

# Administration of Patient Controlled Analgesia Pump

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## Administration of PCA Pump

### Overview of PCA Pump Dosing

PCA dosing contains a variety of variables, including the initial loading dose, bolus or demand dose, lockout interval, continuous infusion rate, and one and four-hour limits.

The **initial loading dose** can be titrated by a nurse to reach the minimum effective concentration (MEC) of the desired medication.

The **bolus or demand dose** is the dose of medication delivered each time the patient presses the button.

A **lockout interval** is the time after a demand dose in which a dose of medication will not get administered even if the patient presses the button; this is done to prevent overdosing.

A **continuous infusion rate** can be used in the background of PCA dosing to maintain the MEC of the medication independent of patient demands.

**One and four-hour limits** put a cap on the maximum allowed amount of medication to be administered within those time periods and are usually less than the dose given if the patient were to press the dosing button at every possible interval.

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## Administration of PCA Pump

### Parts of PCA Pump

- A. Green indicator light: blinks when pump is running
- B. Amber indicator light: blinks when pump is stopped or alarming
- C. Polemount bracket access (back of pump)
- D. Power jack (for power pack or AC adapter)
- E. Data in/out jack (for remote dose cord, modem cable or printer cable)
- F. Battery compartment (side of pump)
- G. Cassette (part of reservoir or administration set that attaches to pump)
- H. Air detector (optional)



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## Administration of PCA Pump

### Procedure

1. Wash hands and apply gloves
2. Prime tubing of administration set
3. Disinfect needleless connection device
4. Flush catheter
5. Connect primed administration set to needleless connection device
6. Open clamp on tubing
7. Establish prescribed rate of flow using an electronic infusion pump
8. Begin infusion
9. Instruct resident on expected outcomes and potential side effects

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### Procedure (cont'd)

10. Use pulse oximeter to monitor for respiratory depression. Monitor resident closely. Assess and re-assess the resident for:
  - a) Current level of pain
  - b) Side effects of pain medications
  - c) Adverse reactions to pain medication
11. When infusion is complete, clamp tubing and disconnect from catheter
12. If tubing will be reused, replace sterile end cap on tubing
13. Flush catheter per protocol
14. Document procedure in the resident's medical record
15. Document the procedure

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## Administration of PCA Pump

### Documentation

Documentation in the medical records includes, but is not limited to:

- Results of the initial and/or follow-up pain assessments
- Any complications, side effects, problems with infusion, change in dose, refusal of medication
- Any communication with physician, supervisor, or oncoming shift
- Any waste of narcotic when treatment is finished
- Effectiveness of pain treatment, per resident statement or use of scale
- Any change in orders
- Condition of catheter and any complications/interventions

Refer to your facility policy for additional flow sheet required for the monitoring of a patient receiving patient-controlled analgesia. An example can be found in the resources tab below.

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## Administration of PCA Pump

### Reporting

The following should be reported to the physician, supervisor, and oncoming shift as per facility policy:

- Resident refusal of treatment
- New onset or worsening of assessed or resident-reported pain level
- Effectiveness of treatment
- Any side effects or complications from treatment/interventions
- Resident statement regarding tolerance of treatment

These should also be documented directly in the resident's chart.

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### Additional considerations for the monitoring of patients using a PCA pump

The patient should be monitored carefully and frequently every one to two hours for the first 24-48 hours to assess pain and sedation levels because the patient is at the highest risk of hypoventilation and nocturnal hypoxemia during that time.

Nurses should also assess for comfort using standard numeric or behavior scales and evaluate the number of demands the patient has made for medication. Based on the patient's requirements, the dose of the PCA can be adjusted.

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## 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.