Despite current research on the neonate's experience of pain, infant pain often remains inadequately managed. The mismanagement of infant pain is partially the result of misconceptions regarding the effects of pain on the neonate and the lack of knowledge of immediate and long-term consequences of untreated pain. Infants respond to noxious stimuli through physiologic indicators (increased heart rate and blood pressure, variability in heart rate and intracranial pressure, and decreases in arterial oxygen saturation [SaO_2] and skin blood flow) and behavioral indicators (muscle rigidity, facial expression, crying, withdrawal, and sleeplessness) (Clark, 2011; Oakes, 2011). The physiologic and behavioral changes, as well as a variety of neurophysiologic responses to noxious stimulation, are responsible for acute and long-term consequences of pain.

Several harmful effects occur with unrelieved pain, particularly when pain is prolonged. Pain triggers a number of physiologic stress responses in the body, and they lead to negative consequences that involve multiple systems. Unrelieved pain may prolong the stress response and adversely affect an infant or child's recovery, whether it is from trauma, surgery, or disease (see the Research Focus box).

Research Focus

Deep Intraoperative Anesthesia: Landmark Study

In the landmark study by Anand and Hickey (1992), 30 neonates received deep intraoperative anesthesia with high doses of the opioid sufentanil, followed postoperatively by an infusion of opioids for 24 hours; and 15 neonates received lighter anesthesia with halothane and morphine, followed postoperatively by intermittent morphine and diazepam. The 15 neonates who received the lighter anesthesia and intermittent postoperative opioids had more severe hyperglycemia and lactic acidemia, and four postoperative deaths occurred in the group. The 30 neonates who received deep anesthesia had a lower incidence of complications (sepsis, metabolic acidosis, disseminated intravascular coagulation) and no deaths.