Patient Controlled Analgesia (PCA) for Pain Management

1

General Knowledge for PCA

Objectives

After completing this class, the student will:

- Understand what PCA is and why it is used
- Be able to identify indications and contraindications for PCA
- Be knowledgeable of the advantages and disadvantages of PCA
- Be able to differentiate the methods of administration for PCA
- Know the proper procedure for the administration of PCA, including documentation
- Be aware of possible complications that can arise while a patient is receiving PCA

2

General Knowledge for PCA

Definitions

- **Patient Controlled Analgesia –** The inability to feel pain as controlled by a patient.
- **Absolute contraindications –** a situation which makes a particular treatment or procedure absolutely inadvisable.
- **Relative contraindications –** a situation in which caution should be used when two drugs or procedures are used together.
- **Vaso-occlusive pain crisis –** occurs when sickled red blood cells block blood flow to the point that tissues become deprived of oxygen.
- **Complex regional pain syndrome –** Chronic arm or leg pain developing after injury, surgery, stroke, or heart attack.

3

General Knowledge for PCA

What is patient-controlled analgesia?

Patient-controlled analgesia, or PCA, is a treatment method which involves the use of a patient-controlled pump to efficiently deliver pain relief intravenously or transdermally at a patient's preferred dose and schedule.

Who needs patient-controlled analgesia?

Patients suffering from acute, chronic, and postoperative pain who are unable to tolerate oral medications. PCA is particularly useful for patient's who's pain fluctuates, causing predetermined dosing to put stress on the nursing staff responsible for caring for the patient.

4

General Knowledge for PCA

Patient controlled analgesia pumps are indicated for managing pain in:

- Patients who suffer from acute pain for whom there is inadequate pain control from the initial opioid administration, as can be caused by:
  - Vaso-occlusive pain crisis
  - Trauma
  - Pancreatitis
  - Burns
- Patients with chronic illnesses suffering from lower levels of constant chronic pain, the most common examples of which being:
  - Metastatic cancer
  - Phantom limb syndrome
  - Complex regional pain syndrome
- PCA pumps are also indicated for post operational patients due to the superior pain control compared to scheduled nursing dosing.

5

General Knowledge for PCA

Absolute contraindications to PCA

- The patient is unable to understand the concept behind PCA
- Systemic infection, or infections at the preferred site of PCA placement
- Allergic reactions to the selected medication
- Burns or trauma on the area of PCA placement

Relative contraindications to PCA

- Chronic renal failure
- The patient is on antithrombotic therapy
- The patient has a documented bleeding disorder
- Sleep apnea

6

General Knowledge for PCA

Advantages of patient-controlled analgesia

- More effective at pain control than non-patient controlled opioid injections.
- Results in higher patient satisfaction.
- Preferred by nurses because it allows for a reduction in their workload.
- Enables patients to be in more control over their pain.

Disadvantages of patient-controlled analgesia

- Less cost-effective than traditional dosing.
- Does not affect the average length of stay for patients.
- Results in higher opioid consumption than traditional dosing.

7

General Knowledge for PCA

Complications associated with the use of PCA pumps

- Runaway pumps are a result of a mechanical error in which a pump malfunctions and delivers doses at incorrect intervals and amounts.
- Failure to use an anti-reflux valve can result in refluxed medication into the fluid infusion line. This medication could then all be delivered to the patient at once if the intravenous line is flushed, resulting in an overdose.
- If the cassette containing the medication is damaged or incorrectly placed into the PCA machine, it could potentially empty by gravity and administer the entire cassette of medication to the patient at once.
- PCA by proxy is when someone besides the patient is pressing the button to administer a dose because they believe the patient is in pain and needs it.

8

General Knowledge for PCA

Complications associated with the use of PCA pumps (cont'd)

Other Complications of PCA include:

- Infection
- Catheter dislodgement
- Medication leakage
- Skin irritation
- Allergic reaction

Side effects of PCA administration can be related to the medications or the delivery device used and include nausea and vomiting, constipation, urinary retention, pruritus, and respiratory depression.

9

References

- Pastino A, Lakra A. Patient Controlled Analgesia. [Updated 2021 Jul 24]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK551610/
- Nemati M. H. (2015). The evaluation of the benefits of pain control by patients using PCA pump compared to medicine injection to ease the pain by nurses. Journal of medicine and life, 8(Spec Iss 4), 144–149.

10