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Purpose/Policy

To enable the safe and appropriate IV administration of naloxone for adult patients

Scope

Inpatient Services

Registered Nurses/Midwives with IV Endorsement (Level 1 or 2), Approved persons.

Prescribers/Medical Practitioners.

Associated Documents

- Adult Patient Controlled Analgesia (PCA) Treatment Sheet C160012
- Adult Epidural Infusion C160013
- Anaesthetic Chart
- Medication Chart/Fluid Prescription Chart
- Observation Chart
- CDHB Fluid and Medication Manual
- Notes on Injectable Drugs
- Hospital Health Pathways

Introduction

Naloxone is a competitive antagonist to opioid drugs, and most commonly used to treat opioid overdose. Naloxone is administered parentally, as it has little effect when given orally or sublingually due to a high first pass effect. Naloxone has a half-life of approximately 60 minutes. **It is important to note that this is shorter than most opioid drugs.** Therefore close patient monitoring is required, as repeat doses may be needed to maintain the clinical effect.

Indications for use

Naloxone can be administered to reverse the following adverse opioid-related effects. Opioid side effects may be reversed without affecting analgesia; this is because analgesia occurs with lower plasma concentrations of opioid than those that are usually required to cause these side effects. With appropriate dose titration of naloxone, the goal is to reverse the unwanted opioid effect, yet still maintain some analgesia.

Common situations where use of naloxone may be appropriate:

- Opioid-Induced Ventilatory Impairment
- Respiratory depression
- Excessive sedation

- Pruritus
- Opioid related nausea and vomiting

It is important to note that the doses of naloxone used will vary according to the indication for use and severity of this.

The preferable route of administration is intravenous; however subcutaneous or intramuscular administration may be considered in situations where IV access is not available.

Opioid Induced Ventilatory Impairment (OIVI)

The depressant effects of opioids on the CNS can be divided into 3 main areas – one or all of these can contribute to OIVI

Depression of respiratory drive - 'central respiratory depression'

Depression of consciousness – 'sedation'

Depression of supraglottic airway muscle tone – with concurrent sedation, patients may be unable to self-correct this, leading to airway obstruction resulting in hypoxia and hypercapnia. Detection and intervention is paramount.

Patients who are at risk of airway compromise during normal sleep (i.e. OSA or sleep-disordered breathing) are at particular risk of exacerbation due to opioids.

Central Respiratory Depression

This is the most commonly known side effect of opioids due to alterations in the intrinsic cyclical activity, and CO2-driven respiratory drive in the inspiratory centre, compromise the usual mechanisms that drive breathing - reducing the frequency of inspiration.

Sedation

Opioid-induced sedation influences both arousal (response to a stimulus) and concentration (ability to remain alert).

In practice, the sedative effects of opioids usually manifest before respiratory effects. Therefore **sedation is an important early warning sign** – inappropriate reliance can be put upon the patient's respiratory rate.

It is therefore **very important** that patients who are sleeping are woken to check sedation

Patients who may be at increased risk of OIVI

- OSA or sleep-disordered breathing – note that many people with this are undiagnosed
- Obesity
- Opioid naïve or known sensitivity to opioids
- Opioid overdose
- Renal and/or liver impairment
- Intrathecal opioids
- Within the first 24 hours after surgery
- Concurrent benzodiazepines or other sedatives
- Fatigued/sleep deprived patients
- Pulmonary disease (i.e. COPD)

Strategies to reduce the risk

The patient should be in an appropriate environment according to their level of risk

Close monitoring – sedation scores, respiratory rate and oxygen saturations as per standing orders for opioid administration. Be aware that respiratory rate can remain normal in the presence of hypercapnia.

Minimising the use of drugs that increase the risk of OIVI – take a multi-modal, opioid-sparing approach to analgesia

Avoidance of concurrent sedative drugs where possible

Appropriate documentation and interventions

Appropriate systemic opioid prescriptions, particularly in opioid-naïve or elderly patients.

Supplemental O2 therapy as per standing orders, and where clinically indicated.

Naloxone Use

Potential adverse effects

Use of naloxone when it is not indicated, or in larger than recommended doses, can cause a rapid reversal of analgesia, leading to pain and distress.

Abrupt reversal of opioids may precipitate an acute withdrawal syndrome in people who are opioid tolerant. Symptoms may include restlessness, severe agitation, delirium, nausea and vomiting, sweating, shivering, abdominal pain, tachycardia, hypertension and tachypnoea

Naloxone Management

If the patient is difficult to rouse/unrousable (sedation score of 3) and/or respirations are less than 8 per minute:

- Perform Airway Breathing and Circulation (ABC) assessment
- Activate the Clinical Emergency Pathway as appropriate or alert Medical Staff immediately
- Administer oxygen according to prescription
- Reconsider further opioid dosing and cease as appropriate.
- Administer Naloxone as per prescription
- Contact APMS/Duty anaesthetist

Baseline Observations

Continue to complete 15 minute observations to determine the patients NZ EWS and perform a sedation score (or more frequent if clinically indicated) - the patient may need repeated boluses and/or a naloxone infusion due to its shorter duration of action.

Naxolone use for Respiratory Depression/Sedation: Adult Incremental bolus IV Naloxone dosing guidelines

Draw up 400mcg naloxone with Sodium Chloride 0.9% to make 10ml – this will give a concentration of 40mcg/ml.

Administer 40mcg (1mL) Naloxone IV – repeat every 3 minutes until the patient is rousable and breathing.

Emergency/Opioid overdose: Adult Incremental bolus IV Naloxone dosing guidelines

Draw up 400mcg naloxone with Sodium Chloride 0.9% to make 10ml – this will give a concentration of 40mcg/ml

Administer 100 - 200 mcg IV as a bolus (2.5 – 5 mLs) – repeat as necessary until the patient is rousable and breathing

Post bolus monitoring

Continue to complete 15 minute observations to determine the patients NZEWS and perform a sedation score (or more frequent if

clinically indicated) - the patient may need repeated boluses and/or a naloxone infusion due to its shorter duration of action.

Continuous infusion requirements

An IV naloxone infusion may be useful where repeated doses of naloxone are required, and/or in situations where patients have taken opioids with a longer duration of action (such as slow-release morphine or oxycodone, methadone or intrathecal morphine).

Naloxone infusions must be run within an **area with close and continuous oxygen saturation monitoring** with an RN special or in ICU, SPCU, OTU, PACU and CCU due to the risk of reoccurance of respiratory depression.

Naloxone infusions must be administered through a Volumetric Pump, and clearly labelled on the infusion line.

The Acute Pain Management Service will review the patient whilst the infusion is in progress.

Adult Naloxone IV Continous Infusion dosing guidelines

Draw up **400mcg Naloxone in 100ml bag of Sodium Chloride 0.9%** to make a concentration 4mcg/ml

The rate should initially set at 60% of the IV resuscitation dose per hour, then adjusted according to response

Monitoring requirements:

Respiratory rate and sedation score must be monitored ½ hourly for 2 hours, then hourly whilst on the Naloxone infusion. Sleeping patients **must** be woken to check sedation level.

Pain score monitoring should be monitored hourly when the patient is awake.

Monitor the Intravenous Cannula or Central Venous Access Device – if the peripheral line extravasates or is dislodged, it will need urgent resiting due to Naloxone's short duration of effect.

Naloxone use for opioid-related pruritus and/or nausea/vomiting

Pruritus is a reasonably common side effect of opioids. It is not associated with a rash and is not an allergic response. In situations of opioid-related pruritus, the patient will typically complain of itching over the trunk, face, and neck.

Pruritus does not always need treatment, particularly when it is not bothering the patient. In cases where it is disturbing to the patient, options may include switching opioids (i.e. from morphine to fentanyl). Other options include ondansetron, and naloxone – however it is important to balance this so as to not negatively affect analgesia.

Anti-histamines are not routinely recommended, as these often have little benefit and can significantly increase the risk of sedation.

Naloxone can be effective in the treatment of opioid induced nausea and/or vomiting. It is important to use small doses in this instance.

Recommended dosing of Naloxone for opioid-related pruritus or nausea and vomiting

As an incremental IV bolus for opioid related pruritis/nausea or vomitting:

Dilute 400mcg Naloxone with Normal Saline up to 20ml – to make a concentration of 20 mcg/ml **Administer 20 mcg increments naloxone every 10mins – max 4 doses/hr**

When adding to PCA for opioid related pruritis/nausea or vomitting

Add Naloxone 1-2 mcg/ml (50-100mcg per 50ml syringe)

Measurement or Evaluation

- APMS review of individual patients
- Incident management process

References

Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine (2015), Acute Pain Management Scientific Evidence, Second edition.

MacIntyre, P.E. and Schug, S.A. (2015). Acute Pain Management: A Practical Guide (4th Edition), CRC Press.