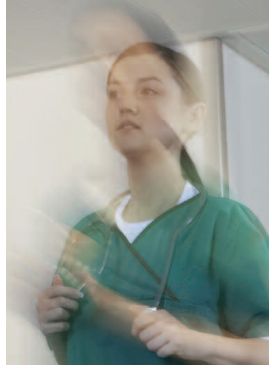

Barely breathing

Close assessment, quick response, and careful monitoring save a child's life.

By Danielle Van Damme, MSN, CPNP-AC, and Lauren Marentette, BSN, RN

After cleft palate repair, 16-month-old Nicholas* is admitted to the general care unit in a children's hospital for postoperative monitoring. Because of the nature of the procedure, Nicholas has a nasal trumpet sutured in place by the plastic surgeon to maintain airway patency. Nicholas's initial vital signs are 98.2° F (36.8° C) axillary temperature; heart rate (HR), 110 beats per minute (bpm); respiratory rate (RR), 24 breaths per minute; blood pressure (BP), 92/70 mm Hg; and oxygen saturation (SpO_2), 96% on room air.

Lauren, the bedside nurse, finds a sleepy toddler who awakens and cries during vital signs but falls back to sleep when he's not disturbed. About 15 minutes later, Lauren notes that Nicholas's SpO_2 is 92% and he continues to sleep. She applies blow-by oxygen for support because she's concerned the nasal cannula will not effectively deliver oxygen with a nasal trumpet in place. However, the SpO_2 drops to 89%. Concerned about the persistent hypoxia, Lauren calls the rapid response nurse for further assessment.

History and assessment

When Angela, the rapid response nurse, arrives, Nicholas's vital signs are HR 94, RR 12 breaths per minute, BP 90/68 mm Hg, and SpO_2 88%. During her exam, Angela notes that Nicholas is lethargic with shallow breathing and breath sounds that are clear and equal bilaterally.

Angela first attempts to suction the nasal trumpet to ensure patency, but the suction depth is limited because of the surgical repair. She positions Nicholas with the head of his bed elevated and in a neutral position to open his airway. Angela doesn't believe that the saturations are related to mucous or airway obstruction because his lung sounds are clear, with no evidence of retractions, and suctioning doesn't produce any secretions. She verifies that a bag valve mask is available at the bedside with the appropriate-size mask. When she reviews Nicholas's health record, Angela learns that he received a dose of morphine in the postanesthesia care unit immediately before transfer to the general care unit. Angela alerts the plastic surgery and pediatric intensive care teams about Nicholas's condition, and a decision is made to administer an opioid receptor antagonist.

Outcome

Angela administers 0.1 mg/kg of naloxone I.V. Nicholas immediately awakens and his SpO_2 improves to 96%. Because naloxone is short acting, Angela remains at the bedside to assess Nicholas's response. After about 20 minutes, he again becomes sleepy, his RR drops to 14 breaths per minute, and his SpO_2 drops to 89%. Angela administers a second dose of naloxone and places Nicholas on oxygen via facemask. He again has a good response and his SpO2 returns to 97%.

Lauren continues to monitor Nicholas, and he doesn't experience any further respiratory depression or require additional doses of naloxone. Rapid assessment and communication by Lauren and Angela led to Nicholas's clinical improvement and prevented a transfer to the pediatric intensive care unit.

Education

Opioid-induced respiratory depression (OIRD) is an emergency and can be life-threatening in children. Perform a thorough assessment to identify the possible causes of respiratory distress, and consider OIRD when you find clear lung sounds, slow RR, and lethargy. OIRD can be reversed with an opioid antagonist, such as naloxone. The recommended dose for I.V. naloxone is 0.1 mg/kg per dose for children who weigh less than 20 kg; for children who weigh more than 20 kg, the recommended dose is 2 mg I.V. Symptoms can reoccur after administering the opioid antagonist, so continuously monitor patients for at least 2 hours. ★

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*Names in clinical scenarios are fictitious.