كلية التقنيات الصحية و الطبية – الدور
قسم العلاج الطبيعي
المرحلة الثانية

العلاج الطبيعي للجراحة العامة

اعداد
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INTRODUCTION

WHAT IS REHABILITATION?

Rehabilitation (also called rehab) is a treatment program to help to recover from an illness or injury. It helps to relearn the skills of everyday life. Patient may learn new ways to:

- Eat, cook, dress, or bathe.
- Exercise to improve strength and balance.
- Improve ability to remember things or solve problems.
- Listen, read, speak, and write.

SURGICAL REHABILITATION.

Post-surgical physiotherapy can help to ease post-operative consequences seen with a number of surgical procedures, such as:

- Orthopedic.
- Cardiac.
- Thoracic.
- Neurological.
- Abdominal surgery

WHAT ARE THE DIFFERENT METHODS OF SURGERY?

- Open surgery - an "open" surgery means the cutting of skin and tissues so that the surgeon has a full view of the structures or organs involved such as renal transplant.
- Minimally invasive surgery - minimally invasive surgery is any technique involved in surgery that does not require a large incision Such as laparoscopic sx.

CLASSIFICATION OF SURGERY

1	**Immediate (emergency)**	**Within minutes of decision to operate such as RTA SX.**
2	**Urgent**	**Within hours of decision to operate and normally once resuscitation completed such as appendectomy**
3	**Elective**	**Planned such as elective CS**

INDICATIONS OF SURGERY

- Amputation / excision / resection / debridement (removal of dead)
- Reconnection reimplantation
- Repairing (anastomosis for vessels)
- Reduction
- Ligation
- Grafts
- Transplant / insertion of prosthetic parts (replacement)
- Clearing clogged ducts, blood or other vessels
- Removal of harm of foreign bodies
- Draining of accumulated fluids

General anesthesia

is a method of medicine inducing loss of consciousness that make patient un arousable even with painful stimuli. This effect is achieved by administering either intravenous or inhalational general anesthetic medications, which often act in combination with an analgesic and neuromuscular blocking agent. triad of 1**Unconsciousness 2Analgesia 3Muscle relaxation**

Spontaneous ventilation is often inadequate during the procedure and intervention is often necessary to protect the airway. General anesthesia is generally performed in an operating theater to allow surgical procedures that would otherwise be intolerably painful for a patient, or in an intensive care unit or emergency department to facilitate endotracheal intubation and mechanical ventilation in critically ill patients.

A variety of drugs may be administered, with the overall goal of achieving unconsciousness, amnesia, analgesia, loss of reflexes of the autonomic nervous system, and in some cases paralysis of skeletal muscles. The optimal combination of anesthetics for any given patient and procedure is typically selected by an anaesthetist

Side effects of general anesthesia can include:

- temporary confusion and memory loss, although this is more common in older adults
- dizziness
- difficulty passing urine
- bruising or soreness from the IV drip
- nausea and vomiting
- shivering and feeling cold
- sore throat, due to the breathing tube

However, older adults and those undergoing lengthy procedures are most at risk of negative outcomes. These negative outcomes can include:

- postoperative confusion
- heart attack
- stroke
- pneumonia

Some specific conditions increase the risk to the patient undergoing general anesthetic, such as:

- seizures
- existing heart, kidney, or lung conditions
- high blood pressure
- alcohol use disorder
- smoking
- history of reactions to anesthesia
- medications that can increase bleeding — aspirin, for example
- drug allergies
- diabetes
- obesity or overweight

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Hemorrhage

is a loss of blood from a damaged blood vessel. The bleeding can be minor, such as when the superficial vessels in the skin are damaged, leading to petechiae and ecchymosis.

The presentation of hemorrhage varies by anatomic location

There are three main types of bleeding: arterial, venous, and capillary bleeding. These get their names from the blood vessel that the blood comes from. Additionally, bleeding can be either external, such as what comes from a minor skin scrape, or internal, such as what comes from an injury to an organ or bone.

Classification of hemorrhage

1. Primary hemorrhage: occurring immediately due to an injury (or surgery).
2. Reactionary (reactive) hemorrhage : is delayed hemorrhage (within 24 hours) and is usually due to dislodgement of a clot by resuscitation, normalization of blood pressure and vasodilatation. Or due to technical failure (slippage of a ligature).
3. Secondary hemorrhage : due to sloughing of the wall of a vessel. 7–14 days after injury and is precipitated by factors such as infection, pressure necrosis (such as from a drain) or malignancy

The severity of hemorrhage is divided into a class system organized by the percent of blood volume loss.

Class I hemorrhage Up to 15% of blood volume loss. The patient is generally asymptomatic, and vital signs are within normal limits.

Class II hemorrhage is a loss of 15 to 30% of total blood volume. Common manifestations include complaints of nausea and fatigue. On physical exam, there will be pallor and cooling of the extremities. Vital signs will start to deviate from normal, with tachycardia being the first vital sign to increase (100 to 120 beats per minute), followed by an increased respiratory rate (20-24 breaths per minute).

Class III hemorrhage is 30 to 40% of total blood volume loss. Common manifestations include delayed capillary refill (greater than two seconds) and changes in mental status.. Vital signs may reflect a systolic less than 90 mmHg HR is greater than 120; changes in mental status; These changes represent the body attempting to maintain perfusion to the vital organs by constricting peripheral blood vessels.

Class IV hemorrhage is defined as greater than 40% of total blood volume loss. There is commonly a lack of urine output, absent peripheral pulses, and further deviations in vital signs. Severe hemorrhaging can lead to shock,

shock, which occurs when the blood loss becomes significant enough that it is unable to meet the oxygen demands of the tissue. Cellular aerobic metabolism shuts down, and anaerobic metabolism begins, leading to the production of lactic acid and, ultimately, metabolic acidosis. The risk is very high for organ failure, coma, and death

Shock

Shock is a life-threatening condition that occurs when the body is not getting enough blood flow. So it is inadequate tissue perfusion and oxygenation. Lack of blood flow means the cells and organs do not get enough oxygen and nutrients to function properly. Many organs can be damaged as a result. Shock requires immediate treatment and can get worse very rapidly. As many 1 in 5 people in shock will die from it.

Types of shock include:

- Hypovolemic shock : hemorrhagic , non-hemorrhagic (dehydration, 3rd space loss)
- Cardiogenic shock : CAD , arrhythmias , VHD , CMP
- Obstructive shock : pulmonary embolism(PE) , tamponade , tension pneumothorax
- Distributive shock : septic , anaphylactic , neurogenic(spinal cord injury)

Symptoms

A person in shock has extremely low blood pressure. Depending on the specific cause and type of shock, symptoms will include one or more of the following:

- Anxiety or agitation/restlessness
- Bluish lips and fingernails
- Chest pain
- Confusion
- Dizziness, lightheadedness, or faintness
- Pale, cold skin
- Low or no urine output
- Profuse sweating, moist clammy skin
- Rapid but weak pulse
- Shallow breathing
- Unconscious (unresponsive)

Monitor :

Minimum : 1 Blood pressure 2 Pulse oximetry 3 ECG 4 Urine output

Additional modalities : 1 Central venous pressure 2 Invasive blood pressure 3 Cardiac output 4 Base deficit and serum lactate

Treatment

- Resuscitation : IV fluid , blood in hemorrhage
- Blood transfusion (Indications : 1.active acute blood loss 2.perioperative anemia 3.chronic severe anemia)
  (Blood products are: whole blood, packed RBC, plasma(clotting factors), cryoprecipitate(fibrinogen+CFVIII), platelets)
- Vasopressor : norepinephrine in distributive shock
- Inotropes : dobutamine in cardiogenic shock

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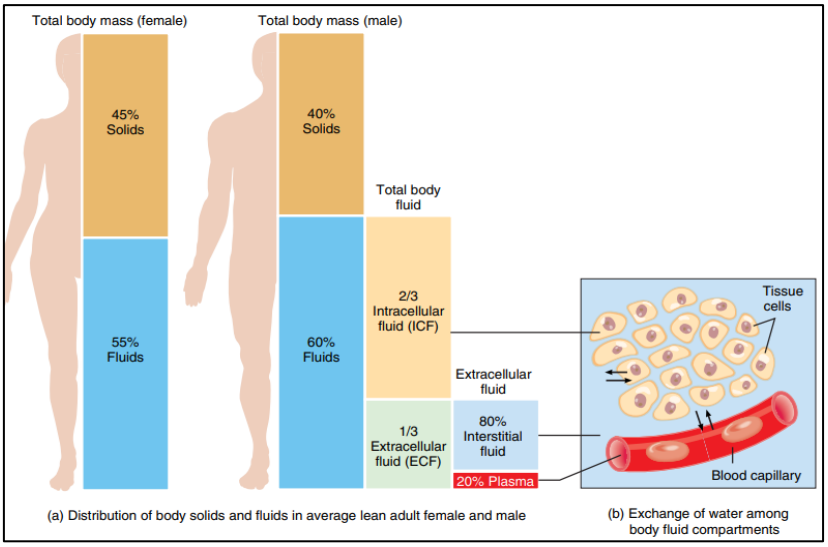
ELECTROLYTE ABNORMALITIES

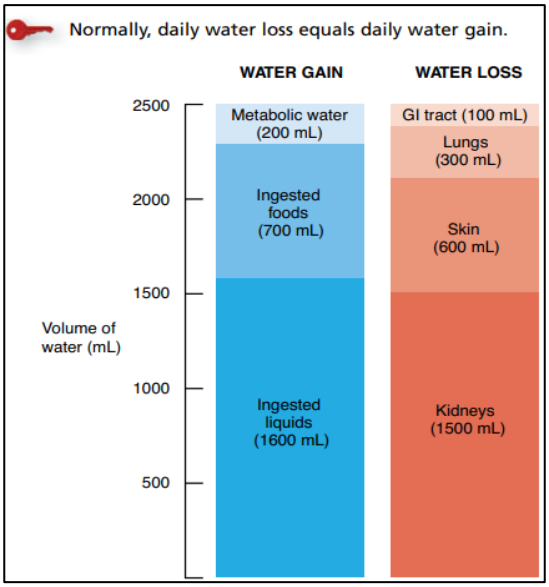
Electrolyte are substances located in the extracellular and intracellular fluid. Electrolytes are essential for basic life functioning, such as maintaining electrical neutrality in cells and generating and conducting action potentials in the nerves and muscles. Significant electrolytes include sodium, potassium, chloride, magnesium, calcium, phosphate, and bicarbonates. Electrolytes come from our food and fluids.

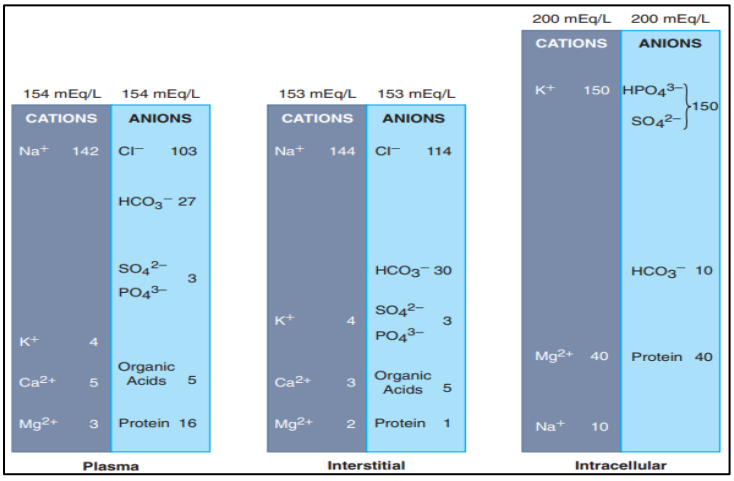
These electrolytes can be imbalanced, leading to high or low levels. High or low levels of electrolytes disrupt normal bodily functions and can lead to life-threatening complications.

Postoperative surgery patients are prone to electrolyte unbalance related to the loss of blood and bodily fluids, the stress response to surgery, intravenous fluid administration, blood transfusion, and the underlying surgical disease.

Crystalloid fluids — A variety of crystalloids are used in fluid resuscitation after surgery, including 0.9% sodium chloride, Lactated Ringer's (LR) solution, and balanced salt solutions such as glucose saline







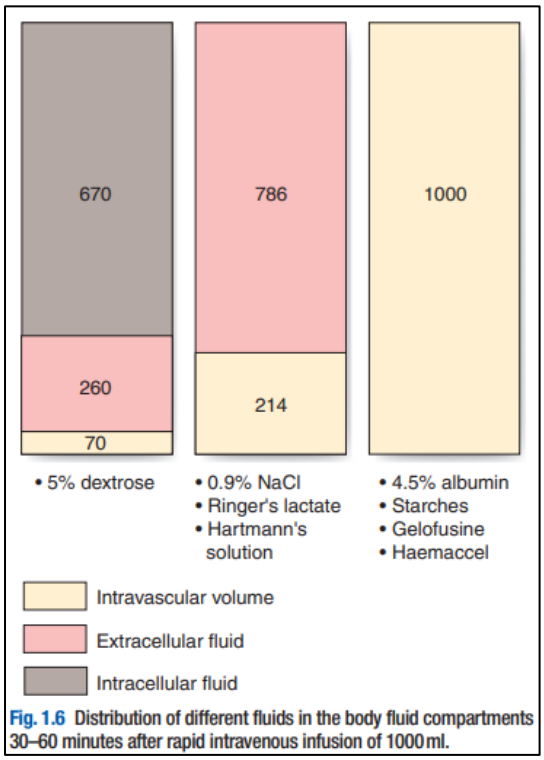


Fig. 1.6 Distribution of different fluids in the body fluid compartments 30–60 minutes after rapid intravenous infusion of 1000 ml.

TABLE 8-1. ELECTROLYTE CONTENT OF INTRAVENOUS FLUIDS

Solution (mEq/L)	Sodium	Potassium	Chloride	Bicarbonate
Normal saline (0.9% NaCl)	154	—	154	—
Ringer's lactate solution	130	4	109	28*
5% dextrose ½ normal saline	77	—	77	—

*Lactate is converted immediately to bicarbonate.

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Electrolyte Imbalances

Imbalance	Signs and Symptoms	Common Causes
Hypercalcemia Serum calcium level >10.5 mg/dL	Weakness, fatigue, anorexia, nausea, vomiting, constipation, polyuria, tingling lips, muscle cramps, confusion, hypoactive bowel tones.	Hyperparathyroidism or malignancies, thiazide diuretics, lithium, renal failure, immobilization, metabolic acidosis.
Hypocalcemia Serum calcium level <8.5 mg/dL	Anxiety, irritability, twitching around the mouth, convulsions, tingling/numbness of fingers, diarrhea, abdominal/muscle cramps, arrhythmias.	Low albumin level is most common, renal failure, hyperthyroid, ↑ magnesium, acute pancreatitis, Crohn's disease.
Hyperkalemia Serum potassium level >5.0 mEq/L	Weakness, nausea, diarrhea, hyperactive GI, muscle weakness and paralysis, arrhythmias, dizziness, postural hypotension, oliguria.	Potassium-sparing diuretics, NSAIDs, renal failure, multiple transfusions, ↓ renal steroids, OD of potassium supplements.
Hypokalemia Serum potassium level <3.5 mEq/L	Anorexia, nausea, vomiting, fatigue, ↓ LOC, leg cramps, muscle weakness, anxiety, irritability, arrhythmias, postural hypotension, coma.	Anorexia, fad diets, prolonged NPO status, alkalosis, transfusion of frozen RBCs, prolonged NGT suctioning.
Hypermagnesemia Serum magnesium level >2.7 mg/dL	Muscle weakness and fatigue are most common, nausea, vomiting, flushed skin, diaphoresis, thirst, arrhythmias, palpitations, dizziness.	↑ Magnesium intake, chronic renal disease, pregnant women on parenteral magnesium for pre-eclampsia, Addison's disease.

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POST-OPERATIVE COMPLICATION

Understanding the risks of surgery:

No surgery is risk-free, but understanding the possible complications can help patient makea better decision. Immediately before surgery, the surgeon will meet with patient and explain the potential risks for surgery. This process is called "informed consent" and is necessary. One of the best ways to lower risk is to choose a surgeon who performs the procedure regularly in a facility that is familiar with both the surgeon and the surgery.

Post-operative discomfort

The amount of discomfort following surgery depends on many things, including the type of surgery performed. Typical discomforts may include:

- Nausea and vomiting from general anesthesia
- Sore throat (caused by the tube placed in the windpipe for breathing during surgery)
- Soreness, pain, and swelling around the incision site
- Restlessness and sleeplessness
- Thirst
- Constipation and gas (flatulence)

Common surgical risks:

Complications of anaesthesia and surgery
General complications • Nausea and vomiting • Hiccups • Headache
Pulmonary complications • Pulmonary collapse • Pulmonary infection • Respiratory failure • Acute respiratory distress syndrome (ARDS) • Pleural effusion • Pneumothorax
Cardiac complications • Myocardial ischaemia/infarction • Cardiac failure • Arrhythmias • Postoperative shock
Urinary complications • Urinary retention • Urinary tract infection • Renal failure
Cerebral complications • Cerebrovascular accidents (CVA) • Neuropsychiatric disturbances • Delirium tremens
Venous thromboembolism • Deep venous thrombosis • Pulmonary embolism
Wound complications • Wound infection • Wound dehiscence.

SHOCK: Shock may be caused by blood loss, infection, brain injury, or metabolic problems.

Treatment may include any or all of the following:

- Stopping any blood loss
- Helping with breathing (with mechanical ventilation if needed)
- Reducing heat loss
- Giving intravenous (IV) fluids or blood
- Providing oxygen
- Prescribing medicines, for example, to raise blood pressure

HEMORRHAGE. Hemorrhage means bleeding. Rapid blood loss from the site of surgery, for example, can lead to shock. Treatment of rapid blood loss may include:

- IV fluids or blood plasma
- Blood transfusion
- More surgery to control the bleeding

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Wound infection and wound dehiscence: They delayed healing after surgery. When bacteria enter the site of surgery, an infection can result. Infections can delay healing. Wound infections can spread to nearby organs or tissue, or to distant areas through the blood stream.

Treatment of wound infections: Some patients take longer to heal than others, particularly people with more than one illness, such as Diabetics who have surgery typically have a longer healing time, especially if blood sugar levels are poorly controlled.

- Antibiotics
- Surgery or procedure to clean or drain the infected area

Deep vein thrombosis (DVT) and pulmonary embolism (PE). Together, these conditions are referred to as venous thromboembolism (VTE). This term is used because the conditions are very closely related. And, because their prevention and treatment is also closely related. A deep vein thrombosis is a blood clot in a large vein deep inside a leg, arm, or other parts of the body. Symptoms are pain, swelling, and redness in a leg, arm, or other area

The reason these clots develop, has to do with three possible factors.

1. Stasis, or lack of movement of blood in the legs during surgery as Muscle relaxants that are used as part of general anesthesia can increase the size of patient's leg veins during anesthesia — causing cracks in the vein lining — and they can slow blood flow out of the legs, both of which can result in DVT,
2. Hypercoagulability, increased clotting in the blood which could be due to genetic disorders, or stress.
3. Injury to the blood vessels themselves.

Pulmonary embolism. The clot can separate from the vein and travel to the lungs. This forms a pulmonary embolism. In the lungs, the clot can cut off the flow of blood. This is a medical emergency and may cause death.

Symptoms are:

- chest pain
- trouble breathing
- coughing (may cough up blood)
- sweating
- fast heartbeat
- fainting.

Treatment depends on the location and size of the blood clot. It may include:

- Anticoagulant medicines (blood thinners to prevent further clotting)
- Thrombolytic medicines (to dissolve clots)
- Surgery or other procedures

BREATHING PROBLEM. Most patients can be removed from the ventilator at the end of surgery. Some patients can require the ventilator longer. Such as those with pulmonary diseases, smokers, patients who are chronically ill and patients who required ventilator support prior to surgery. pulmonary complications arise due to lack of deep breathing and coughing exercises within 48 hours of surgery. They may also result from pneumonia or from inhaling food, water, or blood, into the airways. Symptoms may include wheezing, chest pain, fever, and cough (among others).

URINARY RETENTION OR DECREASE URINE OUTPUT. Temporary urine retention, or the inability to empty the bladder, may occur after surgery. Caused by the anesthetic, urinary retention is usually treated by the insertion of a catheter to drain the bladder until the patient regains bladder control. Sometimes medicines to stimulate the bladder may be given. decrease urine output could be as a result of dehydration

REACTION TO ANESTHESIA. Although rare, allergies to anesthetics do occur. Symptoms can range from mild to severe. Treatment of allergic reactions includes stopping specific medicines that may be causing allergic reactions. Also, administering other medicines to treat the allergy.

PRESSURE SORES DUE TO LACK OF MOBILITY .

DEATH DUE TO SURGERY

INJURY DURING SURGERY: during surgery there is a risk that parts of the body may be damaged. For example, a patient having surgery to remove their appendix may have an accidental injury to the intestine, which is attach to the appendix. This sort of injury may be detected during the procedure and treated immediately or may become an issue during recovery when medical staff detects the problem.

PARALYSIS CAUSED BY SURGERY: paralysis is uncommon but can happen during brain and spinal surgery and depending on the nature and location of the surgery, the risk may be greater.

POOR RESULTS AFTER SURGERY: A poor surgical outcome can include severe scarring, the need for additional surgery or a procedure that does not provide the desired results.

NUMBNESS AND TINGLING AFTER SURGERY:

Many patients experience numbness and tingling around their surgical site, for some it is a temporary condition. Creating an incision requires the surgeon to cut through nerves, which send messages between the body and the brain.If enough nerves are cut the area surrounding the surgical site may have numbness or a tingling sensation. Depending on the location of the damage, the nerve may regenerate, allowing sensation to return to the area over the course of weeks or months. In other cases, damage to the nerves may be too great for the body to repair, resulting in permanent numbness or tingling.

SCARRING AFTER SURGERY: Scarring after surgery is not always preventable, especially when a large incision or multiple incisions must be made. In elective surgery such as plastic surgery, an obvious scar can be a much larger issue as the surgery is typically done in a place

that is visible to others. Patients have a significant responsibility for the prevention of scarring. Following instructions from the surgeon is essential.

SWELLING AND BRUISING AFTER SURGERY:

Surgical site bruising and swelling are considered normal parts of the healing process after surgery. The severity can be influenced by many factors including the type of surgery, the amount of force required to complete the surgery, the type of the patient and the type of care given after surgery.

SO WE CAN CLASSIFY POST OP COMPLICATION INTO:

A-Immediate

1. Primary hemorrhage
2. Basal atelectasis: minor lung collapse.
3. Shock: blood loss, acute myocardial infarction, pulmonary embolism septicemia,
4. Low urine output (dehydration)
5. Injury during surgery

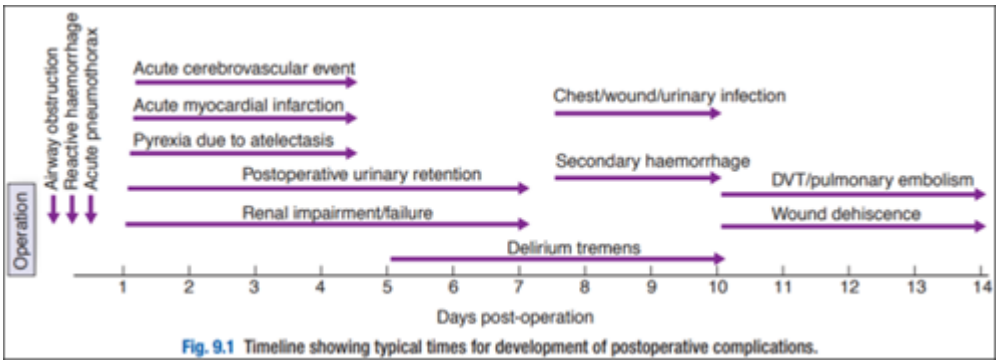


Fig. 9.1 Timeline showing typical times for development of postoperative complications.

B-Early

1. Pain and Acute confusion: dehydration, sepsis, pain, sleep disturbance, medication or
2. metabolic disturbances.
3. Nausea and vomiting: analgesia or anesthetic-related; paralytic ileus.
4. Fever.
5. Secondary hemorrhage: often as a result of infection.
6. Pneumonia, lung atelectasis
7. Wound dehiscence or infection
8. DVT , pulmonary embolism
9. Acute urinary retention + Urinary tract infection (UTI)
10. Pressure sores.

Causes of a fever in a postoperative patient
Days 0–2 • Physiological as response to tissue injury – low grade • Pulmonary collapse / atelectasis • Blood transfusions • Thrombophlebitis
Days 3–5 • Sepsis – wound infection • Biliary or urinary sepsis • Intra-abdominal collection • Pneumonia
Day 5–7 • Deep vein thrombosis (DVT) • Enteric anastomotic leak
> 7 Days • Intra-abdominal collection • DVT • Septicaemia.

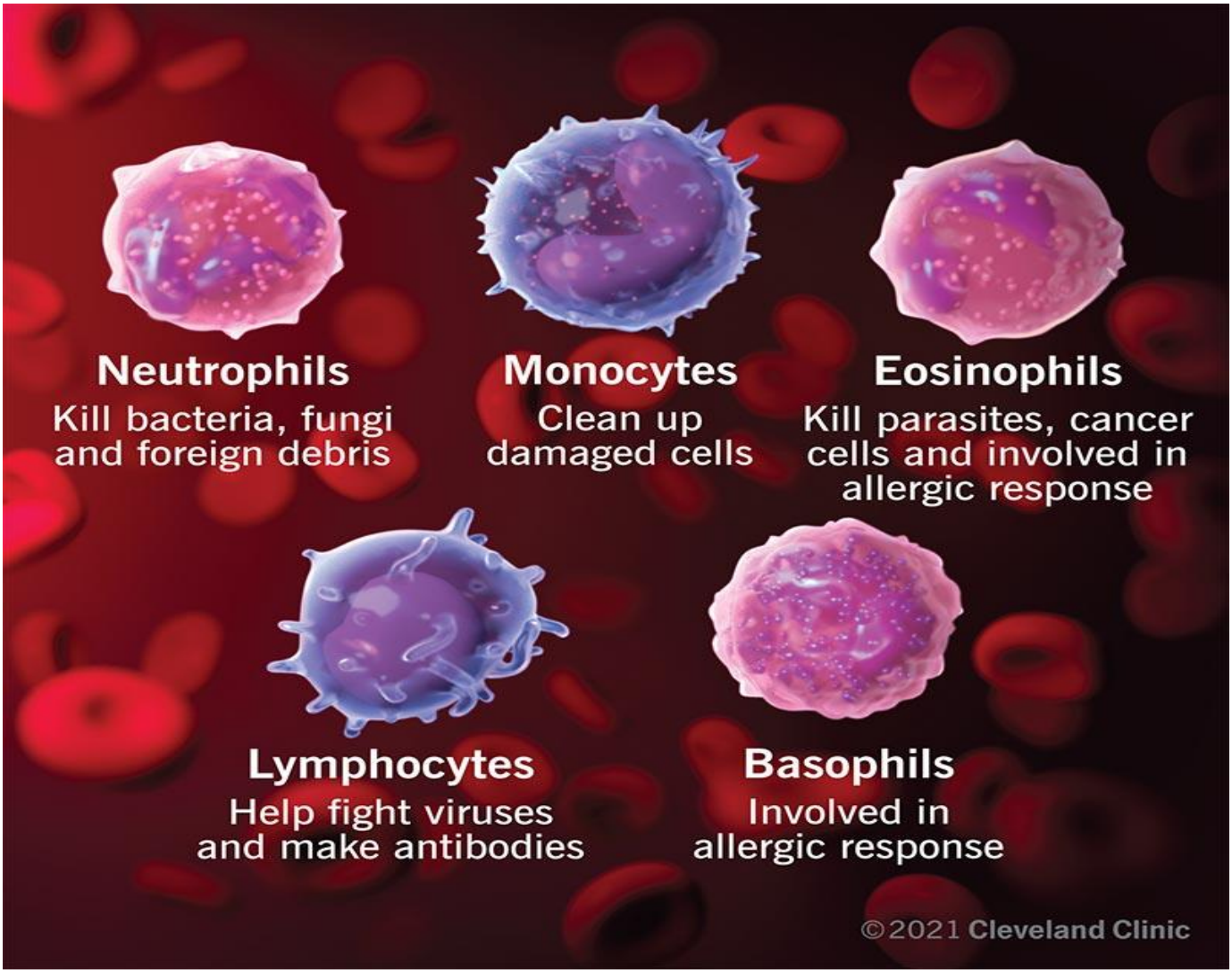
C. Late

1. Bowel obstruction due to fibrous adhesions.
2. Incisional hernia.
3. Persistent sinus.
4. Recurrence of reason for surgery - e.g. malignancy.
5. Keloid formation.
6. Cosmetic appearance

INFLAMMATION AND INFECTION

Types of white blood cells

- MONOCYTES. They have a longer lifespan than many white blood cells and help to break down bacteria and cleaning up damaged cells.
- LYMPHOCYTES. Consist of T cells, natural killer cells and B cells to protect against viral infections and produce proteins to help you fight infection (antibodies). They create antibodies to fight against bacteria, viruses, and other potentially harmful invaders.
- NEUTROPHILS**.** They kill and digest bacteria and fungi. They are the most numerous type of white blood cell and your first line of defense when infection strikes.
- BASOPHILS**.** These small cells seem to sound an alarm when infectious agents invade your blood. They secrete chemicals, such as histamine, a marker of allergic disease, that help control the body's immune response.
- EOSINOPHILS**.** They attack and kill parasites and cancer cells, and help with allergic responses.



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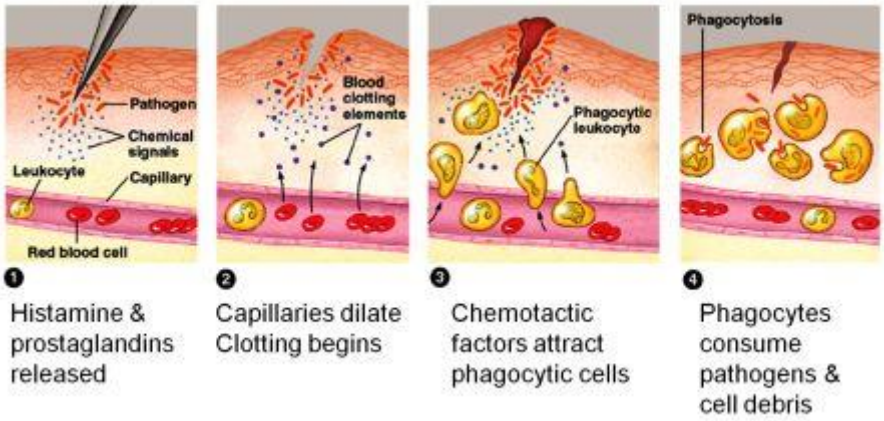
Infection and inflammation

You may hear the words infection and inflammation together, but they mean very different things. **Infection** refers to the invasion and multiplication of organism within the body, while **inflammation** is the body's protective response against harm, its purpose is an immediate response following an injury to repair and regenerate the living tissue

Infection can cause inflammation, where inflammation is a result of an infection.

Inflammation

Inflammation is the normal tissue reaction following an injury from a traumatic agent or growth of organisms, basically an infection. It's an interior reaction from the body's response through the process of white blood cells.



Signs and symptoms of inflammation

There are five symptoms that may be signs of an acute inflammation:

- Redness.
- Heat.
- Swelling.
- Pain.
- Loss of function.

Inflammation is beneficial as the body's defense protocol, but it if lasts too long in healthy tissue it can become damaging. The inflammation process begins immediately with the initial trauma. The arterioles in the surrounding tissues widen, allowing increased blood flow to the area causing the redness. This reaction increases permeability of the arterioles causing the white blood cells, prostaglandins (chemical mediators) and blood proteins and other fluid to build up in the injured location.

When this accumulation of fluid swelling happens, it compresses the nerves in the area—causing pain. Prostaglandins produced by the cells may cause irritation of the nerves and cause even more pain. At the site of injury, components transferred by the blood carry out the functions to protect the tissue by the white blood cells to eat the foreign bacteria, which begins the clotting process if bleeding is involved. This chemical process and increased blood supply cause the area to feel heated.

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ACUTE OR CHRONIC INFLAMMATION

There are two types of inflammation: acute and chronic. People are most familiar with acute inflammation. This is the redness, warmth, swelling, and pain around tissues and joints that occurs in response to an injury, When the body is injured, immune system releases white blood cells to surround and protect the area.

"Acute inflammation is how body fights infections and helps speed up the healing process,". "In this way, inflammation is good because it protects the body

In contrast, when inflammation gets turned up for a long time, and the immune system continues to pump out white blood cells and chemical messengers that prolong the process, that's known as chronic inflammation. "From the body's perspective, it's under consistent attack, so the immune system keeps fighting indefinitely,"

When this happens, white blood cells may end up attacking nearby healthy tissues and organs. For example, if patients are overweight and have more visceral fat cells — the deep type of fat that surrounds your organs — the immune system may see those cells as a threat and attack them with white blood cells. The longer they are overweight, the longer their body can remain in a state of inflammation.

Research has shown that chronic inflammation is associated with heart disease, diabetes, cancer, arthritis, and bowel diseases like Crohn's disease and ulcerative colitis.

Yet, because chronic inflammation can continue for a long time, it's not easy to know its exact impact. "It's a chicken-and-egg scenario,".

The following table summarizes some key differences between acute and chronic inflammation.

	Acute	Chronic
Cause	Harmful pathogens or tissue injury.	Pathogens that the body cannot break down, including some types of viruses, foreign bodies that remain in the system, or overactive immune responses.
Onset	Rapid.	Slow.
Duration	A few days.	From months to years.
Outcomes	Inflammation improves, or an abscess develops or becomes chronic.	Tissue death, thickening, and scarring of connective tissue.

It is essential to identify and manage inflammation and related diseases to prevent further complications.

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Factors that may increase the risk of chronic inflammation include:

- older age
- obesity
- a diet that is rich in unhealthy fats and added sugar
- smoking
- stress
- sleep problems

examples for long-term diseases that associate with inflammation include:

- asthma
- chronic peptic ulcer
- tuberculosis
- rheumatoid arthritis
- ulcerative colitis and Crohn's disease
- sinusitis
- active hepatitis

SYSTEMIC EFFECTS

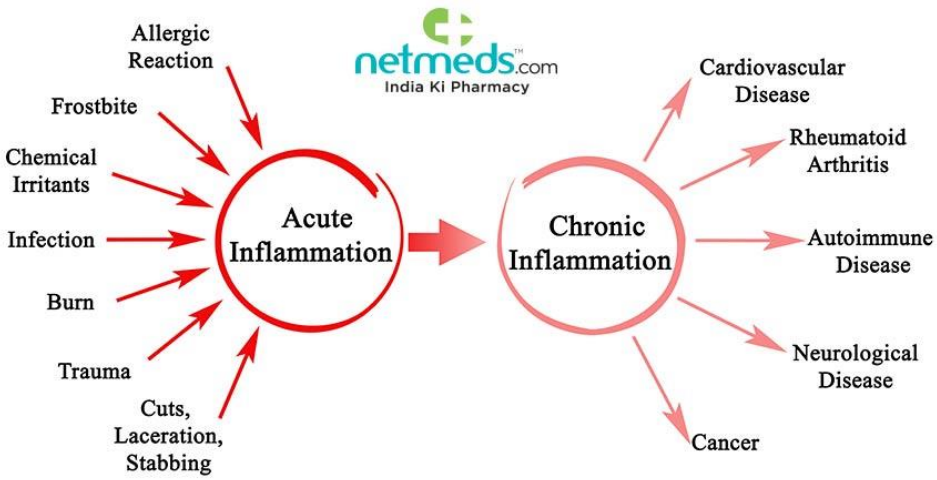
Inflammation plays a vital role in healing, but chronic inflammation may increase the risk of various diseases, including some cancers

Increased Acute-Phase Protein : (C-reactive protein, serum amyloid A, and serum amyloid P) are responsible for:
* Fever
* Increased blood pressure
* Decreased sweating
* Malaise,
* Loss of appetite
* Somnolence

Increased WBC (leukocytosis) : (normal range 4-11 $\times 10^9$ cell/µL)
Leukopenia can be induced by certain infections and diseases :
* viral infection
* tuberculosis
* Rickettsia infection
* some protozoa and cancers

CAUSES OF INFLAMMATION

Inflammation can result from a variety of factors, such as environmental chemicals, injuries, scrapes, insect stings, as well as radiation and pathogens including bacteria, fungi, parasite or viruses.



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COMMON TREATMENTS

Treatment of inflammation will depend on the cause and severity.

In terms of acute inflammation, a doctor may prescribe treatment to remove the cause of inflammation, manage symptoms, or both.

Acute inflammation

- Nonsteroidal anti-inflammatory drugs

Nonsteroidal anti-inflammatory drugs (NSAIDs) will not remove the cause of inflammation, but they can help relieve pain, swelling, fever, and other symptoms. They do this by countering an enzyme that contributes to inflammation(: Inhibit the cells from producing prostaglandins, a group of hormones that will create the reactions that cause pain

Examples of NSAIDs include naproxen, ibuprofen, and aspirin.

People should only use NSAIDs long term if a doctor recommends them, as they can have adverse effects. Aspirin is not suitable for children.

- Painkillrs

Acetaminophen, including paracetamol or Tylenol, can relieve pain but does not reduce inflammation. These drugs allow the inflammation to continue its role in healing.

- Corticosteroids

Corticosteroids, such as cortisol, are a type of steroid hormone. They affect various mechanisms involved in inflammation.

Corticosteroids Inhibit prostaglandins formation by the cells and inhibits the function of white blood cells. can help manage a range of conditions, including:arthritis, systemic lupus asthma

Long-term use of corticosteroids can be harmful. A doctor can advise on their risks and benefits.

Treatment for diseases that involve long-term inflammation will depend on the condition.

Some drugs act to repress the body’s immune reactions. These can help relieve symptoms of rheumatoid arthritis, psoriasis, and other similar autoimmune reactions. However, they can also leave a person’s body less able to fight an infection if it occurs.

- Antihistamines:

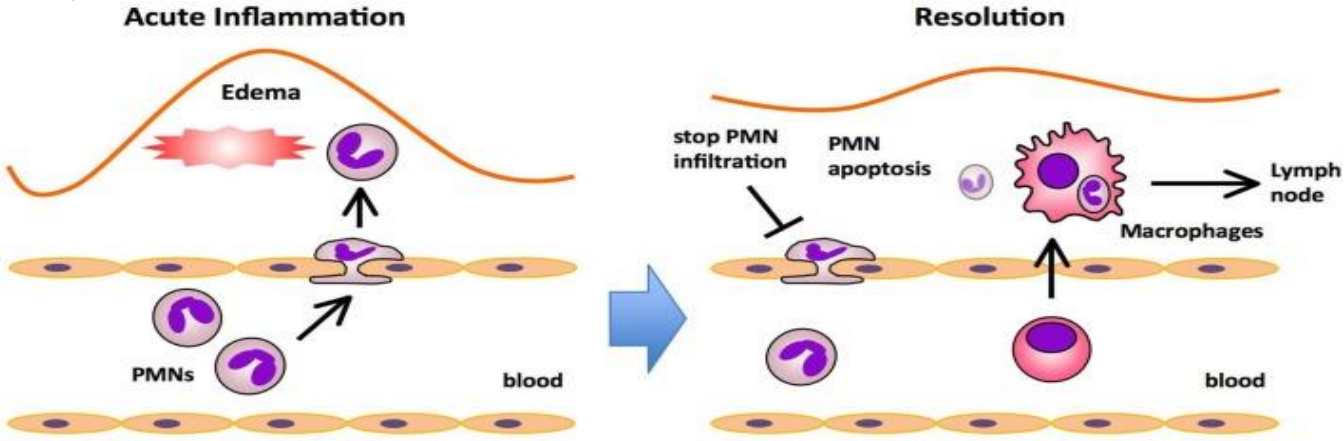
Histamine is produced by the white blood cells and causes local inflammation; these medications block the white blood cells from producing and secreting histamines.

- Hot and cold therapy:

Cold constricts the blood vessels, inhibiting inflammation by numbing the pain and cooling the area. Heat reduces inflammation and the build-up of fluid in tissues.

OUTCOMES

1. Resolution :complete restoration of the inflamed tissue back to a normal status. vasodilation, chemical production, and leukocyte infiltration cease, and damaged parenchymal cells regenerate
2. Fibrosis: scarring occurs in damage areas, which is composed primarily of collagen. The scar will not contain any specialized structures or parenchymal cells which lead to impaired function
3. Abscess formation : A cavity is formed containing pus, an opaque liquid containing dead white blood cells and bacteria with general debris from destroyed cells.
4. Chronic inflammation : In acute inflammation, if the injurious agent persists then chronic inflammation will ensue. This process, marked by inflammation lasting many days, months or even years, may lead to the formation of a chronic wound. Chronic inflammation is characterised by the dominating presence of macrophages in the injured tissue



INFECTION

An infection is different in that it occurs via the invasion of an organism (virus, bacteria, fungi, or parasites) that enters the body and causes issues. It's an exterior entry and growth of the organism.

Diagnosis :

1. Symptoms and Clinical picture
2. Microbial Culture : growth medium is provided for a specific agent which is isolated from the appropriate clinical specimen
3. Microscopy
4. Biochemical tests : metabolic or enzymatic products characteristic of a particular infectious agent. Serological methods and Immunoassay
5. PCR-based diagnostics

Pathophysiology :

A.Colonization (replication and invasion)
B.Disease (harm the host)
C.Transmission (spreads) by many routes like :

1. Droplet or airborne
2. Fecal-oral
3. Oral
4. Sexual
5. vertical
6. Direct contact
7. Iatrogenic
8. Vector-borne

Classifications :

Primary infection : initial infectious agent in host
Reinfection : recurrent infection with same pathogen
Secondary : by aid of another pathogen that lower the host immunity

Focal : infection is localized in same region
Dissiminated : spreaded through body

Exogenous : outside pathogen
Endogenous : by microbes present in the body as (normal flora) and change to pathogen outside its habitat or location

Nosocomial (hospital-acquired)
Subclinical : the symptoms/signs didn't appear
Latent : hidden & no symptoms/signs wait body immunity become low to proliferate
Carriers : carry infection and spread it but have no symptoms/signs

Acute infections develop suddenly and last a few days or weeks and are generally caused by a virus, infection injury, or improper use of drugs or medications. An acute infection such as a cold, flu, bronchitis, pneumonia, , burns, respiratory infection, or strep throat, often requires urgent short-term care.

Chronic infections is characterized by the continued presence of infectious virus following the primary infection and may include chronic or recurrent disease. Slow infection is characterized by a prolonged incubation period followed by progressive disease such as hepatitis B ,AIDS.

If left untreated could lead to chronic inflammation.

Symptoms of infection include fever or chills, body aches and pains, coughing or sneezing, digestive upset, and feeling tired or fatigued.

Treatment of infection depend on site and severity usually treated by antibiotics , anti-parasite and anti-viral drugs with symptomatic treatment.

WOUNDS & ULCER

Wounds

Definition : any disruption of or damage to living tissue, such as skin, mucous membranes, or organs. such as skin, mucous membranes, or organs.

Wounds can either be the sudden result of direct trauma (mechanical, thermal, chemical) [Acute wounds], or can develop slowly over time due to underlying disease processes such as diabetes mellitus, venous/arterial insufficiency, or immunologic disease [chronic wounds].

The four stages or phases of wound healing along an expected timeline.

The phase	Time	Cellular and Bio-physiologic Events
1.Hemostasis	minutes to hours after initial injury	1. vascular constriction 2. platelet aggregation, degranulation, and fibrin formation (thrombus)
2.Inflammatory	1 to 3 days	1. neutrophil infiltration 2. monocyte infiltration and differentiation to macrophage 3. lymphocyte infiltration
3.Proliferation	few days up to a month	1. re-epithelialization 2. angiogenesis Phase Cellular and Bio-physiologic Events 3. collagen synthesis 4. ECM formation
4.Remodeling / scar formation	12 months but can continue as long as 2 years	1. collagen remodeling 2. vascular maturation and regression

Acute Wounds

are classified as either :

- *Open wound* : is any injury whereby the integrity of the skin has been disrupted and the underlying tissue is exposed.
- *Closed wound* : is any injury in which underlying tissue has been damaged but the overlying skin is still intact.

Open wounds subclassified into :

1. Abrasions (grazes) : superficial wounds caused by the tangential application of blunt force usually associated with dirt
2. Incisional (cut) : caused by a sharp-edged object such as a knife, razor, or glass splinter.
3. Lacerations : irregular tear-like wounds caused by some blunt trauma.
   Lacerations and incisions may appear linear (regular) or stellate (irregular).
4. Avulsions : body structure is detached from normal point of insertion. It's a type of amputation where the extremity is pulled off rather than cut off
   Degloving: avulsion of skin.
5. Puncture / penetrating: caused by an sharp or tapered object puncturing the skin.
6. Gun-shot : 2 wounds (enter-exit) or through-and-through.

Closed wounds are subclassified into:

1. Hematomas (blood tumor) : caused by damage to a blood vessel that in turn causes blood to collect under the skin.

Hematomas that originate from internal blood vessel pathology or due to external source of trauma are : A. petechiae (<3mm) B. purpura(3-10mm) C. ecchymosis or bruises (>10mm).

2. Crush injury : caused by a great or extreme amount of force applied over a long period of time.

CHRONIC WOUNDS

Are wound that fails to heal in the expected time, which is usually less than 3 weeks. Delays in healing can occur at any phase of wound healing but most often occur in the inflammatory phase. (the most common chronic wound is Ulcer)

ULCER

Definition : It is a break in the epithelial continuity.

Common ulcer causes:

1. Diabetes mellitus
2. Venous/arterial insufficiency
3. Immunologic disease like arteritis
4. Pressure ulcer and bed sore
5. Chronic infection
6. Tumor/Malignancy

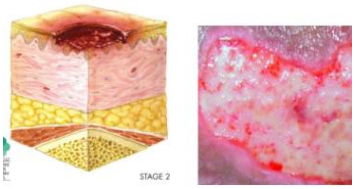
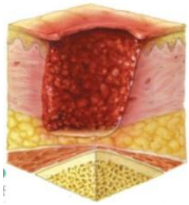
PRESSURE ULCER (PRESSURE SORE)

Definition: It is localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear." Pressure ulcers can range in severity from patches of discolored skin to open wounds that expose the underlying bone or muscle

Pathophysiology of pressure ulcer

- Perpendicular force
- Compresses tissue
- Restricts blood flow
- Causes ischemia and necrosis
- Ruptures cells and vessels
- Causes tissue deformation

Stages of pressure ulcer (pressure sore)

Stage	Definition	Description	Picture
1	Intact skin with nonblanchable redness of a localized area, usually over a bony prominence. – Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area	Area may be more painful, firm, or soft, or warmer or cooler than adjacent tissue. • it may be difficult to detect in persons with dark skin tones	
2	• Partial thickness loss of dermis presenting as a shallow open ulcer with a red/pink wound bed, without slough. • May also present as an intact or open/ruptured serum-filled or serosanguineous filled blister	• Presents as a shiny or dry shallow ulcer without slough or bruising	
3	• Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon, or muscle are not exposed. Some slough may be present. • May include undermining and tunneling.	• The depth of a stage III pressure ulcer varies by anatomical location. – The bridge of the nose, ear, occiput, and malleolus do not have “adipose” subcutaneous tissue and stage III ulcers can be shallow. • In contrast, areas of significant adiposity can develop extremely deep stage III pressure ulcers. • Bone/tendon is not visible or directly palpable	 
4	• Full thickness tissue loss with exposed bone, tendon, or muscle. – Slough or eschar may be present. • Often include undermining and tunneling	• The depth of a stage IV pressure ulcer varies by anatomical location. – The bridge of the nose, ear, occiput, and malleolus do not have “adipose” subcutaneous tissue and stage IV ulcers can be shallow. • Stage IV ulcers can extend into muscle and/or supporting structures (e.g., fascia, tendon, or joint capsule), making osteomyelitis or osteitis likely to occur. • Exposed bone/tendon is visible or directly palpable.	 
Unstageable	• Full thickness tissue loss in which actual depth of the ulcer is completely obscured by slough (yellow, tan, gray, green, or brown) and/or eschar (tan, brown, or black) in the wound bed	• Until enough slough and/or eschar is removed to expose the base of the wound, the true depth cannot be determined but it will be either a Stage III or IV	

It usually affect area of bony prominences (ischium, sacrum, heel, back)

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Assessment

Wound

- T Tissue both in and around the wound—granulation, slough, necrotic black, pink, mix.
- I Infection. Any open area always has the potential for infection.
- M Moisture (exudate). This determines type of dressing needed to maintain balance.
- E Edges. Are they contracted, rolling, undermining

Ulcer

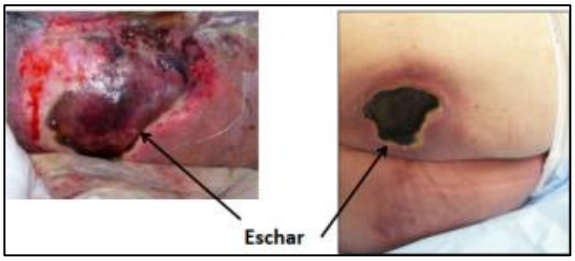
- Location
- Length, width, and depth
- Stage
- edges (attached, not attached, rolled under, irregular, callous)
- Exudate (amount, color, and consistency)
- Tunneling and/or undermining
- % of each type of tissue in wound (granulation, epithelial, eschar, slough, fibrinous)

Assessment Terms:

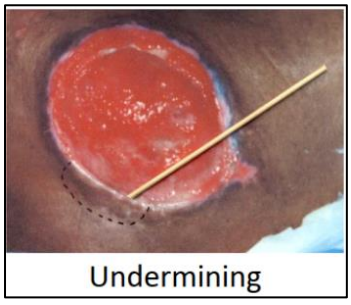
Eschar: Cornified or dried out dead tissue.

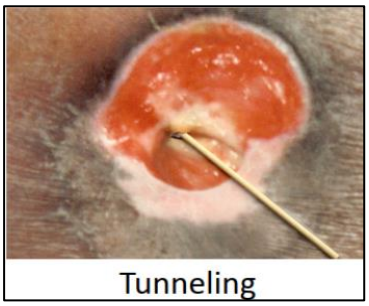
Slough: Liquefied or wet dead tissue.

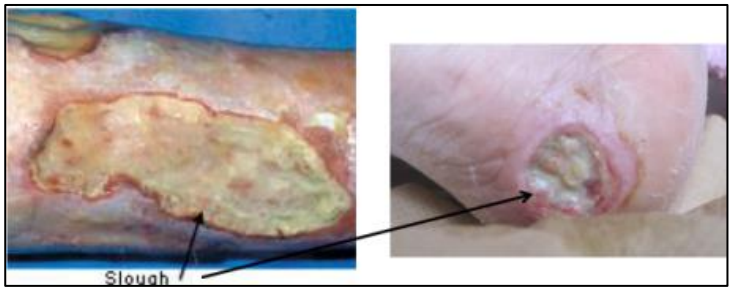
Undermining: Bigger area of tissue destruction than can be seen (extends under the edge).



Tunneling; Tracts extending out from the wound.


Undermining


Tunneling



Signs of trouble

- ✗ An increase in the size or drainage of the sore.
- ✗ Increased redness around the sore or black areas starting to form.
- ✗ The sore starts smelling and/or the drainage becomes a greenish color.
- ✗ develop a fever

How to know if the sore is healing

- ✓ The sore will get smaller.
- ✓ Pinkish tissue usually starts forming along the edges of the sore and moves toward the center
- ✓ Some bleeding may be present. This shows that there is good blood circulation to the area, which helps healing

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Factors Affecting Wound Healing

- Oxygenation
- Infection
- Foreign body
- Ischemia
- Venous sufficiency
- Age and gender
- Sex hormones
- Stress
- Diseases: diabetes, keloids, fibrosis, hereditary healing disorders, jaundice, uremia
- Nutrition
- Obesity
- Medications: glucocorticoid steroids, non-steroidal anti-inflammatory drugs, chemotherapy
- Alcoholism and smoking
- Immunocompromised conditions: cancer, radiation therapy, AIDS

Management

Wound

Wounds, whether caused by accidental injury or a surgical scalpel, heal in three ways:

1. primary intention (wound edges are brought together, as in a clean surgical wound)
2. secondary intention (the wound is left open and heals by epithelization)
3. third intention, or delayed closure (the wound is identified as potentially infected, is left open until contamination is minimized, and is then closed).

Sutures are the most commonly used means of wound closure, although staples and adhesive tissue tape may be more appropriate in certain circumstances. Sutures typically are removed after 3 to 14 days, depending on the area involved, the cosmetic result desired, the blood supply to the area, and the amount of reaction that occurs around the sutures.

Sutures on the face usually are removed in three to five days to avoid suture marks. Tape is often used to provide support for the remainder of the time the wound needs to heal. Sutures on the trunk or leg will be removed after 7 to 10 days or longer if there is much tension on the wound. Tension and scarring are minimized in surgical procedures by making an incision parallel to normal skin lines, as in the horizontal neck incision for thyroidectomy.

Ulcer

1. Keep pressure off the sore!
2. Maintain good hygiene. Washing with mild soap and water, rinse well, patient dry carefully (but gently). Do not rub vigorously directly over the wound.
3. Evaluate diet
4. Review mattress, wheelchair cushion, transfers, pressure releases, and turning techniques for possible cause of the problem.
5. If the sore seems to be caused by friction. protect the area by allowing the skin to slide easily.
6. If the sore does not heal in a few days or recurs, consultation to specialist

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IMMOBILIZATION COMPLICATION

Bed rest was first introduced as a medical treatment in the 19th century to minimize the metabolic demand on the body and enable a focus on healing and rest to promote recovery. Although bed rest and immobilization often benefit the acutely affected part of the body, but when prolonged, they often harm the rest of the body.

Problems arising from immobilization can complicate a primary disease or trauma and might actually become greater problems than the primary disorder.

Chronically ill, disabled, and geriatric people are particularly at risk.

Complications of immobilization are much easier to prevent than to treat.

A.Musculoskeletal complications

1. Muscle weakness and atrophy

The most obvious effect of prolonged immobilization is loss of muscle strength and endurance. A muscle at complete rest loses 10% -15% of its strength each week.

2. Contractures and soft tissue changes

Contractures: defined as fixed deformities of joints as a consequence of immobilization, and develop when normal elastic tissue are replaced with inelastic fibrous tissue. Collagen fibers maintain their length if frequently stretched but shorten if immobilized.

Ligament complexes are affected biomechanically, biochemically, and morphologically by immobilization, and these changes occur in both bony ligament insertions and the ligament substance itself.

Immobilization can cause fibrofatty infiltration in joints that can mature into strong adhesions within the joints and might destroy cartilage.

Shortening collagen fibers can restrict movement significantly even within 1 week.

Many factors contribute to contractures:

1. Denervated muscle
2. Improper bed positioning
3. Adaptive shortening of soft tissues when the limb is held in a shortened position (eg, in a cast) might occur.
4. Sometimes contractures arise from the disease itself, such as burns and joint degenerative or inflammatory disorders.

Complications of contractures:

1. Limit positioning.
2. Difficulty of bathing and transfers.
3. Increase the risk of pressure ulcer.
4. Often are painful and may prevent ambulation.
5. Lengthen hospital stays.

Treatment of contractures:

1. Emphasizes prevention.
2. Changing the positions of immobile joints regularly.
3. Performing active or passive range-of-motion exercises twice daily.
4. Using resting splints for joints that tend to maintain a desirable position help prevent contractures.

Abundant evidence appears to show that early active mobilization after initial stabilization is beneficial.

3. Disuse osteoporosis

Bone is a dynamic tissue. A constant equilibrium is maintained between bone formation and resorption. Bone morphology and density depend on forces that act upon the bone, such as the direct pulling action of tendons and weight bearing. Immobilization leads to bone mass loss in association with hypercalciuria and negative calcium balance. Loss is generally greater with lower motor neuron flaccid lesions than with upper motor neuron spastic lesions.
Both cortical and trabecular bone are lost, trabecular bone predominantly. Trabecular bone is found in the spine, femur, and wrist, making these areas susceptible to fractures after trauma. Osteoporosis can lead to fractures of the spinal vertebrae, femur, and distal radius. Repeated anterior fractures of the spinal vertebrae result in a dorsal kyphosis and chronic back pain.

4. Degenerative joint disease

Researchers now believe that both the contracted capsule and joint immobilization in a fixed position cause prolonged compression of the cartilage contact sites and their subsequent degeneration.

B.Cardiovascular complications

1. Increased heart rate

Heart rate increases following immobilization, probably due to increased sympathetic nervous system activity. During bed rest, the resting pulse rate speeds up one beat each minute every two days. Because the increased heart rate results in less diastolic filling time and a shortened systolic ejection time, the heart is less capable of responding to metabolic demands above the basal level. Shorter diastolic time reduces coronary blood flow and decreases the oxygen available to cardiac muscle.

2. **Cardiac output, stroke volume, and left ventricular function decline** Physical exertion can then lead to tachycardia and angina in predisposed individuals and work capacity is reduced.

3. **Orthostatic hypotension**.

Orthostatic hypotension is believed to occur when the cardiovascular system does not adapt normally to an upright posture. It occurs after 3 weeks of bed rest (earlier in elderly) because of excessive pooling of blood in the lower extremities and a decrease in circulating blood volume.

Treatment of orthostatic hypotension:

1. Leg exercises and even upper limb exercises.
2. Early mobilization and ambulation.
3. Elastic stockings.

In cases of prolonged bed rest, graduated increase in the standing posture might be necessary.

4. **Venous thromboembolism.**

Venous thromboembolism is due primarily to venous stasis and to a lesser degree to increased blood coagulability.

Prevention: involves decreasing venous stasis by such physiotherapy as leg exercises, leg elevation, elastic stockings, early ambulation

C.Respiratory complications

1. **Decreased ventilation**.

Immobilized patients show decrease of respiratory muscle strength, deconditioning of respiratory muscles, and failure to fully expand the chest wall results in a 25-50 % to decrease in respiratory capacity. Costovertebral and costochondral range of motion decrease. Weakness of the diaphragm, intercostals and accessory muscles of respiration develop.

Respiratory rate increases to compensate for decreased capacity.

2. **Atelectasis and pneumonia**.

Immobilization (often made worse by motor weakness) can result in a markedly impaired ability to clear secretions. Secretions then accumulate in the lower parts of the bronchial tree, blocking airways and eventually causing atelectasis and hypostatic pneumonia. As well, the atelectasis and pooled secretions form an ideal environment for the development of bacterial pneumonia.

Treatment to prevent respiratory complications includes chest physiotherapy, such as deep breathing, coughing and vibration.

D.Renal complications

1. **Increased diuresis, natrtiuresis, and extracellular fluid shifts.**
2. **Hypercalcemia and calcium loss.**
3. **Renal stones.**

E.Endocrine complications Glucose intolerance: The glucose intolerance appears to be due to increased tissue resistance to endogenous insulin; insulin levels can rise to twice normal.

F.Gastrointestinal complications

1. **Anorexia and Loss of appetite**: due to decreased caloric demands, endocrine changes, anxiety, and depression
2. **Weight gain**: is common due to inactivity.
3. **Constipation**: results from decreased peristalsis and constrictive sphincters. Low-fiber diets and decreased fluid intake also contribute to constipation.

G.Pressure sores

They are usually found over bony prominences subjected to external pressure for prolonged periods.

H.Nervous system complications

1. **Dependency**
2. **Balance and coordination.**
3. **Depression.**

ABDOMINAL SURGERIES OF GIT

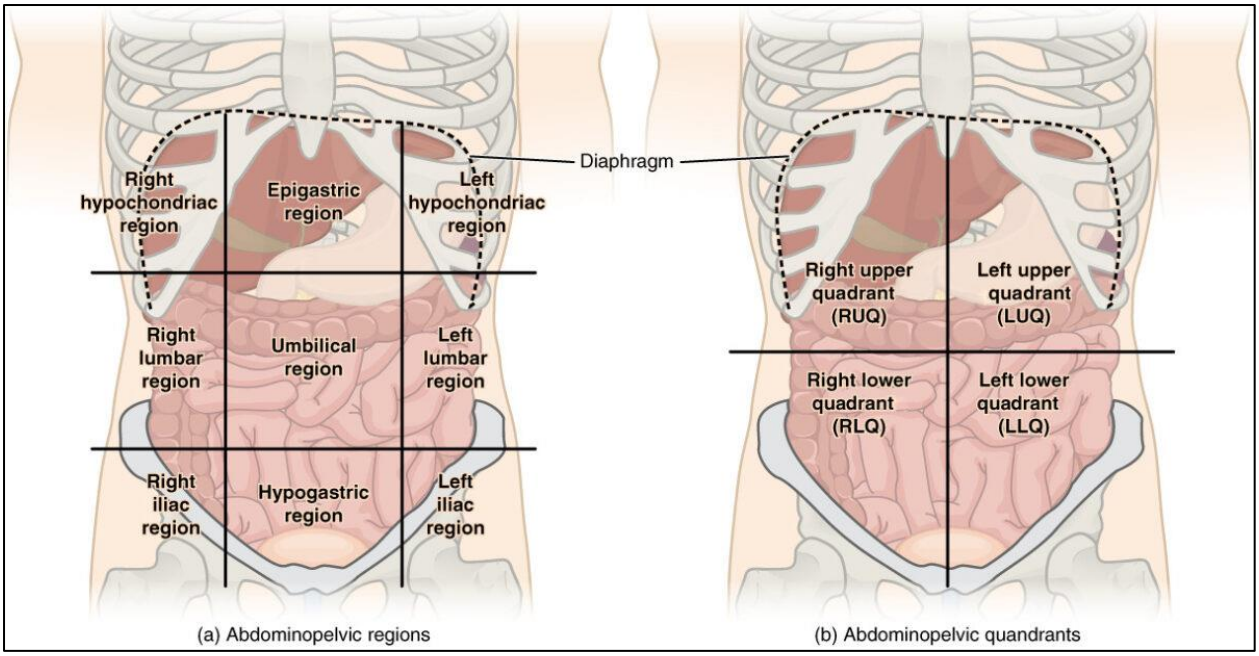
SURGICAL ANATOMY OF ABDOMEN

Boundaries:

Superior: Xiphoid process, Costal cartilages of the 7th–10th, ribs

Inferior: Pubic bone and pubic symphysis, Inguinal ligaments

Lateral: Superior: inferior aspect of the 10th rib. & Inferior: iliac crest

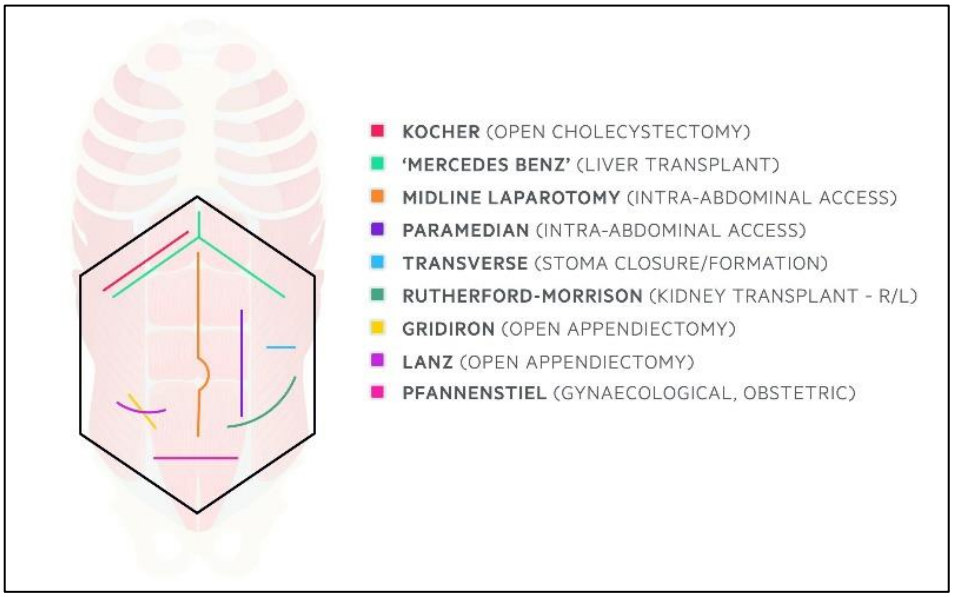


SURGICAL APPROACHES

Kocher: This is a subcostal incision that is used commonly in cholcystectomy the upper abdomen.

Chevron: A chevron incision is more commonly known as a 'rooftop' incision.

it is essentially an extension of the Kocher incision across the midline to involve the other side of the abdomen. (e.g. liver transplantation, duodenal surgery).



The rooftop incision may be combined with a sternotomy incision during cardiac or liver surgery. This combined incision is known as a *'Mercedes-Benz' incision*.

Midline laparotomy incision: involves a longitudinal cut in the middle of the abdomen.

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It is often performed in an emergency (e.g. trauma) as it provides the most rapid entry into the abdomen. It may be a full incision from the xiphoid process to pubic symphysis or limited to the upper or lower abdomen by halting the incision at the umbilicus.

Variations of this longitudinal incision may be performed, which include:

Paramedian incision: cut 2-5 cm left or right of the midline

Transverse: Several transverse incisions may be made across the abdomen for both abdominal and pelvic surgery.

Transverse incisions will usually follow the natural skin tension lines leading to a better cosmetic result during closure.

The Pfannenstiel incision: refers to a low transverse incision (10-15 cm) that is 2-5 cm above the pubic symphysis an example of a commonly employed transverse incision for gynaecological and obstetric procedures.

Gridiron incision: that is used in conventional open appendicectomy.

Rutherford-Morrison: The Rutherford-Morrison is an extension of the gridiron incision that is commonly performed for transplant surgery.

Lanz: A Lanz incision is a commonly performed abdominal incision for open appendicectomy

Most common abdominal surgeries

- Cesarean section
- Appendectomy
- Cholecystectomy
- Bariatric surgery
- Hernia repair
- Bowel resection
- Laparoscopy
- Colectomy
- Colon and Rectal Surgery
- Nephrectomy
- Splenectomy

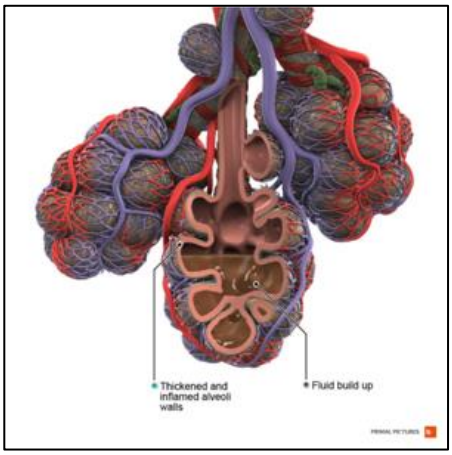
Scar management

Following the initial 2- to 3-week period of healing, the scar has built enough tensile strength to allow for the initiation of scar massage.

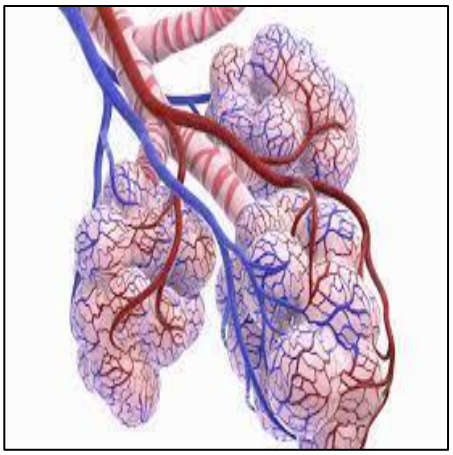
- Scar massage leads to a more soft scar through the degradation of excessive and nonpliable collagen. It is important to note that scar massage should not be started until the wound has closed completely. It is recommend beginning scar massage approximately 2 to 3 weeks postoperatively and performing twice daily 10-minute massages for a total duration of at least 6 weeks. Scar massage needs to be performed carefully so as to not cause any additional trauma to the closed incision.
- Applying gentle pressure in a circular motion with the use of petroleum jelly or a lubricating moisturizer during the massage is an effective maneuver in improving outcomes.

- Silicone gel sheeting is a moisture-protective dressing thought to work by providing the wound with a good environment conducive to faster epithelialization, while simultaneously decreasing collagen deposition.

POSTOPERATIVE ACTIVITY



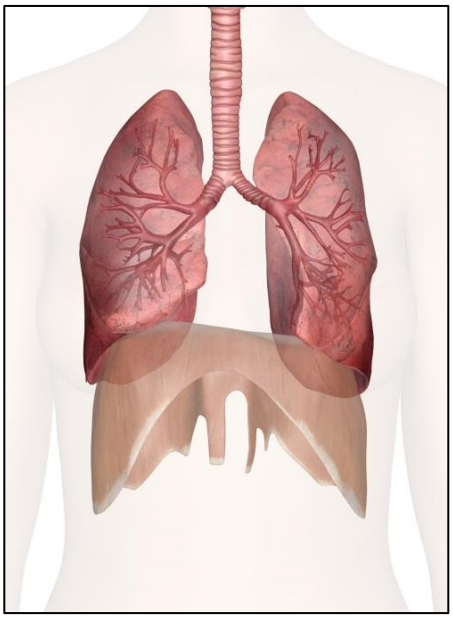
1. Whilst in bed after operation, it is important not to slump down as this restricts chest expansion and air cannot get to the bottom of lungs. In general, anesthetic had affected the lungs, and together with the pain from wound, makes taking a deep breath and coughing difficult.
2. Deep breathing, coughing and moving around after surgery are important to help clear any mucus and prevent from developing a chest infection.
3. Thick mucus can collect in lungs. It is important to start to clear any mucus as soon as possible after surgery. It may be uncomfortable but will not do any damage to stitches or staples It is vitally important to become comfortable enough to deep breath, cough and move. If cannot must tell someone.



BREATHING EXERCISES

To reduce the effects of a general anesthetic, practice the following exercises hourly throughout the day

These exercises can be performed sitting up in bed, or preferably in a chair.



Deep breathing exercises:

1. Relax shoulders and upper chest.
2. Take a slow, deep breath in through nose to fill up the bottom of lungs, hold for a few seconds and then breathe out through the mouth.
3. This should be done five times every hour.

Huffing:

1. Take a deep breath in, and then breathe out quickly and forcefully through the mouth.
2. Help the patient to loosen any phlegm if needed.

Coughing:

1. Coughing is the normal way to clear mucus from the lungs.
2. Do this more often in the first few days following operation.

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3. To make this more comfortable for patient after surgery and to strengthen cough, use a rolled up towel or pillow to apply gentle pressure and support over area of wound.

GETTING OUT OF BED AND WALKING:

1. One of best things, after operation to aid recovery, is to get out of bed as soon as possible.
2. Help the patient to prevent a chest infection, but will also help to gut to start working again and maintain circulation.
3. Do this on morning after operation (or the same day of the operation for some people).
4. They will continue to help until the patient able to do it himself.
5. Drips and drains can be moved with patient and will not prevent from getting out of bed.
6. On each day after operation it is advised that the patient sit out for at least six to eight hours in total, with rests in between and regular walks.
7. Some weakness and tiredness is to be expected but it is important to try and do a little more each day.
8. Physiotherapist helps patient to practice and improve walking until able to walk safely.
9. Once can do so, will then be responsible for walking regularly on the ward until go home.
10. If a patient has any stairs at home, and are concerned about how may manage them, the physiotherapist can practice these with whilst are in hospital.

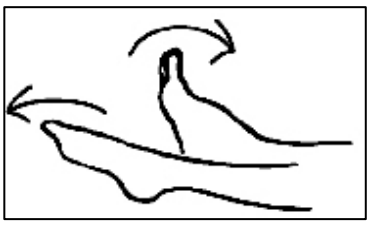
To get out of bed:

1. Bend both knees and roll onto side by moving shoulders and knees together.
2. Lower feet to the floor, use arms to push the body into a sitting position on the side of the bed.

CIRCULATORY EXERCISES:

1. Simple exercises applied to improve the circulation in the legs.
2. Done either lying in bed or sitting in chair.

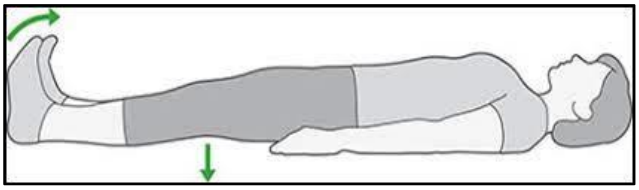
Ankles:



Bend and stretch the ankles up and down firmly and quickly (repeat 10 times).

Knees:

A. In bed:



1. Pull up the toes towards and push the back of knee down into the bed.
2. Hold for five seconds then relax.
3. Repeat five times on each leg.

B. Sitting in a chair straighten.

1. The knee out in front.
2. Hold for five seconds then relax.
3. Repeat five times on each leg.

BUTTOCKS

Tighten buttocks regularly to relieve pressure from bottom (repeat five times).

ABDOMINAL EXERCISES

Start all exercises by lying with head on a pillow, knees bent and feet flat on the bed.

1. *Abdominal exercise*:
    a. Gently place hands on the lower abdomen.
    b. Breathe in through nose and as breathe out, gently pull abdomin away from hands towards for back.
    c. Feel the muscles tighten, try to hold for a count of three and then relax.
    d. Breathe in and out normally.
2. *Pelvic tilting*:
    a. Place hands in the hollow of the back.
    b. Tighten abdomen muscles (Exercise1), flatten lower back onto hands and tilt bottom.
    c. Breathe normally.
    d. Hold for three seconds and release gently.
3. *Knee rolling*:
    a. Tighten abdomen muscles (Exercise1) and gently lower both knees to one side as far as is comfortable.
    b. Bring them back to the middle and relax.
    c. Repeat to the other side.

Notes: Each of these exercises:

a) Done three times a day.
b) Repeat each one five times.
c) Applied more repetitions as feel able.
d) Discontinue the exercises if they cause any pain and seek advice from physiotherapist.

POSTURE AND BACK CARE:

It is important to be aware posture and take special care for six weeks after surgery.
A good posture will help to prevent backache.

Sitting:

1. Sit upright in a supportive chair, if possible, with both feet on the floor.
2. Do not slouch.

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3. Find it helpful to place a small cushion or rolled towel in the small of back.

Standing or walking:

1. Avoid holding abdomen with hands and slouching forwards.
2. Stand upright with shoulders back.

Lifting:

1. Do not lift heavy objects for at least six weeks.
2. When the patient need to lift or pick something up, bend knees and keep back straight.

BEFORE GO HOME

1. The need for continued pain relief at home is very individual.
2. Please discuss this with nurse.
3. If the patients have any worries , please talk to the ward physiotherapist or nursing staff.

ADVICE ON DISCHARGE:

1. Exercises: Continue with exercises for at least six weeks, preferably three months, if returning to a physical job.
2. Rest:
   A. The body is using energy to heal itself so will feel more tired than normal.
   B. Do not try to do too much , and allow some rest time each day to aid recovery.
   C. Feel better some days than others, this is normal.
3. Walking:
   A. Try to walk for about five to 10 minutes at least once a day.
   B. Hills and stairs are quite safe but build up speed and distance gradually.
   C. Walking is a very valuable ; try to increase walking time and distance each week.
4. Driving:
   A. Do not expect to drive for about four to six weeks, depending on surgery.
   B. Make sure can wear a seatbelt comfortably and perform maneuvers and an emergency stop without undue pain.
5. Work and sports:
   A. Always get approval from doctor to return to work.
   B. Get approval to return to normal exercise routine e.g. (Swimming, Cycling, Aerobics and other sports).
6. Gardening:
   A. Avoid gardening for a few weeks.
   B. Start slowly.
7. Household activities:

   A. Do's:

   a. Independent personal hygiene.
   b. Light housework.
   c. Making drinks.
   d. Washing and drying dishes.
   e. Preparing light meals.

   B. Don'ts:

   a. Decorating.
   b. Heavy lifting.
   c. Shaking the duvet or heavy bedding.
   d. Cooking a large meal using the oven.
   e. Heavy housework; gardening.
   f. Needs practical help with some tasks from family and friends.

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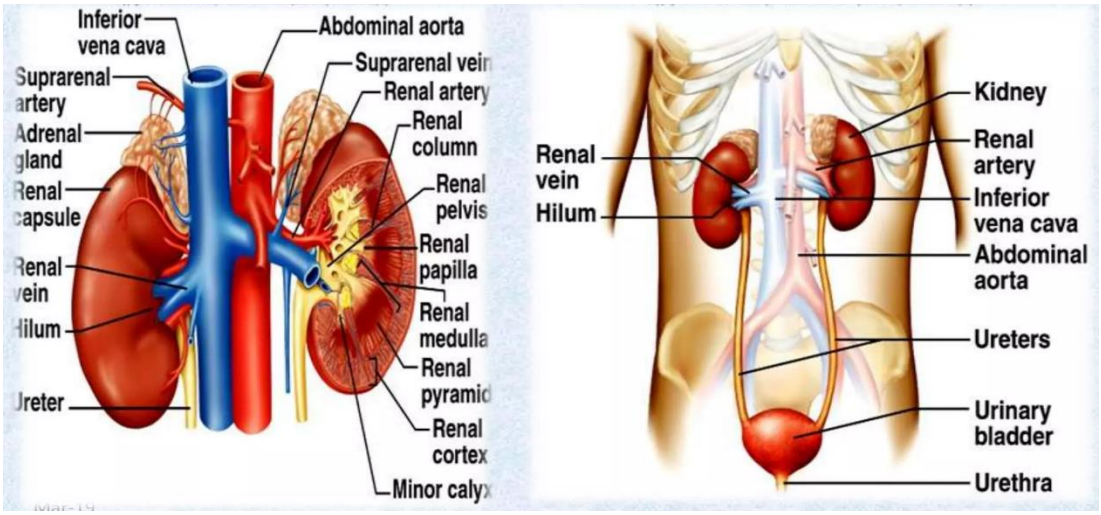
GENITO-URINARY SYSTEM SURGERIES

Surgical anatomy

The gross anatomy of the kidney shows renal capsule which surrounds each kidney; it is a thin fibroelastic structure that encases the parenchyma and holds it together.

There is a depression (the hilum) on the medial surface of each kidney, which opens into the renal sinus a central space surrounded by the renal parenchyma that contains the urinary collecting structures and renal vessels which exit the kidney via the hilum medially and varying amounts of fat.



The kidneys are mobile and their position changes during respiration. The right kidney generally lies lower than the left due to the mass of the liver. The upper pole of the left kidney lies at the level of the 12th thoracic vertebrae and its lower pole at the 3rd lumbar vertebrae.

The upper pole of the right kidney lies at the level of the 1st lumbar vertebrae and its lower pole at the bottom of the 3rd lumbar vertebrae.

Posteriorly the diaphragm covers the upper pole of each kidney. Any direct approach to the upper pole of either kidney risks entering the pleural space and this should be minded with all supracostal approaches. The medial portions of the lower two-thirds of both kidneys(with their associated renal vessels and pelvis) lie against the psoas muscle, whilst quadratus lumborum and the aponeurosis of transversus abdominus sit behind both kidneys.

Most Common Urologic Surgical Procedure

- Nephrectomy, nephoscopy PCNL , pylectomy ,renal stone ,renal transplanter, renal tumor removal.
- Ureterectomy, ureter reimplant, ureter stone removal or Ureteral stent placement by ureteroscope.
- Cystectomy, cystoscopy, bladder tumor removal
- Inguinal hernia repair, Hypospadias, Orchiopexy, prostatectomies, and surgeries for urinary incontinence.

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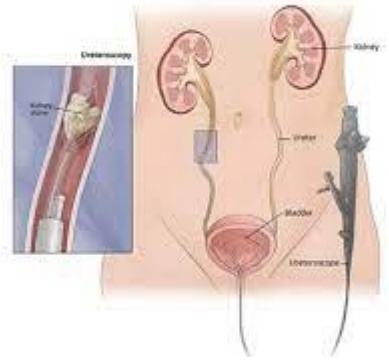
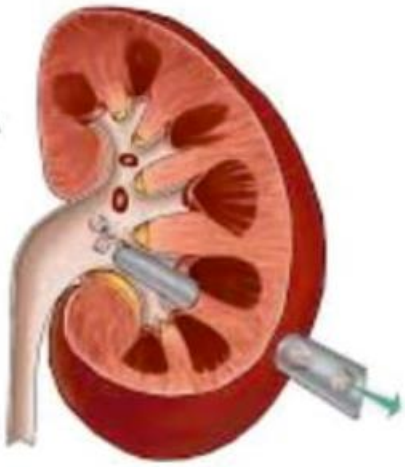
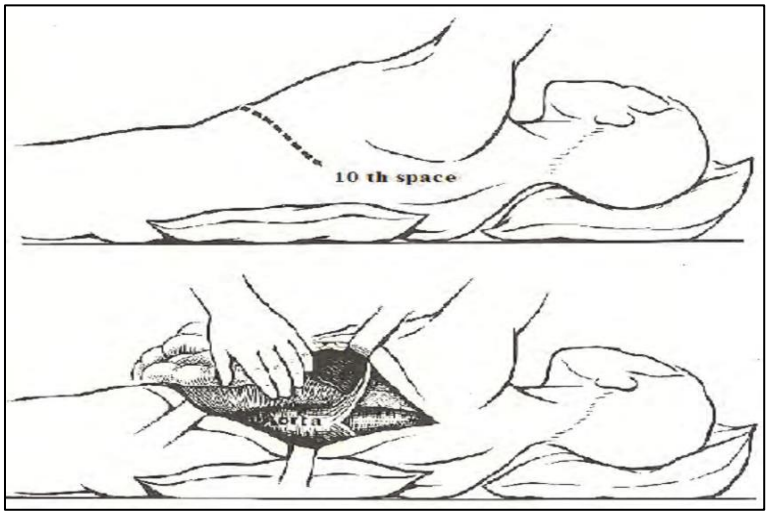




Surgical approaches in urology

1. Complete Midline laparotomy (large mass, trauma, bilateral nephrectomy and ureterctomy)
2. Subcostal incision (Kocher for hilum of kidney exposure)
3. Flank incision (renal upper pole and adrenal gland)
4. Thoracoabdominal laparotomy (large upper pole tumor, adrenal tumor)
5. Lower midline incision (prostate, bladder, ureter, pelvic lymph node)
6. Upper midline incision (adrenal gland, kidney, ureter, retroperitoneal LN)
7. Pfannenstiel incision (prostate, bladder, ureter, pelvic lymph node)
8. Paramedian laparotomy
9. Gibson incision (lower ureter, bladder, pelvic vessels)
10. Inguinal incision (inguinal hernia)
11. Surgical approach to the groin (urethral sx.)
12. Circumcising incision
13. Perineal approach for surgery of the bulbar urethra and membranous urethra sx.
14. Laparoscopy (nephroscopy , cystoscope, urethroscopy ,ureteroscope)



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PHYSIOTHERAPY AFTER GENITO-URINARY SX.

The Role Of Physiotherapy In Rehabilitation

Physiotherapy after urological surgery focuses on restoring strength, flexibility, and function in the affected areas. A key component is pelvic floor physiotherapy, which aims to retrain and strengthen the pelvic floor muscles. These muscles play a vital role in urinary and fecal continence, sexual function, and core stability. In addition to abdominal, back and thoracic muscles.

Physiotherapy intervention is crucial pre and post-surgery. The initial assessment by a physiotherapist will typically involve evaluating the patient's physical condition, range of motion, muscle strength, and any specific challenges could arise from the surgery.

Based on the assessment, the physiotherapist will develop a personalized rehabilitation program. This program may include exercises for pelvic floor muscle training, core strengthening, abdominal muscle thoracic muscle depending on type of operation and general conditioning. The exercises are progressively adjusted as the patient's condition improves.

After operation

Rehabilitation depend on type of operation, type of incision, general condition of the patient

- Pain Management modalities
- Breathing exercise
- Circulatory exercise
- ROM exercise
- Core Abdominal exercise
- Pelvic floor exercise

Learning patient to exercise the right muscles of pelvic floor muscles (**Kegel exercise**)

- Sit in a chair with your knees slightly apart. Imagine you are trying to stop wind escaping from your anus (back passage). You will have to squeeze the muscle just above the entrance to the anus. You should feel some movement in the muscle. Don't move your buttocks or legs.
- Now imagine you are passing urine and are trying to stop the stream. You will find yourself using slightly different parts of the pelvic floor muscles to the first exercise (ones nearer the front). These are the ones to strengthen. If you are not sure that you are exercising the right muscles, put a couple of fingers into your vagina. You should feel a gentle squeeze when doing the exercise (in case of female patient).

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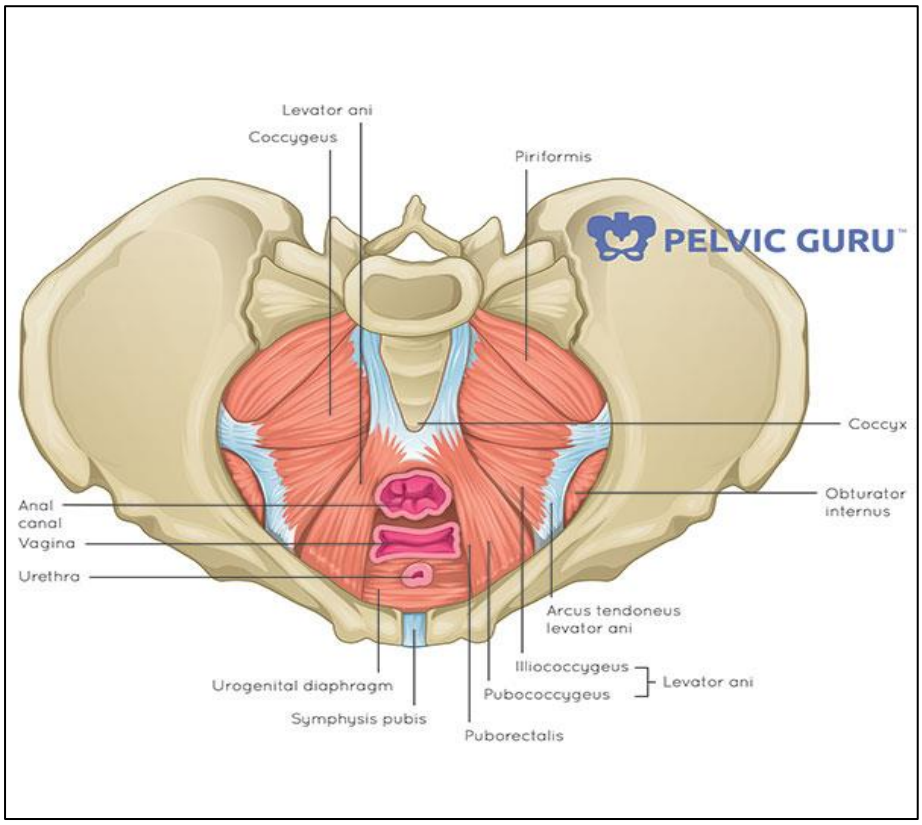
Doing the exercises (instructions):

1. You need to do the exercises every day.
2. Sit, stand or lie with your knees slightly apart. Slowly tighten your pelvic floor muscles as hard as you can. Hold to the count of five, then relax. Repeat at least five times. These are called slow pull-ups.
3. Then do the same exercise quickly for a second or two. Repeat at least five times. These are called fast pull-ups.
4. Keep repeating the five slow pull-ups and the five fast pull-ups for five minutes.
5. Aim to do the above exercises for about five minutes at least three times a day, and preferably 6-10 times a day.
6. Ideally, do each five-minute bout of exercise in different positions. That is, sometimes when sitting, sometimes when standing, and sometimes when lying down.
7. As the muscles become stronger, increase the length of time you hold each slow pull-up. You are doing well if you can hold each slow pull-up for a count of 10 (about 10 seconds).
8. Do not squeeze other muscles at the same time as you squeeze your pelvic floor muscles. For example, do not use any muscles in your back, thighs, or buttocks.

Other ways help with exercising pelvic floor muscles

- Electrical stimulation. Sometimes a special electrical device is used to stimulate the pelvic floor muscles with the aim of making them contract and become stronger.
- Biofeedback.
- Vaginal cones.

The long-term benefits of integrating physiotherapy into post-urological surgery rehabilitation are significant. Patients often experience improved functional outcomes, reduced incidence of complications such as incontinence or sexual dysfunction, and an overall better quality of life.



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Breast cancer and mastectomy

Epidemiology

Breast cancer accounts for 12.5% of all new annual cancer cases worldwide, making it **the most common cancer in the world**.

It is estimated that about 1.2 million women worldwide per year will be diagnosed with breast cancer in the decade 2000–2010, and about 400 000 women will die of the disease per year.The incidence of the disease rises from a low level before 30 years of age to about 2 women per 1000 per year at the age of 50.

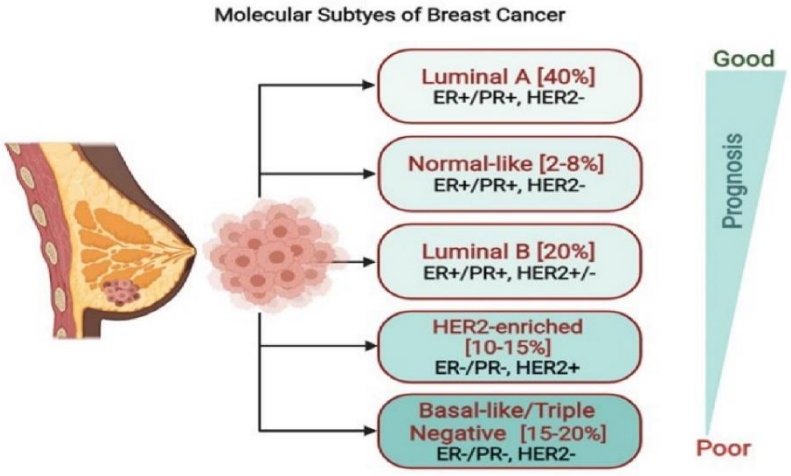
Risk factors for breast cancer

- Getting older. The risk for breast cancer increases with age. Most breast cancers are diagnosed after age 50.
- Genetic mutations. Women who have inherited changes (mutations) to certain genes, such as BRCA1 and BRCA2, are at higher risk of breast and ovarian cancer.
- Reproductive history. Starting menstrual periods before age 12 and starting menopause after age 55 expose women to hormones longer, raising their risk of getting breast cancer.
- Having dense breasts. Dense breasts have more connective tissue than fatty tissue, which can sometimes make it hard to see tumors on a mammogram. Women with dense breasts are more likely to get breast cancer.
- Personal and Family history of breast cancer or certain non-cancerous breast diseases or ovarian cancer.
- Previous treatment using radiation therapy.
- Exposure to the drug diethylstilbestrol (DES), hormonal drug and alcohol.
- Overweight and physical inactivity, never child birth

Classification of breast cancer

Accordingly, the following four subtypes of breast cancer are widely recognized:

- luminal A
- normal like
- luminal B
- HER2-positive(human epidermal growth factor receptor 2)
- triple-negative.



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TNM System for Staging Breast Cancer

The TNM system for cancer staging refers to an international standard for classifying the malignancy of a tumor based on a list of factors involving the tumor (T), node (N), and metastases (M). The criteria used includes:

- Size of the tumor (T): How large is the area of cancer?
- Spread to lymph nodes (N): Has the cancer spread to nearby lymph nodes?
- Metastasis to distant sites (M): Has the cancer spread to other areas of the body?
- Hormone receptor status: Is it indicative of hormone-positive breast cancer?
- HER2 (human epidermal growth factor receptor 2) status: Is the cancer HER2-positive?
- Grade of the cancer (G): How closely do cancer cells resemble normal cells?

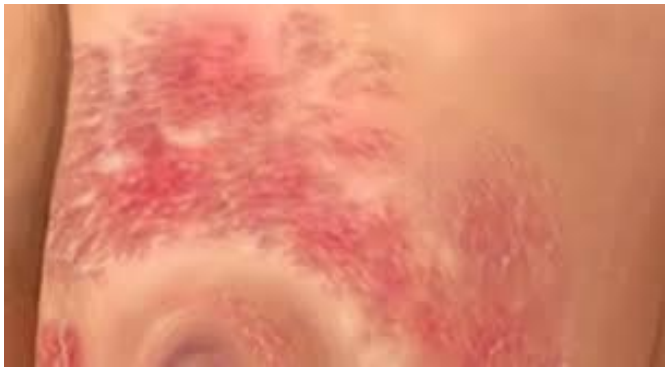
Stage 0 Breast Cancer

Cancer classified as stage 0 is only located in the breast ducts. It has not spread to surrounding tissue, lymph nodes or distant sites. This stage describes non-invasive types of cancer, such as ductal carcinoma in situ (DCIS).

Stage I Breast Cancer

Stage I cancer is the earliest stage for most types of invasive breast cancer (cancer that has spread to nearby tissue). Most stage I breast tumors are 2 centimeters or smaller, as indicated by the T1 of the TNM staging system.

Stage II Breast Cancer



Stage II breast cancer has not spread to distant sites. Cancer in this stage may have spread to lymph nodes under the arm and/or near the breastbone. Even if there is no spread to lymph nodes, cancer is often classified as stage II if the tumor is larger than 2 cm.

Stage III Breast Cancer

All inflammatory breast cancer is classified as stage III. Other types of cancer assigned to stage III may have larger tumors and/or advanced lymph node spread. Cancer that has grown into the chest wall or breast skin is considered stage III. At this stage, the cancer has not spread to distant sites in the body.

Stage IV Breast Cancer

Stage IV breast cancer, commonly called metastatic breast cancer, has spread to distant organs or lymph nodes far from the breast. The most likely areas of spread are the bones, liver, brain and lungs. The initial breast cancer can be any size and may or may not have spread to nearby lymph nodes.

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Metastasis: happens when cancer cells break away from the original tumor in the breast and travel to other parts of the body. These cancer cells travel through the bloodstream or the lymphatic system (the network of lymph nodes and vessels that removes bacteria, viruses, and cell waste).

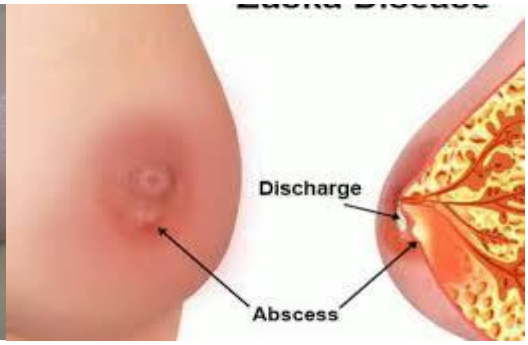
Breast cancer can come back in another part of the body months or years after the original diagnosis and treatment. This is called metastatic recurrence or distant recurrence.

Metastatic breast cancer is made up of cells from the original tumor that developed in the breast. So if breast cancer spreads to the bone, the metastatic tumor in the bone is made up of breast cancer cells, not bone cancer cells.

Clinical presentation

Most early breast cancer patients are asymptomatic and discovered during screening mammography. With increasing size, the patient may discover cancer as a

- lump that is felt accidentally, mostly during combing or showering.
- Breast pain is an unusual symptom that happens 5% of the time.
- frank ulceration, or fixation to the chest wall in locally advanced disease
- breast abscess with swelling, redness, and other local signs of inflammation in case of inflammatory breast cancer which is an advanced form of breast cancer.
- Paget disease of the nipple usually presents with nipple changes that must be differentiated from nipple eczema.



Surgical treatment

Surgery has a major role in the treatment of breast cancer.

1. **Radical mastectomy of Halsted**, which removed the breast with axillary lymph node dissection and excision of both pectoralis muscles, is no longer recommended due to the high rate of morbidity without a survival benefit.
2. **Modified radical mastectomy** of Patey is more famous. It entails removing the whole breast tissue with a large part of the skin and the axillary lymph nodes. The pectoralis major and minor muscles are preserved.
3. **Simple mastectomy** Breast-only removal without axillary dissection.

4. **Breast-conserving surgery** (BCS) is aimed at removing the tumor plus a rim of safe margin of normal breast tissue (wide local excision).
5. **Axillary procedures** may include sentinel lymph node biopsy, sampling, partial (II), or complete (III) axillary lymph node dissection.
6. **Lumpectomy** is the removal of a benign mass without excision of the normal breast tissue.

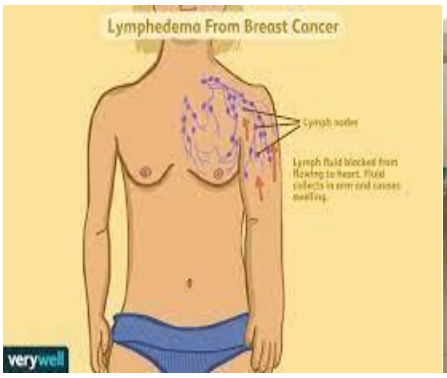
Post-mastectomy pain syndrome (PMPS)

is defined as chronic pain for over a 3-month period. It is caused either by primary lesion or by dysfunction in the nervous system. It is considered a neuropathic condition which arises after surgical treatment for breast cancer and can occur due to intercostobrachial nerve lesion, neuroma, lesions of other nerves or the phantom breast pain. it is typically localized to the anterior or lateral region of thorax, axillary and/or medial upper arm, causing burning pain, shooting pain, pressure sensation or numbness

Some research concluded that younger women (<40 years) and those who were submitted to axillary lymphadenectomy (with more than 15 lymph nodes removed) have shown risk of developing pain syndrome after breast cancer surgical treatment.

lymphedema

Lymphedema is the accumulation of lymphatic fluid that can cause swelling in the arm and/or hand. Lymphatic fluid is normally filtered through the lymph nodes. Removal of lymph nodes requires lymph fluids from the arm to be rerouted and filtered through remaining axillary lymph nodes occur in up to 5% of patients with an axillary dissection or radiation to the axilla presented with arm and hand swelling



Physiotherapy after mastectomy

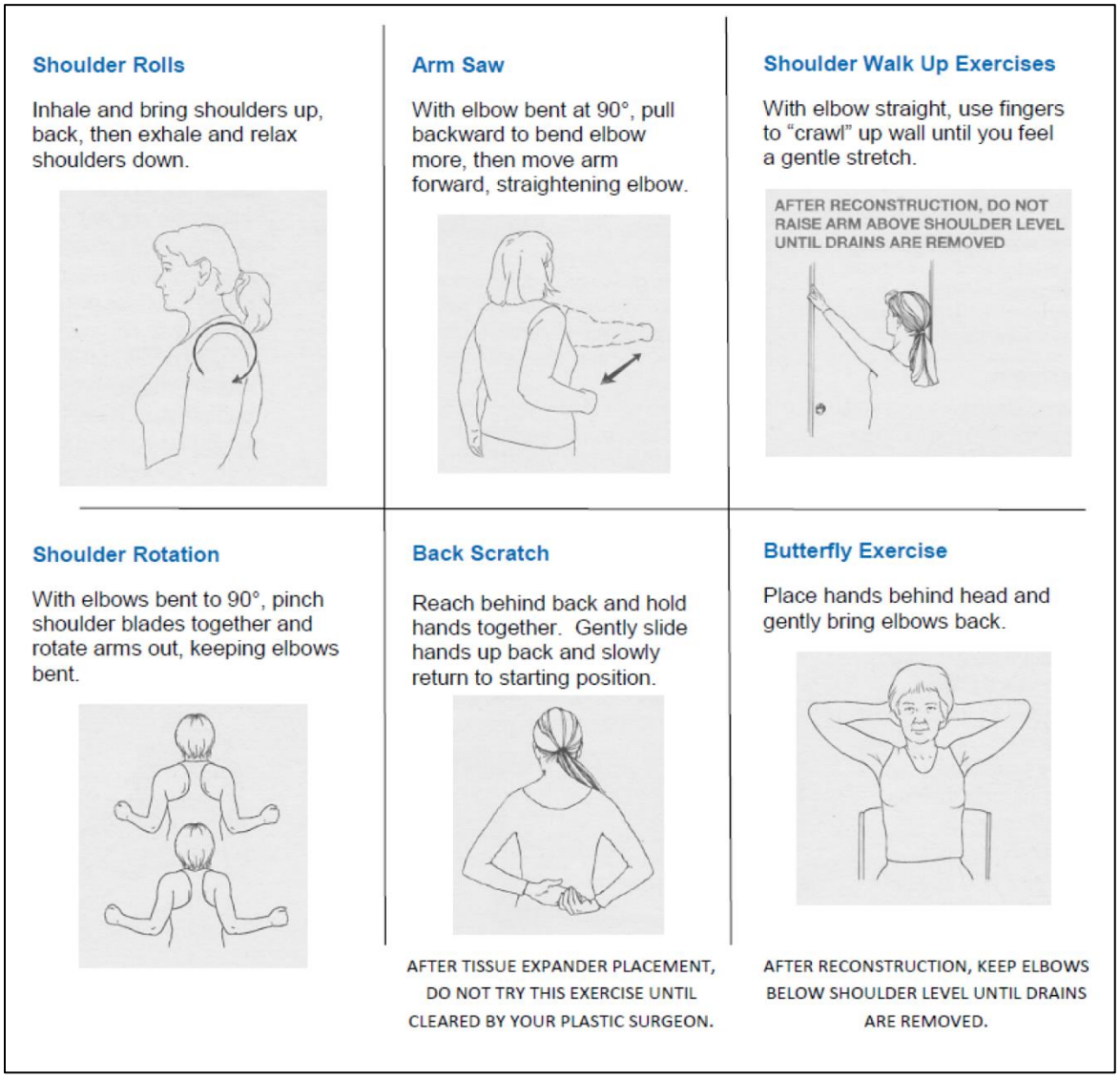
Scar tissue formation from a mastectomy, lumpectomy, or lymph node removals can be painful and can restrict movement in the shoulder, even leading to serious orthopedic side effects like frozen shoulder. Exercises to maintain shoulder range of motion and arm mobility may be prescribed as early as 1 week after surgery. main physical therapy resources used to achieve

that, are: manual lymphatic drainage, ultrasound, cryotherapy, laser therapy, electrotherapy, active exercises which is fundamental to the recovery process

Shoulder ROM exercise

Breathing diaphragmatic exercise are important for pain control, relaxation and to relieve tightness in the chest wall and back

Scar massage to decrease tightness and increase flexibility



Benefit of physiotherapy after mastectomy

- Improved upper extremity range of motion and upper extremity strength functional mobility
- Improved posture and core strength
- Decreased pain and swelling on the affected side
- Improved sensation at the surgical site and scar tissue mobility
- Reduce fears of surgery
- Provide a therapeutic environment and psych osocial approach

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General recommendation

- Avoid any activity that bounces or jostles the breast for two weeks after surgery (i.e.: running, jumping).
- Avoid heavy lifting on the surgical side for 4 weeks after surgery.
- In case of breast reconstructive Should not lift arm above shoulder level until cleared by plastic surgeon
- In case of axillary discectomy or lymphedema Keep arm clean and dry, use daily moisturizer. Avoid tight jewelry, tight clothing, or elastic bands around the affected arm or fingers. Wear gloves while doing activities that might cause skin injury, such as gardening, working with tools, and using chemicals such as detergents. Protect arm from sun and insects If get a scratch, bite, burn, or break in skin, wash the affected area immediately with soap and water, and apply antibiotic ointment.
- Avoid Blood pressure readings, blood injections, tests and infusions in case of lymphedema

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