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DEPARTMENT OF ANATOMY

ORAL PRESENTATIONS

Abstract – Anat - 01

Eagle's Syndrome

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Eagle syndrome is characterized by recurrent pain in the oropharynx and face due to an elongated styloid process or calcified stylohyoid ligament. The styloid process is a slender outgrowth at the base of the temporal bone, immediately posterior to the mastoid apex. With the stylohyoid ligament and the small horn of the hyoid bone, the styloid process forms the stylohyoid apparatus, which arises embryonically from the Reichert cartilage of the second branchial arch. Eagle defined the length of a normal styloid process at 2.5-3.0 cm. Patients with the classic "Eagle Syndrome" can present with unilateral sore throat, dysphagia, tinnitus, unilateral facial and neck pain, and otalgia. In patients with the vascular form of "Eagle syndrome", the elongated styloid process is in contact with the extracranial internal carotid artery. This can cause a compression (while turning the head) or a dissection of the carotid artery causing a transient ischemic event or a stroke. Eagle's syndrome represents symptoms brought on by compression of regional structures by elongation of the styloid process or ossification of the stylohyoid or stylomandibular ligaments. Watt Eagle described it for the first time in 1937, dividing it into two subtypes: the "classic syndrome" and the "stylo-carotid artery syndrome." Many theories have been put forth regarding its pathogenesis. Depending on the underlying pathogenetic mechanism and the anatomical structures compressed or irritated by the styloid process, symptoms vary greatly, ranging from cervicofacial pain to cerebral ischemia. The syndrome generally follows tonsillectomy or trauma. Diagnosis is confirmed by radiological findings. Palpation of the styloid process in the tonsillar fossa and infiltration with anesthesia are also used in making the diagnosis. The treatment is primarily surgical; however, some conservative treatments have also been used. The current literature on Eagle's syndrome is reviewed, highlighting its often underestimated frequency and its clinical importance. A controversial entity, Eagle's syndrome, is reviewed. After an anatomical description of the maxillo-vertebro-pharyngeal region we summarize the causative, diagnostic and therapeutic aspects of the syndrome. Two different conditions are often reported as Eagle's syndrome: one characterized by dysphagia and unilateral pharyngeal pain radiating to the ear and worsened by swallowing; the other characterized by pain in the head and neck region due to compression of the neurovascular structure by an elongated styloid process.



Abstract – Anat - 02

Craniosynostosis

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Craniosynostosis consists of premature fusion of 1 or more cranial sutures, often resulting in an abnormal head shape. It may result from a primary defect of ossification (primary craniosynostosis) or, more commonly, from a failure of brain growth (secondary craniosynostosis). Simple craniosynostosis is a term used when only 1 suture fuses prematurely. Complex or compound craniosynostosis is used to describe premature fusion of multiple sutures. When children with craniosynostosis, usually complex, also display other body deformities, this is termed syndromic craniosynostosis. In cases in which the compensation does not effectively provide enough space for the growing brain, craniosynostosis results in increased intra cranial pressure leading possibly to visual impairment, sleeping impairment, eating difficulties, or an impairment of mental development combined with a significant reduction in IQ. Craniosynostosis occurs in one in 2000 births. Craniosynostosis is part of a syndrome in 15 to 40% of the patients, but it usually occurs as an isolated condition. New insights have given fuel to a debate whether there might be an intrinsic factor causing the premature fusion of the sutures. Brain structures of children with craniosynostosis were evaluated using magnetic resonance imaging. Differences were seen compared with the brain structures of normal children. The question now is whether these differences are caused by the craniosynostosis, or are the cause of craniosynostosis. The cause of craniosynostosis is unknown. Genes may play a role. However, there is usually no family history of the condition.



Abstract – Anat - 03

Non Dysjunction

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Nondysjunction is failure of homologous chromosomes or sister chromatids to separate subsequent to metaphase in meiosis or mitosis so that one daughter cell has both and the other neither of the chromosomes failure of homologous chromosomes or sister chromatids to separate subsequent to metaphase in meiosis or mitosis so that one daughter cell has both and the other neither of the chromosomes.



Abstract – Anat - 04

Gametogenesis

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Gametogenesis: The development and production of the male and female germ cells required to form a new individual. The male and female germ cells are called gametes. The gametes in human males are produced by the testes, Gametes in human females are produced by the ovaries, during sexual intercourse, an ejaculated sperm cell penetrates an egg and unites with it (fertilizes it). The fertilized egg is called the zygote. The reproductive organs in both males and females (testes and ovaries, respectively) begin gametogenesis with a primitive germ cell. A primitive germ cell initiates the process that eventually results in a new being. The primitive germ cell contains 46 pairs of chromosomes. Chromosomes occur in pairs because they reflect the makeup of the previous generation - 23 chromosomes from the father and 23 from the mother. However, the gametes produced by the testes and the ovaries cannot each contain 46 chromosomes. Otherwise, after they unite, they will contain 92 chromosomes! Thus, the germ cells produced by the testes and ovaries each divide once, then divide again, in a reduction process that creates cells containing 23 chromosomes, or half the original number. This reduction process is known as meiosis. Gametogenesis is a biological process by which diploid or haploid precursor cells undergo cell division and differentiation to form mature haploid gametes. It is also the process of gamete formation, which includes micro- and megagametogenesis. Depending on the biological life cycle of the organism, gametogenesis occurs by meiotic division of diploid gametocytes into various gametes, or by mitotic division of haploid gametogenous cells. Gametogenesis initiates after specialized cells in the sporophyte undergo meiosis, and subsequent mitotic divisions yield the gametophytic phase of the plant life cycle. In higher plants, microgametogenesis occurs in the anther, producing tricellular pollen with two sperm cells within a vegetative cell. Megagametogenesis occurs in the ovule, producing an embryo sac. The male gametes, the two sperm cells, and the female gametes, the egg and central cell, fuse to yield the zygote and the endosperm, respectively. Both micro- and megagametogenesis are under strict genetic control. Studies of gametophytic mutants have identified genes important for gametogenesis. Furthermore, high-throughput expression profiling techniques have helped identify gene regulatory networks that operate during gametogenesis. Gametogenesis requires the successful coordination of two key processes, meiotic nuclear division and gamete morphogenesis. A central regulatory step in progression through gametogenesis occurs at the pachytene stage of meiotic prophase.



Cavernous Sinus

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The cavernous sinus is one of the dural venous sinuses. It is located on either side of the pituitary fossa and body of the sphenoid bone between the endosteal and visceral layers of the dura. It receives blood from the inferior ophthalmic vein, superficial middle cerebral vein, inferior cerebral veins, sphenoparietal sinus and occasionally central retinal vein, frontal tributary of the middle meningeal vein. Potential causes of cavernous sinus syndrome include metastatic tumors, direct extension of nasopharyngeal tumors, meningioma, pituitary tumors or pituitary apoplexy, aneurysms of the intracavernous carotid artery, cavernous-carotid arteriovenous fistula, bacterial infection causing cavernous sinus thrombosis, aseptic thrombosis, idiopathic granulomatous disease. The cavernous sinus (or lateral sellar compartment), within the human head, is a large collection of thin-walled veins creating a cavity bordered by the temporal bone of the skull and the sphenoid bone, lateral to the sellaturcica. The cavernous sinus is one of the dural venous sinuses. It is located on either side of the pituitary fossa and body of the sphenoid bone between the endosteal and visceral layers of the dura. Cavernous sinus thrombosis is a rare and life-threatening condition in which a blood clot develops in the cavernous sinuses. The cavernous sinuses are a series of hollow spaces located under the bottom of the brain, behind each eye socket. A major blood vessel called the jugular vein carries blood through the cavernous sinuses away from the brain. Radiographic signs of cavernous sinus thrombosis were found in eight consecutive patients with an angiographic diagnosis of carotid-cavernous sinus fistula; six were of the dural type and the ninth case was of a shunt from a cerebral hemisphere vascular malformation. Diagnostic features consisted of filling defects within the cavernous sinus and its tributaries, an abnormal shape of the cavernous sinus, an atypical pattern of venous drainage, and venous stasis. Progression of thrombosis was demonstrated in five patients who underwent follow-up angiography. Because of a high incidence of spontaneous resolution, patients with dural-cavernous sinus fistulas who show signs of venous thrombosis at angiography should be followed conservatively. It is the only anatomic location in the body in which an artery travels completely through a venous structure. If the internal carotid artery ruptures within the cavernous sinus, an arteriovenous fistula is created (more specifically, a carotid-cavernous fistula). Lesions affecting the cavernous sinus may affect isolated nerves or all the nerves traversing through it. The pituitary gland lies between the two paired cavernous sinuses. An abnormally growing pituitary adenoma, sitting on the bony sellaturcica, will expand in the direction of least resistance and eventually compress the cavernous sinus.



Ernest Syndrome

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Ernest Syndrome, a condition discovered by Dr. Ernest in 1982, is a painful headache disorder and facial pain condition that may result from car accidents, blows to the head, falls, prolonged opening of the mouth, wisdom teeth surgery procedures or general anesthesia. The facial pain begins below the lobe of the ear and radiates to the ear, temple, cheek bone, lower rear teeth, eye, jaw joint and throat. Treatment may first include injection of medication into the damaged ligament. It often resembles a temple headache and earache. . Diagnosis is confirmed by radiological findings. Palpation of the styloid process in the tonsillar fossa and infiltration with anesthesia are also used in making the diagnosis. The treatment is primarily surgical; however, some conservative treatments have also been used. The current literature on Eagle's syndrome is reviewed, highlighting its often underestimated frequency and its clinical importance .A controversial entity, Eagle's syndrome, is reviewed. After an anatomical description of the maxillo -vertebro-pharyngeal region we summarize the causative, diagnostic and therapeutic aspects of the syndrome. Two different conditions are often reported as Eagle's syndrome: one characterized by dysphagia and unilateral pharyngeal pain radiating to the ear and worsened by swallowing; the other characterized by pain in the head and neck region due to compression of the neurovascular structure by an elongated styloid process.



Lymphatics of Head And Neck

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The lymph glands of the head are Occipital, Facial, Posterior Auricular, Deep Facial, Anterior Auricular, Lingual, Parotid, Retropharyngeal. The occipital glands (lymphoglandulæ occipitales), are placed on the back of the head close to the margin of the Trapezius and resting on the insertion of the Semispinalis capitis. The posterior auricular glands (lymphoglandulæ auriculares; mastoid glands), are situated on the mastoid insertion of the Sternocleidomastoideus, beneath the Auricularis posterior. The anterior auricular glands (lymphoglandulæ auriculares anteriores; superficial parotid or preauricular glands), lie immediately in front of the tragus. The parotid glands (lymphoglandulæ parotideæ), form two groups in relation with the parotid salivary gland, viz., a group imbedded in the substance of the gland, and a group of subparotid glands lying on the lateral wall of the pharynx. The facial glands comprise three groups: (a) infraorbital or maxillary, scattered over the infraorbital region from the groove between the nose and cheek to the zygomatic arch; (b) buccinator, one or more placed on the Buccinator opposite the angle of the mouth; (c) supramandibular, on the outer surface of the mandible, in front of the Masseter and in contact with the external maxillary artery and anterior facial vein. The deep facial glands (lymphoglandulæ faciales profunda; internal maxillary glands) are placed beneath the ramus of the mandible, on the outer surface of the Pterygoideus externus, in relation to the internal maxillary artery. The lingual glands (lymphoglandulæ linguales) are two or three small nodules lying on the Hyoglossus and under the Genioglossus. The retropharyngeal glands, from one to three in number, lie in the buccopharyngeal fascia, behind the upper part of the pharynx and in front of the arch of the atlas, being separated, however, from the latter by the Longus capitis. The lymphatic vessels of the scalp are divisible into (a) those of the frontal region, which terminate in the anterior auricular and parotid glands; (b) those of the temporoparietal region, which end in the parotid and posterior auricular glands; and (c) those of the occipital region, which terminate partly in the occipital glands and partly in a trunk which runs down along the posterior border of the Sternocleidomastoideus to end in the inferior deep cervical glands. The lymphatic vessels of the auricula and external acoustic meatus are also divisible into three groups: (a) an anterior, from the lateral surface of the auricula and anterior wall of the meatus to the anterior auricular glands; (b) a posterior, from the margin of the auricula, the upper part of its cranial surface, the internal surface and posterior wall of the meatus to the posterior auricular and superior deep cervical glands; (c) an inferior, from the floor of the meatus and from the lobule of the auricula to the superficial and superior deep cervical glands.



Abstract – Anat - 08

Meninges of Brain

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The meninges from Ancient Greek: “membrane”, are the membranes that envelop the central nervous system. In mammals, the meninges consist of three layers: the dura mater, the arachnoid mater, and the pia mater. The primary function of the meninges and of the cerebrospinal fluid is to protect the central nervous system. These are the structures involved in meningitis, an inflammation of the meninges, which, if severe, may become encephalitis, an inflammation of the brain. The dura mater also rarely called meninx fibrosa or pachymeninx is a thick, durable membrane, closest to the skull. The dura mater, the outermost part, is a loosely arranged, fibroelastic layer of cells, characterized by multiple interdigitating cell processes, no extracellular collagen, and significant extracellular spaces. The middle region is a mostly fibrous portion. It consists of two layers: the periosteal layer, which lies closest to the calvaria (skull)—and the inner meningeal layer, which lies closer to the brain. It contains larger blood vessels that split into the capillaries in the pia mater. It is composed of dense fibrous tissue, and its inner surface is covered by flattened cells like those present on the surfaces of the pia mater and arachnoid mater. The dura mater is a sac which envelops the arachnoid mater and surrounds and supports the large dural sinuses (dural sinuses) carrying blood from the brain toward the heart. The dura has four areas such as, falx cerebri, tentorium cerebelli, falx cerebelli, and diaphragm sellae. The arachnoid mater provides a cushioning effect for the central nervous system. The arachnoid mater is a thin, transparent membrane. It is composed of fibrous tissue and, like the pia mater, is covered by flat cells also thought to be impermeable to fluid. The arachnoid does not follow the convolutions of the surface of the brain and so looks like a loosely fitting sac. In the region of the brain, particularly, a large number of fine filaments called arachnoid trabeculae pass from the arachnoid through the subarachnoid space to blend with the tissue of the pia mater. The pia mater is a very delicate membrane. It is the meningeal envelope that firmly adheres to the surface of the brain and spinal cord, following the brain's minor contours (gyri and sulci). It is a very thin membrane composed of fibrous tissue covered on its outer surface by a sheet of flat cells thought to be impermeable to fluid. The pia mater is pierced by blood vessels to the brain and spinal cord, and its capillaries nourish the brain.



Abstract – Anat - 09

Metopic Suture

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Metopism is partially or totally persisting suture extending from the nasion to the anterior angle of the bregma. Persistent metopic suture may be misdiagnosed as a vertical traumatic skull fracture extending in the mid-line in head trauma patients. The time of physiological closure of the metopic suture varies from birth to 8 years of age. Widely accepted closing time is approximated at 2 years of age. The frontal suture is a dense connective tissue structure that divides the two halves of the frontal bone of the skull in infants and children. It usually disappears by the age of six, with the two halves of the frontal bone being fused together. It is also called the metopic suture, although this term may also refer specifically to a persistent frontal suture. If the suture is not present at birth because both frontal bones have fused (craniosynostosis), it will cause a keel-shaped deformity of the skull called "trigonocephaly." Rarely some individuals have continued to have a persistent metopic suture, a normal anatomical variation. Metopic sutures have a characteristic midline position and demonstrate sutural interdigitations. The metopic suture (also known as the median frontal suture) is a type of calvarial suture.



Abstract – Anat - 10

Abnormal Implantation

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The term "implantation" is used to describe process of attachment and invasion of the uterus endometrium by the blastocyst (conceptus) in placental animals. In humans, this process begins at the end of week 1, with most successful human pregnancies the conceptus implants 8 to 10 days after ovulation, and early pregnancy loss increases with later implantation. Abnormal implantation sites or Ectopic Pregnancy occurs if implantation is in uterine tube or outside the uterus. It may be in the external surface of uterus, ovary, bowel, gastrointestinal tract, mesentery, peritoneal wall. Tubal pregnancy contributes to about 94% of ectopic pregnancies. In this case embryo may develop through early stages, can erode through the uterine horn and reattach within the peritoneal cavity. Another type of abnormality is when only the conceptus trophoblast layers proliferates and not the embryoblast, no embryo develops, this is called a "hydatidiform mole", which is due to the continuing presence of the trophoblastic layer, this abnormal conceptus can also implant in the uterus. Abnormalities can range from anatomical associated with degree or site of implantation, structure (as with twinning), to placental function, placento-maternal effects (pre-eclampsia, fetal erythroblastosis) and finally mechanical abnormalities associated with the placental (umbilical) cord.



Abstract – Anat - 11

Down's syndrome

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Down's syndrome, also known as trisomy 21, is a genetic disorder caused by the presence of all or part of a third copy of chromosome 21. About 1% to 2% of people with Down syndrome inherit additional genes from chromosome 21, but not in every cell of the body. This is known as mosaic Down syndrome. These individuals may, for example, have inherited extra genes from chromosome 21 in their muscle cells, but not in any other type of cell. Because the percentage of cells with extra genes from chromosome 21 varies in people with mosaic Down syndrome, they often don't have all the typical physical characteristics and may not be as severely intellectually impaired as people with full trisomy 21. Sometimes, mosaic Down syndrome is so mild that it will go undetected. On the other hand, mosaic Down syndrome can also be misdiagnosed as trisomy 21, if no genetic testing has been done. It is typically associated with physical growth delays, characteristic facial features and mild to moderate intellectual disability. The average IQ of a young adult with Down syndrome is 50, similar to the mental age of an 8 or 9 year old child, but this varies widely. Life expectancy for individuals with Down syndrome has dramatically increased over the past few decades as medical care and social inclusion have improved. A person with Down syndrome in good health will on average live to age 55 or beyond. Down syndrome is named after Dr. Langdon Down, who in 1866 first described the syndrome as a disorder. Although Down made some important observations about Down syndrome, he did not correctly identify what causes the disorder. It wasn't until 1959 that scientists discovered the genetic origin of Down syndrome. Down syndrome can be identified during pregnancy by prenatal screening followed by diagnostic testing or after birth by direct observation and genetic testing. Since the introduction of screening, pregnancies with the diagnosis are often terminated. Regular screening for health problems common in Down syndrome is recommended throughout the person's life.



Abstract – Anat - 12

Mutation

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A Mutation occurs when a DNA gene is damaged or changed in such a way as to alter the genetic message carried by that gene. A Mutagen is an agent of substance that can bring about a permanent alteration to the physical composition of a DNA gene such that the genetic message is changed. Once the gene has been damaged or changed the mRNA transcribed from that gene will now carry an altered message. The polypeptide made by translating the altered mRNA will now contain a different sequence of amino acids. The function of the protein made by folding this polypeptide will probably be changed or lost. Mutations play a part in both normal and abnormal biological processes including: evolution, cancer, and the development of the immune system. Due to the damaging effects that mutations can have on genes, organisms have mechanisms such as DNA repair to prevent or correct (revert the mutated sequence back to its original state) mutations. Mutations can involve the duplication of large sections of DNA, usually through genetic recombination. These duplications are a major source of raw material for evolving new genes, with tens to hundreds of genes duplicated in animal genomes every million years. Most genes belong to larger families of genes of shared ancestry. Novel genes are produced by several methods, commonly through the duplication and mutation of an ancestral gene, or by recombining parts of different genes to form new combinations with new functions.



Abstract – Anat - 13

Stem Cell Research

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Stem cells are undifferentiated biological cells that can differentiate into specialized cells and can divide (through mitosis) to produce more stem cells. They are found in multi cellular organisms. In mammals, there are two broad types of stem cells: embryonic stem cells, which are isolated from the inner cell mass of blastocysts, and adult stem cells, which are found in various tissues. In adult organisms, stem cells and progenitor cells act as a repair system for the body, replenishing adult tissues. In a developing embryo, stem cells can differentiate into all the specialized cells—ectoderm, endoderm and mesoderm (see induced pluripotent stem cells)—but also maintain the normal turnover of regenerative organs, such as blood, skin, or intestinal tissues. Stem cells have offered much hope by promising to greatly extend the numbers and range of patients who could benefit from transplants, and to provide cell replacement therapy to treat debilitating diseases such as diabetes, Parkinson's and Huntington's disease. The issue of stem cell research is politically charged, prompting biologists to begin engaging in ethical debates, and generating in the general public an unusually high level of interest in this aspect of biology. But excitement notwithstanding, there is a long way to go in basic research before new therapies will be established, and now the pressure is on for scientists and clinicians to deliver. Stem cells can also be taken from umbilical cord blood just after birth. Of all stem cell types, autologous harvesting involves the least risk. By definition, autologous cells are obtained from one's own body, just as one may bank his or her own blood for elective surgical procedures. Adult stem cells are frequently used in medical therapies, for example in bone marrow transplantation. Stem cells can now be artificially grown and transformed (differentiated) into specialized cell types with characteristics consistent with cells of various tissues such as muscles or nerves.



Abstract – Anat - 14

Referred Cardiac Pain to Left Lower Jaw

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A dull, vague pain on the lower left side of your jaw should never be ignored. This pain increases and decreases over the course of a few minutes. In addition, it moves around so you can't quite pinpoint exactly where it bothers you. Known as "referred pain," this sensation occurs when the nerves surrounding the heart become agitated, sending pain through the nerves in the spine to other locations in the body, specifically the left jaw, shoulder and arm. Dr. Oz's When to Worry Scale can help you understand the difference between benign jaw pain such as TMJ, a sinus infection or a toothache, and serious jaw pain associated with a heart attack. Green Zone: Lowest Risk - If moving your jaw around (such as while chewing) increases the pain, it's likely the discomfort has nothing to do with your heart. Yellow Zone: Medium Risk- Jaw pain that happens in the morning can be an instance of referred pain and serves as a warning sign that you're at risk for a heart attack. Your blood is thicker at this time of the day, which causes blood pressure to surge, increasing heart attack risk. Red Zone: The Highest Risk-Pain brought on by physical activity can manifest in several areas including the chest, jaw, left arm and shoulder, a scenario that typically indicates you're having a heart attack. Shortness of breath, a common heart attack symptom in women, may also occur. You may also get additional classic heart attack signs such as dizziness or nausea. In this case, see a doctor immediately.



Abstract – Anat - 15

Surface Anatomy in Clinical Practice

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Superficial anatomy (also called surface anatomy) is the study of the external features of the body. It deals with anatomical features that can be studied by sight, without dissecting an organism. It is a branch of gross anatomy, along with endoscopic and radiological anatomy. Superficial anatomy is a descriptive science. In particular, in the case of human superficial anatomy, these are the form and proportions of the human body and the surface landmarks which correspond to deeper structures hidden from view, both in static pose and in motion. It is also called "viseral anatomy". In addition, the science of superficial anatomy includes the theories and systems of body proportions and related artistic canons. Studying of superficial anatomy is the basis for depiction of human body in classic art. Some pseudo-sciences such as physiognomy, phrenology and palmistry rely on superficial anatomy. Surface projections of the major organs of the trunk, using the vertebral column and rib cage as main reference points of superficial anatomy. In addition, the science of superficial anatomy includes the theories and systems of body proportions and related artistic canons. Studying of superficial anatomy is the basis for depiction of human body in classic art.



Abstract – Anat - 16

Transposition of Great Viscera

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Transposition of the viscera, although not a rare condition, is interesting. Reports of such cases serve a very useful purpose of putting the physician on guard for these anomalies. To the surgeon, and needless to say, to the patient, a timely diagnosis of visceral transposition is obviously of the greatest importance. A laterization defect marked by asymmetric position of visceral organs usually occurring as a component of a wide variety of abnormalities. Transposition may be complete, with the heart, lungs and all abdominal organs reversed, or incomplete, manifesting itself as a simple reversal of the stomach or spleen. Associated malformations are variable and may include tetralogy of Fallot, transposition of great vessels, pulmonary valve stenosis, ventricular and atrial septal defects, asplenia-polysplenia. and other defects. Situs inversus is generally an autosomal recessive genetic condition, although it can be X-linked or found in identical "mirror" twins. In the absence of congenital heart defects, individuals with situs inversus are phenotypically normal, and can lead normal healthy lives, without any complications related to their medical condition. There is a 5 –10% prevalence of congenital heart disease in individuals with situs inversus totalis, most commonly transposition of the great vessels. The incidence of congenital heart disease is 95% in situs inversus with levocardia. The condition affects all major structures within the thorax and abdomen. Generally, the organs are simply transposed through the sagittal plane. The heart is located on the right side of the thorax, the stomach and spleen on the right side of the abdomen and the liver and gall bladder on the left side. The left lung is trilobed and the right lung bilobed, and blood vessels, nerves, lymphatics and the intestines are also transposed. If the heart is swapped to the right side of the thorax, it is known as situs inversus with dextrocardia or situs inversus totalis. If the heart remains on the normal left side of the thorax, a much rarer condition (1 in 22,000 of the general population), it is known as situs inversus with levocardia or situs inversus incompletus. Situs inversus is thought to be present in 0.01% of the population, or a 1 in 10,000 chance.



ANATOMY (POSTER PRESENTATIONS)

Abstract – Anat - 01

Posterior Triangle

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The posterior triangle (or lateral cervical region) is a region of the neck. It has the following boundaries: Apex: Union of the sternocleidomastoid and the trapezius muscles at the superior nuchal line of the occipital bone; Anterior: Posterior border of the sternocleidomastoideus; Posterior: Anterior border of the trapezius; Base: Middle one third of the clavicle. The posterior triangle is crossed, about 2.5 cm above the clavicle, by the inferior belly of the omohyoid muscle, which divides the space into two triangles: an upper or occipital triangle, and a lower or subclavian triangle (or supraclavicular triangle). The accessory nerve (CN XI) is particularly vulnerable to damage during lymph node biopsy. Damage results in an inability to shrug the shoulders or raise the arm above the head (e.g., for brushing hair), particularly due to compromised trapezius muscle innervation. The external jugular vein's superficial location within the posterior triangle also makes it vulnerable to injury. It is also the site of clinical examination of Jugular venous pressure. The Contents include: Nerves and Plexuses: Spinal accessory nerve (Cranial Nerve XI), Branches of cervical plexus, Roots and trunks of brachial plexus, Phrenic nerve (C3,4,5); Vessels: Subclavian artery (Third part), Transverse cervical artery, Suprascapular artery, Terminal part of external jugular vein; Lymph nodes: Occipital and Supraclavicular; Muscles: Inferior belly of omohyoid muscle, Anterior Scalene, Middle Scalene, Posterior Scalene, Levator Scapulae Muscle, Splenius Muscle



Abstract – anat - 02

Scalp

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The scalp is the anatomical area bordered by the face anteriorly and the neck to the sides and posteriorly. The scalp plays an important role in the aesthetics of the face. Androgenic alopecia, or male pattern hair loss, is a common cause of concern to men. It may be treated with varying rates success by medication (e.g. finasteride, minoxidil) or hair transplantation. If the scalp is heavy and loose, a common change with ageing, the forehead may be low, heavy and deeply lined. The brow lift procedure aims to address these concerns. The soft tissue envelope of the cranial vault is called the scalp. The scalp extends from the external occipital protuberance and superior nuchal lines to the supraorbital margins. The scalp consists of 5 layers (seen in the image below): the skin, connective tissue, epicranial aponeurosis, loose areolar tissue, and pericranium. The first 3 layers are bound together as a single unit. This single unit can move along the loose areolar tissue over the pericranium, which is adherent to the calvaria. The scalp is a common site for the development of tumours including: epidermoid cyst, pilar cyst, actinic keratosis and squamous cell carcinoma, basal cell carcinoma and merkel cell carcinoma. The scalp plays an important role in the aesthetics of the face. Androgenic alopecia, or male pattern hair loss, is a common cause of concern to men. It may be treated with varying rates success by medication (e.g. finasteride, minoxidil) or hair transplantation. If the scalp is heavy and loose, a common change with ageing, the forehead may be low, heavy and deeply lined. The brow lift procedure aims to address these concerns.



Abstract – Anat - 03

Developmental Deformities of Teeth

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The close relationship among oral, systemic, and psychologic health requires that oral health be evaluated thoroughly as part of health maintenance supervision. An understanding of the normal sequence and patterns of tooth eruption is the foundation for identifying and treating children with abnormal dental development and optimizing their oral health. Distinguishing normal from pathological dental development requires careful evaluation of the patient, including medical, dental, and family history; clinical examination; radiographic evaluation; and possibly special laboratory tests. Problems in dental development and syndromes associated with abnormal dental development are reviewed here. The normal anatomy and development of human dentition are discussed separately. Problems in tooth eruption include natal and neonatal teeth, premature eruption, and failed tooth eruption. Natal and neonatal teeth — Teeth that are present in the oral cavity at the time of birth are natal teeth; those that erupt during the neonatal period are neonatal teeth. The majorities of natal teeth is the primary mandibular incisors and are not extra or supernumerary teeth . Natal teeth may be associated with a variety of syndromes including chondroectodermal dysplasia (Ellis-van Creveld syndrome), pachyonychiacongenita, Sotos syndrome, and Hallerman-Streiff syndrome .Treatment of natal teeth may involve observation, smoothing of the incisal edge (to prevent potential discomfort during breastfeeding and ulceration in the floor of the mouth), or extraction . Extraction of natal teeth should be considered only if they cause feeding difficulties for the infant or mother. Excessive natal tooth mobility has been considered to be a risk for aspiration. However, aspiration rarely, if ever, occurs.



Abstract – Anat - 04

Pituitary Tumour

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Cells within the brain normally grow in an orderly and controlled way. But if for some reason this order is disrupted, the cells continue to divide and form a lump or tumour. A tumor can be either benign or malignant. Although a benign tumor can continue to grow, the cells do not spread from the original site. In a malignant tumor, the cells can invade and destroy surrounding tissue and may spread to other parts of the brain. Almost all tumors of the pituitary gland are benign and do not spread. They are sometimes called adenomas. Pituitary tumors are either secreting (producing hormones) or non-secreting tumors (not producing hormones). Secreting tumors can release excess amounts of any of the pituitary hormones, and are named after the hormone that's being overproduced, for example a prolactin-secreting tumor. Pituitary tumors include (in decreasing order of frequency): Non-functioning adenomas; Prolactinomas; Growth hormone (GH)-secreting; Adrenocorticotrophic hormone (ACTH)-secreting; Thyroid-stimulating hormone-secreting; Leutinising hormone/follicle-stimulating hormone (LH/FSH)-secreting tumors. The first symptoms caused by pituitary tumors often depend on whether they are releasing excess hormones (functional adenomas) or not releasing hormones (non-functional adenomas). Functional adenomas may cause problems because of the hormones they release. Typically, a functional adenoma makes too much of a single pituitary hormone without making too much of the other hormones. These tumors are often detected while they are still fairly small (microadenomas). Symptoms from functional adenomas are described below, based on which pituitary hormone they secrete. Tumors that are not making excess hormones often become large (macroadenomas) before they are noticed. Large tumors can affect nearby nerves or parts of the brain, leading to headaches and visual problems. As the tumor gets larger, it puts pressure on the normal pituitary tissue. This can lead to a loss of normal pituitary hormone production, and low levels of some normal body hormones such as cortisol, thyroid hormone, and sex hormones. Non-functional adenomas that cause no symptoms are sometimes found because of an MRI or CT scan done for other reasons. These tumors are now being found more often as more MRI and CT scans of the brain are done. These may be the most common pituitary tumors. As long as they aren't causing problems, they probably do not need treatment.



Abstract – Anat - 05

Brachial Plexus

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The brachial plexus is a network of nerve fibers, running from the spine, formed by the ventral rami of the lower four cervical and first thoracic nerve roots (C5-C8, T1). It proceeds through the neck, the axilla (armpit region), and into the arm. It is a network of nerves passing through the cervico-axillary canal to reach axilla and innervates brachium (upper arm), antebrachium (forearm) and hand. Brachial plexus injury affects cutaneous sensations and movements in the upper limb. They can be caused by stretching, diseases, and wounds to the lateral cervical region (posterior triangle) of the neck or the axilla. Depending on the location of the injury, the signs and symptoms can range from complete paralysis to anesthesia. Testing the patient's ability to perform movements and comparing it to their normal side is a method to assess the degree of paralysis. A common brachial plexus injury is from a hard landing where the shoulder widely separates from the neck (such as in the case of motorcycle accidents or falling from a tree). These stretches can cause ruptures to the superior portions of the brachial plexus or avulse the roots from the spinal cord. Upper brachial plexus injuries are frequent in newborns when excessive stretching of the neck occurs during delivery. Studies have shown a relationship between birth weight and brachial plexus injuries; however, the number of cesarean deliveries necessary to prevent a single injury is high at most birth weights.^[3] For the upper brachial plexus injuries, paralysis occurs in those muscles supplied by C5 and C6 like the deltoid, biceps, brachialis, and brachioradialis. A loss of sensation in the lateral aspect of the upper limb is also common with such injuries. An inferior brachial plexus injury is far less common, but can occur when a person grasps something to break a fall or a baby's upper limb is pulled excessively during delivery. In this case, the short muscles of the hand would be affected and cause the inability to form a full fist position.^[4] In order to differentiate between a pre ganglionic and a post ganglionic type of injury on clinical examination one has to keep the following points in mind. In pre ganglionic injuries there will be loss of sensation above the level of clavicle, presence of pain in an otherwise insensate hand, presence of ipsilateral Horner's syndrome and loss of function of muscles supplied by branches arising directly from roots i.e. long thoracic nerve palsy leading to winging of scapula and elevation of ipsilateral diaphragm due to phrenic nerve palsy. Acute brachial plexus neuritis is a neurological disorder that is characterized by the onset of severe pain in the shoulder region. Additionally, the compression of cords can cause pain radiating down the arm, numbness, paresthesia, erythema, and weakness of the hands. This kind of injury is common for people who have prolonged hyperabduction of the arm when they are performing tasks above their head.



Abstract – Anat - 06

Bell's Palsy

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Bell's palsy is a form of facial paralysis resulting from a dysfunction of the cranial nerve VII (the facial nerve) causing an inability to control facial muscles on the affected side. Several conditions can cause facial paralysis, e.g., brain tumor, stroke, myasthenia gravis, and Lyme disease. However, if no specific cause can be identified, the condition is known as Bell's palsy. Named after Scottish anatomist Charles Bell, who first described it, Bell's palsy is the most common acutemononeuropathy (disease involving only one nerve) and is the most common cause of acute facial nerve paralysis (>80%). Bell's palsy is defined as an idiopathic unilateral facial nerve paralysis, usually self-limiting. The hallmark of this condition is a rapid onset of partial or complete paralysis that often occurs overnight. In rare cases (<1%), it can occur bilaterally resulting in total facial paralysis. It is thought that an inflammatory condition leads to swelling of the facial nerve. The nerve travels through the skull in a narrow bone canal beneath the ear. Nerve swelling and compression in the narrow bone canal are thought to lead to nerve inhibition, damage or death. Corticosteroids have been found to improve outcomes, when used early, while anti-viral drugs have not. Most people recover spontaneously and achieve near-normal to normal functions. Many show signs of improvement as early as 10 days after the onset, even without treatment. Often the eye in the affected side cannot be closed. The eye must be protected from drying up, or the cornea may be permanently damaged resulting in impaired vision. In some cases denture wearers experience some discomfort. Most cases are thought to be caused by the herpes virus that causes cold sores. In most cases of Bell's palsy, the nerve that controls muscles on one side of the face is damaged by inflammation. Many health problems can cause weakness or paralysis of the face. If a specific reason cannot be found for the weakness, the condition is called Bell's palsy.



Abstract – Anat - 07

Pandora's Box

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In classical Greek mythology, Pandora was the first woman on Earth. Zeus ordered Hephaestus, the god of craftsmanship, to create her, so he did—using water and earth. The gods endowed her with many gifts: Athena clothed her, Aphrodite gave her beauty, and Hermes gave her speech. When Prometheus stole fire from heaven, Zeus took vengeance by presenting Pandora to Epimetheus, Prometheus' brother. With her, Pandora was given a beautiful jar – with instructions not to open it under any circumstance. Impelled by her curiosity (given to her by the gods), Pandora opened it, and all evil contained therein escaped and spread over the earth. She hastened to close the container, but the whole contents had escaped, except for one thing that lay Pandora's box is an artifact in Greek mythology, taken from the myth of Pandora's creation in Hesiod's Works and Days. The "box" was actually a large jar given to Pandora ("all-gifted", "all-giving"), which contained all the evils of the world. Today the phrase "to open Pandora's box" means to perform an action that may seem small or innocent, but that turns out to have severe and far-reaching consequences. The sternocleidomastoid muscle (SCM) has been acknowledged from surgeons of the head and neck as a significant anatomical landmark of the anterior and lateral neck region while carries prominent interest for anesthetists. Equitably, it can be called as the “Pandora’s box” , as it provides coverage to many important deeper lying structures such as the accessory nerve, brachial plexus, cervical plexus nerves, carotid artery, jugular vein, and jugular chain lymph nodes. The anterior and posterior rim of the SCM serves as the boundary for the division of each hemineck into the anterior and posterior cervical triangle respectively, whilst its two heads near their origin create the minor supraclavicular fossa. The SCM can be subdivided into superficial and deep parts, while the amount of fusion between the two SCM heads varies considerably between subjects . The cleidomastoid segment of the SCM can be found as an independent muscle belly in 10% of cases . The anatomical variability is attributed to differences in the arrangement of the layers and parts of the SCM. A summary of the typical and aberrant SCM features are presented in. We describe a rare variation of combining bilateral aberrant SCM anatomy which is of anatomical interest but also considerable surgical and clinical importance during neck dissections, excision of the deep cervical lymph nodes, carotid artery surgery, venous or arterial catheterization, and in ultrasound guided brachial plexus block techniques.



Abstract – Anat - 08

Karyotyping

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A karyotype (Greek karyon = kernel, seed or nucleus) is the number and appearance of chromosomes in the nucleus of a eukaryotic cell. The term is also used for the complete set of chromosomes in a species, or an individual organism. Karyotypes describe the number of chromosomes, and what they look like under a light microscope. Attention is paid to their length, the position of the centromeres, banding pattern, any differences between the sex chromosomes, and any other physical characteristics. The preparation and study of karyotypes is part of cytogenetics. The study of whole sets of chromosomes is sometimes known as karyology. The chromosomes are depicted (by rearranging a microphotograph) in a standard format known as a karyogram or idiogram: in pairs, ordered by size and position of centromere for chromosomes of the same size. The basic number of chromosomes in the somatic cells of an individual or a species is called the somatic number and is designated $2n$. Thus, in humans $2n = 46$. In the germ-line (the sex cells) the chromosome number is n (humans: $n = 23$). So, in normal diploid organisms, autosomal chromosomes are present in two copies. Polyploid cells have multiple copies of chromosomes and haploid cells have single copies.



Abstract – Anat - 09

Dural Folds

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The dura separates into two layers at dural reflections (also known as dural folds), places where the inner dural layer is reflected as sheet-like protrusions into the cranial cavity. There are two main dural reflections. The tentorium cerebelli exists between and separates the cerebellum and brainstem from the occipital lobes of the cerebrum. The falx cerebri, which separates the two hemispheres of the brain, is located in the longitudinal cerebral fissure between the hemispheres. Two other dural infoldings are the cerebellar falx and the sellar diaphragm: The cerebella falx(or falx cerebelli) is a vertical dural infolding that lies inferior to the cerebellar tentorium in the posterior part of the posterior cranial fossa. It partially separates the cerebellar hemispheres. The sellar diaphragm is the smallest dural infolding and is a circular sheet of dura that is suspended between the clinoid processes, forming a partial roof over the hypophysial fossa. The sella diaphragm covers the pituitary gland in this fossa and has an aperture for passage of the infundibulum (pituitary stalk) and hypophysial veins.



Abstract – Anat - 10

Anterior Triangle

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The anterior triangle is situated at the front of the neck. It is bounded Superiorly by Inferior border of the mandible (jawbone), Laterally by Medial border of the sternocleidomastoid, Medially by Imaginary sagittal line down midline of body. The muscles in this part of the neck are divided as to where they lie in relation to the hyoid bone. There are four suprahyoid muscles (stylohyoid, digastric, mylohyoid, and geniohyoid) and four infrahyoid muscles (omohyoid, sternohyoid, thyrohyoid, and sternothyroid) With respect to the vasculature, the common carotid artery passes through the anterior triangle, and bifurcates within the triangle into the external and internal carotid arteries. The internal jugular vein also can be found within this area. It drains blood from the head and neck. Numerous cranial nerves are located in the anterior triangle. Some pass straight through, and others give off branches to innervate some of the other structures within the triangle. The cranial nerves in the anterior triangle are the facial [VII], glossopharyngeal [IX], vagus [X], accessory [XI], and hypoglossal [XII] nerves.



Abstract – Anat - 11

Development of face with deformities

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Face development of the embryo refers to the development of the structures from the third to eighth week that give rise to the future head and neck. They consist of three layers, the ectoderm, mesoderm and endoderm, which form the mesenchyme (derived from the lateral plate and paraxial mesoderm), neural crest and neural placodes (from the ectoderm). The paraxial mesoderm forms structures named somites and somitomeres that contribute to the development of the floor of the brain and voluntary muscles of the craniofacial region. The lateral plate mesoderm consists of the laryngeal cartilages (arytenoid and cricoids). The formation of each region of the face is due to the migration of the neural crest cells that come from the ectoderm. These cells determine the future structure from the pharyngeal arch, to form the forebrain, midbrain and hindbrain, cartilage, bone, dentin, tendon, dermis pia mater and arachnoid mater, sensory neurons and glandular stroma. Any deviation from the development of face causes facial deformity. The deformities are Treacher collins syndrome which leads to absence of cheek bones and cleft lip and cleft palate.



Abstract – Anat - 12

Twins-Monozygote and Dizygote

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Twins are two offspring produced by the same pregnancy. Twins can either be monozygotic ("identical"), meaning that they develop from one zygote that splits and forms two embryos, or dizygotic ("fraternal"), meaning that they develop from two eggs, each fertilized by separate sperm cells. Fraternal or dizygotic (DZ) twins (also referred to as "non-identical twins", "dissimilar twins", "biovular twins", and, in cases of females, sororal twins) usually occur when two fertilized eggs are implanted in the uterus wall at the same time. When two eggs are independently fertilized by two different sperm cells, fraternal twins result. The two eggs, or ova, form two zygotes, hence the terms dizygotic and biovular. Fraternal twins are, essentially, two ordinary siblings who happen to be born at the same time, since they arise from two separate eggs fertilized by two separate sperm, just like ordinary siblings. A natural monozygotic twinning, a recent theory posits that monozygotic twins are formed after a blastocyst essentially collapses; splitting the progenitor cells (those that contain the body's fundamental genetic material) in half, leaving the same genetic material divided in two on opposite sides of the embryo.



DEPARTMENT OF BIOCHEMISTRY

(ORAL PRESENTATIONS)

Abstract – Bio - 01

Saliva As A Diagnostic Tool

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Saliva is a complex fluid consisting of secretions from the major and minor salivary glands. Gland-specific saliva can be used to diagnose any pathology from the specific major salivary gland. Whole saliva has serum constituents that are derived from the local vasculature of the salivary glands and gingival crevicular fluid. Saliva, as a diagnostic fluid, has distinctive advantages over serum as whole saliva can be collected non-invasively by individuals with limited training using simple equipments. This review aimed to explore the diagnostic applications of saliva in systemic and oral diseases. Analysis of saliva can offer a cost-effective approach to screen for a larger population. Salivary analysis may be useful for diagnosing systemic oral disorders, as well as for monitoring hormone and therapeutic levels of drug. As a diagnostic fluid, saliva offers distinctive advantages over serum because it can be collected non-invasively by individuals with modest training. Furthermore, saliva may provide a cost-effective approach for the screening of large populations. Gland-specific saliva can be used for diagnosis of pathology specific to one of the major salivary glands. Whole saliva, however, is most frequently used for diagnosis of systemic diseases, since it is readily collected and contains serum constituents. These constituents are derived from the local vasculature of the salivary glands and also reach the oral cavity *via* the flow of gingival fluid. Analysis of saliva may be useful for the diagnosis of hereditary disorders, autoimmune diseases, malignant and infectious diseases, and endocrine disorders, as well as in the assessment of therapeutic levels of drugs and the monitoring of illicit drug use. As a diagnostic fluid, saliva offers distinctive advantages over serum because it can be collected non-invasively by individuals, even by patient. Does not require special equipment for collection and storage as unlike blood saliva does not clot. Advantageous for person in whom blood drawing is difficult as in obese and hemophilic patient.



Abstract – Bio - 02

III Effects Of Soft Drinks On Teeth
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It's called "pop" in the Midwest and most of Canada. It's "soda" in the Northeast. And it goes by a well-known brand name in much of the South. People across North America use different words to identify a sugary, carbonated soft drink. During the past generation, milk intakes have decreased while soda pop and 100 percent juice intakes have increased. It has become a daily habit for a growing number of people, especially kids, teens and young adults. A steady consumption of soft drinks is one of the leading causes of tooth decay. But however they say it, they're talking about something that can cause serious oral health problems. Soft drinks have many potential health problems. The inherent acids and sugars have both acidogenic and carcinogenic potential, resulting in dental caries and potential enamel erosion. Dental erosion (erosive tooth wear) is the situation of a chronic loss of dental hard tissue that is chemically etched away from the tooth surface by acid and or chelation without bacterial involvement. Acids of intrinsic (gastrointestinal) and extrinsic (dietary and environmental) origins are the main etiologic factors. We're Drinking More and More. Soft drink consumption in the United States has increased dramatically across all demographic groups, especially among children and teenagers. The problem is so severe that health authorities such as the American Academy of Pediatrics have begun sounding the alarm about the dangers. How many school age children drink soft drinks? Estimates range from one in two to more than four in five consuming at least one soft drink a day. At least one in five kids consumes a minimum of four servings a day. The study measured the acidity, or pH, of 20 commercial soft drinks, including Coke, Pepsi, 7 Up and their diet versions, immediately after cans were opened. Then slices of enamel from freshly extracted teeth were weighed before and after being immersed in the soft drinks for 48 hours. The result was that the teeth immersed in Coke, Pepsi, RC Cola, Squirt, Surge, 7 Up and Diet 7 Up lost more than 5 percent of their weight, according to the report by Students of Southern Illinois University School of Dental Medicine. If you indulge in a glass of soda occasionally, take steps to minimize any damage. Drink through a straw; this deposits the soda farther back in your mouth, away from your teeth. Don't sip at a soda over an hour; drink it fairly quickly; constant sipping keeps your mouth bathed in acids longer. Rinse your mouth out with water when you finish removing the soda residue. Chew sugarless gum when you finish to increase saliva output and to raise the pH in your mouth. Don't brush your teeth for at least 30 minutes after drinking soda; the acid weakens the enamel and brushing too soon can cause further damage.



Abstract – Bio - 03

DNA Finger Printing

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Many of the revolutionary changes that have occurred in biology over the past fifteen years can be attributed directly to the ability to manipulate DNA in defined ways. The principal tools for this recombinant DNA technology are enzymes that can cut, mend, wind, unwind, transcribe, repress, and replicate DNA. Restriction enzymes are the “chemical scissors” of the molecular biologist; these enzymes cut DNA at specific nucleotide sequences. Methods of DNA identification have been applied to many branches of science and technology, including medicine (prenatal tests, genetic screening), conservation biology (guiding captive breeding programs for endangered species), and forensic science. In the latter discipline, analysis of the pattern of DNA fragments in a restriction digest loosely called a DNA fingerprint, enables us to discriminate between suspects accused of a crime or potential fathers in a paternity suit. The term “DNA finger printing” was coined by geneticist Alec J. Jeffreys, University of Leicester, U.K., who developed the method in 1985. In DNA fingerprinting, radioactive pieces of DNA called probes are added to the separated DNA fragments. The probes are designed to bind specific sequences on the DNA, thus marking some of the fragments. X-ray film placed on top of the gel will become exposed by the radioactivity, and black bands will become visible on the film. The variation in DNA from one person to the next is so great that the probability of two people sharing the same DNA fingerprint are essentially zero. And unlike conventional fingerprints, which are often difficult to gather at a crime scene, a DNA fingerprint can be made from a very small sample of blood, skin or semen – or even a single hair! DNA fingerprinting is also used to unravel all the mysteries associated with the oral cavity and its manifestations during diseased conditions. DNA is an excellent means for identification of unidentified human remains. As dental pulp is surrounded by dentin and enamel, which forms dental armor, it offers the best source of DNA for reliable genetic type in forensic science.



Abstract – Bio - 04

Nano Robots
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Imagine going to the doctor to get treatment for a persistent fever. Instead of giving you a pill or a shot, the doctor refers you to a special medical team which implants a tiny robot into your bloodstream. The robot detects the cause of your fever, travels to the appropriate system and provides a dose of medication directly to the infected area. Surprisingly, we're not that far off from seeing devices like this actually used in medical procedures. They're called nanorobots and engineering teams around the world are working to design robots that will eventually be used to treat everything from hemophilia to cancer. As you can imagine, the challenges facing engineers are daunting. A viable nanorobot has to be small and agile enough to navigate through the human circulatory system, an incredibly complex network of veins and arteries. The robot must also have the capacity to carry medication or miniature tools. Assuming the nanorobot isn't meant to stay in the patient forever, it also has to be able to make its way out of the host. In this article, we'll learn about the potential applications of nanorobots, the various ways nanorobots will navigate and move through our bodies, the tools they will use to heal patients, the progress teams around the world have made so far and what theorists see in the future. Like primitive engineers faced with advanced technology, medicine must 'catch up' with the technology level of the human body before it can become really effective. Since the human body is basically an extremely complex system of interacting molecules (i.e., a molecular machine), the technology required to truly understand and repair the body is molecular machine technology. A natural consequence of this level of technology will be the ability to analyze and repair the human body as completely and effectively as we can repair any conventional machine today. Nanotechnology is "Research and technology development at the atomic, molecular and macromolecular levels in the length scale of approximately 1 -100 nanometer range, to provide a fundamental understanding of phenomena and materials at the nanoscale and to create and use structures, devices and systems that have novel properties and functions because of their small and/or intermediate size." It is the application of nanotechnology (engineering of tiny machines) to the prevention and treatment of disease in the human body's. More specifically, it is the use of engineered nanodevices and nanostructures to monitor, repair, construct and control the human biological system on a molecular level. The most elementary of nanomedical devices will be used in the diagnosis of illnesses. A more advanced use of nanotechnology might involve implanted devices to dispense drugs or hormones as needed in people with chronic imbalance or deficiency states. Lastly, the most advanced nanomedicine involves the use of Nanorobots as miniature surgeons. Such machines might repair damaged cells, or get inside cells and replace or assist damaged intracellular structures. At the extreme, nanomachines might replicate themselves, or correct genetic deficiencies by altering or replacing DNA (deoxyribonucleic acid) molecules.



Abstract - Bio - 05

Stem Cells

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Stem cells have the remarkable potential to develop into many different cell types in the body during early life and growth. In addition, in many tissues they serve as a sort of internal repair system, dividing essentially without limit to replenish other cells as long as the person or animal is still alive. When a stem cell divides, each new cell has the potential either to remain a stem cell or become another type of cell with a more specialized function, such as a muscle cell, a red blood cell, or a brain cell. Stem cells are distinguished from other cell types by two important characteristics. First, they are unspecialized cells capable of renewing themselves through cell division, sometimes after long periods of inactivity. Second, under certain physiologic or experimental conditions, they can be induced to become tissue- or organ-specific cells with special functions. In some organs, such as the gut and bone marrow, stem cells regularly divide to repair and replace worn out or damaged tissues. In other organs, however, such as the pancreas and the heart, stem cells only divide under special conditions. Until recently, scientists primarily worked with two kinds of stem cells from animals and humans: embryonic stem cells and non-embryonic "somatic" or "adult" stem cells. The functions and characteristics of these cells will be explained in this document. Scientists discovered ways to derive embryonic stem cells from early mouse embryos nearly 30 years ago, in 1981. The detailed study of the biology of mouse stem cells led to the discovery, in 1998, of a method to derive stem cells from human embryos and grow the cells in the laboratory. These cells are called human embryonic stem cells. The embryos used in these studies were created for reproductive purposes through in vitro fertilization procedures. When they were no longer needed for that purpose, they were donated for research with the informed consent of the donor. In 2006, researchers made another breakthrough by identifying conditions that would allow some specialized adult cells to be "reprogrammed" genetically to assume a stem cell-like state. This new type of stem cell, called induced pluripotent stem cells (iPSCs), will be discussed in a later section of this document. Stem cells are important for living organisms for many reasons. In the 3- to 5-day-old embryo, called a blastocyst, the inner cells give rise to the entire body of the organism, including all of the many specialized cell types and organs such as the heart, lung, skin, sperm, eggs and other tissues. In some adult tissues, such as bone marrow, muscle, and brain, discrete populations of adult stem cells generate replacements for cells that are lost through normal wear and tear, injury, or disease. Given their unique regenerative abilities, stem cells offer new potentials for treating diseases such as diabetes, and heart disease



Abstract – Bio - 06

Dental Fluorosis

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The proper amount of fluoride helps prevent and control tooth decay in children and adults. Fluoride works both while the teeth are developing and every day after the teeth have emerged through the gums. Fluoride consumed during tooth development can also result in a range of visible changes to the enamel surface of the tooth. These changes have been broadly termed dental fluorosis, or dental fluorosis. Dental fluorosis is a change in the appearance of the tooth's enamel. These changes can vary from barely noticeable white spots in mild forms to staining and pitting in the more severe forms. Dental fluorosis only occurs when younger children consume too much fluoride, from any source, over long periods when teeth are developing under the gums. Only children aged 8 years and younger can develop dental fluorosis because this is when permanent teeth are developing under the gums. Once the teeth erupt through the gums and are in the mouth, they can no longer develop fluorosis. The teeth of children older than 8 years, adolescents, and adults cannot develop dental fluorosis. They develop like, very mild and mild forms of dental fluorosis—teeth have scattered white flecks, occasional white spots, frosty edges, or fine, lacy chalk-like lines. These changes are barely noticeable and difficult to see except by a dental health care professional. Moderate and severe forms of dental fluorosis—teeth have larger white spots and, in the rare, severe form, rough, pitted surfaces. Dental fluorosis is caused by taking in too much fluoride over a long period when the teeth are forming under the gums. Only children aged 8 years and younger are at risk because this is when permanent teeth are developing under the gums. The severity of the condition depends on the dose (how much), duration (how long), and timing (when consumed) of fluoride intake. Increases in the occurrence of mostly mild dental fluorosis were recognized as more sources of fluoride became available to prevent tooth decay. These sources include drinking water with fluoride, fluoride toothpaste—especially if swallowed by young children—and dietary prescription supplements in tablets or drops (particularly if prescribed to children already drinking fluoridated water). Dental fluorosis occurs among some persons in all communities, even in those with a low natural concentration of fluoride in the drinking water.



Application Of Biotechnology In Medicine

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Biotechnology is one of the fastest moving and most exciting areas of science today. Due to new biotechnology which has stored unlimited possibilities of its application of genetic engineering and hybridism technology, the progress has been very rapid. As a result, substantial improvements in human and health care and production of useful breeds of plants and animals have already occurred and more will occur in coming year. Society has already gained a lot from new biotechnology. Medicine is by means of biotechnology techniques so much in diagnosing and treating dissimilar diseases. It also gives opportunity for the populace to defend themselves from hazardous diseases. The pasture of biotechnology, genetic engineering, has introduced techniques like gene therapy, recombinant DNA technology and polymerase chain retort which employ genes and DNA molecules to make a diagnosis diseases and put in new and strong genes in the body which put back the injured cells. By means of the technique of biotechnology, the drugs biopharmaceuticals were urbanized. There are no chemicals concerned in the combination of these drugs, but microorganisms have completed it likely to expand them. Large molecules of proteins are typically the source of biopharmaceuticals. They when under attack in the body attack the hidden mechanisms of the disease and wipe out them. Now scientists are annoying to expand such biopharmaceutical drugs which can be treated against the diseases like hepatitis, cancer and heart diseases. Gene therapy is one more technique of biotechnologies which is used to delicacy and diagnoses diseases like cancer and Parkinson's disease. The apparatus of this technique is that the fit genes are under attack in the body which either obliterate the injured cells or replace them. In some cases, the fit genes make corrections in the genetic information and that is how the genes start performance in the favor of the body. Pharmacogenomics is an additional genetically modified method which is used to learn the genetic information of a personality. It analyzes the body's reply to sure drugs. It is the mixture of pharmaceuticals and genomics. The aspire of this field is to expand such drugs which are inserted in the person according to the genetic information there in the individual. Genetic testing is a technique of heredity which is used to conclude the genetic diseases in parents, sex and carrier screening. The technique of genetic testing is to use DNA probes which have the sequence alike to the mutated sequences. This technique is also used to recognize the criminals and to test the parenthood of the child. It is completed that no field of science can be winning until it uses the techniques of biotechnology.



Test Tube

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If tissue engineers can manufacture living replacement teeth, they would blaze a trail for engineering larger organs while leading dentistry into the age of regenerative medicine. With this forethought, dentistry is set to go steps forward in technological advancements both at a microscopic as well as macroscopic levels. More complicated than they look, teeth are actually tiny organs. In theory, a natural tooth made from the patient's own tissue and grown in its intended location would make the best possible replacement, although such bioengineered teeth have for many years been little more than a dream. Recently, however, progress in understanding how teeth first develop has combined with advances in stem cell biology and tissue engineering technology to bring us close to the realization of biological replacement teeth. Apart from the potential benefit to people who need new teeth, this research also offers two significant advantages for testing the concept of organ replacement: teeth are easily accessible, and whereas our quality of life is greatly improved if we have them, we do not need our teeth to live. These may seem trivial points, but as the first wave of replacement organs start to make their way toward the clinic, teeth will serve as a crucial test of the feasibility of different tissue engineering techniques. With organs essential to life, doctors will have no leeway to make mistakes, but mistakes with teeth would not be life-threatening and could be corrected. This is not to say that engineering teeth will be simple. Millions of years of evolution went into establishing the complex processes that produce organs, teeth included, during embryonic development. The challenge for tissue engineers is to replicate those processes, which are tightly controlled by the growing embryo's genes. A good way to start learning how to build teeth, therefore, is to observe how nature does it. To date, the teeth generated by any of the tissue engineering methods we have described have not developed roots. In truth, both root development and the stimuli that initiate tooth eruption are complex and still little understood. Roots are the last part of teeth to form, completing their development during the eruption process, and more research is needed to understand what conditions would best favour their creation in replacement teeth.



Abstract – Bio - 09

Anti-Oxidants In Defensive Mechanism
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Damage to cells caused by free radicals is believed to play a central role in the aging process and in disease progression. Antioxidants are our first line of defense against free radical damage, and are critical for maintaining optimum health and well-being. The need for antioxidants becomes even more critical with increased exposure to free radicals. Pollution, cigarette smoke, drugs, illness, stress, and even exercise can increase free radical exposure. Because so many factors can contribute to oxidative damage, reactive oxygen species occur in tissues and can damage DNA, proteins, carbohydrates, and lipids. These potentially deleterious reactions are controlled by a system of enzymatic and nonenzymatic antioxidants which eliminate prooxidants and scavenge free radicals. The ability of the lipid-soluble carotenoids to quench singlet molecular oxygen may explain some anticancer properties of the carotenoids, independent of their provitamin A activity. Tocopherols are the most abundant and efficient scavengers of hydroperoxyl radicals in biological membranes. Water-soluble antioxidants include ascorbate and cellular thiols. Glutathione is an important substrate for enzymatic antioxidant functions and is capable of nonenzymatic radical scavenging. Thiols associated with membrane proteins may also be important to the antioxidant systems. Interactions between the thiols, tocopherols, and other compounds enhance the effectiveness of cellular antioxidant defense. Cellular antioxidant defense mechanisms can be classified into primary and secondary systems. The primary defenses include familiar nutrients such as vitamins (vitamin E and vitamin C), carotenoids (β-carotene, lycopene), thiols (glutathione, lipoic acid), ubiquinol, flavonoids and polyphenols (from herbs, teas, grape skins) and so on and a variety of enzyme systems (catalase, superoxide dismutase, glutathione peroxidase). Primary defense mechanisms are thought to interact directly with harmful free radicals. The secondary defenses include enzymes that breakdown proteins and lipids and DNA repair mechanisms. Secondary defenses are primarily involved in repair of already damaged proteins and lipids. Clinical studies have also shown that supplemental levels of antioxidant vitamins (vitamin E, vitamin C and β-carotene) reduce an individual's risk for certain cancers and cardiovascular disease. Moreover, a protective relationship has been shown between cancer risk and fruit and vegetable consumption (the major source of antioxidant nutrients). Antioxidants are widely used in dietary supplements and have been investigated for the prevention of diseases such as cancer, coronary heart disease and even altitude sickness. Although initial studies suggested that antioxidant supplements might promote health, later large clinical trials with a limited number of antioxidants detected no benefit and even suggested that excess supplementation with certain putative antioxidants may be harmful. Antioxidants also have many industrial uses, such as preservatives in food and cosmetics and to prevent the degradation of rubber and gasoline.



BIOCHEMISTRY (POSTER PRESENTATIONS)

Abstract – Bio - 01

Different Neurotransmitters Responsible For Different Emotions

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Neurotransmitters are the chemicals which allow the transmission of signals from one neuron to the next across synapses. They are also found at the axon endings of motor neurons, where they stimulate the muscle fibers. And they and their close relatives are produced by some glands such as the pituitary and the adrenal glands. In this chapter, we will review some of the most significant neurotransmitters. There are several types of neurotransmitters, and each one of them is responsible for some specific functions. Neurotransmitters are usually classified as amino acids, peptides, and monoamines. Epinephrine also known as adrenaline is a neurotransmitter and hormone essential to metabolism. It regulates attention, mental focus, arousal, and cognition. Dopamine is responsible for motivation, interest, and drive. It is associated with positive stress states such as being in love, exercising, listening to music, and sex. Dopamine also is involved in muscle control and function. Low Dopamine levels can drive us to use drugs (self medicate), alcohol, smoke cigarettes, gamble, and/or overeat. High dopamine has been observed in patients with poor GI function, autism, mood swings, psychosis, and children with attention disorders. GABA A largely inhibitory neurotransmitter distributed widely throughout the central (Gamma aminobutyric acid) nervous system. Implicated in sleep and eating disorders. Low levels of GABA have also been linked to extreme anxiety. Anxiety is a normal part of the response to a challenging or threatening situation...Anxiety symptoms include palpitations, sweating, trembling and feelings of fear and panic. Most neurotransmitters are made from protein or its subunits, amino acids. Serotonin, Dopamine and GABA are neurotransmitters that are essential for a positive, calm, happy outlook and a sense of well-being. When Neurotransmitters are out of balance (or when receptors on cells responsible for receiving neurotransmitter signals are impaired) they have a significant impact on our mood and behavior. When we are deficient in specific neurotransmitters a number of emotional symptoms are likely. Deficits in serotonin can lead to depression, aggressiveness, anxiety, panic attacks, food and alcohol cravings, irritability and insomnia .Nor adrenaline is important for alertness, concentration and attention



Abstract – Bio - 02

Cell Phone Radiations Damages DNA
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The widespread use of cell phones, from businessman to street side vendor, has helped the mobile phone industry flourish in India in spite of various reports published on the ill-effects of mobile and tower radiation, and sometimes radiation even causing DNA mutation. Radio waves from mobile phones harm body cells and damage DNA in laboratory conditions, according to a new study majority-funded by the European Union, researchers said on Monday. The so-called Reflex study, conducted by 12 research groups in seven European countries, did not prove that mobile phones are a risk to health but concluded that more research is needed to see if effects can also be found outside a lab. Insect studies have demonstrated that acute exposure to GSM (Global System for Mobile) signals brings about DNA fragmentation in insects' ovarian cells, and consequently a large reduction in the reproductive capacity of the insects. Further studies demonstrated that long exposures induced cell death to the insects in the study. Dr. Adamantia Fragopoulou, leader of a team at the University of Athens, found effects on embryonic development taking place in the presence of a mild electromagnetic field. Throughout the gestation period, exposure to radiation for just six minutes a day affects the bone formation of fetuses. The team suggests that this is possibly caused by the interaction of cell phone radiation with crucial molecules and ions involved in embryogenesis. increasing use of cell phones — and the increasing number of associated base stations — are becoming a widespread source of non-ionizing electromagnetic radiation. The rat's brains can be used to correspond to the brains of human teenagers. Children are increasingly heavy users of cell phones; at higher frequencies, children absorb more energy from external radio frequency radiation than adults, because their tissue normally contains a larger number of ions and so has a higher conductivity. They conclude limiting cell phone and cordless phone use by young children and teenagers to the lowest possible level and urgently ban telecom companies from marketing to them. In addition, research from a team at the University of Athens found that rats exposed to cell phone radiation were unable to remember the location of places previously familiar to them. This finding is of potentially critical importance for people who heavily rely on spatial memory for recording information about their environment and spatial orientation.



Regenerative Medicine

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The emerging field of treatment called “regenerative medicine” or “cell therapy” refers to treatments that are founded on the concept of producing new cells to replace malfunctioning or damaged cells as a vehicle to treat disease and injury. Our focus is the development of effective methods to generate replacement cells from stem cells. Many significant and currently untreatable human diseases arise from the loss or malfunction of specific cell types in the body. This is especially true of diseases associated with aging such as Alzheimer’s disease, Parkinson’s disease, type II diabetes, heart failure, osteoarthritis, and aging of the immune system, known as immunosenescence. This is also true for medical conditions resulting from damage to cells due to acute disease, such as trauma, infarction and burns. We believe that replacing damaged or malfunctioning cells with fully functional ones may be a useful therapeutic strategy in treating many of these diseases and conditions. A stem cell is a cell that has the ability to branch out and change, or differentiate, into two or more different cell types. Stem cells are self-renewing primitive cells that have the ability to develop into functional, differentiated cells. In general, there are two broad categories of stem cells: adult stem cells and embryonic stem cells. Adult stem cells are derived from various tissues in the human body. Because they can branch out into many different cell types, they are referred to as “multipotent.” Multipotent means these cells develop into multiple, but not all, types of cells in the body. Embryonic stem cells, referred to as ES cells, which are derived from pre-implantation embryos, are unique because they are “pluripotent,” which means that they can develop into all cells and tissues in the body, and they self-renew indefinitely in their undifferentiated state. The ability of ES cells to divide indefinitely in the undifferentiated state without losing pluripotency is a unique characteristic that distinguishes them from all other stem cells discovered to date in humans. Because of the potential of ES cells, one of our primary efforts is the development and commercialization of ES cell based technologies. Since the discovery of the human ES cell, medical researchers worldwide have generally recognized the significance of this new technology and have begun to focus research on the translation of this discovery into important new therapies along with several challenges. We believe that solving the potential rejection of ES cells in patients is the greatest scientific obstacle to developing successful therapeutics. Our research and technologies are focused on solving this obstacle by creating stem cell therapeutics with compatible tissues. Compatible tissues are referred to as being histocompatible.



Abstract – Bio - 04

Translation

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DNA as messenger RNA and turns it into a series of amino acids bound together with peptide bonds. It is essentially a translation from one code (nucleotide sequence) to another code (amino acid sequence). The ribosome is the site of this action, just as RNA polymerase was the site of mRNA synthesis. The ribosome matches the base sequence on the mRNA in sets of three bases (called codons) to tRNA molecules that have the three complementary bases in their anticodon regions. Again, the base-pairing rule is important in this recognition (A binds to U and C binds to G). The ribosome moves along the mRNA, matching 3 base pairs at a time and adding the amino acids to the polypeptide chain. When the ribosome reaches one of the "stop" codes, the ribosome releases both the polypeptide and the mRNA. This polypeptide will twist into its native conformation and begin to act as a protein in the cells metabolism. The genes in DNA encode protein molecules, which are the "workhorses" of the cell, carrying out all the functions necessary for life. For example, enzymes, including those that metabolize nutrients and synthesize new cellular constituents, as well as DNA polymerases and other enzymes that make copies of DNA during cell division, are all proteins. During translation, which is the second major step in gene expression, the mRNA is "read" according to the genetic code, which relates the DNA sequence to the amino acid sequence in proteins. Each group of three base pairs in mRNA constitutes a codon, and each codon specifies a particular amino acid (hence, it is a triplet code). The mRNA sequence is thus used as a template to assemble—in order—the chain of amino acids that form a protein. There are three termination codons that are employed at the end of a protein-coding sequence in mRNA: UAA, UAG, and UGA. No tRNAs recognize these codons. Thus, in the place of these tRNAs, one of several proteins, called release factors, binds and facilitates release of the mRNA from the ribosome and subsequent dissociation of the ribosome. Comparing Eukaryotic and Prokaryotic Translation The translation process is very similar in prokaryotes and eukaryotes. Although different elongation, initiation, and termination factors are used, the genetic code is generally identical. As previously noted, in bacteria, transcription and translation take place simultaneously, and mRNAs are relatively short-lived. In eukaryotes, however, mRNAs have highly variable half-lives, are subject to modifications, and must exit the nucleus to be translated; these multiple steps offer additional opportunities to regulate levels of protein production, and thereby fine-tune gene expression.



Abstract – Bio - 05

Progeria

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Progeria is a rare and peculiar combination of dwarfism and premature aging. The incidence is one in several million births. It occurs sporadically and is probably an autosomal recessive syndrome. Though the clinical presentation is usually typical, conventional radiological and biochemical investigations help in confirming the diagnosis. We present a rare case of progeria with most of the radiological features as a pictorial essay. Hutchinson–Gilford progeria syndrome (HGPS) is an extremely rare genetic disorder that causes premature, rapid aging shortly after birth. Recently, de novo point mutations in the Lmna gene have been found in individuals with HGPS. Lmna encodes lamin A and C, the A-type lamins, which are an important structural component of the nuclear envelope. The most common HGPS mutation is located at codon 608 (G608G). This mutation creates a cryptic splice site within exon 11, which deletes a proteolytic cleavage site within the expressed mutant lamin A. Incomplete processing of prelamin A results in nuclear lamina abnormalities that can be observed in immune fluorescent studies of HGPS cells. Mouse models, such as Lmna knockout, Zmpste24 knockout, and Lmna L530P knockin will help the study of progeria. Lmna mutations have also recently been found in patients with atypical forms of progeria. The discovery of the HGPS mutations brings the total number of diseases caused by mutant Lmna to nine, underscoring the astonishing spectrum of laminopathies. Future research into HGPS could also provide important clues about the general process of aging and aging-related disease. The mutant form of lamin A responsible for the premature aging disease Hutchinson-Gilford progeria syndrome (termed progerin) acts as a dominant negative protein that changes the structure of the nuclear lamina. How the perturbation of the nuclear lamina in progeria is transduced into cellular changes is undefined. Using patient fibroblasts and a variety of cell-based assays, we determined that progerin expression in Hutchinson-Gilford progeria syndrome inhibits the nucleocytoplasmic transport of several factors with key roles in nuclear function. We found that progerin reduces the nuclear/cytoplasmic concentration of the Ran GTPase and inhibits the nuclear localization of Ubc9, the sole E2 for SUMOylation, and of TPR, the nucleoporin that forms the basket on the nuclear side of the nuclear pore complex.



Abstract – Bio - 06

Collagen
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Collagens are the most abundant proteins in mammals. The collagen family comprises 28 members that contain at least one triple-helical domain. The common structural feature of collagens is the presence of a triple helix that can range from most of their structure (96% for collagen I) to less than 10% (collagen XII). Four collagens are type II membrane proteins that also exist in a soluble form released from the cell surface by shedding. More than 27 forms of collagen are present in animal tissues. Some of them (types I, II, III, V, and XI) are arranged in fibrils and are found in tissues that must be able to resist tensile, shear, or compression forces, including tendon, bone, cartilage, and skin. Collagen fibrils are characterized by a 67-nm axial periodicity; they also define the shape of the tissues in which they occur. Type I collagen is the most abundant type of collagen and is widely distributed in almost all connective tissues with the exception of hyaline cartilage. It is the major protein in bone, skin, tendon, ligament, sclera, cornea and blood vessels. Other types of collagens such as types III and V are present at low levels in bone and appear to modulate the fibril diameter. Collagen fibers form the basic structural components of extracellular matrix (ECM) of vertebrates that serve to store elastic energy during muscular deformation, transmit stored energy into joint movement, and transfer excess energy from the joint back to the attached muscles for dissipation. They also act as mechanotransducers by transferring stress borne by the musculoskeleton to the attached cells in order to either up - or down - regulate tissue metabolism as a result of changes in mechanical loading. Collagen has been widely applied for the design of vascular grafts, fibrous materials for stem cell differentiation, biomimetic scaffolds for regenerative medicine, and tissue-like matrices for hard tissue repair. Collagen is also an important component for cosmetic formulation, where it is an effective natural humectant with high substantivity. But with age collagen becomes less soluble, more crosslinked and more glycosylated, and it accumulates yellow and fluorescent pigments. Collagen fibers, sponges, and fleeces have long been used in medicine as hemostatic agents. Collagen sponges are particularly useful in this regard, as their wet strength allows the suturing of the material to soft tissue, thereby providing a template for new tissue growth. Collagen-based implants have been used as vehicles for delivery of cultured keratinocytes and drugs for skin replacement and burn wounds.



Abstract – Bio - 07

Oral Cancer

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Oral cancer or mouth cancer, a subtype of head and neck cancer, is any cancerous tissue growth located in the oral cavity. It may arise as a primary lesion originating in any of the oral tissues, by metastasis from a distant site of origin, or by extension from a neighbouring anatomic structure, such as the nasal cavity. Alternatively, the oral cancers may originate in any of the tissues of the mouth, and may be of varied histologic types:teratoma, adenocarcinoma derived from a major or minor salivary gland, lymphoma from tonsillar or other lymphoid tissue, or melanoma from the pigment-producing cells of the oral mucosa. There are several types of oral cancers, but around 90% are squamous cell carcinomas,¹ originating in the tissues that line the mouth and lips. Oral or mouth cancer most commonly involves the tongue. It may also occur on the floor of the mouth, cheek lining, gingiva (gums), lips, or palate (roof of the mouth). Most oral cancers look very similar under the microscope and are called squamous cell carcinoma, but less commonly other types of oral cancer occur, such as Kaposi's sarcoma. Signs and symptoms include, Skin lesion, lump, or ulcer that do not resolve in 14 days located, On the tongue, lip, or other mouth areas , Usually small, Most often pale colored, be dark or discoloured .Early sign may be a white patch (leukoplakia) or a red patch (erythroplakia) on the soft tissues of the mouth. It is usually painless initially .It may develop a burning sensation or pain when the tumour is advanced.The basic principle behind the development of these cancers are that, the Oncogenes-cancer causing cells are activated as a result of mutation of the DNA. It is important to note that around 75 percent of oral cancers are linked to modifiable behaviours such as tobacco use and excessive alcohol consumption. Other factors include poor oral hygiene, irritation caused by ill-fitting dentures and other rough surfaces on the teeth, poor nutrition, and some chronic infections caused by bacteria or viruses. If oral cancer is diagnosed in its earliest stages, treatment is generally very effective.

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Nano Medicine

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Recent years have witnessed an unprecedented growth in research in the area of nanoscience. There is increasing optimism that nanotechnology applied to medicine which is called 'Nanomedicine' will bring significant advances. The field of 'Nanomedicine' is the science and technology of diagnosing, treating and preventing disease and traumatic injury, of relieving pain, and of preserving and improving human health, using molecular tools and molecular knowledge of the human body. Nanomedicine offers the prospect of powerful new tools for the treatment of human diseases and the improvement of human biological systems using molecular Nanotechnology. The term 'Nanotechnology' generally refers to engineering and manufacturing at the molecular or nanometer length scale (A nanometer is one-billionth of a meter, about the width of 6 bonded carbon atoms). They could remove obstructions in the circulatory system, kill cancer cells, or take over the function of subcellular organelles. Just as today the artificial heart has been developed, so in the future, perhaps artificial mitochondrion would be developed. Unlike previous "revolutions" in the "war" on cancer that raised hope, nanomedicine is not just one more tool, it is an entire field, and the science in this area is burgeoning, they are enabling landmark research to combine all advances, creating nanosized particles that contain drugs targeting cell surface receptors and other potent molecules designed to kill cancerous cells. With at least 12 nanomedicines already approved and progressively more in active development, the next five years should see a steady succession of new nanotech-based drugs, imaging agents, and diagnostic products entering the marketplace. The most active areas of medical nanotechnology are in drug delivery and in vivo imaging. One of the major problems with conventional problems in glucose self monitoring are overcome by advances in nanomedicine, like Glucose nanosensors, layer-by-layer (LBL) technique, Carbon Nanotubes and Quantum Dots(QD's) etc. The major problem concerning about diabetes control with improper insulin administration routes also achieved by nanomedicine with better insulin delivery technology like oral insulin formulations, artificial pancreas, microsphere and nanopumps etc.. New research in nano medicine is moving close towards offering scientists a new way for treating and curing neuro degenerative diseases such as Alzheimer's disease and Parkinson's disease. Nanomedicine in future refers to developments in medicine that will be based on the ability to build nanorobots. In the future these nanorobots could actually be programmed to repair specific diseased cells, functioning in a similiar way to antibodies in our natural healing processes.



Calcium Homeostasis

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Calcium has a number of critical roles in physiology. Biochemical and physiological processes involved in maintaining the concentration of calcium in plasma at a constant level and providing a sufficient supply of calcium for bone mineralization. Calcium homeostasis refers to the regulation of the concentration of calcium ions in the extracellular fluid [Ca⁺⁺] ECF. It is required for muscle contraction, as an enzyme co-factor, and as a second messenger. In order for these processes to function properly, extracellular calcium concentration must be maintained within a narrow range. Calcium is also a major component of bone; the bone can act as a reservoir to allow serum calcium levels to be maintained, but excessive demineralization of bone as a result can lead to severe problems in older individuals. Calcium and phosphate homeostasis is complex, yet three important hormones are responsible for modulating most of the extracellular control of these minerals. Parathyroid hormone acts directly on bone and kidney and indirectly on the intestine to maintain or restore the serum calcium level. The signal for increased PTH synthesis and secretion is a decrease in the serum ionized calcium concentration and a decrease in serum levels of 1,25(OH)₂-D. Calcitonin is produced in parafollicular cells of the thyroid and inhibits bone resorption in pharmacologic doses. These cells recognize the calcium signal in a different way. A diminution in serum calcium decreases calcitonin production and release. The role of calcitonin in normal human physiology, however, remains in dispute. Finally, the biologically potent metabolite of vitamin D, 1, 25(OH)₂-D, stimulates intestinal absorption of calcium and phosphate. It also probably plays a role in the orderly mineralization and resorption of bone and has some influence on renal resorption of filtered calcium and phosphorus. A major stimulus to its production by proximal renal tubule cells is elevated PTH and decreased serum levels of calcium and phosphate. The absence of PTH as well as high serum calcium and phosphate levels can reduce its synthesis and secretion. These three hormones along with other mediators and messengers work in concert to maintain the normal calcium homeostasis. A disturbance at any level in this intricate regulatory network will result in a host of compensatory changes that may lead to clinical disease. A complete understanding of these normal mechanisms is a prerequisite to investigating the etiology and treatment of the various pathologic responses seen with many of the metabolic bone disorders. This report summarizes the evidence that the control of the concentration of free calcium ions in body fluids is centered at mineralized bone surfaces.



Abstract – Micro - 01

Recent Microbial Assessment Tools In Endodontics

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Bacteria are the major cause of pulpal and periapical diseases. Complexity of the root canal system, invasion of the dentinal tubules by microorganisms, formation of smear layer during instrumentation and presence of dentin as a tissue are the major obstacles for complete elimination of bacteria during cleaning and shaping of root canal systems. The bacterial population of infected root canals can be significantly reduced by using saline irrigation; however, irrigants that have antibacterial effects have clearly superior effectiveness in bacterial elimination when compared with saline solution. Diagnosis, instrumentation, obturation and restoration are the main steps involved in the treatment of teeth with pulpal and periapical diseases. Elimination or significant reduction of irritants and prevention of recontamination of the root canal after treatment are the essential elements for successful outcomes. Although many advances have been made in different aspects of endodontics within the last few years to preserve natural dentition, the main objective of this field remains elimination of microorganisms from the root canal systems and prevention of recontamination after treatment. The common belief that inadequate obturation is the major cause of endodontic failures has been proven to be fallacious as obturation reflects the adequacy of cleaning and shaping. In other words, what you take out of a root canal may be more important than what you put in it. The aim of this study was to assess the level of cleaning of endodontic files after its use in root canals preparation and their influence on the sterilization process. Fifty files were divided into two groups: one group of 25 files for analysis in scanning electron microscopy (SEM) for verification of cleaning and another group of 25 files for microbiological analysis in thiogly- colate and BHI after sterilization. The results showed that endodontic files had different degrees of dirt on his active part through evaluation by scanning electron microscopy. The bacterial growth wasn't detected through microbiological test after sterilization. Conclusion: It was concluded that despite the significant presence of dirt on endodontic files in their active part, this dirt don't interfere in the sterilization process. The endodontic instruments are used to remove the remnants of pulp tissue during the procedures of cleaning and shaping of the root canal system. These instruments are submitted by a cleaning process before sterilization to be reused, with the aim of removal of organic matter and waste tissue in the instruments



Transferable drug resistance and its importance.

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Antibiotic resistance is a natural phenomenon. When an antibiotic is used, bacteria that can resist that antibiotic have a greater chance of survival than those that are "susceptible." Susceptible bacteria are killed or inhibited by an antibiotic, resulting in a selective pressure for the survival of resistant strains of bacteria. Some resistance occurs without human action, as bacteria can produce and use antibiotics against other bacteria, leading to a low-level of natural selection for resistance to antibiotics. However, the current higher-levels of antibiotic-resistant bacteria are attributed to the overuse and abuse of antibiotics. In some countries and over the Internet, antibiotics can be purchased without a doctor's prescription. Patients sometimes take antibiotics unnecessarily, to treat viral illnesses like the common cold. Drug resistance is the reduction in effectiveness of a drug such as an antimicrobial or an antineoplastic in curing a disease or condition. When the drug is not intended to kill or inhibit a pathogen, then the term is equivalent to dosage failure or drug tolerance. It may take the form of a spontaneous or induced genetic mutation, or the acquisition of resistance genes from other bacterial species by horizontal gene transfer via conjugation, transduction, or transformation. Many antibiotic resistance genes reside on transmissible plasmids, facilitating their transfer. Exposure to an antibiotic naturally selects for the survival of the organisms with the genes for resistance. In this way, a gene for antibiotic resistance may readily spread through an ecosystem of bacteria. Antibiotic-resistance plasmids frequently contain genes conferring resistance to several different antibiotics. This is not the case for *Mycobacterium tuberculosis*, the bacteria that causes Tuberculosis, since evidence is lacking for whether these bacteria have plasmids. Also *M. tuberculosis* lack the opportunity to interact with other bacteria in order to share plasmids. Antibiotic resistance traits can be lost, but this reverse process occurs more slowly. If the selective pressure that is applied by the presence of an antibiotic is removed, the bacterial population can potentially revert to a population of bacteria that responds to antibiotics. In this paper the significance of drug resistance with respect to clinical aspects is discussed



Abstract – Micro - 03

Caries Risk Indicators In Children Of 3 To 5 Years Age Group Residing In Chennai

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Dental caries (decay) is one of the most prevalent chronic childhood diseases worldwide and it is a major problem, both from a population health perspective and for the individual families who have to deal with young children who suffer from toothaches . Once it occurs, its manifestation persists throughout life, even after the lesion is treated. Dental caries is increasing in India and it is important that steps be taken to curb this trend, because this may lead to crippling consequences on the functional component of the oral cavity. Assessing the caries risk is important for all the patients and the process has to be repeated at intervals. It must be appreciated that a primary prevention will be required in all the children, to maintain a low caries risk status . The preschool period is the time when deleterious oral habits, the caries patterns and the risk factors are being established. It is the ideal time to intervene and establish a healthy trend which can have a lifelong influence. The detection and the prevention of early dental caries is very necessary, because the recent clinical studies have confirmed that the presence of early dental caries is one of the most accurate measures which can predict the children who care at a risk for future tooth decay. Repeatedly epidemiologic studies and reports have confirmed a substantial decline in dental caries among children in Western Europe during the 1970s and early 1980s. Among proposed explanatory factors for the reduction are widespread use of fluoride, school- based prevention programs and dental care activities at child welfare centres. Changes in diagnostic criteria and a more conservative treatment philosophy have also been listed as contributory factors. It is widely accepted that countries, which have achieved a low mean level of dental caries appear to be resistant to further decline. Among 5- yr-olds, some researchers suggest even a caries increases. Trends towards static caries levels have been noticed in both primary and permanent teeth among 6- and 7-yr-olds, but most dental health reports covering 12-yr-olds describe a continuing caries decline. Inter-country differences exist, and within this age group, there are populations in which the caries reduction has bottomed out.



Flu Vaccines
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Influenza vaccine has been demonstrated to prevent disease and death, both in numerous controlled studies and in painstaking scientific reviews of these studies. The CDC reports that studies demonstrate that vaccination is a cost-effective counter-measure to seasonal outbreaks of influenza. Vaccination against influenza is also thought to be important for members of high-risk groups who would be likely to suffer complications from influenza, for example pregnant women and children and teenagers from six months to 18 years of age. For healthy, working adults, influenza vaccines can provide moderate protection against virologically confirmed influenza, but such protection is greatly reduced or absent in some seasons. Evidence for protection in adults aged 65 years or older is lacking. New vaccines with improved clinical efficacy and effectiveness are needed to further reduce influenza-related morbidity and mortality. It is important to note that the flu vaccine takes about two weeks to build up enough antibodies to protect against the flu (thus making the vaccinated person protected against the disease), and that the vaccine does not protect against every strain of the flu. Flu vaccines cause antibodies to develop in the body about two weeks after vaccination. These antibodies provide protection against infection with the viruses that are in the vaccine. Influenza is a serious disease that can lead to hospitalization and sometimes even death. Every flu season is different, and influenza infection can affect people differently. Even healthy people can get very sick from the flu and spread it to others. Traditional flu vaccines made to protect against three different flu viruses (called “trivalent” vaccines) are available. In addition, this season flu vaccines made to protect against four different flu viruses (called “quadrivalent” vaccines) also are available. The seasonal flu vaccine protects against the influenza viruses that research indicates will be most common. Everyone who is at least 6 months of age should get a flu vaccine. Influenza vaccine effectiveness (VE) can vary from year to year and among different age and risk groups. This paper deals with various flu vaccines available along with their effects.



Bacterial Superantigens
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This paper aims at briefing the importance of Bacterial Superantigens . Superantigens (SAGs) are a group of virulent toxins that indiscriminately activate T-cells of the immune system causing system-wide inflammation and other serious, potentially fatal symptoms . They are not quite the same as antigens - though they almost all have antigenic properties- but rather receive their name from their powers to stimulate a massive antigen-nonspecific immune response. Bacterial superantigens (Sags) constitute a family of very stable bacterial proteins that are the most potent known activators of the immune system. They can cause food poisoning or, if they occur at sufficient concentration in the blood or lymphoid tissue, systemic shock . Those unfortunate enough to eat food contaminated with *Staphylococcus aureus* will experience a brief but violent episode of vomiting and diarrhoea just a few hours later—the gut's attempt to expel the Sag before it wreaks havoc with the immune system. If a Sag does get into the bloodstream, and if the patient has no neutralising antibody from previous exposure, then the Sag will induce a sudden and profound T cell stimulation that generates a cascade of cytokines, resulting in symptoms that include high fever, headache, vomiting, hypotension, aches, and rash, causing the condition known as Toxic Shock Syndrome. This life-threatening illness is often associated with young females who have developed an intra-vaginal infection of a staphylococcal strain producing the Sag Toxic Shock Syndrome Toxin (TSST) . Deep tissue infections by *Streptococcus pyogenes* can also produce similarly powerful Sags capable of causing lethal shock . Interestingly, the Sag-induced immune response is not targeted at the bacteria themselves, but rather Sags function to direct a nonspecific T cell- and cytokine-mediated immune response that somehow assists in bacterial survival. Although many cytokines are produced in response to a single Sag, acute toxicity is blamed on the excessive production of three T cell cytokines—Interleukin-2 (IL-2), Interferon- γ (INF- γ), and particularly Tumour necrosis Factor α (TNF- α). The large number of activated T-cells generates a massive immune response which is not specific to any particular epitope on the SAG thus undermining one of the fundamental strengths of the adaptive immune system, that is, its ability to target antigens with high specificity. More importantly, the large number of activated T-cells secrete large amounts of cytokines, the most important of which is Interferon gamma.



Synthetic Peptide Vaccines

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A convenient and versatile approach to the direct synthesis of a peptide-antigen matrix by the solid-phase method is described. The approach is called the multiple antigen peptide system (MAP) and it utilizes a simple scaffolding of a low number of sequential levels (n) of a trifunctional amino acid as the core matrix and $2n$ peptide antigens to form a macromolecule with a high density of peptide antigens of final Mr 10,000. The MAP model chosen for study was an octa-branching MAP consisting of a core matrix made up of three levels of lysine and eight amino terminals for anchoring peptide antigens. The MAP, containing both the core matrix and peptides of 9-16 amino acids, was prepared in a single synthesis by the solid-phase method. SA convenient and versatile approach to the direct synthesis of a peptide-antigen matrix by the solid-phase method is described. The approach is called the multiple antigen peptide system (MAP) and it utilizes a simple scaffolding of a low number of sequential levels (n) of a trifunctional amino acid as the core matrix and $2n$ peptide antigens to form a macromolecule with a high density of peptide antigens of final Mr 10,000. The MAP model chosen for study was an octa-branching MAP consisting of a core matrix made up of three levels of lysine and eight amino terminals for anchoring peptide antigens



Abstract – Micro - 07

Oral Manifestation In Systemic Infection

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The oral cavity might well be thought of as the window to the body as oral manifestations accompany many systemic diseases. But with recent research it may be said that the oral cavity has opened a door for many systemic diseases. The concept of ‘focal infection’ was propounded by Dr. William Hunter in 1910, whereby disease at a distant site, such as the mouth, could contribute to diseases such as anaemia, gastritis, colitis and so on. This theory is currently being carefully reconsidered. In addition, conditions such as diabetes have been shown to increase the risk of periodontal disease. Conversely periodontal therapy may improve the diabetic condition by stabilizing the systemic blood sugar levels. It is becoming increasingly clear that infections and chronic inflammatory conditions such as periodontitis may influence the atherosclerotic process. They may increase haemostatic variables which promote haemostatic plugs and thrombi and rheological variables (which affect blood flow), both of which play important roles in the pathogenesis of vascular diseases (viz ischemic heart disease, stroke). It has been recognized that oral infection, especially periodontitis, may affect the course and pathogenesis of a number of systemic diseases, such as cardiovascular disease, bacterial pneumonia, diabetes mellitus, and low birth weight. The purpose of this review is to evaluate the current status of oral infections, especially periodontitis, as a causal factor for systemic diseases. Three mechanisms or pathways linking oral infections to secondary systemic effects have been proposed: (i) metastatic spread of infection from the oral cavity as a result of transient bacteremia, (ii) metastatic injury from the effects of circulating oral microbial toxins, and (iii) metastatic inflammation caused by immunological injury induced by oral microorganisms. Periodontitis as a major oral infection may affect the host's susceptibility to systemic disease in three ways: by shared risk factors; subgingival biofilms acting as reservoirs of gram-negative bacteria; and the periodontium acting as a reservoir of inflammatory mediators.



Abstract – Micro - 08

M RSA- Major Problem Or Minor Threat

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Methicillin-resistant Staphylococcus aureus (MRSA) is a feature of modern day health care across the world. MRSA is a subgroup within a group of organisms known as Staphylococcus aureus. Staphylococcus aureus is a bacterium that can reside on the skin or can be found in the nose of about one third of healthy individuals. It is generally non-pathogenic except where it gains access to deep tissues such as broken skin, resulting in surgical site or wound infection, the bloodstream leading to bloodstream infection or bacteraemia, and to the lungs causing for example ventilator-associated pneumonia. Early penicillin antibiotics such as flucloxacillin were effective in the treatment of infections caused by Staphylococcus aureus but since the late 1960s many strains have become resistant, but as methicillin was amongst the first anti-staphylococcal agents used, these strains have subsequently been known as MRSA. The prevention and control of MRSA is a challenge in hospitals and in the community throughout the world. MRSA has been prevalent in many Irish hospitals since the early 1970s. Considerable work was undertaken on the epidemiology and clinical importance of MRSA, which has significantly contributed to the world literature. At that time, most MRSA isolates were recovered from burns, surgical wounds and traumatic skin lesions, and invasive infection such as bloodstream infection, deep wound sepsis and osteomyelitis, was rarely seen during that early period. However, the importance of MRSA and its contribution to hospital-acquired infection was not widely acknowledged at the time, despite the efforts of those involved in describing their clinical experiences and in undertaking significant laboratory research. Nonetheless, our knowledge of MRSA, and in particular its contribution to hospital morbidity and mortality, owes much to this seminal body of work and to others. The objective of control measures should be to improve patient care, minimise patient mortality and morbidity, and to help contain healthcare costs. In hospitals where MRSA is endemic, the objective is to minimise spread and in particular to avoid as far as possible the clinical impact of systemic or deep infection in high-risk patients such as those in the intensive care unit (ICU) or other key clinical areas. Harbarth and colleagues argue that the number of patients with MRSA bacteraemia correlates with the hospital-wide prevalence of MRSA and that control measures have a substantial impact on both the reservoir of MRSA patients and the attack rate of MRSA bacteraemia or bloodstream infection



MICROBIOLOGY (POSTER PRESENTATIONS)

Abstract – Micro - 01

Probiotics In Health And Disease

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Each day, every human being ingests a large number of living microorganisms, predominantly bacteria. Although these organisms are naturally present in food and water, they can also be deliberately added during the processing of foods such as sausages, cheese, yoghurt and fermented milk products. For several decades now, bacteria called probiotics have been added to some foods because of their beneficial effects for human health. Endorsed by the Food and Agriculture Organization and the World Health Organization, the definition of probiotics, in 2001, describes them as live microorganisms which when administered in adequate amounts confer health benefits on the host. Commonly, most of the species ascribed as having probiotic properties belong to the genera *Lactobacillus* and *Bifidobacterium*. These bacteria are generally regarded as safe because they can reside in the human body causing no harm and, on the other hand, they are key microorganisms in milk fermentation and food preservation and used as such from the dawn of mankind. Probiotic strains are now widely used to give consumers a health benefit substantiated in a range of randomized clinical trials. The list of disease conditions that may benefit from bacteria includes systemic and infectious diseases such as acute diarrhoea and Crohns disease, cardiovascular disease, urogenital infections, oropharyngeal infections, cancers, food allergies, lactose intolerance, cystic fibrosis, reduction of antibiotic associated side effects, dental and oral disorders-prevention of dental caries, periodontal disease and treatment of oral malodour and this list tends to increase with the advent of more sophisticated research methods utilized in studying the microbe-host interactions. Over the years, the scientific interest to discover, asses and analyze species with probiotic properties has intensively grown. This article aims to summarize in the light of currently available literature about probiotics and their role in health and disease. The mechanism of action of probiotic microorganisms can be explained by enhancement of the non-specific and specific immune response of the host, production of antimicrobial substances and competition with pathogens for binding sites. Further probiotics show adhesion and colonization (at least transitory) of the human body which may increase their retention time thus facilitating prolonged probiotic activity Although the application of probiotics shows some promising results and trends with respect to select aspects of immune modulation, the underlying mechanisms are unclear.



Abstract – Micro - 02

Occupation Risk In The Field Of Dentistry

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Dental professionals are predisposed to a number of occupational hazards. These include exposure to infections (including Human Immunodeficiency Virus and viral hepatitis); percutaneous exposure incidents, dental materials, radiation, and noise; musculoskeletal disorders; psychological problems and dermatitis; respiratory disorders; and eye insults. Percutaneous exposure incidents remain a main concern, as exposure to serious infectious agents is a virtual risk. Minimizing percutaneous exposure incidents and their consequences should continue to be considered, including sound infection control practices, continuing education, and hepatitis B vaccination. Basically, for any infection control strategies, dentists should be aware of individual protective measures and appropriate sterilization or other high-level disinfection utilities. Strained posture at work disturbs the musculoskeletal alignment and leads to stooped spine. The stooped posture also involved certain groups of muscles and joints. This may lead to diseases of the musculoskeletal system. Continuous educating and appropriate intervention studies are needed to reduce the complication of these hazards. So, it is important for dentists to remain constantly up-to-date about measures on how to deal with newer strategies and dental materials, and implicates the need for special medical care for this professional ground. There is also a need for continuing dental education programs in dentistry so that dentists can update themselves with the latest and newer techniques and materials. The first step and key component of a health and safety program is to identify all situations or events that could affect the safety of workers in the dental profession. The methodology used benchmarking literature available but it also relied on personal experience and on a series of best practices and guidelines that describe methods for employers and employees to improve health and safety in the dental field. The research has allowed the preparation of lists that provide basic information about the biological, chemical, physical. Occupational health hazards are unavoidable in many professions. In order to be a productive professional one must be healthy. High production demands in combination with stressful working conditions will affect health. One thing should kept in mind that every technology, no matter how beneficial, can exert a negative impact on some members of the population. The reality of public health will always involve balancing maximum benefit and minimum harm to the public health and well-being. Immunization against various infectious diseases like HIV, HBV etc. is very essential for every Dental Health Care Worker.



Abstract – Micro - 03

Dental Procedures That Require Antibiotic Coverage

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Antibiotic prophylaxis with dental procedures is reasonable only for patients with cardiac conditions associated with the highest risk of adverse outcomes from endocarditis. Infective endocarditis is much more likely to result from frequent exposure to random bacteremias associated with daily activities than from bacteremias caused by a dental, GI tract or GU tract procedure. Prophylaxis may prevent an exceedingly small number of cases of IE, if any, in individuals who undergo a dental, GI tract or GU tract procedure. The risk of antibiotic-associated adverse events exceeds the benefit, if any, from prophylactic antibiotic therapy. Maintenance of optimal oral health and hygiene may reduce the incidence of bacteremia from daily activities and is more important than prophylactic antibiotics for a dental procedure to reduce the risk of IE. the patient is taking an antibiotic normally used for endocarditis prophylaxis, it is prudent to select a drug from a different class rather than increase the dose of the current antibiotic. If possible, you should delay the dental procedure until at least 10 days after completion of the antibiotic. This will allow for the usual oral flora to be re-established. If an individual receiving long-term parenteral antibiotic therapy for IE requires dental treatment, the treatment should be timed to occur 30 to 60 minutes after the parenteral antibiotic therapy has been delivered. If the dosage of an antibiotic is inadvertently not administered before the procedure, the dosage may be administered up to two hours after the procedure. However, administration of the dosage after the procedure should be considered only when the patient did not receive the preprocedure dose. The current practice of giving patients antibiotics prior to a dental procedure is no longer recommended except for patients with the highest risk of adverse outcomes resulting from IE. The Committee cannot exclude the possibility that an exceedingly small number of cases, if any, of IE may be prevented by antibiotic prophylaxis prior to a dental procedure. If such benefit from prophylaxis exists, it should be reserved only for those patients listed below. The Committee recognizes the importance of good oral and dental health and regular visits to the dentist for patients at risk of IE.



Abstract – Micro - 04

Antigenic Shift And Drift In Influenza Virus

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The structure of the influenza virus does not remain the same over the time. It changes in two methods, antigenic drift and antigenic shift. All types of Influenza viruses change constantly by antigenic drift whereas antigenic shift only occurs once in a while. On top of this, Influenza Type A viruses are more susceptible to experience both methods of changes but Influenza Type B viruses can change only by antigenic drift. Antigenic drift is the minor mutation of the surface glycoproteins, namely hemagglutinin (HA) and neuraminidase (NA) of the influenza virus. Antigenic drift occurs over a long period of time and it is a gradual process. Hence, due to the process of antigenic drift, influenza viruses are able to infect the same person for multiple times. Another result caused by antigenic drift is the seasonal epidemics that occur in winter every year. In order to prevent these occasional epidemics, scientists have to create vaccines based on regular global surveillance around the world. It is also for safety precautions that people get a flu shot every now and then to protect themselves. In contrast to antigenic drift, antigenic shift is a major change to the virus structure to create an absolutely new subtype of influenza virus. Antigenic shift can occur in two ways. The first method is by direct human contact with poultry infected with avian influenza virus and the second method is by the mixing of the human influenza virus with the avian influenza virus by a process named genetic reassortment . A new subtype which humans have little resistance and immunity to will develop and a possible pandemic may occur. This process of antigenic shift in influenza viruses has been hastened by species which are capable of being infected by different types of the influenza virus. This species, in particular, is the pigs. The pigs are capable of being infected by the avian influenza virus, the human influenza virus and also the swine influenza virus. Hence, there is a very high possibility for genetic reassortment to occur in a pig infected by different types of the virus which will result in a novel influenza virus.



Abstract – Path - 01

Diet and Cancer

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Experts believe that more than half of human cancers may be preventable. Diet, as well as tobacco use, infections, and chemicals or hormones are thought to be major risk factors that can be changed. However, there is still little agreement over which dietary changes can prevent most cancers. Diet and breast cancer: Although a high-fat diet has been studied as a cause of breast cancer, no clear evidence has been found. A high-fat diet may promote breast cancer by causing the body to release more of certain hormones. Diet and prostate cancer: Because prostate cancer appears to be more common with a Western lifestyle, diet has been closely studied as a risk. However, results have not led to a clear answer: Fats - Some studies have linked prostate cancer to a high-fat diet, especially including red meat and high-fat dairy products. Vegetables and fruits - A diet rich in vegetables, fruits, and legumes appears to protect against prostate cancer. This may be because these foods are low in fat. No one vegetable or fruit has been proven to decrease the risk. Lycopene, which is found in tomatoes, has been investigated, but the evidence that it protects against prostate cancer has not been proven. Vitamins and minerals - Major studies have found that vitamin and mineral supplements (vitamin E, vitamin C, vitamin D, and selenium) do not prevent prostate cancer. Calcium - A high intake of calcium has been linked to an increased risk for prostate cancer in some studies. Diet and colon or rectal cancer - A diet high in red and processed meats increases the risk for colorectal cancer. Diets high in fruits and vegetables appear to reduce the risk. Several major studies have found that eating a lot of high-fiber foods protects against colorectal cancer, but other studies show little benefit. It is also not clear whether a lack of certain vitamins, such as folic acid (a type of B vitamin), could increase the risk for colorectal cancer. Recent studies have shown that taking folic acid supplements does not lower the risk of getting colorectal cancer, and that supplements appear to increase the risk for polyps. Diet and stomach or esophageal cancer - Countries in which people eat a lot of salt-cured, smoked, and nitrite-cured foods have a high rate of cancer of the stomach and esophagus. Examples of such foods include bacon, ham, hot dogs, and salt-cured fish.



Lead Poisoning

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Lead poisoning, also called plumbism, is the deleterious effect of a gradual accumulation of lead in body tissues, as a result of repeated exposure to lead-containing substances. In humans the main sources of lead are usually lead-based paint and drinking water carried through lead pipes; lead-based paints are especially harmful to children who chew on painted toys and furnishings and eat paint peelings from walls. The poison affects the entire body—especially the nervous system, the gastrointestinal tract, and the blood-forming tissues. The victim usually becomes pallid, moody, and irritable and may complain of a metallic taste. Digestion is deranged, the appetite fails, and there may be severe abdominal pain, with spasms of the abdominal muscles (“lead colic”) and constipation. A black line (“lead line”) may appear at the base of the gums. There is often anemia. In later stages, headache, dizziness, confusion, and visual disturbances may be noted. Peripheral nerve involvement results in a paralysis (“lead palsy”) that generally first affects the fingers, hands, and wrists (“wrist drop”). The primary cause of lead's toxicity is its interference with a variety of enzymes because it binds to sulfhydryl groups found on many enzymes. Part of lead's toxicity results from its ability to mimic other metals that take part in biological processes, which act as cofactors in many enzymatic reactions, displacing them at the enzymes on which they act. Lead is able to bind to and interact with many of the same enzymes as these metals but, due to its differing chemistry, does not properly function as a cofactor, thus interfering with the enzyme's ability to catalyze its normal reaction or reactions. Among the essential metals with which lead interacts are calcium, iron, and zinc. One of the main causes for the pathology of lead is that it interferes with the activity of an essential enzyme called delta-aminolevulinic acid dehydratase, or ALAD, which is important in the biosynthesis of heme, the cofactor found in hemoglobin. Lead also inhibits the enzyme ferrochelatase, another enzyme involved in the formation of heme. Ferrochelatase catalyzes the joining of protoporphyrin and Fe²⁺ to form heme. Lead's interference with heme synthesis results in production of zinc protoporphyrin and the development of anemia. Another effect of lead's interference with heme synthesis is the buildup of heme precursors, such as aminolevulinic acid, which may be directly or indirectly harmful to neurons. Lead exposure damages cells in the hippocampus, Lead interferes with the release of neurotransmitters, chemicals used by neurons to send signals to other cells. It interferes with the release of glutamate, a neurotransmitter important in many functions including learning, by blocking NMDA receptors. The targeting of NMDA receptors is thought to be one of the main causes for lead's toxicity to neurons. In addition, lead has been found in animal studies to cause programmed cell death in brain cells.



Oral Brush Biopsy
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Oral lesions are commonly encountered in family practice and can present a diagnostic dilemma. These patients require microscopic evaluation of the lesion to rule out a diagnosis of squamous cell carcinoma. As an excisional biopsy is often impractical in an office setting, many family physicians refer these patients to dentists or to ear, nose, and throat surgeons for a biopsy. Referring all of these cases for an initial biopsy, however, can result in a delay in diagnosis and increased costs for the patient and the health care system. The most definitive, accurate, and reliable method for diagnosing oral mucosal lesions is the scalpel biopsy. The oral brush biopsy coupled with computer-assisted has been developed as a technique for evaluating unexplained clinically detectable alterations of the surface epithelium of the oral mucosa whether cancer or pre-cancer is suspected. The goal of the oral brush biopsy is to provide a highly sensitive and specific technique that is less painful and simpler to perform than a scalpel or punch biopsy. The oral brush biopsy, using a specially designed circular bristled brush, has been designed to access and sample all epithelial layers, including the basal cell layer and the most superficial aspects of the lamina propria. Thus, the cellular material obtained should include all epithelial layers in a disaggregated form spread over the surface of a glass slide. There are 2 applications of this technique. The first is for cases of oral lesions considered to be clinically low risk. In these instances, performing a brush biopsy; if the sample is of adequate quality for interpretation and has negative results, I will observe the lesion in my office with repeat sampling if it persists. The second application is for cases of obviously suspicious lesions, where performing a brush biopsy and refer the patient to an ear, nose, and throat surgeon at the same time. Positive cytology results will often be available for surgeons at the time of their initial consultation with patients, which could considerably speed up the process of definitive surgical resection. Finally, exercising care in patients using blood thinners, where the risk of bleeding must be balanced with the risk of stopping the anticoagulants before the procedure takes place.



Lesions of Vitamin C Deficiency

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The antioxidant properties of vitamin C (ascorbic acid) and its role in collagen synthesis make vitamin C a vital molecule for skin health. Dietary and topical ascorbic acid have beneficial effects on skin cells, and some studies have shown that vitamin C may help prevent and treat ultraviolet (UV)-induced photodamage. However, the effects of vitamin C in the skin are not well understood due to limited research. Vitamin C is a normal skin constituent that is found at high levels in both the dermis and epidermis . The vitamin C content of the epidermis is higher than the dermis, although the vitamin C concentrations in both layers are approximately equal to that of other water-soluble antioxidants, including uric acid and glutathione). Aging, however, causes a decline in vitamin C content in both the epidermis and dermis . Excessive exposures to UV light or pollutants (e.g., cigarette smoke and ozone) may also lower vitamin C content, primarily in the epidermis . Vitamin C in the skin is normally transported from the bloodstream. Transport proteins specific for ascorbic acid are found on cells in all layers of the skin. Keratinocytes have a high capacity for vitamin C transport, possibly to compensate for limited vascularization of the epidermis . Oral supplementation with vitamin C effectively increases vitamin C levels in the skin . However, when plasma vitamin C levels are saturated, skin vitamin C concentrations no longer increase. Symptoms of vitamin C deficiency (known as scurvy) appear once plasma concentrations of ascorbic acid drop below 10 micromolar, a level that can be prevented by consuming as little as 10 mg of ascorbic acid daily .Cutaneous manifestations of scurvy result from declines in collagen synthesis, leading to disruption of connective tissue and fragility of blood vessels. Early symptoms in the skin include a thickening of the stratum corneum and spots of small subcutaneous bleeding . As scurvy progresses, wound healing is impaired due to the loss of mature collagen, which allows wounds to remain open . Skin lesions caused by vitamin C deficiency are remediated by an adequate intake of vitamin C. One of the distinctive features of scurvy is poor wound healing . Vitamin C levels decrease rapidly at a wound site . Although inflammatory responses often increase free radicals at the site of injury and the presence of vitamin C may limit free radical damage, free radicals may play a complex role in the healing response that is not yet understood . However, the increased demand for dermal collagen synthesis may increase utilization of vitamin C. Vitamin C may have additional roles in wound healing, for example, by promoting keratinocyte differentiation , stimulating the formation of the epidermal barrier , and re-establishing the stratum corneum .



Diagnostic Aids In Oral Cancer

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Most cancers of the oral cavity are oral squamous cell carcinomas (OSCC), and tobacco, alcohol and betel use the main risk factors for these and many potentially malignant lesions (PML). The main high risk groups are older adult males who use tobacco and alcohol. It is expected that early diagnosis of PML can reduce mortality. Early diagnosis of OSCC can speed proceeding to treatment and can improve the prognosis. This requires patients to seek an oral and dental examination at an early stage. Conventional oral examination (COE) is the standard method of revealing PML and OSCC, confirming the clinical suspicion by biopsy and histopathological examination. Histopathology has for many years been the gold standard in the diagnosis of OSCC; however, it is a rather slow process, requiring several days to fix, embed and stain the biopsy specimen before results can be available. It is subject to inter-pretation of pathologists, and although it can detect cellular changes, it can only detect molecular changes if special techniques are employed. Currently available diagnostic technologies are Biopsy and histopathological examination, Vital staining, Biomarkers, DNA ploidy (chromosomal polysomy), Brush biopsy and Optical techniques . The biopsy should be sufficiently large to include suspect and apparently normal tissue to give the pathologist a chance to make a diagnosis and not to have to request a further specimen. Since red rather than white areas are most likely to show any dysplasia present in the lesion, a biopsy should include the former. Various attempts to clinically highlight probable dysplastic areas before biopsy have, unfortunately, not proven to be absolutely reliable but may be of some help where there is widespread "field change" such as seen in patients at high risk for OSCC. Toluidine blue (TB) staining is a simple and inexpensive diagnostic tool that uses a blue dye to highlight abnormal areas of mucosa. TB is a basic metachromatic nuclear stain which stains nuclear material of malignant lesions and PML but not normal mucosa, used by (a) the patient rinsing the mouth with 1% acetic acid for 20 seconds followed by a similar rinse with water twice for 20 seconds; (b) rinsing the mouth with 5-10 cc. 1% toluidine blue solution; and (c) rinsing with 1% acetic acid solution (5 oz.) for about 1 minute followed by a water rinse. The most predictive of the molecular markers thus far available and assessed in OSCC development include the TSG p53 protein expression, chromosomal polysomy (DNA ploidy), and changes (termed loss of heterozygosity; LOH) in chromo-somes 3p or 9p (probably due to changes in the TSG p16). The use of such biomarkers as adjuncts to routine histopathological examination may help prognostication and effective management of PMLs but their routine use is still hampered by the cost and complexity of the tests, the lack of facilities in some labs and limited outcome studies to date. DNA ploidy is the measurement of nuclear DNA content. This may provide a surrogate measure of gross genetic damage and this could act as a surrogate for individual molecular markers.



Dry Socket

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Alveolar osteitis is inflammation of the alveolar bone (i.e., the alveolar process of the maxilla or mandible). Classically, this occurs as a postoperative complication of tooth extraction. Alveolar osteitis usually occurs where the blood clot fails to form or is lost from the socket (i.e., the defect left in the gum when a tooth is taken out). This leaves an empty socket where bone is exposed to the oral cavity, causing a localized alveolar osteitis limited to the lamina dura (i.e., the bone which lines the socket). This specific type of alveolar osteitis is also known as dry socket or, less commonly, fibrinolytic alveolitis, and is associated with increased pain and delayed healing time. Dry socket occurs in about 0.5–5% of routine dental extractions, and in about 25–30% of extractions of impacted mandibular third molars (wisdom teeth which are buried in the bone). Since dry socket occurs exclusively following a dental extraction, it could be considered both a complication and an iatrogenic condition, but this does not take into account both the reason why the tooth required extraction (i.e., extraction may have been unavoidable due to significant pain and infection) and also the fact that many dry sockets are the result of poor compliance with postoperative instructions, notably refraining from smoking in the days immediately after the procedure. Since alveolar osteitis is not primarily an infection, there is not usually any pyrexia (fever) and cervical lymphadenitis (swollen glands in the neck), and only minimal edema (swelling) and erythema (redness) is present in the soft tissues surrounding the socket. The cause(s) of dry socket are not completely understood. Normally, following extraction of a tooth, blood is extravasated into the socket, and a blood clot (thrombus) forms. This blood clot is replaced with granulation tissue which consists of proliferating fibroblasts and endothelial cells derived from remnants of the periodontal membrane, surrounding alveolar bone and gingival mucosa. In time this in turn is replaced by coarse, fibrillar bone and finally by mature, woven bone. The clot may fail to form because of poor blood supply (e.g., secondary to local factors such as smoking, anatomical site, bone density and conditions which cause sclerotic bone to form). The clot may be lost because of excessive mouth rinsing, or disintegrate prematurely due to fibrinolysis. Fibrinolysis is the degeneration of the clot and may be caused by the conversion of plasminogen to plasmin and formation of kinins. Factors which promote fibrinolysis include local trauma, estrogens, and pyrogens from bacteria. Bacteria may secondarily colonize the socket, and lead to further dissolution of the clot. Bacterial breakdown and fibrinolysis are widely accepted as a major contributing factors to the loss of the clot. Bone tissue is exposed to the oral environment, and a localized inflammatory reaction takes place in the adjacent marrow spaces. This localizes the inflammation to the walls of the socket, which become necrotic. The necrotic bone in the socket walls is slowly separated by osteoclasts and fragmentary sequestra may form.



Abstract – Path - 07

Biopsy

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A biopsy is a sample of tissue taken from the body in order to examine it more closely. A doctor should recommend a biopsy when an initial test suggests an area of tissue in the body isn't normal. Doctors may call an area of abnormal tissue a lesion, a tumor, or a mass. These are general words, used to emphasize the unknown nature of the tissue. The suspicious area may be noticed during a physical examination or inside the body on an imaging test. In some cases, a biopsy of normal-appearing tissue may be done. This can help check for cancer spread or rejection of a transplanted organ. There are many different kinds of biopsies. Nearly all of them involve using a sharp tool to remove a small amount of tissue. If the biopsy will be on the skin or other sensitive area, local anaesthesia is given. Needle biopsy. Most biopsies are needle biopsies, meaning a needle is used to access the suspicious tissue. CT-guided biopsy - A person rests in a CT-scanner; the scanner's images help doctors determine the exact position of the needle in the targeted tissue. Ultrasound-guided biopsy - An ultrasound scanner helps a doctor direct the needle into the lesion. Bone biopsy - A bone biopsy is used to look for cancer of the bones. This may be performed via the CT scan technique or by an orthopedic surgeon. Bone marrow biopsy - A large needle is used to enter the pelvis bone to collect bone marrow. This detects blood diseases such as leukemia or lymphoma. Liver biopsy - A needle is injected into the liver through the skin on the belly, capturing liver tissue. Kidney biopsy - Similar to a liver biopsy, a needle is injected through the skin on the back, into the kidney. Aspiration biopsy - A needle withdraws material out of a mass. This simple procedure is also called fine-needle aspiration. Prostate biopsy - Multiple needle biopsies are taken at one time from the prostate gland. To reach the prostate, a probe is inserted into the rectum. Skin biopsy - A punch biopsy is the main biopsy method. It uses a circular blade to get a cylindrical sample of skin tissue. Surgical biopsy - Either open or laparoscopic surgery may be necessary to obtain a biopsy of hard-to-reach tissue. Either a piece of tissue or the whole lump of tissue may be removed. A pathologist examines the biopsy tissue under a microscope. By noting the tissue cells' type, shape, and internal activity, in most cases a pathologist can diagnose the problem. When the laboratory receives the biopsy sample, the tissue is processed and an extremely thin slice of tissue is removed from the sample and attached to a glass slide. Any remaining tissue is saved for use in later studies, if required. The slide with the tissue attached is treated with dyes that stain the tissue, which allows the individual cells in the tissue to be seen more clearly. The slide is then given to the pathologist, who examines the tissue under a microscope, looking for any abnormal findings. The pathologist then prepares a report that lists any abnormal or important findings from the biopsy. This report is sent to the physician who originally performed the biopsy on the patient.



Tobacco Smoking – A Luring Devil

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The health effects of smoking are the circumstances, mechanisms, and factors of tobacco consumption on human health. Epidemiological research has been focused primarily on cigarette tobacco smoking, which has been studied more extensively than any other form of consumption. Tobacco is the single greatest cause of preventable death globally. Tobacco use leads most commonly to diseases affecting the heart, liver and lungs, with smoking being a major risk factor for heart attacks, strokes, chronic obstructive pulmonary disease (COPD) (including emphysema and chronic bronchitis), and cancer (particularly lung cancer, cancers of the larynx and mouth, and pancreatic cancer). It also causes peripheral vascular disease and hypertension. The effects depend on the number of years that a person smokes and on how much the person smokes. Starting smoking earlier in life and smoking cigarettes higher in tar increases the risk of these diseases. Also, environmental tobacco smoke, or second hand smoke, has been shown to cause adverse health effects in people of all ages. Cigarettes sold in underdeveloped countries tend to have higher tar content, and are less likely to be filtered, potentially increasing vulnerability to tobacco-related disease in these regions. Smoke contains several carcinogenic pyrolytic products that bind to DNA and cause many genetic mutations. There are more than 45 known or suspected chemical carcinogens in cigarette smoke. Tobacco also contains nicotine, which is a highly addictive psychoactive drug. When tobacco is smoked, nicotine causes physical and psychological dependency. Tobacco use is a significant factor in miscarriages among pregnant smokers, and it contributes to a number of other threats to the health of the fetus such as premature births and low birth weight and increases by 1.4 to 3 times the chance for Sudden Infant Death Syndrome (SIDS). The result of scientific studies done in neonatal rats seems to indicate that exposure to cigarette smoke in the womb may reduce the fetal brain's ability to recognize hypoxic conditions, thus increasing the chance of accidental asphyxiation. Incidence of impotence is approximately 85 percent higher in male smokers compared to non-smokers, and is a key factor causing erectile dysfunction (ED). A person's increased risk of contracting disease is directly proportional to the length of time that a person continues to smoke as well as the amount smoked. However, if someone stops smoking, then these chances gradually decrease as the damage to their body is repaired. A year after quitting, the risk of contracting heart disease is half that of a continuing smoker. The health risks of smoking are not uniform across all smokers. Risks vary according to amount of tobacco smoked, with those who smoke more at greater risk. Smoking so-called "light" cigarettes does not reduce the risk.



Abstract – Path - 09

Radiation Injury

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Radiation injury are the tissue damage or changes caused by exposure to ionizing radiation namely, gamma rays, X-rays, and such high-energy particles as neutrons, electrons, and positrons. Sources of ionizing radiation may be natural (e.g., radioactive substances such as the element radium or the radioisotopes potassium-40 and carbon-14) or man-made (X-ray machines, nuclear reactors, particle accelerators, nuclear weapons, etc.). Radiation injury occurs in various forms, with each type dependent on the ionizing radiation involved, its penetrating ability, the portion of the body exposed, the duration of exposure, and the total dose. Radiation injury occurs most readily in tissues and organs consisting of rapidly proliferating cells, as, for example, the skin, the lining of the gastrointestinal tract, and the bone marrow, where progenitor cells multiply continuously to replace the mature cells that are constantly being lost through normal aging. The effects of radiation on these organs result primarily from the destruction of the progenitor cells and the consequent interference with the replacement of the mature cells, which is so vital to the maintenance of tissue structure and function. Symptoms resulting from the intensive irradiation of a large segment of the gastrointestinal tract or portion of the bone marrow constitute a condition called radiation sickness, or acute radiation syndrome. Early signs of this condition include loss of appetite, nausea, and vomiting within the first few hours after irradiation, followed by a symptom-free period that lasts until the main phase of the illness. In the intestinal form of radiation sickness, the main phase is characterized by abdominal pain, fever, and diarrhea, which lead within several days to dehydration, prostration, and a fatal shocklike state. The main phase of the hemopoietic form (that associated with bone marrow) of the illness begins later (about 2–3 weeks after irradiation), with typical symptoms including fever, weakness, loss of hair, infection, and hemorrhage. When damage to the bone marrow is severe, death may result from infection and uncontrollable bleeding. Other manifestations of radiation injury are certain forms of cancer. The survivors of the atomic-bomb blasts at Hiroshima and Nagasaki, some patients subjected to multiple fluoroscopic chest examinations, and certain groups of radiation workers (e.g., women who painted radium watch and clock dials) have exhibited dose-dependent increases in the incidence of cancer, most notably leukemia and breast cancer. Radiation injury also includes abnormalities produced in the embryo. The tissues of the embryo, like others composed of rapidly proliferating cells, are extremely sensitive to ionizing radiation. Organs irradiated during the process of formation thus tend to be malformed.



Leiyomyosarcoma
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Leiomyosarcoma is a malignant cancer of smooth muscle. When such a neoplasm is benign, it is a leiomyoma. Leiomyosarcoma is a relatively rare form of cancer, and accounts for between 5–10% of soft tissue sarcomas, which are in themselves relatively rare. Leiomyosarcomas can be very unpredictable. They can remain dormant for long periods of time and recur after years. It is a resistant cancer, meaning generally not very responsive to chemotherapy or radiation. The best outcomes occur when it can be removed surgically with wide margins early, while small and still in situ. There are no specific clinical features diagnostic of leiomyosarcoma of soft tissue that distinguish these tumors from other soft tissue sarcomas. Women are affected more than men (2:1), with the disease typically occurring in the 5th and 6th decades of life. This gender distribution may reflect the proliferation of smooth muscle that can occur in response to estrogen. Prognosis and treatment varies on the location, stage and grade of the primary tumor as well as the presence of metastatic disease. The most common site of involvement of leiomyosarcoma is the retroperitoneum, accounting for approximately 50% of occurrences. In the case of retroperitoneal tumors, presenting signs and symptoms can include an abdominal mass, pain, swelling, weight loss, nausea or vomiting. Leiomyosarcoma of somatic soft tissues, like other soft tissue sarcomas, often present as an enlarging, painless mass. Although these tumors are generally associated with small blood vessels, they usually do not present with signs or symptoms of vascular compression. However, when leiomyosarcoma arises from a major blood vessel, symptoms of vascular compromise or leg edema may be present, as well as neurologic symptoms such as numbness from compression of an adjacent nerve. Soft tissue leiomyosarcoma typically affects adults, however it can present in childhood. The histologic appearance of leiomyosarcoma of soft tissue exhibits significant variability. Typical features include a highly cellular field, with abundant pink to deep red cytoplasm on H&E staining. Cells are arranged in fascicles, and in well-differentiated tumors these fascicles are often arranged at right angles, allowing identification of both longitudinal and cross-sectional areas within one field. The nuclei are usually centrally located, and are classically described as cigar-shaped. One of the key features is the presence of myofibrils that are longitudinal and run the length of the cell. As the cells become increasingly de-differentiated, they become disorganized, and begin to lose their distinguishing characteristics.



PATHOLOGY – (POSTER PRESENTATIONS)

Abstract – Path - 01

Obesity

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Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have a negative effect on health, leading to reduced life expectancy and/or increased health problems. People are considered obese when their body mass index (BMI), a measurement obtained by dividing a person's mass by the square of the person's height, exceeds 30 kg/m^2 . Obesity increases the likelihood of various diseases, particularly heart disease, type 2 diabetes, obstructive sleep apnea, certain types of cancer, and osteoarthritis. Obesity is most commonly caused by a combination of excessive food energy intake, lack of physical activity, and genetic susceptibility, although a few cases are caused primarily by genes, endocrine disorders, medications or psychiatric illness. Evidence to support the view that some obese people eat little yet gain weight due to a slow metabolism is limited. On average obese people have a greater energy expenditure than their thin counterparts due to the energy required to maintain an increased body mass. Dieting and physical exercise are the mainstays of treatment for obesity. Diet quality can be improved by reducing the consumption of energy-dense foods such as those high in fat and sugars, and by increasing the intake of dietary fiber. Anti-obesity drugs may be taken to reduce appetite or decrease fat absorption when used together with a suitable diet. If diet, exercise and medication are not effective, a gastric balloon may assist with weight loss, or surgery may be performed to reduce stomach volume and/or bowel length, leading to feeling full earlier and a reduced ability to absorb nutrients from food. Obesity is a leading preventable cause of death worldwide, with increasing rates in adults and children. Authorities view it as one of the most serious public health problems of the 21st century. Obesity is stigmatized in much of the modern world (particularly in the Western world), though it was widely seen as a symbol of wealth and fertility at other times in history, and still is in some parts of the world. In 2013, the American Medical Association classified obesity as a disease.



Pathological Changes In Amyloidosis

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Amyloidosis, disease characterized by the deposition of an abnormal protein called amyloid in the connective tissues and organs of the body that inhibits normal functioning. Amyloid is a fibrous, insoluble protein-carbohydrate complex that forms when normally soluble proteins such as antibodies become misfolded and adopt a fibril structure. There are different types of amyloid, and each type can be distinguished by the major protein component that it contains. There are numerous symptoms that are associated with this disease. The most common ones have to do with the heart, such as heart failure and arrhythmia. Also, the respiratory tract can be affected and cause hemoptysis. Usually, the spleen enlarges and sometimes ruptures. The gastrointestinal tract is usually affected and causes vomiting, hemorrhaging and diarrhea. Amyloidosis can also affect the body's motor functions and cause polyneuropathy. When the amyloid fibrils and oligomers get to the skin, they can cause skin lesions and petechiae. One of the most well-known symptoms is macroglossia. If diagnosis of amyloidosis is suspected, a tissue sample of abdominal wall fat, the rectum or a salivary gland, can be examined in biopsy for evidence of characteristic amyloid deposits. The tissue is treated with various stains. The most useful stain in the diagnosis of amyloid is Congo red, which, combined with polarized light, makes the amyloid proteins appear apple-green on microscopy. Also, thioflavin T stain may be used. An abdominal wall fat biopsy is not completely sensitive and, sometimes, biopsy of an involved organ (such as the kidney) is required to achieve a diagnosis. The nature of the amyloid protein can be determined by various ways: the detection of abnormal proteins in the bloodstream (on protein electrophoresis or light chain determination), binding of particular antibodies to the amyloid found in the tissue, or extraction of the protein and identification of its individual amino acids.



Stress Related Disorders

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Stress is a conscious or unconscious psychological feeling or physical situation which comes after as a result of physical or/and mental 'positive or negative pressure' to overwhelm adaptive capacities. Stress is a psychological process initiated by events that threaten, harm or challenge an organism or that exceed available coping resources and it is characterized by psychological responses that are directed towards adaptation. Stress is wear and tear on the body in response to stressful agents. Hans Selye called such agents stressors and said they could be physical, physiological, psychological or sociocultural. And stress is not an anxiety disorder and it is not a normative concept. A person typically is stressed when positive or negative (e.g., threatening) experiences temporarily strain or overwhelm adaptive capacities. Stress is highly individualized and depends on variables such as the novelty, rate, intensity, duration, or personal interpretation of the input, and genetic or experiential factors. Both acute and chronic stress can intensify morbidity from anxiety disorders. One person's fun may be another person's stressor. For an example, panic attacks are more frequent when the predisposed person is exposed to stressors. Acute stress disorder occurs in individuals without any other apparent psychiatric disorder, in response to exceptional physical/or psychological stress. While severe, such reactions usually subside within hours or days. The stress may be an overwhelming traumatic experience (e.g. accident, battle, physical assault, rape) or unusually sudden change in social circumstances of the individual, such as multiple bereavement. Individual vulnerability and coping capacity play a role in the occurrence and severity of acute stress reactions, as evidenced by the fact that not all people exposed to exceptional stress develop symptoms. However, it needs to be remembered that an acute stress disorder falls under the class of an anxiety disorder. Symptoms show considerable variation but usually include: An initial state of "DAZE" with some constriction of the field of consciousness and narrowing of attention, inability to comprehend stimuli, disorientation. Followed either by further withdrawal from the surrounding situation to the extent of a dissociative stupor or by agitating and over activity. Autonomic signs of "Panic Anxiety" are tachycardia (increased heart rate), Sweating, Hyperventilation (increased breathing). The symptoms usually appear within minutes of the impact of the stressful stimulus and disappear within 2–3 days. Stress ulceration is a single or multiple fundic mucosal ulcers which often gives upper gastrointestinal bleeding developed during the severe physiologic stress of serious illness. Ordinary peptic ulcers are found commonly in the "gastric antrum and the duodenum" whereas Stress ulcers are found commonly in "fundic mucosa and can be located anywhere within the stomach and proximal duodenum". Post-traumatic Stress disorders - This arises after response to a stressful event or situation of an exceptionally threatening nature and likely to cause pervasive distress (great pain, anxiety, sorrow, acute physical or mental suffering, affliction, trouble) in almost anyone.



Abstract – Path - 04

Say Yes To Dragon Fruit , No To Systemic Diseases

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"Dragonfruit" always refers to fruit of the genus *Hylocereus*. The fruit was probably introduced by Europeans who brought it from the New World. In the case of Taiwan, the fruit was brought in by the Dutch. *Hylocereus* blooms only at night; the large white fragrant flowers of the typical cactus flower shape are among those called "moonflower" or "Queen of the Night". Sweet pitahayas have a creamy pulp and a delicate aroma. It is also grown as an Ornamental plant, used in gardens as a flowering vine and a house plant indoors. Dragonfruit is football-shaped and has a leathery, leafy skin that is deep red or pink in color. It comes in three varieties, red flesh, white flesh and yellow flesh, all of which are embedded with hundreds of black seeds and have a mild, sweet taste. The best-tasting variety is the one with red flesh, which is succulent when eaten. One dragonfruit can weigh between 150 and 600g, but with its thick covering, only about 60 percent is edible. To enjoy dragonfruits, it is best to eat the creamy pulp cold. The middle part is the sweetest, and after cutting the fruits in half, you just have to spoon the flesh out. Dragonfruits are common in Asia (particularly in Taiwan, Vietnam, Thailand and the Philippines) and in Central and South America. They are among the many wonder fruits that are said to provide multiple health benefits. In addition, dragonfruits help protect the environment because they absorb carbon dioxide at nighttime, and then release oxygen to purify the air. A 100g serving of dragonfruit has only 60 calories: 18 calories from fat (all unsaturated), 8 calories from protein and 34 calories from carbohydrates. Dragonfruits do not have complex carbohydrates, so they can be easily broken down by the body. Dragonfruits do not contain cholesterol, saturated fat and trans fat, so regular consumption will help manage blood pressure and control cholesterol levels. The seeds of dragonfruits are high in polyunsaturated fatty acids (omega-3 and omega-6 fatty acids) that reduce triglycerides and lower the risk of cardiovascular disorder. Dragonfruits are high in fiber, so regular consumption can help avoid constipation, improve your digestive health and help you reduce weight. Dragonfruits are rich in vitamin C, containing 9mg per serving that is equivalent to 10 percent of the daily value. Thus, eating dragonfruits helps strengthen your immune system and promotes faster healing of bruises and wounds. In fact, regular eating of dragonfruits will help ward off chronic respiratory disorders such as asthma and cough.



Abstract – Pharm - 01

Role of Antibiotics In Dentistry

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Although the potential exists for oral microorganisms to seed and infect distant tissues after oral procedures. Treatment and prophylaxis with antibiotics are normal parts of oral care. However, the indications for antibiotics in dentistry are limited. These indications include serious odontogenic infections with rapid spreading, diffuse swelling, and systemic signs. Management of some periodontal conditions is another indication, although the best antibiotic and the exact conditions warranting their application have not yet been clearly defined. Some infections of the jaws, including osteomyelitis and severe pericoronitis, may also be treated aggressively with the adjunctive use of antibiotics. Placement of regenerative membranes may benefit from antibiotic prophylaxis. Prophylaxis with antibiotics to prevent bacteremia and metastatic infection is indicated in some situations. It is apparent that antibiotics are used widely in dentistry, often unnecessarily. Dental practitioners must become better educated about the prudent use of antibiotics and the dangers and cost of their overuse and misuse. Antibiotics are prescribed for pericoronitis, facial injuries, surgical prophylaxis, and osteomyelitis. Oral and maxillofacial surgeons often treat patients with many of the conditions above, including endodontic and periodontal infections, on an emergency basis. Pericoronitis is inflammation of a flap of gingival tissue that overlies a partially impacted tooth, usually a third molar. Food debris and bacteria can invade the space between the tooth and the tissue, which may then become traumatized by occlusion from an upper tooth. This damage results in a secondary infection with pain and swelling, usually on the inside of the mandible extending posteriorly toward the pharynx. More serious infections require more aggressive therapy, including antibiotics. Because the offending microorganisms are from the oral cavity, the antibiotic of choice is penicillin. Traumatic injuries to the soft and hard tissues of the face may be treated by an oral or maxillofacial surgeon. These injuries include soft-tissue lacerations, fractured and displaced teeth, and fractures of the facial bones. Antibiotics have been widely used as an adjunct to prevent infection in the management of facial fractures. Recent evidence shows that antibiotics are beneficial when given during treatment but can be discontinued after reduction and fixation of the fractures. Additional antibiotic therapy postoperatively does not decrease the overall rate of infection. When antibiotic prophylaxis is indicated, it should start prior to the operation, the appropriate dosage of the correct antibiotic should be used, and the antibiotics should be discontinued when the surgical procedure has been completed. When these guidelines are followed, the incidence of infection is minimized.



Abstract – Pharm - 02

Geriatric Pharmacology

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The chance of an adverse drug event (ADE) or drug-drug interaction (DDI) increases with the number of drugs. In age, 15-50% of all hospital admissions are due to ADEs. In a patient taking more than 5 drugs, the statistical chance of a DDI or ADE is 100%. Many drugs are distributed [are active] primarily into the body's water compartment. Total body water decreases significantly with age. Diuretics and poor oral intake worsen this. Therefore, there is a greater risk of drug toxicity. Examples: digoxin, theophylline, lithium, aminoglycosides, anti-arrhythmics, lidocaine. In age, renal function declines about 1% per year over age 50. This is markedly increased if the patient is also dehydrated. The majority of drugs are renally excreted and are therefore at risk to accumulate. Examples: meperidine, metabolites of morphine, anti-arrhythmics. In age, liver function stays about the same under normal circumstances. However, liver blood flow is decreased with dehydration or CHF, and liver function decline with cachexia or metastases. Therefore many drugs have prolonged half-lives: tricyclic antidepressants, many opioids, verapamil, benzodiazepines. Elderly people are very susceptible to anticholinergic drugs. They cause delirium, memory loss, urinary retention, constipation, dry eyes and mouth) Population aging evokes doomsday economic and sociological prognostication, despite a minority of older people suffering significant dependency and the potential for advances in therapeutics of age-related disease and primary aging. Biological aging processes are linked mechanistically to altered drug handling, altered physiological reserve, and pharmacodynamic responses. Parenteral loading doses need only be adjusted for body weight as volumes of distribution are little changed, whereas oral loading doses in some cases may require reduction to account for age-related increases in bioavailability. Age-related reduction of hepatic blood flow and hepatocyte mass and primary aging changes in hepatic sinusoidal endothelium with effects on drug transfer and oxygen delivery reduce hepatic drug clearance. Primary renal aging is evident, although renal clearance reduction in older people is predominantly disease-related and is poorly estimated by standard methods.



Abstract – Pharm - 03

Antioxidants & Periodontal Diseases

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Periodontitis is a term used to describe an inflammatory process initiated by plaque biofilm that leads to loss of periodontal attachment to root surfaces and adjacent alveolar bone which ultimately results in loss of tooth. The primary etiological agent is specific, predominantly gram negative anaerobic facultative bacteria within subgingival biofilm. These bacteria have the ability to activate host defense mechanisms which breakdown epithelia and other structures of gingiva and periodontium, while at the same time inactivating repair systems. Bacteria cause tissue destruction directly by toxic products and indirectly by activating host defense mechanisms. Periodontal disease is a chronic adult condition. Bacteria implicated in the etiology of this disease causes destruction of connective tissue and bone. As a result of stimulation by bacterial antigen PMN produces free radicals via respiratory burst as a part of host response to infection. Patients with periodontal disease display increased PMN number and activity. Periodontal disease is a chronic adult condition. Bacteria implicated in the etiology of this disease causes destruction of connective tissue and bone. As a result of stimulation by bacterial antigen polymorphic neutrophils (PMN) produces free radicals via respiratory burst as a part of host response to infection. Patients with periodontal disease display increased PMN number and activity. This proliferation results in high degree of free radical release culminating in heightened oxidative damage to gingival tissues, periodontal ligament and alveolar bone. Damage mediated by free radicals can be mitigated by "ANTIOXIDANT DEFENSE SYSTEM". Physiological alteration and pathological states produced by free radicals depend on disequilibrium between free radical production and antioxidant levels leading to oxidative stress. Among the host responses leukocytes serve as the initial host defense against periodontal pathogens. After stimulation by bacterial pathogens neutrophils produce free radicals. Periodontal tissue destruction is caused by an inappropriate host response to these microorganisms and their products. More specifically due to oxidative stress.



Abstract – Pharm - 04

Role of Herbs In Dentistry

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Since antiquity, herbs and spices are derived from medicinal plants rich in minerals and organic matter remain the mainstay of about 75–80% of the world's population for health care and gaining popularity in developed and developing countries. Herbs have medicinal property due to presence of different active principles like alkaloids, volatile essential oils, glycosides, resins, oleoresins, steroids, tannins, terpenes and phenols. In recent years there is an exponential growth in the field of herbal medicine because of their natural origin, easy availability, efficacy, safety and less side effects. Oral bacteria are the primary etiologic agents that cause dental caries/plaque. Bacteria have evolved to survive in the environment of the tooth surface, gingival epithelium, and oral cavity. Acidogenic oral bacteria like streptococcus mutans, streptococcus salivarius, Streptococcus mitis, Streptococcus sanguis and lactobacillus acidophilus primarily causes dental caries/plaque that surround orthodontic appliances in many patients undergoing Orthodontic treatment. Such bacteria can lead to tooth enamel breakdown and potential discoloration of the tooth surface, and these aesthetic changes can persist for many years after orthodontic treatment. Natural products derived from plant source are found to be highly efficient in eradicating the dental caries/plaque found in fixed orthodontic appliances patients undergoing orthodontic treatment. Enterococcus faecalis is a facultative anaerobic microorganism that are commonly detected in asymptomatic, persistent endodontic infections. E. faecalis is a normal inhabitant of the oral cavity. E. Faecalis is responsible for root canal treatment failure cases and is resistant to calcium hydroxide due to its proton pump. E faecalis can also survive by genetic polymorphism and its ability to bind to dentin, invade dentinal tubules, and survive starvation. E. faecalis possesses virulence factors including lytic enzymes, cytolysin, aggregation substance, pheromones, and lipoteichoic acid. It has been shown to adhere to host cells, express proteins that allow it to compete with other bacterial cells, and alter host responses. The most effective method for eliminating E. faecalis from the root canal space and dentinal tubules is the use of sodium hypochlorite and 2% chlorhexidine, in a 2% gel or liquid concentration form.



Pharmacotherapy Of Acne vulgaris

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Topical retinoids are comedolytic and anti-inflammatory. They normalize follicular hyperproliferation and hyperkeratinization. Topical retinoids reduce the numbers of microcomedones, comedones, and inflammatory lesions. They may be used alone or in combination with other acne medications. The most commonly prescribed topical retinoids for acne vulgaris include adapalene, tazarotene, and tretinoin. These retinoids should be applied once daily to clean, dry skin, but they may need to be applied less frequently if irritation occurs. Skin irritation with peeling and redness may be associated with the early use of topical retinoids and typically resolves within the first few weeks of use. The use of mild, nonirritating cleansers and noncomedogenic moisturizers may help reduce this irritation. Alternate-day dosing may be used if irritation persists. Topical retinoids thin the stratum corneum, and they have been associated with sun sensitivity. patients are instructed about sun protection. Also see Sunscreens and Photoprotection. Topical antibiotics are mainly used for their role against *Propionibacterium acnes*. They may also have anti-inflammatory properties. Topical antibiotics are not comedolytic, and bacterial resistance may develop to any of these agents. The development of resistance is lessened if topical antibiotics are used in combination with benzoyl peroxide. Commonly prescribed topical antibiotics for acne vulgaris include clindamycin (or less commonly erythromycin) alone or in combination with benzoyl peroxide. Clindamycin is available in a variety of topical agents. They may be applied once or twice a day. Gels and solutions may be more irritating than creams or lotions. Clindamycin has maintained better efficacy than erythromycin, which is infrequently used. Benzoyl peroxide products are also effective against *P acnes*, and bacterial resistance to benzoyl peroxide has not been reported. Benzoyl peroxide products are available over the counter and by prescription in a variety of topical forms, including soaps, washes, lotions, creams, and gels. Benzoyl peroxide products may be used once or twice a day. These agents may occasionally cause a true allergic contact dermatitis. More often, an irritant contact dermatitis develops, especially if used with tretinoin or when accompanied by aggressive washing methods. If intensive erythema and pruritus develop, a patch test with benzoyl peroxide is indicated to rule out allergic contact dermatitis.



Health Supplements & Their Health Risks

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Health or dietary supplements refer to a diverse group of products commonly consumed for the purpose of supplementing the diet and enhancing health. They are usually presented in dosage forms such as capsules, softgels, tablets and liquids. Some examples of health supplements include vitamins, minerals (e.g. calcium, iron, magnesium) and herbal supplements (e.g. Echinacea, Guarana). These products typically contain ingredients from natural sources. They are not medicinal products meant to prevent, treat, cure or alleviate the symptoms of medical diseases or conditions and are generally considered low-risk. Serious side effects and which haven't been shown to do what they claim to do. They are: aconite, bitter orange, chaparral, colloidal silver, coltsfoot, country mallow, germanium, greater celandine, kava, lobelia, yohimbe. The FDA tells CNN it hasn't been able to determine what scientific basis Consumer Reports is using for their warning. FDA spokesperson Siobhan DeLancey says the agency has cautioned consumers or provided articles and case studies about possible side effects for 7 of the 12 supplements listed by Consumer Reports (aconite, chaparral, colloidal silver, comfrey, germanium, kava and yohimbe). "It is important to note that these potential adverse events are based in large part on a degree of exposure and the duration of that exposure," said DeLancey. In other words, a specific amount of the ingredient over a specific amount of time. Problems with dietary supplements have been making headlines for quite some time. Last May, the government's General Accounting Office (GAO) revealed what it learned in an undercover investigation of the deceptive or dangerous marketing of herbal supplements.



Abstract – Pharm - 07

Adverse Effects of Drugs

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Adverse reactions to drugs are common. Almost any drug can cause an adverse reaction. Reactions range from irritating or mild side effects such as nausea and vomiting to life-threatening anaphylaxis. A true drug allergy is caused by a series of chemical steps in the body that produce the allergic reaction to a medication. Most side effects of drugs are not due to an allergic reaction. For example, aspirin can cause nonallergic hives or trigger asthma. Some drug reactions are considered "idiosyncratic." This means the reaction is an unusual effect of the medication, not due to a predictable chemical effect of the drug. Many people confuse an uncomfortable, but not serious, side effect of a medicine (such as nausea) with a true drug allergy, which can be life threatening. Allergic reactions can happen with any drug and can range from itching and rash all the way up to a life-threatening anaphylactic reaction. Some drugs can't help but trigger side effects because of their chemical structure. One example is the common allergy drug diphenhydramine (also known by the brand name Benadryl). Though it eases allergy symptoms, it also suppresses the activity of the body chemical acetylcholine, and that leads to drowsiness and a host of other side effects, including dry mouth. Some drugs have barely noticeable side effects when dosed properly. For example, Warfarin (Coumadin, Jantoven), used to prevent blood clots, is usually well tolerated, but serious internal bleeding can occur. Side effects may only pop up when certain drugs are mixed with certain other things. These might also be considered drug interactions. Drinking alcohol with narcotic painkillers has caused an alarming increase in accidental overdose deaths. Drinking grapefruit juice can affect the blood levels of several drugs, including the heart drug Digoxin.



Abstract – Pharm - 08

Antidiabetic Herbs

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Diabetes mellitus is a chronic metabolic disorder characterized by hyperglycemia and altered metabolism of carbohydrates, lipids and proteins .Type 2 diabetes has developed into a major health problem and is responsible for early morbidities and mortality that affects over a billion people worldwide. Studies and surveys show that its world prevalence in adults may reach 7.7 % by 2030 though it was 6.4% in 2010. Developing countries have a faster increase in number of adults with diabetes compared to developed countries.Type 2 diabetes may be treated with many drugs like sulphonyl ureas, biguanides, thiazolidinediones, Meglitinides, acarbose and miglitol etc. Among these drugs, acarbose and miglitol are newer drugs with a different mechanism of action. They inhibit α -glucosidase enzymes responsible for the metabolism of carbohydrates. Inhibition of α -glucosidase and α -amylase helps to control the post prandial hyperglycemia. many plants have potential ingredients with α -glucosidase and α -amylase inhibitory activity and are used for the management of diabetes.. Use of various plant parts like leaves, bark, flowers, fruits, seeds, roots or the whole plant as such for medicinal purpose has a long tradition in different culture. Averrhoa bilimbi (Bilimbi) is medicinally used as a folk remedy for many symptoms .It is an attractive, long-lived tropical tree, reaching 5-10 m in height. It has a short trunk and a number of upright branches. The fruit conserve is administered as a treatment for coughs, beri-beri and biliousness. Syrup prepared from the fruit is taken as a cure for fever and inflammation and to stop rectal bleeding and alleviate internal hemorrhoids. The leaves are applied as a paste or poulticed on itches, swellings of mumps and rheumatism, and on skin eruption. The leaves have hypoglycemic and hypolipidemic activities. A flower infusion is said to be effective against coughs and thrush.



PHARMACOLOGY (POSTER PRESENTATIONS)

Abstract – Pharm - 01

Pharmacotherapy of Viral Infection

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Viruses are capsules with genetic material inside. They are very tiny, much smaller than bacteria. Viruses cause familiar infectious diseases such as the common cold, flu and warts. They also cause severe illnesses such as HIV/AIDS, smallpox and hemorrhagic fevers. Viruses invade living, normal cells and use those cells to multiply and produce other viruses like themselves. This eventually kills the cells, which can make you sick. Viral infections are hard to treat because viruses live inside your body's cells. They are "protected" from medicines, which usually move through your bloodstream. Antibiotics do not work for viral infections. There are a few antiviral medicines available. Vaccines can help prevent you from getting many viral diseases. Standard antiretroviral therapy (ART) consists of the combination of at least three antiretroviral (ARV) drugs to maximally suppress the HIV virus and stop the progression of HIV disease. Huge reductions have been seen in rates of death and suffering when use is made of a potent ARV regimen, particularly in early stages of the disease.. Two classes of antiviral drugs are available for the prevention and treatment of influenza: The neuraminidase inhibitors, zanamivir and oseltamivir, which are active against both influenza A and influenza B. The adamantanes, amantadine and rimantadine, which are only active against influenza A. The use of antiretroviral therapy can effectively control HIV and its disease progress. Successful treatment depends on how you know about and get the most from your medicine over a long period of time. HIV enters a healthy CD4 cell. Once inside the cell, HIV converts its own genetic material RNA into DNA using the enzyme reverse transcriptase. This new DNA acts as a blueprint directing the infected cell to make new virus particles. Mature viral cores are produced through action of viral protease after budding. The new virus is then released and can infect other healthy cells. Thus, the function of immune system will be progressively destroyed. The antiretroviral agents attack HIV at different stages of its life cycle to inhibit HIV replication and thus bring the viral load down. Combination therapy of two or more drug components has become the standard of treatment of HIV disease. Highly active anti-retroviral therapy (HAART) refers to very potent regimen in which almost invariably inhibits viral replication to an undetectable level in the blood. An example of HAART is the use of triple therapy comprises 2 Nucleoside Reverse Transcriptase Inhibitors (NRTI) and 1 Protease Inhibitors (PI).



Abstract – Pharm - 02

Pharmacotherapy of Peptic Ulcer

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Treatment of peptic ulcers varies depending on the etiology and clinical presentation. The initial management of a stable patient with dyspepsia differs from the management of an unstable patient with upper GI hemorrhage. In the latter scenario, failure of medical management not uncommonly leads to surgical intervention. Treatment options include empiric antisecretory therapy, empiric triple therapy for H pylori infection, endoscopy followed by appropriate therapy based on findings, and H pylori serology followed by triple therapy for patients who are infected. Breath testing for active H pylori infection may be used. Endoscopy is required to document healing of gastric ulcers and to rule out gastric cancer. This usually is performed 6-8 weeks after the initial diagnosis of PUD. Documentation of H pylori cure with a noninvasive test, such as the urea breath test or fecal antigen test, is appropriate in patients with complicated ulcers. Given the current understanding of the pathogenesis of PUD, most patients with PUD are treated successfully with cure of H pylori infection and/or avoidance of NSAIDs, along with the appropriate use of antisecretory therapy. Computer models have suggested that obtaining H pylori serology followed by triple therapy for patients who are infected is the most cost-effective approach; however, no direct evidence from clinical trials provides confirmation. The indications for urgent surgery include failure to achieve hemostasis endoscopically, recurrent bleeding despite endoscopic attempts at achieving hemostasis (many advocate surgery after 2 failed endoscopic attempts), and perforation. Many authorities recommend simple oversewing of the ulcer with treatment of the underlying H pylori infection or cessation of NSAIDs for bleeding PUD. Additional surgical options for refractory or complicated PUD include vagotomy and pyloroplasty, vagotomy and antrectomy with gastroduodenal reconstruction or gastrojejunal reconstruction, or a highly selective vagotomy.



Abstract – Pharm - 03

Pharmacology of Cough

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Cough is one of the most common symptoms for which patients seek medical attention from primary care physicians and pulmonologists. Cough is an important defensive reflex that enhances the clearance of secretions and particles from the airways and protects the lower airways from the aspiration of foreign materials. Therapeutic suppression of cough may be either disease-specific or symptom related. The potential benefits of an early treatment of cough could include the prevention of the vicious cycle of cough. There has been a long tradition in acute cough, which is frequently due to upper respiratory tract infections, to use symptom-related anti-tussives. Suppression of cough (during chronic cough) may be achieved by disease-specific therapies, but in many patients it is often necessary to use symptomatic anti-tussives, too. In addition to being an airway defence mechanism, coughing is a very common symptom observed in many diseases other than those affecting the respiratory system. To recognize its cause is not always an easy task. Where possible, the clinician should avoid treatment based on symptoms only which often only serves the purpose to reassure the patient or the parents (in the case of a paediatric patient). On the other hand it is worth mentioning that internal medicine physicians are frequently overwhelmed by requests for help by patients who report coughing, alone or together with other non-specific symptoms such as malaise, pharyngodynia, and a mild temperature. In such cases, treatment of symptoms alone appears justified as a therapeutic approach. However, it must be emphasized that a high level of suspicion needs to be maintained, especially when coughing persists which would require a thorough investigation of other possible causes. Acute cough is rather arbitrarily referred to as a cough lasting for a maximum of 3 weeks. In the majority of patients, it is caused by upper respiratory tract infections (URTI), acute bronchitis or tracheo-bronchitis due to bacterial or more frequently viral infections. It has been estimated that only few patients with URTI-induced cough seek medical attention. Acute cough due to such infections is usually self-limited and subsides within one to two weeks along with the clearing of the infection. There are no targets or reliable measures to predict the duration of a cough at its onset (i.e., resolution within 3 weeks). Neither is it possible to predict which cough will persist into the sub acute or chronic stage. The issue is further complicated by the fact that effective therapy can abort or abbreviate the duration of a cough, whereas failure to institute effective therapy can convert what might have been an acute cough into a sub acute or chronic one. Furthermore, recurrent acute episodes of cough can be a manifestation of an undiagnosed chronic disease (e.g., asthma). Nevertheless, keeping these caveats in mind, a relatively "standard" diagnostic and therapeutic approach based on the duration of the cough has proved useful.



Drug Abuse

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Some people are able to use recreational or prescription drugs without ever experiencing negative consequences or addiction. For many others, substance use can cause problems at work, home, school, and in relationships, leaving you feeling isolated, helpless, or ashamed. People experiment with drugs for many different reasons. Many first try drugs out of curiosity, to have a good time, because friends are doing it, or in an effort to improve athletic performance or ease another problem, such as stress, anxiety, or depression. Use doesn't automatically lead to abuse, and there is no specific level at which drug use moves from casual to problematic. It varies by individual. Drug abuse and addiction is less about the amount of substance consumed or the frequency, and more to do with the consequences of drug use. No matter how often or how little you're consuming, if your drug use is causing problems in your life—at work, school, home, or in your relationships—you likely have a drug abuse or addiction problem. Addiction is a complex disorder characterized by compulsive drug use. While each drug produces different physical effects, all abused substances share one thing in common: repeated use can alter the way the brain looks and functions. People who experiment with drugs continue to use them because the substance either makes them feel good, or stops them from feeling bad. In many cases, however, there is a fine line between regular use and drug abuse and addiction. Very few addicts are able to recognize when they have crossed that line. While frequency or the amount of drugs consumed don't in themselves constitute drug abuse or addiction, they can often be indicators of drug-related problems. The good news is that with the right treatment and support, you can counteract the disruptive effects of drug use and regain control of your life. The first obstacle is to recognize and admit you have a problem, or listen to loved ones who are often better able to see the negative effects drug use is having on your life.



Abstract – Pharm- 05

Cosmetic Dentistry

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Today, cosmetic dentistry is more popular than ever, from whitening and shaping, to closing spaces and replacing teeth. And dentists have a wide array of tools and techniques at their disposal for improving the look of your smile. Before deciding to undergo any cosmetic procedure, it's important to know the benefits and risks, and what you can expect during the process. Make sure you're clear about what it will cost, how much experience your dentist has with the procedure, and whether any special maintenance will be needed afterward. Over time teeth can become stained or discolored, especially after smoking, taking certain medications, or consuming foods and beverages such as coffee and tea. Using a chemical process, the dentist can bleach your teeth in one of two ways. He can do an in-office procedure, or provide you with a system to use at home. Bonding may improve how your teeth look if they have excess space between them, or if they are chipped, broken, stained, or cracked. Dentists also use bonding materials to fill small cavities or to protect the exposed root of a tooth. The dentist can usually do this procedure in a single office visit by applying an etching solution followed by tooth-colored materials -- sometimes composite resins -- directly to the tooth's surface where needed. Dentists often suggest veneers for some of the same problems that bonding addresses. Yet, the process for inserting veneers is not reversible like dental bonding, which can be removed. Veneers are less expensive than crowns. And they last longer and have better color stability than bonding. Before inserting veneers, the dentist first takes an impression of your tooth, then buffs the tooth before cementing the veneer in place. A beam of light helps harden the cement which secures the veneer to your tooth. Porcelain veneers are made in a laboratory. So you would need a second visit to the dentist to have them inserted.



Abstract – Pharm - 06

Neutraceuticals

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Nutraceutical, a portmanteau the words “nutrition” and “pharmaceutical”, is a food or food product that provides health and medical benefits, including the prevention and treatment of disease. Health Canada defines the term as, "A nutraceutical is a product isolated or purified from foods that is generally sold in medicinal forms not usually associated with food. A nutraceutical is demonstrated to have a physiological benefit or provide protection against chronic disease." Such products may range from isolated nutrients, dietary supplements and specific diets to genetically engineered foods, herbal products, and processed foods such as cereals, soups, and beverages. With recent developments in cellular-level nutraceutical agents, researchers, and medical practitioners are developing templates for integrating and assessing information from clinical studies on complementary and alternative therapies into responsible medical practice. The term nutraceutical was originally defined by Dr. Stephen L. DeFelice, founder and chairman of the Foundation of Innovation Medicine (FIM), Crawford, New Jersey. Since the term was coined by Dr. DeFelice, its meaning has been modified by Health Canada which defines nutraceutical as: a product isolated or purified from foods, and generally sold in medicinal forms not usually associated with food and demonstrated to have a physiological benefit or provide protection against chronic disease. Nutraceutical foods are not subject to the same testing and regulations as pharmaceutical drugs. The following is an incomplete list of foods with reported medicinal value: Antioxidants: resveratrol from red grape products; flavonoids inside citrus, tea, wine, and dark chocolate foods; anthocyanins found in berries Reducing hypercholesterolemia: soluble dietary fiber products, such as psyllium seed husk Cancer prevention: broccoli (sulforaphane) fiddleheads (Matteuccia Struthiopteus) Improved arterial health: soy or clover (isoflavonoids) Lowered risk of cardiovascular disease: alpha-linolenic acid from flax or Chia seeds.



DEPARTMENT OF PHYSIOLOGY

ORAL PRESENTATION

Abstract – Physio - 01

Parkinsonism

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Parkinsonism is a neurological syndrome characterized by tremor, hypokinesia, rigidity, and postural instability. Parkinsonism shares symptoms found in Parkinson's Disease, from which it is named; but Parkinsonism is a symptom complex, and differs from Parkinson disease which is a progressive neurodegenerative illness. The underlying causes of Parkinsonism are numerous, and diagnosis can be complex. The neurodegenerative condition Parkinson's disease (PD) is the most common cause of Parkinsonism. However, a wide range of other etiologies may lead to a similar set of symptoms, including some toxins, a few metabolic diseases, and a handful of neurological conditions other than Parkinson's. About 7% of people with Parkinsonism have developed their symptoms following treatment with particular medications. Side effect of medications, mainly neuroleptic antipsychotics especially the phenothiazines (such as perphenazine and chlorpromazine), thioxanthenes (such as flupenthixol and zuclopenthixol) and butyrophenones (such as haloperidol (Haldol)), piperazines (such as ziprasidone), and, rarely, antidepressants. The incidence of drug-induced Parkinsonism increases with age. Drug induced Parkinsonism tends to remain at its presenting level, i.e. does not progress like the parkinson disease. The primary lesion of PD is degeneration of the neuromelanin-containing neurons in the brainstem, particularly those in the pars compacta of the substantia nigra. The cardinal motor signs and symptoms of PD, include the characteristic clinical picture of resting tremor, rigidity, akinesia, and impairment of postural reflexes. It evolves slowly. Although preclinical detection of PD have been investigated, a practical, inexpensive, sensitive and specific screening test has yet to be made available. Furthermore, in the absence of a disease-specific biologic marker, a definitive diagnosis of PD can be made only at autopsy by the presence of specific neuropathological findings including Lewy bodies. The pharmacologic /surgical treatment of PD can be divided into three major conceptual categories: symptomatic, protective, restorative. Although the goal of therapy is to reverse the functional disability, abolition of all symptoms and signs is not currently possible even with high doses of medication.



Abstract – Physio - 02

Clotting Factors

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Coagulation (thrombogenesis) is the process by which blood forms clots. It is an important part of hemostasis, the cessation of blood loss from a damaged vessel, wherein a damaged blood vessel wall is covered by a platelet and fibrin-containing clot to stop bleeding and begin repair of the damaged vessel. Disorders of coagulation can lead to an increased risk of bleeding (hemorrhage) or obstructive clotting (thrombosis). Coagulation is highly conserved throughout biology; in all mammals, coagulation involves both a cellular (platelet) and a protein (coagulation factor) component. The system in humans has been the most extensively researched and is the best understood. Coagulation begins almost instantly after an injury to the blood vessel has damaged the endothelium lining the vessel. Exposure of the blood to proteins such as tissue factor initiates changes to blood platelets and the plasma protein fibrinogen, a clotting factor. Platelets immediately form a plug at the site of injury; this is called primary hemostasis. Secondary hemostasis occurs simultaneously: Proteins in the blood plasma, called coagulation factors or clotting factors, respond in a complex cascade to form fibrin strands, which strengthen the platelet plug. Rare clotting factor deficiencies are a group of inherited bleeding disorders caused by a problem with one or several clotting factors. Clotting factors are proteins in the blood that control bleeding. Many different clotting factors work together in a series of chemical reactions to stop bleeding. This is called the clotting process. Problems with factor VIII and factor IX are known as hemophilia A and B, respectively. Rare clotting factor deficiencies are bleeding disorders in which one of the other clotting factors (i.e. factors I, II, V, V + VIII, VII, X, XI, or XIII) is missing or not working properly. Less is known about these disorders because they are diagnosed so rarely. In fact, many have only been discovered in the last 40 years. Various substances are required for the proper functioning of the coagulation cascade. Calcium and phospholipid (a platelet membrane constituent) are required for the tenase and prothrombinase complexes to function. Calcium mediates the binding of the complexes via the terminal gamma-carboxy residues on FXa and FIXa to the phospholipid surfaces expressed by platelets, as well as procoagulant microparticles or microvesicles shed from them. Calcium is also required at other points in the coagulation cascade. Vitamin K is an essential factor to a hepatic gamma-glutamyl carboxylase that adds a carboxyl group to glutamic acid residues on factors II, VII, IX and X, as well as Protein S, Protein C and Protein Z. In adding the gamma-carboxyl group to glutamate residues on the immature clotting factors Vitamin K is itself oxidized. Another enzyme, Vitamin K epoxide reductase, (VKORC) reduces vitamin K back to its active form.

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Abstract – Physio - 03

Synapse

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In the nervous system, a synapse is a structure that permits a neuron (or nerve cell) to pass an electrical or chemical signal to another cell (neural or otherwise). Santiago Ramón y Cajal proposed that neurons are not continuous throughout the body, yet still communicate with each other, an idea known as the neuron doctrine. The word "synapse" was introduced in 1897 by English physiologist Michael Foster at the suggestion of English classical scholar Arthur Woollgar Verrall. Synapses are essential to neuronal function: neurons are cells that are specialized to pass signals to individual target cells, and synapses are the means by which they do so. At a synapse, the plasma membrane of the signal-passing neuron (the presynaptic neuron) comes into close apposition with the membrane of the target (postsynaptic) cell. Both the presynaptic and postsynaptic sites contain extensive arrays of molecular machinery that link the two membranes together and carry out the signaling process. In many synapses, the presynaptic part is located on an axon, but some presynaptic sites are located on a dendrite or soma. Astrocytes also exchange information with the synaptic neurons, responding to synaptic activity and, in turn, regulating Synaptic vesicle docking is perhaps the least understood stage of the vesicle cycle in part due to the difficulties of assaying the docking process. In cultured vertebrate neurons, fluorescently labeled synaptic vesicles have been observed to approach the plasma membrane, and become stationary for periods of time, prior to either detaching or fusing. Thus docking may represent a reversible step of membrane association prior to priming. FM-dye uptake studies at the frog neuromuscular junction suggest vesicles that contribute to the readily releasable pool are mobilized to the active zone from disparate regions of the terminal immediately prior to release. These data challenge the widely held notion that vesicles in the readily releasable pool, reside at the active zone in a docked and primed state awaiting a calcium signal to fuse. In *C. elegans* and other systems attempts to define the docked vesicle pool have relied on conventional electron microscopy.



Abstract – Physio - 04

Invitro fertilization

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In vitro fertilisation (IVF) is a process by which an egg is fertilised by sperm outside the body: in vitro. IVF is a major treatment for infertility when other methods of assisted reproductive technology have failed. The process involves monitoring and stimulating a woman's ovulatory process, removing ovum or ova (egg or eggs) from the woman's ovaries and letting sperm fertilise them in a fluid medium in a laboratory. The fertilised egg (zygote) is cultured for 2–6 days in a growth medium and is then transferred to the mother's uterus with the intention of establishing a successful pregnancy. The first successful birth of a "test tube baby", Louise Brown, occurred in 1978. Louise Brown was born as a result of natural cycle IVF where no stimulation was made. Robert G. Edwards, the physiologist who developed the treatment, was awarded the Nobel Prize in Physiology or Medicine in 2010. The term in vitro, from the Latin meaning in glass, is used, because early biological experiments involving cultivation of tissues outside the living organism from which they came, were carried out in glass containers such as beakers, test tubes, or petri dishes. Today, the term in vitro is used to refer to any biological procedure that is performed outside the organism it would normally be occurring in, to distinguish it from an in vivo procedure, where the tissue remains inside the living organism within which it is normally found. A colloquial term for babies conceived as the result of IVF, "test tube babies", refers to the tube-shaped containers of glass or plastic resin, called test tubes, that are commonly used in chemistry labs and biology labs. However, in vitro fertilisation is usually performed in the shallower containers called Petri dishes. One IVF method, autologous endometrial coculture, is actually performed on organic material, but is still considered in vitro. This extraordinary complexity of living organisms is a great barrier to the identification of individual components and the exploration of their basic biological functions. The primary advantage of in vitro work is that it permits an enormous level of simplification of the system under study, so that the investigator can focus on a small number of components.



Renal failure

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It is a medical condition in which the kidneys fail to adequately filter waste products from the blood. The two main forms are acute kidney injury, which is often reversible with adequate treatment, and chronic kidney disease, which is often not reversible. In both cases, there is usually an underlying cause. Renal failure is mainly determined by a decrease in glomerular filtration rate, the rate at which blood is filtered in the glomeruli of the kidney. This is detected by a decrease in or absence of urine production or determination of waste products (creatinine or urea) in the blood. Depending on the cause, hematuria (blood loss in the urine) and proteinuria (protein loss in the urine) may be noted. In renal failure, there may be problems with increased fluid. Acute kidney failure occurs when your kidneys suddenly become unable to filter waste products from your blood. When your kidneys lose their filtering ability, dangerous levels of wastes may accumulate and your blood's chemical makeup may get out of balance. Acute kidney failure also called acute renal failure or acute kidney injury develops rapidly over a few hours or a few days. Acute kidney failure is most common in people who are already hospitalized, particularly in critically ill people who need intensive care. Acute kidney failure can be fatal and requires intensive treatment. However, acute kidney failure may be reversible. If you're otherwise in good health, you may recover normal kidney function. In the body (leading to swelling), increased acid levels, raised levels of potassium, decreased levels of calcium, increased levels of phosphate, and in later stages anemia. Bone health may also be affected. Long-term kidney problems are associated with an increased risk of cardiovascular disease. The main causes of kidney failure in Swaziland are: High Blood Pressure (Hypertension) Diabetes Mellitus Human Immuno-deficiency Virus infection (HIV and AIDS) Traditional medicines Chronic urinary tract infections Familial/genetic causes. The signs and symptoms of kidney failure are usually very vague and can be found in patients with many other diseases says Dr Jambaya. However, he said if the following signs and symptoms occur in people with chronic illnesses. These symptoms are due to build-up of waste products and water in the body and they are: Headache A metallic taste in the mouth or ammonia breathe Trouble sleeping Muscle cramping especially at night Nausea, poor appetite, vomiting Protein aversion (no longer wanting to eat meat) Difficulty concentrating Itchiness throughout the body Tiredness, weakness, decreased sexual interest Drowsiness Difficulty with breathing



Abstract – Physio - 06

Anaemia

Santo grace

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Anemia is a decrease in number of red blood cells (RBCs) or less than the normal quantity of hemoglobin in the blood. Anemia may also be diagnosed where there is decreased oxygen-binding ability of each hemoglobin molecule due to deformity or lack in numerical development as in some other types of hemoglobin deficiency. Because hemoglobin (found inside RBCs) normally carries oxygen from the lungs to the capillaries, anemia leads to hypoxia (lack of oxygen) in organs. Since all human cells depend on oxygen for survival, varying degrees of anemia can have a wide range of clinical consequences. Anemia is the most common disorder of the blood. The several kinds of anemia are produced by a variety of underlying causes. It can be classified in a variety of ways, based on the morphology of RBCs, underlying etiologic mechanisms, and discernible clinical spectra, to mention a few. The three main classes include excessive blood loss (acutely such as a hemorrhage or chronically through low-volume loss), excessive blood cell destruction (hemolysis) or deficient red blood cell production (ineffective hematopoiesis). There are more than 400 types of anemia, which are divided into three groups: Anemia caused by blood loss Anemia caused by decreased or faulty red blood cell production Anemia caused by destruction of red blood cells Anemia Caused by Blood Loss Red blood cells can be lost through bleeding, which can occur slowly over a long period of time, and can often go undetected. This kind of chronic bleeding commonly results from the following: Gastrointestinal condition such as ulcers, hemorrhoids, gastritis (inflammation of the stomach), and destruction and loss, and the "morphologic" approach groups anemia by red blood cell size. The morphologic approach uses a quickly available and low-cost lab test as its starting point (the MCV), although this test can lack sensitivity and specificity in many diseases. On the other hand, focusing early on the question of production may allow the clinician to expose cases more rapidly where multiple causes of anemia coexist. With this type of anemia, the body may produce too few blood cells or the blood cells may not function correctly. In either case, anemia can result. Red blood cells may be faulty or decreased due to abnormal red blood cells or a lack of minerals and vitamins needed for red blood cells to work properly. Conditions associated with these causes of anemia include the following: Sickle cell anemia Iron-deficiency anemia Vitamin deficiency Bone marrow and stem cell problems.



Abstract – Physio - 07

Blood groups

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A blood type (also called a blood group) is a classification of blood based on the presence or absence of inherited antigenic substances on the surface of red blood cells (RBCs). These antigens may be proteins, carbohydrates, glycoproteins, or glycolipids, depending on the blood group system. Some of these antigens are also present on the surface of other types of cells of various tissues. Several of these red blood cell surface antigens can stem from one allele (or very closely linked genes) and collectively form a blood group system. Blood types are inherited and represent contributions from both parents. A total of 32 human blood group systems are now recognized by the International Society of Blood Transfusion (ISBT). The two most important ones are ABO and the RhD antigen; they determine someone's blood type (A, B, AB and O, with + and - denoting RhD status). Many pregnant women carry a fetus with a blood type different from their own, and the mother can form antibodies against fetal RBCs. Sometimes these maternal antibodies are IgG, a small immunoglobulin, which can cause hemolytic disease of the newborn called erythroblastosis fetalis, an illness of low fetal blood counts that ranges from mild to severe. Sometimes the placenta and cause hemolysis of fetal RBCs, which in turn can lead to sometimes this is lethal for the fetus; in these cases it is called hydrops fetalis. The Rh system is the second most significant blood-group system in human-blood transfusion with currently 50 antigens. The most significant Rh antigen is the D antigen, because it is the most likely to provoke an immune system response of the five main Rh antigens. It is common for D-negative individuals not to have any anti-D IgG or IgM antibodies, because anti-D antibodies are not usually produced by sensitization against environmental substances. However, D-negative individuals can produce IgG anti-D antibodies following a sensitizing event: possibly a fetomaternal transfusion of blood from a fetus in pregnancy or occasionally a blood transfusion with D positive RBCs. Rh disease can develop in these cases. Rh negative blood types are much less common in proportion of Asian populations (0.3%) than they are in White (15%). In the table below, the presence or absence of the Rh antigens is signified by the + or - sign, so that for example the A- group does not have any of the Rh antigens.



Abstract – Physio - 08

Myasthenia Gravis
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Myasthenia gravis is an autoimmune neuromuscular disease leading to fluctuating muscle weakness and fatigue. Muscle weakness is caused by circulating antibodies that block acetylcholine receptors at the postsynaptic neuromuscular junction, inhibiting the excitatory effects of the neurotransmitter acetylcholine on nicotinic receptors at neuromuscular junctions. Myasthenia is treated medically with acetylcholinesterase inhibitors or immunosuppressants, and, in selected cases, thymectomy. The disease incidence is 3–30 cases per million per year and rising as a result of increased awareness. MG must be distinguished from congenital myasthenic syndromes that can present similar symptoms but do not respond to immunosuppressive treatments. The hallmark of myasthenia gravis is fatigability. Muscles become progressively weaker during periods of activity and improve after periods of rest. Muscles that control eye and eyelid movement, facial expressions, chewing, talking, and swallowing are especially susceptible. The muscles that control breathing and neck and limb movements can also be affected. Often, the physical examination yields results within normal limits. The onset of the disorder can be sudden. Often symptoms are intermittent. The diagnosis of myasthenia gravis may be delayed if the symptoms are subtle or variable. In most cases, the first noticeable symptom is weakness of the eye muscles. In others, difficulty in swallowing and slurred speech may be the first signs. The degree of muscle weakness involved in MG varies greatly among patients, ranging from a localized form that is limited to eye muscles (ocular myasthenia), to a severe and generalized form in which many muscles--sometimes including those that control breathing--are affected. Symptoms, which vary in type and severity, may include asymmetrical ptosis (a drooping of one or both eyelids), diplopia (double vision) due to weakness of the muscles that control eye movements, an unstable or waddling gait, weakness in arms, hands, fingers, legs, and neck, a change in facial expression, dysphagia (difficulty in swallowing), shortness of breath and dysarthria (impaired speech, often nasal due to weakness of the velar muscles). Myasthenia gravis is an autoimmune channelopathy: it features antibodies directed against proteins that are naturally present in the body. While various similar diseases have been linked to immunologic cross-reaction with an infective agent, there is no known causative pathogen that could account for myasthenia. There is a slight genetic predisposition: particular HLA types seem to predispose for MG (B8 and DR3 with DR1 more specific for ocular myasthenia). Up to 75% of patients have an abnormality of the thymus; 10% have a thymoma, a tumor (either benign or malignant) of the thymus, and other abnormalities are frequently found.



Pain

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Pain is a feeling triggered in the nervous system. Pain may be sharp or dull. It may come and go, or it may be constant. You may feel pain in one area of your body, such as your back, abdomen or chest or you may feel pain all over, such as when your muscles ache from the flu. Pain can be helpful in diagnosing a problem. Without pain, you might seriously hurt yourself without knowing it, or you might not realize you have a medical problem that needs treatment. Once you take care of the problem, pain usually goes away. However, sometimes pain goes on for weeks, months or even years. This is called chronic pain. Sometimes chronic pain is due to an ongoing cause, such as cancer or arthritis. Sometimes the cause is unknown. Fortunately, there are many ways to treat pain. Treatment varies depending on the cause of pain. Pain relievers, acupuncture and sometimes surgery are helpful. Pain is usually transitory, lasting only until the noxious stimulus is removed or the underlying damage or pathology has healed, but some painful conditions, such as rheumatoid arthritis, peripheral neuropathy, cancer and idiopathic pain, may persist for years. Pain that lasts a long time is called chronic, and pain that resolves quickly is called acute. Traditionally, the distinction between acute and chronic pain has relied upon an arbitrary interval of time from onset; the two most commonly used markers being 3 months and 6 months since the onset of pain, though some theorists and researchers have placed the transition from acute to chronic pain at 12 months. Others apply acute to pain that lasts less than 30 days, chronic to pain of more than six months duration, and subacute to pain that lasts from one to six months. A popular alternative definition of chronic pain, involving no arbitrarily fixed durations is "pain that extends beyond the expected period of healing". Chronic pain may be classified as cancer pain or benign. . As Physical Therapists, we are lucky to have such a wide range of methods available to us when it comes to treating pain. One that has become very popular, but has existed for hundreds of years in Traditional Chinese Medicine (TCM) is acupuncture. Over time, the concepts of TCM acupuncture have been combined with anatomy, physiology and pathophysiology to create what we call "anatomical acupuncture". Acupuncture is used to treat pain which arises from a variety of conditions such as postoperative pain, fibromyalgia, headaches, back pain and carpal tunnel syndrome. It is important to note that through concepts developed in TCM, anatomical acupuncture is also used to treat disorders that aren't pain related, such as hypertension, vomiting and anxiety.



Abstract – Physio - 10

Thalassemia

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Thalassemia is a blood disorder passed down through families (inherited) in which the body makes an abnormal form of hemoglobin, the protein in red blood cells that carries oxygen. The disorder results in excessive destruction of red blood cells, which leads to anemia. Hemoglobin is made of two proteins: Alpha globin and beta globin. Thalassemia occurs when there is a defect in a gene that helps control production of one of these proteins. There are two main types of thalassemia Alpha thalassemia occurs when a gene or genes related to the alpha globin protein are missing or changed (mutated) and Beta thalassemia occurs when similar gene defects affect production of the beta globin protein. Alpha thalassemias occur most commonly in persons from southeast Asia, the Middle East, China, and in those of African descent. Beta thalassemias occur in persons of Mediterranean origin, and to a lesser extent, Chinese, other Asians, and African Americans. There are many forms of thalassemia. Each type has many different subtypes. Both alpha and beta thalassemia include the following two forms Thalassemia major and Thalassemia minor. Thalassemia minor occurs if you receive the defective gene from only one parent. Persons with this form of the disorder are carriers of the disease and usually do not have symptoms. Beta thalassemia major is also called Cooley's anemia. Risk factors for thalassemia include Asian, Chinese, Mediterranean, or African American ethnicity and Family history of the disorder. Symptoms are the most severe form of alpha thalassemia major causes stillbirth (death of the unborn baby during birth or the late stages of pregnancy). Children born with thalassemia major (Cooley's anemia) are normal at birth, but develop severe anemia during the first year of life. Other symptoms can include Bone deformities in the face, Fatigue, Growth failure, Shortness of breath, Yellow skin (jaundice. Persons with the minor form of alpha and beta thalassemia have small red blood cells (which are identified by looking at their red blood cells under a microscope), but no symptoms. Thalassemia is a quantitative problem of too few globins synthesized, whereas sickle-cell anemia (a hemoglobinopathy) is a qualitative problem of synthesis of an incorrectly functioning globin. Thalassemias usually result in underproduction of normal globin proteins, often through mutations in regulatory genes. Hemoglobinopathies imply structural abnormalities in the globin proteins themselves. The two conditions may overlap, however, since some conditions which cause abnormalities in globin proteins (hemoglobinopathy) also affect their production (thalassemia). Thus, some thalassemias are hemoglobinopathies, but most are not. Either or both of these conditions may cause anemia.



Memory

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In psychology, memory is the process in which information is encoded, stored, and retrieved. Encoding allows information that is from the outside world to reach our senses in the forms of chemical and physical stimuli. In this first stage we must change the information so that we may put the memory into the encoding process. Storage is the second memory stage or process. This entails that we maintain information over periods of time. Finally the third process is the retrieval of information that we have stored. We must locate it and return it to our consciousness. Some retrieval attempts may be effortless due to the type of information. From an information processing perspective there are three main stages in the formation and retrieval of memory encoding or registration is receiving, processing and combining of received information, storage is creation of a permanent record of the encoded information and retrieving is recall or recollection: calling back the stored information in response to some cue for use in a process or activity. The loss of memory is described as forgetfulness, or as a medical disorder, amnesia. "Memory" is really made up of a group of systems that each play a different role in creating, storing, and recalling your memories. When the brain processes information normally, all of these different systems work together perfectly to provide cohesive thought. Short-term memory allows recall for a period of several seconds to a minute without rehearsal. Its capacity is also very limited. Modern estimates of the capacity of short-term memory are lower, typically of the order of 4–5 items, however, memory capacity can be increased through a process called chunking. Short-term memory is supported by transient patterns of neuronal communication, dependent on regions of the frontal lobe (especially dorsolateral prefrontal cortex) and the parietal lobe. Long-term memory, on the other hand, is maintained by more stable and permanent changes in neural connections widely spread throughout the brain. The hippocampus is essential (for learning new information) to the consolidation of information from short-term to long-term memory, although it does not seem to store information itself. Without the hippocampus, new memories are unable to be stored into long-term memory, as learned from patient Henry Molaison after removal of both his hippocampi, and there will be a very short attention span. The storage in sensory memory and short-term memory generally have a strictly limited capacity and duration, which means that information is not retained indefinitely. By contrast, long-term memory can store much larger quantities of information for potentially unlimited duration (sometimes a whole life span). Its capacity is immeasurably large. For example, given a random seven-digit number we may remember it for only a few seconds before forgetting, suggesting it was stored in our short-term memory. On the other hand, we can remember telephone numbers for many years through repetition; this information is said to be stored in long-term memory.



Abstract – Physio - 12

Speech

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Speech is the vocalized form of human. It is based upon the syntactic combination of flexicals and names that are drawn from very large (usually about 10,000 different words). Each spoken word is created out of the phonetic combination of a limited set of vowel and consonant speech sound units. These vocabularies, the syntax which structures them, and their set of speech sound units differ, creating the existence of many thousands of different types of mutually unintelligible human languages. Most human speakers are able to communicate in two or more of them, hence being polyglots. The vocal abilities that enable humans to produce speech also provide humans with the ability to sing. A gestural form of human communication exists for the deaf in the form of sign language. Speech in some cultures has become the basis of a written language, often one that differs in its vocabulary, syntax and phonetics from its associated spoken one, a situation called diglossia. Speech in addition to its use in communication, it is suggested by some psychologists such as Vygotsky is internally used by mental processes to enhance and organize cognition in the form of an interior monologue. Speech is researched in terms of the speech production and speech perception of the sounds used in vocal language. Other research topics concern speech repetition, the ability to map heard spoken words into the vocalizations needed to recreate that plays a key role in the vocabulary expansion in children and speech errors. Another area of research is how the human brain in its different areas such as the Broca's area and Wernicke's area underlies speech. It is controversial how far human speech is unique in that other animals also communicate with vocalizations.



Abstract – Physio - 13

Myth buster-common nutrition related myths & facts

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MythBusters is a science entertainment television program created and produced by Australia's Beyond Television Productions for the Discovery Channel. The series is transmitted by numerous international broadcasters, including SBS Australia, and other Discovery channels worldwide. The show's hosts, special effects experts Adam Savage and Jamie Hyneman, use elements of the scientific method to test the validity of rumors, myths, movie scenes, adages, Internet videos, and news stories. The show is one of the oldest and the most popular on Discovery Channel currently in production, being preceded only by How It's Made in the US and Daily Planet in Canada. Newspapers, magazines and the internet are full of stories about miracle superfoods. Celery, broccoli, beetroot juice, jam, popcorn, cereals and even the great British cuppa, to name just a few, have all been hyped as superfoods in the past two years. There is no official definition of a superfood. The EU has banned the use of the word on product packaging unless the claim is backed up by convincing research. Microwaves don't kill bacteria – microwaves generate heat that kills bacteria in foods. Microwave ovens are great time-savers and will kill bacteria when foods are heated to a safe internal temperature. But microwaved foods can cook unevenly because of irregular shapes or variations in thickness. Even turntable-equipped microwave ovens can cook unevenly and leave cold spots where harmful bacteria can survive. Follow package instructions that call for rotating and stirring foods during the cooking process. Observe any called-for stand times—the amount of time after cooking that microwaved food should stand before it is eaten. Check the temperature of microwaved foods with a food thermometer in several spots. Raw foods such as meat, poultry, egg products, and seafood thawed in the refrigerator, may be safely re-frozen without cooking for later use. Never let raw foods thaw sitting on the kitchen counter. If raw foods are thawed outside of the refrigerator, for example in the microwave or in cool water, they should be cooked immediately. Never re-freeze raw or not fully cooked foods that have been thawed outside of the refrigerator. To ensure that a food is safely cooked, and not overcooked, check it with a food thermometer. Clean your food thermometer with soap and water after each use.



Obesity

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Obesity and overweight have in the last decade become a global problem - according to the World Health Organization (WHO) back in 2005 approximately 1.6 billion adults over the of age 15+ were overweight, at least 400 million adults were obese and at least 20 million children under the age of 5 years were overweight. Experts believe if the current trends continue by 2015 approximately 2.3 billion adults will be overweight and more than 700 million will be obese. The scale of the obesity problem has a number of serious consequences for individuals and government health systems. Obesity is a concern because of its implications for the health of an individual as it increases the risk of many diseases and health conditions including coronary heart disease, Type 2 diabetes, Cancers (endometrial, breast, and colon), Hypertension (high blood pressure), Dyslipidemia (for example, high total cholesterol or high levels of triglycerides), Stroke, Liver and Gallbladder disease, Sleep apnoea and respiratory problems, Osteoarthritis (a degeneration of cartilage and its underlying bone within a joint) and Gynaecological problems (abnormal menses, infertility). These conditions can cause or contribute to premature death and substantial disability. Cardiovascular disease - mainly heart disease and stroke - is already the world's number one cause of death, killing 17 million people each year and diabetes has rapidly become a global epidemic - according to WHO projections diabetes deaths will increase by more than 50% worldwide in the next 10 years. Less common health conditions associated with increased weight include asthma, hepatic steatosis and sleep apnoea. Overweight and obesity are defined by the WHO as abnormal or excessive fat accumulation that presents a risk to an individual's health. Overweight and obesity are major risk factors for a number of chronic diseases, including diabetes, cardiovascular diseases and cancer and while it was once an issue only in high income countries, overweight and obesity has now dramatically risen in low- and middle-income countries. Such countries are now facing a "double burden" of disease, for while they continue to deal with the problems of infectious disease and under-nutrition, they are also experiencing a rapid upsurge in chronic disease risk factors such as obesity and overweight, particularly in urban settings. Under-nutrition and obesity often exist side-by-side within the same country, the same community and even within the same household and this double burden is caused by inadequate pre-natal, infant and young child nutrition followed by exposure to high-fat, energy-dense, micronutrient-poor foods and lack of physical activity.



Abstract – Physio - 15

Saliva as the biomarker

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As health care practitioners use saliva, possibly instead of blood, to diagnose and monitor oral and systemic health. With time and continued research funding, we are hoping to realize portable devices that can diagnose a wide variety of disease conditions using saliva." Early detection of disease plays a crucial role in successful therapy. Early diagnosis and management reduces the severity and possible complications of the disease process. To overcome this challenge, medical researchers are devoted to finding molecular disease biomarkers that reveal a hidden lethal threat before the disease becomes complicated. Saliva, an important physiologic fluid, containing a highly complex mixture of substances, is rapidly gaining popularity as a diagnostic tool. Periodontal disease is a chronic disease of the oral cavity comprising a group of inflammatory conditions affecting the supporting structures of the dentition. In the field of periodontology, traditional clinical criteria are often insufficient for determining sites of active disease, for monitoring the response to therapy, or for measuring the degree of susceptibility to future disease progression. Saliva, as a mirror of oral and systemic health, is a valuable source for clinically relevant information because it contains biomarkers specific for the unique physiologic aspects of periodontal diseases. This review highlights the various potentials of saliva as a diagnostic biomarker for periodontal diseases. Currently, three major limitations have prevented people from recognizing the full potential of disease detection, and have seriously hampered the development of clinical diagnostics, namely Lack of definitive molecular biomarkers for specific diseases, Lack of an easy and inexpensive sampling method with minimal discomfort and Lack of an accurate, easy-to-use, and portable platform to facilitate early disease detection. Saliva, an oral fluid that contains an abundance of proteins and genetic molecules and is readily accessible via a totally noninvasive approach, has long been recognized as the potential solution to these limitations. Saliva provides an easily available, noninvasive diagnostic medium for a rapidly widening range of diseases and clinical situations. In the field of periodontology, traditional clinical criteria are often insufficient for determining sites of active disease, for monitoring the response to therapy or for measuring the degree of susceptibility to future disease progression. Saliva as a mirror of oral and systemic health is a valuable source for clinically relevant information because it contains biomarkers specific for the unique physiological aspects of periodontal diseases.



PHYSIOLOGY (POSTER PRESENTATIONS)

Abstract – Physio - 01

High Altitude Physiology
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Both the high altitude physiologist and the intensives are challenged by the human organism in a hypoxic environment. The variation in barometric pressure which occurs with latitude influences enormously the inspired oxygen concentration at extreme altitudes and can significantly affect performance. The cardiorespiratory changes which take place at high altitude, and in particular the putative control mechanisms increasing ventilation; changes in the oxygen-hemoglobin dissociation curve; diffusion limitation during exercise; cardiac function; the pulmonary circulation; and changes in erythropoiesis and fluid homeostasis are reviewed. As some of the physiological changes during acclimatization may be detrimental for some individuals, it is desirable to screen out such persons during selection of the mountaineers for high altitude climbs. Those with a past history of certain illness are not advised to go high in the mountains because at high altitude either their disease is likely to get aggravated or their acclimatization may be considerably delayed. These diseases are obesity, High blood pressure, Anemia, i.e., deficiency of blood, Peptic ulcer—these tend to bleed profusely, Liver diseases, like jaundice, amoebic hepatitis, Lung diseases, like chronic bronchitis, asthma, emphysema, tuberculosis, Heart disease and Diabetes Nervous temperament. Those who are free from diseases usually stand the altitude well irrespective of age. There are, however, a certain number of absolutely healthy individuals who do not get acclimatized to altitude and are a handicap to the mountaineering team. In such persons, the symptoms of acute mountain sickness like vomiting, loss of appetite, inability to sleep, severe headache, persist for a long time without any improvement even after two to three weeks. These symptoms are more among the sedentary persons than in physically active persons. A test for selecting mountaineers on the basis of their physical fitness has been tried. The acute physiological adjustments and early acclimatization that occur in the cardiovascular system and the lungs of healthy individuals. These ensure life-sustaining oxygen delivery to the tissues despite a reduction in the partial pressure of inspired oxygen between 20% and 60% at 2500 and 8000 m, respectively. One of the acute adjustments, hypoxic pulmonary vasoconstriction (HPV), may be disadvantageous in those with a vigorous response and lead to 2 potentially lethal illnesses, high-altitude pulmonary edema (HAPE) and subacute mountain sickness (SAMS), which we present in more detail.



Cushing's syndrome

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Cushing's syndrome is a hormonal disorder caused by prolonged exposure of the body's tissues to high levels of the hormone cortisol. Sometimes called "hypercortisolism," it is relatively rare and most commonly affects adults aged 20 to 50. An estimated 10 to 15 of every million people are affected each year. It may also occur if you take too much cortisol or other steroid hormones. Symptoms vary, but most people have upper body obesity, rounded face, increased fat around the neck, and thinning arms and legs. Children tend to be obese with slowed growth rates. Other symptoms appear in the skin, which becomes fragile and thin. It bruises easily and heals poorly. Purplish pink stretch marks may appear on the abdomen, thighs, buttocks, arms and breasts. The bones are weakened and routine activities such as bending, lifting or rising from a chair may lead to backaches, rib and spinal column fractures. Most people have severe fatigue, weak muscles, high blood pressure and high blood sugar. Irritability, anxiety and depression are common. Women usually have excess hair growth on their faces, necks, chests, abdomens, and thighs. Their menstrual periods may become irregular or stop. Men have decreased fertility with diminished or absent desire for sex. The main treatment for iatrogenic Cushing's syndrome is to decrease or withdraw the use of corticosteroids. However, this must be done gradually to avoid any unpleasant side effects. For endogenous Cushing's syndrome, surgery to remove the tumour is usually recommended. If surgery is unsuccessful, or it is not possible to remove the tumour safely, medication can be used to counter the effects of the high cortisol levels. Although treatment is effective, it can take some time to bring the symptoms under control. Anytime from a few weeks to a few years in some cases. Left untreated, Cushing's syndrome can cause high blood pressure which increases the risk of heart attack and stroke. Possible complications are Diabetes, Enlargement of pituitary tumor, Fractures due to osteoporosis, High blood pressure, Kidney stones and Serious infections. Medications used in the management of Cushing syndrome include the following Somatostatin analogs (eg, pasireotide) and adrenal steroid inhibitors (eg, metyrapone, ketoconazole, aminoglutethimide, mifepristone). Remove a culprit tumor, if possible. The treatment of choice for endogenous Cushing syndrome is surgical resection of the causative tumor. The primary therapy for Cushing disease is trans sphenoidal surgery, and the primary therapy for adrenal tumors is adrenalectomy.



Abstract – Physio - 03

ADHD

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Attention deficit hyperactivity disorder (ADHD) is one of the most common childhood brain disorders and can continue through adolescence and adulthood. Symptoms include difficulty staying focused and paying attention, difficulty controlling behavior, and hyperactivity (over-activity). These symptoms can make it difficult for a child with ADHD to succeed in school, get along with other children or adults, or finish tasks at home. Brain imaging studies have revealed that, in youth with ADHD, the brain matures in a normal pattern but is delayed, on average, by about 3 years. The delay is most pronounced in brain regions involved in thinking, paying attention, and planning. More recent studies have found that the outermost layer of the brain, the cortex, shows delayed maturation overall, and a brain structure important for proper communications between the two halves of the brain shows an abnormal growth pattern. These delays and abnormalities may underlie the hallmark symptoms of ADHD and help to explain how the disorder may develop. Treatments can relieve many symptoms of ADHD, but there is currently no cure for the disorder. With treatment, most people with ADHD can be successful in school and lead productive lives. Researchers are developing more effective treatments and interventions, and using new tools such as brain imaging, to better understand ADHD and to find more effective ways to treat and prevent it. The symptoms of ADHD include inattention and/or hyperactivity and impulsivity. These are traits that most children display at some point or another. But to establish a diagnosis of ADHD, sometimes referred to as ADD, the symptoms should be inappropriate for the child's age. Adults also can have ADHD; in fact, up to half of adults diagnosed with the disorder had it as children. When ADHD persists into adulthood, symptoms may vary. For instance, an adult may experience restlessness instead of hyperactivity. In addition, adults with ADHD often have problems with interpersonal relationships and employment. There are three different subtypes of ADHD, including combined ADHD (the most common subtype), which involves symptoms of both inattentiveness and hyperactivity/impulsivity, Inattentive ADHD (previously known as ADD), which is marked by impaired attention and concentration, Hyperactive-impulsive ADHD, which is marked by hyperactivity without inattentiveness. For a diagnosis of ADHD, some symptoms that cause impairment must be present before age seven. Also, some impairment from the symptoms must be present in more than one setting. For instance, the person may be impaired at home and school or home and work.



Abstract – Physio - 04

Intravenous Fluids

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The administration of intravenous fluids is one of the most common and universal interventions in medicine. Crystalloid solutions are the most frequently chosen, by far, with normal saline (NS) and lactated Ringer's (LR) both being frequent choices in the United States. Colloids are an alternative to crystalloids, with highly variable use depending on a myriad of clinical variables. Of interest, the choice of intravenous fluids has remained one of the most controversial subjects in critical care over the past half a century. Given the frequency that these medications are used with impunity in the daily practice of medicine, it is remarkable how few data exist confirming either the safety or the efficacy of these intravenous fluids. The body reacts to internal and environmental changes by adjusting vital functions to keep fluids and electrolytes in balance, maintaining homeostasis. Various I.V. fluids can be used to maintain homeostasis and specific electrolyte imbalances. The most viable intravenous fluids used before patients enter hospitals are crystalloid solutions. Depending on the concentration of electrolytes, the fluids behave differently in terms of how water is distributed. Tonicity defines how many electrolytes are concentrated in the solution in relation to the human body, and how the fluid gets across membranes based on this relationship is called osmosis. Fluids that have equal electrolytes to the body plasma are called isotonic crystalloids, while hypertonic crystalloids are higher in tonicity and cause fluids to fill the blood vessels. Hypotonic fluids have a lower tonicity, so they allow water to move from inside blood vessels toward cells. Body fluids tend to move toward areas where the electrolytes or molecule count are higher. Medical personnel administer fluids based on knowledge of what a patient needs. It is extremely important to give the proper concentration of fluid, because the wrong one can be fatal for someone who is sick or injured. Another type of intravenous therapy is the injection of blood, or components of it. Blood volume can be increased and the concentration of red blood cells with hemoglobin, which carries oxygen, is raised. Synthetic intravenous fluids include oxygen-carrying solutions, which can carry oxygen throughout the body similar to how blood does and are easily transported into the field where injuries may have led to extreme blood loss. All IV fluid bags are required to have a label indicating the type, amount of, and expiration date of the solution.



Abstract – Physio - 05

Swine Flu

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Swine flu (swine influenza) is a respiratory disease caused by viruses (influenza viruses) that infect the respiratory tract of pigs, resulting in nasal secretions, a barking cough, decreased appetite, and listless behavior. Swine flu produces most of the same symptoms in pigs as human flu produces in people. Swine flu can last about one to two weeks in pigs that survive. Swine influenza virus was first isolated from pigs in 1930 in the U.S. and has been recognized by pork producers and veterinarians to cause infections in pigs worldwide. In a number of instances, people have developed the swine flu infection when they are closely associated with pigs (for example, farmers, pork processors), and likewise, pig populations have occasionally been infected with the human flu infection. In most instances, the cross-species infections (swine virus to man; human flu virus to pigs) have remained in local areas and have not caused national or worldwide infections in either pigs or humans. Unfortunately, this cross-species situation with influenza viruses has had the potential to change. Investigators decided the 2009 swine flu strain, first seen in Mexico, should be termed novel H1N1 flu since it was mainly found infecting people and exhibits two main surface antigens, H1 (hemagglutinin type 1) and N1 (neuraminidase type1). The eight RNA strands from novel H1N1 flu have one strand derived from human flu strains, two from avian (bird) strains, and five from swine strains. Swine flu is transmitted from person to person by inhalation or ingestion of droplets containing virus from people sneezing or coughing; it is not transmitted by eating cooked pork products. The newest swine flu virus that has caused swine flu is influenza A H3N2v (commonly termed H3N2v) that began as an outbreak in 2011. The cause of the 2009 swine flu was an influenza A virus type designated as H1N1. In 2011, a new swine flu virus was detected. The new strain was named influenza A (H3N2). Only a few people (mainly children) were first infected, but CDC officials reported increased numbers of people infected in the 2012-13 flu season. Currently (fall 2013), there are not large numbers of people infected with H3N2v. Unfortunately, another virus termed H3N2 has been detected and caused flu, but this strain is different from H3N2v. In general, all of the influenza A viruses have a structure similar to the H1N1 virus; each type has a somewhat different H and/or N structure.



Abstract – Physio - 06

ANS

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The nervous system comprises the brain and various types of nerves, including afferent nerves, which carry sensory impulses from all parts of the body to the brain and efferent nerves through which "messages" are conducted from the brain to the muscles and all of the organs of the body. The somatic part of the nervous system has sensory components which convey sensations from the eyes, the nose and other sensory organs to the brain (mainly the cerebral cortex) where most of the impulses reach our awareness, and motor components transmitting impulses to the skeletal muscles in the limbs and trunk permitting voluntary control of movements. The autonomic nervous system conveys sensory impulses from the blood vessels, the heart and all of the organs in the chest, abdomen and pelvis through nerves to other parts of the brain (mainly the medulla, pons and hypothalamus). These impulses often do not reach our consciousness, but elicit largely automatic or reflex responses through the efferent autonomic nerves, thereby eliciting appropriate reactions of the heart, the vascular system, and all the organs of the body to variations in environmental temperature, posture, food intake, stressful experiences and other changes to which all individuals are exposed. There are two major components of the autonomic nervous system, the sympathetic and the parasympathetic systems. The afferent nerves subserving both systems convey impulses from sensory organs, muscles, the circulatory system and all the organs of the body to the controlling centers in the medulla, pons and hypothalamus. From these centers efferent impulses are conveyed to all parts of the body by the parasympathetic and sympathetic nerves. The impulses of the parasympathetic system reach the organs of the body through the cranial nerves # 3, 7, 9, & 10, and some sacral nerves to the eyes, the gastrointestinal system, and other organs. The sympathetic nerves reach their end-organs through more devious pathways down the spinal cord to clusters of sympathetic nerve bodies (ganglia) alongside the spine where the messages are relayed to other nerve bodies (or neurons) that travel to a large extent with the blood vessels to all parts of the body. Through these nervous pathways, the autonomic nerves convey stimuli resulting in largely unconscious, reflex, bodily adjustments such as in the size of the pupil, the digestive functions of the stomach and intestines, the rate and depth of respiration and dilatation or constriction of the blood vessels.



Abstract – Physio - 07

Acute Nephrotic Syndrome

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Acute nephritic syndrome is a group of disorders affecting kidney by causing inflammation and pores in glomerulus which results in passage of red blood cells and excess proteins into the urine and restores excess fluid in the body. It is a type of glomerulonephritis, common among children between 2 – 12 years and it is more predominant in males with its severity. Acute nephritic syndrome is generally associated with immune response triggered by infection like pneumococcal, coxackie virus or herpes zoster or other disease. The most common causes includes Hemolytic uremic syndrome, Henoch-Schonlein purpura, IgA nephropathy, Post-streptococcal glomerulonephritis, Abdominal abscesses, Good pasture syndrome, Hepatitis B or C, Infective endocarditis, Membranoproliferative GN I, Membrane proliferative GN II, SLE or lupus nephritis, Vasculitis and few Viral diseases like mononucleosis and measles. Acute nephritic syndrome may be associated with acute kidney failure and high blood pressure. The main symptom shown by acute nephritic syndrome patient is blood in urine (hematuria) and excess secretion of protein in urine (proteinuria). Apart from the above mentioned, a few other symptoms include Decreased or no urine (oliguria), Elevated blood nitrogen (azotemia), Swelling of body parts such as face, eye socket, legs, arms, hands, feet, abdomen etc, Blurred or abnormal vision, Cough having frothy material, Lack of attention, Confusion and drowsiness, Pain in muscles and joints, Malaise, Headache, Difficulty in breathing, Difficulty in movement, Hypertension and Renal insufficiency. Prolonged condition may develop complications like chronic kidney failure, end-stage kidney disease, high blood pressure, congestive heart failure, pulmonary edema, chronic glomerulonephritis and nephrotic syndrome. Though there is no specific diagnostic test for nephritic syndrome, it can be detected through the study of symptoms revealed. Examination of symptoms like abnormal heart and lung sounds, enlarged liver and neck veins, general swelling, high blood pressure, signs of acute kidney failure, and signs of fluid overload can indicate presence of nephritic syndrome. A few tests that may be performed include Blood electrolytes, Blood urea nitrogen (BUN), Creatinine, Creatinine clearance, Potassium test, Protein in the urine, Urinalysis, Urine appearance and color and Kidney biopsy – to indicate the cause of the condition.



Abstract – Physio - 08

Myocardial Infarction

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Patients with acute myocardial infarction (AMI) usually complain of sudden or gradual onset of discomfort in the anterior chest, which may also be described as heaviness, pressure, or gas. Diagnosis of AMI is determined by a high clinical suspicion from history and physical examination, in addition to changes in cardiac biomarkers (creatinine kinase MB [CK-MB], troponins, and myoglobin) and electrocardiogram (ECG) findings. Imaging techniques, such as two-dimensional echocardiography, are also useful in demonstrating myocardial dysfunction. Treatment focuses on limiting the injury to cardiac tissue. Reperfusion therapy should be initiated as early as possible by the use of thrombolytics or percutaneous coronary intervention (PCI). Oxygen, nitrates, analgesic medications, aspirin, β -blockers, and angiotensin-converting enzyme (ACE) inhibitors are the cornerstone medications in the treatment of AMI. Complications may arise as a result of myocardial damage, leading to arrhythmias, shock, and cardiac failure. These complications must be taken into account when considering treatment. Cardiac rehabilitation involves preventive strategies to decrease the risk for reinfarction. Strategies include patient and family education; optimal control of comorbid conditions (particularly hypertension, diabetes mellitus, and hyperlipidemia); and lifestyle modification strategies, including smoking cessation, weight management, and physical activity. Maintenance medication is also prescribed, as determined by patient needs. Your heart is the main organ in your cardiovascular system, which includes different types of blood vessels. Some of the most important vessels in your body are the coronary arteries. They take blood, rich in oxygen, to every location in your body. When arteries become blocked or restricted by buildup, they can cause blood flow to stop or decrease significantly. Several factors may cause a heart attack such as bad cholesterol, also called low-density lipoprotein (LDL), is one of the leading problems that cause blockage. Cholesterol is a colorless substance found in the food you eat as well as produced naturally in your body. Not all cholesterol is bad, but LDL cholesterol can stick to the walls of your arteries and produce plaque. Plaque is a hard matter that blocks blood flow in the arteries. Blood platelets, which help blood to clot, may stick to the plaque and build up over time. Saturated fats (found mostly in meat) may contribute to the buildup of plaque in the coronary arteries.