

research. Although waveform analysis does not yet have standardized nomenclature, some clinicians use the angles of the waveform coupled with the quantitative value of ETCO_2 to classify the severity of asthma exacerbations. The severity of diabetic ketoacidosis (Fearon and Steele, 2002) and acidosis from gastroenteritis (Nagler, Wright, and Krauss, 2006) has also been researched in children and is used in some facilities.

When there is a change in the ETCO_2 value or waveform, assess the patient quickly for adequate airway, breathing, and circulation. Sedated patients may be hypoventilating and need stimulation. Intubated patients may need suctioning, have self-extubated or dislodged the tube, or have equipment failure or disconnection. Patients with asthma may have a worsening condition. Problems with the ETCO_2 monitoring system can include a kink in the sample line or disconnection. In general, check the patient first and then the equipment.

Bronchial (Postural) Drainage

Bronchial drainage is indicated whenever excessive fluid or mucus in the bronchi is not being removed by normal ciliary activity and cough. Positioning the child to take maximum advantage of gravity facilitates removal of secretions. Postural drainage can be effective in children with chronic lung disease characterized by thick mucus, such as cystic fibrosis.

Postural drainage is carried out three or four times daily and is more effective when it follows other respiratory therapy, such as bronchodilator or nebulization medication. Bronchial drainage is generally performed before meals (or 1 to $1\frac{1}{2}$ hours after meals) to minimize the chance of vomiting and is repeated at bedtime. The duration of treatment depends on the child's condition and tolerance; it usually lasts 20 to 30 minutes. Several positions facilitate drainage from all major lung segments.

Chest Physical Therapy

Chest physical therapy (CPT) usually refers to the use of postural drainage in combination with adjunctive techniques that are thought to enhance the clearance of mucus from the airway. These