BURNS: CHEMICAL/THERMAL INJURY

PURPOSE:

To outline the management of the patient injured by flame, conduction, hot liquid or caustic chemicals.

SUPPORTIVE DATA:

Fluid resuscitation is indicated for adults/children with burns greater than or equal 20% total body surface area (TBSA). Complications of chemical/thermal burns include: compartment syndrome, altered clotting, rhabdomyolysis, renal failure, and sepsis.

Chemical injuries may be local or systemic. Treatment consists of immediate water irrigation / use of neutralizing agents. Prolonged exposure increases the risk of deep tissue damage even after the chemical has been neutralized.

Burn time begins at the time of injury, not on admission. It is used to calculate the estimated fluid resuscitation. The American Burns Association consensus formula for fluid resuscitation is as follows:

- Fluid
  - Ringer's Lactate without dextrose: 2-4 mL/kg x % second and third degree burn surface area
- Volume
  - Half of total calculated volume given over the first 8 hours post-burn injury
  - Second half of total calculated volume given over the second 16 hours post-burn injury
  - Half of first day calculated volume given over next 24 hours and spread evenly
  - Increased fluids may be ordered to prevent rhabdomyolysis in patients sustaining high voltage or soft tissue injuries

ADMISSION ASSESSMENT:

1. Calculate the burn for percent & depth of burn (not to include first degree burns) using the Rule of Nines.
2. Assess for associated injuries.
3. Assess for pre-existing disease.
4. Assess for possible abuse/neglect when assessing burns (e.g., consistency of the history with the burn)
5. Perform nerve and circulation checks with circumferential burns of arms legs, neck and chest (e.g. check pulses and doppler pulses as applicable, check for tautness, warmth, color, capillary refill)
6. Assess for tetanus immunization status.
7. Assess for presence of jewelry and remove immediately.
   - Send jewelry to cashier for storage of valuables

ONGOING ASSESSMENT:

8. Monitor vital signs (VS), fluid intake, urine quantity and color as follows:
   - ICU: Every 1 hour
   - Ward: Every 2 hours during fluid resuscitation (burn time) for the first 12 hours, then a minimum of every 4 hours
9. Perform nerve and circulation checks with circumferential burns of arms, legs, neck and chest as follows:
   - ICU: every hour for the first 24 hours then a minimum of every 4 hours
   - Ward: every 2 hours for the first 24 hours then a minimum of every 4 hours
10. Assess pain level a minimum of every 4 hours (ICU: every hour).
11. Assess the burn for the following **daily:**
    - Percent and depth of burn (do not include first degree burns)
    - Hypergranulation
    - Signs of infection:
      - Change in color, presence of odor or excessive drainage

- Graft site sloughing
- Non-healing wounds

12. Ensure burn wound photo is obtained within 24 hours of admission and on discharge.
13. Obtain a weight upon admission then:
    - ICU: Every day
    - Burn ward:
      - Every Thursday
      - Every Monday and Thursday (Tube fed patients only)
      - Pediatrics: Every day

FLUID REPLACEMENT:

14. Administer fluids as ordered: order to include type, volume, rate, and route.

PREVENTION/ TREATMENT:

15. Obtain wound, nasal, urine and sputum cultures as ordered.
16. Administer continuous/routine pain medication as ordered.
17. Administer additional pain medication as ordered. Recommendation: a minimum of 30 minutes prior to all procedures/dressing changes.
    - Avoid subcutaneous or intramuscular injections due to delayed absorption
18. Implement burn wound dressing procedure as ordered:
    - Burn Service R.N. will debride wound as necessary
    - If patient out of Burn Area, collaborate with primary provider regarding burn service consultation

POSITIONING:

19. Elevate burned extremities at all times.
20. Apply double ace wrap to lower extremity burn prior to patient ambulation
21. Apply splints /rehabilitative appliance to prevent contractures.
22. Apply hand splints as ordered for 5 days post-grafting to burns over proximal interphalangeal joints immediately after cleaning wound. Discontinue splints after graft has taken.
23. Do not use pillow for patients with neck injury or ear burns.

REPORTABLE CONDITONS:

24. Notify the provider immediately for:
    - Deterioration in VS, neurovascular status
    - Urine output:
      - Less than 30 mL/hour (adults)
      - Less than 1 mL/kg/hour (pediatric patients)
    - Pink tinged, bloody, or tea-colored urine
    - Signs of wound infection
    - Abnormal lab values
    - Signs and symptoms (S/S) of fluid overload or deficit
    - S/S of pneumonia
    - Inability to relieve pain

COLLABO-RATION:

25. Collaborate with the following as indicated:
    - Rehabilitative medicine, PT/OT
    - Pediatric specialist
    - Dietary
    - Psychiatry
    - Social Services
    - Burn Pharmacy

PATIENT/FAMILY TEACHING:

26. Instruct on the following:
    - Notification of RN for increased pain or decreased sensation to dressed wounds
    - Pain management
    - Burn wound management
    - Medications
    - Activity/immobility
    - Life style changes
    - Purpose of dressings, splints, appliances, procedures, isolation
    - Need for increased nutrition to promote wound healing

- Signs/symptoms of infection, pneumonia

ADDITIONAL STANDARDS:

27. Refer to the following as indicated:
    - Artificial airway
    - Mechanical Ventilation
    - Grieving
    - Immobility
    - Indwelling Bladder Catheter
    - Intravenous Therapy
    - Pain Management
    - Restraints
    - Sedation and Analgesia (Intravenous) – ICU
    - Wound Management/ Vacuum Assisted Closure Therapy
    - Central Venous Catheter

DOCUMENTATION

28. Document in accordance with documentation standards.
29. Document in iView on the Quick View, Systems Assessment, and Burn Care Management Navigator bands.

Initial date approved:	Reviewed and approved by:	Revision Date:
11/94	Professional Practice Committee Nurse Executive Council Attending Staff Association Executive Committee	02/96, 10/00, 03/05, 4/09, 03/14, 03/15, 1/19