Smoke inhalation is a multilevel insult to the pulmonary system.

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Inhalation injury represents an ongoing threat to patients with thermal injury. The magnitude of the disease severity is related to the multilevel insult to the pulmonary system. Asphyxiants present in inhaled smoke can compromise oxygen delivery, resulting in cell death. Also, early changes in the microcirculation of the lung parenchyma, related to polymorphonuclear cell activation and oxygen free radical production, are responsible for early pulmonary edema. Perhaps the most significant pathologic change caused by smoke inhalation is loss of the respiratory epithelium and the formation of tracheobronchial casts. The recent application of high-frequency flow interruption ventilation and intrapulmonary percussive ventilation has made the largest impact on improved survival in patients suffering from smoke inhalation.

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