



Shriners Hospitals for Children — Cincinnati
Burn Management
FREQUENTLY ASKED QUESTIONS



Temperature Management

How do I keep the patient warm?

Keep the patient covered at all times with dry dressings. Warming IV fluids, increasing ambient temperatures and Bair Huggers are all very helpful. Maintaining the patient's temperature is a priority. The room should be warmed, and the patient should be covered with dry sheets and blankets to prevent hypothermia. Warmed IV fluid (37-40°C) may be used for resuscitation.^[1]



Airway Management

How do I assess for INHALATION injury?

There are 3 distinguishable types of airway inhalation injury:

1. **Carbon monoxide poisoning;** Treatment is application of 100% oxygen
2. **Inhalation (thermal) injury** above the glottis; The patient may have a hoarse raspy voice, stidor respiratory distress and
3. **Inhalation (chemical and irritant) injury** below the glottis

What is considered a "CONFINED/ CLOSED SPACE?"

A confined/closed space is an area where smoke and heat cannot readily escape thereby increasing the risk of an inhalation injury.

How do I know if I need to INTUBATE?

Stridor, hoarseness of voice or cry, drooling, difficulty speaking, respiratory distress, and obvious swelling of the oropharynx are indications for emergent intubation. An

Airway Management continued

obtunded patient or a patient with absent airway reflexes mandates emergent intubation. Extensive total body surface area burns (> 40%) may also require intubation.^[1, 2] Flash facial burns, singed nasal/facial hair, and carbonaceous material (soot) in the nasopharynx or oropharynx are NOT absolute indications for emergent intubation as long as the patient is breathing comfortably and does not display any of the above mentioned signs.

What should I expect a burn patient's MENTAL STATUS to be like?

Typically, a burn patient is alert and oriented and may be in a significant amount of pain. If the patient is not alert, consider associated trauma/injury, carbon monoxide poisoning, cyanide poisoning, hypoxia, and hypoglycemia.^[1, 2]



Fluid Management/ Resuscitation

WHERE should I place an IV?

Preferably through unburned skin, but vessels underlying burned skin can be used if necessary.^[1] Preparation of the skin or burned tissue overlying the vessel to be cannulated should follow the same protocol as typical IV placement. If peripheral venous access cannot be obtained, Intraosseous lines can serve as temporizing measures until venous access is achieved.

How do I SECURE an IV?

Adhesive tape sticks poorly to burned skin. IV catheters can be secured using a gauze roll or Coban™ Self-Adherent Wrap if available.

WHO needs a FLUID BOLUS?

Routine fluid boluses should be avoided in order to prevent fluid overload (ie "fluid creep") that will exacerbate generalized edema and contribute to respiratory distress syndrome. In the absence of a

Fluid Management/Resuscitation continued

history of acute blood loss, initiate resuscitation fluids at the recommended rate.

What is "FLUID CREEP?"

"Fluid creep" refers to fluid overload that may result from overestimation of burn size, under appreciation of the limitations of standard hemodynamic monitoring methods in the burn patient, and inadequate reduction of fluid infusion in response to excessive urine output.^[3]

What are the GOALS for FLUID RESUSCITATION in a burn patient?

Fluid resuscitation should be aimed at maintaining tissue perfusion and organ function while avoiding the complications of inadequate or excessive fluid therapy. Peripheral vascular resistance markedly increases and cardiac output decreases in the early stages after thermal injury.

^[1] Tissue blood flow is diminished and redistributed. The edema that forms in injured tissue reaches its maximum in the second 24 hours post burn. Excessive volume of resuscitation fluid exaggerates edema formation leading to compromised local blood supply as well as contributing to worsened respiratory distress syndrome and prolonged time on the ventilator. Inadequate resuscitation can lead to shock and organ failure, most commonly acute renal failure.^[1]

Which burn patients REQUIRE a FOLEY CATHETER?

A patient with TBSA burns of 20% or more should have a Foley catheter placed in order to monitor urine output.

What is the best way to know that I am RESUSCITATING EFFECTIVELY?

Urine output is the best guide for ensuring the appropriateness of fluid resuscitation.

^[1] Insertion of a Foley catheter allows for the calculation of hourly urine output. Goal urine output: adults = 30-50 mL/hr; children <30kg = 0.05 mL-1 mL/kg/hr.^[1-3]

Fluid Management/Resuscitation continued

Is RINGER'S LACTATE or NORMAL SALINE better for a burn patient?

Either fluid can be used depending on ease of availability. If a burn patient has metabolic acidosis or is hyperchloremic or hypernatremic, Ringer's lactate would be preferred.



Pain Management

What is the best way to control a burn patient's PAIN?

IV morphine (0.1 mg/kg/dose, max 10 mg/dose) or fentanyl (1-2 mcg/kg/dose, max 200 mcg/dose) is indicated for control of pain associated with moderate to severe burns. Alterations in tissue blood flow resulting from the systemic inflammatory response syndrome associated with the burn make absorption of intramuscular or subcutaneous injections unpredictable.^[1] The use of IM injections is therefore not recommended due to this variable absorption and lag time to peak effect. IV administration is the recommended route.



Calculating TBSA (Total Body Surface Area)

For small burns

The most accurate way to estimate TBSA in small burns is to use the palmar surface of the patient's hand including the fingers. This represents approximately 1% of the patient's total body surface area. Assessment of the size of the palmar surface of the patient's hand and approximating it to the burn areas can aid in estimating the TBSA when burns are scattered or irregularly-shaped.^[1]

PALMAR METHOD (Patient's hand)



Burn Dressings

Cover the burn area with a clean, dry sheet. Covering burn wounds prevents air currents from causing pain in partial thickness burns. Ice or wet dressings should not be applied directly to the burn in order to avoid hypothermia and frostbite.^[1]

Do not apply topical antibiotic ointment if immediate transfer to Shriners is planned. If the patient is to be seen in the outpatient department apply bacitracin or polysporin and instruct the family to leave the dressing intact until seen at Shriners.



Threats / Pitfalls

MOST COMMON in management of burns \geq 20% TBSA

- Over/under resuscitation with IV fluids
- Endotracheal intubation when it is not necessarily indicated
- Lack of adequate temperature monitoring and warming resulting in hypothermia
- Inadequate measurement of the response to resuscitation with early placement of a Foley catheter and measurement of hourly urine output.^[1, 3]
- Hypothermia



Toxicology Considerations

Which burn patients require DECONTAMINATION?

Indications for decontamination of a burn patient are the same as for other patients and include, but are not limited to, exposure to corrosive agents on the clothes or skin and volatile fumes emanating from the patient or the patient's clothing (e.g. gasoline). Clothing should be removed and the patient's skin flushed with copious amounts of lukewarm water.

What is the recommended TREATMENT for CARBON MONOXIDE poisoning?

Humidified 100% oxygen should be administered by non rebreathing face mask or endotracheal tube until carboxyhemoglobin levels of less than 5% are

Toxicology Considerations continued

achieved.^[1, 3, 4] The approximate half-life of elimination of carboxyhemoglobin during treatment with high-flow oxygen is approximately 45 minutes. In room air, the approximate half-life is as much as 3 hours.

WHO should receive the CYANOKIT?

Cyanide poisoning usually results in sustained loss of consciousness, persistent, severe lactic acidosis, and hypotension. Seizures may also be seen. It is reasonable to consider administration of the Cyanokit to a patient with persistent, severe lactic acidosis and altered mental status of unclear etiology despite adequate oxygenation and ventilation. However, administration of the Cyanokit interferes with laboratory testing performed by colorimetric assay eg: AST, creatinine, magnesium, and bilirubin (see Cyanokit package insert for additional details.^[7-9] Therefore, the risks and benefits should be weighed carefully before administering the Cyanokit. Urine, sweat, tears, and other secretions become pink or red after Cyanokit administration.^[5]



Transfer a Patient

call 24/7 866-947-7840



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