**Class:** Opioid analgesic, mixed opioid agonist-antagonist.

**Indications:** Moderate to severe acute pain, including myocardial infarction, premedication, peri-operative analgesia.

**Contra-indications:** Chronic use of morphine or other stong opioid agonist, e.g. hydromorphone, oxycodone.

**Pharmacology**

Nalbuphine is not a controlled drug. It has no place in the management of cancer pain. It is included in PCF because it is being used increasingly by paramedics for pre-hospital analgesia, e.g. for severe chest pain, fractures and burns.[1, 2] This has resulted in problems when given to patients already receiving long-term morphine. In this circumstance nalbuphine acts as an antagonist to morphine and may precipitate an opioid withdrawal syndrome with severe agitation and pain. Doses of morphine or diamorphine greater than expected are then needed to re-establish satisfactory analgesia.[3] Such patients should *not* receive nalbuphine; instead they should be given p.r.n. doses of their usual opioid analgesia. Patients who are opioid-naïve (i.e. are not physically dependent) and who need additional analgesic medication after the pre-hospital use of nalbuphine may also need greater than expected doses of morphine/diamorphine.[4]

Nalbuphine is a synthetic opioid which is structurally related to both naloxone and oxymorphone.[5] It is primarily a kappa agonist and a mu partial antagonist. Like other mixed agonist-antagonists, nalbuphine manifests a ceiling effect at about 30mg/70kg. Up to this level, the analgesic potency of nalbuphine is generally equivalent to that of morphine.[6] The depressant effect on respiratory function has a comparable ceiling.[7] However, in volunteers, naloxone 400microgram failed to completely reverse the respiratory depression associated with 60mg of nalbuphine.[8]

It is approximately 1/3 as potent as naloxone as an opioid antagonist.[9] Nalbuphine has been used successfully to reverse postoperative respiratory depression induced by fentanyl and oxymorphone.[10] Nalbuphine reverses pruritus caused by epidural morphine in opioid-naïve subjects without reversing analgesia.[11]

***Bio-availability*** 80% IM, SC.
***Onset of action*** 2-3min IV, 10-15min SC.
***Time to peak plasma concentration*** 30-40min IM, SC.
***Plasma halflife*** 2-3h.
***Duration of action*** 3-6h.[12]

**Cautions**

Increased intracranial pressure, renal impairment, hepatic impairment.
Sedation or respiratory depression is increased if nalbuphine is used with other CNS or respiratory depressants. After prolonged use, abrupt discontinuation may precipitate opioid withdrawal symptoms.

**Undesirable effects**

*For full list, see manufacturer's SPC*
Very common (>10%): sedation.
Common (<10% >1%): sweating, nausea and/or vomiting, dizziness/vertigo, dry mouth, headache.

**Dose and use**

Nalbuphine can be administered SC, IM or IV.

The injection solution is compatible with 0.9% sodium chloride, 5% dextrose, 4.3% dextrose plus 0.18% sodium chloride and Hartmann's solution used in glass, polyvinyl chloride (PVC) or polyethylene containers.

***Moderate to severe pain***

- starting dose 10–20mg for a 70kg adult
- adjust dose according to pain severity, the patient's physical status and other concurrent medication.

***Pain relief in suspected myocardial infarction***

- give by slow IV injection: some patients may achieve adequate relief on 10mg, others may need 30mg
- a second dose of up to 30mg may be given after 30min if the pain is not relieved.

**Supply**

Nubain® (Bristol-Myers Squibb 0208 572 7422)

***Injection* nalbuphine hydrochloride** 10mg/1ml amp = £0.70; 20mg/2ml amp = £1.08.

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