

developing RDS, then extubating and placing on nasal continuous positive airway pressure (CPAP); this decreased the overall incidence of bronchopulmonary dysplasia, need for mechanical ventilation, and fewer air leak syndromes ([Gardner, Enzman-Hines, and Dickey, 2011](#)). Research is in progress to investigate the possibility of delivering an aerosolized surfactant ([Pillow and Minocchieri, 2012](#)). This method would decrease the problems associated with current delivery systems (contamination of the airway, interruption of mechanical ventilation, and loss of the drug in the ET tubing from reflux).

The goals of oxygen therapy are to provide adequate oxygen to the tissues, prevent lactic acid accumulation resulting from hypoxia, and at the same time avoid the potentially negative effects of oxygen and barotrauma. Numerous methods have been devised to improve oxygenation ([Table 8-5](#)). All require that the gas be warmed and humidified before entering the respiratory tract. If the infant does not require mechanical ventilation, oxygen can be supplied by nasal cannula or via nasal prongs in conjunction with CPAP (see [Oxygen Therapy, Chapter 20](#)). If oxygen saturation of the blood cannot be maintained at a satisfactory level and the carbon dioxide level (PaCO_2) rises, infants will require ventilatory assistance.

TABLE 8-5

Common Methods for Assisted Ventilation in Neonatal Respiratory Distress

Method	Description	How Provided
Conventional Methods		
Continuous positive airway pressure (CPAP)	Provides constant distending pressure to airway in spontaneously breathing infant	Nasal prongs ET tube Face mask
Intermittent mandatory ventilation (IMV)*	Allows infant to breathe spontaneously at own rate but provides mechanical cycled respirations and pressure at regular preset intervals	ET intubation and ventilator
Synchronized intermittent mandatory ventilation (SIMV)	Mechanically delivered breaths are synchronized to the onset of spontaneous patient breaths; assist/control mode facilitates full inspiratory synchrony; involves signal detection of onset of spontaneous respiration from abdominal movement, thoracic impedance, and airway pressure or flow changes	Patient-triggered infant ventilator with signal detector and assist/control mode; ET tube