Patient Controlled Analgesia (PCA) Learning Package

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2025

Developed and endorsed by Gippsland Health Services Consortium 2006
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CPD Points: 3

Introduction

This self-directed learning package (SDLP) is intended to provide Nursing staff with the necessary knowledge to safely and competently care for the patient using patient-controlled analgesia (for the purposes of this learning package, referred to as PCA). It is designed to complement the clinical education and policy provided within your Health Service.

This SDLP should be utilised in conjunction with your organisations Policies and Procedures relating to pain management, assessment and PCA's. Please obtain access to these documents prior to undertaking this package.

Accreditation

After completing this SDLP you are required to forward the written assessment to the Education Department at your Health Service for marking, and successfully pass the competency assessment tool attached to this document. It is recommended you keep a record of this information in your own portfolio for future reference.

Disclaimer

The information in this learning package is intended to be a guide only and Health Care Professionals should be aware of the policies and procedures of their employing organisation.
The references used to compile the information contained in this module are listed in the reference notes or on the page and should be accessed for more information as required.
This learning package consists of current best practice at the time of review however it should be noted that changes in the Health Care field occur quite rapidly therefore it is up to the individual to ensure they are accessing current information.

Learning Objectives

To provide nursing staff with the necessary knowledge to safely and competently care for the patient using PCA.

At the completion of this accreditation process the nurse will be able to:

- Understand the principles and purpose of PCA.
- Identify indications and contraindications of PCA use.
- Show understanding of correct terminology related to PCA.
- Demonstrate safe nursing management of a patient with a PCA. Including appropriate monitoring, correct documentation, & recognition of clinical deterioration and appropriate escalation of care.
- Implement safe preparation of equipment; including changes to parameters, and troubleshooting errors.
- Demonstrate knowledge of common medications, dosage and administration.
- Recognition and management of potential complications.
- Demonstrate the ability to provide patient & carer education regarding PCA use.

Contents

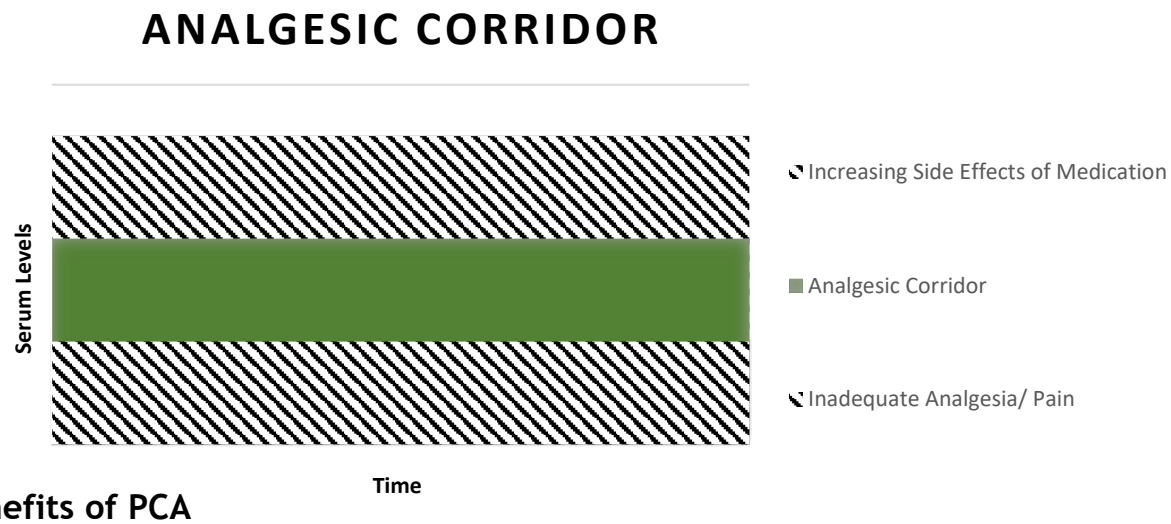
Glossary Of Terms

Analgesic window	The period of time for which opiates are most effective in their therapeutic range
Anti-reflux valve	One way valve found on infusion set, which prevents backflow of the drug into the IV infusion line.
Anti-syphon valve	Prevents uncontrolled siphoning of drug from the drug reservoir and reduces the risk of inadvertent free flow.
Background Infusion	Continuous delivery of analgesic infusion, run in addition to the demand bolus. Typically prescribed as a low dose, it will provide background analgesia which the patient can then adjunct using the demand button.
Good demands	The total amount of patient demands which result in a dose being delivered
Handset	Connected to PCA pump, consisting of cord and button which when pressed by patient delivers fixed bolus dose of prescribed medication.
Loading Dose	A system control that is programmed to allow an initial dose of opioid to be administered at the commencement of infusion. It is usually higher than the PCA dose and ensures that the patient has a baseline level of analgesia prior to the commencement of the PCA
Lockout interval	The duration which no drug delivery happens, even if the patient pushes demand button. It is commonly set at 5–10 min irrespective of the opioid being used. This lockout avoids potential drug stacking and overdosage
PCA dose/bolus dose	The amount of drug the patient receives when the demand button is activated
PCA pump	A computerised pump capable of delivering predetermined doses of a drug providing time delays between doses as prescribed
Patient Controlled Epidural Analgesia (PECA)	Incorporates either local anaesthetic or a combination of opioid and local anaesthetic to provide demand dosing for pain relief in obstetric or post-surgical patients via an indwelling epidural catheter.
Post- Occlusion Bolus	After the release of an occlusion the increased pressure generated by the pump whilst the line is occluded can result in the delivery of a sudden, unintended, dose of medication.
Total amount of drug	The cumulative total of drug delivered
Total demands	The total number of times the demand button is pressed, including the demands during lockout where a bolus of the drug wasn't delivered

An Introduction to Patient Controlled Analgesia

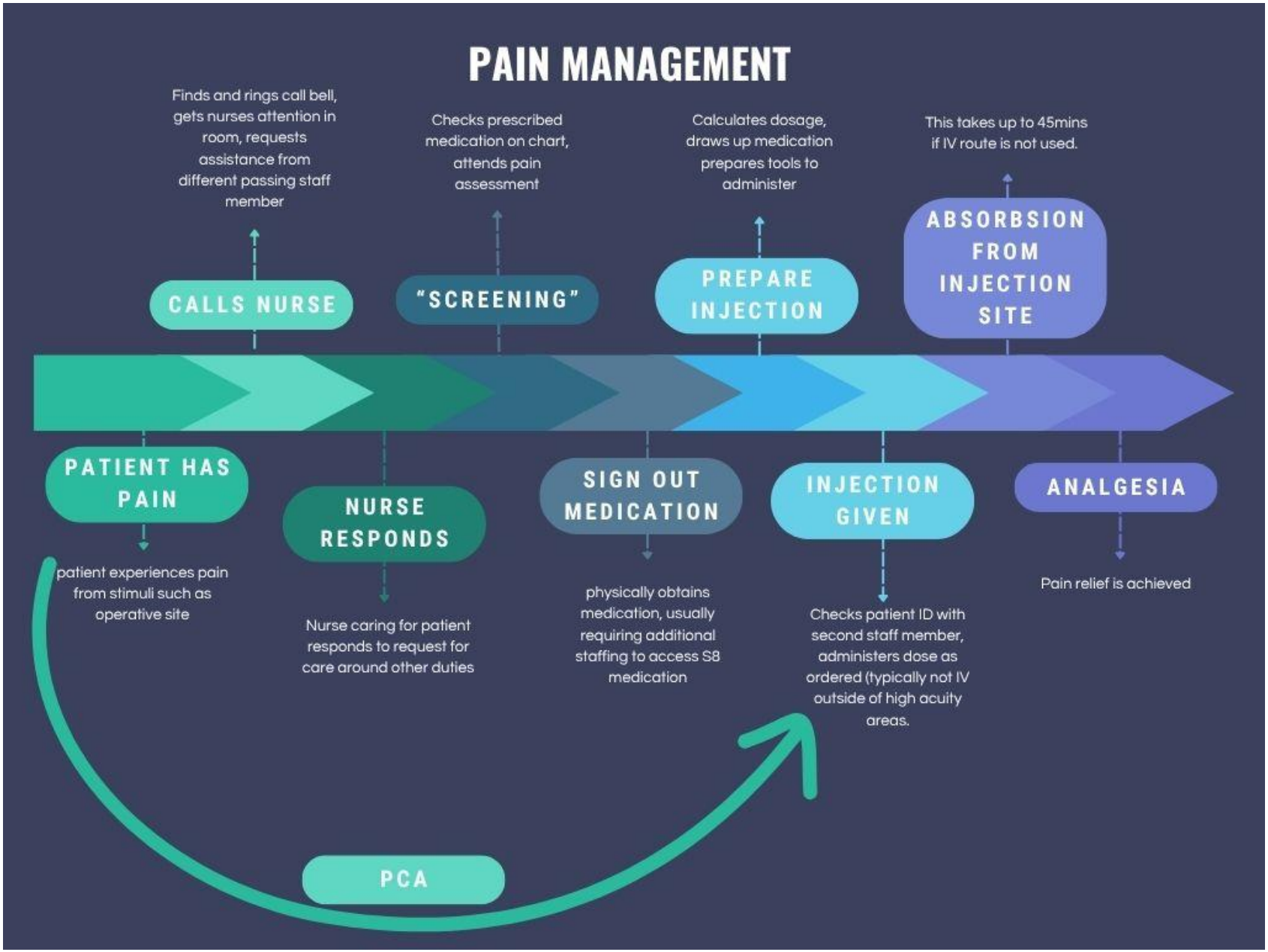
Patient controlled analgesia (PCA) refers to a medication delivery system that allows the patient to administer a prescribed dose of analgesia as they feel the need. It can be initiated via the intravenous route (PCIA), subcutaneously or via an epidural catheter (PCEA) and is considered a highly effective form of pain management that can be used in a number of clinical settings.

PCA therapy works by delivering a predetermined dose of analgesia when the patient presses a demand button. Hourly medication limits and a timed lockout function are programmed in order to minimise adverse effects and facilitate patient safety. PCA may be ordered with or without a continuous background infusion. When appropriate, PCA should be combined with multimodal analgesic regimens or regional anaesthesia in order to reduce opioid requirement and improve patient outcomes.



Benefits of PCA

- Improved analgesic efficacy as titration of plasma opioid concentration can be maintained within the "analgesic corridor". The analgesic corridor describes the range between the minimum effective dose required to elicit a clinically significant response, and the maximum safe dose, beyond which adverse or toxic effects may occur.
- Patient is in control of own pain relief & not dependent on nursing staff which leads to greater patient satisfaction.
- More effective pain control allows for earlier mobilisation & is associated with earlier discharge times.
- Reduced risk of adverse effects of opioid medication such as nausea, sedation, confusion and constipation.
- Overcomes variation of opioid requirements for each individual patient.
- Allows rapid analgesic administration for activities that may increase pain stimulus e.g., moving in bed or physiotherapy.
- Minimises needle use and possible needle stick injury.
- Avoids time delay that may occur if patient relying on PRN pain relief.
- Avoids discomfort and variable drug absorption rate associated with intramuscular injections.


PAIN MANAGEMENT
Finds and rings call bell, gets nurses attention in room, requests assistance from different passing staff member
Checks prescribed medication on chart, attends pain assessment
Calculates dosage, draws up medication prepares tools to administer
This takes up to 45mins if IV route is not used.
CALLS NURSE
"SCREENING"
PREPARE INJECTION
ABSORBSION FROM INJECTION SITE
PATIENT HAS PAIN
NURSE RESPONDS
SIGN OUT MEDICATION
INJECTION GIVEN
ANALGESIA
patient experiences pain from stimuli such as operative site
Nurse caring for patient responds to request for care around other duties
physically obtains medication, usually requiring additional staffing to access S8 medication
Checks patient ID with second staff member, administers dose as ordered (typically not IV outside of high acuity areas.
Pain relief is achieved
PCA

Limitations of PCA

- Not suitable for all patients e.g., babies/young children or patients that don't have the mental alertness, cognitive physical or psychological ability to manage the device.
- Additional care with prescribing and observation will be required, although overall it has been proven to reduce time spent with individual patient by nurse.
- Higher risk of complications for patients with morbid obesity, obstructive sleep apnoea, opioid tolerance, and the elderly and frail.
- Higher maintenance costs relating to equipment, equipment maintenance & consumables.
- Risk of inappropriate use by patient, family or visitors.
- Subject to potential operator error e.g., programming or prescription error.
- Requires separate IV line dedicated to PCA.

Contraindications

- Patient refusal.
- Untrained staff.
- Physical inability to use the PCA.
- Difficulty in understanding the concept of PCA, cognitive impairment or irresolvable language barriers
- Hypersensitivity or allergy to analgesic drug
- Increased ICP for epidural catheter placement
- Proceed with care: chronic renal failure, antithrombotic therapy, bleeding disorder, sleep apnoea, morbid obesity, high risk of developing delirium.

Pre-requisites for Successful and Safe Usage of PCA

- A co-operative patient with enough comprehension to understand the concept of PCA.
- Education must be provided to the patient along with any family in attendance about the use of PCA.
- A physician titrated loading dose should be given prior to the initiation of PCA.
- Demand dose should be set according to patient weight, age, and disease profile to provide sufficient analgesia.
- Set the lockout interval to provide maximal effect of the previous demand dose while avoiding break-through pains. These parameters should be routinely reviewed at shift handover.
- Separate IV line dedicated for IV PCA.
- Any additional opioid medication should be ordered by the managing doctor or specialised pain team.

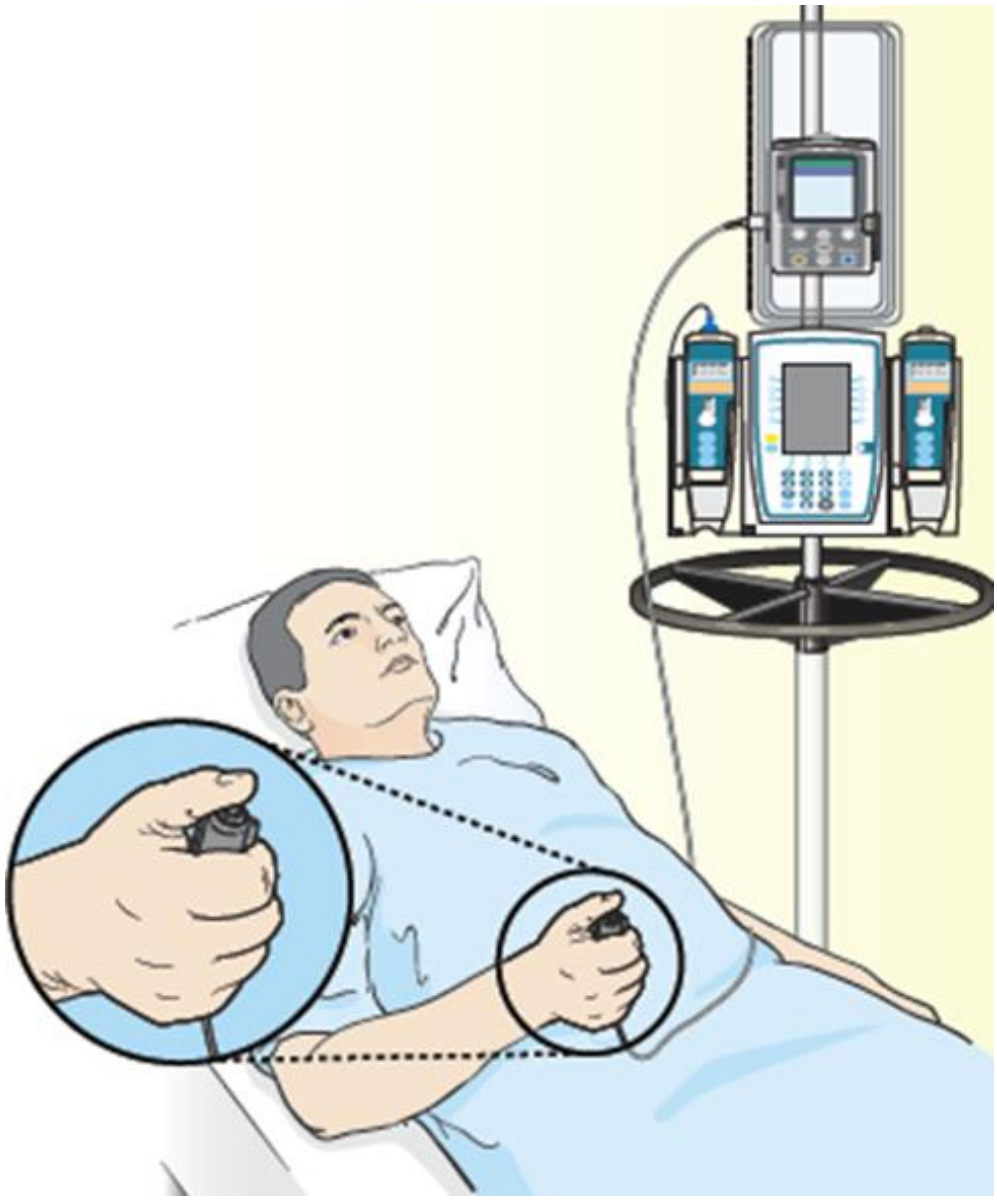
PCA Delivery Systems

A variety of devices for delivering PCA are available. They consist of an

- **Infusion pump** that can be programmed by medical or nursing staff according to hospital protocol and specific patient medication orders.

- **Locking device** to prevent tampering and unauthorised adjustment of settings. Key kept with Schedule 8 medication keys.
- **Patient demand button** that allows a fixed bolus of prescribed analgesic to be delivered.

Please look at the PCA delivery device your health service uses & ask an experienced staff member or educator to demonstrate use. You must be able to demonstrate competency in the use of this pump prior to undertaking care of a patient with a PCA. There is a competency assessment tool at the end of this SDLP please review this at the same time.



Pain

The definition of pain as stated by the International Association for the Study of Pain is: “An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage”. The way an individual experiences pain is varied, influenced by biological, psychological, and social factors. A person’s report of their experience of pain should be respected. Acute pain is a subjective experience that can have both somatic (originating in the periphery from free nerve endings) and visceral (originating from deeper internal structures) components.

There are many types of pain for which a PCA will be initiated, for example following surgery, palliative pain management, and during labour. This decision should occur in collaboration with the patient and health care team, based on an assessment of risk factors, and the patient’s level of cognition, and ability to use the device.

Inadequately managed pain can lead to significant adverse physical and psychological outcomes. Continuous, unrelieved pain can suppress the immune system, result in infection and compromise healing. It is also associated with negative effects on the cardiovascular, gastrointestinal, and renal systems, increasing the risk of adverse events such as cardiac ischemia and ileus.

Of particular importance to nursing care, unrelieved pain reduces patient mobility, resulting in complications such as deep vein thrombosis, pulmonary embolus, and pneumonia. Complications related to inadequate pain management negatively affect the patient’s welfare and the hospital performance with extended lengths of stay and readmissions, both of which increase the cost of care. Continuous, unrelieved pain also affects the psychological state of the patient and family members.

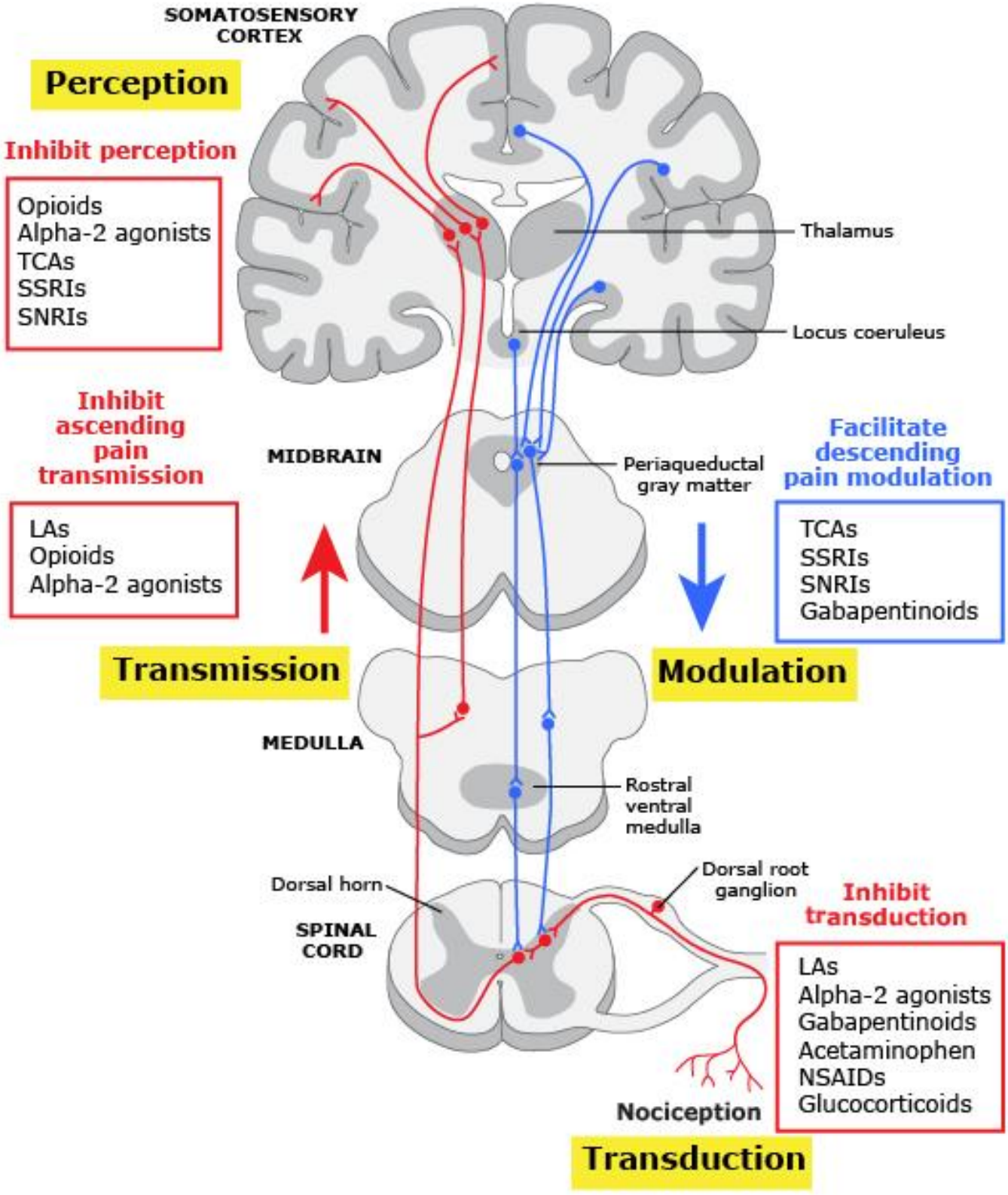
Understanding pain pathways and analgesic techniques can help to mitigate these risks.

Nociception is defined as the neural process of encoding noxious stimuli and is a physiologic response to a painful stimulus involving the processes of transduction, transmission, modulation, and perception. Various forms of analgesia can be used to target each of these four processes. It is important to note that pain and nociception are not synonymous, the experience of pain cannot be inferred solely from activity in sensory neurons.

Factors influencing an individual’s perception of pain include:

- Emotional state
- Past experiences
- Cultural background
- Age
- Cognitive level
- Anxiety
- Education

This graphic shows the four major processes of pain transmission and what are thought to be the primary sites of action of medications that affect those processes.



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Common Medications and Pharmacology

Multimodal approach

The use of multimodal analgesia is a key strategy for pain management in a patient receiving PCA therapy. This approach involves the use of a combination of analgesic techniques, with the goal of improving analgesia, reducing side effects, and minimising reliance on opioids. The use of regional anaesthesia techniques as appropriate, nonopioid analgesics, and non-pharmacological techniques, in conjunction with PCA's are have been found to provide a reduced reliance on opioids without compromising adequate control of pain.

Multimodal analgesia may include nonpharmacologic therapy (eg, patient education, psychological preparation, immobilization, compression, elevation, or cryotherapy of a body part), local or regional anaesthesia techniques, nonopioid medications, and opioids if necessary. Most multimodal analgesia protocols include more than one nonopioid agent. The specifics of multimodal analgesia must be individualised taking into consideration the etiology of the pain and patient factors.

Nonopioid analgesics commonly used for acute pain in adults

- Paracetamol / Acetaminophen
- Nonsteroidal anti-inflammatory drugs (NSAIDs)
- Gabapentinoids
- Ketamine
- Lidocaine
- Dexamethasone
- Alpha-2-receptor agonists

Examples of non- pharmacological treatments

- Education
- Warmth or cooling
- Rubbing (counter irritant)
- Neurostimulation, eg TENS
- Distraction
- Gentle exercise
- Physical therapy, Strengthening, Stretching, bracing
- Distraction
- Cognitive behavioural therapy
- Empathetic support
- Hypnosis
- Positioning

Example of PCA regimens for adults

Medications utilised in PCA therapy can include morphine, fentanyl, hydromorphone, oxycodone, sufentanil, alfentanil, remifentanil, dexmedetomidine, dezocine, ketamine and tramadol/lornoxicam. A wide variety of factors contribute to the selection of medication including: drug stability and availability, patient location, staff's scope of knowledge, patients' comorbidities, local hospital policy and onset/ duration of action. The maximum concentration after a bolus injection is typically around 6minutes, explaining the delay between subsequent doses and the "lock out" period. During the lock-out time the PCA pump will not permit further delivery, allowing each bolus to reach the peak effect before the next can be delivered, thus reducing the risk of overdose.

Some examples of common medications for PCA are as follows, please refer to your local hospital guidelines for specific data on types and administration protocol. There is wide inter-institution variability in PCA pump settings. This table shows an example of one protocol.

Drug	Concentration	Demand dose range (starting)	Lockout interval
Hydromorphone	0.2 mg/mL	0.1 to 0.3 mg	6 to 10 minutes
Morphine	1 mg/mL	0.5 to 2 mg	6 to 10 minutes
Fentanyl	10 mcg/mL	5 to 20 mcg	4 to 8 minutes

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PCA in Chronic Pain Patients

Opioid tolerant patients require additional adjustments when using IV-PCA for acute pain management. For patients who are chronically taking high doses of opioids, or medication for opioid use disorder, it is reasonable to start with demand doses at the high end of the ranges, and lockout intervals at the low end of the ranges, while continuing their baseline opioid. It is important to monitor such patients closely for pain control and opioid related side effects and adjust the PCA settings accordingly.

Routes of Administration

- Intravenous Patient Controlled Analgesia (IVPCA)
- Subcutaneous PCA
- Epidural (PECA)
- Central lines
- Transdermal delivery systems.

Patient Controlled Epidural Analgesia (PCEA)

Caring for someone who has a **PCEA** requires specialised knowledge and skills, completion of the Epidural SDLP/equivalent theory and associated competency is a prerequisite for this. Check your health service requirements.

You must be familiar with your local protocols, guidelines used for PCEA as well as the equipment and drugs used.

As well as the monitoring and safety guidelines associated with PCA there will be other **specific requirements associated with delivering PCA via the epidural route**.

- Observation regimen will include assessment of motor and sensory function
- Side effects and complications will differ due to drugs used and their action via the epidural route
- Effect on mobilisation and bladder function
- Drug concentrations, demand boluses and lockout intervals will be different via the epidural route
- There are specific requirements for the labouring woman

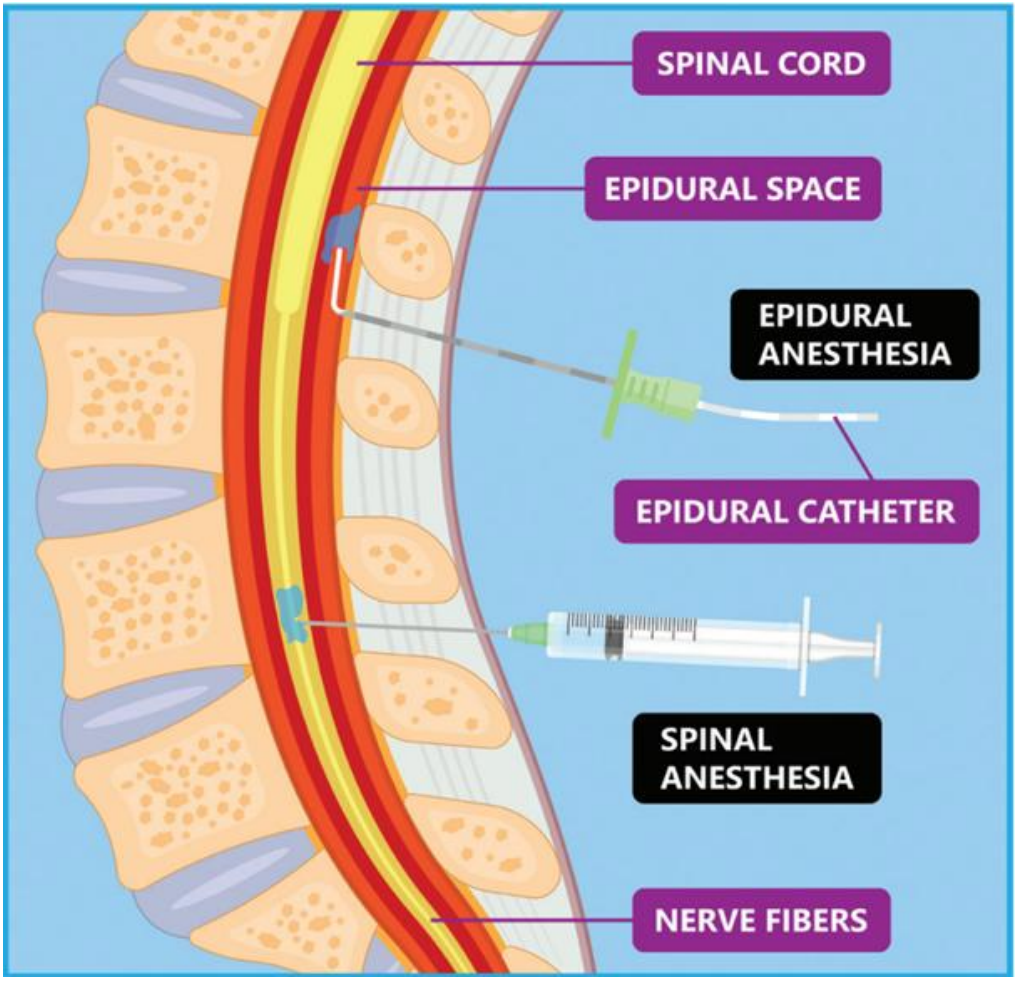

Image: Epidural and spinal anaesthesia.
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Nursing Responsibilities

Guidelines for Patient Education

It is important to provide education prior to PCA use to enhance patient experience and deliver more effective pain control. In patients who are having surgery this education should be completed preoperatively when the patient is able to fully comprehend instructions. Information can then be repeated following commencement of PCA until the patient is confident and capable of using the device appropriately. Patients and their families often mistakenly expect to be completely pain-free. Providing preoperative education, regularly assessing pain, and working together to set realistic goals for pain management and functional recovery can significantly enhance understanding and improve the overall patient experience.

Common concerns of patients who are in control of their own pain relief may be:

Worried about overdosing.	Explain lockout safety mechanism and importance of only pressing the button themselves.
Fear of opioid addiction.	Reassure patient they are unlikely to become addicted to the medication while it is being used for pain relief over a very short duration in a highly monitored setting.
Opioid-related side effects.	These are reasonably uncommon and, in most cases, easily treatable.
Worried about inefficient pain relief.	Explain that early pain management plays a critical role in improving outcomes, reducing the need for invasive treatments, and enhancing overall quality of life. Should they require a review they should alert nursing staff.

It is important to reiterate the following key points:

- How to use the control button to administer analgesia. Include information such as a delay for medication onset, what the button or pump will look and sound like in lock out intervals and how/when to alert staff if the machine is alerting.
- Lockout safety mechanism- the patient can push the button many times, but the lockout mechanism will prevent overdose.
- **Who can press the button** - the patient and their carer must understand that the **patient only** is allowed to press the handset button. It is helpful to discuss the risks associated with unauthorised use of the PCA dosing button, known as “PCA by Proxy,” often by well-meaning family members or caregivers. In some rare cases there may be a need for authorised PCA by proxy
- The inherent safety of PCA analgesic administration and supervision of the patient by nursing staff.
- Associated risks and adverse effects of the medication being used.
- The importance of adequate analgesia to reduce complications such as chest infections, blood clots, and chronic pain.
- To press the button when they are uncomfortable or pain is mild, don’t wait till pain is moderate to severe.
- To press the button before mobilisation or other activity that may exacerbate pain, they may

need to press the button more than once over a period of 10-15mins to achieve adequate pain control.

- To alert the nurse if they are pressing the demand button and pain is not being relieved.
- If they become nauseated or have other side effects to alert the nurse as there are medications that can help this.
- They may also receive some oral pain medications at the same time which will complement the PCA medications.

Patient handouts are also available as patient education tools. Nursing staff are responsible for reinforcing this education during the pre, intra-operative stage as well as post-operatively or in other circumstances where a patient may be ordered a PCA. It is expected that this information may need to be reiterated following initial education.

Authorised PCA by Proxy

Please follow local policy as this may not be permitted within your facility.

Patient-controlled analgesia by proxy (activation of the PCA pump by anyone other than the patient) is controversial and not typically recommended outside of specialist practice. It involves a patient's family member or caregiver acting as an authorised proxy in administering a PCA bolus. To assist, they will push the button on the PCA pump when the patient is awake and looks to be in pain. This happens when the patient cannot use PCA because of multiple factors such as young age, developmental stage, injury, or illness. In this scenario only the designated proxy, who has been properly educated prior to implementation, is allowed to push the button.

Equipment

Please obtain information on the PCA device used at your health service as you work through the SDLP

A commonly used pump for IVPCA is the Alaris PCA pump. For an instructional video of set up please follow the following link.

Alaris 8120 PCA Training (Med One Group) https://youtu.be/F0Elf14nXGI

Preparation and administration- **Please follow local policy**

- A thorough past medical history and physical assessment should be completed on all patients prior to administration of PCA. Special attention should be paid to previous history of opioid use as well as cognitive status and potential complicating medical conditions.

- A prescription for PCA analgesia should be written on the PCA infusion therapy chart or equivalent. It may be ordered in the EMR if your health service uses this system. When choosing a regimen, the medical team must consider doses for on-demand boluses, loading dose, hourly limits, lockout intervals, and if a basal infusion will be initiated.

- PCA is delivered by a dedicated pump designed for this purpose, with a specialised giving set. Please review instructions for set up specific to the device in use at your health service.

- Two Registered Nurses (competent in PCA management) prepare and label the infusion as per orders and according to hospital procedure. Labelling needs to comply with Labelling of Injectable Medicines Fluids and Lines guidelines. Dosing should be based on comprehensive patient assessment and regularly monitored and reassessed.

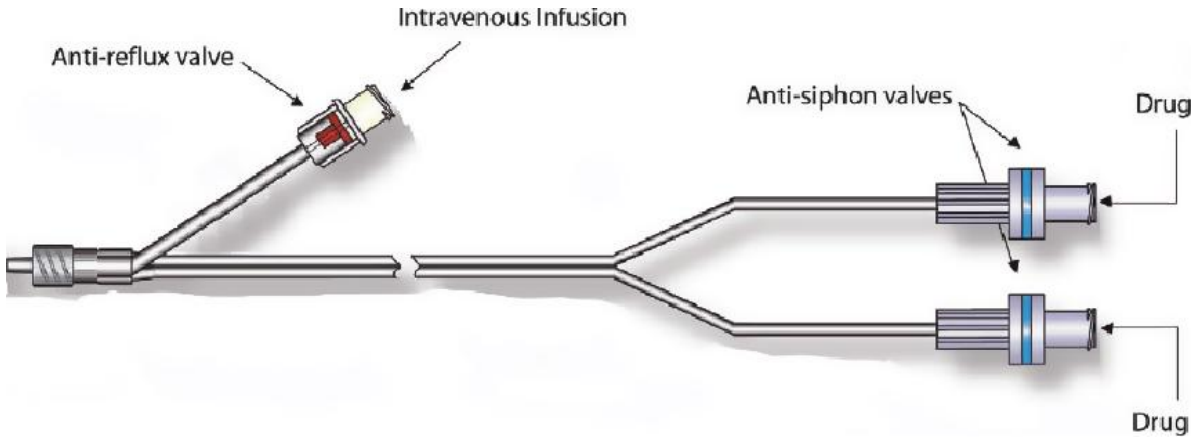
- The machine is programmed according to PCA prescription and checked by 2 Registered Nurses. Give special attention to drug, concentration, dose and rate of infusion to reduce the risk of adverse outcomes and medication errors.

- Patient and caregiver education is provided.

- A lockout interval will be ordered to reduce the risk of overdose.

- A background infusion may also be ordered. If this is the case patient may need to be nursed in HDU department, dependant on local policy.

- The PCA infusion set must contain an ***anti-syphon valve.*** If the PCA infusion is connected to the primary infusion, an ***anti-reflux or non-return valve*** must be utilised. This is located in the non-PCA infusion tubing, upstream from the PCA line connection. The purpose of this is to prevent backflow up the primary infusion line and inadvertent analgesic overdose.



- Ensure PCA pump is connected to AC power or that battery is charged

- The syringe cover must be closed and locked with the key or code. The key is removed while PCA is in use and kept with the schedule 8 keys.

- The patient demand button is connected at the back of the syringe pump. The handset is given to the patient and instruction on how to use it is reinforced.

- Regular re-evaluation of a patient's PCA settings is indicated to ensure appropriate analgesic management. A dose increase may be indicated if patient requires frequent clinician boluses or if they report uncontrolled pain. It is recommended review is undertaken by nursing staff at shift handover, and by the managing doctor on a daily basis.

Source	Problem	Solution
Patient related	• Misunderstanding of how PCA therapy works • Confusion regarding operating demand button • Mistaking PCA button for nurse call button • Family members operating demand button • Intentional tampering with device • Fear of opiate addiction	• Appropriate patient selection • Patient and family education prior to PCA use • Staff education • Routine patient monitoring of pain scores & analgesic consumption • Pump locked with key so syringe cannot be accessed by unauthorised people
Adverse reactions to opioids	• Respiratory depression • Sedation • Nausea/vomiting • Pruritus • Urine retention	• Availability of Naloxone to reverse sedative & respiratory effects ▪ Optimise dose to provide good pain relief with minimal side effects • Anti-emetic drugs as required • Possible use of small doses Naloxone to reduce pruritus
Device safety and equipment issues	• Battery, display board or software failures • Failure to deliver drug on demand • Faulty alarm system • Pump not set up properly ▪ IV-line patency	• Equipment should be regularly serviced by qualified personnel • Equipment inspected prior to and during use • Pump battery re-charged on mains power when pump not in use • Staff education • Instruction manual, wall charts and brochures
Operator error	• PCA pump programming error (i.e. dose, concentration or rate) • Failure to clamp or unclamp tubing • Improperly loading syringe or cartridge • Failure to monitor for side effects/overdose • Not responding to safety alarms	• Staff in-service and training conducted regularly • Syringe preparation and programming of pump checked by 2 Registered Nurses (Div. 1) • Patient monitoring and observations according to guidelines

Patient assessment and observations

Patients utilising a PCA device are often post-operative and require close observation in relation to this as well as the required observation of someone having PCA for pain relief.

Vital signs including pain score, sedation score, nausea and vomiting assessment, respiratory rate, heart rate, oxygen saturation, and blood pressure are included in the PCA monitoring regime.

Careful assessment of pain, at rest and with movement, is critical to the success of PCA. Utilise pain assessment tools, and incorporate Functional Activity Scoring (FAS) as part of your assessment. It is also important to review pump data, compare demand doses vs dose given and cumulative dose of PCA.

Assessment of sedation is also a critical component of the observation regimen in order to detect potential side effects and escalate care in a timely manner. Utilise the sedation scoring method which is endorsed at your health service.
Example of sedation score (University of Michigan Sedation Scale):

Value	Patient state
0	Awake and alert
1	Minimally sedated: tired/sleepy, appropriate response to verbal conversation, and/or sound
2	Moderately sedated: somnolent/sleeping, easily aroused with light tactile stimulation or a simple verbal command
3	Deeply sedated: deep sleep, aroused only with significant physical stimulation
4	Unarousable

Most hospitals have differing observation regimes, so it is important to know what regime is in place at your hospital.

For detailed information refer to local health service policy, however, a typical example of **minimum** observations requirements are:

- Half hourly for 2 hours,
- Then hourly for 12 hours, and if the patient is stable
- 2-hourly thereon until the infusion is ceased
- Observation regimen should continue for at least 4 hours post cessation of PCA.
- Frequency of observation should be reassessed in clinical state changes.

*Clinical judgement and local policy should be utilised when assessing frequency of observation for home based PCA therapy.

Recording PCA pump data as part of the observation regimen is critical

- Total volume (mg) infused
- Total demands
- Successful dose delivery from demands
- Cumulative dose (mg)

Observations are undertaken and recorded, to detect the following side effects of narcotic analgesia:

- Respiratory depression
- Sedation
- Severe nausea & vomiting
- Urinary retention
- Pruritus
- Inadequate analgesia

Escalation of care & management of complications/side effects

There will often be parameters indicated on the PCA infusion chart/EMR to identify requirements for escalation of care in addition to local policy and systems.

Respiratory depression

Respiratory depression doesn't "just happen." Sedation precedes respiratory depression and thus is the most clinically relevant assessment. Reportable parameters for respiratory rate and sedation score may be specified on the PCA infusion chart.

- In the event of severe respiratory depression cease any background infusions, remove patient button from device and stop PCA until further review.
- Assess and mange airway, breathing & circulation using DRSABCD approach.
- Escalate care/activate rapid response protocol as per local policy.
- Notify nurse in charge and managing doctor.
- Apply supplemental oxygen if indicated & monitor oxygen saturation.
- Administer Naloxone as ordered on PCA infusion chart and repeat if required. Naloxone is indicated for sedation score 3 (difficult to rouse or unresponsive) or sedation score 2 (constantly drowsy unable to stay awake) and a respiratory rate less than or equal to 5 breaths per minute.

Best Practice recommendations include:

- A risk factor assessment for respiratory depression is recommended for the patients with patient-controlled analgesia.
- Oxygen saturation should be monitored for patients with patient-controlled analgesia at night and during sleep.
- Patients who are receiving PCA therapy postoperatively should be monitored closely from 8 to 24 hours for signs of respiratory depression.

Risk factors for opioid induced respiratory depression

- Prematurity
- Elderly and Frail
- Male gender
- Morbid Obesity
- Known or suspected sleep disordered breathing problems
- Pre-existing pulmonary and/or cardiac disease
- Renal insufficiency
- Impaired liver function
- Continuous basal infusions

Treatment algorithm for oxygen therapy

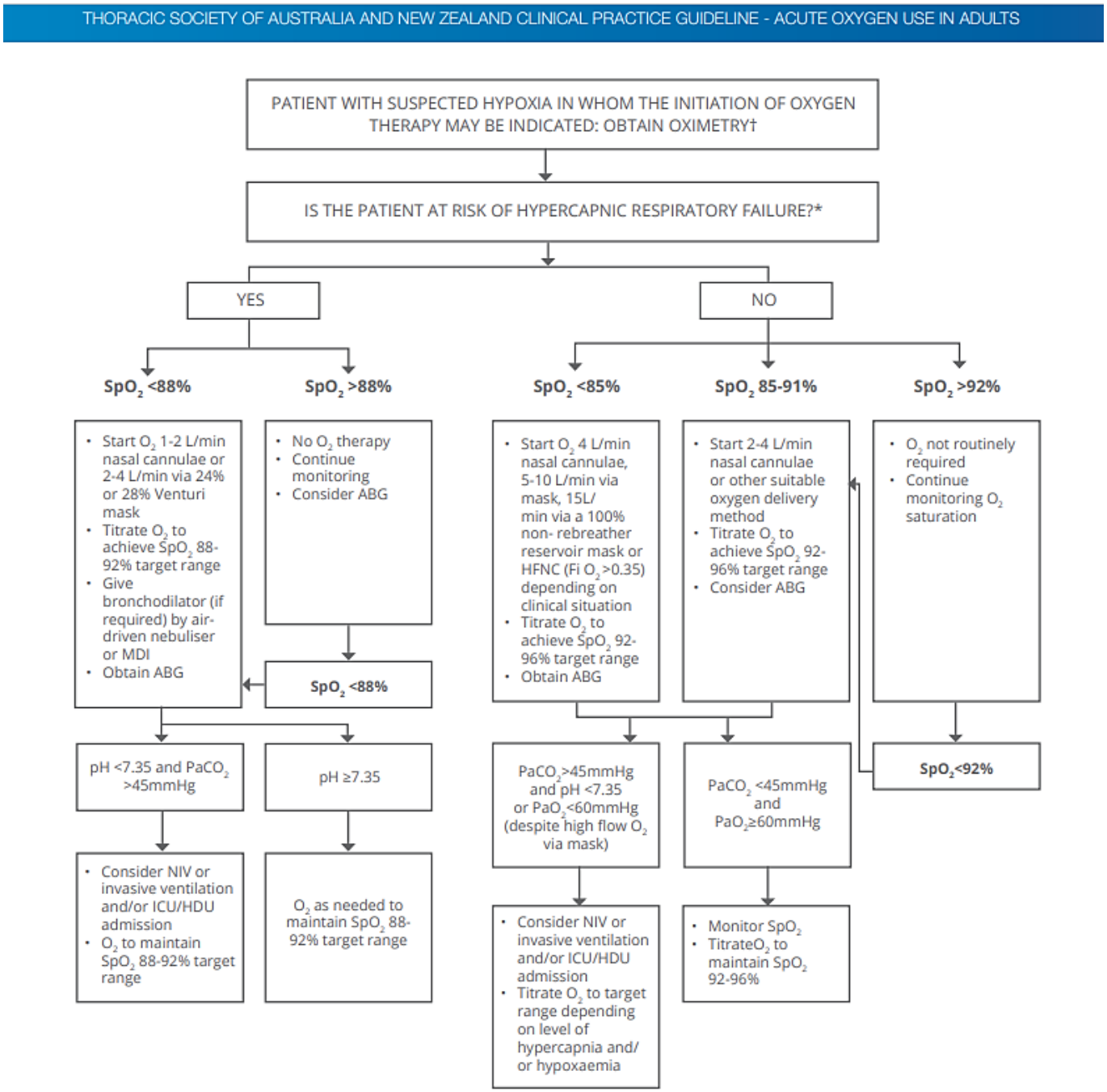


Figure 1: Treatment algorithm for oxygen therapy

Retrieved from https://aci.health.nsw.gov.au/__data/assets/pdf_file/0011/456527/TSANZ-AcuteOxygen-Guidelines-2016-web.pdf

Sedation is often the most sensitive indication of opioid-induced respiratory depression

Sedation

- Escalate care/activate rapid response protocol
- Monitor and manage airway breathing & circulation
- Remove demand button or cease background infusion if required
- Apply O2 if indicated & monitor SpO2
- Administer Naloxone

Pain

- Assess patient, vital signs, pain & sedation score
- Consider other causes such as post op complications
- Check equipment & patency of IV line
- Check demand history and ensure patient understands how system operates and they can press the button whenever they have pain and not wait till pain is moderate-severe pain
- Give adjunct analgesia as ordered or consider bolus dose if ordered
- Escalate care
- The risk of chronic pain as a consequence of surgery is often underestimated, one of the key risk factors for developing chronic pain include uncontrolled acute pain. A multimodal approach to analgesia is recommended.

Verbal description is only one of several behaviours to express pain; inability to communicate does not negate the possibility that an individual experiences pain. Different methods of pain assessment are available however the Wong-Baker Face Pain Scale is commonly utilised to facilitate communication and improve assessment so pain can be appropriately addressed.

Retrieved from https://wongbakerfaces.org/

Nausea & vomiting

- Treat with prescribed anti emetic
- If unrelieved or persistent escalate care
- Exclude other causes hypotension, urinary retention

Urinary retention

- Monitor urine output
- Escalate care
- Consider need for indwelling catheter

Pruritis

- More common when opioids are administered neuraxially. Patient may require a low dose of naloxone or antihistamine.

Infection prevention and control

- Adherence to 5 moments of hand hygiene
- Standard aseptic technique used for all infusion and line setup, manipulations and syringe and line changes
- Syringe and lines changed in line with local guideline

Cessation of the PCA

- The decision to cease the PCA is made in consultation with treating doctor, acute pain service (if you have one at your health service) or in accordance with hospital policy.
- Most patients self-wean off PCA, using it less as their pain decreases.
- Ensure adequate analgesia is ordered and available once PCA has ceased
- Dispose of schedule 8 drugs in line with regulatory framework
- It is recommended to continue observation regimen for a minimum of 4 hours post cessation of PCA
- Document the date and time of ceasing intervention.
- Any remaining opioid must be disposed of according to your local drugs of addiction policy.
- Continue to assess patient post cessation of PCA and escalate care as required

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QUIZ

Short Answer

1. Define PCA therapy

2. List 4 benefits of PCA

-
-
-
-

3. List 4 contraindications of PCA

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-
-
-

4. Define *multimodal approach* in relation to pain management

5. What is the purpose of a lockout period?

6. What are three routes of PCA administration?

-
-
-

7. Detail the education you would provide a patient who is to receive IV PCA therapy following a surgical procedure

8. What is the purpose of an anti-reflux valve?

9. What actions should be taken for a patient with a sedation score of 3 and a respiratory rate of 5 breaths per minute?

10. Outline the observation regime recommended at your health service for a patient receiving opiate PCA therapy.

11. What data do you collect from the pump to be recorded in addition to your routine observations?

12. Which medications are used to inhibit ascending transmission in the pain pathway?

13. How do you dispose of schedule 8 medication once PCA therapy is complete in your health service?

14. Your patient is complaining of unrelieved pain despite appropriate use of their PCA device. What steps should you take?

15. List 5 factors that increase the risk of a patient experiencing respiratory depression when prescribed opiates.

-
-
-
-
-

True or False

16. A PCA should always have a background infusion?

True

False

17. PCA devices must be lockable to prevent tampering?

True

False

18. There is no risk of respiratory depression associated with PCA use?

True

False

19. The patient's family can operate the PCA demand button if the patient is too sedated?

True

False

20. PCA protocols should include minimum criteria for observations?

True

False

PCA Competency Assessment Tool **Performance Criteria**	CRITERIA C = Competent S = Requires supervision D = Requires development		
	C	**S**	**D**
Demonstrates safe practice			
• Reads PCA prescription/EMR orders • Adheres to the hospital policies related to PCA management • Identifies patient • Discusses process of patient preparation and education • Does not leave medication unattended • Checks for known drug allergy • Assesses patency of IV cannula • Observes patient for any adverse drug reaction			
Performs procedure: Set up			
• Gathers equipment • Prepares medication • Labels prepared syringe in line with regulatory framework • Adheres to medication administration guidelines & regulations • Primes the line and anti-reflux valve • Connects to the patient			
Performs procedure: Programming of the PCA pump			
• Programming confirmed with a second RN • Selects protocol • Modifies protocol as required • Confirms all program parameters • Commences PCA • Hands button to patient			
Performs procedure: Syringe change			
• Gathers equipment • Prepares medication with second RN • Labels prepared syringe • Adheres to medication administration guidelines & regulations • Changes syringe • Appropriately discards remaining drug volume in used syringe • Reconfirms all program parameters with second RN			

PERFORMANCE CRITERIA	C	S	D
Performs procedure: Records observations			
• Performs & records observations in line with local protocol • Determines pain score at rest and on movement • Assesses respiratory rate • Determines oxygen saturation • Assesses sedation score • Assess patient for any complications or adverse effects • Escalates care in response to abnormal findings in line with hospital escalation protocol • Records demands made and successful doses received • Records amount remaining in syringe • Records cumulative total of drug delivered • Records current infusion rate if applicable • Checks patient's understanding of PCA use			
Infection Prevention & Control awareness			
• Adheres to 5 moments of hand hygiene throughout care • Adheres to standard aseptic technique when preparing equipment and drugs, including line manipulations • Ensures patient comfort • Dons appropriate PPE • Disposes of equipment & sharps safely • Cleans reusable equipment in line with infection prevention and control guidelines			
Demonstrates communication/interpersonal skills			
• Addresses patient by name • Provides education & explains procedures • Responds to needs • Completes documentation			
Date of assessment			
Competent (please circle)	Yes		No
Registered Nurse (Assessee) (Signature)			
Educator / Nurse (Assessor) (Name & signature)			