require a separate peripheral cannula.

On the occasion where peripheral access has failed and PCA requires to be maintained it can also be administered through a central line, however only with caution and appropriate labelling on the infusion line.

Remifentanil PCAs require a dedicated cannula through which only the drug and its diluent are used with particular attention in obstetric patients.

## Advantages of PCA

<u>For Patient</u>

Patient does not have to demonstrate pain before analgesia is given and then experience unacceptable discomfort before analgesia takes effect

The patient is more in control of pain management and therefore more confident

Analgesia is titrated to the individual patients' needs and so is safer than other methods.

Excessive demands of the opioids produce onset of sedation, causing the patient to fall asleep. Whilst asleep no morphine demands are made allowing morphine blood levels to decrease.

PCA promotes a natural sleep-wake cycle

Patient will be more active and as a result there will be a reduction in the complications of immobility

For Staff

PCA has shown to be safer and more effective than conventional methods of bolus injection of analgesia

Patients tend to be more co-operative

Patients often feel more satisfied with the pain control that they receive

**Potential Hazards Associated With PCA**

The following are potential hazards associated with PCA

- Improper programming of the pump
- Incorrect analgesic medication used
- PCA patient handset being misplaced and triggering unrequested dose
- Bolus dose given if the line is flushed with another fluid
- Equipment malfunction – patient may experience unacceptable levels of pain if the machine fails to deliver the dose

**Infection control**

"The risk of infection increases when one or more elements of a procedure are excluded or not performed" (DoH 2007). Therefore, patients receiving IV PCA the following good practice actions must be followed.

**Hand Hygiene**

Follow the Trust infection control guideline

**Patient Selection**

Patient related factors, including concurrent disorders, psychological characteristics, and opioids dependency may have a significant influence on the safety and efficacy of the PCA.

Staff must be aware of which patients are unsuitable for PCA. Exclusion for PCA may include the following:

- Chronic obstructive airways disease

- Impaired mental status
- Severe metabolic disorder
- Physical inability to use equipment
- Language barriers
- Reluctance to use PCA

The clinical effects of opioids are altered by impaired renal function, not only because of altered clearance of the drug, but also the accumulation of toxic or therapeutically active metabolites (Davies et al 1996). This patient group are not excluded from using IV-PCA containing opioids. However, the analgesic drug regimes may require alteration or alternative opioids may be considered and prescribed.
This list is not exhaustive.

The following categories of patients may be suitable for PCA (This list is not exhaustive):

- Major gynaecological surgery
- Major oncology surgery
- Post caesarean section
- Delivery of IUD
- Unsuitable or refuse Epidural Analgesia for Labour (with specific precautions)

This list is not exhaustive

Patients who satisfy an inclusion category should be assessed regarding the appropriateness of providing PCA using the following criteria (This list is not exhaustive):

- Patient understands of cause and effect of PCA
- Patient can use the PCA device
- Patient wants to use the PCA

PCA is most commonly used for women who have poorly controlled pain and who have contraindications to, are unsuitable for, or who refuse to have, epidural analgesia.

**Opioid-Tolerant Patients**

Patients with a history of opioid consumption (e.g. cancer pain, chronic non-cancer pain, and those with opioid addiction) have higher opioid requirements. Deviation from the ‘standard’ PCA prescription may be needed in this group of patients.

**Availability of PCA Equipment**

To ensure the timely availability of PCA pumps the prescriber must ensure that they inform theatre recovery staff that their patient will require a PCA setting up prior to the patient arriving in recovery.

## Prescribing PCA

It is the responsibility of the prescriber to ensure that IV-PCA is a suitable analgesic route for the patient. This decision will be based upon clinical condition of the patient requiring the need for a readily available pain relief.

The PCA prescription must be prescribed via Expanse (Digicare) electronic system. PCA is part of PONV order sets, it is also available individually. Alternatively, if the electronic system is not functioning then the prescription for the PCA must be clearly written by a doctor on the patient's prescription chart.
Ensure oxygen is prescribed

Oxygen administered for the whole duration of PCA through either nasal cannula (Low flow rates 2- 4LPM) or facemask (flowrates >4 LPM) to ensure pulse oxygen saturation >95%

The common opioid solutions used at the Liverpool Women's Hospital are:

- Morphine ready bags 100 mg/100 ml
- Oxycodone ready bags 100mg/100 ml
- Remifentanil 4mg to be added to 100 ml normal saline bag

## Device Settings

Settings are to be tailored to meet each patient's individual requirements.

The common settings used at the Liverpool Women's Hospital are:

- Morphine standard protocol: 1mg bolus, 5minutes lockout time, no background infusion
- Morphine plus protocol: 2mg bolus, 5minutes lockout time, no background infusion
- Morphine renal protocol: 0.5mg bolus, 10minutes lockout time, no background infusion
- Oxycodone standard protocol: 1mg bolus, 5minutes lockout time, no background infusion
- Oxycodone plus protocol: 2mg bolus, 5minutes lockout time, no background infusion
- Oxycodone renal protocol: 0.5mg bolus, 10minutes lockout time, no background infusion
- Remifentanil protocol (Obstetrics): 0.02, 0.03 or 0.04 mg (weight related), 2 minutes lockout time, no background infusion

Please note these settings are adjustable to suit the pain management needs of the individual patient however DO NOT make alterations to the pump programme unless on the instruction of an anaesthetist.
The staff on the ward must always check the prescription tallies with the functioning of the device.
If there are any discrepancies contact the anaesthetist or pain nurse to review and rectify the situation.
Ensure the Gynaecology Anaesthetic Registrar is aware of any discrepancies (Bleep 504)

## Initiation Of PCA

All patients receiving opioid PCA must have oxygen prescribed and administered.

## Programming the Pump

Nurses competent in administering intravenous therapies, who have undertaken training in the management of Smiths medical CADD Solis pumps, may commence PCA infusions.

Infusion bags for PCA will be supplied ready prepared by Pharmacy and a stock should be kept in recovery areas and all wards where PCAs are used.

Please refer to the Smiths medical CADD Solis troubleshooting guide, which attached on each infusion device and should be kept within the acute pain management folder within your clinical area (appendix C).

PCA keys must be kept with the controlled drug keys.
The use of Standard Protocols stored in the pump is recommended.

PCA should not be commenced until it has been prescribed and the patient is sufficiently awake.

The patient should be made comfortable using loading doses if required. If this appears inadequate then further advice should be sought from the pain team.

The patient is the only person who is entitled to use the bolus button.

**Documentation of controlled drugs**

This guideline must be read in conjunction with the Trust guideline for the Safe and Secure Handling of Controlled Drugs.

It is the responsibility of the registered nurse, each shift to check the remaining volume of the drug in the infusion bag and document on the physiological observation chart.

Infusion bag changes must be documented in the CD register, patient's drug prescription and nursing notes.

**Problematic Device Function**

If the equipment is faulty, it should be sent to medical engineering (ext. 4400)
In this situation the patient may require a second PCA pump to be commenced.

**Patient Information / Education**

All patients using PCA should be counselled accordingly and provided with a patient information leaflet (appendix D).

When a patient is suitable for PCA the following must be adhered to:

- Patients should verbally agree that they wish to use IV PCA and this must be recorded in the case notes by the anaesthetist. This may not be possible with emergency cases.
- Ward staff must be aware of which patients are using PCA and it must be documented.
- All patients who will be using PCA post elective surgery must be taught about PCA and how to use the device and be given the opportunity to discuss any fears or concerns with staff. This should take place in the pre-operative clinic or, if this has not been possible, on admission to hospital, or prior to commencement of
PCA. The patient information leaflet 'Patient Controlled Analgesia' should be given to every patient using a PCA.
- If a patient is expecting to use PCA post-operatively but returns from theatre without PCA then an explanation must be given and the patient informed

- If a patient is not expecting to use PCA, but comes out of theatre with PCA, then an explanation as to why it has been allocated to them and education about how to use the device must be provided. This information must be given as soon as this is appropriate in the recovery area or on their return to the ward. The patient information leaflet 'Patient Controlled Analgesia' should be given.

Patients must be confident to use the PCA and be able to understand the following

- PCA can be used when required, it is an interactive analgesia and if they don't use it their pain may increase
- PCA will not alleviate all the pain, they may still feel acceptable levels of discomfort
- PCA is safe
- They are the only ones permitted to press the button

**Staff Education**

The cascade staff will provide training. Please contact if training is required.

- All staff must be confident and competent with using the high-risk Smiths medical CADD Solis Ambulatory IV PCA device or, when using Remifentanil, the Fresenius PCA infusion pump.
- Training for the device will be provided by the cascade trainers.
- Every member of staff looking after patients with PCA needs to complete a competency document on an annual basis.
- All staff must be aware of the specific monitoring requirements of patients using PCA and be able to identify potential complications of using PCA.
- All staff must be aware of guidance around discontinuation of PCA.
- Instructions for how to use the Smiths medical CADD Solis device are attached to each lock box and instructions for the Fresenius pump is available in the appropriate orange box. Copies of each are included at the end of this protocol.

**Monitoring**

In addition to normal post-operative monitoring, a record of respiratory rate, sedation level, pain score, nausea and vomiting score, cumulative dose of opiate, and infusion site must be made.

<u>Observations and Rationale</u>

Blood Pressure & Heart Rate: Pain tends to increase blood pressure and heart rate
Respiratory rate & pulse oximetry: Opiates are potential respiratory depressants
Sedation Level: Opiates are sedatives
Pain Score: To assess effectiveness of analgesic
Nausea & Vomiting Score: Opiates can induce nausea and vomiting
Itching Score: Opiates can induce pruritis
Cumulative Dose: To identify how much analgesic the patient has required
Infusion Site: To check for pain, swelling or leakage

If the patient is sleeping and the previous observations have been satisfactory, it is acceptable to mark the sedation level, and pain, nausea and vomiting, and itching scores as an 'S' for sleeping.

Stable Condition
Observations must be made using the following frequency:
Recovery:
Observations every 15 mins for one hour (in recovery or on ward)
Wards:
Hourly for the next four hours and 4 hourly if stability maintained thereafter.

Unstable Condition
If the condition of the patient becomes unstable then increase the frequency of observations as clinically required and contact the on call anaesthetist immediately to review the situation.

**Intravenous cannula/central venous catheter lines**
Date and time of insertion of cannula must be recorded. If the PCA is no longer required or there is no clinical indication for a cannula then the intravenous cannula should be removed and documented.

**Site inspection**
Regular observations for signs of infection should be performed at least daily.

**Dressing**
An intact, dry, adherent dressing should be insitu

**Giving sets**
Giving sets should be replaced after 72 hours. Date and time of replacement should be documented.

**Pain Assessment and documentation**
Self-reporting of pain should be used whenever appropriate as pain is an individual and subjective experience. Regular assessment of pain leads to improved acute pain management (Gould et al 1992). Best practice requires the documentation of pain assessment scores at rest and on movement by using the verbal descriptive tool none, mild, moderate, severe, unbearable (0, 1, 2, 3, 4).

**Multimodal Analgesia**
The lowest rung on the World Health Organisation (WHO 2002) analgesic ladder consists of non-opioid simple analgesics. The main drugs are Paracetamol and NSAIDs e.g. Ibuprofen/ Diclofenac.

These are very effective in treating mild-to-moderate pain and when prescribed and administered regularly, they have an opioid sparing effect therefore the patient requires reduced doses of opioids (Lloyd 2008). When these drugs are prescribed and administered regularly, they provide balanced analgesia.

**Mobilisation**
If a patient's condition is satisfactory, they may be mobilised with the PCA running. Assess individually, some patients may feel light headed, dizzy or nauseated on first mobilising.

**Duration of Therapy**
It is recommended that the PCA pump be taken down when the patient feels ready to manage without it. This decision is taken jointly between the patient and either the ward staff or the anaesthetist.

**Discontinuation Of PCA**
Before discontinuing therapy, assess the patient's pain and Morphine (or other IV PCA opioid) usage over the previous 12-24 hours.

PCA should be discontinued when minimal use is required and the patient is able to tolerate oral analgesia. Ensure that adequate analgesia is prescribed and given.

To ensure continuity of analgesia, patients should be taking regular oral balanced analgesia. Full explanation and reassurance must be given to the patient.

Aim to discontinue the PCA in the day rather than the evening as this prevents pain problems in the night.
Continue regular pain assessment after the pain control system has been discontinued and act accordingly.

**Opioid**
Individual doses that are prepared and not administered shall be destroyed on the ward / theatre/ recovery in the presence of a second person who could be a pharmacist, authorised nurse or doctor. This will include the remains of partly used PCA infusion bags. An entry of the destruction is to be made in the register and countersigned by the both parties witnessing the destruction. This must be actioned before the device is returned to theatre recovery.

*When PCA is discontinued, time, date and nurse's signature, together with amount of remaining drug in milligrams should be clearly entered in the back of the cd book.*

**Decontamination of the pump**
Before returning the PCA pump to recovery it must be cleaned as per infection control guidelines for decontamination of equipment. The pump must then be returned directly to recovery, clean and intact

**Complications & Actions**
Opioids are thought to act upon receptors in the spinal column and CNS and produce analgesia, euphoria and sedation. They can also produce unpleasant side effects such as respiratory depression, nausea and vomiting, constipation and pruritis. No additional opioids are to be given to the patient except if the anaesthetist has order them.

<u>Respiratory Depression (Respiratory Rate < 8 / Min)</u>

If the respiratory rate drops to less than 8 per minute take the PCA button away from the patient, ensure oxygen is delivered, then refer to the following 'patient controlled analgesia induced respiratory depression' flowchart (see appendix E) and theNaloxone administration flowchart (see appendix F).
Emergency respiratory equipment should be made immediately available.

Sedation

Monitoring a patients' sedation score will enable changes in the patient's state of consciousness to be determined. Regular assessment of the level of sedation, the character of respiration and O2 saturation are essential for patients who are receiving opioid therapy.

Over sedation is a warning of impending respiratory depression.

Unresponsive Patient

If the patient is unresponsive, start resuscitation as indicated, call the hospital emergency team on 2222, and take the PCA button away from the patient

Apnoea

If the patient becomes apnoeic commence basic life support as appropriate and call the hospital emergency team on 2222.

Post-Operative Nausea / Vomiting (PONV)

The causes of postoperative nausea and vomiting are multifactorial. If the level of nausea and / or vomiting the patient is experiencing is unacceptable to them then refer to the guidelines for the management of postoperative nausea and vomiting (see appendix G).

Pain / Discomfort

If the level of pain / discomfort the patient is feeling is unacceptable to them then initially encourage the patient to use the PCA device more frequently and, if applicable, ensure Paracetamol and a non-steroidal anti-inflammatory have been administered.

If the level of pain / discomfort remains unacceptable to the patient, then contact the pain team or the on call anaesthetist to review the situation.

Pruritis

Pruritis is thought to result from the activation of opioid receptors in the spinal cord. It is common, so staff need to be aware of signs of patient discomfort such as rubbing, scratching the arms, face and neck.

If the level of pruritis is unacceptable to the patient then administer antihistamine. If this treatment is ineffective on reassessment then contact on call anaesthetist to review the situation.

Urinary Retention

Urinary retention could be due to opioid inhibition of the parasympathetic nervous system on the bladder.

If urinary retention is suspected then contact the on call anaesthetist to review the situation.

Blood In PCA Line

If blood appears in the PCA line clamp the line off and contact the call anaesthetist to review the situation.

Hypotension

The aetiology of the hypotension should be determined. A falling blood pressure associated with an increased pulse rate, decreasing urine output, loss of skin turgor and a dry mouth should indicate the need for volume replacement. If systolic falls <85mmHg stop the PCA infusion, lay flat – not head down, elevate legs only – give 4litres of O2/min. Contact the on call anaesthetist to review the situation.

**Multidisciplinary Support**

All patients with PCA insitu will be visited on a daily basis by the anaesthetist (Bleep 504)

If you have any questions regarding the management of a patient with a PCA insitu then contact the anaesthetist for advice.

**Actions of Health Care Professionals**

It is the responsibility of staff to be aware of their obligations to affect safe clinical care, timely recognition, and management of the patients with a PCA in situ. Staff need to ensure up to date documentation and written follow-up care is in place.

**Key Performance Indicators**

100% Compliance with all recommendations from the above document.
100% Patients should have pain scores documented.
100% of patients should receive care that follows the recommendations in this, and related policies.

**Associated Policies**

- Postoperative Nausea & Vomiting
- Obstetric analgesia and anaesthesia protocols
- Administration of drugs
- Handling and storage of controlled drugs
- Infection control

**Equality & Diversity**

An Equality Impact Assessment guideline screening checklist has been completed for this guideline and is not attributed to have an adverse impact on any group – please refer to appendix H.

**References**

Davies, G Kingswood, C et al (1996) Pharmacokinetics of opioids in renal dysfunction. Clin Pharmacokinetics 31: 410-22

Evron s, Glezerman M, Sadan O, Boaz M, Ezri T. Remifentanil: a novel systemic analgesic for labor pain. Anesthesia and Analgesia.
2005;100:233-8.

Gould TH, Crosby DL, Harmer M et al (1992). Guideline for controlling pain after surgery: effect on sequential changes in management BMJ 305:1187-93

Joint Commission on Accreditation of Healthcare Organisations and the National Pharmaceutical Council, Inc (2001) Pain: Current Understanding, Assessment, Management and Treatments.

Lloyd, A. (2008) chapter 8, In PAIN Management From basics to clinical practice John Hughes (Ed) Churchill Livingstone

Levin, A. Klein, SL. Brolin, RE. Pitchford, DE. (1992) Patient-controlled analgesia for morbidly obese patients: an effective modality if correctly used. Anaesthesiology; 76:857-8

Mc Caffery, M. Pasero, XC (1997) Pain ratings: the fifth vital sign American Journal of Nursing. 97(2) 15-16

McCarthy DM. (1999) Comparative toxicity of nonsteroidal anti-inflammatory drugs. Am J Med;107:37S–47S

National Patient Safety Agency (2006) Ensuring safer practice with high dose ampoules of Diamorphine and Morphine. Patient Safety Alert 12: NPSA/2006/12: NPSA

National Patient Safety Agency (2007a) Promoting safer use of injectable medicines. Patient Safety Alert 20: NPSA/2007/20: NPSA

Nursing and Midwifery Council (2007) Standards for medicines management. NMC London.

Royal college of anaesthetists and the pain society. (2003), Royal College of anaesthetists and the pain society Pain management services: good practice. London.

Rapp SE. Ready LB, Nessly ML. (1995) Acute pain management in patients with prior opioids consumption: a case controlled retrospective review. Pain.61:195-201

Risk Management for Trusts National Health Service Litigation Authority (NHSLA) April 2007

Safer Management of Controlled Drugs: Changes to Record Keeping Requirements (for England only) Department of Health. 28th January 2008

Saving lives: reducing infection, delivering clean, safe care. DoH 21ST October 2007Thurlow JA, Laxton CH, Dick A, et al. Remifentanil by patient-controlled analgesia compared with intramuscular meperidine for pain relief in labour. British Journal of Anaesthesia. 2002;88:374-8.

Volmanen P, Akural E, Raudaskoski T, Ohtonen P, Alahuhta S. Comparison of remifentanil and nitrous oxide in labour analgesia. Acta Anaesthesiol Scandinavia.

2005;49:453-8.

Walder B, Schafer M, et al (2001) Efficacy and safety of patient-controlled opioids analgesia for acute postoperative pain. Acta Anaesthesiol Scand 45: 795-804

World Health Organisation (2002) National cancer control programmes: policies and managerial guidelines. World Health Organisation. Geneva

Young, T.Skatrud, J. Peppard, PE. (2004)Risk factors for obstructive sleep apnoea in adults. Jama291; 2013-16.

**Intranet Classification**

| | |
|---|---|
| **Tags (separated by ;)** | PCA; |

**Version Control Sheet**

| Version | Date | Author | Status | Comment |
|---|---|---|---|---|
| 1.0 | Jan 2010 | Gynae and Surgical Services Manger | Archived | Creation |
| 2.0 | Jan 2015 | Consultant Anaesthetist | Archived | Reviewed updated |
| 3.1 | Jan 2018 | Consultant Anaesthetist | Archived | Removed pain nurse |
| 3.2 | Oct 2020 | Mark Entwistle | Archived | Updated in line with Analgesia guideline |
| 4.0 | May 2024 | Mohamad Elmawy | Current | • Drug used<br>• Documentation and Prescribing<br>• Equipment |

**Appendix A: Competency BLUE PCA**

**Smiths medical CADD Solis- BLUE PCA**

Complete this front sheet fully and return it to the local OLM Administrator for your Department.

| | |
|---|---|
| Name (block capitals) | |
| Role | |
| Department | |
| Work Telephone Number | |

Having answered yes, I declare that I am competent to use this device without further training.

Signed: Date:

*Do not use high risk equipment unless you are competent to do so*

Name: Job Title: Department:

I certify that the above person has undergone competency training

Key Trainer/Assessor

Signed: Date:

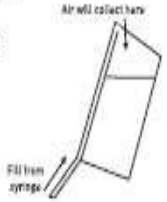
NHS
Liverpool Women's
NHS Foundation Trust

## Appendix B: PCA Machine

### Filling 50ml and 100ml medication cassettes

This should be a clean/aseptic technique.

1. Open and inspect the cassette to ensure that it is intact and sterile.
2. Attach a Luer lock syringe containing the medication to the end of the line.
3. Tilt the cassette to approx 70° angle and fill. When 3/4 of the fluid is inserted, clamp the line. Gently tap the cassette to collect air in the outlet point.




4. Open the clamp and withdraw the air into the syringe.
5. Hold the syringe with the tip downwards and finish filling the reservoir.
6. Clamp the line and disconnect the syringe. Cap the line with a sterile cap, or attach an extension line.

### External reservoir adaptor

For infusion of larger volumes of fluid, an External reservoir adaptor (ERA) can be used to attach a non-vented fluid bag.
This should be a clean/aseptic technique.

1. Open and inspect the ERA to ensure it is intact and sterile.
2. Close clamp to stop flow of fluid down the line.
3. Remove sterile cap and spike the fluid bag.

### Changing medication cassette / ERA

Follow your standard protocol for preparing the cassette.

1. Press ⏻. Pump displays Stop pump?
2. Press Yes. Pump displays Pump is stopping.
3. Clamp the tubing and disconnect from the patient.
4. Unlock the cassette latch and remove the empty cassette.
5. Attach a new cassette (see *Attaching cassette/ERA*).
6. Set Reservoir Volume? press Yes.
7. Enter security code (see *Unlocking the pump*).
8. Press (select) to reset to the protocol volume displayed, or ▲ and ▼ to adjust.

9. When the reservoir volume is correct, press Save. Pump displays Reservoir volume.....saving.
10. Prime the tubing when prompted. (See *Prime the tubing*).
11. Review pump setting and start pump? Press Yes.
12. Press Review, then check the patient specific parameters and Accept Value on each parameter.
13. When you have finished the review, press Next to continue.

Start pump? Press Yes.

### Troubleshooting

**Air in-line. Press 'Acknowledge' then prime tubing**

**There may be air bubbles in the line; the pump will not run.**

1. Press Acknowledge to silence the alarm.
2. Before clearing the air from the tubing, clamp the tubing and disconnect from the patient. Open the clamp on tubing when disconnected.
3. Press Tasks, use ▲ and ▼ to highlight the Prime Tubing option, then press (select) (see *Prime the tubing*).
4. Reconnect tubing to patient and start pump.

**Battery low. Replace battery**

**The battery power is low but the pump is still operable.**

1. Press Acknowledge to silence the alarm.
2. Change the batteries or recharge the battery pack as soon as possible.

**Downstream occlusion. Clear occlusion between pump and patient**

**High pressure may be due to blockage, kink in line or closed clamp.**

- Remove the obstruction to resume operation without stopping the pump or,
- Stop the pump, remove obstruction, review the program settings then restart the pump.



Smiths Medical ASD, Inc.
1265 Grey Fox Road, St. Paul, MN 55112, U.S.A.
European Representative:
Smiths Medical International Limited
Watford, Hertfordshire, WD24 4LG, UK.
Smiths Medical International Limited
Hithe, Kent, CT21 4JL, UK.
www.smiths-medical.com
Smiths Medical - part of the global technology business Smiths Group
CE 0473



Part No. 1PI-01132-101 11/09

smiths medical

## Quick Guide for the CADD®-Solis

Refer to the Operators Manual for the full instructions, including Warnings and Cautions, for the safe use of this product.

- Continuous infusion pain management with or without clinician bolus and/or patient controlled doses.
- Pump programmed by choosing a protocol: therapy, qualifier and drug, or programmed manually.

### Switch on

- To switch the pump on, press and hold the power switch.
- The pump carries out self-tests and sounds six beeps when the tests are complete.
- Screen shows Start New Patient?

### Insert batteries

- Open the battery compartment and insert four AA batteries matching the + and - markings inside the battery compartment.

- Close the compartment cover when the batteries are in place.

CADD™

**Appendix C: Patient Information Leaflet**

## Patient Controlled Analgesia (PCA)

### What Is PCA?

The amount of pain feel after an operation varies a lot from one person to another. You are the only person who knows exactly how much post-operative discomfort you feel. P.C.A. is a system that involves a drip in your arm connected to a machine containing a supply of pain relieving medicine (usually morphine). The machine allows you control of providing your own pain relieving medication, hence the name “Patient Controlled Analgesia”. Some people feel much less anxious when they have control of their pain relief

**When Do I Receive The Medication?** When you wake up in the recovery room, the nurse will connect your PCA machine to your drip. The nurse will place an analgesia request button in your hand that you can start to use as soon as you begin to feel any discomfort.

### How Does The PCA Work?

Whenever you feel discomfort or pain, you give yourself a small dose of the medication by **pressing** and **releasing** the analgesia request button. As you release the button the pump will automatically deliver a measured dose of medicine.

When you press and release the button the machine will make a beep noise; this tells you that you have used the button correctly. You may also hear the pump providing you with your dose of analgesia.

You are the only person who knows when you need the pain relieving medication, so you are the **only** person who is allowed to press the button. Please do not allow anyone else such as family or friends to press your PCA button for you.

### What Are The Advantag es Of PCA?

There are three main advantages of using PCA. You

- are in control of your own pain relief You don’t have
- to wait for staff to give you the pain relieving medicine
- PCA avoids the need for injections.

### How Often Should I Press The Button?

Your aim is to be comfortable so you can press the button as often as you wish as no-ones discomfort or pain is the same and everyone requires different amounts of the pain relieving medication, It is important to push the button when you feel uncomfortable and **not to wait** until the pain has built up.

It is a good idea to push the button before doing anything you think may be uncomfortable, for example getting out of bed, having physiotherapy treatment, or undergoing a nursing procedure, it will help make things more comfortable.

### Can I Give Myself Too Much Pain Relieving Medication?

It is very unlikely that you will receive too much pain relieving medication. Once the machine has given you a dose of medicine it will not give you any more, despite the fact that you may continue pressing the button, for a set length of time (usually 5 minutes) to ensure that the dose has worked before more is provided.

**Is It Possible To Become Addicted To The Pain Relieving Medicine?**

No. There is no evidence to suggest that people become addicted to the pain relieving

**What are the Risks involved with using PCA?**

As with all drugs the pain relieving medicine can produce unwanted side effects and we can not predict who will be affected.

If you experience any of the side effects (listed below) then please inform a member of staff immediately.

- **Nausea**

This does not affect everyone, and even if you do feel sick as a result of the PCA morphine we should be able to treat it effectively

– only rarely are we unable to get rid of nausea completely.

- **Sleepiness**

All PCA drugs cause sleepiness to varying degrees. As you get sleepy you won't press the button and so you'll gradually become more alert.

- **Constipation**

People can become constipated for many reasons when they have surgery. This can usually be treated easily.

- **Slow breathing**

Your breathing will be monitored closely, and it is usual for you to have a small oxygen mask while you have a PCA. If your breathing becomes very slow you will be prevented from pressing the bu tton until it returns to normal.

- **Hallucinations**

These are uncommon.

- **Low blood pressure**

Your blood pressure will be monitored closely while you use a PCA, and you will probably have a drip following major surgery.

- **Itchiness**

This bothers some people but can be treated and always goes when the PCA is stopped. It is very important that you tell the nursing staff, so they can give you medication to help relieve this.

**How Long Will I Need PCA?**

The amount of time for which you will need PCA will vary depending on the type of surgery you have had, how quickly you

**What are the Risks involved with using PCA?** As with all drugs the pain relieving medicine can produce unwanted side effects and we can not predict who will be affected.

If you experience any of the side effects (listed below) then please inform a member of staff immediately.

- **Nausea**

This does not affect everyone, and even if you do feel sick as a result of the PCA morphine we should be able to treat it effectively

– only rarely are we unable to get rid of nausea completely.

- **Sleepiness**

All PCA drugs cause sleepiness to varying degrees. As you get sleepy you won't press the button and so you'll gradually become more alert.

- **Constipation**

People can become constipated for many reasons when they have surgery. This can usually be treated easily.

- **Slow breathing**

Your breathing will be monitored closely, and it is usual for you to have a small oxygen mask while you have a PCA. If your breathing becomes very slow you will be prevented from press ing the button until it returns to normal.

- **Hallucinations**

These are uncommon.

- **Low blood pressure**

Your blood pressure will be monitored closely while you use a PCA, and you will probably have a drip following major surgery.

- **Itchiness**

This bothers some people but can be treated and always goes when the PCA is stopped. It is very important that you tell the nursing staff, so they can give you medication to help relieve this.

**How Long Will I Need PCA?**

The amount of time for which you will need PCA will vary depending on the type of surgery you have had, how quickly you are recovering, and how much discomfort you still have. You must be able to drink when the PCA is stopped so that it may be replaced with painkilling tablets.

There is no time limit on how long you can use a PCA for. You decide, together with the staff, when you are ready to stop using the PCA. Most patients use PCA for one or two days after their operation.

Before you stop using PCA you will start to use tablets and perhaps pain relieving suppositories to relieve any discomfort.

**Can I Walk Around Whilst using PCA?**

Yes. The machine is attached to a stand on wheels.

**Can I Take Other Painkillers Whilst I Am Using The PCA?**

Yes. Other painkillers will be used at the same time as your PCA. This reduces the amount of PCA medication you need and reduce its unwanted side effects.

**What If I Am Still In Pain?**

The ward staff will regularly monitor your pain levels after your operation but occasionally some patients still have pain despite making full use of the PCA and having other milder painkillers.

If your pain is not controlled the nurse will give you another form of painkiller, and / or arrange for the surgeon, on call anaesthetist to come and assess you.

**What Are The Alternatives To Having A PCA ?**

You will have the opportunity to discuss the right post operative pain relief

The other methods of pain relief available include:

### Tablets, Liquids & Suppositories

If you are able to eat & drink the most convenient way to take painkillers is by mouth. We know that combinations of different types of painkillers provide the best pain relief

- **Injections**

When patients are experiencing a lot of discomfort an injection of a strong pain killer can be given either into a muscle or vein.

- Epidural

Epidural analgesia is administered using a small plastic tube which is placed into the epidural space in your back. There is a separate information leaflet about epidural analgesia available, please ask for a copy if you wish to read more.

### I Prefer Not To Take Painkillers Generally. Is It Not Better To 'Grin And Bear It'?

No. It is extremely important to have good pain relief, as it will enable you to get up and about after your operation. Complications associated with surgery such as a bad chest and bedsores can then be avoided. Good pain relief will also allow you to get the rest you need to allow wound healing to take place.

### The Acute Pain Team

The anaesthetist or the pain nurse may visit you after your surgery. This will give you further opportunity to ask any questions which may be worrying you and allow us to check that you are satisfied with the pain relief you are receiving.

### Pain Killers To Take At Home

When you are ready to be discharged from hospital the ward doctors will write a prescription for painkillers along with other medicines that they want you to continue at home.

The painkillers will work most effectively if taken regularly and if they are taken together with regular Paracetamol. You should continue the painkillers until normal day-to-day activities are comfortable.

If you are not sure about how or when to take painkillers please ask the doctor or nurse before you are discharged

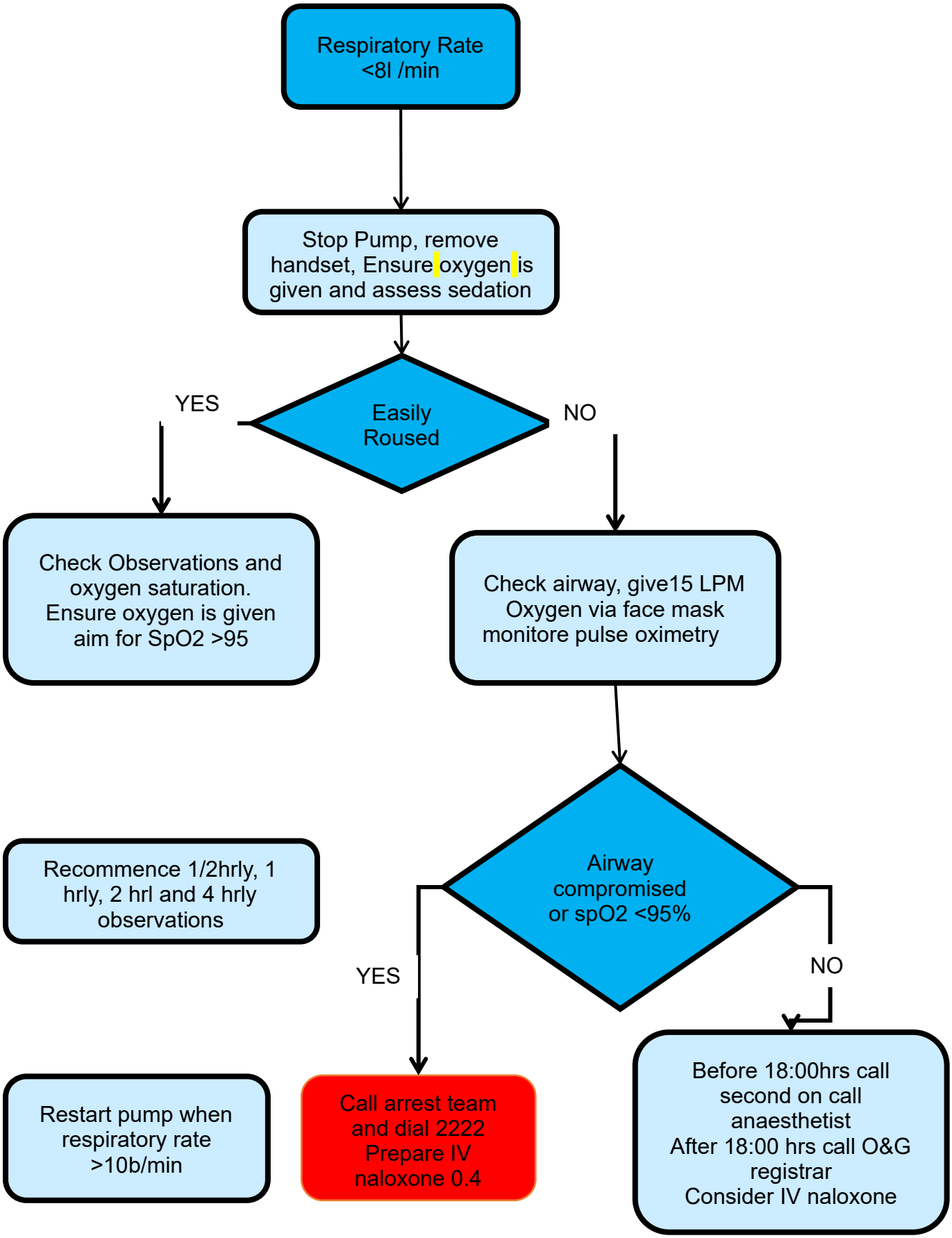
### Any Other Questions?

If you have any other questions about controlling your postoperative discomfort you are welcome to contact the Pain Nurse on (0151) 702 4143.

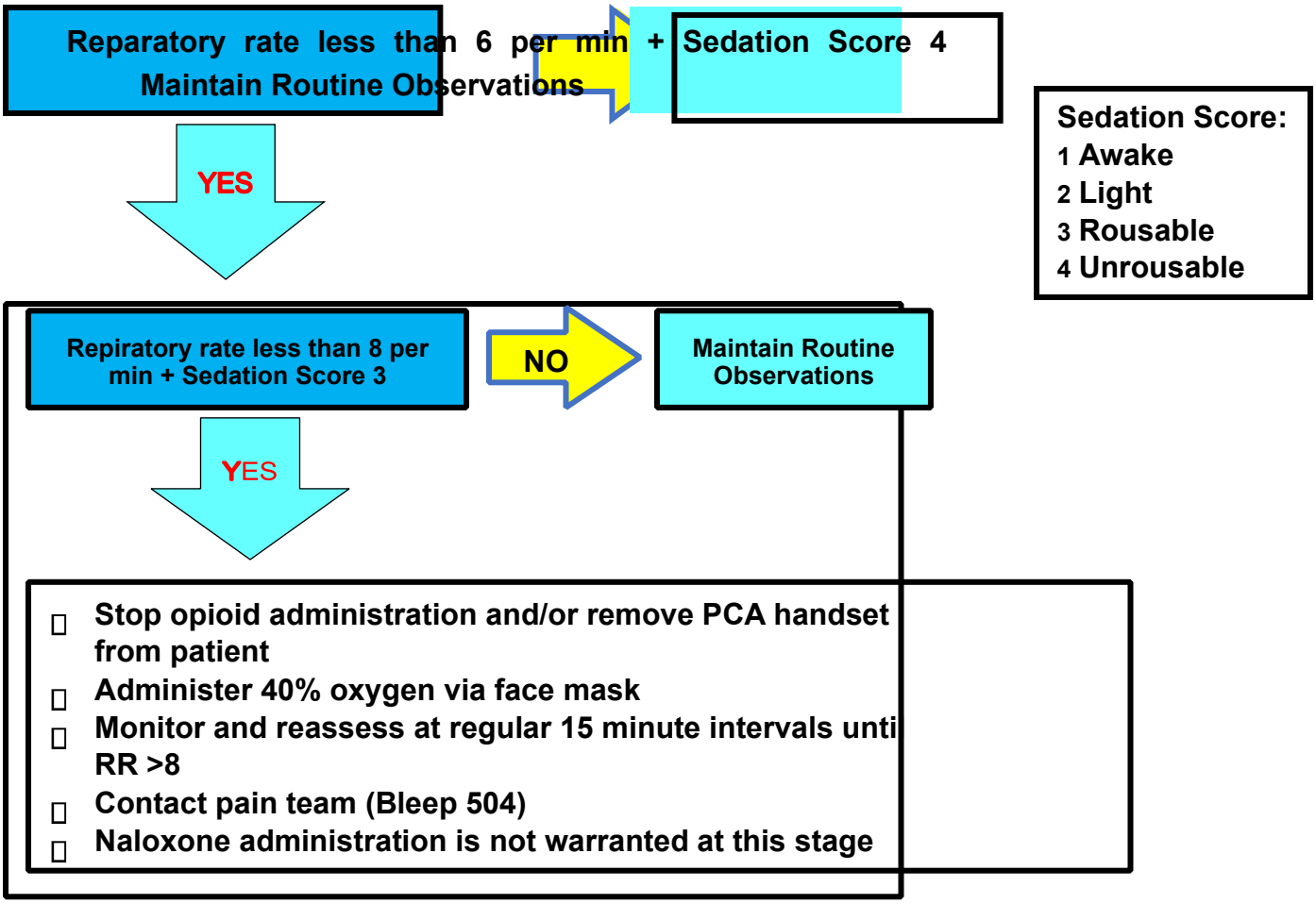
Once you are in hospital if you have any questions do not hesitate to ask the ward staff for advice.

The ward staff may arrange for a doctor, an anaesthetist, or the pain nurse to come and speak with you.

**Appendix D: Patient Controlled Analgesia Induced Respiratory Depression**



## Appendix E: Administration of Naloxone




- **Stop opioid administration and/or remove PCA handset from patient**
- **Administer 15LPM oxygen via face mask**
- **Attempt to waken patient**
- **Administer 100 micrograms Naloxone IV immediately**
- **Seek urgent assistance from on-call anaesthetist/pain team (Bleep 504 )**
- **Document in case notes**
- **Repeat this dose if no or limited response after 2 minutes**
- **Support ventilation by face mask or Ambu bag if rate declines further or if respiratory depression persists**
- **Consider Naloxone infusion**

**Preparation & Administration of Naloxone**

- The 1 ml ampoule contains 400micrograms/ml of Naloxone
- Dilute 1ml of Naloxone 400mcg/ml with 7mls of Normal Saline to give 8mls of a 50 mcg/ml solution.
- Give 2mls (100micrograms) IV of this mixture. If no IV access is available – give IM.
- Titrate the dose to reverse respiratory depression without reversing analgesia.
- If no response after 2 minutes repeat to a maximum of 400mcgs (8mls).

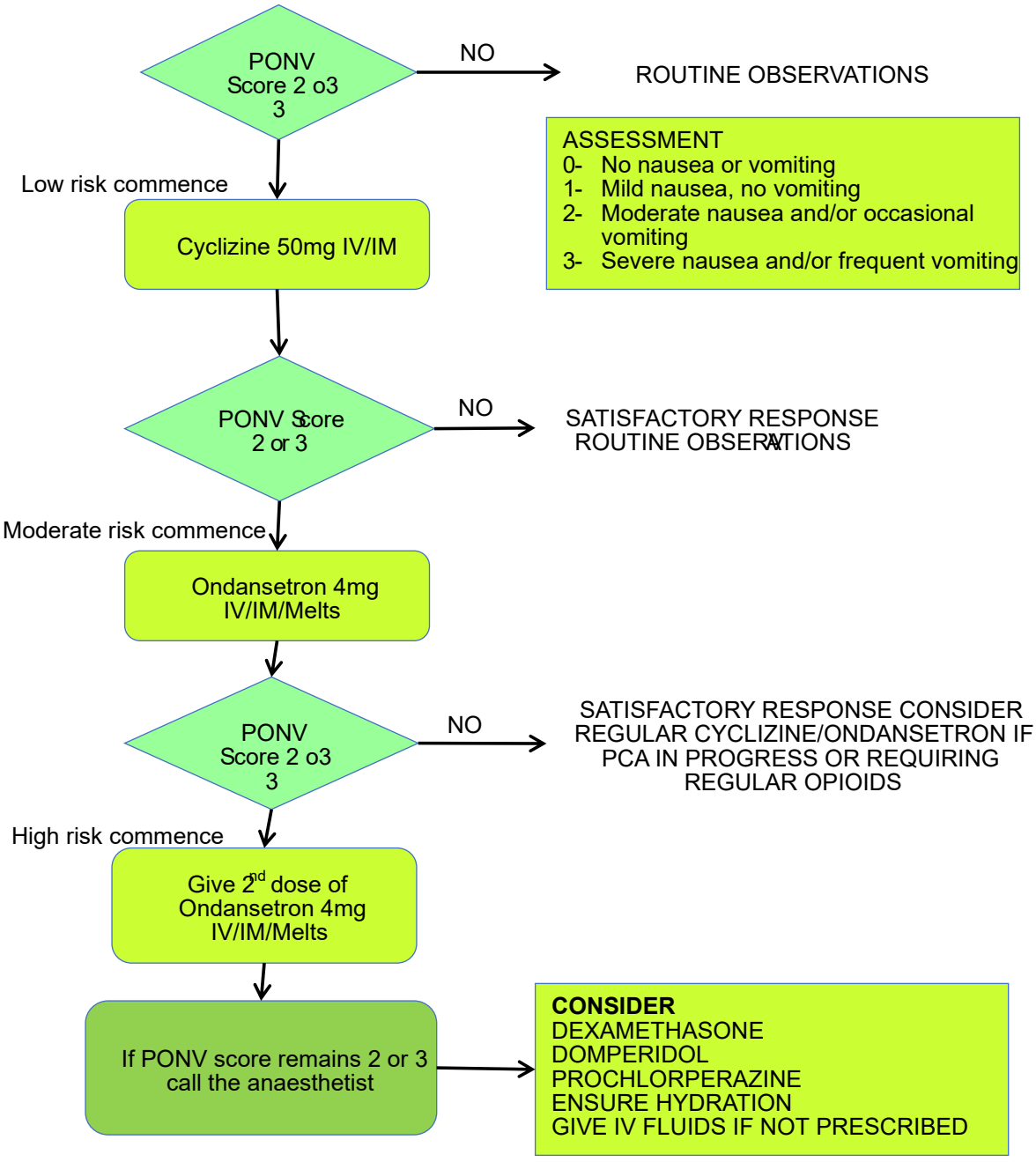
**Preparation for infusion**

- Add 2mg (5 ml=5vials) of Naloxone to 500mls of Normal Saline or Dextrose 5% (this gives a final concentration of 4mcg/ml)
- Usual infusion rate is 25-100ml/hr (100-400mcg/hr).
- Rate of infusion should be adjusted according to the response, and can be increased up to 200ml/hr (800mcg/hr).

## Appendix F: Postoperative Nausea and Vomiting (PONV)

Guideline for the Management of Postoperative Nausea nad Vomiting (PONV)

| Risk | Example | Prophylaxis |
|---|---|---|
| **Low** | Local Anaesthetic, VTOP | **None** |
| **Moderate** | use of morphine, PCA | **Cyclizine 50 mg** |
| **High** | Hx of PONV, laparoscopy | **Cyclizine 50 and Ondansetron 4 mg** |


PONV
Score 2 o3
3
NO
ROUTINE OBSERVATIONS
ASSESSMENT
0- No nausea or vomiting
1- Mild nausea, no vomiting
2- Moderate nausea and/or occasional vomiting
3- Severe nausea and/or frequent vomiting
Low risk commence
Cyclizine 50mg IV/IM
PONV Score
2 or 3
NO
SATISFACTORY RESPONSE
ROUTINE OBSERVATIONS
Moderate risk commence
Ondansetron 4mg
IV/IM/Melts
PONV
Score 2 o3
3
NO
SATISFACTORY RESPONSE CONSIDER REGULAR CYCLIZINE/ONDANSETRON IF PCA IN PROGRESS OR REQUIRING REGULAR OPIOIDS
High risk commence
Give 2nd dose of
Ondansetron 4mg
IV/IM/Melts
If PONV score remains 2 or 3
call the anaesthetist
CONSIDER
DEXAMETHASONE
DOMPERIDOL
PROCHLORPERAZINE
ENSURE HYDRATION
GIVE IV FLUIDS IF NOT PRESCRIBED