Respiratory Emergency

Respiratory Failure

Effective pulmonary gas exchange requires clear airways, normal lungs and chest wall, and adequate pulmonary circulation. Anything that affects these functions or their relationships can compromise respiration. In general, the term **respiratory insufficiency** is applied to two situations: (1) when there is increased work of breathing but gas exchange function is near normal and (2) when normal blood gas tensions cannot be maintained and hypoxemia and acidosis develop secondary to carbon dioxide retention.

Respiratory failure is defined as the inability of the respiratory system to maintain adequate oxygenation of the blood with or without carbon dioxide retention. This process involves pulmonary dysfunction that generally results in impaired alveolar gas exchange, which can lead to hypoxemia or hypercapnia. Respiratory failure is the most common cause of cardiopulmonary arrest in children. **Respiratory arrest** is the complete cessation of respiration. **Apnea** is the cessation of breathing for more than 20 seconds or for a shorter period when associated with hypoxemia or bradycardia (Kline-Tilford, Sorce, Levin, et al, 2013). Apnea can be (1) central, in which both airflow and chest wall movement are absent; (2) obstructive, in which airflow is absent but chest wall motion is present; and (3) mixed, in which both central and obstructive components are present.

Respiratory dysfunction may have an abrupt or an insidious onset. Respiratory failure can occur as an emergency situation or may be preceded by gradual and progressive deterioration of respiratory function. Most clinical manifestations are nonspecific and are affected by variations among individual patients and differences in the severity and duration of inadequate gas exchange.

Diagnostic Evaluation

The diagnosis of respiratory failure is determined by the combined application of three sources of information:

1. Presence or history of a condition that might predispose the