

Title: <b>Nebulized Heparin for Smoke Inhalation Injury</b>		<b>Guideline</b>
<b>Patient Age Group:</b>	<input type="checkbox"/> N/A <input type="checkbox"/> All Ages <input type="checkbox"/> Newborns <input type="checkbox"/> Pediatric <input checked="" type="checkbox"/> Adult	

## DESCRIPTION/OVERVIEW

Mortality associated with smoke inhalation injury has been reported from 20-80%. Approximately 70% of all fire victims die within 12 hours post burn from smoke inhalation injury-related complications. Airway edema combined with obstructive casts produced from cellular debris, fibrin clots, polymorphonuclear leukocytes, and mucus are believed to cause airway obstruction contributing to pulmonary failure. Fibrin formation and deposition in the alveolar space is considered to be a hallmark of smoke inhalation induced acute lung injury.

Heparin inhaled in combination with N-acetylcysteine and albuterol significantly improve pulmonary function, decrease lung injury and improve survival in patients with inhalation injury.

## REFERENCES

- Enkhbaatar P, Trader DL. Pathophysiology of acute lung injury in combined burn and smoke inhalation injury. Clin Sci (Lond) 2004;107:137-43.
- Palmieri TL, et al. Inhalation Therapies. J Burn Care Res 2009;30:156-171.
- Miller AC, et al. Influence of nebulized unfractionated heparin and n-acetylcysteine in acute lung injury after smoke inhalation injury. J Burn Care Research 2009;30(2):249-255.

## AREAS OF RESPONSIBILITY

Medical Staff, Nursing, Respiratory Therapy, Pharmacy

## GUIDELINE PROCEDURES

### Inclusion Criteria:

- Adults
- History of inhaling smoke in an enclosed space
- Carboxyhemoglobin >10% on admission
- Carbonaceous sputum

### Exclusion Criteria:

- Known hypersensitivity to heparin or N-acetylcysteine or albuterol
- History of HIT (Heparin-Induced Thrombocytopenia)
- Hemoptysis
- Thrombocytopenia  $\leq 50,000$  platelets/mm<sup>3</sup> or a drop in platelets more than 50% from baseline

**Nebulized Treatment:** All nebulized medications are mixed and administered by respiratory therapists, and must be documented in the eMAR. The patient's nurse must serve as the witness to heparin nebulization in eMAR documentation. The nebulized therapy order set for inhalation injury includes all three medications listed below:

1. 5000 units heparin mixed in 3mL of NS Neb Q4H RT x 7 days
2. 2.5 mg albuterol in mixed in 3mL of NS Neb Q4H RT x 7 days
3. 600 mg (3 mL) of 20% N-acetylcysteine (Mucomyst) Neb Q4H RT x 3 days

**Monitoring:**

- Monitor patient's vital signs at baseline and per unit routine

**Notify prescribing physician or resident on call if:**

- Severe bronchospasm- wheezing not responsive to bronchodilator
- Stridor
- Increasing airway pressures
- Hypertension: SBP greater than 160 mm Hg or DBP greater than 100 mm Hg
- Arrhythmias
- Nausea/ vomiting

**DEFINITIONS**

SBP = Systolic blood pressure

DBP = Diastolic blood pressure

**SUMMARY OF CHANGES**

New document

**RESOURCES/TRAINING**

Resource/Dept	Contact Information
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**DOCUMENT APPROVAL & TRACKING**

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<b>Medical Director/Officer</b>	Christopher Lentz, MD		Y
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