

**Ministry of Higher Education and Scientific
Research**

College of Health and Medical Technology

Anaesthesia Techniques Department

Subject: Basics of Surgery (2) ,

2nd stage.

2023-2024

معرف القناة الرسمية

@ccvv26

Lecture 1

Principle of Pediatric Surgery

Principle of pediatric surgery

The important differences between adults and children which have clinical implications,

- . How to safely prescribe perioperative fluids in children,
- . How to avoid the pitfalls that lead to a missed or delayed diagnosis for common emergency conditions,

Common terms.

Preterm <37 completed weeks gestation,

Full term Between 37 and 42 completed weeks of gestations,

Neonate Newborn baby up to 28 days of age,

Infant Up to 1 year of age,

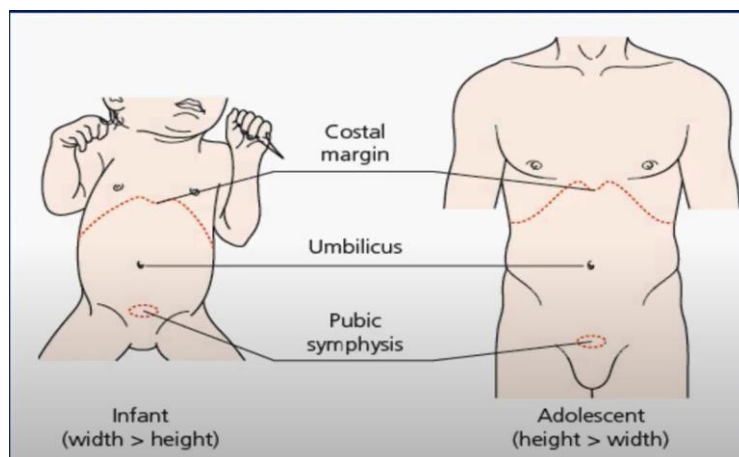
Child All ages up to 16 years, but often divided into

Preschool child (usually < 5 years), child and adolescent (puberty up to 16 years)

Some examples differences between adults and children

- Facts infant and small children have a wide abdomen, abroad costal margin and a shallow pelvis,
- . The edge of the liver comes below the costal margin and the bladder is largely intra abdominal,
- . The ribs are more horizontal and are flexible the umbilicus is relatively low lying,
- . Transverse supra umbilical incisions give greater access than vertical midline ones for open surgery,
- . Trauma (including surgical access) can easily damage the liver or bladder the geometry of the ribs means that ventilation requires greater diaphragmatic movement. Their flexible means that rib fractures are rare and often a sign of abuse

A stoma in the lower abdomen of a neonate must be carefully sited for its bag not to interfere with the umbilicus



Maintaining temperature

- Children, infants have less subcutaneous fat,
 - . Immature vasomotor control,
 - Greater heat loss from pulmonary evaporation,
 - . Surface area to weight ratio is higher,

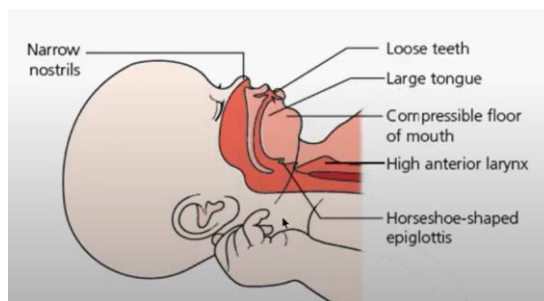
Environments must be warm

- Infusions are warmed, and respiratory gases both warmed and humidified,
The core temperature is monitored and safe direct warming is needed for lengthy operation's

Airway

The infant large head and short neck predispose to flexion,

- . Large tongue,
- . Epiglottis projects posteriorly,
- . Larynx is high.



Perioperative fluids in children

Child weight,

- . Vital signs,
- . Moderate dehydration (5% loss of total body water),
- . Severe dehydration (> 10 per cent),

Problems

1- hypotonic maintenance fluids (e.g. 0.18 % saline),

2- maintenance fluids have been given in excess,

Hypotonic considered fluid 0.18 percent saline with 4 percent glucose and 0.45 percent saline with 5 percent

Age	Weight (kg)		
Term neonate	3.5		
1 year	10		
5 years	20		
10 years	30		
(b) Vital signs			
Age (years)	Heart rate (bpm)	Systolic blood pressure (mmHg)	Respiratory rate (b/min)
<1	110–160	70–90	30–40
2–5	90–140	80–100	25–30
5–12	80–120	90–110	20–25
(c) Maintenance fluid requirements			
Weight	Daily fluid requirement (mL/kg/day)	mL/kg/hour	
Neonate	120–150	5	
Older child:			
First 10 kg	100	4	
Second 10 kg	50	2	
Each subsequent kg	20	1	

Operative surgery

Not been the excessively staved,

- . Appropriate consent,
- . Gentle technique,
- . Strict haemostasis, fine suture materials and often magnification aids,
- . Wound dehiscence is rare and usually the result of poor technique,
- . Analgesia must be adequate and appropriate,
- . Recognizing the potential for respiratory depression with opioids.

Fluid balance, temperature pain control, and glucose levels during recovery

Starvation instructions

- Two hours for clear fluids
- Four hours for breast milk
- Six hours for solids

Surgical technique in children

- Gentle tissue handling
- Abdominal incisions can be closed with absorbable sutures
- Bowel can be anastomosed with interrupted single-layer extramucosal sutures
- Skin can be closed with absorbable subcuticular sutures

Indication of intravenous fluid in children four reason

.Circulatory support in resuscitating vascular collapse.

.Replacement of previous fluid and electrolyte deficits.

.Replacement of ongoing losses.

.Maintenance.

A. Circulatory support in resuscitating vascular collapse

*(Given as a bolus of 10 to 20 ml/kg over periods up to 20 minutes with close monitoring of the response. Can be repeated Up to 40 ml/ kg, then seek urgent help)

*0.9 percent saline

*Blood

*4.5 percent albumin

*Colloid

B. Replacement of previous fluid and electrolyte deficits

*(Given over a longer period Up to 48 hours with clinical and biochemical review)

* 0.9 percent saline with 0.15 percent kcl

* Hartman's solution

C. What a placement of ongoing losses

- * (Or a fluid tailored to the losses , e.g. 4.5% albumin if protein loss is great replace losses ml for ml)
- * 0.9 percent saline with 0.15 percent kcl
- * Hartman's solution

D. Maintenance

1. Outside neonatal period (hypotonic 0.18 % saline should not be used the neonatal period)
0.45% saline with 0.15 % KCl in 2.5 _ 5 % glucose
Hartman's with or without glucose
0.9 % saline with 0.15 % KCl with or without glucose

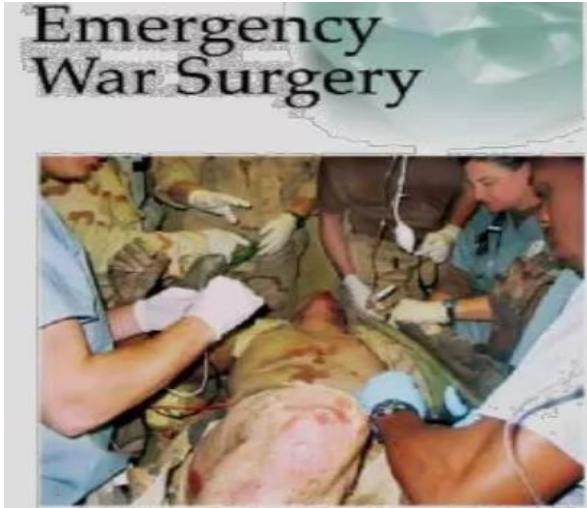
2. In the neonatal

In term neonates in the first 48 hours of life, 10% glucose at 60 mL/ kg per day Sodium 0.18 % and potassium 0.15 % are added on day 2 from Day 3 , around 4_5 ml/kg % hour or 100 ml to 120 ml/kg per day
Preterm babies or those < 2 kg may require 180 ml / kg day of fluid consider impaired gluconeogenesis: monitor and keep glucose above 2.6 mmol/L

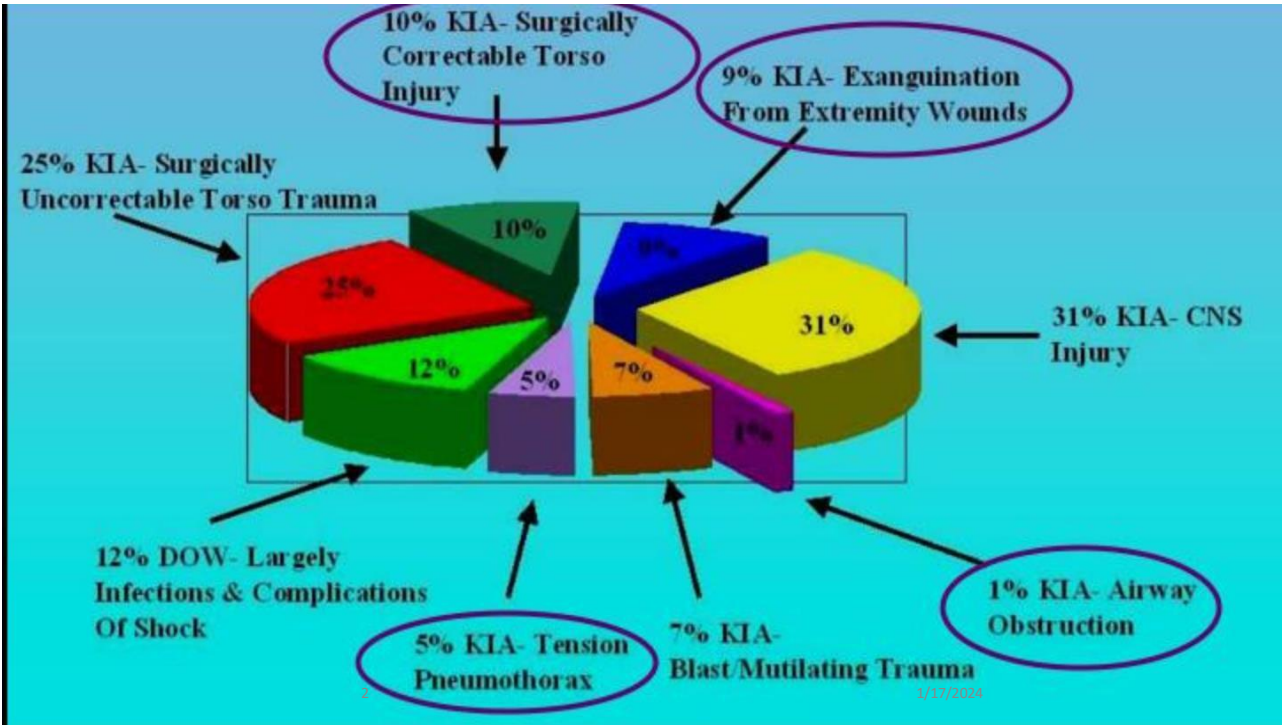
Lecture 2

Warfare Injuries

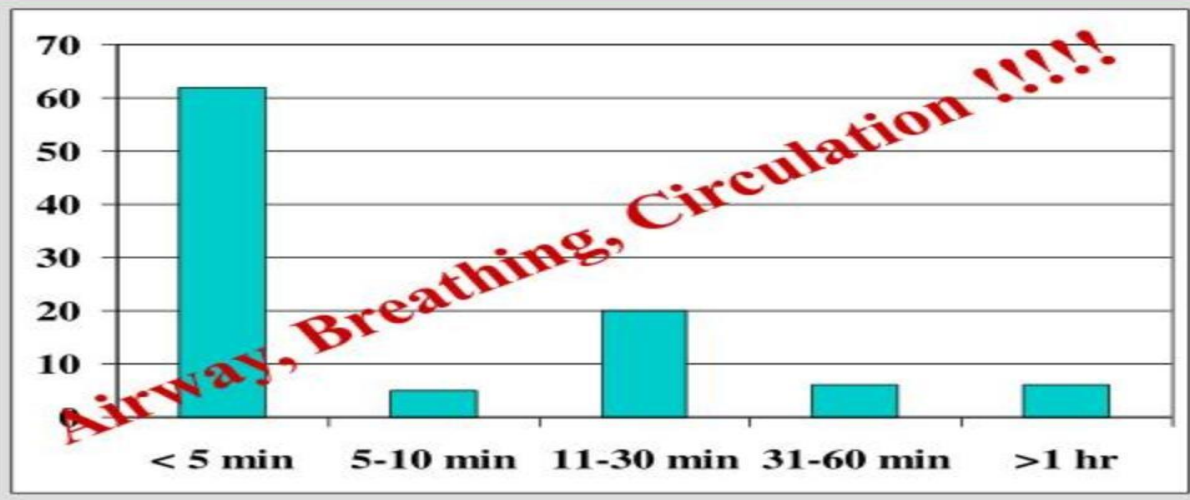
Warfare Injuries



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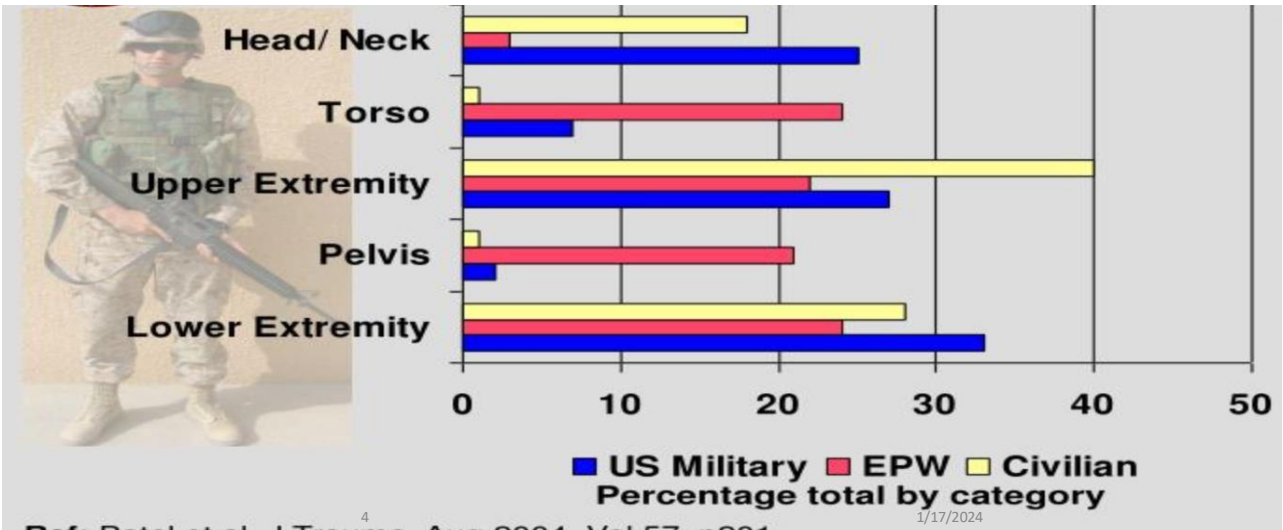
Military Fatality Rates



Estimated Time, Wounding to Death

(Zajtchuk, et al, Military Medicine, 1/17/2018)

Battlefield Distribution of wounds



Ref: Patel et al, J Trauma, Aug 2004, Vol 57, p201

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Triage

- Triage is the dynamic process of sorting casualties to identify the priority of treatment and evacuation of the wounded, given the limitations of the current situation, the mission, and available resources (time, equipment, supplies, personnel, and evacuation capabilities).
- Vital signs defining the color-coded triage. RR: respiratory rate; SpO₂: saturation of peripheral oxygen (pulse oximetry); HR: heart rate; GCS: Glasgow Coma Score; Tp: temperature. Abnormal vital signs are strong predictors for intensive care unit admission and in-hospital mortality in adults triaged in the emergency department.

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Triage also sets priorities for evacuation and transport as follows

- Deceased are left where they fell. These include those who are not breathing and repositioning their airway efforts were unsuccessful.
- Immediate or Priority 1 (red) evacuation by MEDEVAC if available or ambulance as they need advanced medical care at once or within one hour. These people are in critical condition and would die without immediate assistance.
- Delayed or Priority 2 (yellow) can have their medical evacuation delayed until all immediate people have been transported. These people are in stable condition but require medical assistance.
- Minor or Priority 3 (green) are not evacuated until all immediate and delayed persons have been evacuated. These will not need advanced medical care for at least several hours. Continue to re-triage in case their condition worsens. These people are able to walk and may only need bandages and antiseptic.

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Triage Systems

- The scale consists of 5 levels, with 1 being the most critical (resuscitation), and 5 being the least critical (nonurgent).

Australasian Triage Scale

Level	Description	Should be seen by provider within
1	Resuscitation	0 minutes
2	Emergency	10 minutes
3	Urgent	30 minutes
4	Semi-Urgent	60 minutes
5	Nonurgent	120 minutes

Canadian Triage and Acuity Scale (CTAS)

Level	Description	Should be seen by provider within
1	Resuscitation	0 minutes
2	Emergency	15 minutes
3	Urgent	30 minutes
4	Less Urgent	60 minutes
5	Non Urgent	120 minutes

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	1 Red Resuscitation (0min)	2 Orange Urgent (15min)	3 Yellow Less urgent (60min)	4 Green Not urgent (180min)
A	Obstructed airway Stridor	Threatened airway		
B	SpO ₂ < 80 RR > 35 or < 8	SpO ₂ : 80-89 RR: 31 - 35	SpO ₂ : 90-94 RR: 26 - 30	SpO ₂ ≥ 95 RR: 8 - 25
C	HR > 130 BP _{sys} < 80	HR: 121 - 130 HR < 40 BT _{sys} : 80 - 89	HR: 111 - 120 HR: 40 - 49	HR: 50 - 110
D	GCS ≤ 8	GCS: 9 - 13	GCS = 14	GCS = 15
E		Tp > 40 Tp < 32	Tp: 38.1 - 40.0 Tp: 32 - 34	Tp: 34.1 - 38.0

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Goals of combat surgery

- 1- Return greatest number to combat
- 2- Save life
- 3- Save limb
- 4- Save eyesight



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Principles of combat surgery

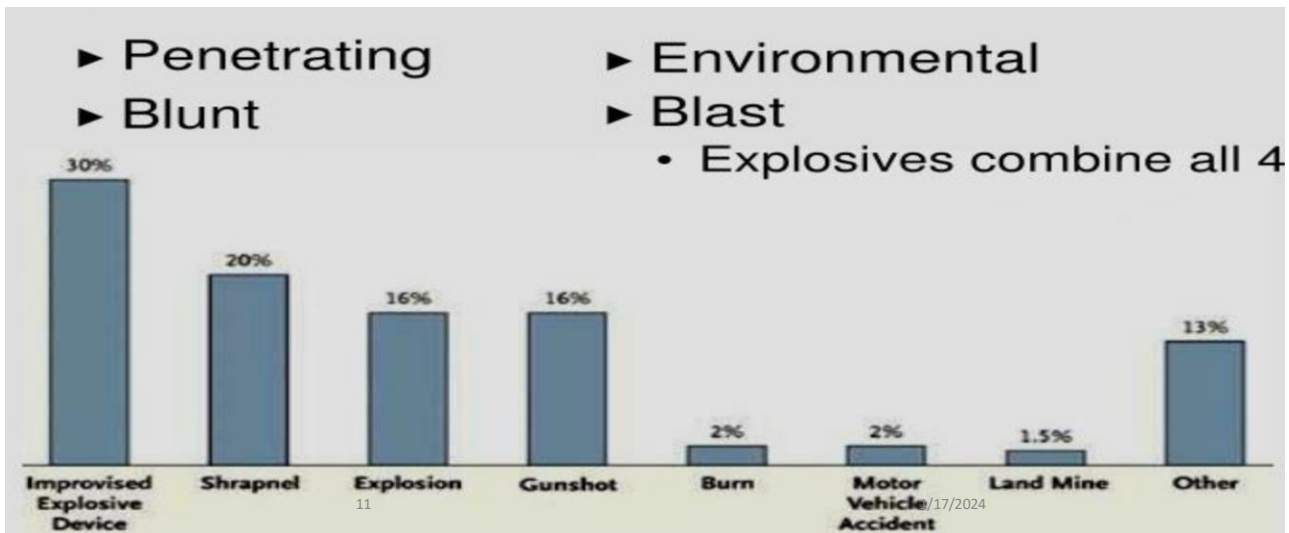
- 1- Establish priorities of care
- 2- Treat the wound not the weapon
- 3- prevent infectious complications
- 4- minimize residual disability



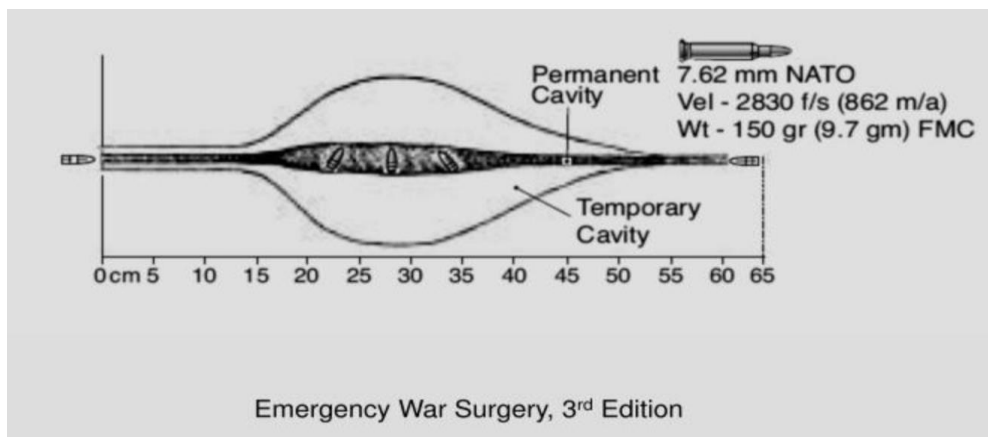
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Battle Injuries _ Mechanisms



High Velocity GSW



Fragments

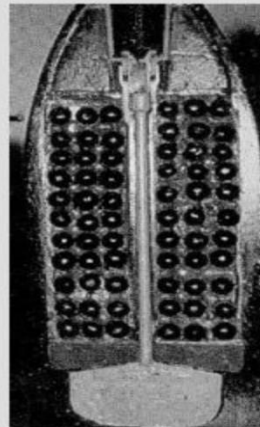
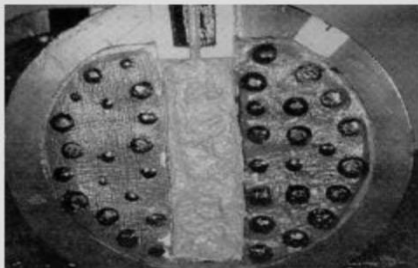
- 1- Derived from explosive munitions
 - . IEDs
 - . Grenades
 - . Homicide bombers
 - . Car bombers
- 2- variable
 - . Size
 - . Shape
 - . Composition



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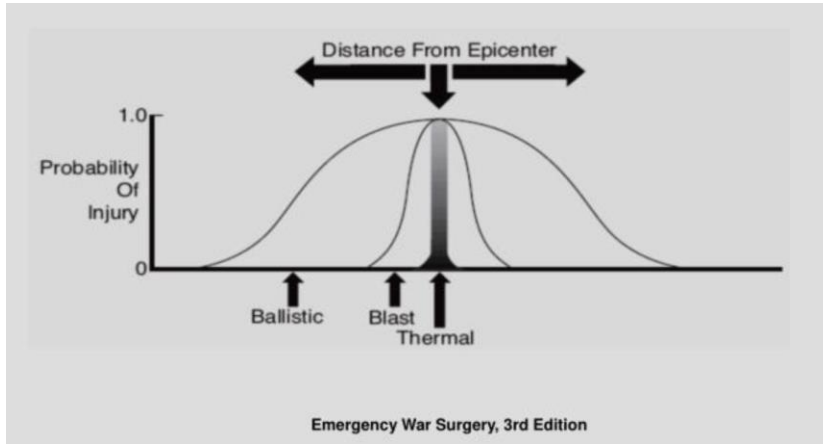
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Fragment ≠ Shrapnel



Shrapnel last used in World War I

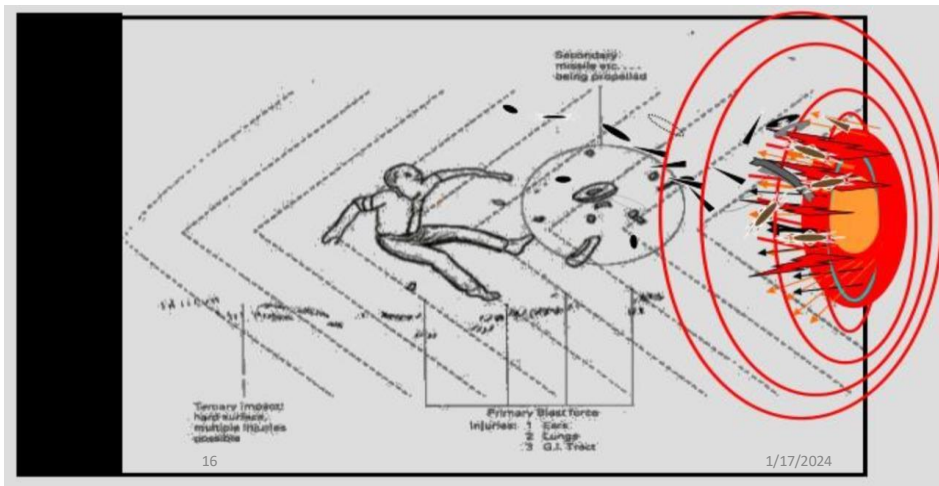
Explosive Mechanisms



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Blast Wave (Primary)



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Primary

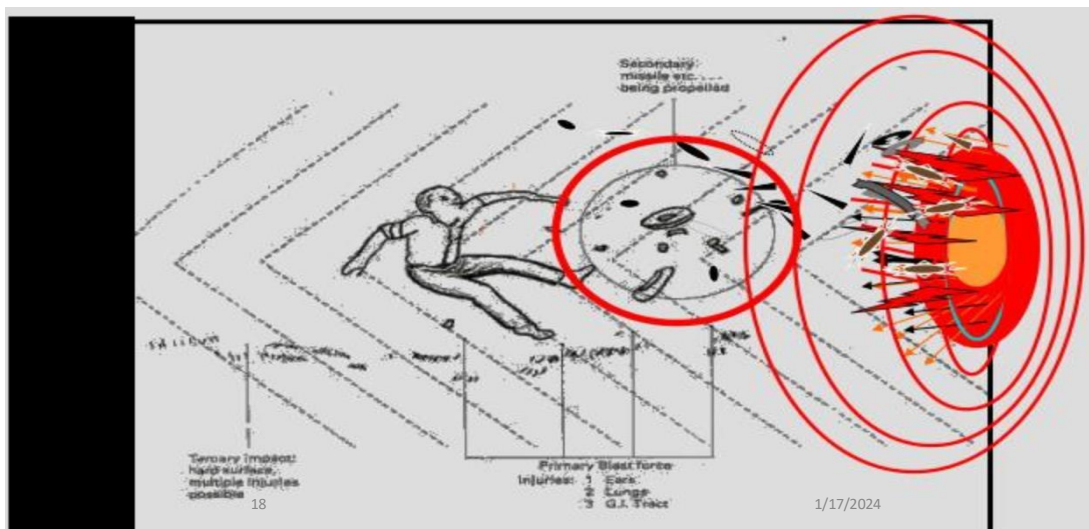
- Blast pressure wave
 - . Total lung barotrauma (blast lung)
 - . Tympanic membrane rupture
 - . Bowel perforation
 - . Severe cerebral contusions

Responsible for death

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Penetrating (Secondary)



Secondary

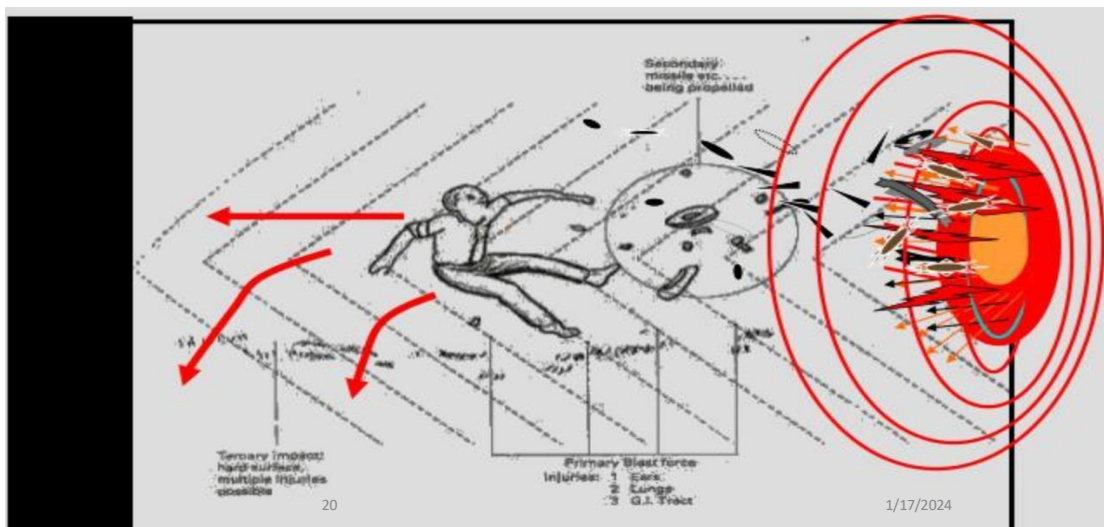
- Penetrating (fragments and debris)
 - . Unprotected torso
 - . Extremity
 - . Eye
 - . Head/ neck

Responsible for
wounding

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Blunt (Tertiary Blast Wind)



Tertiary

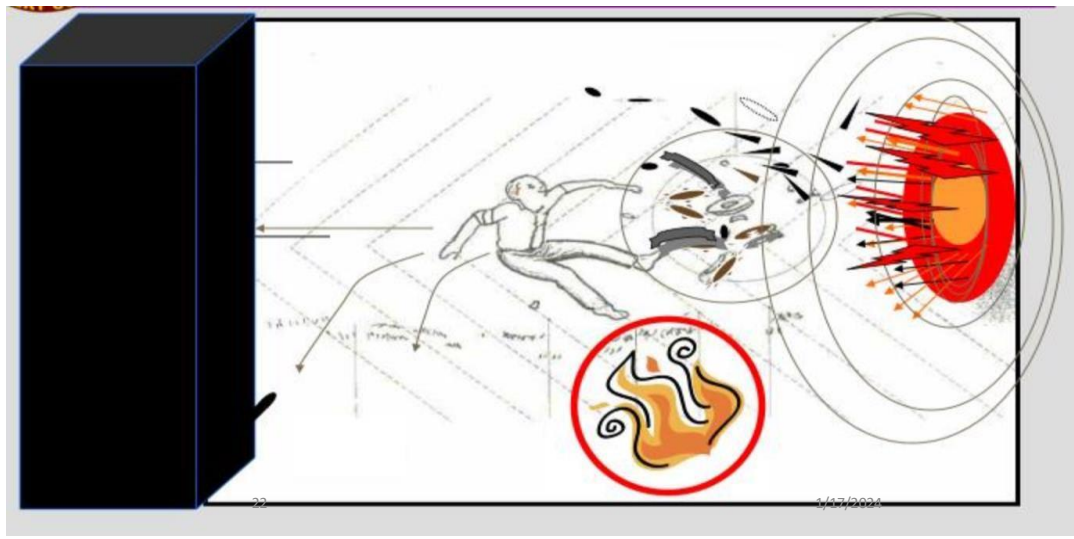
- Blunt (blast wind)
 - . Falls
 - . Crush



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Thermal(Quaternary)



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Quaternary

All other injuries/ illnesses

- . Thermal



- . Exacerbations of pre-existing conditions



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Casualties from Explosions

Δ Type of explosive (high vs. Open)

Δ Environment (confined vs. Open)

Δ Nature of deliver

Δ Radius from blast

Δ Intervening protection

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Landmine Injury



Nothing is what it seems, so . . .

Emergency War Surgery, 3rd Edition
War Wounds of Limbs, ICRC

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**Emergency War Surgery Course
War Wounds**

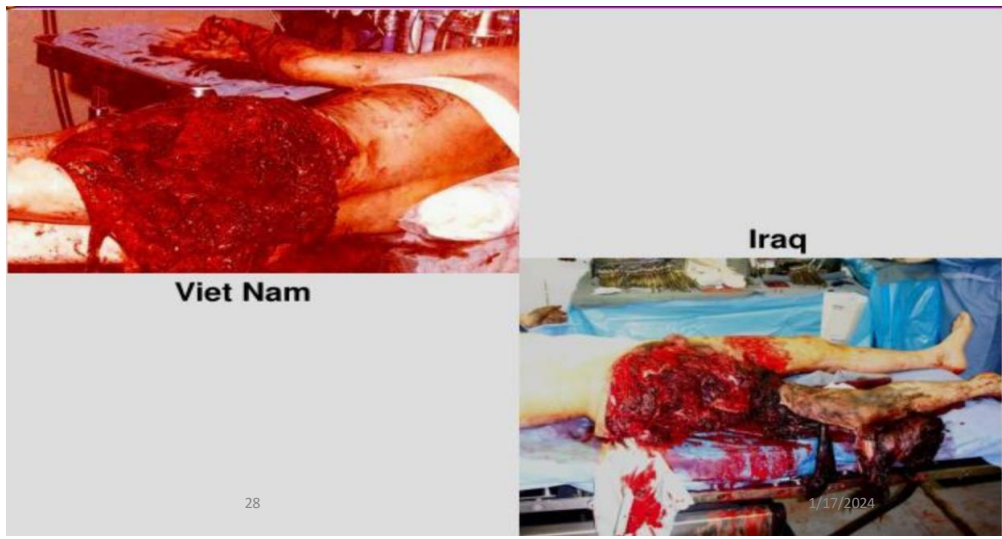


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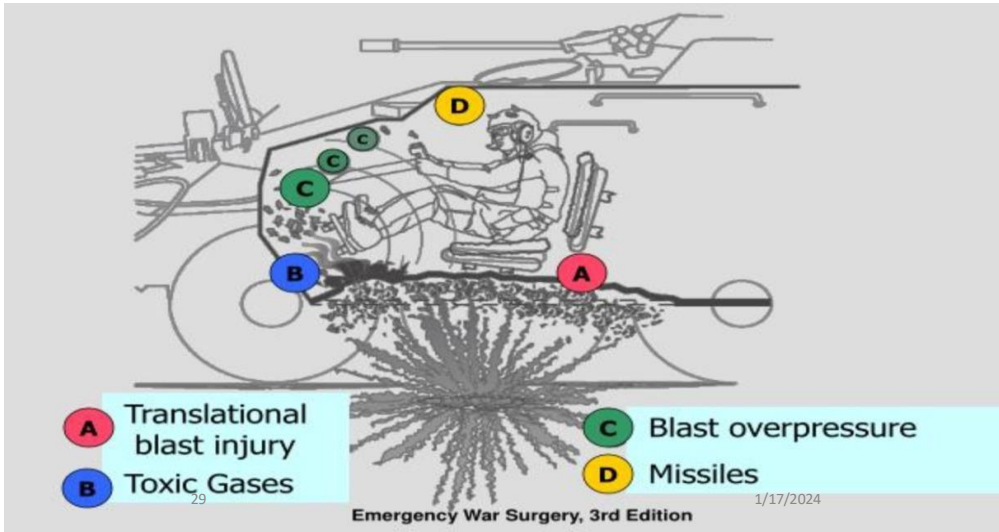
New Wound?



New Wounds ?



Armored Vehicles

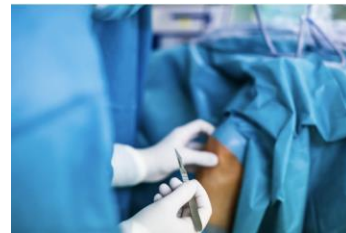


Lecture 3

Day Case Surgery



Day case surgery



Introduction

- **Day case surgery** is the admission of **select patients** to hospital for a planned surgical procedure, **returning home on the same day**. In the UK, this represents about 70% of all surgery performed.
- **Surgical day cases** are often viewed as the highest impact change in healthcare to improve productivity; healthcare guidelines have previously advised for a target of “treating day surgery [rather than inpatient surgery] as the norm for elective surgery”.

The advantages of day case surgery are:

- Shorter inpatient stays
- Reduced risk of hospital acquired infection
- Reduced waiting lists
- Reduced hospital costs
- Reduced demand for inpatient beds



Preparing for Day Case

- A patient undergoing a **day case procedure** should be advised **not to eat and drink for the 6 hours** prior to the surgery (when involving a general anesthetic). Most departments will allow a patient to drink **clear fluids up to 2 hours** before the procedure; local guidelines should be adhered to.
- **Medications** should be reviewed to ensure that they will not **impact the planned surgery** and additional guidance may be necessary from the operating surgeon and / or anesthetist. Often, this is one of the areas reviewed as part of a **pre-operative appointment** with a specialist nurse or anesthetist.

Types of Day Case Surgery

- For a surgical procedure to be considered for day case surgery, it must meet the following criteria:
- **Minimal blood loss** expected
- Low risk of significant immediate **complications**
- No requirement for **specialist aftercare**
- Patient can **manage pain** and **enteral nutrition** at home
- **Able to mobilise**

Procedure	Current Day Case Rate (%)
Inguinal hernia	47.5
Varicose veins	54.4
Termination of pregnancy	89.0
Cataract	90.6
Submucous septal resection	22.9
Extraction of wisdom tooth	87.9
Cystoscopy	19.1

Selection of the Patient

Much of the **success of day-case surgery** is down to care in **patient selection**. Most hospitals follow local guidelines to aid in this, which generally include absolute and relative contraindications based on co-morbidities.

The selection of a patient for day surgery should be based upon social and medical factors:

- **Social factors** – a patient must understand the planned procedure, consent appropriately, and understand the following post-operative care
 - The patient should also have sufficient provisions to have a responsible adult escort them home and provide support for the first 24 hours of post-operative care
- **Medical factors** – a patient's health must be suitable for a day case procedure, remembering that some stable chronic diseases (e.g. diabetes mellitus) can often be better managed as a day procedure to minimize any disruption to their daily routine
 - Those with poorly-controlled or severe co-morbidities may not be suitable for a day case pathway

Lecture 4

Reaction of Body to Injury

Reaction of body to injury

What Homeostasis

The human body is balanced before injury or surgery occurs



Homeostasis

- Maintenance of nearly conditions in the internal environment
- Essentially all organs and tissues of the body perform functions that help maintenance theses constant conditions

Basic concepts in homeostasis

Homeostasis: is the foundation of normal physiology



- Stress- free peri-operative care helps to preserve homeostasis following elective surgery
- Resuscitation, surgical intervention and critical care can return the severely injured p.t to a situation in which homeostasis becomes possible once again.

Metabolic response to injury

Response Phases

Two phases:

'ebb' and 'flow'

EBB PHASE

During the first few hours after injury.

Patients were cold and hypotensive (shocked shock was sometimes found to be reversible with resuscitation and in other cases irreversible).

Response Phases

- FLOW PHASE
- If the individual survived the ebb phase, patients entered the flow phase which was itself divided into two parts.
 1. Catabolic flow phase
 2. Anabolic flow phase

Response Phases

2 parts flow phase

catabolic flow phase

Initial

lasted about a week

a high metabolic rate

breakdown of proteins and fats

net loss of body nitrogen (negative nitrogen balance) and weight loss.

Response Phases

2 parts flow phase

• Anabolic flow phase

- Late

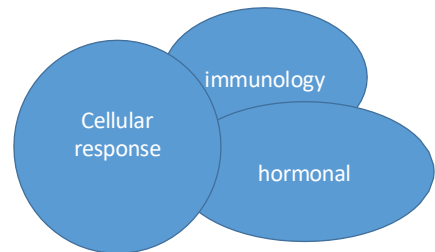
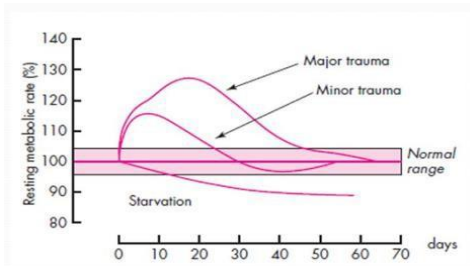
- Lasted 2--1 weeks

- Follow the catabolic phase

- Protein and fat stores were restored and weight gain occurred (positive nitrogen balance).

Metabolic response to injury is graded and evolve with time

- The more severe the injury, the greater the response in metabolic and immunology change:



Response components

- Physiological consequences
- Metabolic manifestations
- Clinical manifestations
- Laboratory changes

Response components

- **Physiological**
 - Cardiac output
 - Ventilation
 - Membrane transport
 - Weight loss
 - Wound healing
- **Metabolic**
 - Hyper metabolism
 - Accelerated gluconeogenesis
 - Enhance proteins breakdown
 - Increase fat oxidation

Response components

- **Clinical**
 - Fever
 - Tachycardia
 - Tachypnea
 - Presence of wound inflammation
 - Anorexia
- **Laboratory**
 - Leukocytosis
 - Hyperglycemia
 - Hepatic renal dysfunction

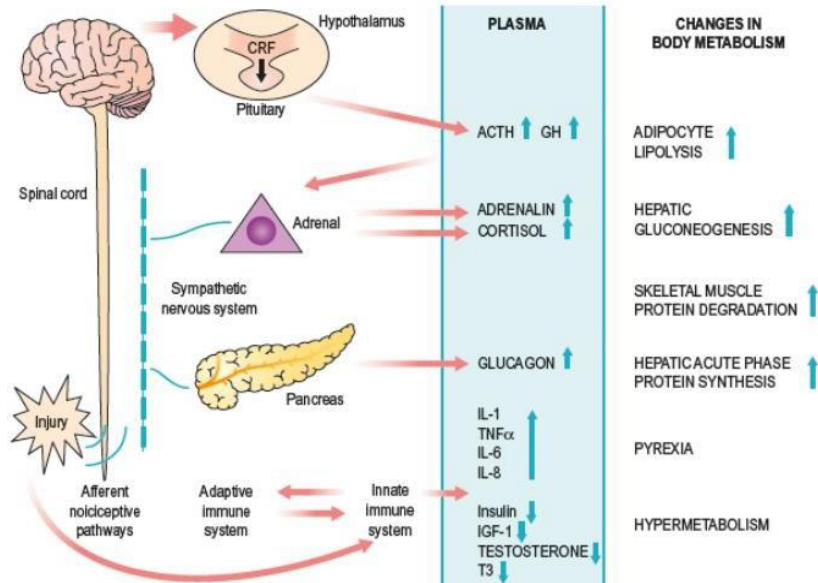
Mediators of injury response

Nuro-Endocrine (hormonal)

Immune system (cytokines)

Nuro-Endocrine Response To Injury

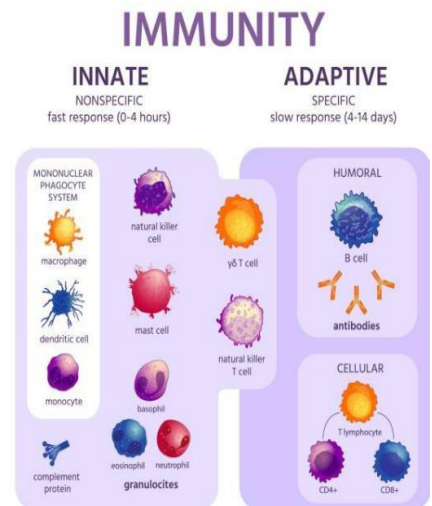
- **Acute phase** (changes for short-term survival)
 - Characterized by: an actively secreting pituitary and elevated counter regulatory hormones (cortisol, glucagon and adrenaline).
- **Chronic phase** (Changes contribute to chronic wasting).
 - Hypothalamic suppression
 - Low serum levels of the respective target organ hormones.



	Pituitary	Adrenal	Pancreatic	Others
↑ secretion	Growth hormone (GH) Adrenocorticotrophic hormone (ACTH) Prolactin Antidiuretic hormone / arginine vasopressin (ADH/AVP)	Adrenaline Cortisol Aldosterone	Glucagon	Renin Angiotensin
Unchanged	Thyroid-stimulating hormone (TSH) Luteinizing hormone (LH) Follicle-stimulating hormone (FSH)	-	-	-
↓ secretion	-	-	Insulin	Testosterone Oestrogen Thyroid hormones

Immunology Response To Injury

- **The innate immune system** (principally macrophages) interacts in complex manner with :
 - **The adaptive immune system** (T cells, B cells) in cogenerating the metabolic response to injury.



Systemic inflammation response syndrome(SIRS)

- **Two or more of the following critical :**
 1. Heart rate > 90
 2. Temp > (38 C) or < (36 C)
 3. Respiratory rate > 20
 4. WBC > 12.000\mm or < 4.000mm

SIRS + suspected or present source of infection = Sepsis

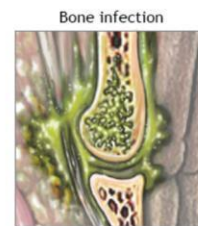
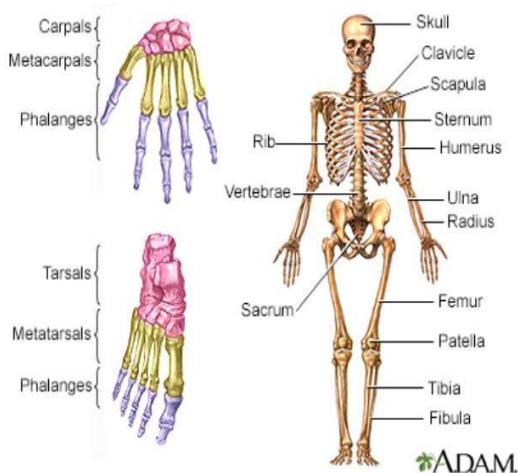
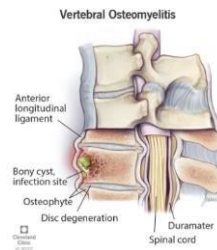
Lecture 5

Infection of The Joint and Bone

Infection Of The Joint And Bone

Definition

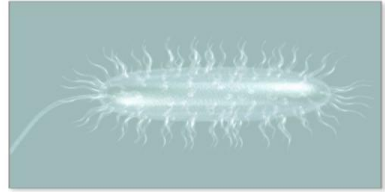
- Osteomyelitis is a bone and joint infection. It is mainly caused by bacteria or other germs



ADAM

The skeleton consists of groups of bones which protect and move the body.

Causes



Bacteria

- Bone infection is most often caused by bacteria. But it can also be caused by fungi or other germs. When a person has osteomyelitis:
- Bacteria or other germs may spread to a bone from infected skin, muscles, or tendons next to the bone. This may occur under a skin sore.
- The infection can start in another part of the body and spread to the bone through the blood.
- The infection can also start after bone surgery. This is more likely if the surgery is done after an injury or if metal rods or plates are placed in the bone.

Risk factors are:

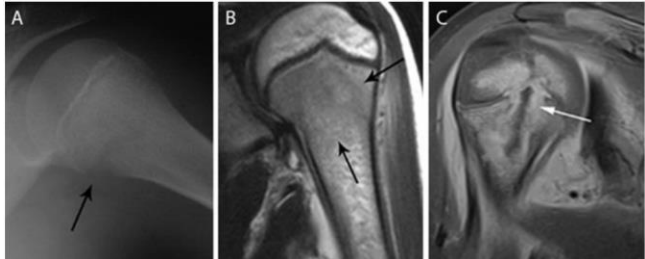
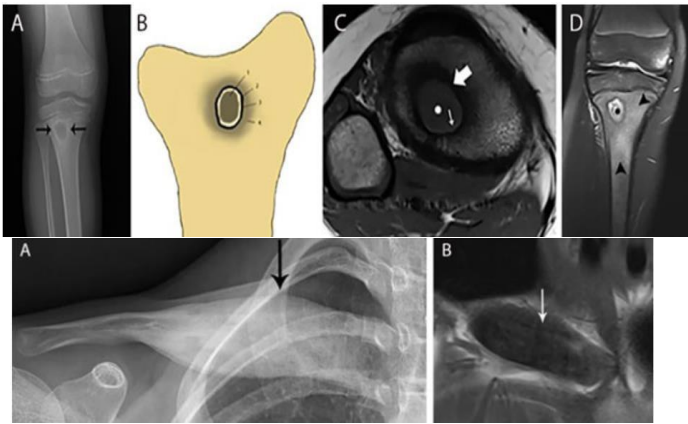
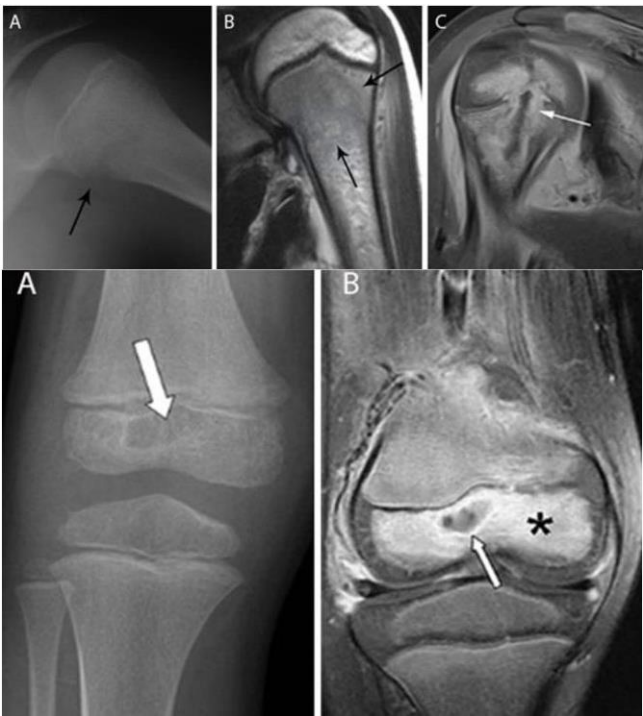
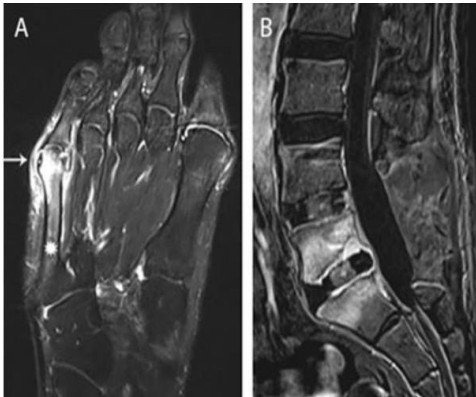
- Diabetes
- Hemodialysis
- Poor blood supply
- Recent injury
- Use of injected illicit drugs
- Surgery involving bones
- Weakened immune system

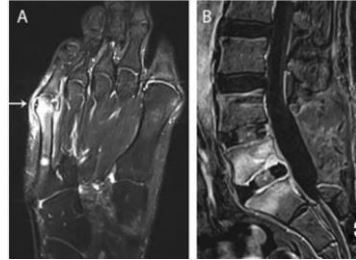
Symptoms

- Bone and joint pain
- Excessive sweating
- Fever and chills
- General discomfort, uneasiness, or ill feeling (malaise)
- Local swelling, redness, and warmth
- Open wound that may show pus
- Pain at the site of infection

Exams and Tests

- Blood cultures
- Bone biopsy (the sample is cultured and examined under a microscope)
- Bone scan
- Bone x-ray
- Complete blood count (CBC)
- C-reactive protein (CRP)
- Erythrocyte sedimentation rate (ESR)
- MRI of the bone
- Needle aspiration of the area of the affected bones





Treatment

The goal of treatment is to get rid of the infection and reduce damage to the bone and surrounding tissues.

Antibiotics are given to destroy the bacteria causing the infection:

- You may receive more than one antibiotic at a time.
- Antibiotics are taken for at least 4 to 6 weeks, often at home through an IV (intravenously, meaning through a vein).

Cot....

Surgery may be needed to remove dead bone tissue if the above methods fail:

- If there are metal plates near the infection, they may need to be removed.
- The open space left by the removed bone tissue may be filled with **bone graft** or packing material. This promotes resolution of the infection.

Cot....

If you have diabetes, it will need to be well controlled. If there are problems with blood supply to the infected area, such as the foot, surgery may be needed to improve blood flow in order to get rid of the infection.



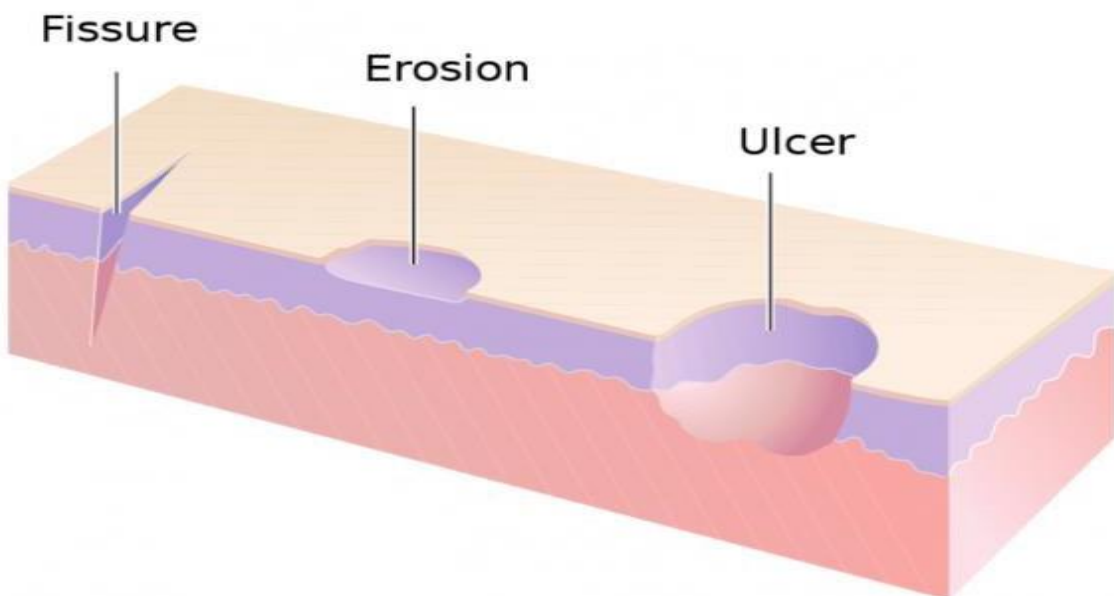
- Bone and joint infections are usually caused by bacteria called ***Staphylococcus aureus*** (or “staph”) and require treatment with antibiotics. A serious form of staph known as methicillin-resistant *Staphylococcus aureus* (MRSA) causes infections that can be more severe and need special antibiotics to treat.
- ☐ It is important to recognize and treat bone and joint infections because they can:
 - Spread to the blood and other organs causing life-threatening illness
 - Damage growth plates, bones and joints
 - Cause chronic arthritis and bone fractures

Lecture 6

Peptic Ulcers

Ulcers

- An 'erosion' is a term that refers to the loss of only the superficial layers of the skin (epidermis), and healing usually occurs without scarring. An ulcer refers to loss or damage of both superficial and deeper skin layers (epidermis and dermis) and can sometimes extend to underlying fat and muscle. When an ulcer is very deep but narrow, it is called a 'fissure' as seen to occur in the anal area due to trauma-induced by hard stools. A 'sore' is an umbrella term for any damaged, inflamed, or injured area which causes discomfort or pain.



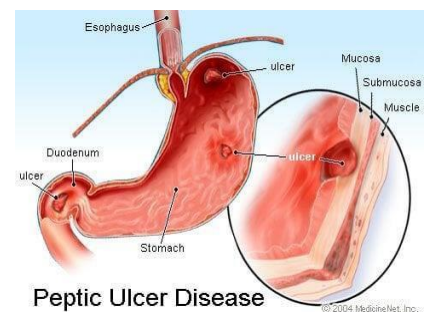
RESSURE

- Continuous pressure on a particular area of the body, can also decrease the local blood circulation and make the skin break down to form pressure ulcers. Here the cause is not primarily in the blood vessels as seen with arterial and venous ulcers, but due to continuous pressure on the skin.
- This is commonly seen in people who are in a lying position (decubitus) for prolonged periods, due to which there is increased pressure of the bodyweight on areas like buttocks, hips, and back. Ulcers which develop as a consequence are called bed sores or decubitus ulcers. Such ulcers can also be found on the back of the head, shoulder, elbow, ankle, or heel.

What is a stomach ulcer?

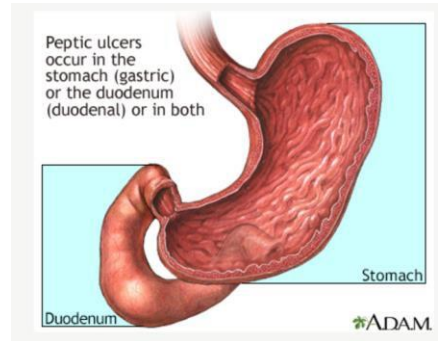
A stomach ulcer is a sore in the lining of your stomach. The medical term for them is peptic ulcers. A peptic ulcer can be in the stomach or in the beginning of the small intestine.

- Gastric ulcer: an ulcer in the stomach
- Duodenal ulcer: an ulcer in the small intestine

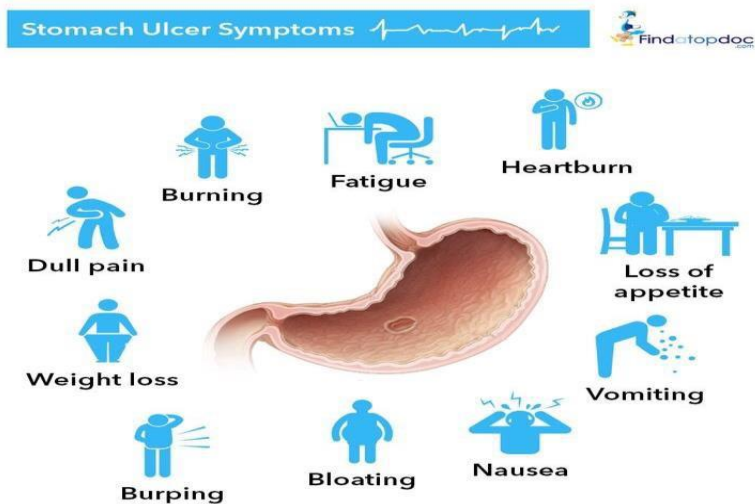


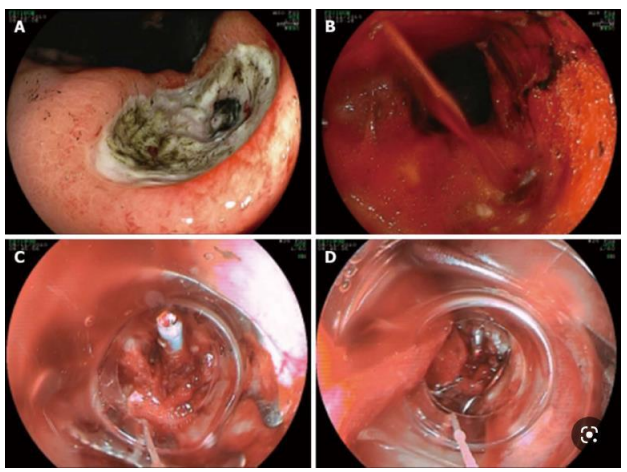
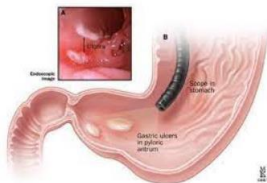
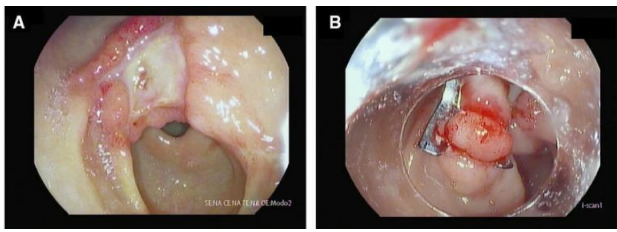
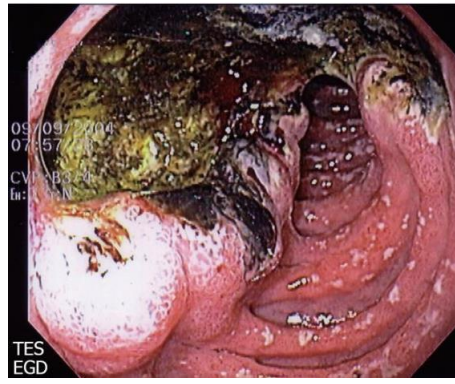
The mucosa is the layer membrane interior of the GIT if tear by the ulcer is result bleeding

- Melena is the dark stool
- Hematochezia is the fresh blood with stool



Stomach Ulcer Symptoms





Sever peptic ulcers symptoms

1. Vomiting or vomiting blood
2. Dark blood in stools
3. Stools that are black and tarry
4. Trouble breathing
5. Unexplained weight loss
6. Appetite changes

Stomach ulcer causes

1. The most common cause of stomach ulcers is an infection with (*H. pylori*).
2. Long-term use of non-steroidal anti-inflammatory drugs (NSAIDs).
3. Corticosteroids.
4. Anticoagulants.
5. Antidepressants like Paxil and Zoloft.
6. Osteoporosis medications – Actonel and Fosamax.

Stomach ulcer risk factors

1. Smoking.
2. Drinking alcohol.
3. Having a family history of ulcers.
4. Are over 70 years of age
5. Take high doses of NSAIDs
6. Are female
7. Have a personal history of ulcer disease

Pain medication

Another common cause of peptic ulcer disease is the routine use of pain medications called nonsteroidal anti-inflammatory drugs (NSAIDs).

• **Examples of the drugs that can cause peptic ulcer disease are:**

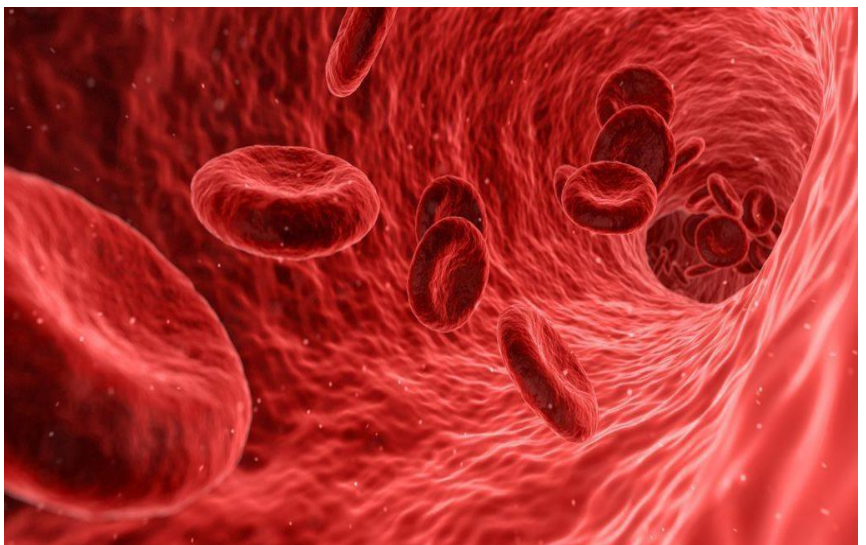
- Aspirin.
- Ibuprofen.
- Naproxen.
- Ketoprofen.
- Meloxicam.
- Celecoxib.

You're at risk for peptic ulcer disease if you:

- Are 50 years old or older.
- Drink alcohol in large amounts and/or often.
- Smoke cigarettes or use tobacco.
- Have a family member who has ulcer disease.

Gastric ulcer complications

1. Blood loss.
2. Peritonitis.
3. Obstructions.

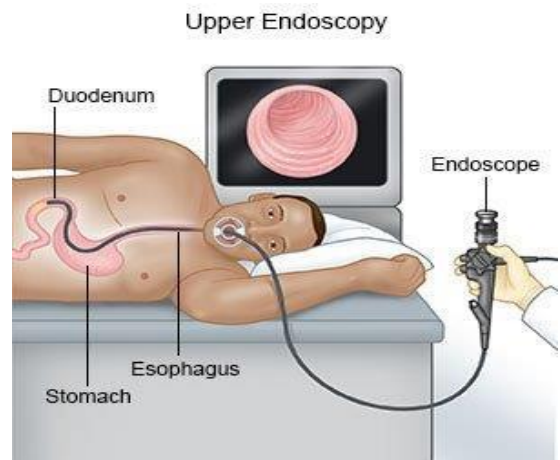
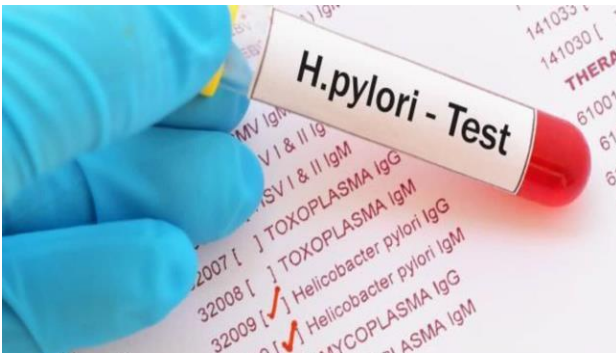


Upper



Gastric ulcer diagnosis

- An upper endoscopy (view the inside of your stomach with a small camera).
- Laboratory testing for *H. pylori*



Gastric ulcer treatment

1. Treatment with antibiotics may be necessary when there is an *H. pylori* infection causing the ulcer.
2. Proton-pump inhibitors: omeprazole.
3. Histamine blockers: famotidine.
4. Antacids like Tums for pain relief.

What is a pilonidal sinus?



A pilonidal sinus.

- A pilonidal sinus is a problem in your natal cleft (the area between your buttocks) that can cause infection.
- Hairs can grow in your natal cleft, or loose hairs can fall and collect in your natal cleft.
- Hairs carry bacteria, which can cause inflammation and infection.
- An abscess (a collection of pus) can form or the pus can drain through a tunnel (sinus) out to your skin.

What are the benefits of surgery?

- Surgery is the most dependable way to remove the pilonidal sinus and pockets of infection.

What does the operation involve? |

The operation is performed under a general anaesthetic and usually takes about 30 minutes.

Your surgeon will remove the sinus and infected tissue, sometimes over a large area.

What complications can happen?

Some complications can be serious and can even cause death.

General complications of any operation

- bleeding
- allergic reaction to the equipment, materials or medication
- blood clot in your leg
- blood clot in your lung
- chest infection

Specific complications of this operation

- partial breakdown of your wound
- slow healing
- numbness around your wound
- the problem coming back

Consequences of this procedure

1. pain
2. unsightly scarring of your skin

How soon will I recover?

- You should be able to go home the same day.
- You should be able to return to work after 2 to 3 weeks.
- Regular exercise should help you to return to normal activities as soon as possible. Before you start exercising, ask the healthcare team or your GP for advice.
- The pilonidal sinus can come back.
- It is important to keep the area free from hairs and as clean as possible to reduce this risk.

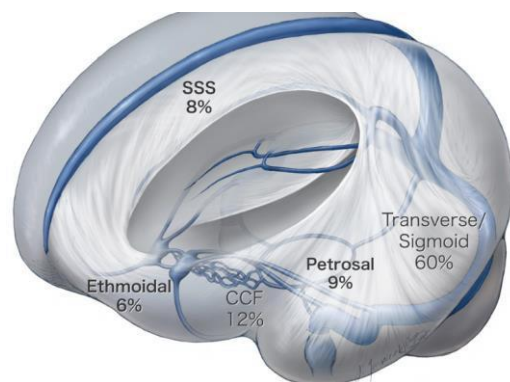
fistula

A fistula is an abnormal channel in the body

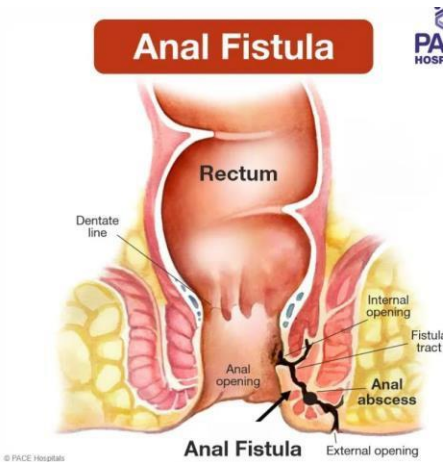
The best treatment is surgery, which is performed in multiple places in the body

- The term fistula often refers to an abnormal connection between two parts, which may be an organ or blood vessel to another structure.

- Arteriovenous Fistula

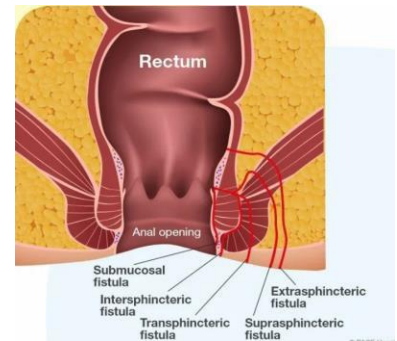


An example of fistula in this lecture



Incidence of anal fistula (fistula in ano)

- An anal fistula or fistula in ano is common in men when compared to that of women. It is usually developed in 12.3 cases per 100,000 men and 5.6 cases per 100,000 women. It is most commonly seen in the age group between 20-40 years.



Anal fistula symptoms

- Swelling and pain around the anal region
- Fever and Chills
- Feeling sick and tired
- Soreness, redness or itching at the anal opening
- Drainage associated with pus at the anal opening

Anal fistula causes

- The causes of anal fistula or fistula in ano include:
 - Peri anal abscess
 - Inflammatory conditions such as Crohn's disease, diverticulitis
 - Radiation therapy
 - Anal STIs (sexually transmitted infections)
 - Hidradenitis suppurativa (chronic inflammatory skin disease)
 - Anus affected by tuberculosis
 - Surgical complication near the anus

Risk Factors of Anal Fistula

The risk factors for anal fistula are as follows:

- Anal gland obstruction
- History of surgery or radiation therapy at the site of the anal region
- Obesity
- Diabetes
- Smoking
- Sedentary lifestyle
- History of perianal abscess
- Inflammatory bowel diseases
- Chronic STIs



Anal fistula diagnosis

- The diagnosis of anal fistula or fistula in ano includes:
- Physical rectal examination
- Digital rectal examination
- Fistula probe
- Anoscopy
- **Imaging techniques such as:**
- CT pelvis
- CT fistulography
- MRI of pelvis
- **Laboratory findings such as:**
- CBC (Complete blood picture count)
- CRP (C-reactive protein)

Prevention of Anal Fistula



The following lifestyle modifications can do anal fistula prevention:

This includes anal fistula diet, anal fistula medicine, and anal fistula home treatment.

Anal fistula diet - Taking fibre-rich foods, Drinking plenty of water, Taking fibre supplements, Avoiding too much alcohol and caffeine.

Anal fistula medicine -

OTC (over-the-counter) medications, such as topical ointments with analgesics and corticosteroids, and antibiotics, Avoiding painkillers, Taking stool softeners or bulk laxatives.

Anal fistula home remedies:

- Soaking the anal region in warm water
- Wearing the pad over the anal region
- Taking a sitz bath (a warm or shallow bath)
- Application of dressings at the site of wounds
- Maintain a healthy weight



Lecture 7

**Type of surgical disease(hereditary,
congenital, acquired)**

Type of surgical disease(hereditary, congenital, acquired)

Hereditary

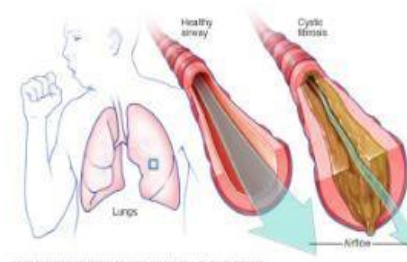
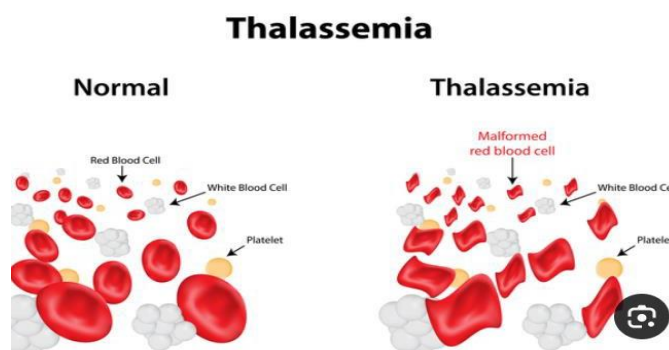
is the transmission of physical characteristics in living organisms from organisms to their offspring. It occurs through the offspring sharing the genetic code of the parents through half of the genetic code from the mother, and half of the genetic code from the father. This fusion occurs when the father's sperm combines with the mother's egg.

EXAMPLES OF SINGLE-GENE DISEASES AND RATES OF OCCURRENCE

- Achondroplasia is a bone growth disorder that causes short-limbed dwarfism in which there is a problem converting cartilage into bone

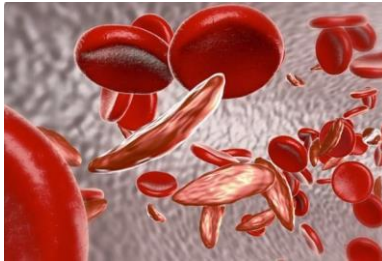


- Beta-thalassemia is a blood disorder that reduces production of hemoglobin and causes anemia, bone, and organ damage

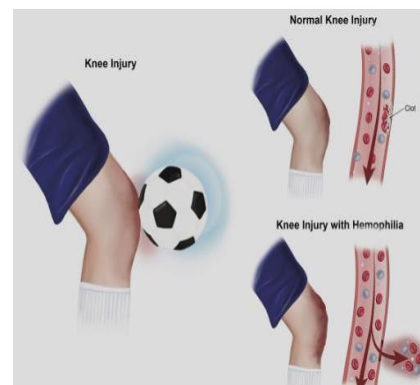


- Cystic fibrosis is an inherited disease characterized by a buildup of thick, sticky mucus that causes respiratory and digestive problems
- Cystic fibrosis (CF) is an inherited disorder that causes severe damage to the lungs, digestive system and other organs in the body.

- Sickle cell disease (SCD) is a progressive genetic disease characterized by blood vessel damage and blocked blood vessels. In SCD, high levels of abnormal sickle hemoglobin in red blood cells lead to unpredictable and life-threatening complications and chronic organ damage, including organ failure



- Hemophilia is an inherited bleeding disorder where blood fails to clot properly. Problems with hemophilia can range from spontaneous bleeds in joints, muscles, and organs as well as prolonged bleeding following surgery. The bleeding is caused by a missing protein. Depending on the missing protein, a person may have either hemophilia.



Types of Treatment for Genetic Diseases

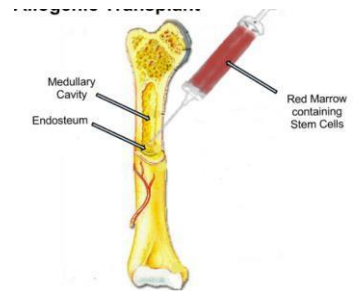
- Symptomatic treatment
- Relieving symptoms is one of the ways that treating a genetic disease can potentially improve patient outcomes. For example, people with hemophilia may need a treatment that replaces the clotting factor that their bodies fail to produce.
- Solid organ transplant

Cot.....

- For genetic diseases that only affect one organ in the body, solid organ transplantation may be an option. Removing a diseased organ and replacing it with a donor organ can help prevent disease complication and may help improve life expectancy. Solid organ transplant, as a potential curative option, can occur in the following diseases:
 - Metabolic liver disease
 - Polycystic kidney disease
 - Congenital heart disease
- When considering treatment options like solid organ transplantation, people should discuss their specific situation and the risks and benefits with their doctor.

Bone marrow transplant (BMT)

- About 65 years ago, another approach for treating certain genetic diseases became available: bone marrow transplant (BMT). This treatment is also called stem cell transplant or hematopoietic stem cell transplant (HSCT).

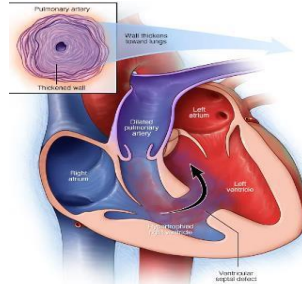


Difference between genetic and hereditary

- **Genetic diseases** are pathologies that occur because of an alteration in our genetic material or DNA. Mutations can be caused by an error in DNA replication or by environmental factors (e.g. cigarette smoke or exposure to radiation). In this case, the disease can manifest itself at any age. Genetic diseases may be transmitted by parents to their offspring or not.
- **A hereditary disease** is caused by alterations in the genetic material, transmitted from parents to children. While there is also a change in the DNA, the key characteristic here is the fact that the disease is transmitted, because the alteration is present in all the cells of the organism including in the germline cells as we will explain below.

Acquired

- An acquired is a medical condition that develops after the fetus is born. Unlike a congenital defect that is present at birth. A congenital defect may precede an acquired disorder, such as:



- ***Eisenmenger syndrome***

the development of pulmonary hypertension (high blood pressure in the lungs) due to an untreated congenital heart defect. The disease can cause complications including permanent heart and lung damage. Nonsurgical treatments focus on easing symptoms, but there is no cure