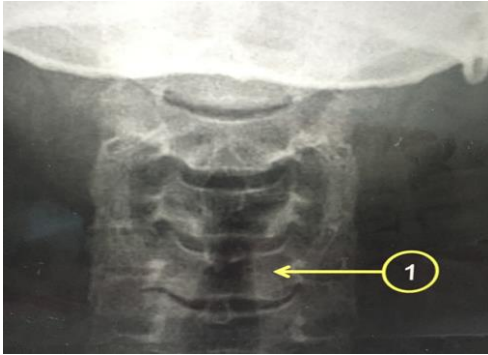




Radiology

Q1- what is the name of the following area ?



Vertebral body C5

Q-2 Which imaging is the faster in Time Taken for Complete Scan?
X-ray

Q-3 The most expensive one?
MRI

Pathology

- A 60 years old women present to the doctor with swelling deep, aching pain in her joints exacerbated by use, and limited range of movement.

- ***What the first thing you think about ?***

- Osteoarthritis.

- ***What other clinical presentation this women may has?***

- Heberden nodes.

- ***If you look to it under the microscope, what you might see?***

- Small cysts develop in the bone and osteophytes

- ***What are the common affected joints?***

- osteoarthritis affects joints that are constantly exposed to wear and tear.

the fingers in typists the knee in professional footballers

- ***What might be the cause?***

1. aging
2. abnormal load on joints

Pathology

A 29 years old female present in the clinic with fever malaise and red , swollen painful joints . The doctor asked her to do an x-ray and blood test and serum antibodies

What is the first thing you think of?

Rheumatoid arthritis

what will the xray show?

joint effusions, juxta-articular osteopenia, erosions .

The blood test, serum antibodies?

We will find high lycopcytes level, and in the serum we will find Rheumatoid factor and Anti-CCP.

What will you see under the microscope?

Pannus :formed by proliferating synovial-lining cells admixed with inflammatory cells, granulation tissue, and fibrous connective tissue.

What is the prognosis of this disease ?

Bad prognosis . It Reduces life expectancy by 3-7 years death due to amyloidosis, vasculitis, GI bleeds from NSAIDs, infections from steroids.

Is rheumatoid arhtritis affected by the sex?

it is more in female than male

Pathology

A 28 years old male present to the clinic with swollen, red, and very painful first metatarsophalangeal joint.

What is the first thing you think about?

Gout

Is it affected by the gender?

Yes in males more than females

What causes the inflammatory response ?

Sodium urate crystals have precipitated into the joint

What you can see under the microscope?

Tophi consist of crystals that are surrounded by macrophages, lymphocytes, and often foreign body giant cells

If the depositing crystals was Calcium pyrophosphate crystals, what is the name of the disease ?

Pseudogout

What are the most affected parts in pseudogout ?

in structures composed of cartilage such as menisci, intervertebral discs, and articular surfaces

Pathology

Q1-“Describe the Colles' fracture”?
A Colles' fracture is a fracture of the bone of the forearm called the radius, which results in a dinner-fork deformity at the wrist. It often follows a fall on the outstretched hand.

**Q2-“what group of people most commonly have incomplete fractures?
why?
children's,bones are not as completely ossified as adults**

Q3-what are the seven types of complete fractures?
Simple
Compound
Depressed
Comminuted
Avulsion
Impaction
Pathologica

**Q4-“reduction can be done in two ways, what are they?
open,closed**

Pathology

A 64-year-old retired firefighter retired nine years ago presents for physical examination, complaining his back has been “worse than usual” the past three weeks”, he said that he don’t take any medications and he was a prior smoker and he quit smoking one year ago, he don’t have a history of familial disease.

Q1-In this case what tests would you consider ordering?

X-ray.

Q2-what is the diagnosis:

Osteoporosis.

Q3-what do you think that this man will have to if he doesn’t treated:

He will be more Susceptible to fracture.

Q4-what would you ask him to do in order to reduce the risk:

High Calcium in the diet, habitual exercise, avoidance of smoking & alcohol intake & drinking carbonated soft drinks

Pathology

A 35 years old man complaining from pain in his right knee showing swelling and redness tests showed high leukocytosis and ESR ,history of urinary infection months ago

what is the possible diagnosis ?

infectious arthritis

what is the possible cause ?

gonococcus

what further complication he would develop ?

ankylosis- fatal septicemia

Treatment?

antibiotics- joint aspirations or drainage

Pharmacology

Which drug can cause acute gouty arthritis ?

Small dose of aspirin.

Patient was taking anti-inflammatory drug for a long time, he came to the emergency with severe pain. The diagnosis was peptic ulceration. Which of the following drug he might be taking ?

Nonselective
COX1/COX2 inhibitors.

A 9 years old child have a history of viral infection and he was treated by taking NSAIDs ,after one week he came to emergency suffers from confusion, seizures and loss of consciousness he also have swelling in the liver and brain.The diagnosis was (Reye's syndrome).Which of the following NSAIDs he might have?

Aspirin

pharmacology

A patient with urinary retention came to see a doctor. The doctor gave him a subcutaneous injection of a direct-acting cholinergic drug.

A- what was the drug?

- **Bethanechol**

B- explain the drug's mechanism of action.

- It binds to the Muscarinic receptor and produce effects similar to Ach and the parasympathetic nervous system. This leads to contraction of the urinary bladder's wall and Relaxation of sphincter (Urination).

pharmacology

A patient with urinary retention came to see a doctor. The doctor gave him a subcutaneous injection of a direct-acting cholinergic drug.

C- does the drug have central effect? Why?

No, it has quaternary structure that makes it polar. Thus can't cross the blood-brain barrier

D- what adverse effects would possibly happen to the patient after administering the drug?

- Diarrhea
- Bradycardia
- Sweating & Salivation
- Broncho-constriction

Anatomy

A 35 years old American patient came to the ER with problem in moving his arm (he is unable extend his elbow, fingers & his wrist joint). We know that he spent the last night celebrating in a party and when he wake up his problem start.

Q1-What is his problem?

(Wrist Drop) due to an injury on his radial nerve

Q2-what other causes may cause this problem?

-fractures and dislocations of the proximal end of the humerus.

-Injury or fracture of the spiral groove of the humerus

Q3-what other muscles may affect in this case?

The triceps, the anconeus, and the long extensors of the wrist are paralyzed.

Q1-What are the muscles that supply by the deep branch of the radial nerve?
the extensor muscles in the posterior compartment of the forearm

Q2-Is it motor or sensory nerve ?
it is PURELY Motor --> no sensory lose

Q3-How can it be damage?
by fractures of the proximal end of the radius or during dislocation of the radial head.

Q4-Why there is no wrist drop if the deep branch of the radial nerve is damaged?
because the latter muscle is powerful, it will keep the wrist joint extended.

Q1-What are the area that supply by the Superficial branch of the radial nerve?
the dorsum of the hand and lateral three and half fingers up to the base of their proximal phalanges

Q2-Is it motor or sensory nerve ?
sensory

Q3-How can it be damage?
by Injury like a stab wound, results in a variable small area of anesthesia

Anatomy

**Q1-What are the two possible affected area in ulnar nerve injury ?
the Elbow & the wrist**

Q2-What could be cause by each injury ?

At the elbow:

Atrophy of Ulnar side of forearm.

Flexion of the wrist with Abduction.

Claw hand.

Wasting of Hypothenar Eminence

At the wrist:

Claw Hand.

Wasting of Hypothenar Eminence.

Anatomy

Q1- Patient using crutches because of his broken leg he complained about pain on his upper limb. After doing some examinations the diagnosis was injury of nerve because of incorrect use of crutches . What is the name of this nerve ?

Axillary nerve.

Q2- Patient was suffering from loss of sensation in the thumb and lateral 2 (1\2) fingers & lateral (2\3) of the palm. What is the cause of his disability ?

Injury of the median nerve.

Anatomy

what is the most common injury that affect the elbow joint ?

- elbow dislocation - most are posterior - it is common in children because of the parts of the bones that stabilize the joint are incompletely developed.
- normally in non affected person the elbow joint is stable because of the wrench shaped articular surface of the olecranon and the pulley shaped trochlea of humerus + strong medial and lateral ligament

Anatomy

what can we find in cubital fossa ?

basilic vein -cephalic vein and
median cubital vein

what is the vein of the choice for IV
fluid ? and why ?

median cubital vein due to its
superficial position

how can we stop bleeding from
brachial artery ?

pressure on the artery on the

UPPER part of the arm pushed
(laterally)

LOWER part of the arm pushed
(posteriorly)

Anatomy

A 55 years old woman with osteoporosis complain from a pain in her hip ,test showed fracture in the neck of femur

what is the possible diagnosis ? avascular necrosis

what is the type of the joint ? synovial ,ball and socket

Give another example for other complications could affect the same joint ?

congenital dislocation (inability to adduct the thigh)

Biochemistry

what is UDP Glucose? It is the building block of glycogenesis

Mention the function of glycogen synthase in the process of glycogenesis. elongates pre-existing glycogen fragment or glycogen primer (glycogenin) by α 1-4 linkages. NOTE: Glycogen synthase cannot initiate synthesis glycogen

The enzyme that breaks down the alpha 1,6 glycosidic bond. debranching enzyme

Disease known as(skeletal muscle glycogen phosphorylase deficiency).

McARDLE SYNDROME

Biochemistry

What are the three amino acids required for the biosynthesis of creatine? 1- Glycine 2-Arginine 3-Methionine (as S-adenosylmethionine)

The enzymes involved in creatine biosynthesis, and their positions in the body. Amidino- transferase (kidney), Methyltransferase (Liver)

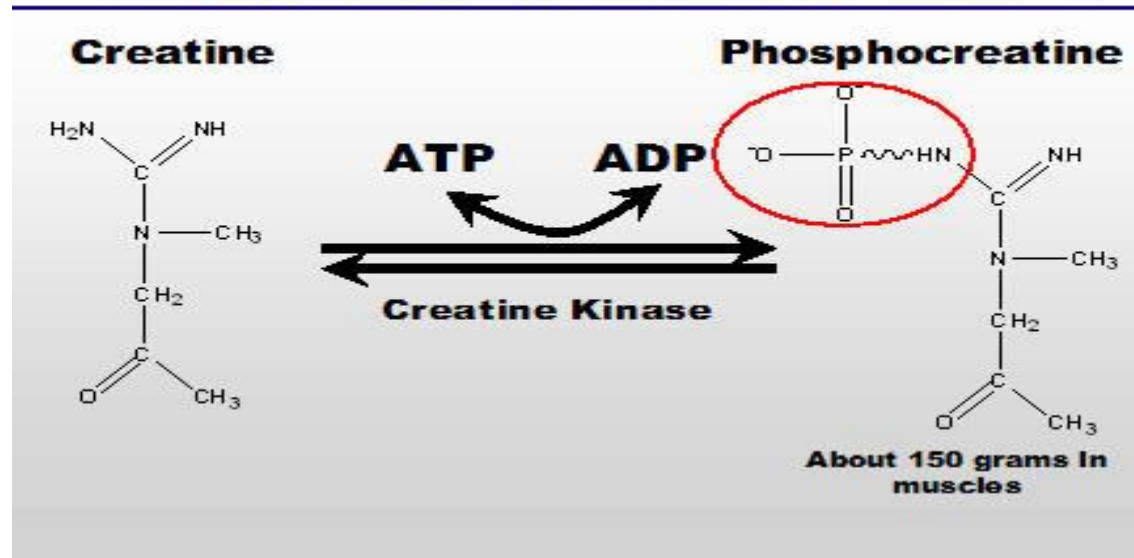
Explain why Proline prevents collagen chains to form α -helix: It does not have backbone amino group (it is a ring structure with secondary amino group) , therefore hydrogen bonding within the helix is not possible

What is the function of lysyl oxidase enzyme? oxidatively deaminates some of the lysine and hydroxylysine residues in collagen.

Biochemistry

The energy source of the muscle is creatine phosphate, explain the process of formation.

Phosphocreatine, an Energy Reserve



Biochemistry

Q1- Anaerobic metabolism is inefficient, why?

- 1- large amount of glucose are used for a very small ATP returns
- 2- lactic acid is produced whose presence contributes to muscle fatigue

Q2- What is the fiber type used is a strong contraction?
white.

Q3- Alanine consist of ?

Pyruvate+NH₂

biochemistry

what is oxygen debt ?

the extra oxygen that must be used in the oxidative energy processes after a period of strenuous exercise to reconvert lactic acid to glucose and decomposed ATP and creatine phosphate to their original states.

[for further information](#)

<https://www.youtube.com/watch?v=RDUqDWIFJdw>

Anatomy

What is a joint? It is the site where two or more bones meet together.

what are the types of joints, and they are classified based on what ?

Joints are classified according to the tissues that lie between the bones, and the joint could be Fibrous, Cartilaginous, Synovial.

what is the characteristics of the synovial joints ?

- 1. Fibrous capsule**
- 2. Articular cartilage**
- 3. Synovial membrane**
- 4. Joint cavity containing synovial fluid**

during delivery, which joint is used in the process of crowning (overlapping of bones in baby's head during pregnancy) ? Sagittal joint

ANATOMY

Group children were playing on the street; one of them suffered a heavy fall and his hands were outstretched. The boy was suffering from a severe pain around the shoulder area. Then, he was taken to the ER and had X-ray. The X-ray results showed a fracture of a bone, and the medial fragment of the fractured bone was elevated upward and the lateral fragment was pulled downward.

Name the fractured bone in the following case? **Clavicle**

What is the type of the bone (mentioned in the case), and what makes it so unique compared to other bones of the same type? **it is considered as a long bone but it has no medullary (bone marrow) cavity.**

ANATOMY

Mention one function of the bone (mentioned in the case). It serves as a rigid support from which the scapula and free upper limb are suspended keeping them away from the trunk, so that the arm has maximum freedom of movement.

Mention the articulations of the fractured bone.

Medially, sternoclavicular joint with manubrium

Laterally, Acromioclavicular joint with the Acromial end of the scapula

Inferiorly, costoclavicular Joint with the 1st rib

ANATOMY

A patient went to the doctor and he was complaining about a pain around the shoulder area. The doctor touched the area and felt a protrusion of the acromion process. The doctor diagnosed the condition as a fracture, and he performed an X-ray to confirm his hypothesis.

Before getting the X-ray results, which bone is most probably fractured in the following case? **Scapula**

Name the processes of the bone other than the one mentioned in the case. **Spine, and coracoid processes**

Name one articulation of the mentioned bone. **Shoulder joint (head of the humerus with glenoid cavity)**

ANATOMY

An old man fell on his hand when he walked on a slippery floor. The man went to the hospital and got an X-ray, and the X-ray results show a fracture in the humerus.

Which part of the humerus will most probably be fractured in the following case? **Surgical neck**

The following fracture could disrupt which nerve? Name one muscle that could be affected. **Axillary nerve, deltoid muscle**

ANATOMY

A 65-year-old woman fell on her hand, which led to a severe pain in her forearm. When she went to the doctor she performed an X-ray, and the X-ray results show a fracture in the distal end of the radius.

Name the type of fracture in the following case? **Colle's fracture**

Given the status of the patients, what do you think is the greatest factor that helped initiate the fracture (other than the fall itself)? **Given her age the patient is probably postmenopausal, so she has a great degree of osteoporosis, which makes her more susceptible to fracture.**

ANATOMY

A patient was complaining from a severe pain in the wrist. The X-ray result shows a fracture in the one the carpal bone?

Which carpal is most commonly fractured? **Scaphoid**

Name the proximal row of the carpal bones (from the lateral to the medial)

1-Scaphoid 2-Lunate 3-Triquetral 4-Pisiform

Name the distal row of the carpal bones (from the lateral to the medial)

1-Trapezium 2-Trapezoid 3-Capitate 4-Hamate

ANATOMY

What are the articulations of the femur?

1. Articulates with the acetabulum of the hipbone to form the hip joint.
2. Articulates with the tibia and patella to form the knee joint.

How can you tell the position of the femur (Right, Left)? The head is directed upward and medially and the shaft is smooth and convex anteriorly and rough and concave posteriorly.

How can you tell the position of the tibia (Right, Left)? Upper end is larger than lower end. Medial malleolus is directed downward and medially and shaft has sharp anterior border.

ANATOMY

What are the subcutaneous parts of bones in the lower limb?

Patella, anterior border of the tibia, tibial tuberosity, medial malleolus of the tibia and lateral malleolus of the fibula.

Name the tarsal bones, and identify which one is the largest.

Calcaneum (largest bone of the foot), talus, navicular, cuboid and three cuneiform.

ANATOMY

which joint that allows you to say “yes” and the name of the vertebrae involved? (Atlanto-Occipital) and the name of the vertebrae (Atlas).

which joint that allows you to say “no” and the name of the vertebrae involved? (Atlanto-Axial) and the name of the vertebrae (atlas and axial)

Movements in the Atlanto-Occipital joint?

Flexion, Extension, and Lateral flexion

ANATOMY

the patient is complaining from a back pain, and the X Ray results show forward displacement of a lumbar vertebra.

Name the condition of the case, and where it most commonly occurs in the lumbar vertebral bodies? **Spondylolisthesis, and it occurs most commonly in L5 vertebrae**

Name the largest movable vertebrae in our body and 2 things you know about it? **Vertebra L5, It has a massive body and thick transverse processes.**

Name the 3 Abnormal Curvatures of spine? **Thoracic curvatures (Kyphosis) , Lumbar curvature (Lordosis) , Lateral curvature of spine. (Scoliosis).**

Anatomy

A patient is admitted to the ER because he suffered a car accident. the patient seems to be complaining about a severe pain around his hip. the doctor immediately orders an emergency X-ray test and the result shows fractures in the pelvis.

Mention parts of the pelvis that are easily fractured. 1-Pubic ram 2-Acetabula 3-Region of sacroiliac joint 4-Alae of the ilium.

Difference between the male and female in the general structure of pelvis ?

Male : Thick & heavy Female : Thin, smaller & lighter

Anatomy

Mention the Types of Obstetrical Female Pelvis, and mention some general features about each type.

Gynaecoid: it is the typical female type

Anthropoid; long narrow and oval shaped.

Android : it is funnel shaped with contracted outlet.(it causes hazards to normal vaginal delivery)

Platypelloi ; wide,flattened at the brim, with forward promontory.

Anatomy

Patient A is a woman, 54 years of age, who has been employed for 17 years in the manufacturing industry. She has missed little work and continues to perform her regular duties, which include spending many hours each day at an assembly station. Patient A also spends time each day at her home computer. The patient presents to her physician's office with chronic pain, tingling, and numbness in her right hand and wrist as well as pain, tingling, and numbness in her neck and shoulders. Patient A indicates that she is unable to take anti-inflammatory medication due to a peptic ulcer and that she has had no success alleviating symptoms with other medications. She also reports a history of hypertension and recent-onset arthritis.

What is the most likely diagnosis ?

Carpal tunnel syndrome .

Anatomy

What is the cause of carpal tunnel syndrome ?

Compression of the median nerve within the carpal tunnel .

What are the manifestation of carpal tunnel syndrome ?

Burning pain (pins and needles) in the lateral three and half fingers.

No Weakness or atrophy of the thenar muscles (Ape Hand).

Inability to Oppose the thumbparesthesia over the thenar eminence .

What is the action of **Palmar Interossei** ?

Adduction of fingers toward center of the 3rd one.

Anatomy

Enumerate the structure passing deep to flexor retinaculum of the hand .

Tendon of Flexor carpi ulnaris.

Ulnar nerve.

Ulnar artery.

Palmar cutaneous branch of ulnar nerve.

Palmaris longus tendon.

Palmar cutaneous branch of median nerve

ANATOMY

CASE: A patient had severe car accident and the trauma was around the back, and when he recovered the patient noticed that he could not abduct his right arm more than 90 degrees.

Mention the muscle responsible for that movement. **TRAPEZIUS**

Which nerve is probably damaged in the back region? **Accessory nerve**

Mention the origin and insertion of the muscle mentioned in the case.

origin: Spines of cervical & thoracic vertebrae

insertion: lateral 1/3 of clavicle + acromion & spine of scapula.

Anatomy

List *the* superficial group of back muscles? Trapezius, Levator scapulae, Rhomboid minor, Rhomboid major, Latissimus dorsi.

Mention the muscle triangles of the back and one of their clinical uses.

1-Auscultatory Triangle: Site on back where breath sounds are most easily heard with a stethoscope.

Lumbar Triangle: for the emergence of pus from the abdominal wall.

Anatomy

Boundaries of axilla ? 1-Clavicle anteriorly 2-Upper border of the scapula posteriorly 3-outer border of the first rib medially

What is the brachial plexus? Network of nerves that present at the root of the neck to enter the upper limb

Mention the branches of lateral cord ? 1-lateral pectoral nerve

2- musculocutaneous nerve 3-median nerve (lateral root)

Anatomy

Mention the muscle used by climbers, and mention the origin, insertion, and nerve supply. pectoralis major muscle

origin: 2 heads; 1-clavicular head 2- sternocostal head

insertion: Lateral lip of bicipital groove.

Nerve supply: Medial & lateral pectoral nerves.

**Mention the structures that pierce clavipectoral region? 1- lateral pectoral nerve
2-thoraco-acromial artery 3-cephalic vein 4-lymph vessels**

Anatomy

If an individual fails to abduct his arm between 15-90 degrees, what could be the damaged nerve? and which muscle is affected ? **Axillary nerve, deltoid muscle**

If an individual fails to initiate the abduction of his arm, what could be the damaged nerve ? and which muscle is affected ? **Supraspinatus, suprascapular nerve.**

List the muscles of the rotator cuff. **supraspinatus, infraspinatus, teres minor and subscapularis**

What is the common site of rotator cuff injury ? **Supraspinatus tendon**

Anatomy

List the reasons for the instability in the shoulder joint

- 1. Head of humerus is 3 times larger than glenoid cavity**
- 2. Capsule is redundant.**
- 3. Few ligamentous support: glenoid labrum, coracohumeral**
- 4. Main support: muscles around the joint (ROTATOR CUFF)**
- 5. Wide range of movement**

HISTOLOGY

What is the contractile unit of a myofibril? **The sarcomere**

Which band shows a dark line in the middle (Z line)? **(I) band**

Mention two some microscopic features of a skeletal muscle (in the light microscope). **1- Multinucleated 2- –Cytoplasm (sarcooplasm) is acidophilic and shows clear transverse striations.**

Mention two microscopic features of smooth muscles (in the electron microscope). **1-Sarcooplasm contains mitochondria and sarcoplasmic reticulum. 2- Myosin & actin filaments are irregularly arranged (that's why no striations could be observed).**

HISTOLOGY

Difference between bone and cartilage ?

Cartilage: 1-cells are known as chondrocytes 2-usually nonvascular 3-rigid matrix

Bone:1-cells are known as osteocytes 2-vascular 3-hard matrix

Types of bone and difference between them ?

1-Compact bone: a-made of osteons. b-found in diaphysis of long bones. c-Haversian system present

2-spongy bone: 1 -made of trabeculae 2-epiphysis of long bones 3-Haversian system absent

HISTOLOGY

list the types of cartilage and their corresponding sites in the body.

1-Hyaline cartilage :

foetal skeleton – costa cartilage – nose , trachea

2-elastic cartilage :

external ear – Epiglottis

3- fibrocartilage :

Intervertebral disk

Physiology

What are the 3 states of the Na⁺ gate?

1. **Resting state:** when the MP is between -70 to -90 mV. The activation gate is closed.
2. **Activated state:** when the MP reaches the threshold value -65 to -55. Both gates are open.
3. **Inactivated state:** a few milliseconds after the activation gate opens the inactivation gate closes.

What is a threshold stimulus?

It's a stimulus strong enough to depolarize the membrane and move the MP to threshold level -65 to -50 mV.

Physiology

What are the states of the voltage-gated potassium channel?

Resting state: the gate is closed

Activation state: shortly after the inactivation of the sodium channel the channel opens.

How is AP conducted in myelinated fibers? Ionic currents travel from one node of ranvier to another call saltatory (jumping) conduction.

Why is myelin an excellent insulator? It prevents leakage and loss of ions and ions are only allowed to pass at nodes of ranvier increasing conduction velocity.

Physiology

What are the excitable tissues? Muscle and nervous tissue.

What property do excitable tissues have that makes them different from other body tissues? Their membrane acts as an electric capacitor storing opposite charges on the opposite sides of the membrane.

What contributes to the RMP?

- 1. K diffusion potential.**
- 2. Na diffusion potential.**
- 3. Na/K Pump.**

Physiology

What is the ion concentration for K⁺, Na⁺, Cl⁻ and charged proteins inside and outside the cell?

Intracellular conc.: K⁺ 140, Na⁺ 14, Cl⁻ 9 and charged proteins 106.5.

Extracellular conc.: K⁺ 4, Na⁺ 142, Cl⁻ 125 and charged proteins are 0.

Why is it that only electrolytes are important?

Because they are electrically charged.

Physiology

What are proteins that responsible for muscle contraction, and What are protein that regulate the contraction process? Myosin and Actin are responsible for contraction , Troponin and Tropomyosin regulate the process

During contraction, what change will happen in I-band and a-band ?The distance between two z-lines will decrease and make I- band smaller ,and a-band it doesn't change

How does ca initiates contraction of muscle? the attachment of Ca to Troponin will cause Tropomyosin to move away from the active sites on actin & expose them to myosin head

Physiology

What happens when myosin head attaches to actin?

It will form the cross-bridge that will activate the enzyme ATPase in the Myosin head, and ATPase breaks down ATP releasing energy

what is the Power Stroke ?

It is using y that produce by ATPase to move the myosin head leading to pulling & dragging of actin

Physiology

A patient was admitted to the hospital, and he had some problems with hands. The patients complained about his difficulty to pick up objects. The doctor made some tests and he diagnosed the patient with motor unit disease.

What is a Motor Unit? It is the Anterior Horn Cell and all the muscle Fibers it supplies

Explain Motor Unit Recruitment? Recruitment of motor units is the progressive activation of a muscle by successive recruitment of contractile units (motor units) to accomplish increasing degrees of contractile strength (force)

what most probably is the test referred to by the case? Electromyography

Physiology

A librarian feels pain when she left books. She requires frequent rest to recharge and to perform her work, and the patient usually has ptosis (drooping of the eyelid . Her respiratory and cardiovascular functions are normal. After performing more tests the doctor confirmed that it is a problem in the neuromuscular junction?

The Neuromuscular junction consists of what? 1- Axon terminal 2- Synaptic cleft 3- Synaptic gutter

Name the neurotransmitter of the neuromuscular junction and where it is found.

acetylcholine; found In vesicles in the axon terminal of the neuromuscular junction

Physiology

What is the function of Acetylcholinesterase? Destroyed Ach into Acetate & Choline

Name one disease that can be presented with these symptoms? Myasthenia Gravis

Deficiency of what ion would most probably cause the problems in the neuromuscular junction, and explain your reasoning? Calcium, because it causes the release of acetylcholine from the vesicles.

Physiology

A nerve conduction study (NCS) is? An electrophysiology test commonly used to evaluate the function of peripheral nerves of the human body, and it could be Motor or Sensory.

Define latency. Time between the stimuli and the response.

define electromyography. a technique for evaluating and recording physiologic properties of muscles at rest and while contracting , OR It's a recording of electrical activity of the muscle.

Physiology

A patient has performed a nerve conduction study in the upper and lower proximal muscles. The results are listed in the following:

the conduction velocity in the lower proximal muscles (legs): 46 m/s

the conduction velocity in the upper proximal muscles (arm): 41 m/s

Explain the data gathered from the test: the conduction velocity in the lower proximal muscles appear to be within the normal range (40-60 m/s), whereas the conduction velocity in the upper proximal muscles is abnormal and below the normal range (50-70 m/s).

Physiology

An athlete was competing in a marathon, and he was extremely fatigued at end of the marathon. He took some rest and fluids after the race, which helped with his recovery.

Name the metabolic systems that are important in physical activities? 1- phosphocreatin – creatine system (PCR) 2-Glycogen – lactic acid system 3- Aerobic system

Which metabolic system is used by the athlete the most in the marathon?

Aerobic system

Physiology

Describe recovery of aerobic system after exercise ? Oxygen debt : there is 11.5 L of oxygen should be repaid after exercise is over (2L Stored – 9.5L Consumed)

mention three Causes of muscle fatigue. 1-Glycogen depletion 2- Neuromuscular fatigue 3- Interruption of blood flow

Name four factors affecting athletic performance. 1-caffeine 2-anabolic steroids 3- gender 4-glucose availability

Physiology

Define Muscles Strength: Refers to the amount of force a muscle can Produce.

What factors affect the maximal oxygen consumption in aerobic metabolism (VO₂ max) ? 1- Genetic factors like Chest sizes in relation to body size, and Stronger respiratory muscles 2- it is also likely that many years of training increase the VO₂max

define Oxygen-Diffusing Capacity of Athletes. The oxygen diffusing capacity is a measure of the rate at which oxygen can diffuse from the pulmonary alveoli into the blood.

Physiology

It is summer in the city Riyadh, a construction worker is admitted to the ER. He is unconscious, the doctor gave the patient some fluids and the patient recovered. The doctor asked the patient some questions to learn about his condition. The patient mentioned the weather was hot, and he was sweating heavily, and he felt some headache and nausea before he collapsed.

What is the diagnosis ? heatstroke

explain what caused the patient to faint. the elevated temperature becomes destructive to tissue cells, especially brain cells.

what is the treatment ? Reduce the body temperature as rapidly as possible

pharmacology

What is the best drug used to treat tetanus if the patient has kidney failure ? explain why ? Atracurium , Because Atracurium undergo spontaneous hydrolysis at body ph (doesn't need kidney for excretion).

Why Pancuronium cause tachycardia ? Because it blocks muscarinic receptors in the heart.

If a patient took overdose of Vecuronium , what drug do you give him to reverse the effect? and why? Neostigmine , Cholinesterase breaks Acetylcholine to acetate and choline. When the patient take neostigmine , it will inhibit cholinesterase which mean more acetylcholine will be there that lead to contraction. (see physiology lecture : Neuromuscular junction if not clear).

Pharmacology

All the Reversible anticholinesterases drug are polar except ?

physostigmine.

Which type of anticholinesterases drugs can produce a CNS action ?

lipid soluble

anticholinesterases

as:

- physostigmine (reversible - Intermediate acting)
- Isoflurophate (Irreversible -long acting)

determine the **Adverse effects of cholinergic drugs?**

Bradycardia

Sweating & Salivation

Bronchoconstriction

Diarrhea

Microbiology

What are the most common causes of skin and soft tissue infections? Staph. Aureus and streptococcus.

What are cutaneous abscesses ? Collection of pus within the dermis and deeper skin tissues.

What's the difference between furuncles and carbuncles?

Furuncle: infections of the hair follicle, usually caused by s. aureus, in which suppuration extends through the dermis into the subcutaneous tissue.

Carbuncle: extending to involve adjacent follicles with coalescent inflammatory mass at the back of the neck especially in diabetics.

Microbiology

CASE: A patient comes to the emergency room with an excruciating pain in his legs, the patient feels that he will die. There was heat, redness, and swelling in his legs. He has some fever and he was vomiting frequently.

What is the diagnosis ? **Necrotizing fasciitis**

The disease has two types, name the organisms that cause each type.

Type 1 : Polymicrobial Type 2 : Monomicrobial (Group A strept only)

Mention the medical approach for treatment ? **1- surgery 2- Antibiotics (penicillin, clindamycin)**

Microbiology

CASE: A child came to the hospital with pain, fever with rigors and diaphoresis. After examination you noticed these local signs: soft tissue swelling, erythema, warmth, limited mobility.

What is the most probable disease? Acute osteomyelitis

How to confirm your diagnosis? By doing a blood culture, and aspiration of overlying abscess if blood cultures are negative

What are the microorganisms that is most likely to cause this disease in this patient?
Because he is a child, Staphylococcus aureus, group A streptococcus

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Microbiology

what is the most common pathogen in chronic osteomyelitis? Staphylococcus aureus

the most common cause for sickle cell disease? salmonella and streptococcus pneumoniae

What is the medical approach for the treatment of chronic osteomyelitis?
Surgery

the most common cause for sickle cell disease? salmonella and streptococcus pneumoniae

Immunology

how do Autoimmunities develop ? Failure of Immune Tolerance

Mention the 4 proposed Mechanisms that Induce Autoimmunity ?

1. Polyclonal B cell activation
2. Sequestered antigens
3. Molecular mimicry
4. Inappropriate class II MHC expression on non-antigen presenting cells

Give 2 Examples of Sequestered Antigens? Myelin basic protein , Lens and corneal

What is the Mechanism known as initiating step in a variety of autoimmune diseases ? Molecular Mimicry

Immunology

CASE:

“40 year old man , inpatients in king fahad hospital they gave him Hydralazine to treat his hypertension alongside with many other drugs”

what disease could develop during his treatment? **Lupus erythematosus like syndrome**

name 2 other Drugs that could induce his condition ? **Isoniazid , Penicillin**

Name the antibody which is frequently present in his condition. **Anti-histone**

Immunology

Briefly talk Graves' Disease: It is an organ specific autoimmune disease characterized by unregulated production of thyroid hormones.

Which antibody interacts with ACh receptors at nicotinic neuromuscular junction in Myasthenia Gravis ? IgG

What is the best screening test for Systemic lupus erythematosus? The anti-nuclear antibody (ANA) test

What are the treatments for systemic lupus erythematosus ? NSAIDs , Antimalarials (Hydroxychloroquine) , Immunosuppressive agents

anatomy

Badly placed intramuscular injections in the gluteal region could cause an injury to what nerve ?

-sciatic nerve

what can we do to avoid this injury ?

-injections should be done into the gluteus maximus or medius (into the upper outer quadrant of the buttock).

what other causes to the sciatic nerve injury ? and whats the most common injured part ?

-Posterior dislocation of the hip joint(due to car accident)

- The common peroneal nerve is the most affected part because its fibers lie ***superficial*** in the sciatic nerve.

anatomy

*-A patient came with pain experienced in the posterior aspect of the thigh, the posterior and lateral sides of the leg, and the lateral part of the foot .
the condition is known as ?*

Sciatica describes the condition in which patients have *pain along the sensory distribution of the sciatic nerve.*

- What might cause sciatica ?

1-Prolapse of an intervertebral disc, with pressure on one or more roots of the lower lumbar and sacral spinal nerves,

2-Pressure on the sacral plexus or sciatic nerve by an intrapelvic tumor,

3-Inflammation of the sciatic nerve or its terminal branches

anatomy

-a 10 years old girl came to the clinic and had a fracture in the neck of the fibula, what nerve is most likely to be injured in this case ? and why ?

The common peroneal nerve is in an *exposed position* as it leaves the popliteal fossa it winds around neck of the fibula to enter peroneus longus muscle, (Dangerous Position).

-what might be other cause to common peroneal nerve injury ?
pressure from casts or splints.

-what we call the situation of the leg ?

we referred to as Talipes "Equinovarus".

anatomy

the tibial nerve is *rarely injured why* ? **Because of its deep and protected position**

what we call the leg of tibial injury ? **attitude referred to as Taleps Calcaneovalgus.**

venous thrombosis due to : bone fracture

Venous stasis due to: pressure on the veins from the bedding during prolonged hospital stay and aggravated by muscular inactivity

Thrombophlebitis(inflammation of the veins): may develop around the vein.

Pulmonary thromboembolism (انتقال الجلطة من الوريد للرئة)

) may occur when a thrombus breaks free from the lower limb vein and passes to the lungs.

anatomy

a patient present with *Dilatation and Degeneration of the superficial veins that may be complicated by ulcers* it is mostly likely to be?

VARICOSE VEINS

what actually happens to the veins ?

Results because of incompetence of the valves in the perforating veins, Or valves within the great saphenous itself.

what is the most common affected part of the body ?

More common in the postero medial part of the lower limb.

Anatomy

what is the different result in injuring the radial nerve In axilla or In spiral groove?
both will lead to a condition known as “ drop wrist “ but • If the nerve was injured in the axilla the patient is unable to extend the elbow, wrist and fingers ”we lost everything” • If the nerve was injured in the spiral groove The patient is able to extend the elbow (weak extension) “the nerve branches in the axilla are not lost”.

what is the consequence of fracture of medial epicondyle of humerus?

1-Atrophy of Ulnar side of forearm. 2-Flexion of the wrist with Abduction. 3- Claw hand. 4-Wasting of Hypothenar Eminence.

dose the Radial Nerve supply any joints pass on it?

yes . The Radial nerve is going to supply the elbow & the wrist joints.

PHARMACOLOGY 6

A 37-year-old woman gradually developed painful wrists over 3 months; she consulted her doctor only when the pain and early morning stiffness stopped her from gardening. On examination, both wrists and the metacarpophalangeal joints of both hands were swollen and tender but not deformed. There were no nodules or vasculitic lesions. On investigation, she was found to have a raised C-reactive protein (CRP) level (27mg/l) (NR <10) but a normal haemoglobin and white-cell count. A latex test for rheumatoid factor was negative and antinuclear antibodies were not detected.

What is the most likely diagnosis ?

Rheumatoid arthritis

What is the first line DMARD for treating Rheumatoid arthritis ?

Methotrexate .

What are the ADRS of Methotrexate ?

Bone marrow suppression

Dyspepsia, Mucosal ulcers

Hepatotoxicity

Pneumonitis

Teratogenicity

Leukopenia, anemia, stomatitis, GI ulcerations, and alopecia are probably the result of inhibiting cellular proliferation

What are the clinical uses of infliximab ?

Infliximab is approved for use in RA, Ankylosing spondylitis, Crohn's disease, ulcerative colitis

This work was Done

by:

ريناد القحطاني
شهد العنزي
فتون الصالح

لينة الشهري
دانا فوزي
منيرة العمري
نورة العقيل
اسرار باطرفي
افنان المالكي
العنود العمران
دلال الحزيمي
رزان السبتي

محمد خالد الدغيشر
محمد الفضل
محمد أبو نيان
عبدالرحمن الزامل
عبدالله الفريح
عبدالرحمن الناصر
فيصل عبداللطيف
عبدالله العيدي
راكان البهيجان