Burns

Definition

A burn is a tissue injury caused by exposure to thermal, chemical, electrical or radiation energy. Burns are classified by their degree (depth) and size.

Pathophysiology

Burn injuries result in tissue damage, ranging from superficial damage to deep tissue or organs damage. These can lead to a range of complications such as hypovolemia, shock, infection and organ dysfunction.

Types/Forms

Burns are classified as first, second, third, and fourth-degree, based on their severity.

- A first-degree burn causes mild pain, redness, and swelling.
- Second-degree burns blister and can cause more severe pain.
- Third-degree burns penetrate through the entire skin layer, while fourth-degree burns result in additional damage to underlying structures.

Causes

Burns can happen to people of all ages and genders, and can be caused by a variety of factors including exposure to fire, hot or boiling liquids, electricity, chemicals, or even exposure to excessively cold temperatures. Burn injuries in children are more common because of their lack of awareness of their surroundings.

Clinical Manifestations

Clinical manifestations can include redness, swelling, blistering, charring, shock, and difficulty breathing. Pain is usually present and can vary in intensity depending on the degree and extent of the injury.

Diagnostic Criteria

A diagnosis of burns is usually made based on the physical examination and clinical presentation of the injury. In more severe cases, skin or tissue biopsy may be required.

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Treatment

Treatment of burns depends on the severity and extent of the injury. Treatment can include removing the heat source and cooling the affected area with running water, applying a sterile dressing, and administering pain medication. Advanced care, such as intravenous fluids, antibiotic therapy, and/or surgical intervention, may also be necessary.

The treatment of burns varies depending on the cause of the burn injury. Here are some common types of burns and their corresponding treatments

- **Thermal burns:** Thermal burns are caused by heat from flames, hot liquids, or objects. The first step in treating a thermal burn is to remove the source of the heat. If the burn is minor, it can be treated with cool running water and over-the-counter pain relievers. More severe burns may require medical attention, including IV fluids, pain management, and possibly surgical intervention.

- **Chemical burns:** Chemical burns are caused by contact with acids, alkalis, or other chemicals. The affected area should be flushed with cool running water for at least 20 minutes, and any contaminated clothing or jewelry should be removed. It is important to identify the type of chemical causing the burn, as different chemicals may require different treatments. In some cases, chemical burns may require medical attention, including IV fluids and wound care.

- **Electrical burns:** Electrical burns are caused by contact with electrical current. The first step in treating an electrical burn is to turn off the power source. Electrical burns can be deceptive, as they may not appear severe on the surface, but can cause significant internal damage. Electrical burns should be evaluated by a medical professional, as they may require medical attention, including IV fluids and cardiac monitoring.

- **Radiation burns:** Radiation burns are caused by exposure to radiation, such as from cancer treatment. Treatment may include topical wound care, pain management, and antibiotics to prevent infection.

- **Sunburns:** Sunburns are caused by exposure to ultraviolet (UV) radiation from the sun. Treatment includes over-the-counter pain relievers, cool compresses, and moisturizers to help soothe the skin. It is important to stay hydrated and avoid further sun exposure to prevent further damage to the skin.

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Contraindications/Cautions

Patients with burns may have underlying conditions (such as diabetes or heart disease) that can complicate treatment. Some medications may also interact with treatment options such as antibiotics, so it's important to inform your healthcare provider of any medical history and current medication use.

Complications

Burns can result in a variety of complications, which can range from minor to life-threatening, depending on the severity and extent of the burn injury. Some common complications include:

- **Infection**: Burns damage the skin's protective barrier, which increases the risk of infection. If bacteria or other pathogens enter the wound, they can cause infection, which can lead to sepsis (a potentially life-threatening condition).
- **Scarring**: Burns can cause scarring, which can be disfiguring and limit mobility. Severe burns may require skin grafts to prevent scarring.
- **Respiratory problems**: Burns that affect the face or throat can cause swelling that may obstruct the airway, making it difficult to breathe.
- **Hypovolemia**: Severe burns can result in fluid loss, which can lead to hypovolemia (low blood volume). This can cause low blood pressure, reduced blood flow to vital organs, and shock.
- **Contractures**: As burns heal, the skin may tighten and contract, causing deformities and limiting mobility.
- **Nerve damage**: Burns can damage nerves, resulting in numbness, tingling, or loss of sensation in the affected area.
- **Psychological effects**: Burn injuries can cause psychological trauma, such as anxiety, depression, and post-traumatic stress disorder (PTSD).

Gender and Age Differences

Burn injuries can happen to anyone regardless of age or gender, but children and the elderly are more susceptible to severe injuries.

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Nursing Assessment for Burns

- Assess the extent and severity of the burn injury, including the size and depth of the burn, the location of the burn, and the presence of any associated injuries.
- Assess the patient's pain level and response to pain management interventions.
- Assess the patient's vital signs, including heart rate, blood pressure, and respiratory rate.
- Assess the patient's fluid and electrolyte balance, including urine output and laboratory values such as serum electrolytes and blood glucose.
- Assess the patient's nutritional status and intake, as burns can increase metabolic demands and lead to malnutrition.
- Assess the patient's psychological and emotional state, including anxiety, depression, and coping mechanisms.

Nursing Diagnosis for Burns

- Impaired skin integrity
- Acute pain
- Risk for infection
- Risk for imbalanced fluid volume
- Imbalanced nutrition: less than body requirements
- Impaired gas exchange
- Disturbed body image
- Anxiety

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Nursing Management for Burns

- Monitor and manage the patient's fluid and electrolyte balance, including fluid resuscitation and electrolyte replacement as needed.
- Monitor and manage the patient's nutritional status, providing appropriate enteral or parenteral nutrition as needed.
- Monitor and manage the patient's wound care, including debridement, dressing changes, and topical or systemic antimicrobial therapy as appropriate.
- Monitor and manage the patient's respiratory status, including airway management, oxygen therapy, and pulmonary hygiene.
- Monitor and manage the patient's psychological and emotional needs, providing appropriate support and counseling as needed.
- Educate the patient and family on burn prevention, wound care, and rehabilitation strategies.
- Collaborate with the interdisciplinary team to provide comprehensive care for the patient, including physical therapy, occupational therapy, and social work services as needed.