

Patient Controlled Analgesia (PCA)

Towards a Safe Application

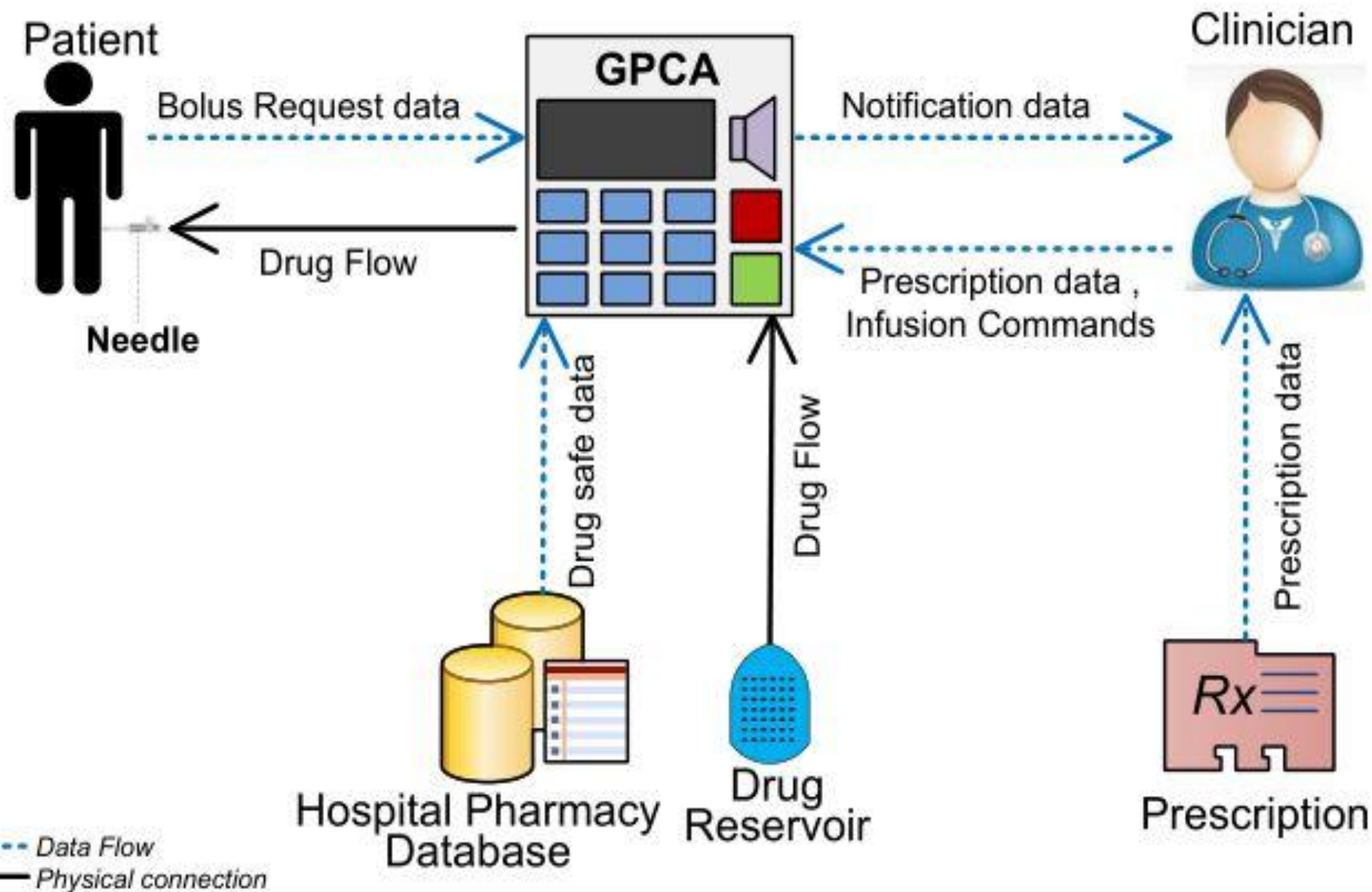
By

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Definition

- Patient-controlled analgesia (PCA) is a pain medication delivery system that enables effective and flexible pain treatment by allowing patients to adjust the dosage of anesthetics.
- PCA has become one of the most effective techniques for postoperative analgesia.
- It also has the programming options to deliver patient boluses along with a continuous infusion, or a continuous infusion without patient boluses.
- PCA by Proxy: is a term which describes activation of the analgesic infusion pump by anyone other than the patient.

- **Authorized Agent Controlled Analgesia (AACCA)** is a method of pain control in which a competent individual is authorized & educated to activate the dosing button of an analgesic infusion pump .
- **Nurse Controlled Analgesia (NCA)**: the authorized agent is the nurse responsible for the patient.
- **Caregiver Controlled Analgesia (CCA)**: the authorized agent is a nonprofessional individual (e.g. parent).

What is IV PCA?

- **PCA** refers to a setup in which patients are able to administer their own drugs on a preset basis.
- I.V. access → a system is attached in which patient may bolus small amount of opioid every few minutes.

What is IV PCA? - cont

- “A lockout period” is also established to avoid overdosing.
- This system may be used on top of a baseline continuous infusion.

Advantages of continuous

I.V. infusion.

- Rapid onset of analgesia.
- Steady-stat plasma concentration.
- Painless.

Disadvantages of continuous I.V. infusion

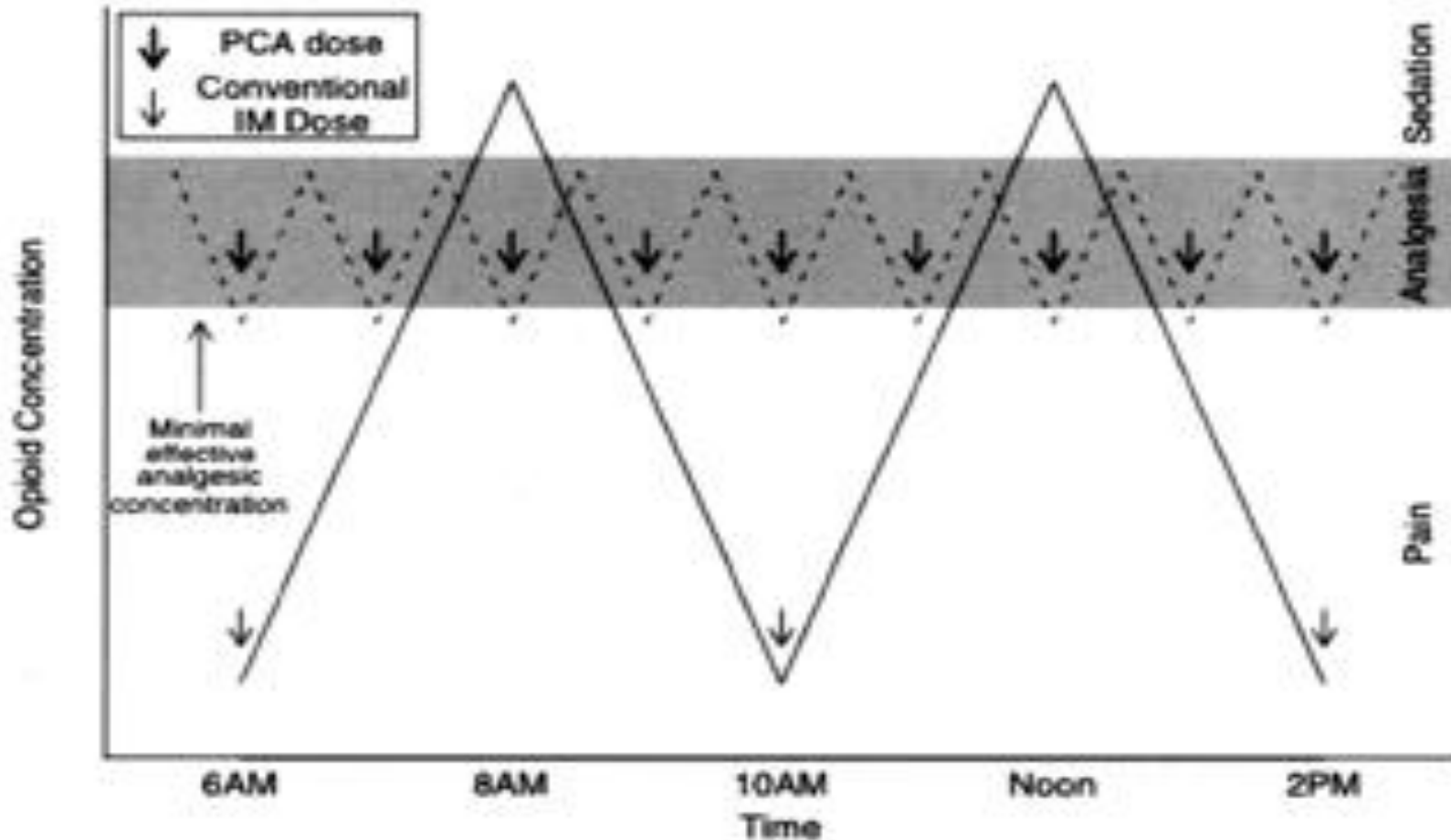
- Fixed dose not related to pharmacodynamic variability.
- Errors may be fatal.
- Expensive fail-safe equipment required may result in less frequent assessment by nursing staff.

Advantages of PCA over nurse-administered I.M. opioids.

Problems with the traditional nurse-administered I.M. opioids:

1. Lack of knowledge and over concern about respiratory depression and addiction.
- 2 . Long lag period between the onset of pain & administration of opioids.
- 3 . Patients & nurses think it's better to tolerate pain as much as possible before taking pain killers.

PCA versus traditional IM opioids



Advantages of PCA.

- Dose matches patient's requirements & therefore compensate for pharmacodynamic variability.
- Dose given are small & therefore fluctuations in plasma concentrations are reduced.
- Reduces nurses' workload.
- Painless.

Disadvantages of PCA.

- Technical errors may be fatal.
- Expensive equipments.
- Requires ability to cooperate and understand.

What is the youngest age for which PCA is appropriate?

- Patients over 7 → do very well.
- Patients ages 5-6 → variable success.
- Patients ages ≤ 4 → do not use PCA successfully.
- PCA is inappropriate for those under 5 years of age.

Is background continuous infusion necessary with I.V. PCA?

- A continuous background infusion dose not improve pain scores and may be even associated with more side effects.
- It may serve a role in extensive abdominal and thoracic operations.



Troubleshooting for PCA

- ***Problem 1:***

The patient is still having pain .
This is the most common problem.
The patient may fear overdosing.

- ***Solution :***

Explain the pump's safety features & encourage the patient not to wait until the pain is severe.

Troubleshooting for PCA

■ ***Problem 2 :***

The patient has received maximum dose but still experiencing pain.

Solution :

Notify the physician to:

- administer a bolus dose.
- increase the maximum hourly dose.
- add (NSAID)
- Check for a neuropathic element of Pain

Troubleshooting for PCA

■ ***Problem 3 :***

Patients are worried about becoming addicted to the opioid.

Solution :

Allow the patient & family to vent their fears when you talk to them.

Explain → incidence of opioid addiction in hospitalized patients is less than 1%.

Troubleshooting for PCA

■ **Problem 4 :**

Patients are not taught about the pump until after surgery.

In PACU, patients are sedated and confused.

Solution :

- The ideal time→ preoperative visit.
- If he uses hearing aid or glasses.
- Only patient → press the button.
- Pressing the button when patient asleep
→ getting more opioid.

Troubleshooting for PCA

■ ***Problem 5 :***

The patient experiences nausea and vomiting.

Opioid therapy frequently causes nausea or vomiting during the first few days.

Solution :

Notify the physician to order an antiemetic, decrease the narcotic dose, or switch to a different opioid.

Troubleshooting for PCA

■ ***Problem 6:***

The pump, syringe, PCA tubing, and IV lines are not properly assembled.

Setting up PCA pump incorrectly → interfere with the flow.

Solution :

Keep brochures on assembling the equipment or quick-reference diagrams at the nurses station.

Troubleshooting for PCA

■ ***Problem 7 :***

The opioid is not reaching the patient quickly enough.

If the opioid is flowing too slow→ may not reach patient's circulatory system quickly enough to relief pain.

Solution :

Check pump tubing for infiltration, kinking, blockage & flow regulator.

Use a separate IV line for PCA.

Troubleshooting for PCA

■ **Problem 8 :**

Nurses are not familiar with the doses of opioids.

Solution :

- Training should cover the adverse effects, dosing, and administration of opioids used with PCA.
- Reminder dosing cards.
- Phone number of (anesthesia dep., pharmacy dep. pain management team).

Troubleshooting for PCA

■ **Problem 9:**

The patient develops respiratory depression.

Especially if he's elderly, has a reduced metabolic rate, chest injury, hepatic or renal impairment.

Solution :

- If respiratory rate < 10 breaths/min. → Notify physician, reduce the opioid dose, and monitor the respiratory status.
- opioid antagonist (Naloxon).

Troubleshooting for PCA

- ***Problem 10 :***

Nurses complain that PCA involves too much charting.

Solution :

We use a one-page pain management flow sheet that contains the PCA drug, concentration, dosage, pump settings, vital signs, pain assessments, adverse effects & intervention.

“ Patients will be far more comfortable and satisfied, and the nurses will be better organized by using PCA pump “

PCA Safety

5 sources of danger associated with PCA pumps

1. Misprogramming the pump:
PCA Safety Checklist: Many facilities require two nurses to check the programming on the pump when it is set up.
2. Monitoring of the patient: Inability to communicate, Slowed respirations, Drop of pulse oximeter, Elevated ETCO₂.
3. Not responding fast enough.
4. Not using Narcan: Naloxone (Narcan) is a fast acting medication that can reverse the effects of narcotics.
5. Not reporting changes in condition.



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