

such as sleep, when the patient cannot control the infusion.

As with any type of analgesic management plan, continued assessment of the child's pain relief is essential for the greatest benefit from PCA. Typical uses of PCA are for controlling pain from surgery, sickle cell crisis, trauma, and cancer. Morphine is the drug of choice for PCA and usually comes in a concentration of 1 mg/ml. Other options are hydromorphone (0.2 mg/ml) and fentanyl (0.01 mg/ml). Hydromorphone is often used when patients are not able to tolerate side effects, such as pruritus and nausea from the morphine PCA. [Table 5-11](#) provides initial PCA settings for opioid-naive children.

TABLE 5-11

Initial Patient-Controlled Analgesia Settings for Opioid-Naive Children

Drug	Continuous Infusion Dosage	Bolus Dosage/Frequency
Morphine	0-0.02 mg/kg/h	0.02 mg/kg q 15-30 min
Hydromorphone	0-0.004 mg/kg/h	0.004 mg/kg q 15-30 min
Fentanyl	0-0.5 to 1 mcg/kg/h	0.5-1 mcg/kg q 10-15 min

Epidural Analgesia

Epidural analgesia is used to manage pain in selected cases. Although an epidural catheter can be inserted at any vertebral level, it is usually placed into the epidural space of the spinal column at the lumbar or caudal level (Suresh, Birmingham, and [Kozlowski, 2012](#)). The thoracic level is usually reserved for older children or adolescents who have had an upper abdominal or thoracic procedure, such as a lung transplant. An opioid (usually fentanyl, hydromorphone, or preservative-free morphine, which is often combined with a long-acting local anesthetic, such as bupivacaine or ropivacaine) is instilled via single or intermittent bolus, continuous infusion, or patient-controlled epidural analgesia. Analgesia results from the drug's effect on opiate receptors in the dorsal horn of the spinal cord, rather than the brain. As a result, respiratory depression is rare, but if it occurs, it develops slowly, typically 6 to 8 hours after administration. Careful monitoring of sedation level and respiratory status is critical to prevent opioid-