COMMON MEDICAL SURGICAL CONDITIONS

CELLULITIS

- This is direct spread of infection of the tissues in the extracellular spaces.

Cause:

- Bacteria which release toxins into the subcutaneous tissues, streptococci and staphylococcus.

Predisposing factors

- Cracks and fissures in the skin e.g. between toes
- prick / injection sites
- contusions
- abrasions
- ulcerations
- in-growing toenails

Pathophysiology

- allows bacteria to enter and release toxins in the subcutaneous tissues

Signs / symptoms

- Acute onset of swelling
- localized redness(patches)
- pain
- fever
- chills
- sweating
- tender enlarged lymph nodes
- Skin sore or rash that starts suddenly, and grows quickly in the first 24 hours
- Tight, glossy, stretched appearance of the skin
- Warm skin in the area of redness

DIAGNOSIS

- History taking
- Physical examination
- Complete blood count
- Blood culture

Medical Management

- Oral antibiotic therapy in OPD if mild(cephalexin, amoxicillin and cloxacillin)
- Erythromycin and clindamycin are given to those patients allergic to penicillins.
- if severe, - admit, identify site of entry, IV antibiotics for 7 – 14 days to prevent recurrences
- Analgesics for pain
- Removal of dead tissues

Nursing Care

- Elevation of affected area higher than your heart to reduce swelling.
- warm moist packs at site for 2 – 4 hours with special attention for those with circulatory deficits e.g. diabetes to prevent burns
- education on prevention of recurrence
- skin and foot care for diabetics

COMPLICATIONS

- Subcutaneous abscess
- Blood infection (septicaemia)
- Bone infection (osteomyelitis)
- Inflammation of the lymph vessels (lymphangitis)
- Inflammation of the heart (endocarditis)
- Meningitis
- Shock
- Tissue death (gangrene)

ABSCESSES / FURUNCLES (BOILS)

- **An abscess** is an acute inflammatory condition surrounding a hair follicle, with pus and one opening for drainage.
- **A furuncle** is an acute inflammation arising deep in one or more hair follicles and spreading into the surrounding dermis.
- More prevalent to areas subject to irritation, pressure, friction, and excessive perspiration such as the back of the neck, axilla and the buttocks.
- **Cause**: Staphylococcal pyogens

Signs and symptoms

- Localized itching pimple which increases in size
- Surrounding area becomes hardened and painful
- pus forms, a yellow discharge occurs,
- sloughing is replaced by granulation tissue as healing commences.
- If healing / resolution occurs without pus, it is known as a `blind boil`.

CARBUNCLE

- This is a large number of abscesses / boils close together in a mass due to infection of multiple hair follicles especially at the back of the neck (NB> Diabetics are prone)

Management for boils and Cabuncles

- Urine is tested for sugar
- if present, administration of insulin
- administration of appropriate antibiotics
- if pus is present, incision and drainage

SUBCUTANEOUS ABSCESS

- This is a frequent complication of cellulitis
- **Signs and symptoms:** Classical signs and symptoms of inflammation are present (see cellulitis)
- **Treatment:** as above

LYMPHANGITIS AND LYMPHADENITIS

- **LYMPHANGITIS**
- Inflammation of the lymphatic vessels between the site of infection and the regional lymph glands, with characteristic red lines e.g. on the arm or leg of a patient suffering from a septic finger or toe.
- Recurrent episodes of lymphangitis are associated with progressive lymph-edema due to obstructed lymph drainage preventing protein molecules from returning to the circulation from the interstitial fluid.

LYMPHADENITIS

- Is inflammation of the lymph nodes (glands) or invasion by microorganisms carried through the lymphatic vessels which become enlarged, swollen and tender (i.e. acute lymphadenitis) or may necrose to form an abscess (i.e. suppurative lymphadenitis).
- Lymphangitis may be a sign that a skin infection is getting worse.

Cont…

- **Common sites:** The neck – from face, mouth, tongue and scalp; the axilla – from breast and upper limb; the groin – from lower limb, groin and perineum.
- **Cause:** Hemolytic streptococcus
- **After acute attacks, an elastic compression stocking or sleeve should be worn** on affected extremity for several months to prevent long term edema.

Signs and symptoms

- Chills
- Enlarged and tender lymph nodes (glands) -- usually in the elbow, armpit, or groin
- Fever
- General ill feeling (malaise)
- Headache
- Loss of appetite
- Muscle aches
- Red streaks from the infected area to the armpit or groin (may be faint or obvious)
- Throbbing pain along the affected area

Diagnosis

- History taking
- Perform a physical exam, which includes feeling your lymph nodes.
- Look for signs of injury around swollen lymph nodes.
- A biopsy and culture of the affected area may reveal the cause of the inflammation.
- A blood culture may be done to see if the infection has spread to the blood.

Management

- Antibiotics to treat any infection
- Pain medicine to control pain
- Anti-inflammatory medicines to reduce inflammation and swelling
- Warm, moist compresses to reduce inflammation and pain

BACTEREMIA

Definition

- Laboratory proven presence of bacteria in the bloodstream.
- **Causative organism:** Mainly staphylococcal
- **Causes**
- Nosocomial infections
- Vascular access device (VAD) short or long term
- Contamination can occur from the patient`s own flora access to exterior of a cannula / brannula during manipulation:
- Contaminated intravenous fluids.
- Indwelling catherters.
- Dental procedures(occasionally can be caused by tooth brushing)

Diagnosis

- Compete blood count
- Blood culture

Prevention

- Washing of hands and asepsis during procedures; for central catheter insertion, full surgical technique – face mask, scrubbing, gowning, gloving and draping of patient
- Disinfection of skin with chlorhexidine gluconate (hibitane) providone iodine or alcohol; gauze dressings used should be sterile and sealed along the entire perimeter.
- Give antibiotic before surgical procedures ie dental procedures

Cont…

- **Indications that patient has VAD Bacteremia**
- Brannula /cannula in situ, patient appears septic but has no obvious reason to suggest sepsis
- Vascular line insertion site is red, swollen or draining pus
- Patient has an IV line at onset of sepsis
- No infection at another body site
- Infection is caused by common skin organims (staphs, bacilli or corynebacterium)
- Patient remains septic after therapy but device still in situ

- Administration of antibiotics according to culture and sensitivity

Nursing intervention

- Monitor patient for evidence of infection to promote early detection and treatment
- Assess treatment effectiveness of all identified infections as the course of some infections may be rapid if treatment is not given
- Administer antibiotics, first dose promptly to improve outcomes

SEPTICAEMIA

- Is persistence multiplication of live bacteria in the blood. If untreated, patient goes into septic shock.
- Results from gram –ve bacteria
- Cocci (neisseria miningitidis, neisseria gonorrhoeae
- Escherichia – coli
- Salmonella

Signs and symptoms of septicaemia

- **Hyper-dynamic shock:**
- Sudden high fever and chills,
- rapid strong pulse (tachycardia ^ 90 bpms),
- rapid deep gasping respirations (hyperventilation),
- BP normal or slightly low,
- skin is flushed, warm and dry with dehydration,
- changed mental status(confusion, anxiety,)
- Abdominal pains
- Nausea, vomitting, diarrhea

Cont…

- **If infection is not treated**
- **Hypo-dynamic (hypovolemic) shock:**
- Pallor of mucous membranes,
- Cold clammy skin (due to vasoconstriction),
- Hyperventilation due to hypoxemia,
- Rapid weak thready pulse and
- Decreasing blood pressure (hypotension) as more plasma leaks into tissues
- Concentrated urine with low output (oliguria), diaphoresis

Management of septicaemia

- Administration of intravenous antibiotics immediately awaiting laboratory results

complications

- Endocarditis
- Pericarditis
- Meningitis
- Osteomyelitis
- Septic shock

PYAEMIA

- Is a grave form of septicemia in which blood borne bacteria lodge and grow in distant organs e.g. brain, kidneys, heart, lungs etc. to form multiple abscesses (covered under affected organs/systems)
- **Treatment**
- This will depend on the site of the abscess.

TOXEMIA/TOXIC SHOCK SYNDROME(TSS)

- This is a life threatening disease in response to toxins produced by strains of staphylococcus aureas mainly associated with menstruation e.g. in use of tampons.
- **Non – menstrual predisposing factors of blood poisoning include**
- Absorption of toxins from a local site of infection e.g. abscess, osteitis, skin and post – operative infections, cellulitis, mastitis, etc.
- Post – partum and post – abortion infections
- Infected burns
- Infected foreign bodies e.g. diaphragms, nasal packs, IUCDs etc.

Clinical manifestation

- **Classic sign – a red macular rash (diffuse macular erythroderma) in trunk or hands and feet**
- Sudden onset with fever (38.9 0C), chills, malaise, dizziness, muscle pain (myalgia), headache
- Vomiting, diarrhea, hypo-tension
- + or – signs of septic shock
- Inflammation of mucus membranes
- In 7 – 10 days, the skin becomes scaly or peels (desquamation)
- If severe,
- Acute Respiratory Distress Syndrome (ARDS) from pulmonary oedema and cardiac dysfunction
- Oliguria

Diagnostic findings/features

- Raised blood urea nitrogen (BUN) leading to disorientation
- Leucocytosis
- Increased bilirubin levels
- Uncontrollable hypotension
- Disseminated intravascular coagulation (DIC)

Medical Management

- ***The most important thing in treatment is removal and elimination of the source of infection.**
- Administration of intravenous fluids to restore volume
- Vasopressor for uncontrolled hypotension e.g. IV dopamine (neuro-transmitter related to adrenaline / nor-adrenaline – vasoconstrictor) to manage shock
- Antibiotics depending on culture and sensitivity of organism in the blood, pus or urine etc.
- Anticoagulants for DIC
- Irrigation of site of infection
- Oxygen administration in ARD
- catheter to monitor hypo-dynamic shock
- Psychological care

Nursing Management

- Assessment of factors e.g. tampon insertion, duration, absorbency, changing and trauma on insertion
- Collect specimens for lab investigations
- Assessment of effectiveness of treatment through vital signs and monitoring of complications e.g. DIC – hematomas, petechiae, oozing from puncture sites (anticoagulants), cyanosis, cold extremities, skin changes, neurological status
- Fluid input and output chart to monitor kidney function and hydration
- Detection and prevention of complications of immobility by exercises, physiotherapy, turning etc.

Nursing Management Cont…

- **Patient Education on self care on discharge**
- Long period before recovery, so patient must be prepared in participation
- Causes of TSS and steps to prevent recurrence e.g. if tampons, not to use them again; if used, to be changed at most every 4 hours, should not be super absorbent , and to avoid injury
- Diaphragms (AFP) should not be left in for longer than 8 hours, not used during menses or 3 months post partum as they pose a risk of infection during bleeding.

FUNGAEMIA

- This is also a nosocomial infection caused by a fungal organism.
- Bloodstream infection caused by fungal organism.
- **Fungal organisms that can also infect the CNS**
- **Worldwide** – Creptococcus neoformans, Histoplasma capsulatum (produces Chlamydia spores in infected tissue), Aspergillus, Candida albicans
- **Regional –** Coccidioides immitis (California, SW USA etc.)
- **Predisposing Causes, Prevention and Indications**
- Similar to bacteraemia

Treatment

- Anti-fungals depending on causative fungi. These are given for a period of time to cure the infection for patients with competent immune systems.
- Those with compromised immunity will receive treatment to control the infection, then a maintenance dose for an indefinite period of time.
- Drugs used include: Griseofulvin (for skin); Amphotericin B (Amphocin / Fungizone) is the standard treatment (IV if severe), also available in tablet form, lozenges and pessaries; Fluconazole (Diflucan); Flucytocine (Alcobon) – oral 200 mg / kg in 4 divided doses.

GANGRENE (MORTIFICATION)

- This is death of tissue and may be massive as in death of a whole limb or it may be localized e.g. fingertip or toe.
- When the process is slow and superficial and microscopic parts are dying in progression it is known as ulceration.
- Necrosis usually refers to death of internal organs, particularly bones.
- **Causes**
- Loss of blood supply from e.g. thrombosis
- Physical or chemical injury e.g. burns
- Infection e.g. gas gangrene
- Toxins e.g. snake bite venom

GANGRENE

- **Moist/wet Gangrene (Infective):**
- Develops as a complication of an untreated infected wound.
- Swelling resulting from the bacterial infection causes a sudden stoppage of blood flow.
- Cessation of blood flow facilitates invasion of the muscles by the bacteria and multiplication of the bacteria because disease-fighting cells (white blood cells) cannot reach the affected part

- There is inflammation and putrefaction (rotting). The tissues are moist and infection spreads rapidly. Toxic products are absorbed in the tissues near the gangrenous area. Dead tissue is called slough. If bone, it is called sequestrum. The area must be treated as a septic wound and amputation / sequestrectomy done as soon as possible.
- occurs in naturally moist tissue and organs such as the mouth, bowel, lungs, cervix, and vulva. Bedsores occurring on body parts such as the sacrum, buttocks, and heels — although not necessarily moist areas — are also wet gangrene infections

- **Dry Gangrene:**
- Dry gangrene is caused by a reduction of blood flow through the arteries.(ischemia)
- Is usually vascular and spread is slow it is commonly seen in people with blockage of arteries (arteriosclerosis) resulting from increased cholesterol levels, diabetes, cigarette smoking, and genetic and other factors. . Circulation stops and the part withers and dries up. If the part is kept dry, it may separate at a line of demarcation, the tissues left being healthy and viable. Usually affects the periphery.
- In most people, the affected part does not become infected.
- In this type of gangrene, the tissue becomes cold and black, begins to dry, and eventually sloughs off.

- **Gas Gangrene:**
- Gangrene is the death of body tissue.
- Gas gangrene is a type of wet gangrene caused by the bacteria known as *Clostridia*. *Clostridia* are a type of infection-causing bacteria that grow only in the absence of oxygen. As*Clostridia* grow, they produce poisonous toxins and gas; therefore, the condition is called gas gangrene.
- Gas gangrene, also known as clostridial myonecrosis, is a fast-spreading and potentially life-threatening form of gangrene caused by a bacterial infection. The infection causes toxins to release gas, which leads to tissue death.

Signs and symptoms

- Swelling
- Blisters that contain gas bubbles near the area of infection
- Increased heart rate
- High fever.
- Skin in the affected area often turns from pale to brownish-red.
- Symptoms progress at a very rapid rate.

Management of a gangrenous limb

- Keep the area / limb cool to reduce metabolism, and dry by exposure, and separated.
- Protect the part / limb from weight of bed clothes by a bed cradle and supported on a foam pad.
- Adequate relief of pain with analgesics.
- **Surgery and types**
- **Arterial surgery**:- for gangrene of digits
- **Amputation:-** Mid-thigh amputation for limb for better chances of healing
- **Lumbar Sympathectomy: -** to enhance vasodilatation of the collateral blood vessels if cause is vascular
- **Pre- and Post-operative care**

Dry vs. Wet Gangrene

Dry Gangrene

Wet Gangrene

Dry

Gangrene

Wet

Gaseous