- Nursing roles during a disaster:
    - Role of the nurse during a disaster varies
    - Nurses may be asked to perform duties outside their areas of expertise and may take on responsibilities normally held by physicians or advanced practice nurses
    - A nurse may serve as the triage officer
    - New settings and atypical roles for nurses arise during a disaster
- Triage officers during a disaster:
    - A new nurse may serve as this position
- HICS:
    - Hospital incident command center
    - Assists hospitals in improving their emergency management planning, response and recovery capabilities for planned and unplanned events
    - Modification of ICS that is used by both hospitals and law enforcement agencies
- Disaster Triage
        - Assign tag color
            - Black - deceased or expectant
                - **Expectant**: Injuries are extensive, and chances of survival are unlikely even with definitive care. Persons in this group should be separated from other casualties, but not abandoned. Comfort measures should be provided when possible.
                - Unresponsive patients with penetrating head wounds, high spinal cord injuries, wounds involving multiple anatomic sites and organs, 2nd/3rd degree burns in excess of 60% of body surface area, seizures or vomiting within 24 hours after radiation exposure, profound shock with multiple injuries, agonal respirations; no pulse, no blood pressure, pupils fixed and dilated
            - Red - immediate
                - **Immediate**: Injuries are life threatening but survivable with minimal intervention. Individuals in this group can progress rapidly to expectant if treatment is delayed.
                - Sucking chest wound, airway obstruction secondary to mechanical cause, shock, hemothorax, tension pneumothorax, asphyxia, unstable chest and abdominal wounds, incomplete amputations, open fractures of long bones, and 2nd/3rd degree burns of 15%–40% total body surface area

        - Yellow - delayed
            - **Delayed**: Injuries are significant and require medical care but can wait hours without threat to life or limb. Individuals in this group receive treatment only after immediate casualties are treated.
            - Stable abdominal wounds without evidence of significant hemorrhage; soft tissue injuries; maxillofacial wounds without airway compromise; vascular injuries with adequate collateral circulation; genitourinary tract disruption; fractures requiring open reduction, débridement, and external fixation; most eye and central nervous system injuries
        - Green - minor
            - **Minimal**: Injuries are minor, and treatment can be delayed hours to days. Individuals in this group should be moved away from the main triage area.
            - Upper extremity fractures, minor burns, sprains, small lacerations without significant bleeding, behavioral disorders or psychological disturbances
    - Prioritize by acuity
        - Red = 1
        - Yellow = 2
        - Green = 3
        - Black = 4
- ABC assessment prioritization
    - Airway
    - Breathing
    - Circulation
- Emergency preparedness kits
    - Items to include
        - Back pack, personal identification, clean clothing, sturdy footwear; pocket-knife; 3-day supply of water; 3-day supply of non-perishable food; blankets/sleeping bag/pillow; first aid kit; adequate supply of prescription medications; battery operated radio; flashlight & batteries; credit card/cash/traveler’s checks; extra set of keys and full tank of gas in the car; cell phone; toiletries; matches in waterproof container
- Burns:
    - First, second, third degree burns
        - Which layers are involved:
            - First degree: also known as superficial

        - Reddened, blanches with pressure, dry, minimal or no edema and possible blister
        - Epidermis is involved
    - Second degree: also known as partial thickness
        - Blistered, mottled, red base, disrupted epidermis, weeping surface, edema
        - Epidermis and portion of the dermis
    - Third degree: also known as full thickness
        - Dry, pale white, red, brown leathery or charred, coagulated vessels may be visible, edema
        - Epidermis, dermis and sometimes subcutaneous tissue, may also involve connective tissue and muscle
    - Fourth degree: also known as full-thickness
        - Charred
        - Deep tissue, muscle and bone exposed
    - Example of each
    - First degree: sunburn, low-intensity flash, superficial scald
    - Second degree: scalds, flash flame and contact
    - Third degree: flame, prolonged exposure to hot liquids, electric current, chemical contact
    - Fourth degree: prolonged exposure or high voltage electrical injury
- Escharotomy
    - Patient education:
    - Watch for complications such as infection
        - Red, puffy, warm, foul odor
- Wound care
    - Nursing interventions:
        - Cleansing and gentle debridement (using scissors & forceps) during a regular shower or w/ patient in bed
        - Once daily shower & dressing change w/ an evening dressing change in the patient's room are often routine in burn centers
        - Extensive, surgical debridement done in OR
        - Patients find 1st wound care to be both physically & mentally demanding; provide emotional support & begin to build trust during this activity
        - INFECTION can cause further tissue injury & possible sepsis

        - Source of infection is likely the patient's own normal flora, mostly from skin, respiratory, & GI systems
    - Always wear PPE and use sterile gloves when applying ointments & sterile dressings
    - Permanent skin coverage is the primary goal à autograft (patient's own skin) or allograft (cadaver skin) is generally used; newer biosynthetic options are now available
    -
- Emergent phase
    - Nursing Interventions:
    - The emergent phase is the resuscitation phase
    - Primary concern is the onset of hypovolemic shock
    - Fluid:
        - Massive shift of fluids out of the blood vessels as a result of increased capillary permeability & can begin as early as 20 min post-burn
        - As capillary walls become more permeable, water, Na+, & plasma proteins (albumin) move into interstitial spaces & other surrounding tissue
        - Colloidal osmotic pressure decreases w/ progressive loss of protein from the vascular space àresults in more fluid shifting out of vascular space into the interstitial spaces à third spacing
    - Other sources of fluid loss are insensible
    - Net result is **intravascular volume depletion**
    - Electrolytes:
        - Major electrolyte shifts of Na+ & K+
        - Potassium shift develops d/t injured cells & hemolyzed RBCs release potassium into circulation à hyperkalemia
        - Sodium rapidly moves to interstitial spaces & remains there until edema formation ends à hyponatremia
    - Inflammation & Healing
        - Burning injury to tissues & vessels causes coagulation necrosis
        - Fibroblasts & newly formed collagen fibrils appear & begin wound repair w/in 1st 6-12 hrs after injury
        - Immunologic Changes
        - Skin barrier (normally 1st line of defense) is destroyed

        - PATIENT IS AT A GREATER RISK FOR INFECTION
    - Manifestations
        - Hypovolemic shock, Patients w/ larger burn may develop a paralytic ileus, w/ absent or decreased bowel sounds, Shivering may occur as a result of chilling that is caused by heat loss, anxiety, or pain, Patient may be frightened & need reassurance à give simple explanations of what to expect as you provide care
    - Nursing:
        - Care predominantly focuses on airway management, fluid therapy, & wound care
        - Airway management
        - Early endotracheal intubation to reduce need for emergency tracheostomy
        - Escharotomy in circumferential burns to neck &/or chest
        - If no intubation, 100% humidified O2 & place in high fowler's
        - Encourage TCDB (turn, cough, deep breathe)
        - Fluid therapy
        - Parkland (Baxter) formula
        - If electrical burn then require both fluids & mannitol (osmotic diuretic) to increase UO & overcome high levels of myoglobin & hemoglobin in urine
        - Assess for adequacy of fluid resuscitation using clinical parameters:
        - Urine output à 0.5-1.0mL/kg/hr; 75-100mL/hr for electric burns
        - Cardiac parameters à MAP >65, SBP >90, HR <120
- Nutrition in emergent phase
    - Early & aggressive nutritional support w/in several hours of burn injury can decrease complications & mortality, optimize burn wound healing, & minimize the negative effects of hypermetabolism & catabolism
        - Basal metabolic rate is 40-100x higher than normal w/ burn injury
    - Maintain NPO status until bowel sounds are heard, & then advance to clear liquids as prescribed

- Provide diet high in protein, carbohydrates, fats, & vitamins, w/ major burns requiring more than 5000 calories/day
- Monitor calorie intake & daily weights
- Failure to supply adequate calories & protein leads to malnutrition & delayed healing

- **Parkland (Baxter) Formula**
  - 4mL/kg x % of TBSA = total fluid requirements for 1st 24 hrs
  - Use Lactated Ringers
  - Application:
  - ½ of total in 1st 8 hrs
  - ¼ of total in 2nd 8 hrs
  - ¼ of total in 3rd 8 hrs
    - Formulas are guidelines. Fluid is given at a rate to produce 0.5-1 mL/kg/hr of urine output. The American Burn Association Consensus Fluid Resuscitation Formula has suggested 2-4mL/kg x % TBSA burned = total fluid requirements for 1st 24 hrs. This strategy avoids over-resuscitation of fluids or “fluid creep”.
- Example:
  - For a 70-kg patient w/ 50% TBSA burn:
  - 4mL x 70 kg x 50 = 14,000mL in 24 hrs
  - 7000mL (1/2) given in 1st 8 hrs
  - 3500mL (1/4) given in the 2nd 8 hrs
  - 3500mL (1/4) given in the 3rd 8 hrs
- Assessing severity of burns:
  - Severity of burn is determined by the:
    - Location
    - Depth
    - Extent
    - Patient risk factors
- Palmer Method
  - Used for patients with scattered burns
  - The patient’s hand (including fingers) is approx 1% TBSA
- ABC assessment prioritization:
  - Airway
  - Breathing
  - Circulation
- Rule of Nines
    - Calculate TBSA affected
    - Used for initial assessment because it is easy to remember

        - Legs = 18%, arms = 9%, genitals = 1%, head = 9%, posterior and anterior = 18%
    - Prioritize nursing interventions based on TBSA
        - Face & neck & circumferential burns to the chest or back:
            - May interfere w/ breathing as a result of mechanical obstruction from edema or leathery, devitalized burn tissue (eschar)
            - May also indicate possible smoke or inhalation injury
        - Hands, feet, joints, & eyes
            - Make self-care difficult & may jeopardize future function
        - Hands & feet
            - Challenging to manage because of superficial vascular & nerve supply systems that must be protected while the burn wounds are healing
        - Ears and nose
            - Great risk for infection d/t skin is very thin and the underlying skeleton is frequently exposed
        - Buttocks or perineum
            - High risk for infection from urine or feces contamination
        - Circumferential burns to extremities
            - Can cause circulation problems distal to the burn, with possible nerve damage to the affected extremity
            - Patients may also develop compartment syndrome from direct heat damage to the muscles, swelling, &/or pre-burn vascular problems
        - Small thermal burns (<10% TBSA)
            - Cover w/ clean, cool, tap water-dampened towel for patient comfort & protection until medical care is available
            - Cooling w/in 1 minute of injury helps minimize depth of injury
        - Large (>10%) or electrical or inhalation burn
            - Focus on CAB à circulation (C), airway (A), breathing (B)
        - To prevent hypothermia, cool large burns for no more than 10 min
            - <u>Do not immerse burned body part in cool water because it may cause extensive heat loss</u>
        - Never cover a burn w/ ice à may cause hypothermia & vasoconstriction of blood vessels, thus further reducing blood flow to injury
        - Wrap pt in dry, clean sheet or blanket to prevent further contamination of the wound and to provide warmth
    - Fluid resuscitation
        - Fluids used, over what timeframes

- Modified Brooke: 5% albumin in isotonic saline, Lactated Ringers without dextrose
    - 0.5 mL to 15 mL/kg/%TBSA burn
- Parkland (Baxter): crystalloid only (lactated Ringers)
    - 4 ml/kg/%TBSA burn
- Modified Parkland: Crystalloid only (Lactated Ringer's)
    - 4 mL/kg/%TBSA burn + 15 mL/m2 of TBSA

■ Signs of adequate replacement

- Vitals are back to within normal limits
- No shortness of breath
- Urinating 30 mL per hour
- Electrolytes are within normal limits

○ Facial burns

■ Priority assessment:

- Airway, breathing and circulation
- May interfere w/ breathing as a result of mechanical obstruction from edema or leathery, devitalized burn tissue (eschar)
- May also indicate possible smoke or inhalation injury

○ Anticipated electrolyte imbalances:

■ Hyponatremia
■ Hyperkalemia
■ Hypocalcemia
■ Hypomagnesemia
■ Hypophosphatemia
■ Loss of fluids

○ Inhalation injury:

■ Treatment:

- Provide 100% humidified oxygen
- Fluid replacements
- Cover burns

■ Nursing interventions:

- Initial:
    - If unresponsive, <u>assess circulation, airway, & breathing,</u> If responsive, <u>monitor airway, breathing, & circulation</u>
    - Stabilize cervical spine
    - Assess for concurrent thermal burn
    - Anticipate ET intubation & MV w/ significant inhalation injury
    - Monitor VS, LOC, O2sat, & heart rhythm

                - Remove non-adherent clothing, jewelry, glasses, or contact lenses (if face was exposed)
                - Establish IV access w/ 2 large bore IV catheters if burn >15% TBSA
                - Begin fluid replacement
                - Insert indwelling urinary catheter if burn >15% TBSA
                - Elevated burned limb(s) above heart to decrease edema
                - Obtain ABG, carboxyhemoglobin levels, & CXR
                - Give IV analgesia & assess effectiveness frequently
                - Identify & treat other associated injuries (e.g. fractures, pneumothorax, head injury)
                - Cover concurrent burned areas w/ dry dressings or clean sheet
                - Anticipate need for fiberoptic bronchoscopy or intubation
            - Ongoing Monitoring:
                - Monitor airway, breathing, & circulation
                - Monitor VS, O2sat, heart rhythm, & LOC
                - Monitor pain level
                - Monitor urine output
        - Circumferential burns
            - Nursing interventions:
                - Can cause circulation problems distal to the burn, with possible nerve damage to the affected extremity
                - Patients may also develop compartment syndrome from direct heat damage to the muscles, swelling, &/or pre-burn vascular problems
                - We need to be watching patient circulation and watch for risk of compartment syndrome
        - Medication calculation
- ABC assessment prioritization
    - Airway
        - Most important step in performing the primary survey
        - If airway is no established, subsequent steps are futile
        - As a result of hypoxia, brain injury or death will occur within 3-5 minutes

        - If client is awake and responsive, airway is open
        - Inhalation injury, obstruction, penetrating wounds or blunt force trauma
    - Breathing
        - Once open airway is achieved the nurse should assess the breathing
        - Respirations, depth, auscultation, assessment of tracheal position, assessment of JVD
        - Anaphylaxis, flail chest, hemothorax and pneumothorax
    - Circulation
        - Assess the patients circulations
        - Assess HR, BP, peripheral pulses and capillary refill
        - Direct cardiac injury, pericardial tamponade, shock, uncontrolled external hemorrhage, hypothermia
    - Disability:
        - Head injury
        - Stroke
- Primary Survey
    - Components:
        - Primary survey is a rapid assessment of life-threatening conditions.
        - The primary survey should be completed systematically so life-threatening conditions are not missed.
        - Standard precautions are used (gloves, gowns, eye protection, face masks and shoe covers)
            - Should be worn to prevent contamination with bodily fluids
        - The ABCDE guides the primary survey
            - Airway
            - Breathing
            - Circulation
            - Disability (GCS and neuro assessment)
            - Exposure (gasses, hypothermia, hyperthermia)
    - Performing on a client
        - Primary survey is a rapid assessment on a patient
- ESI Triage
    - Assess acuity level
        - Level 1:
            - Needs immediate life-saving intervention
            - Airway, emergency meds or other hemodynamic interventions (IV, supplemental O2, ECG or labs don’t count), intubated, apneic, pulselessness, severe respiratory

distress, spo2 less than 90, acute mental status change or unresponsive
                - Unresponsiveness is define as either 1) nonverbal and not following commands or 2) requires noxious stimulus sclare
            - Level 2:
                - High risk situation, confused, lethargic, severe pain or distress
                - High risk: patient you would put in your last bed
                - Severe pain or distress: determined by clinical observation and/or patient rating of greater than 7
            - Level 3:
                - Danger zone vitals
                - SaO2 lower than 92%
                - RR >20 for 8 years older or not, >30 for 3-8 years old, >40of 3m - 3 years, >50 less than 3 months
                - HR >100 for 8 years and older, >140 for 3-8 years, >160 for 3 months - 3 years, >180 for less than 3 months
            - Level 4: only using on resource
                - Resources: Labs (blood, urine), ECG, X-rays, CT, MRI, US, angiography, IV fluids for hydration, IV or IM or nebulizer treatments, specialty consultation, simple procedure (lac repair, foley cath) is only 1 resource, complex procedure (conscious sedation) is two resources
                - Not a resource: History and physical, point of care testing, saline or heplock, PO meds, tetanus immunization, prescription refills, phone call to PCP, simple wound care like a dressing or a recheck, crutches, splints and slings
            - Level 5: not using any resources
        - Prioritize patients based on chief complaint and presentation
- Opioid overdose
    - Treatment:
        - Naloxone
        - A,B,C
        - Oxygen
        - Close monitoring
        - May need ventilation
- Acetaminophen OD
    - Manifestations:
        - Phase 1: (within 24 hours) malaise, diaphoresis, N/V
        - Phase 2: (24-48 hours) RUQ pain, abdominal pain, decreased urinary output, diminished nausea, elevated LFTs

        - Phase 3: (72-96 hours) N/V, malaise, jaundice, hypoglycemia, enlarged liver, possible coagulopathies including DIC
        - Phase 4: (7-8 days) recovery, resolution of symptoms or permanent liver damage, LFT remain high
    - Treatment:
        - Activated charcoal, N-acetlycysteine
- Hypothermia
    - Manifestations :
        - First stage:
            - Shivering, reduced circulation
        - Second stage:
            - Slow, weak pulse, slowed breathing, lack of coordination, irritability, confusion, behavior
        - Third stage:
            - Slow, weak or absent respirations, loss of consciousness
- Frostbite
    - Nursing Interventions :
        - Re-warming of the skin - use a bath water for 15-30 minute, skin may look soft and red
        - Provide pain medicine
        - Protect the injury - once thawed loosely wrap
        - PT
        - Wound care
        - Antibiotics
        - Clot busters
        - Hyperbaric oxygen chamber - involves breathing pure oxygen in a room
- Consent
    - Unresponsive patients :
        - If life saving measures need to be taken, no family is around and you don’t know the code of a patient, you do what needs to be done
- Heat Stroke
    - Manifestations:
        - Hypotension, tachypnea, tachycardia, anxious, confusion, unusual behavior, decreased LOC, seizures, coma
- Airway obstruction
    - Manifestations:
        - Stridor
        - Shortness of breath
        - Nasal flaring
        - Accessory muscle use

        - Cyanosis
        - Hypoxia
- RACE acronym for fire
    - Rescue
    - Alarm
    - Contain
    - Extinguish
- Carbon monoxide poisoning
    - Manifestations:
        - Dull headache
        - Loss of conscious
        - n/v
        - Shortness of breath
        - Weakness
        - Blurry vision
        - Confusion
        - Dizziness