

opioid agents. When morphine is not a suitable opioid, drugs such as hydromorphone hydrochloride (Dilaudid) and fentanyl citrate (Sublimaze) are used. Codeine, a once commonly used oral opiate analgesic, is a weak opioid and has well-known safety and efficacy problems related to genetic variability in biotransformation (Yellon, Kenna, Cladis, et al, 2014; Racoosin, Roberson, Pacanowski, et al, 2013; World Health Organization, 2012). For this reason, codeine is excluded as a recommendation for treatment of moderate pain in the *WHO Guidelines on the Pharmacological Treatment of Persisting Pain in Children with Medical Illnesses*. Dilaudid has a longer duration of action than morphine (4 to 6 hours) and is less associated with nausea and pruritus than morphine. Sublimaze is a synthetic product that is 100 times more potent than morphine (Tobias, 2014b).

### Safety Alert

The optimum dosage of an analgesic is one that controls pain without causing undesirable side effects. This usually requires titration, the gradual adjustment of drug dosage (usually by increasing the dose) until optimum pain relief without excessive sedation is achieved. Dosage recommendations are only safe initial dosages (see Tables 5-5 to 5-7), not optimum dosages.

**TABLE 5-5**

#### **Starting Dosages for Opioid Analgesics in Opioid-Naive Children (1 to 12 Years Old)**

Medicine	Route of Administration	Starting Dosage
Morphine	Oral (immediate release)	1 to 2 years old: 200-400 mcg/kg every 4 h 2 to 12 years old: 200-500 mcg/kg every 4 h (maximum: 5 mg)
	Oral (prolonged release)	200-800 mcg/kg every 12 h
	IV injection*	1 to 2 years old: 100 mcg/kg every 4 h
	SC injection	2 to 12 years old: 100-200 mcg/kg every 4 h (maximum: 2.5 mg)
	IV infusion	Initial IV dose: 100-200 mcg/kg <sup>a</sup> , then 20-30 mcg/kg/h
	SC infusion	20 mcg/kg/h
Fentanyl	IV injection	1-2 mcg/kg, <sup>†</sup> repeated every 30 to 60 min
	IV infusion	Initial IV dose 1-2 mcg/kg, <sup>†</sup> then 1 mcg/kg/h
Hydromorphone <sup>‡</sup>	Oral (immediate release)	30-80 mcg/kg every 3-4 h (maximum: 2 mg/dose)