ii. Ketorolac
1. Adult: 30 mg IM or 15 mg IV
2. Pediatric age 2–16 years old: 0.5 mg/kg (maximum dose of 30 mg IM or 15 mg IV)

c. Nitrous Oxide

6. For Moderate to Severe pain, analgesics include:
   a. Morphine sulfate:
      i. 0.1 mg/kg IM, IV or IO (maximum initial dose is 10 mg)
   b. Fentanyl:
      i. 1 mcg/kg IN, IM, IV or IO (maximum initial dose of 100 mcg)
   c. Hydromorphone:
      i. 0.015 mg/kg IM, IV, or IO (maximum initial dose 2 mg; maximum cumulative dose of 4 mg)
   d. Ketamine:
      i. 0.25 mg/kg IM, IV or IO (maximum initial dose 25 mg; maximum cumulative dose 100 mg)
7. Use of non-invasive capnography is an earlier predictor of hypoventilation than pulse oximetry if opioid medications are administered
8. Consider administration of oral, sublingual, or IV antiemetics to prevent nausea [See Nausea/Vomiting Guideline]
9. If indicated based on pain assessment, and vital signs allow, repeat pain medication administration (excluding acetaminophen and nonsteroidal anti-inflammatory medicines) after 5 minutes of the previous dose
10. Transport in position of comfort and reassess as indicated

Patient Safety Considerations

1. All patients should have drug allergies identified prior to administration of pain medication
2. Administer opioids with caution to patients with Glasgow Coma Score (GCS) less than 15, hypotension, identified medication allergy, hypoxia (SPO_2 less than 90%) after maximal supplemental oxygen therapy, or signs of hypoventilation
3. Opioids are contraindicated for patients who have taken monoamine oxidase inhibitors (MAOI) during the previous 14 days
4. Avoid non-steroidal anti-inflammatory medications such as ibuprofen and ketorolac in patients with NSAID allergy, aspirin-sensitive asthma, renal insufficiency, pregnancy, or known peptic ulcer disease
5. Ketorolac should not be used in patients with hypotension (due to renal toxicity)
6. Use of splinting techniques and application of ice should be done to reduce the total amount of medication used to keep the patient comfortable

Notes/Educational Pearls

Key Considerations

1. Intranasal routes of opioid analgesia are preferred as the initial dosing route in pediatrics where IV access may be problematic; consider in other patient populations when an IV in not otherwise indicated
2. Onset of action is dependent on the pharmacokinetics of the drug class as well as route of administration; oral analgesics are effective for pain control but