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ANATOMY (ORAL PRESENTATIONS)

Abstract – Anat - 01

Bruxism

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Bruxism is the excessive grinding of the teeth and/or excessive clenching of the jaw. Bruxism is an oral parafunctional activity i.e., it is not related to normal function such as eating or talking. It is a common problem: reports of prevalence range from 8–31% in the general population. It may cause minimal symptoms, and therefore people may not be aware of the condition. Several symptoms are commonly associated with bruxism, including hypersensitive teeth, aching jaw muscles, and headaches. It may cause tooth wear, and even the damage or breakage of teeth and dental restorations such as crowns and fillings. Most people probably grind and clench their teeth from time to time. Occasional teeth grinding, medically called bruxism, does not usually cause harm, but when teeth grinding occurs on a regular basis the teeth can be damaged and other oral health complications can arise. Although teeth grinding can be caused by stress and anxiety, it often occurs during sleep and is more likely caused by an abnormal bite or missing or crooked teeth. Because grinding often occurs during sleep, most people are unaware that they grind their teeth. However, a dull, constant headache or sore jaw is a telltale symptom of bruxism. Many times people learn that they grind their teeth by their loved one who hears the grinding at night. In some cases, chronic teeth grinding can result in a fracturing, loosening, or loss of teeth. The chronic grinding may wear their teeth down to stumps. When these events happen, bridges, crowns, root canals, implants, partial dentures, and even complete dentures may be needed.

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Abstract – Anat - 02

Evolution of Temporomandibular joint

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Evolution is a change in gene pool of a population over time. Differences between genomes have anthropological, medical, and forensic implications and applications. Mammals have long been diagnosed from all other vertebrates and from very nearly mammalian animals largely on the basis of their jaw-ear structure but there is an even greater significance to jaw joints in the vertebrate evolution. It highlights the underlying mechanisms through which this basic blue print was renovated to produce certain subsequent divergent mammalian feeding adaptations. Historically the field of temporomandibular disorders (TMD) has been based on testimonials, clinical opinion, and blind faith rather than on science. Reparative procedures to the joints, jaws, or occlusal surfaces of the teeth to develop idealized structural relationships that may be required for dental health and function are less likely to be required for the management of chronic musculoskeletal disorders. Because of the concerns of many people today regarding professional credibility and intellectual honesty, the need for a scientific foundation to support the various belief systems is of paramount importance. In fact, therapeutic approaches for TMD are undergoing a major evolution away from the traditional mechanistic dental concepts of the past to the more current biopsychosocial medical concepts that emphasize multidisciplinary approaches. Recent advances in the understanding of pain mechanisms and management of chronic pain have improved long-term treatment outcome. The emphasis is on treatment that involves the patient in the physical and behavioral management of their own problem. The majority of patients with TMD achieve good relief of their symptoms with noninvasive, conservative therapy.

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Abstract – Anat - 03

Occipital emissary foramen in South Indian Skulls

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Along the skull, there are numerous foramens through which course vital neural and vascular structures. Recognition of these foramens is important not only for understanding the regional neurovascular anatomy, but also to distinguish normal from potentially abnormal structures. The poor interpretation of such variations occasionally creates complications during clinical interventions. Emissary veins traverse emissary foramina of the skull and connect venous sinuses to extracranial veins. Although they are valveless and blood may flow in both directions, flow is usually away from the brain. In ordinary usage, emissary foramina are restricted to mastoid, parietal, condyloid, and the foramen of Vesalius. An occipital emissary foramen has been traditionally described as a solitary foramen occasionally present in the squamous part of the occipital bone at the occipital protuberance. It transmits the occipital emissary vein that connects the confluence of sinuses with the occipital vein. The emissary vein may also receive the occipital diploic vein. This traditional view has now been challenged as the foramen has in the recent studies been found more often near the foramen magnum than the External Occipital Protuberance. The present study was done to ascertain the incidence of the foramen in unsexed adult modern human skulls of South Indian origin. The position of the foramen was also determined as a comparison of the study with the traditional and existing literature was done. The findings of the study were then correlated to possible clinical manifestations that may arise due to the position and number of emissary foramina if seen on the skull.

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Abstract – Anat - 04

Morphometric investigation of the Jugular foramen of the human skull

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The jugular foramen is a large aperture in the base of the skull. It is located behind the carotid canal and is formed in front by the petrous portion of the temporal, and behind by the occipital; it is generally larger on the right than on the left side. It is well known that the jugular foramina are essential for venous drainage of the brain. The size of the foramen is related to the size of the sigmoid sinus and the presence or absence of prominent jugular bulb. The jugular foramen (JF) varies in shape and size from side to side in the same cranium, and in different crania, racial groups and sexes. Side dominance is also said to be common. The foramen's irregular shape, its formation by two bones and the numerous nerves and venous channels that pass through it further compound its anatomy. It is a bony opening on the base of skull, is an opening through which pass the ninth, tenth, and eleventh cranial nerves, two dural sinuses, and the meningeal branches of the occipital and ascending pharyngeal arteries. Most of the approaches for skull base surgeries are designed to drill the bone over jugular foramen for proper exposure. In order to achieve this, an understanding of normal morphometric study of jugular foramen is necessary.

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Abstract – Anat - 05

Morphometric Analysis of Position of Mental Foremen in Dry Mandible

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Mental foramen (MF) is an important landmark to facilitate surgical, local anesthetic, and other invasive procedures. It is located in the antero-lateral aspect of the body of the mandible. Its location and the possibility that an anterior loop of the mental nerve may be present mesial to the mental foramen needs to be considered before implant surgery to avoid mental nerve injury. It is situated midway between the upper and the lower border of the mandible and it transmits the mental nerve and the vessels. The knowledge on the anatomy of the mental foramen is very important in clinical dentistry and in surgical procedures which involve that area. The position and its morphological variations are very essential to localize the important maxillofacial neurovascular bundle passing through. The precise identification of position of the mental foramen is important in both diagnostic and clinical procedures of the mandible. Clinically, mental nerve bundle emerging from the mental foramen may get injured during surgical procedures with resulting paresthesia or anesthesia along its sensory distribution. Anatomically, the mental foramen is the opening of the mental canal. According to standard text books, mental foramen is most commonly situated between the apices of the first and second lower premolar. The mental foramen descends slightly in edentulous individuals. The most frequent position (63%) of the mental foramen is in line with the longitudinal axis of the 2nd premolar tooth. Multiple mental foramina are observed in 17% of the sides. Only (4%) of the mandibles show bilateral multiple mental foramina. The majority of the multiple foramina are unequal in size: a single large foramen while the others are small (satellite) foramina. An incisive mental foramen is observed in 1% of the sides. Knowledge of the position of the mental foramen is important both when administering regional anaesthesia, performing periapical surgery and dental implant surgery and endodontic treatments in the mandible. Although it is often possible to identify the mental foramen radiographically and by palpation, knowing the normal range of possible locations is essential.

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Abstract – Anat - 06

Variations of the Location of Greater Palatine Foramen in dry Human skulls

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The hard palate is an essential region of the skull formed by the two palatal processes of the maxilla and two horizontal plates of the palatine bones which are linked by a crucial suture formed by the junction of the four described bones .Blocking of the maxillary division of the trigeminal nerve or its branches for local anesthesia is a common practice in maxillofacial surgery. The maxillary nerve block is an effective method of achieving profound anesthesia of the hemimaxilla. It is useful in procedures involving quadrant dentistry or in extensive maxillary surgical procedures. One of two approaches is available to gain access to the terminal point for anesthetic delivery– the greater palatine canal through the greater palatine foramen (GPF) and the high tuberosity. The major difficulty encountered with use of the respective techniques is locating the canal for the GPF technique and the higher incidence of hematoma for the high tuberosity (3). The ability to better predict and easily anesthetize the maxillary nerve and its branches with a single injection could make it possible to perform surgical procedures, such as maxillary sinus elevation for dental implants in the posterior maxilla, as routine procedures in the private clinic. Patients accept this approach better than a technique that requires several injections. A common problem encountered with the use of the maxillary nerve block is the inability to obtain profound anesthesia, which is frequently caused by the operator's inability to find the GPF. That is why description of the location of GPF is important. With the required knowledge and respect for the associated anatomy, the technique of maxillary nerve block through the GPF should be considered with greater ease and more confidence, when indicated. At either posterior angle of the hard palate is the greater palatine foramen, for the transmission of the descending palatine vessels and greater palatine nerve; and running anteriorly (forward) and medially (towards the center-line) from it is a groove, for the same vessels and nerve. The greater palatine foramen (GPF) is related to the upper 3rd molar tooth in most of the skulls (55%), 2nd molar in (12%), between the 2nd & 3rd molar in (19%) and retromolar in (14%). The shape of the foramen is elongated antero-posteriorly; however, an unusually crescent shaped foramen is rare.

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Abstract – Anat - 07

Orofacial cleft

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Orofacial clefts are birth defects where mouth or roof of mouth does not form properly. A cleft is a separation in a body structure, often resulting from the failure of tissues to grow together properly. Oral facial clefts may involve the lip, the roof of the mouth (hard palate) or the soft tissue in the back of the mouth (soft palate).Cleft lip is a separation of two sides of lip and often includes the bones of the maxilla and/or the upper gum. A cleft lip varies from notch in lip to a cleft extending up into nose. Sometimes there is a cleft or notch in the gum as well. Cleft palate is an opening in roof of mouth. The two sides of the palate fail to join together or fuse. Most cleft palates involve the hard palate at the front of the roof of the mouth, but the soft palate at the back of the roof of the mouth can also have a cleft. Cleft lip with or without a cleft palate and isolated cleft palate are two different conditions. .Babies with cleft lip/palate has a cleft lip and sometimes a cleft palate. In isolated cleft palate, the cleft palate occurs by itself, without cleft lip or other malformations. These two forms of oral-facial clefts are considered separate birth defects. There is variability in the severity of oral facial clefts. The medical costs associated with orofacial clefts are substantial. Sometimes orofacial clefts are diagnosed by prenatal ultrasound, but there is no systematic screening for orofacial clefts. Most clefts are readily diagnosed in the newborn period, although sometimes a cleft of the soft palate is not recognized. Children with a cleft lip with or without a cleft palate or a cleft palate alone often have problems with feeding and talking. They also might have ear infections, hearing loss, and problems with their teeth. Services and treatment for children with orofacial clefts can vary depending on the severity of the cleft; the presence of associated syndromes or other birth defects, or both; and the child's age and needs. Surgery to repair a cleft lip usually occurs in the first few months of life and is recommended within the first 12 months of life. Surgery to repair a cleft palate is recommended within the first 18 months of life.[5] Many children will need additional surgeries as they get older. Although surgical repair can improve the look and appearance of a child's face, it also may improve breathing, hearing, speech, and language. Children born with orofacial clefts also might need different types of treatments and services, such as special dental or orthodontic care or speech therapy.

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Abstract – Anat - 08

Variation in angle of Mandible

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The mandible (from Latin mandibula, "jawbone") or inferior maxillary bone forms the lower jaw and holds the lower teeth in place. In the midline on the anterior surface of the mandible is a faint ridge, an indication of the mandibular symphysis, where the bone is formed by the fusion of right and left processes during mandibular development. Like other symphysis in the body, this is a midline articulation where the bones are joined by fibrocartilage, but this articulation fuses together in early childhood. The angle of the mandible (gonial angle) is located at the posterior border at the junction of the lower border of the ramus of the mandible. This term arises from the Latin, angulus meaning to bend or diverge from a central point. The angle of the mandible, which may be either inverted or everted, is marked by rough, oblique ridges on each side, for the attachment of the masseter laterally, and the pterygoideus internus medially; the stylomandibular ligament is attached to the angle between these muscles. The forensic term for the midpoint of the mandibular angle is the gonion. The mandibular angle has been named as a forensic tool for gender determination, but recent studies have called into question whether there is any significant sex difference in humans in the angle. With development and function, the mandibular angle has shown changes in size and shape. A variation in mandibular angle with age, gender, and even the dental status has been observed, which is supported by radiographic and anthropometric studies. Angle fractures are often unfavourable because of the actions of the masseter, temporalis, and medial pterygoid muscles, which distract the proximal segment superomedially. Recent evidence evaluating the favourability of angle fractures shows that there is no need to apply different treatment modalities to mandibular fractures regardless of whether the factures are favourable.

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Abstract – Anat - 09

Surgical spaces of neck and its clinical anatomy

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The neck (L. collum, cervix) joins the head to the trunk and limbs and serves as a major conduit for structures passing between them. In addition, several important organs with unique functions are located here: the larynx, thyroid, and parathyroid glands, for example. The skeleton of the neck is formed by the cervical vertebrae (C1–C7), hyoid bone (referred to as the hyoid in common usage), manubrium of the sternum, and clavicles. The mobile hyoid lies in the anterior part of the neck at the level of the C3 vertebra in the angle between the mandible and thyroid cartilage. The hyoid does not articulate with any other bone and functionally serves as an attachment for anterior neck muscles and a prop to keep the airway open. Fascial spaces (also termed fascial tissue spaces, or tissue spaces), are potential spaces that exist between the fascia and underlying organs and other tissues. In health, these spaces do not exist; they are only created by pathology. The fascial spaces can also be opened during the dissection of a cadaver. The fascial spaces are different from the fascia itself, which are bands of connective tissue that surrounds structures, e.g. muscles. The opening of fascial spaces may be facilitated by pathogenic bacterial release of enzymes which cause tissue lysis. The spaces filled with loose areolar connective tissue may also be termed clefts. Other contents such as salivary glands, blood vessels, nerves or lymph nodes are dependent upon the location of the space. Those containing neurovascular tissues (nerves and blood vessels) may also be termed compartments. Generally, the spread of infection is determined by barriers such as muscle, bone and fascia. Pus moves by the path of least resistance. In the head and neck, potential spaces are primarily defined by the complex attachment of muscles, especially mylohyoid, buccinator, masseter, medial pterygoid, superior constrictor and orbicularis oris. Infections involving fascial spaces of the head and neck may give varying signs and symptoms depending upon the space(s) involved. Trismus (difficulty opening the mouth) is a sign that the muscles of mastication (the muscles that move the jaw) are involved. Dysphagia (difficulty swallowing) and dyspnoea (difficulty breathing) may be a sign that the airway is being compressed by the swelling.

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ANATOMY (POSTERS PRESENTATIONS)

Abstract – Anat - 01

Malformation of teeth

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Among the individuals of any species there is always a certain amount of variation, the relatively gross anatomical deviations from the normal being classed as malformations. The variety of malformations of the teeth is very great and only in certain instances has we any idea of the mode of production or causation. Some are frankly hereditary and of genetic origin; others perhaps could be shown to be so if it were possible to examine other members of the families and undertake the laborious work of gathering the data for pedigrees. Trauma to a developing tooth germ can be responsible for malformation of the definitive tooth and experimental work on animals and observations on man have established that if the region of the jaws is irradiated during the period of tooth development teeth may fail to develop or be dwarfed. The vast majority of dental malformations, however, appear to occur quite fortuitously and few writers have cared even to speculate on their etiology. It is very common for the upper lateral incisors to be absent or reduced in size, either unilaterally or bilaterally, Anomalies of the lateral incisors have been described in families with a high incidence of cleft lip and it has been suggested that they represent minor degrees or "formes frustes" of the same disturbance of development. Before this view could be accepted it would be necessary to show that the incidence of lateral incisor anomalies is consistently higher in such families than in the general population. Malformations of the teeth generally are not visible at birth because the teeth do not erupt until after birth (usually) - ENAMEL HYPOPLASIA: defective enamel formation resulting in grooves, pits, and fissures on the enamel surface due to a disturbance in enamel formation. One of its most common causes is rickets, due to vitamin D deficiency ; ABNORMALITIES IN SHAPE: quite common; due to aberrant groups of ameloblasts ; NUMERICAL ABNORMALITIES: One or more extra teeth may develop or the teeth may not form at all Partial anodontia: One or more teeth are absent, Total anodontia: No teeth develop, a very rare condition ; NATAL TEETH AND CAPS: 1 or 2 mandibular incisors are found at birth Premature erupted (teeth may be only small, loose enamel caps over a thin dentin sheet) ; FUSED TEETH: a tooth bud may divide or 2 buds may partly fuse to form a fused or joined tooth; AMELOGENESIS IMPERFECTA: the enamel of the tooth is soft and friable due to hypocalcification.

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Abstract –Anat - 02

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 tumour, 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 acute mononeuropathy (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. Most people who have Bell's palsy recover completely, without treatment, in 1 to 2 months. This is especially true for people who can still partly move their facial muscles. But a small number of people may have permanent muscle weakness or other problems on the affected side of the face. Cortico steroids 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. In most cases, a Bell's palsy is a 'one-off'. About 1 in 10 people who have a Bell's palsy can have a further episode sometime in the future, often several years afterwards.

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Abstract - Anat - 03

Craniosynostosis

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Craniosynostosis (sometimes called craniostenosis) is a disorder in which there is early fusion of the sutures of the skull in childhood. It produces an abnormally shaped head and, at times, appearance of the face. The deformity varies significantly depending on the suture or sutures involved. Surgical correction may be necessary to improve appearance and provide space for the growing brain. It is called 'primary' when not associated with any other problem. When there is an underlying disorder it is considered 'secondary'. It may be "simple" with only one suture closed or "compound" when multiple sutures are involved. The result of craniosynostosis is to change the shape of the head and sometimes face. Craniosynostosis can be associated with other neurologic problems including hydrocephalus, Chiari I malformation and increased intracranial pressure. These are more often associated with multiple suture involvement and syndromic cases. Since the skull cannot expand perpendicular to the fused suture, it compensates by growing more in the direction parallel to the closed sutures. Sometimes the resulting growth pattern provides the necessary space for the growing brain, but results in an abnormal head shape and abnormal facial features. In cases in which the compensation does not effectively provide enough space for the growing brain, craniosynostosis results in increased intracranial pressure leading possibly to visual impairment, sleeping impairment, eating difficulties, or an impairment of mental development combined with a significant reduction in IQ.

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Abstract – Anat - 04

Pulsating Exophthalmos

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Pulsating exophthalmos is an eye disorder characterized by a bulging, pulsating eyeball, caused by an arteriovenous aneurysm involving the internal carotid artery and the cavernous sinus of the orbit. Exophthalmos occurs in 30% of the patients suffering from orbital tumor. However, pain, diplopia, swelling, tearing and blurred vision is much more common presenting complaints. Since most optic nerve gliomas occur in the first two decades of life, loss of vision in children with or without optic atrophy suggests optic nerve glioma, particularly if some degree of exophthalmos exists. In a child, the presence of a retrobulbar mass with ecchymosis of the lids and subconjunctival hemorrhage associated with exophthalmos suggests a malignant tumor, particularly medulloblastoma. Unilateral pulsating exophthalmos was first described by Benjamin Travers in 1809. Exophthalmos, also called exophthalmia or proptosis, is a bulging of the eye anteriorly out of the orbit. Exophthalmos can be either bilateral (as is often seen in Graves' disease) or unilateral (as is often seen in an orbital tumor). Complete or partial dislocation from the orbit is also possible from trauma or swelling of surrounding tissue resulting from trauma. Exophthalmos have many reasons, some thyroid disease, especially Graves 'disease (Graves' disease), may be due to the orbital tissue swelling, abnormal tissue deposition, pushing the eyeball protrusion. Retrobulbar hemorrhage or orbital inflammation can cause acute exophthalmos. Within the orbit and retrobulbar malignant or benign, can also push the protrusion of the eyeball. The abnormal proliferation of orbital tissue (pseudo tumor) also cause proptosis in 2 to 3 months. Cavernous sinus thrombosis ophthalmic vein reflux disorder can cause siltation. Unusual move, retrobulbar vein (arteriovenous malformation) traffic pulsating exophthalmos, eye protrudes forward and pulsating with the heartbeat. pulsating exophthalmos of the right eye with diplopia resulting from severe dysplasia of the sphenoid bone and consecutive herniation of the right temporal lobe. The right orbital tectum was reconstructed with titanium mesh and iliac spongiosa via a lateral orbitotomy using intraoperative navigation. The bruit and pulsations of the orbit usually occur from the synchronous movements of the blood through an arteriovenous fistula. These pathologic processes have been verified by many autopsies. Any retrobulbar mass may produce an exophthalmos, but usually vascular disease is the basis for the pulsating form. An actual increase in the number of capillaries, and all anastomoses to surrounding channels are increased in size. The veins are distended into varicosities. This, of course, holds true especially in the orbit, since the orbital veins connect with both the external and the internal jugular vein.

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Abstract – Anat - 05

Sites of Refered Pain of Teeth And Face

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Referred pain is a common and confusing problem every dental practitioner may encounter. This is a kind of pain perceived in a part of body, which is far from the source of pain. Usually the pain originated in a visceral organ could be referred to a superficial anatomic region such as cardiac pain, which radiates to the shoulder, arm, mandible and face. Referred pain may also be detected in the face and teeth e.g. a toothache may be referred to non dental anatomic structures and vise-versa pain from other regions may be perceived in teeth. Many theories have been proposed to explain referred pain such as “convergence theory” and “expansion of receptive fields”. If the origin of pain is not found it may lead to inappropriate dental care like extraction or root canal therapy. Meanwhile, pain originated from other anatomic sites like masticatory muscles and mucosa will not be relieved by extraction or endodontic treatment. The most common site for referred pain was neighboring teeth (80%), and the frequency of pain radiating to opposite dental arch was 24%. The intensity of pain is significantly correlated to its referral nature while the duration and quality of pain have few effects on it.

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Abstract – Anat - 06

Twin Heads

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Twin heads are conjoined twins, each of whom has a separate head, but whose bodies are joined. They are highly symmetric, giving the appearance of having just a single body with little variation from normal proportion. In fact, several vital organs are doubled up; each twin has a separate heart, stomach, spine, and spinal cord. Twins are two offspring produced by the same pregnancy. Twins can either be *monozygotic* ("identical"), meaning that they develop from one zygotethat splits and forms two embryos, or *dizygotic* ("fraternal"), meaning that they develop from two eggs, each fertilized by separate sperm cells. In contrast, a fetus which develops alone in the womb is called a *singleton*, and the general term for one offspring of a multiple birth is *multiple.* Multiple pregnancies are much less likely to carry to full term than single births, with twin pregnancies lasting only 37 weeks (3 weeks less than full term) on average. Women who have a family history of fraternal twins have a higher chance of producing fraternal twins themselves, as there is a genetically linked tendency to hyper-ovulate. There is no known genetic link for identical twinning.[12] Other factors that increase the odds of having fraternal twins include maternal age, fertility drugs and other fertility treatments, nutrition, and prior births. 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 differentsperm 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.Dizygotic twins, like any other siblings, have an extremely small chance of having the same chromosome profile. Even if they happen to have the same chromosome profile, they will always have different genetic material on each chromosome, due to chromosomal crossover during meiosis. Like any other siblings, dizygotic twins may look similar, particularly given that they are the same age. However, dizygotic twins may also look very different from each other. They may be of different sexes or the same sex, just like ordinary siblings. Polar twins (or "polar body twins"), where two sperm fertilize an ovum, one of the two fertilizing a polar body or where an ovum splits into identical copies, one containing a polar body, prior to fertilization, allowing it to be fertilized by two different sperm.

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Abstract – Anat - 07

Eagle's Syndrome

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Eagle syndrome or styloid–carotid artery syndrome is a rare condition where an elongated temporal styloid process (more than 30mm) is in conflict with the adjacent anatomical structures. Two forms of eagle syndrome exist: The classic form and the vascular one. Patients with this syndrome tend to be between 30 and 50 years of age but it has been recorded in teenagers and in patients > 75 years old. It is more common in women with a male: female ratio ~ 1:2. In both the classic and vascular form, the treatment is surgical. A partial styloidectomy is the preferred approach. Repair of a damaged carotid artery is essential in order prevent further neurological complications. Eagle syndrome is characterized by recurrent pain in the oropharynx and face due to an elongated styloid process or calcified stylohyoid ligament. 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.

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Abstract - Anat - 08

Ludwig's Angina

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Ludwig's angina, otherwise known as angina ludovici, is a serious, potentially life-threatening cellulitis, or connective tissue infection, of the floor of the mouth, usually occurring in adults with concomitant dental infections and if left untreated, may obstruct the airways, necessitating tracheotomy. Ludwig's angina refers to the feeling of strangling, not the feeling of chest pain, though there may be chest pain in Ludwig's angina if the infection spreads into the retrosternal space. Dental infections account for approximately eighty percent of cases of Ludwig's angina. Mixed infections, due to both aerobes and anaerobes, are of the cellulitis associated with Ludwig's angina. Typically, these include alpha-hemolytic streptococci, staphylococci and bacteroides groups. True Ludwig's Angina is a cellulitic facial infection. The signs are bilateral (meaning both sides) lower facial swelling around the lower jaw and upper neck. This is because the infection has spread to involve the Submandibular, Sublingual and Submental spaces of the face. Localisation of infection to the sublingual space is accompanied by swelling of structures in the floor of the mouth as well as the tongue being pushed upwards and backwards. Spread of infection to the submaxillary spaces is usually accompanied by signs of cellulitis rather than those of an abscess. Submental and submandibular regions are swollen and tender.

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Abstract – Anat - 09

Modiolus

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In facial anatomy, the modiolus is a chiasma of facial muscles held together by fibrous tissue, located lateral and slightly superior to each angle of the mouth. It is important in moving the mouth, facial and in dentistry. It derives its motor nerve supply from the facial nerve, and its blood supply from labial branches of the facial artery. It is contributed to by the following muscles: orbicularis oris, buccinator, levator anguli oris,depressor anguli oris, zygomaticus major, risorius, platysma, levator labii superioris. A facial expression is one or more motions or positions of the muscles beneath the skin of the face. These movements convey the emotional state of an individual to observers. Facial expressions are a form of nonverbal communication. They are a primary means of conveying social information between humans, but they also occur in most other mammals and some other animal species.Humans can adopt a facial expression voluntarily or involuntarily, and the neural mechanisms responsible for controlling the expression differ in each case. Voluntary facial expressions are often socially conditioned and follow a cortical route in the brain. Conversely, involuntary facial expressions are believed to be innate and follow a subcortical route in the brain.Facial recognition is often an emotional experience for the brain and the amygdala is highly involved in the recognition process.The eyes are often viewed as important features of facial expressions. Aspects such as blinking rate can be used to indicate whether or not a person is nervous or whether or not he or she is lying. Also, eye contact is considered an important aspect of interpersonal communication. However, there are cultural differences regarding the social propriety of maintaining eye contact or not. Beyond the accessory nature of facial expressions in spoken communication between people, they play a significant role in communication with sign language. Many phrases in sign language include facial expressions in the display.There is controversy surrounding the question of whether or not facial expressions are worldwide and universal displays among humans. Supporters of the Universality Hypothesis claim that many facial expressions are innate and have roots in evolutionary ancestors. Opponents of this view question the accuracy of the studies used to test this claim and instead believe that facial expressions are conditioned and that people view and understand facial expressions in large part from the social situations around them.

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BIOCHEMISTRY
(ORAL PRESENTATIONS)

Abstract - Bio -01

Gene Therapy

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Gene therapy is the use of DNA as a drug to treat disease by delivering therapeutic DNA into a patient's cells. The most common form of gene therapy involves using DNA that encodes a functional, therapeutic gene to replace a mutated gene. Other forms involve directly correcting a mutation, or using DNA that encodes a therapeutic protein drug to provide treatment. In gene therapy, DNA that encodes a therapeutic protein is packaged within a "vector", which is used to get the DNA inside cells within the body. Once inside, the DNA becomes expressed by the cell machinery, resulting in the production of therapeutic protein, which in turn treats the patient's disease. Gene therapy may be classified into the two:In somatic gene therapy, the therapeutic genes are transferred into the somatic cells (non sex-cells), or body, of a patient. Several somatic cell gene transfer experiments are currently in clinical trials with varied success. In germ line gene therapy, germ cells are modified by the introduction of functional genes, which are integrated into their genomes. Germ cells will combine to form a zygote which will divide to produce all the other cells in an organism and therefore if a germ cell is genetically modified then all the cells in the organism will contain the modified gene. This would allow the therapy to be heritable and passed on to later generations. Gene therapy utilizes the delivery of DNA into cells, which can be accomplished by a number of methods. The two major classes of methods are those that use recombinant viruses and those that use naked DNA or DNA complexes. A number of viruses have been used for human gene therapy, including retrovirus, adenovirus, lentivirus, herpes simplex virus, vaccinia, pox virus. Gene therapy can be used to fix defective genes or to replace missing genes. Many diseases are the result of just one gene malfunctioning; sickle cell anemia, cystic fibrosis, SCID, are all caused by one defective gene. To correct the problem, gene therapy is used to deliver genes that function correctly. Other diseases are the result of a missing gene; juvenile Paget's disease - an extremely rare bone metabolism disorder - is one example. In those cases, gene therapy can be used to deliver genes to replace the missing one. Advances in the understanding of molecular biology of human disease and the development of efficient gene transfer techniques have resulted in practical approaches to human gene therapy, with new techniques being developed at an increasing rate. The first trials have now begun in humans and initial results are positive.

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Abstract - Bio -02

Epigenetics

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Epigenetics is the study of heritable changes in gene activity that are not caused by changes in the DNA sequence; it also can be used to describe the study of stable, long-term alterations in the transcriptional potential of a cell that are not necessarily heritable. The term also refers to the changes themselves: functionally relevant changes to the genome that do not involve a change in the nucleotide sequence. Examples of mechanisms that produce such changes are DNA methylation and histone modification, each of which alters how genes are expressed without altering the underlying DNA sequence. Gene expression can be controlled through the action of repressor proteins that attach to silencer regions of the DNA. These epigenetic changes may last through cell divisions for the duration of the cell's life, and may also last for multiple generations even though they do not involve changes in the underlying DNA sequence of the organism; instead, non-genetic factors cause the organism's genes to behave differently. Epigenetic phenomena in animals and plants are mediated by DNA methylation and stable chromatin modifications. There has been considerable interest in whether environmental factors modulate the establishment and maintenance of epigenetic modifications, and could thereby influence gene expression and phenotype. One example of an epigenetic change in eukaryotic biology is the process of cellular differentiation. During morphogenesis, totipotent stem cells become the various pluripotent cell lines of the embryo, which in turn become fully differentiated cells. In other words, as a single fertilized egg cell – the zygote – continues to divide, the resulting daughter cells change into all the different cell types in an organism, including neurons, muscle cells, epithelium, endothelium of blood vessels, etc., by activating some genes while inhibiting the expression of others. In 2011, it was demonstrated that the methylation of mRNA plays a critical role in human energy homeostasis. Specific epigenetic processes include paramutation, bookmarking, imprinting, gene silencing, X chromosome inactivation, position effect, reprogramming, transvection, maternal effects, the progress of carcinogenesis, many effects of teratogens, regulation of histone modifications etc,. Today, epigenetics is a very broad field of study, covering many aspects of biology, including morphogenesis, cell heredity, transgenerational epigenetic inheritance, and the evo-devo approach to evolutionitations affecting parthenogenesis and cloning. Great potential lies in the development of 'epigenetic therapies'. Several inhibitors of enzymes controlling epigenetic modifications, specifically DNA methyltransferases and histone deacetylases, have shown promising anti-tumorigenic effects for some malignancies.

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Abstract - Bio -03

Cancer Immunotherapy

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Cancer immunotherapy is the use of the immune system to reject cancer. The main premise is stimulating the patient's immune system to attack the malignant tumour cells that are responsible for the disease. This can be either through immunization of the patient, in which case the patient's own immune system is trained to recognize tumour cells as targets to be destroyed, or through the administration of therapeutic antibodies as drugs, in which case the patient's immune system is recruited to destroy tumour cells by the therapeutic antibodies. Cell based immunotherapy is another major entity of cancer immunotherapy. Immunotherapy is a new class of cancer treatment that works to harness the innate powers of the immune system to fight cancer. Because of the immune system's unique properties, these therapies may hold greater potential than current treatment approaches to fight cancer more powerfully, to offer longer-term protection against the disease, to come with fewer side effects, and to benefit more patients with more cancer types. Great progress has been made in the field of tumor immunology in the past decade, but optimism about the clinical application of currently available cancer vaccine approaches is based more on surrogate endpoints than on clinical tumor regression. In our cancer vaccine trials of 440 patients, the objective response rate was low (2.6%), and comparable to the results obtained by others. We consider here results in cancer vaccine trials and highlight alternate strategies that mediate cancer regression in preclinical and clinical models. Cancer immunotherapy attempts to harness the equisite power and specificity of the immune system for the treatment of malignancy. Although cancer cells are less immunogenic than pathogens, the immune system is clearly capable of recognising and eliminating tumour cells. Antibodies are important therapeutic agents for cancer. Recently, it has become clear that antibodies possess several clinically relevant mechanisms of action. Many clinically useful antibodies can manipulate tumour-related signalling. In addition, antibodies exhibit various immunomodulatory properties and, by directly activating or inhibiting molecules of the immune system, antibodies can promote the induction of antitumor immune responses. These immunomodulatory properties can form the basis for new cancer treatment strategies.

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Abstract - Bio -04

DNA Based Information Technologies

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Double-stranded RNA-mediated interference has recently emerged as a powerful reverse genetic tool to silence gene expression in multiple organisms including plants, Caenorhabditis elegans and Drosophila. The discovery that synthetic double-stranded, 21-nt small interfering RNA triggers gene-specific silencing in mammalian cells has further expanded the utility of RNAi into mammalian systems. Here we report a technology that allows synthesis of small interfering RNAs from DNA templates *in vivo* to efficiently inhibit endogenous gene expression. Significantly, we were able to use this approach to demonstrate, in multiple cell lines, robust inhibition of several endogenous genes of diverse functions. These findings highlight the general utility of this DNA vector-based RNAi technology in suppressing gene expression in mammalian cells. Cloning-When joining two or more DNA fragments, a researcher can adjust the sequence at the junction in a variety of subtle ways. DNA Cloning-The plasmid cloning vector pBR322 is cleaved with the restriction endonuclease PstI. An isolated DNA fragment from a eukaryotic genome is added to the prepared vector and ligated. The mixture of ligated DNAs is then used to transform bacteria, and plasmid-containing bacteria are selected by growth in the presence of tetracycline. Identifying the Gene for a Protein with a Known Amino Acid Sequence-To translate the genetic code, design a DNA probe that would allow you to identify the gene for a protein with the following amino-terminal amino acid sequence. Designing a Diagnostic Test for a Genetic Disease-Huntington's disease (HD) is an inherited neurodegenerative disorder, characterized by the gradual, irreversible impairment of psychological, motor, and cognitive functions. Glowing Plants-When grown in ordinary garden soil and watered normally, a plant engineered to express green fluorescent protein will glow in the dark, whereas a plant engineered to express firefly luciferase will not. Mapping a Chromosome Segment-A group of overlapping clones, designated A through F, is isolated from one region of a chromosome. Each of the clones is separately cleaved by a restriction enzyme and the pieces resolved by agarose gel electrophoresis. There are nine different restriction fragments in this chromosomal region, with a subset appearing in each clone. Using this information, deduce the order of the restriction fragments in the chromosome. Cloning in Plants-The strategy outlined employs Agro bacterium cells that contain two separate plasmids. Cloning in Mammals-The retroviral vectors described make possible the efficient integration of foreign DNA into a mammalian genome.

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Abstract - Bio -05

Stem Cells

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Stem cells are undifferentiated biological cells that can differentiate into specialized cells and have the remarkable potential to develop into many different cell types in the body. They express three general properties; capability of dividing and renewing themselves for long periods; unspecialized and hence can give rise to specialized cell types. The different kinds of stem cells are embryonic stem cells, adult stem cells and induced pluripotent stem cells. Embryonic stem cells are isolated from the inner cell mass of blastocysts and eventually, these undifferentiated cells can be stimulated to create specialized cells. In adult organisms, stem cells and progenitor cells act as a repair system for the body, replenishing adult tissues. There are three accessible sources of autologous adult stem cells in humans: Bone marrow, Adipose tissue and Blood. Stem cells can also be taken from umbilical cord blood just after birth. Of all stem cell types, autologous harvesting involves the least risk. Stem cells may be pluripotent or multipotent. Pluripotent stem cells have great therapeutic potential and can face formidable technical challenges and so offer the possibility of a renewable source of replacement cells and tissues to treat a myriad of diseases, conditions, and disabilities including Parkinson's disease, amyotrophic lateral sclerosis, spinal cord injury, burns, heart disease, diabetes, and arthritis. 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. Embryonic cell lines and autologous embryonic stem cells generated through therapeutic cloning have also been proposed as promising candidates for future therapies. Medical researchers believe that stem cell therapy has the potential to dramatically change the treatment of human disease. A number of adult stem cell therapies already exist, particularly bone marrow transplants that are used to treat leukaemia. In the future, medical researchers anticipate being able to use technologies derived from stem cell research to treat a wider variety of diseases including cancer, Parkinson's disease, spinal cord injuries, Amyotrophic lateral sclerosis, multiple sclerosis, and muscle damage, amongst a number of other impairments and conditions.

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Abstract - Bio -06

Applications of Biotechnology

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Biotechnology is the use of living systems and organisms to develop or make useful products, or "any technological application that uses biological systems, living organisms or derivatives thereof, to make or modify products or processes for specific use". As such, (traditional) biotechnology has been practiced since the beginning of records history for baking bread, brewing alcoholic beverages, and breed food crops or domestic animals. But recent developments in molecular biology have given biotechnology new meaning, new prominence, and new potential. In the late 20th and early 21st century, biotechnology has expanded to include new and diverse sciences such as genomics, recombinant gene technologies, applied immunology, and development of pharmaceutical therapies and diagnostic tests. Biotechnology has applications in four major industrial areas, including health care (medical), crop production and agriculture, non food (industrial) uses of crops and other products (e.g. biodegradable plastics, vegetable oil, bio fuels), and environmental uses. Medical biotechnology is used in diagnostics, therapeutics, vaccines and forensics. Blue biotechnology is a term that has been used to describe the marine and aquatic applications of biotechnology. Biotechnology has offered opportunities to produce more nutritious and better tasting foods, higher crop yields and plants that are naturally protected from disease and insects as it allows for the transfer of only one or a few desirable genes, thereby permitting scientists to develop crops with specific beneficial traits and reduce undesirable traits. Biotechnology is being applied to medical processes like the designing of organisms to produce antibiotics, and the engineering of genetic cures through genetic manipulation. Biotechnology can be applied to industrial processes for the designing of an organism to produce a useful chemical. Environmental biotechnology is used in cleaning through bioremediation, preventing environmental problems, monitoring the environment. Animal biotechnology is used in artificial insemination, gene transfer. It is also a technique for correcting defective genes that are responsible for disease development. Biotechnology with its various applications still offers a great scope in the field of research even in the future.

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Abstract - Bio -07

Genetic Engineering

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Genetic engineering is the process of manually adding new DNA to an organism. Genetic engineering, also called transformation, works by physically removing a gene from one organism and inserting it into another, giving it the ability to express the trait encoded by that gene. This involves using recombinant nucleic acid (DNA or RNA) techniques to form new combinations of heritable genetic material followed by the incorporation of that material either indirectly through a vector system or directly through micro-injection, macro-injection and micro-encapsulation techniques. Cloning and stem cell research, although not considered genetic engineering, are closely related and genetic engineering can be used within them. Synthetic biology is an emerging discipline that takes genetic engineering a step further by introducing artificially synthesized genetic material from raw materials into an organism. If genetic material from another species is added to the host, the resulting organism is called transgenic. If genetic material from the same species or a species that can naturally breed with the host is used the resulting organism is called cisgenic. Genetic engineering has been applied in numerous fields including research, agriculture, industrial biotechnology and medicine. Plants, animals or micro organisms that have changed through genetic engineering are termed genetically modified organisms or GMOs. Plants have been modified for insect protection, herbicide resistance, virus resistance, enhanced nutrition, tolerance to environmental pressures and the production of edible vaccines. Most commercialised GMO's are insect resistant and or herbicide tolerant crop plants. Genetically modified animals have been used for research, model animals and the production of agricultural or pharmaceutical products. They include animals with genes knocked out, increased susceptibility to disease, hormones for extra growth and the ability to express proteins in their milk. Genetic engineering is rapidly replacing traditional plant breeding program and has become the mainstay of agricultural crop improvement. In medicine genetic engineering has been used to mass-produce insulin, human growth hormones, follistim (for treating infertility), human albumin, monoclonal antibodies, antihemophilic factors, vaccines and many other drugs. Genetic engineering is an important tool for natural scientists. Genes and other genetic information from a wide range of organisms are transformed into bacteria for storage and modification, creating genetically modified bacteria in the process. In materials science, a genetically modified virus has been used in an academic lab as a scaffold for assembling a more environmentally friendly lithium-ion battery. Bacteria have been engineered to function as sensors by expressing a fluorescent protein under certain environmental conditions. Genetically modified foods have made a big splash in the news lately. Before release into commerce, genetic engineered organisms are first assessed for possible risks, including risks to the environment.

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Abstract - Bio -08

Nano Medicine in Dentistry

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Nanotechnology is defined as the design and fabrication of materials, devices and systems with control at nanometer dimensions. Dentistry is frequently facing revolutions in order to provide a most reliable and comfortable therapeutic options for the patients. Application of nanotechnology in dentistry holds promise for the maintenance of comprehensive dental care by employing nanomaterials including tissue engineering and ultimately nanorobots. This paper highlights the role of nanomaterials and their potential to be used in the diagnosis and management of oral diseases. Numerous theoretical predictions have been made based on the potential applications of nanotechnology in dentistry, with varying levels of optimism. Advances in the medical implementations of nanotechnology have resulted in the formation of a new field called nanomedicine. Similar to nanomedicine, the development of nanodentistry will allow nearly perfect oral health by the use of nanomaterials and biotechnologies, including tissue engineering and nanorobots. Titanium implants treated with a nanostructured calcium surface coat were inserted into rabbit tibias, and their effect on osteogenesis was investigated; the nanostructured calcium coat increased the responsiveness of the bone around the implant. Nanorobots (dentifrobots) left by mouthwash or toothpaste on the occlusal surfaces of teeth can clean organic residues by moving throughout the supragingival and subgingival surfaces, continuously preventing the accumulation of calculus. These nanorobots, which can move as fast as 1 to 10 micron/second, are safely deactivated when they are swallowed. Nanoparticles allow the production of composites with a smooth surface after the polishing process and confer superior esthetic features to the material. Composite resins containing such particles are easy to shape and have a high degree of strength and resistance to abrasion. Therefore, the area of use of resins containing nanoparticles is wider than that of composites containing hybrid and microfill fillers. rtificial teeth made of nanocomposite have also been produced. In these artificial teeth, inorganic fillers in nano-dimensions are diffused homogenously without any accumulation in the matrix. Therefore, the smoothness of the surface can be preserved even when the teeth are eroded. Researchers have attempted to generate an effective and satisfactory drug delivery system for the treatment of periodontal diseases by producing nanoparticles impregnated with triclosan. Researchers have attempted to generate an effective and satisfactory drug delivery system for the treatment of periodontal diseases by producing nanoparticles impregnated with triclosan. Advances in digital dental imaging techniques are also expected with nanotechnology. Selective cell manipulation and surgery performed with tools sized at the molecular level will provide great benefits, particularly in tumor tissue surgery. Although the effect of nanotechnology on dentistry is limited to the use of currently available materials, rapidly progressing investigations will ensure that the future holds in store an era of dentistry in which every procedure will be performed using equipments and devices based on nanotechnology.

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Abstract - Bio -09

Test Tube Teeth

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More complicated than they look, teeth are actually tiny organs. We take them for granted until they are gone or require major repairs, and then the options are grim: do without lost teeth or replace them with inert prosthetic versions. An estimated 85 percent of adults have had some form of dental treatment and Seven percent have lost one or more teeth by age 17. After age 50, an average of 12 teeth stands to have been lost. Teeth develop from a series of reciprocal interactions that take place between epithelium and mesenchyme during development of the mouth that begin early in mammalian embryogenesis. The molecular control of key processes in tooth development such as initiation, morphogenesis and cytodifferentiation are being increasingly better understood, to the point where this information can be used as the basis for approaches to produce biological replacement teeth (BioTeeth). This review outlines the current approaches, ideas and progress towards the production of BioTeeth that could form an alternative method for replacing lost or damaged teeth. Best of all, bioengineering teeth from an individual's own tissues avoids immune rejection and allows for a more realistic replacement, since tooth size, shape, and color are genetically determined. Scientists have observed how nature engineers a tooth and have combined this understanding with advances in stem cell biology and tissue engineering technology to get closer to and understand biological replacement teeth. The construction of a tooth takes about 14 months to complete in a developing human. Two different types of embryonic tissue combine to produce a tooth, and an ongoing molecular interaction between them leads the process. Scientists are connecting stem cells to create the tooth buds that form in the early embryo. The idea is to implant these "primordial teeth" (that are in their early stage) into human jaws and let the cells take it from there. By using a patient's own stem cells avoids the problems that often happen in ordinary transplants. Alternative methods include building teeth from existing dental cells or growing them from progenitor tissues. Both approaches have already produced structurally correct teeth. Unfortunately, the challenges of growing roots and identifying ideal raw materials remain. Even so, scientific progress can be fast, and teeth may become the first successfully engineered organs.

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Abstract - Bio - 10

Progeria

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Progeria is a progressive genetic disorder that causes children to age rapidly, beginning in their first two years of life. Children with progeria, also known as Hutchinson-Gilford progeria syndrome (HGPS), generally appear normal at birth. By 12 months, signs and symptoms, such as slow growth and hair loss, begin to appear. The average life expectancy for a child with progeria is about 13, but some with the disease die younger and some live 20 years or longer. Heart problems or strokes are the eventual cause of death in most children with progeria. There's no cure for this condition, but ongoing research shows some promise for treatment. The disorder has a very low incidence rate, occurring in an estimated 1 per 8 million live births. Those born with progeria typically live to their mid teens to early twenties. It is a genetic condition that occurs as a new mutation, and is rarely inherited, as patients usually do not live to reproduce. Diagnosis is suspected according to signs and symptoms, such as skin changes, abnormal growth, and loss of hair. A genetic test for LMNA mutations can confirm the diagnosis of progeria. Although the term progeria applies strictly speaking to all diseases characterized by premature aging symptoms, and is often used as such, it is often applied specifically in reference to Hutchinson–Gilford progeria syndrome (HGPS). Scientists are particularly interested in progeria because it might reveal clues about the normal process of aging.

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Abstract - Bio - 11

Antioxidants In Health And Disease

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An antioxidant is a molecule that inhibits the oxidation , a chemical reaction that can produce free radicals. In turn, these radicals can start chain reactions causing damage or death to the cell. Free radicals can cause "oxidative stress," a process that can trigger cell damage. Free radicals are also produced from exposure to cigarette smoke, excess exposure to the sun, drinking alcohol, from exposure to large amounts of heavy metals and during any inflammatory response. Excess free radical production originating from endogenous or exogenous sources might play a role in many diseases. Antioxidants prevent free radical induced tissue damage by preventing the formation of radicals, scavenging them, or by promoting their decomposition. Multiple types of natural antioxidants, such as glutathione, vitamin C, vitamin A, and vitamin E as well as enzymes such as catalase, superoxide dismutase and various peroxidases exist. Insufficient levels of antioxidants, or inhibition of the antioxidant enzymes, cause oxidative stress and may damage or kill cells. The recent growth in knowledge of free radicals and reactive oxygen species (ROS) in biology is producing a medical revolution that promises a new age of health. The body produces a range of its own protective antioxidants. Some foods are also rich in antioxidants and these may boost the body's own supply. Plants produce hundreds of antioxidants for their own protection. Some of which may also be useful to us are present in vegetables, fruits, herbs and spices, nuts and whole grains. Teas, coffee, extra virgin olive oil, red wine and dark bitter chocolate are also rich in antioxidants. Antioxidant action is also part of the role of vitamins C, E, folate and beta carotene and also the minerals selenium, manganese, copper and zinc. 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. Endogenous antioxidant defense (H_2O_2-removing enzymes, metal binding proteins) are inadequate to prevent damage completely, so diet derived antioxidants are important in maintaining health. Antioxidants are used as food additives to help guard against food deterioration. Antioxidants are frequently added to industrial products. A common use is as stabilizers in fuels and lubricants to prevent oxidation, and in gasolines to prevent the polymerization that leads to the formation of engine-fouling residues. Research into antioxidants is in its infancy. Epidemiological studies show that a diet rich in foods with high levels of antioxidants is associated with longevity and good health. Evidence from laboratory studies indicates that particular antioxidants may have specific roles in disease prevention. However, most clinical trials using antioxidant vitamins have not shown expected results.

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Abstract - Bio - 12

SOD and Effects of Bone Resorption In Implant Patients

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Osteolysis, that is, progressive periprosthetic bone loss, is responsible for approximately 70% of aseptic loosening and implant failure. Usually, it is due to a granulomatous reaction wear-induced, leading to macrophage and osteoclast-mediated bone resorption. At present, there is no established prophylaxis or treatment for this process. For this purpose, as a preliminary investigation, we aimed to study the effects in two directions, inhibition of proinflammatory signals, and bone remodelling activity, of two newly synthesized anthraquinone molecules [N,N′-Diethylamino-2,6-anthraquinone-disulfonamide (GR375) and N,N′-(p-ethoxyphenyl)-2,6-anthraquinone-disulfon amide (GR377)]. Among the pro-inflammatory signals, the ability of the two anthraquinones to interfere with the production of superoxide anion (O_2^-), which was assumed as a marker of reactive oxygen species (ROS), was evaluated in an in vitro cell model by testing phagocytes, such as human neutrophils, challenged by the chemo tactic agent N-formylmethionyl-leucyl-phenylalanine (FMLP). Both compounds inhibited O_2^- production, in a dose-dependent way, without exerting scavenger effects. An in vivo model was applied to investigate their effect on bone remodelling. Fifty-four female Wistar rats were divided into eight groups of six animals each, and a 4-week treatment was applied in two phases. A 25 mg/kg/os dose in the first phase and 12.5–6.25mg/kg/os doses in the second one were employed. The tibia trabecular bone at the secondary spongiosa level was analyzed, and trabecular bone volume (%TBV), trabecular thickness (TbTh), and apatite lattice parameters were measured. At the highest doses of GR375 and GR377 the %TBV and the TbTh increased by 33.2, 34.6%, and 3.6 and 9.1%, respectively, whereas crystallographic parameters were not significantly different from the untreated group. Our results suggest a simultaneous anti-inflammatory and antiosteoclastic activity of both drugs that encourages to perform further research. If it will be confirmed, they could be proposed in a variety of bone diseases, in particular, when acute inflammation is associated to osteolytic processes and, eventually, in the prevention and treatment of periprosthetic osteolysis.

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Abstract - Bio - 13

Collagen

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Collagen is the most abundant protein in mammals, accounting for around 30% of the protein content of the human body. It is often considered to be the "glue that holds the body together". Collagen is found in fibrous tissues such as skin, ligaments and tendons, as well as in the bones, blood vessels, the cornea of the eye, and in the gut. Collagen is vital for strengthening blood vessels and giving skin its elasticity and strength. The fibroblast is the most common cell which creates collagen. In muscle tissue, it serves as a major component of the endomysium. Collagen is a part of the connective tissue that in the skin helps in firmness, suppleness and constant renewal of skin cells. Collagens are the most abundant tissues in nature and due to several properties they are considered for various applications in biomedical sciences. The degradation of collagen causes wrinkles and other skin issues. As a result, collagen is one of the most popular supplements among the elderly - because of its skin healing properties. Collagen is used widely in cosmetic surgery and as wound healing aids in burn patients. These are used widely for reconstruction of bone and a wide variety of dental, orthopedic and surgical purposes. Various studies indicate that chicken collagen supplements can be effective in the treatment of pain, swelling as well as stiffness around joints. This type of collagen is mostly used by people suffering from rheumatoid arthritis. Studies also indicate that collagen supplements used with protein and amino acids supplements help in improving mobility and flexibility in athletes. Gelatin, which is used in food and industry, is collagen that has been irreversibly hydrolyzed. For instance, it is used in cosmetic surgery and burns surgery, for cardiac applications and also for bone grafts. It is widely used in the form of collagen casings for sausages, which are also used in the manufacture of musical strings. One thousand mutations have been identified in twelve out of more than twenty types of collagen. These mutations can lead to various diseases at the tissue level like Osteogenesis imperfecta, Chondrodysplasias and Ehlers-Danlos Syndrome .some types can be lethal that lead to the rupture of arteries, each syndrome is caused by a different mutation.

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Abstract - Bio -14

Inborn Errors of Metabolism

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Inborn errors of metabolism comprise a large class of genetic diseases involving disorders of metabolism. The majority are due to defects of single genes that code for enzymes that facilitate conversion of various substances (substrates) into others (products). In most of the disorders, problems arise due to accumulation of substances which are toxic or interfere with normal function, or to the effects of reduced ability to synthesize essential compounds. Inborn errors of metabolism are now often referred to as congenital metabolic diseases or inherited metabolic diseases. Traditionally the inherited metabolic diseases were categorized as disorders of carbohydrate metabolism, amino acid metabolism, organic acid metabolism, or lysosomal storage diseases. In recent decades, hundreds of new inherited disorders of metabolism have been discovered and the categories have proliferated. Some of the major classes of congenital metabolic diseases include Disorders of carbohydrate metabolism (glycogen storage disease); Disorders of amino acid metabolism (phenylketonuria, maple syrup urine disease);Urea Cycle Disorder (Carbamoyl phosphate synthetase I deficiency);Disorders of organic acid metabolism (alcaptonuria);Disorders of fatty acid oxidation and mitochondrial metabolism(Medium-chain acyl-coenzyme A dehydrogenase deficiency) ;Disorders of porphyrin metabolism(acute intermittent porphyria);Disorders of purine or pyrimidine metabolism (Lesch-Nyhan syndrome);Disorders of steroid metabolism (lipoid congenital adrenal hyperplasia, congenital adrenal hyperplasia);Lysosomal storage disorders (Gaucher's disease and Niemann Pick disease). The overall incidence of the inborn errors of metabolism was estimated to be 70 per 100,000 live births or 1 in 1,400 births. the enormous number of these diseases and wide range of systems affected, nearly every "presenting complaint" to a doctor may have a congenital metabolic disease as a possible cause, especially in childhood. Dozens of congenital metabolic diseases are now detectable by newborn screening tests, especially the expanded testing using mass spectrometry. This is an increasingly common way for the diagnosis to be made and sometimes results in earlier treatment and a better outcome. There is a revolutionary GC/MS based technology with an integrated analytics system, which has now made it possible to test a newborn for over 100 genetic metabolic disorders. In the past twenty years, enzyme replacement, gene therapy, and organ transplantation have become available and beneficial for many previously untreatable disorders. Enzyme replacement, Gene therapy, Bone marrow or organ transplantation and Prenatal diagnosis and avoidance of pregnancy or abortion of an affected fetus are some of the therapys that are under use.

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Abstract - Bio - 15

Relation Between Food and Cancer

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The relationship between diet and cancer has advanced in recent years, but much remains to be understood with respect to diet and dietary components in cancer risk and prevention. Scientists have estimated that unhealthy diets cause nearly one in ten cancer cases. Very few specific foods or drinks have been convincingly shown to increase or reduce the risk of cancer. This is because a person's diet consists of many different foods, nutrients and chemicals that affect their risk of cancer. It is very difficult to design studies that can accurately look at the effect of a single food item. Evidence from clinical trial outcomes, epidemiological observations, preclinical models and cell culture systems have all provided clues about the biology of cancer prevention. Sequencing of the human genome has opened the door to an exciting new phase for nutritional science. There are also many advances in our understanding of the control of gene expression in eukaryotic cells that might impact cancer development, including mechanisms regulating chromatin structure and dynamics, epigenetic processes (DNA methylation, histone posttranslational modification), transcription factors, and noncoding RNA and evidence suggests that environmental factors such as diet influence these processes. Unravelling the effects of bioactive food components on genes and their encoded proteins as well as identifying genetic influences on dietary factors is essential for identifying those who will and will not benefit from intervention strategies for cancer prevention. Additional research needs concerning diet and cancer prevention include: identification and validation of cancer biomarkers and markers of dietary exposure; investigation of the exposure/temporal relationship between food component intakes and cancer prevention; examination of possible tissue specificity in response to dietary factors; and examination of interactions among bioactive food components as determinants of response. Other emerging areas that require greater attention include understanding the link between obesity, diet and cancer, the interaction between diet and the microbiome, as well as how bioactive food components modulate inflammatory processes. Importantly, for the future of nutrigenomics, the "omics" (e.g., genomics, epigenomics, transcriptomics, proteomics, metabolomics) approach may provide useful biomarkers of cancer prevention, early disease, or nutritional status, as well as identify potential molecular targets in cancer processes that are modulated by dietary constituents and/or dietary patterns. A recent study found more than one in ten bowel cancers linked to a low fibre diet. Bacteria in the bowel interact with fibre to produce several chemicals including butyrate, which changes the conditions in the bowel, so that tumours are less likely to develop. Lab experiments have shown that butyrate can also stop the growth of cancer cells and cause them to die off. Studies has found that eating lots of fruit and vegetables could reduce the risk of mouth, oesophageal and lung cancers, as well as some types of stomach cancer.

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Abstract - Bio - 16

Oral Manifestations in AIDS

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Numerous oral manifestations are common in HIV-infected individuals that include oral lesions and novel presentations of previously known opportunistic diseases. These oral manifestations are frequently misdiagnosed or inadequately treated. Common or notable HIV related oral manifestations include Xerostomia, Candidiasis, Oral Hairy Leukoplakia, Periodontal disease such as Periodontitis, Kaposi's Sarcoma, Human Papilloma Virus associated warts and ulcerative conditions including Herpes simplex virus lesions, recurrent aphthous ulcers and neutropenic ulcers. Caries burden is consistently higher in HIV-infected children and increases with the progression of the disease. Clinicians must treat the numerous oral manifestations of HIV; however, treatment and prevention of dental caries will be the dentist's primary function. Early treatment of HIV infection is necessary to reduce the prevalence of the oral manifestations associated with the disease and its progression to AIDS. To provide safe treatment for HIV-infected children, dentists must know the patient's CD4+ T-lymphocyte count and percentage, when to use antibiotic prophylaxis, and when to order additional laboratory tests, including liver function tests, INR, and CBC with differential. While planning treatment for any HIV-infected patient, a thorough review of the patient's medical history is the first step. The dentist must confirm the patient's current medications, the sugar content of each, and their potential for drug-drug interactions. Recommend sugar-free medications if possible. Check to see if the patient has any co-infections (including hepatitis, HSV, and HPV). The dentist and physician must coordinate the patient's dental care. A medical consult requesting current laboratory results and the patient's clinical and immunological categories is essential before the start of dental treatment; in addition, new laboratory tests should be requested every three months to monitor the patient's immune status, liver function, and potential for bleeding. Importantly, sugar-free HIV drugs should be prescribed when possible to reduce the patient's caries risk. Oral conditions seen in association with HIV are still prevalent and are clinically significant. Hence this article summarises a presentation on the oral manifestations of HIV in particular and the treatment plans to be followed. However Prevention is key to maintaining oral health in this population.

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BIOCHEMISTRY (POSTERS PRESENTATIONS)

Abstract - Bio -01

Regenerative Medicine
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Regenerative medicine is the "process of replacing or regenerating human cells, tissues or organs to restore or establish normal function". This field helps in regenerating damaged tissues and organs in the body by replacing damaged tissue and or by stimulating the body's own repair mechanisms to heal previously irreparable tissues or organs. Regenerative medicine also helps in the possibility of growing tissues and organs in the laboratory and safely implants them when the body cannot heal itself. This can potentially solve the problem of the shortage of organs available for donation, and the problem of organ transplant rejection if the organ's cells are derived from the patient's own tissue or cells. It is the process of creating living, functional tissues to repair or replace tissue or organs that are lost due to age, disease, damage or congenital defects. Regenerative medicine refers to a group of biomedical approaches to clinical therapies that may involve the use of stem cells. Examples include the injection of stem cells or progenitor cells (cell therapies); the induction of regeneration by biologically active molecules administered alone or as a secretion by infused cells (immunomodulation therapy); and transplantation of in vitro grown organs and tissues (Tissue engineering). A recent form of regenerative medicine that is made it into clinical practice is the use of heparan sulfate analogues on (chronic) wound healing. Heparan sulfate analogues replace degraded heparan sulfate at the wound site. They assist the damaged tissue to heal itself by repositioning growth factors and cytokines back into the damaged extracellular matrix. For example, in abdominal wall reconstruction (like inguinal hernia repair), biologic meshes are being used with some success.

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Abstract - Bio - 02

Mobile Usage and Effects

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As a result of the enormous increase in mobile phone usage throughout the world the effect of mobile phone radiation on human health has become the subject of recent interest and study. As of November 2011, there were more than 6 billion subscriptions worldwide. Mobile phones use electromagnetic radiation in the microwave range. Other digital wireless systems, such as data communication networks, produce similar radiation. In 2011, International Agency for Research on Cancer (IARC) classified mobile phone radiation as Group-2B - possibly carcinogenic. That means that there "could be some risk" of carcinogenicity, so additional research into the long-term, heavy use of mobile phones needs to be conducted. The world Health Organization (WHO) added that "to date, no adverse health effects have been established as being caused by mobile phone use." Some national radiation advisory authorities have recommended measures to minimize exposure to their citizens as a precautionary approach. Cell phones emit radiofrequency energy, a form of non-ionizing electromagnetic radiation, which can be absorbed by tissues closest to where the phone is held. The amount of radiofrequency energy a cell phone user is exposed to depends on the technology of the phone, the distance between the phone's antenna and the user, the extent and type of use, and the user's distance from cell phone towers. Studies thus far have not shown a consistent link between cell phone use and cancers of the brain, nerves, or other tissues of the head or neck. More research is needed because cell phone technology and how people use cell phones have been changing rapidly. The number of cell phone users has increased rapidly. Globally, the number of cell phone subscriptions is estimated by the International Telecommunications Union to be 5 billion. Over time, the number of cell phone calls per day, the length of each call, and the amount of time people use cell phones has increased. Cell phone technology has also undergone substantial changes.

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Abstract - Bio -03

DNA

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Deoxyribonucleic acid (DNA) is a molecule that encodes the genetic instructions used in the development and functioning of all known living organisms and many viruses. Most DNA molecules are double-stranded helices, consisting of two long biopolymers made of simpler units called nucleotides—each nucleotide is composed of a nucleobases (guanine, adenine, thymine, and cytosine), recorded using the letters G, A, T, and C, as well as a backbone made of alternating sugars (deoxyribose) and phosphate groups (related to phosphoric acid. DNA is well-suited for biological information storage as it's backbone is resistant to cleavage, and both strands of the double-stranded structure store the same biological information. A significant portion of DNA (more than 98% for humans) is non-coding and the two strands of DNA run in opposite directions to each other and are therefore anti-parallel. This refers to the direction the 3rd and 5th carbon on the sugar molecule is facing. Attached to each sugar is one of four types of molecules called nucleobases. It is the sequence of these four nucleobases along the backbone that encodes biological information. Under the genetic code, RNA strands are translated to specify the sequence of amino acids within proteins. These RNA strands are initially created using DNA strands as a template in a process called transcription. Within cells, DNA is organized into long structures called chromosomes. During cell division these chromosomes are duplicated in the process of DNA replication, providing each cell its own complete set of chromosomes. Eukaryotic organisms (animals, plants, fungi, and protists) store most of their DNA inside the cell nucleus and some of their DNA in organelles, such as mitochondria or chloroplasts. In contrast, prokaryotes (bacteria and archaea) store their DNA only in the cytoplasm. Within the chromosomes, chromatin proteins such as histones compact and organize DNA. These compact structures guide the interactions between DNA and other proteins, helping control which parts of the DNA are transcribed. Methods have been developed to purify DNA from organisms; modern biology and biochemistry make intensive use of these techniques in recombinant DNA technology. Forensic scientists can use DNA in blood, semen, skin, saliva or hair found at a crime scene to identify a matching DNA of an individual, such as a perpetrator. DNA nanotechnology uses the unique molecular recognition properties of DNA and other nucleic acids to create self-assembling branched DNA complexes with useful properties. Scientists use DNA as a molecular tool to explore physical laws and theories of life. The unique material properties of DNA have made it an attractive molecule for material scientists and engineers interested in micro- and nano-fabrication. Among notable advances in this field are DNA origami and DNA-based hybrid materials.

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Abstract - Bio -04

Scurvy

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Scurvy is a disease resulting from a deficiency of vitamin C, which is required for the synthesis of collagen in humans. The chemical name for vitamin C, ascorbic acid, is derived from the Latin name of scurvy, scorbutus which also provides the adjective scorbutic Humans cannot synthesize vitamin C, which is necessary for the production of collagen and iron absorption. Moreover, we have to obtain it from external sources, i.e. from fruits and vegetables, or some foods which are fortified with vitamin C in order to prevent the vitamin C deficiency known as scurvy. Though scurvy is a very rare disease, it still occurs in some patients - usually elderly people, alcoholics, or those that live on a diet devoid of fresh fruits and vegetables. Similarly, infants or children who are on special or poor diets for any number of economic or social reasons may be prone to scurvy. Scurvy symptoms may begin with appetite loss, poor weight gain, diarrhoea, rapid breathing, fever, irritability, tenderness and discomfort in legs, swelling over long bones, bleeding (haemorrhaging), and feelings of paralysis. As the disease progresses, a scurvy victim may present bleeding of the gums, loosened teeth, petechial haemorrhage of the skin and mucous membranes (a tiny pinpoint red mark), bleeding in the eye, proptopsis of the eyeball (protruding eye), constochondral beading (beading of the cartilage between joints), hyperkeratosis (a skin disorder), corkscrew hair, and sicca syndrome (an autoimmune disease affecting connective tissue). Infants with scurvy will become apprehensive, anxious, and progressively irritable. They often will assume the frog leg posture for comfort when struck with pseudo paralysis. It is common for infants with scurvy to present subperiosteal haemorrhage, a specific bleeding that occurs at the lower ends of the long bones. Physicians initially will conduct a physical exam, looking for symptoms described above. Actual vitamin C levels can be obtained by using laboratory tests that analyze serum ascorbic acid levels (or white blood cell ascorbic acid concentration). Sometimes, radiological procedures are ordered for diagnostic purposes and to see what damage scurvy has already done. Scurvy is treated by providing the patient with vitamin C, administered either orally or via injection. Orange juice usually functions as an effective dietary remedy, but specific vitamin supplements are also known to be effective. Scurvy can be prevented by consuming enough vitamin C, either in the diet or as a supplement.

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Abstract - Bio -05

Synthetic Insulin

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Insulin is a peptide hormone, produced by beta cells of the pancreas, and is central to regulating carbohydrate and fat metabolism in the body. It causes cells in the liver, skeletal muscles, and fat tissue to absorb glucose from the blood. In mammals, insulin is synthesized in the pancreas within the β-cells of the islets of Langerhans and is provided within the body in a constant proportion to remove excess glucose from the blood, which otherwise would be toxic. When control of insulin levels fails, diabetes mellitus can result. As a consequence, insulin is used medically to treat some forms of diabetes mellitus. Patients with type 1 diabetes depend on external insulin (most commonly injected subcutaneously) for their survival because the hormone is no longer produced internally. Patients with type 2 diabetes are often insulin resistant and, because of such resistance, may suffer from a "relative" insulin deficiency. Some patients with type 2 diabetes may eventually require insulin if other medications fail to control blood glucose levels adequately. Over 40% of those with Type 2 diabetes require insulin as part of their diabetes management plan. Scientists started using the recombinant DNA technology for the mass production of insulin. Recombinant insulin is synthesized by inserting the human insulin gene into E.Coli which then produces insulin for human use. The synthesis of human insulin was done using a process similar to the fermentation process used to make antibiotics. The achievement may be the most significant advance in the treatment of diabetes. Insulin is a protein hormone composed of two chains of amino acids: an "A" chain and a "B" chain linked together by two disulfide bonds. The "A" chain is composed of 21 amino acids and the "B" chain of 30 amino acids, each arranged in a uniquely ordered sequence. Proteins are made by translating the genetic information which is carried in a cell's genes. Scientists synthesized in the laboratory genes for the two insulin "A" and "B" chains. Once the genes were synthesized, they were stitched into Plasmids, rings of DNA which are found within the cell. The newly constructed plasmids containing the transplanted genetic material were introduced into a benign E. coli bacterial strain. Once inside the bacteria, the genes were "switched-on" by the bacteria to translate the code into either the "A" chain or the "B" chain proteins found in insulin. When the cells produced sufficient amounts of the "A" and "B" chains, they were harvested to isolate these proteins from the bacteria and purify it. The two chains were then combined chemically in the laboratory. Recombinant human insulin has almost completely replaced insulin obtained from animal sources (e.g. pigs and cattle) for the treatment of insulin-dependent diabetes. A variety of different recombinant insulin preparations are in widespread use today.

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Abstract - Bio -06

Antioxidants

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An antioxidant is a molecule that inhibits the oxidation of other molecules. Oxidation is a chemical reaction that transfers electrons or hydrogen from a substance to an oxidizing agent, producing free radicals. In turn, these radicals can start chain reactions causing damage or death to the cell. Antioxidants terminate these chain reactions by removing free radical intermediates, and inhibit other oxidation reactions. They do this by being oxidized themselves, so antioxidants are often reducing agents such as thiols, ascorbic acid, or polyphenols. Although oxidation reactions are crucial for life, they can also be damaging; plants and animals maintain complex systems of multiple types of antioxidants, such as glutathione, Vitamin C, vitamin A, and vitamin E as well as enzymes such as catalase, superoxide dismutase and various peroxidases. Furthermore insufficient levels of antioxidants, or inhibition of the antioxidant enzymes, cause oxidative stress and may damage or kill cells. Oxidative stress is damage to cell structure and cell function by overly reactive oxygen-containing molecules and chronic excessive inflammation. Oxidative stress seems to play a significant role in many human diseases, including cancers. Not only that but, the use of antioxidants in pharmacology is intensively studied, particularly as treatments for stroke and neurodegenerative diseases. For these reasons, oxidative stress can be considered to be both the cause and the consequence of some diseases. Free radicals contribute to chronic diseases from cancer to heart disease and Alzheimer's disease to vision loss. This doesn't automatically mean that substances with antioxidant properties will fix the problem, especially not when they are taken out of their natural context. The studies so far are inconclusive, but generally don't provide strong evidence that antioxidant supplements have a substantial impact on disease. But keep in mind that most of the trials conducted up to now have had fundamental limitations due to their relatively short duration and having been conducted in persons with existing disease. That a benefit of beta-carotene on cognitive function was seen in the Physicians' Health Follow-up Study only after 18 years of follow-up is sobering, since no other trial has continued for so long. At the same time, abundant evidence suggests that eating whole fruits, vegetables, and whole grains—all rich in networks of antioxidants and their helper molecules—provides protection against many of these scourges of aging.

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Abstract - Bio -07

Osteoporosis

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Osteoporosis is a condition characterized by low bone mass and increased bone fragility, putting patients at risk of fractures, which are major causes of morbidity substantially in older people. Osteoporosis is currently attributed to various endocrine, metabolic and mechanical factors. However, emerging clinical and molecular evidence suggests that inflammation also exerts significant influence on bone turnover, inducing osteoporosis. Numerous pro inflammatory cytokines have been implicated in the regulation of osteoblasts and osteoclasts, and a shift towards an activated immune profile has been hypothesized as important risk factor. Osteoporosis prevention requires adequate calcium and vitamin D intake, regular physical activity, and avoiding smoking and excessive alcohol ingestion. Risk of fracture determines whether medication is also warranted. A previous vertebral or hip fracture is the most important predictor of fracture risk. Bone density is the best predictor of fracture risk for those without prior adult fractures. Age, weight, certain medications, and family history also help establish a person's risk for osteoporotic fractures. All women should have a bone density test by the age of 65 or younger (at the time of menopause) if risk factors are present. Guidelines for men are currently in development. Medications include both antiresorptive and anabolic types. Antiresorptive medications -- estrogens, selective estrogen receptor modulators (raloxifene), bisphosphonates (alendronate, risedronate, and ibandronate) and calcitonins -- work by reducing rates of bone remodelling. Teriparatide (parathyroid hormone) is the only anabolic agent currently approved for osteoporosis in the United States. It stimulates new bone formation, repairing architectural defects and improving bone density. All persons who have had osteoporotic vertebral or hip fractures and those with a bone mineral density diagnostic of osteoporosis should receive treatment. In those with a bone mineral density above the osteoporosis range, treatment may be indicated depending on the number and severity of other risk factors. Chronic inflammation and the immune system remodelling characteristic of ageing, as well as of other pathological conditions commonly associated with osteoporosis, may be determinant pathogenetic factors.

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MICROBIOLOGY
(ORAL PRESENTATIONS)

Abstract - Micro -01

Role Of Herbs In Prevention Of Dental Caries

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Oral diseases are major health problems with dental caries and periodontal diseases among the most important preventable global infectious diseases. Oral health influences the general quality of life and poor oral health is linked to chronic conditions and systemic diseases. The development of dental caries involves acidogenic and aciduric. Gram-positive bacteria Periodontal diseases have been linked to anaerobic Gram-negative bacteria . Given the incidence of oral disease, increased resistance by bacteria to antibiotics, adverse affects of some antibacterial agents currently used in dentistry and financial considerations in developing countries, there is a need for alternative prevention and treatment options that are safe, effective and economical. While several agents are commercially available, these chemicals can alter oral microbiota and have undesirable side-effects such as vomiting, diarrhea and tooth staining. Hence, the search for alternative products continues and natural phytochemicals isolated from plants used as traditional medicines are considered as good alternatives. In this review, plant extracts or phytochemicals that inhibit the growth of oral pathogens, reduce the development of biofilms and dental plaque and reduce the symptoms of oral diseases will be discussed further. Herbal extracts have been successfully used in dentistry as tooth cleaning and antimicrobial plaque agents. As most of the oral diseases are due to bacterial infections and it has been well documented that medicinal plants confer considerable antibacterial activity against various microorganisms including bacteria's responsible for dental caries. Antibacterial activity of some plant species like *Melia azadirachta, Calotropis gigantean, Leucas aspera, Vitex negundo*, and others have been tested. In India plant wealth is greatly exploited for its therapeutic potential and medicinal efficacy to cure dental caries. In several indigenous tooth powders, toothpastes, toilet soaps, the extract from various parts of this tree is used. The use of Neem twigs as tooth brush has been endorsed by the dentists to prevent caries. *Azadirachta indica* mouth wash is reported to inhibit growth of *S. Mutans* and carious lesions. Standard Western medicine has had only limited success in the prevention of periodontal disease and in the treatment of a variety of oral diseases.

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Abstract - Micro -02

Probiotics In Health And Disease

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Probiotics are micro-organisms that some have claimed provide health benefits when consumed. Lactic acid bacteria (LAB) and bifidobacteria are the most common types of microbes used as probiotics, but certain yeasts and bacilli may also be used. Probiotics are commonly consumed as part of fermented foods with specially added active live cultures, such as in yogurt, soy yogurt, or as dietary supplements.Studies are examining whether probiotics affect mechanisms of intestinal inflammation, diarrhea, urogenital infections or allergies. When a person takes antibiotics, both the harmful bacteria and the beneficial bacteria are killed. A reduction of beneficial bacteria can lead to digestive problems, such as diarrhea, yeast infections and urinary tract infections. The possibility that supplemental probiotics affect such digestive issues is unknown, and remains under study. Researchers believe that some digestive disorders happen when the balance of friendly bacteria in the intestines becomes disturbed. This can happen after an infection or after taking antibiotics. Intestinal problems can also arise when the lining of the intestines is damaged. These friendly organisms may also help fight bacteria that cause diarrhea. Probiotics, microorganisms that have a favorable influence on physiologic and pathological processes of the host by their effect on the intestinal flora, may play a role in improving human health. One of the putative effects is the modulation of immune function. Thus, the mucosal immune system and methods to assess its function are reviewed briefly. Probiotic modulation of humoral, cellular and nonspecific immunity is reviewed, with emphasis placed on immune response in disease models. There are very few reports of human intervention studies with probiotics. However, some of the possible future directions for research with respect to probiotics, immunity, and human health are discussed. Although the application of probiotics has demonstrated trends with respect to altered aspects of immune response, the underlying mechanisms by which that occurs are unclear.

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Abstract - Micro -03

Extended Spectrum Beta Lactamase

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The first β-lactamase was identified in an isolate of Escherichia coli in 1940. The spectrum of β-lactam antibiotics susceptible to hydrolysis by these enzymes. Typically, they derive from genes for TEM-1, TEM-2, or SHV-1 by mutations that alter the amino acid configuration around the active site of these β-lactamases. This extends the spectrum of β-lactam antibiotics susceptible to hydrolysis by these enzymes. An increasing number of ESBLs not of TEM or SHV lineage have recently been described. The presence of ESBLs carries tremendous clinical significance. The ESBLs are frequently plasmid encoded. Plasmids responsible for ESBL production frequently carry genes encoding resistance to other drug classes (for example, aminoglycosides). Therefore, antibiotic options in the treatment of ESBL-producing organisms are extremely limited. Carbapenems are the treatment of choice for serious infections due to ESBL-producing organisms, yet carbapenem resistant isolates have recently been reported. ESBL-producing organisms may appear susceptible to some extended-spectrum cephalosporins. However, treatment with such antibiotics has been associated with high failure rates. There is substantial debate as to the optimal method to prevent this occurrence. It has been proposed that cephalosporin breakpoints for the *Enterobacteriaceae* should be altered so that the need for ESBL detection would be obviated. In common to all ESBL detection methods is the general principle that the activity of extended-spectrum cephalosporins against ESBL-producing organisms will be enhanced by the presence of clavulanic acid. ESBLs represent an impressive example of the ability of gram-negative bacteria to develop new antibiotic resistance mechanisms in the face of the introduction of new antimicrobial agents. Therefore, antibiotic options in the treatment of ESBL-producing organisms are extremely limited. Carbapenems are the treatment of choice for serious infections due to ESBL-producing organisms, yet carbapenem-resistant isolates have recently been reported. ESBL-producing organisms may appear susceptible to some extended-spectrum cephalosporins. However, treatment with such antibiotics has been associated with high failure rates.

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Abstract - Micro -04

Macrophage Interaction In Persistent Viral Infection

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Macrophages are thought to be the first cell to identify the foreign antigen and eliminate them non specifically. It is also important in initiating the specific immune response that offer a complete defense and immunity against them during repeated infections. But macrophages are found to be a safe site for many organisms that resist intracellular digestion. There are viruses that enters the macrophages non specifically and persist in them for life time. This is possible to certain that carries a gene that inhibits the cellular apoptosis, thus making the macrophage immortal. Such viruses that persist in the macrophages do not normally undergo a replicative cycle. Thus they establish a latency where it lives in a compromised state with the host without getting eliminated. The latent viruses will periodically undergo reactivation and sometimes produces a clinical illness. The reactivation is more frequent in immunocompromised and immunosuppresed individuals. The problems are more in AIDS patients which severely deteriorate the quality of life. Certain viruses like the Herpes viruses and measles virus, inherently has the capacity to establish latency. It is evident that the viruses are not neurotropic but still associated with complications of the nervous system. Those viruses are isolated from the macrophages from the apparently healthy individuals. They may persist in the macrophages in the brain tissue and in the macrophages surrounding the ganglion. It should be understood that these viruses do not produce any damage to the neuron as they are non neurotropic. In measles the late compication due to the persistence of the virus in the glial is an autoimmune mechanism. The frequent reactivation of the virus in the glial cells induces interleukin production. This leads to aberrant expression of self MHC molecule that in turn attracts the immune attack. Similar mechanism is also evident in some slow viral infection like visna, meidi and kuru. In general these latent viruses do not produce a clinical illness unless they get an opportunity to multiply. Though the environment plays a major, the main factor that is responsible is the impaired immune response.

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Abstract - Micro -05

Hiv Structure And Enzymes Associated With It

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HIV is spherical in shape and has a diameter of 1/10,000 of a millimeter. The outer coat of the virus, known as the viral envelope, is composed of two layers of fatty molecules called lipids, taken from the membrane of a human cell when a newly formed virus particle buds from the cell. Embedded throughout the viral envelope are proteins from the host cell, as well as 72 copies (on average) of a complex HIV protein known as Env. These Env copies protrude or spike through the surface of the virus particle (called a "virion"). Env consists of a cap made of three molecules called glycoprotein 120 (gp120), and a stem consisting of three molecules called gyclycoprotein 41 (gp41) that anchor the structure in the viral envelope. Much of the research to develop a vaccine to prevent HIV infection has focused on these envelope proteins.Within the viral envelope is a bullet-shaped core or capsid, made up of 2,000 copies of the viral protein, p24. The capsid surrounds two single strands of HIV RNA, each of which has a complete copy of the virus's genes. HIV has three structural genes (gag, pol, and env) that contain information needed to make structural proteins for new virus particles. The env gene, for example, codes for a protein called gp160 that is broken down by a viral enzyme to form gp120 and gp41, the components of the *env* protein.HIV-1 integrase is a multidomain enzyme which is required for the integration of viral DNA into the host genome. It is one of three enzymes of HIV, the others being the Reverse Transcriptase and the Protease. It is an attractive target for therapeutic drug design. We review the structures of various integrase fragments, the core domain with inhibitors bound, and propose a model for DNA binding.HIV-1 protease is a retroviral aspartyl protease (retro pepsin) that is essential for the life-cycle of HIV, the retrovirus that causes AIDS.HIV protease cleaves newly synthesised poly proteins at the appropriate places to create the mature protein components of an infectious HIV virion. Without effective HIV protease, HIV virions remain un infectious. Thus, mutation of HIV protease's active site or inhibition of its activity disrupts HIV's ability to replicate and infect additional cells, making HIV protease inhibition the subject of considerable pharmaceutical research.

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MICROBIOOGY (POSTER PRESENTATIONS)

Abstract - Micro -01

Mitochondrial DNA

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Mitochondrial DNA (mtDNA or mDNA) is the DNA located in organelles called mitochondria, structures within eukaryotic cells that convert chemical energy from food into a form that cells can use, adenosine triphosphate (ATP). Nearly all of the DNA present in eukaryotic cells can be found in the cell nucleus, and in plants, the chloroplast as well. In humans, mitochondrial DNA can be assessed as the smallest chromosome coding for 37 genes and containing approximately 16,600 base pairs. Human mitochondrial DNA was the first significant part of the human genome to be sequenced. In most species, including humans, mtDNA is inherited solely from the mother. The DNA sequence of mtDNA has been determined from a large number of organisms and individuals (including some organisms that are extinct), and the comparison of those DNA sequences represents a mainstay of phylogenetics, in that it allows biologists to elucidate the evolutionary relationships among species. It also permits an examination of the relatedness of populations, and so has become important in anthropology and field biology. Mitochondrial DNA contains 37 genes, all of which are essential for normal mitochondrial function. Thirteen of these genes provide instructions for making enzymes involved in oxidative phosphorylation. The remaining genes provide instructions for making molecules called transfer RNAs (tRNAs) and ribosomal RNAs (rRNAs), which are chemical cousins of DNA. These types of RNA help assemble protein building blocks (amino acids) into functioning proteins.

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Abstract - Micro -02

Mouth Is The Mirror Of The Body

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Oral clinicians emphasize that mouth is a part of the body and not merely a gateway for delicacies. The oral cavity has an important anatomical location and plays an important role in many critical physiologic processes, such as digestion, respiration, and speech. The oral cavity might well be thought as window to the body because oral manifestations accompany many systemic diseases. In most cases, oral involvement precedes the appearance of other symptoms or lesions of systemic diseases at other locations. These oral manifestations must be properly recognized if the patient is to receive appropriate diagnosis and referral for treatment. This poster intends to give a general overview of conditions that have oral manifestations but also involve other organ systems. The mouth is a mirror of health or disease. As the gateway to the body, the mouth can have a constant barrage of invaders like bacteria, viruses, parasites, and fungi. The oral manifestation of various systemic diseases develop lesions on the oral mucosa, tongue, gingiva, dentition, periodontium, salivary glands, facial skeleton, extraoral skin and other related structures. In many cases the oral clues are the first and sometimes even the only evidence of a disturbed state e.g. the much de- scribed Koplik's spots in the buccal mucosa which precede the cutaneous eruption of measles. In other cases, the oral symptoms and/or signs may parallel the complaints and clues elsewhere in the body. Thus, the simultaneous development of an erosive lesion on the buccal mucosa near the angle of lips along with a butterfly rash on the face is presumptive of lupus erythematosus. Lastly, in still other situations, the oral reflections follow the evidence in other parts of the body, like in pemphigus, where the bullae may erupt on the skin days, weeks, or months before the oral ulcers can be demonstrated. Thus oral cavity is an important diagnostic area because it contains derivatives of all of the primary germinal layers and includes tissues not demonstrable anywhere else in the body. It is also because of its role played in diagnosing a number of systemic diseases just because of their oral manifestations.

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Abstract - Micro -03

Risk of Bacteraemia In Dental Procedure

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Bacteria are introduced into the bloodstream by dental work, cuts, or infection outside the heart (such as pharyngitis, pneumonia, or urinary tract infections). There is an abnormal structure inside the heart to which the blood-borne bacteria (bacteremia) can adhere, usually to one of the heart valves. The abnormality might be acquired (such as an artificial valve or a valve damaged by rheumatic fever) or congenital (the valve was abnormal at birth). The abnormality might otherwise be inconsequential and of no medical concern, except for the serious risk of endocarditis. When bacterial endocarditis occurs, the bacteria build growths called vegetations on the heart valves, which can prevent them from opening and closing properly. Pieces of the vegetations can break off and travel (embolize) to other parts of the body, where they can cause sudden blockage of blood flow to arms, legs, and organs, resulting in painful limb loss, strokes, heart attacks, and serious injury to the bowel or kidneys. Abnormal Heart Structures. Certain people are at higher risk of developing bacterial endocarditis than others. Any bacterial infection - such as pharyngitis (for example, strep throat), skin infection, pneumonia, bacterial sinusitis, or a urinary tract infection - can be an opportunity for bacteria to enter the bloodstream. The highest level of oral health should be maintained to reduce potential sources of bacteria. Poor dental hygiene or other dental disease (such as periodontal or periapical infections) may induce bacteremia even in the absence of the additional risk associated with invasive dental procedures. People who no longer have their natural teeth are not free from the risk of bacterial endocarditis.Ulcers caused by ill-fitting dentures should be promptly treated, since they may be a source of bacteremia. Because the symptoms of bacterial endocarditis can be vague, patients at risk should consult a doctor about fever, sweating, chills, loss of appetite or weight loss, pallor, headache, weakness, or tiredness that does not disappear in two to three days. More dramatic symptoms, such as severe abdominal or flank pain, bloody urine, shortness of breath, stroke, or shock may also occur.Treatment of endocarditis always requires a prolonged course of intravenous antibiotics, which is begun in the hospital but can sometimes be finished in the patient's home. Heart surgery is sometimes necessary to eradicate the infection.

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Abstract - Micro -04

Biomedical Waste Management

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Interaction of micro– (internal) and macro– (surrounding) environment of human beings determines the status of health of an individual or of community at–large. On daily basis, generation and disposal of biomedical wastes has become a emerging problem not only in India but the world over. These are being produced during the process of sampling, testing, diagnosis, therapy, immunization and surgery of humans, animals, and in research experiments. Several categories of biomedical wastes have been discussed along with steps involved in the management of biowaste include segregation, storage in containers, labeling, handling, transport, treatment, disposal and waste minimization. Potential implications of biomedical wastes include transmission of diseases like Hepatitis B, C, E, dengue and HIV through improperly contained contaminated sharps; proliferation and mutation of pathogenic microbial population in the municipal waste through dumping of untreated biomedical waste; physical injury and health hazards. Certain other implications include degradation of the environment esthetically by careless disposals, having negative effect on public health; increased risk of nosocomial infections; change of microbial ecology and spread of antibiotic resistance; increased density of vector population, resulting in spread of diseases in public. Sensitization and public awareness is important to protect environment and public health globally. The biomedical waste produced in the course of health care activities carries a higher potential for infection and injury than any other type of waste. Inappropriate handling of biomedical waste may have serious public health consequences and a significant impact on the environment. Managing these wastes is a challenging task due to unpredictable variation in the load on common biomedical waste treatment facility. A case study is presented that predicts the waste incineration at common biomedical waste treatment facility.

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Abstract - Micro -05

ADC AND CDC Sterilisation Protocols In Dentistry

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The U.S. Centers for Disease Control and Prevention (CDC) and Animal Disease Control (ADC) recommends that only heat sterilization be used for all reusable devices entering the oral cavity. However, chemical disinfection is still employed for reprocessing dental devices in many areas of the world. In an analysis of a Florida dental practice responsible for nosocomial human immunodeficiency virus (HIV) transmissions, the possible role of contaminated devices was deemed unlikely in part because they were subjected to high–level disinfection with 2% glutaraldehyde. Disease transmissions have, however, been documented for endoscopes used in diagnostic and surgical procedures even after this treatment. In some dental devices, lubricants mix with potentially infectious patient materials, and organic debris has been observed in endoscopes after cleaning. We have investigated whether lubricants can render high–level chemical disinfection procedures ineffective and have addressed the role that some common devices may play in disease transmission. We report here that HIV in whole–blood samples and Pseudomonas aeruginosa in blood and plasma survived high–level disinfection when entrapped in lubricants used in dental hand pieces and endoscopes. We also found that lubricated dental devices used to clean and polish teeth (prophylaxis angles) have the potential to transfer sufficient amounts of blood to infect human lymphocyte cultures with HIV. Practical infection control in the operatory is a multi-step process. Protocol should be updated to include good: identification of high-risk patient populations, barrier technique, aseptic technique, surface disinfection, instrument sterilization, and equipment disinfection and sterilization. These results emphasize the need to subject reusable dental devices to a heat–sterilization protocol that penetrates the lubricant.

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Abstract - Micro -06

Mode of Spread of Infection In Dentistry

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Every day, bacteria and viruses are transmitted between people at home, in the workplace and in the community. Given the number of these organisms found in the mouth and nasopharynx and the potential for aerosolization of blood and saliva during dental procedures, it is likely that transmission occurs frequently in this setting. Indirect evidence that this occurs can be obtained from seroprevalence studies that show that antibodies to a number of viruses found in saliva (such as cytomegalovirus [CMV], influenza virus and respiratory syncytial virus [RSV]) are more common in dentists than in the general population and increase with time from graduation. Carriers of bacteria can be asymptomatic, and transmission to the dental worker and patients can occur if infection control measures, such as use of gloves, masks, protective eye wear and hand hygiene practices are not adhered to.Mycobacterium tuberculosis, the cause of tuberculosis, is spread via the airborne route. Aerosolized bacteria may remain suspended in the air for long periods of time and inhaled into the lungs of a susceptible person. There have been reports of transmission of tuberculosis in the dental setting. S. aureus, including methicillin-resistant S. aureus (MRSA), is one of the commonest causes of community-acquired and hospital-acquired infections. The nature of many dental procedures can place dental team members and patients in close contact with potential pathogens, especially those found in blood. Diseases can be transmitted from the patient to the dental worker, from the dental worker to the patient, or from one patient to another. In the dental setting, possible modes of transmission include direct contact with blood, oral fluids, or other patient materials; indirect contact with contaminated objects (such as instruments, equipment, environmental surfaces, or a team member's contaminated hands); droplet contact, in which spray or spatter containing microorganisms travels a short distance before settling on the mucous membranes of the eyes, nose, or mouth and inhalation of evaporated microorganisms ("droplet nuclei") that can remain airborne for extended periods of time as aerosols. Bacteria capable of causing serious disease are present in the mouth and saliva of patients who may show no symptoms. Simple infection control precautions, such as use of gloves and a mask and effective hand hygiene practices, can prevent transmission to dental personnel, their families and their patients. This is particularly important for drug-resistant microorganisms. Prevention of transmission of tuberculosis requires prior recognition of infected or high-risk patients

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Abstract - Micro -07

Dietary Habits And Dental Caries

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Oral health is related to diet in many ways, for example, nutritional influences on craniofacial development, oral cancer and oral infectious diseases. Dental diseases impact considerably on self-esteem and quality of life and are expensive to treat. The objective of this paper is to review the evidence for an association between nutrition, diet and dental diseases and to present dietary recommendations for their prevention. Nutrition affects the teeth during development and malnutrition may exacerbate periodontal and oral infectious diseases. However, the most significant effect of nutrition on teeth is the local action of diet in the mouth on the development of dental caries and enamel erosion. Dental erosion is increasing and is associated with dietary acids, a major source of which is soft drinks. Despite improved trends in levels of dental caries in developed countries, dental caries remains prevalent and is increasing in some developing countries undergoing nutrition transition. There is convincing evidence, collectively from human intervention studies, epidemiological studies, animal studies and experimental studies, for an association between the amount and frequency of free sugars intake and dental caries. Although other fermentable carbohydrates may not be totally blameless, epidemiological studies show that consumption of starchy staple foods and fresh fruit are associated with low levels of dental caries. In addition, the frequency of consumption of foods containing free sugars should be limited to a maximum of 4 times per day. It is the responsibility of national authorities to ensure implementation of feasible fluoride programmes for their country. Dental diseases include dental caries, developmental defects of enamel, dental erosion and periodontal disease. The main cause of tooth loss is dental caries in which diet plays an important role. Diet also plays a significant aetiological role in dental erosion, the prevalence of which seems to be increasing, and dietary components may contribute to development of enamel defects (e.g. enamel hypoplasia, fluorosis). However, in modern societies, diet and nutrition play a relatively minor role in the aetiology of periodontal disease (gum disease), another cause of tooth loss in adults. This review will mainly focus on the major dental diseases, dental caries and dental erosion.

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PATHOLOGY
(ORAL PRESENTATIONS)

Abstract - Path -01

Threats of Leukoplakia

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Leukoplakia is a condition where areas of keratosis appear as adherent white patches on the mucous membranes of The mechanism of the white appearance is thickening of the keratin layer (hyperkeratosis). The abnormal keratin appears white when it becomes hydrated by saliva, and light reflects off the surface evenly. This hides the normal pink-red color of mucosae (the result of underlying vasculature showing through the epithelium). The causes are as follows. Tobacco smoking or chewing is the most common etiologic factor, with more than 80% of persons with leukoplakia having a positive smoking history. Smokers are much more likely to suffer from leukoplakia than non-smokers. The size and number of leukoplakia lesions in an individual is also correlated with the level of smoking and how long the habit has lasted for.Other sources argue that there is no evidence for a direct causative link between smoking and oral leukoplakia. Cigarette smoking may produce a diffuse leukoplakia of the buccal mucosa, lips, tongue and rarely the floor of mouth.Reverse smoking, where the lit end of the cigarette is held in the mouth is also associated with mucosal changes. Tobacco chewing (smokeless tobacco), e.g. betel leaf and areca nut, called paan, tends to produce a distinctive white patch in a buccal sulcus termed "tobacco pouch keratosis". In the majority of persons, cessation triggers shrinkage or disappearance of the lesion, usually within the first year after stopping. Although the synergistic effect of alcohol with smoking in the etiology of oral cancer is beyond doubt, there is no clear evidence that alcohol is involved in the development of leukoplakia, but it does appear to have some influence.Excessive use of a high alcohol containing mouth wash (> 25%) may cause a grey plaque to form on the buccal mucosa, but these lesions are not considered true leukoplakia. Ultraviolet radiation is believed to a factor in the development of some leukoplakia lesions of the lower lip, where there is usually an association with actinic cheilosis in addition. Candida in its pathogenic hyphal form is occasionally seen in biopsies of idiopathic leukoplakia. It is debated whether candida infection is a primary cause of leukoplakia with or without dysplasia, or a superimposed (secondary) infection that occurs after the development of the lesion. It is known that Candida species thrive in altered tissues.Some leukoplakias with dysplasia reduce or disappear entirely following use of antifungal medication.Smoking, which as discussed above can lead to the development of leukoplakia, can also promote oral candidiasis. Candida in association with leukoplakia should not be confused with white patches which are primarily caused by candida infection, such as chronic hyperplastic candidiasis ("candidal leukoplakia"). The involvement of viruses in the formation of some oral white lesions is well established, e.g. Epstein-Barr virus in oral hairy leukoplakia (which is not a true leukoplakia).

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PATHOLOGY (POSTER PRESENTATIONS)

Abstract - Path -01

Oral Cancer And Its Prevention

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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 neighboring 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, 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. Steps in preventing oral cancer are as follows. Always brush and floss your teeth regularly. An unhealthy mouth reduces your immune system and inhibits your body's ability to fight off potential cancers. Do not smoke (or chew) any type of tobacco product. If you are a smoker, even with a casual habit, make the decision to stop. The risk of developing oral cancer increases with the amount and length of time alcohol and tobacco products are used. Limit exposure to the sun. Exercise regularly - An active lifestyle is known to boost the immune system and help ward off cancer. Choose cancer-fighting foods in diet like beans, berries, cruciferous vegetables (like cabbage and broccoli), dark green leafy vegetables, flaxseed, garlic, grapes, green tea, soy and tomatoes for their role in cancer prevention. Replace frying and grilling with baking, boiling or steaming. Use healthy spices like garlic, ginger and curry powder for added flavour. visiting dentist or dental hygienist regularly (at least every six months) and ask for an oral cancer screening to be done. Conduct a self exam at least once a month.

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PHARMACOLOGY (ORAL PRESENTATIONS)

Abstract - Pharma -01

Adverse drug reactions

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Adverse drug reaction is defined as "an appreciably harmful or unpleasant reaction, resulting from an intervention related to the use of a medicinal product, which predicts hazard from future administration and warrants prevention or specific treatment, or alteration of the dosage regimen, or withdrawal of the product. The World Health Organization defines it as any noxious, unintentional, and undesired effect of a drug, which occurs at doses used in humans for prophylaxis, diagnosis, or therapy. Adverse drug reactions may be separated into two groups, Type A and Type B. Characteristics Type A reactions include: higher than normal dose administered, impaired metabolism or excretion, or very sensitive individuals. These reactions are often found in the FDA approved product labeling. Type B reactions are idiosyncratic and usually unrelated to the drug's known pharmacology. Adverse drug reactions are classified into .Dose-related (Augmented), non-dose-related (Bizarre), dose-related and time-related (Chronic), time-related (Delayed), withdrawal (End of use), and failure of therapy (Failure). Timing, the pattern of illness, the results of investigations, and re-challenge can help attribute causality to a suspected adverse drug reaction. Management includes withdrawal of the drug if possible and specific treatment of its effects. Though NSAIDs are generally safe, as many as 30% of NSAIDs users suffer from various side effects. The adverse drug reactions are most frequent with NSAIDs are nausea,vomiting,indigestion/upset stomach (dyspepsia), stomach bleeding,stomach ulcers.These digestive problems are a direct result of NSAIDs effects on prostaglandins. With the exception of aspirin (which is heart-healthy in certain situations), NSAIDs carry an increased risk of cardiovascular disease. NSAIDs' effects on the prostaglandin also effect the kidneys, making them less efficient at filtering and eliminating wastes from the body.Some common signs of an NSAID's adverse drug reaction on the kidneys may include salt and water retention (bloating) or hypertension (high blood pressure). More serious conditions may result in pain of the kidneys, a reduction in the amount of urine, or changes in the urine. If these symptoms sound non-specific, it's because they are often very general, so it's best to see a doctor immediately if there are any issues related to urination.Use of NSAIDs has been linked to erectile dysfunction,. Middle-aged men regularly taking NSAIDs are up to 2.4 times more likely to suffer from erectile dysfunction. Photosensitivity is also associated with NSAIDS.All adverse effects of NSAIDS are highlighted in this paper.

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Abstract - Pharma -02

Death Dose

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Morphine is a very strong painkiller. Morphine overdose occurs when a person intentionally or accidentally takes too much of the medicine. The prescription pain killers in combination with the alcohol can cause respiratory depressant that slows breathing. The respiratory depressant can also lead to death..It's not just an issue among teenagers. In fact, rates of accidental overdose among teens, while still a major public health problem, are actually going down. .In fact, males in their 40s and 50s who start off with a prescription for back pain and die from an accidental overdose several years later are dying in significant numbers. It is a common sentiment, and a common scenario a person genuinely needs opioids but becomes addicted to the relief they provide. Rummler still had outstanding prescriptions for hydrocodone and clonazepam at the time of his death, and empty prescription bottles were in his house when the police arrived. His official cause of death was mixed drug toxicity caused by opiates and benzodiazepines Accidental prescription drug overdoses. Patients would be more careful about the storing and disposal of their medications along with how they take them. And, most importantly, pharmacies would keep a watchful eye on all of the substances each of their customers. Possible medication error death claims may be based on wrong medication / prescription. Some medications have similar names or similar packaging, which can lead to a nurse, pharmacist or other medical professional carelessly giving a patient the wrong medication. Sometimes the wrong medication is given because the nurse was in a hurry and didn't double check, the medication was shelved wrong, the doctor prescribed the wrong medication, or the patient was given another patient's medication. Wrong dose of medication/ prescription. When patients are given the wrong dose of a medication, it is usually because of the doctor prescribed the wrong dose, the nurse administered the wrong dose of medication, the pharmacist filled the prescription wrong or the manufacturer of compounding pharmacy made the medication wrong. Many of the wrong dose death cases involve young children who were negligently given an adult dosage of a medication. This paper highlights the various death dose of prescription drugs.

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Abstract - Pharma -03

Liposomal Drug Delivery System For Dental Manangement

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Liposomes are mainly used in drug delivery due to their unusual yet unique properties. A liposome is able to encapsulate a region of aqueous solution inside a water repelling membrane . This otherwise called hydrophobic membrane will not allow dissolved hydrophilic solute to readily pass through the lipids. Hydrophobic chemicals on the other hand can be dissolved into the membrane which allows liposome to carry both hydrophobic and hydrophilic molecules. The molecules are delivered to sites of action when the lipid bilayer fuses with the other bilayer such as the cell membrane. Another way of delivering drugs is by targeting the endocytosis events. Liposomes can be made as targets for macrophages in the body. The drugs are released while the liposomes are being digested by the macrophage. Endocytosis in other cells can be triggered by administrating liposomes decorated with opsonins and ligands Artificial cells are synthesized by using liposome as models. In some liposomes, dissolved aqueous drugs will exist in a charged state. As the pH within the liposome naturally neutralizes, the drug will in turn also be neutralized. This allows it to pass freely through the necessary membrane. By making liposomes in a solution of DNA they can be delivered past the lipid bilayer. Liposomes that contain low pH can be constructed such that dissolved aqueous drugs will be charged in solution. As the pH naturally neutralizes within the liposome, the drug will also be neutralized, allowing it to freely pass through a membrane. These liposomes work to deliver drug by diffusion rather than by direct cell fusion. The development of liposomal formulations that can adsorb to the human dental enamel is to physically protect the teeth against detrimental processes, such as tooth wear, acidic challenges and dental caries. So the liposomal drug delivery system is used in the field of dentistry.The potential of liposomes as a drug delivery system for use in the oral cavity has been investigated. Specifically targeting for the teeth, the in vitro adsorption of charged liposomal formulations to hydroxyapatite (HA), a common model substance for the dental enamel.An appropriate liposomal drug delivery system intended for use in the oral cavity seems to be dependent on the liposomal formulation. Negatively charged DPPC/DPPA-liposomes seem to be most suitable for use in the oral cavity as they were found be the least reactive with the components of parotid saliva.

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Abstract - Pharma -04

Local Drug Delivery System

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Pharmaceutical invention and research are increasingly focusing on delivery systems which enhance desirable therapeutic objectives while minimizing side effects. The method by which a drug is delivered can have a significant effect on its efficacy. Some drugs have an optimum concentration range within which maximum benefit is derived, and concentrations above or below this range can be toxic or produce no therapeutic benefit at all. On the other hand, the very slow progress in the efficacy of the treatment of severe diseases, has suggested a growing need for a multidisciplinary approach to the delivery of therapeutics to targets in tissues. From this, new ideas on controlling the pharmacokinetics, pharmacodynamics, non-specific toxicity, immunogenicity, biorecognition, and efficacy of drugs were generated. These new strategies, often called drug delivery systems (DDS), are based on interdisciplinary approaches that combine polymer science, pharmaceutics, bioconjugate chemistry, and molecular biology. Nanoparticles and nanoformulations have already been applied as drug delivery systems with great success; and nanoparticulate drug delivery systems have still greater potential for many applications, including anti-tumour therapy, gene therapy, AIDS therapy, radiotherapy, in the delivery of proteins, antibiotics, virostatics, vaccines and as vesicles to pass the blood-brain barrier. Nanoparticles provide massive advantages regarding drug targeting, delivery and release and, with their additional potential to combine diagnosis and therapy, emerge as one of the major tools in nanomedicine. The main goals are to improve their stability in the biological environment, to mediate the bio-distribution of active compounds, improve drug loading, targeting, transport, release, and interaction with biological barriers. The cytotoxicity of nanoparticles or their degradation products remains a major problem, and improvements in biocompatibility obviously are a main concern of future research. Recent trends indicate that multiparticulate drug delivery systems are especially suitable for achieving controlled or delayed release oral formulations with low risk of dose dumping, flexibility of blending to attain different release patterns as well as reproducible and short gastric residence time. The release of drug from microparticles depends on a variety of factors including the carrier used to form the multiparticles and the amount of drug contained in them. Consequently, multiparticulate drug delivery systems provide tremendous opportunities for designing new controlled and delayed release oral formulations, thus extending the frontier of future pharmaceutical development.The various local drug delivery methods are presented in a systematic way .

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Abstract - Pharma -05

Scope of Pharmacology In Periodontal Diseases

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Periodontal disease is an infectious disease but factors like environmental, physical, social and host stresses may affect and modify disease expression. Certain systemic disorders affecting the neutrophil, monocyte/macrophage and lymphocyte function result in altered production or activity of host inflammatory mediators which may affect the initiation and progression of gingivitis and periodontitis. It is becoming clear that variations in inflammatory response are a major determinant in susceptibility to periodontitis. However, our understanding of the relationship of the causal agents in periodontitis to the pathogenesis is not as clear as we once thought, and thus therapies based on etiopathogenesis are similarly in question. We are entering a new era of therapeutic discovery that may have a major impact on our management of the periodontal diseases. Fundamentally, periodontitis is an irreversible condition and once both soft and hard tissues are lost, the healthy periodontal architecture cannot be completely or predictably rebuilt. The discovery of new families of lipid mediators of resolution of inflammation (the lipoxins) and eicosapentaenoic-acid- and docosahexaenoic-acid-derived chemical mediators (the resolvins and protectins) opens new avenues to designing resolution-targeted therapies to control the unwanted side effects of excessive inflammation. The novel protective and therapeutic actions of pro-resolution lipid mediators following microbial challenge are mediated by regulation of the local and systemic inflammatory response that has a direct impact on the organization of the biofilm (plaque) and suggests a new paradigm in clinical periodontal therapeutics. The potential effects of periodontal disease on a wide range of organ systems like the cardiovascular, endocrine, reproductive and the respiratory system. Antimicrobial agents are of value in the management of certain types of periodontal disease, notably early onset, juvenile and refractory periodontitis. The diagnosis of these conditions is often made on clinical grounds but microbial sampling of the pocket flora is of value in determining the type of antimicrobial therapy. Tetracyclines and metronidazole are the agents most frequently used in the management of periodontal disease. Both drugs can be given systemically or applied topically into the periodontal pocket. The latter route is preferred since the dose is reduced considerably, but the local tissue concentration is increased. The efficacy of local drug delivery is dependent upon the release kinetics of the drug from the delivery vehicle. Although local application can be time consuming, it reduces the risk of adverse reactions and drug interactions. The tetracyclines have the additional advantage of inhibiting collagenases. This article sheds light on the effects of periodontal disease on different systemic conditions, the possible mechanisms involved.

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PHARMACOLOGY (POSTER PRESENTATIONS)

Abstract - Pharma -01

Drug Delivery And Nanotechnology

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Nanotechnology received a lot of attention with the never-seen-before enthusiasm because of its future potential that can literally revolutionize each field in which it is being exploited.. Many of the current “nano” drug delivery systems, happen to be in the nanometer range, such as liposomes, polymeric micelles, nanoparticles, dendrimers, and nanocrystals. The benefits of nanotechnology are enormous and so these benefits should be maximized while efforts are made to reduce the risks. Nanotechnology is already being used as the basis for new, more effective drug delivery systems and is in early stage development as scaffolding in nerve regeneration research. In the future, nanotechnology will also aid in the formation of molecular systems that may be strikingly similar to living systems. There are numerous examples of disease-fighting strategies in the literature, using nanoparticles. Often, particularly in the case of cancer therapies, drug delivery properties are combined with imaging technologies, so that cancer cells can be visually located while undergoing treatment. The predominant strategy is to target specific cells by linking antigens or other biosensors (e.g. RNA strands) to the surface of the nanoparticles that detect specialized properties of the cell walls. Once the target cell has been identified, the nanoparticles will adhere to the cell surface, or enter the cell, via a specially designed mechanism, and deliver its payload. One the drug is delivered, if the nanoparticle is also an imaging agent, doctors can follow its progress and the distribution of the cancer cell is known. Such specific targeting and detection will aid in treating late-phase metastasized cancers and hard-to-reach tumors and give indications of the spread of those and other diseases. It also prolongs the life of certain drugs that have been found to last longer inside a nanoparticle than when the tumor was directly injected, since often drugs that have been injected into a tumor diffuse away before effectively killing the tumor cells. The Nanotechnology in general and as it relates to drug delivery in humans has been reviewed in this poster.

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Abstract –Pharma-02

Use of cognitive enhancers in alzheimers disease

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Alzheimer's disease is a progressive disease that destroys memory and other important mental functions.It's the most common cause of dementia — a group of brain disorders that results in the loss of intellectual and social skills. These changes are severe enough to interfere with day-to-day life. In Alzheimer's disease, the connections between brain cells and the brain cells themselves degenerate and die, causing a steady decline in memory and mental function. The cause of Alzheimer's disease is unknown, but symptoms of the disease may be associated with the selective loss of brain cells known as cholinergic neuronsin affected areas of the brain. There are certain pathological hallmarks of Alzheimer's disease that are found at autopsy, including senile plaques(degenerat-ing neurons twisted around a waxy protein-polysaccharide substance known as amyloid) and neurofibrillarytangles (helical thread-like tangles within neurons).Current Alzheimer's disease medications and management strategies may temporarily improve symptoms. This can sometimes help people with Alzheimer's disease maximize function and maintain independenceThe management of AD focuses on slowing progression, symptom control, maintaining functional status, improving quality of life, minimizing adverse events, and decreasing caregiver stress. Non-pharmacologic therapy includes social support, cognitive rehabilitation , assistance with activities of daily living, multidisciplinary programs , and providing support to care givers. Recent cognitive enhancers for pharmacologic treatment for AD include the cholinesterase inhibitor drug class (donepezil, galantamine and rivastigmine), as well as memantine, a N-methyl-D-aspartic acid (NMDA) receptor antagonist . The acetylcholinesterase inhibitors donepezil and rivastigmine have similar modes of action, increasing the concentration of acetylcholine at the neurotransmitter sites. Galantamine is another acetylcholinesterase inhibitor that increases acetylcholine at neurotransmitter sites, yet also acts by modulating activity at nicotinic receptors. The NMDA receptor antagonist, memantine , works on the glutamatergic system and modulates the neurotransmitter glutamate . The role of cognitive enhancers are presented in this paper.

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Abstract - Pharma -03

Inhalant Steroids-Side Effects

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Inhaled steroids are the mainstay treatment for controlling asthma. The use of inhaled steroids leads to better asthma control fewer symptoms and flare-ups, reduced need for hospitalization. Inhaled steroids help prevent asthma symptoms, they do not relieve asthma symptoms during and attack. Dosages of inhaled steroids in asthma inhalers vary.Inhaled steroids need to be taken daily for best results. Some improvement in asthma symptoms can be seen in one to three weeks after starting inhaled steroids, with the best results seen after three months of daily use.Inhaled steroid medications for better asthma control.Inhaled steroids come in three forms the metered dose inhaler , dry powder inhaler, and nebulizer solutions.Inhaled steroids have few side effects, especially at lower doses. If you are taking higher doses, thrush and hoarseness may occur. Rinsing the mouth, gargling after using the asthma inhaler and using a spacer device with metered dose inhalers will help prevent these side effects. Thrush is easily treated with an antifungal mouthwash.Inhaled steroids are safe for adults and children. Side effects with these anti-inflammatory asthma inhalers are minimal.Beclomethasone,budesonide,flunisolide, fluticasone, mometasone,triamcinolone, budesonide and formoterol are commonly used . All forms of corticosteroids reduce inflammation in the airways that carry air to the lungs and decrease the mucus made by the bronchial tubes. This makes it easier to breathe. Inhaled corticosteroids treat inflammation in the airway, and only very small amounts of the medicine are absorbed into the body. So these medicines don't tend to cause the serious side effects, such as weakening of the bones, that corticosteroids can cause when taken in liquid, pill, or injection form (systemic corticosteroids).Inhaled corticosteroids are the preferred treatment for long-term control of mild persistent, moderate persistent, or severe persistent asthma symptoms in children, teens, and adults. They help control narrowing and inflammation in the bronchial tubes. In general, they are part of daily asthma treatment and are used every day.When steroid tablets are taken for many months or years, harmful side effects are likely and almost inevitable. The list of possible effects is long; it includes mood changes, forgetfulness, hair loss, easy bruising, a tendency toward high blood pressure and diabetes, thinning of the bones (osteoporosis), suppression of the adrenal glands, muscle weakness, weight gain, cataracts, and glaucoma.

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Abstract - Pharma -04

AIDS & DRUGS

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HIV stands for human immunodeficiency virus. This virus severely damages the immune system and causes acquired immune deficiency syndrome, or AIDS, a condition that defeats the body's ability to protect itself against disease.HIV inflicts this damage by infecting immune cells in our bodies called CD4 positive (CD4+) T cells—essential for fighting infections. HIV converts the CD4+ T cells into "factories" that produce more of the HIV virus to infect other healthy cells, eventually destroying the CD4+ T cells.As CD4+ T cells are lost and the immune system weakens, a person becomes more prone to illnesses and common infections. AIDS is diagnosed when a person has one or more of these infections and a CD4+ cell count of less than 200. No vaccine yet exists to protect a person from getting HIV, and there is no cure. However, HIV can be prevented and its transmission curtailed. Drug abuse treatment fosters both of these goals. HIV medications also help prevent HIV transmission and the progression of HIV to AIDS, greatly prolonging lives. A person infected with HIV may look and feel fine for many years and may not even be aware of the infection. In fact, the Centers for Disease Control and Prevention estimates that 1.2 million people are infected with HIV in the United States and that one in five people infected are unaware of it. HIV testing is critical and can help prevent spread of the infection—among those most at risk (e.g., people who abuse drugs) and in general. Getting tested is not complicated. Some tests can even provide results in 20 minutes, although testing is not accurate until about 6–8 weeks after exposure to HIV. That time is needed for HIV antibodies to form in amounts detectable by a standard HIV test.From the beginning of the HIV/AIDS epidemic in the early 1980s until the mid-1990s, HIV infection was almost guaranteed to result in death from AIDS. The number of deaths declined after 1996, when effective treatments were introduced.Antiretroviral drugs are used to treat HIV and HAART is recommended for management of HIV.

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Abstract - Pharma -05

Herbs –Anticancer Choice

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Unlike certain drugs companies, such herbalists have yet to pay millions of dollars to avoid court action over claims that they hid research studies showing negative results. No herb in recent years has been lauded as a health-restorer, only to be subsequently ´withdrawn´ after causing deformity, heart attacks and/or death. Taking a cocktail of prescription medicines, not herbs, is the number one cause of death in states such as Florida.Acacia Arabica Decoction of bark is an astringent lotion for ulcers, cancerous and syphilitic affections; used as a gargle and mouth wash in relaxed sore throat and spongy gums; infusion of the astringent pods is used in diseases of the mucous membranes, sores of mouth and for healing syphilitic ulcers. Basil,Primarily featured in Italian food, basil has been frequently examined to discover the secrets of its health benefits. With its antibacterial, antiviral and antioxidant properties, there's already plenty of reasons to love basil. However, it's got even more goodness locked away in its leaves. New evidence suggests basil can actually decrease carcinogenesis — new tumors — and help protect against cancer. Cardamom,Maybe making cardamom bread was a delightful part of your childhood, but there's now another reason to use the cardamom herbs. Much like many different spices, cardamom has antioxidant properties. This helps to purge the body of free radicals and help prevent carcinogenesis in some lab studies.Cinnamon, even something as common as everyday cinnamon can be used to reduce your risk of cancer. In several different studies, cinnamon has been shown to reduce cancer risk. This may be due to its high levels of iron and calcium. Even as little as a single half-teaspoon of cinnamon every day may be enough to take advantage of its anti-cancer properties.

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Abstract - Pharma - 06

Drug Allergy

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Adverse reactions to medications are common, yet everyone responds differently. One person may develop a rash or other reactions when taking a certain medication, while another person on the same drug may have no adverse reaction at all.Only about 5% to 10% of these reactions are due to an allergy to the medication.An allergic reaction occurs when the immune system overreacts to a harmless substance, in this case a medication, which triggers an allergic reaction. Sensitivities to drugs may produce similar symptoms, but do not involve the immune system.Certain medications are more likely to produce allergic reactions than others. The most common are Antibiotics, such as penicillin, Aspirin and non-steroidal anti-inflammatory medications, such as ibuprofen, Anticonvulsants, Monoclonal antibody therapy, ChemotherapyThe chances of developing an allergy are higher when you take the medication frequently or when it is rubbed on the skin or given by injection, rather than taken by mouth. The primary goal when treating an allergic drug reaction is symptom relief. Symptoms such as rash, hives, and itching can often be controlled with antihistamines, and occasionally corticosteroids.For coughing and lung congestion, drugs called bronchodilators may be prescribed to widen the airways. For more serious anaphylactic symptoms -- life-threatening allergic reactions including difficulty breathing or loss of consciousness -- epinephrine may be given.Occasionally, desensitization is used to treat a penicillin allergy or other drug allergy. This technique decreases your body's sensitivity to particular allergy-causing agents. Tiny amounts of penicillin are injected periodically in increasingly larger amounts until your immune system learns to tolerate the drug. There is a high risk of anaphylaxis associated with this procedure so desensitization is typically only reserved for patients with no other drug therapeutic options.

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Abstract - Pharma - 07

Edible fruits for diabetes

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Diabetes mellitus is a complex metabolic disorder resulting from either insulin insufficiency or insulin dysfunction. Type I diabetes (insulin dependent) is caused due to insulin insufficiency because of lack of functional beta cells. Patients suffering from Type I diabetes are therefore totally dependent on exogenous source of insulin while patients suffering from Type II diabetes are insulin independent (insulin resistance with obesity and diet as contributors), can be treated with dietary changes, exercise and medication with oral hypoglycaemic agents like sulphonyl ureas, biguanides, meglitinides, thiazolinediones or alpha glucosidase inhibitors. Type II diabetes is the more common form of diabetes constituting 90% of the diabetic population. Symptoms of diabetes include hyperglycaemia, polydipsia (unusual thirst) polyuria (frequent urination), polyphagia (extreme hunger) and loss of weight, blurred vision, nausea and vomiting, extreme weakness and tiredness; irritability, mood changes etc.Though pathophysiology of diabetes remains to be fully understood, experimental evidences suggest the involvement of free radicals in the pathogenesis of diabetes. Many recent studies reveal that antioxidants capable of neutralizing free radicals are effective in preventing experimentally induced diabetes in animal models as well as reducing the severity of diabetic complications. As per the studies made on diabetic patients, health practitioners prefer including more amount of fibre rich fruits in their diet. These fruits with low sugar concentration helps in controlling blood sugar level to a maximum extend. Moreover, intake of fibre rich fruits helps in maintaining cholesterol level which in turn normalizes the metabolic rate of the body. It is better to prefer fresh fruits rather than dry fruits for maximum utilization of food intake. Apple, pear, peach, orange, kiwi and plum are fruits favourable for diabetic patients. These fruits are rich with high protein concentration than sugar concentration. Extracts from some fruits like guava helps in lowering blood sugar level. Grape fruit coming under citrus fruit family is yet another favourable fruit helping for maintaining controlled blood glucose level. Intake of these fruits promotes insulin production there by managing diabetes. Certain fruits like Jackfruit, raisins and apricot are rich with more carbohydrate concentration than protein.

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PHYSIOLOGY
(ORAL PRESENTATIONS)

Abstract - Physio -01

Stroke in hypertension

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Stroke is a disease that affects the blood vessel that supplies blood to the brain. A stroke occurs when a blood vessel to the brain is either blocked by a clot (ischemic stroke) or bursts (hemorrhagic stroke). When that happens, part of the brain is no longer getting the blood and oxygen it needs, so it starts to die. Your brain controls your movement and thoughts, so a stroke doesn't only hurt your brain. It also hurts the brain's ability to think and control body functions. Strokes can affect language, memory and vision as well as cause paralysis and other health issue. There are two types of stroke: Ischemic stroke is similar to a heart attack, except it occurs in the blood vessels of the brain. Clots can form either in the brain's blood vessels, in blood vessels leading to the brain, or even blood vessels elsewhere in the body which then travel to the brain. These clots block blood flow to the brain's cells. Ischemic stroke can also occur when too much plaque (fatty deposits and cholesterol) clogs the brain's blood vessels. About 80% of all strokes are ischemic stroke. Hemorrhagic strokes occur when a blood vessel in the brain breaks or ruptures. The result is blood seeping into the brain tissue, causing damage to brain cells. The most common causes of hemorrhagic stroke are high blood pressure and brain aneurysms. An aneurysm is a weakness or thinness in the blood vessel wall that causes it to balloon outward. Common signs and symptoms of a stroke: The most common signs and symptoms of having a stroke include: severe headache, confusion, feeling unsteady or losing co-ordination, slurring words or having difficulty understanding what people are saying, suddenly losing vision or blurred vision, feeling numb or weak (or being paralysed) on one side of the body.

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Abstract - Physio -02

Sprint Vs Marathon

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The sprint: The speed and power of a sprinter comes from the use of fast-twitch muscle fibers. As their name implies, these muscle fibers fire rapidly with great force. But they also tire just as quickly. Fast-twitch fibers aren't any stronger than other muscle fibers, but they use the anaerobic energy system. While both the anaerobic and aerobic systems use carbohydrates for fuel, the anaerobic system uses chemical compounds in the body, rather than oxygen, to break them down. These compounds release waste products that cause the muscles to fatigue completely within minutes thus the short duration of a high-intensity activity. The long workout: The marathon: We can probably all agree that a marathon is "intense," but in reality, it requires a lower intensity physiologically than a sprint because of its duration. This endurance activity requires the use of slow-twitch muscle fibers. They fire more slowly than fast twitch and take a much longer time to fatigue. They rely on the aerobic energy system, which uses oxygen to break up carbohydrates (in the form of glycogen), for fuel. Couple of core reasons being planning and perseverance. A marathon runner has to plan and run the whole 26 miles. Train for it. Conserve the energy to finish it. Be persistent to continue at several points on the way when the common human instinct is to give up. And the most important thing, for someone who has been a sprinter, is to take the leap and give up sprinting to become a marathon runner. Sprinting, a simple form of speed training exercise, offers more than just calorie burning. Certain enzymes become abundant within the body each time sprinting occurs. These enzymes, along with normal cell functions, help the body store more calories and energy within the muscle tissue rather than the fat storages within the body. Through this process, the body steadily depletes all of its fat storages that normally account for weight gain. Sprinting also increases the amount of impact training involved in a workout regimen. The high level of impact involved in sprinting increases bone strength and density. Impact exercises also aid the building of new muscle tissue around the bones and throughout the rest of the body. Sprinting naturally increases the body's endurance strength, making longer cardio and muscle strengthening training sessions easier to complete. Through sprinting and speed training exercise, the body increases its ability to store oxygen, which helps the muscles function in all forms of exercise.

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Abstract - Physio -03

Thalassemia

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Thalassemia is a group of inherited blood disorders that affect the body's ability to produce hemoglobin and red blood cells - patients have a lower-than-normal number of red blood cells in their bodies and too little hemoglobin. In many cases the red blood cells are too small. The bone marrow of people with Thalassemia does not produce enough healthy hemoglobin or red blood cells, which causes anemia and fatigue because the body is short of oxygen. In more severe Thalassemia cases, the patient's organs may be damaged; there is restricted growth, heart failure, liver damage, and even death. People with mild thalassemia may not require any treatment at all. In more severe forms of the disease, the patient may need regular blood transfusions. Doing plenty of exercises and eating a healthy diet can help some of the symptoms of thalassemia, especially fatigue. A complete blood count (CBC) to measure hemoglobin levels, quantities of red blood cells and their size. Not only do patients with thalassemia have less hemoglobin than normal, their red blood cells may be particularly small. Chorionic villus sampling - a piece of the placenta is taken out and checked in the laboratory. This is usually done at the end of the first trimester, around the 11th week of pregnancy. Amniocentesis - a sample of amniotic fluid is taken. This usually occurs during the 16th week of pregnancy. Amniotic fluid is a clear, slightly yellowish liquid that surrounds the fetus. Bone marrow transplant - also called a stem cell transplant. Bone marrow is a spongy tissue that exists in the hollow centers of large bones. Bone marrow cells produce red and white blood cells, hemoglobin and platelets. Complications of thalassemia: Enlarged spleen (splenomegaly) - also known as hypersplenism. The spleen recycles red blood cells. In patients with thalassemia the red blood cells may have an abnormal shape, making it harder for the spleen to recycle them; the red blood cells accumulate in the spleen, making it grow. An enlarged spleen can become overactive - it starts destroying healthy blood cells the patient receives during transfusions. Sometimes the patient may need a splenectomy (surgical removal of the spleen)

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Abstract - Physio -04

Physiology of Shock

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Shock, in physiology, failure of the circulatory system to supply sufficient blood to peripheral tissues to meet basic metabolic requirements for oxygen and nutrients and the incomplete removal of metabolic wastes from the affected tissues. Shock is usually caused by hemorrhage or overwhelming infection and is characterized in most cases by a weak, rapid pulse; low blood pressure; and cold, sweaty skin. Depending on the cause, however, some or all of these symptoms may be missing in individual cases. The most common cause of shock by dilation of the blood vessels is massive bacterial infection, which may be further exacerbated by reductions in total blood volume caused by fluid losses secondary to the infection. Generally, toxins produced by the bacteria are the cause of the dilation. Foreign substances in the bloodstream can also produce a form of shock, called anaphylactic shock, through allergic reactions causing blood vessels to dilate. Another possible cause of shock through vascular dilation is drugs; many anesthetic drugs create a controlled shock that must be carefully monitored by adjusting dosage, and overdoses of several such drugs, including barbiturates and narcotics, produce shock symptoms. In an ischemic stroke, blood supply to part of the brain is decreased, leading to dysfunction of the brain tissue in that area. There are four reasons why this might happen: Thrombosis (obstruction of a blood vessel by a blood clot forming locally)Embolism (obstruction due to an embolus from elsewhere in the body, see below), Systemic hypoperfusion (general decrease in blood supply, e.g., in shock) Venous thrombosis Intracranial hemorrhage is the accumulation of blood anywhere within the skull vault. A distinction is made between intra-axial hemorrhage (blood inside the brain) and extra-axial hemorrhage (blood inside the skull but outside the brain). Intra-axial hemorrhage is due to intraparenchymal hemorrhage or intraventricular hemorrhage (blood in the ventricular system). The main types of extra-axial hemorrhage are epidural hematoma (bleeding between the dura mater and the skull), subdural hematoma (in the subdural space) and subarachnoid hemorrhage (between the arachnoid mater and pia mater). Most of the hemorrhagic stroke syndromes have specific symptoms (e.g., headache, previous head injury).Symptoms: Loss of consciousness, headache, and vomiting usually occurs more often in hemorrhagic stroke than in thrombosis because of the increased intracranial pressure from the leaking blood compressing the brain. If symptoms are maximal at onset, the cause is more likely to be a subarachnoid hemorrhage or an embolic stroke.

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Abstract - Physio -05

Madras Motor Neuron Disease

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Madras motor neuron disease (MMND) is characterized by weakness and atrophy of limbs, multiple lower cranial nerve palsies and sensorineural hearing loss. Isolated MMND cases have been reported from Thailand and Italy. Onset occurs at a young age with a slight male preponderance or equal sex distribution. Parental consanguinity has been reported in some cases. Main clinical features include thin habitus, wasting and weakness predominantly of the distal limb muscles, involvement of facial and bulbar muscles, and pyramidal dysfunction. Multiple cranial nerve palsies particularly involve the 7th, and the 9th to 12th cranial nerves. Hearing impairment was described in all patients. Optic atrophy is reported in some patients. The etiopathogenesis of MMND remains unknown. The majority of cases are sporadic. A few familial cases have been reported, but the mode of inheritance is yet to be determined. Inflammation and/or environmental factors may play a role in the etiology of MMND. Diagnosis is clinical and is supported by the association of benign focal atrophy of the extremities with hearing impairment. Neuroimaging studies may help to distinguish MMND from other motor neuron diseases. Differential diagnoses include amyotrophic lateral sclerosis, spinocerebellar ataxia syndromes, Brown-Vialetto-Van Laere syndrome, progressive muscular atrophy, post-polio progressive muscular atrophy, and spinal muscular atrophy (see these terms). Currently, there is no cure for MMND. Management should involve a multidisciplinary team (neurologists, physical therapists, occupational therapists, palliative care specialists, specialist nurses and psychologists) and should focus on the relief of symptoms. Predominant initial manifestations were impaired hearing with wasting and weakness of distal limb muscles and pyramidal dysfunction. All patients had clinical and/or audiological evidence of hearing impairment. Patients with MMNDV in addition had optic atrophy. Thus, Madras motor neuron disease is clinically a distinct entity with features of amyotrophic lateral sclerosis but with young age of onset and presence of auditory neuropathy. Studies to look for environmental and genetic basis of this intriguing disease are necessary to find the causation of this rare disorder. Currently, there is no cure for MMND. Management should involve a multidisciplinary team (neurologists, physical therapists, occupational therapists, palliative care specialists, specialist nurses and psychologists) and should focus on the relief of symptoms. Symptomatic treatment and supportive care can help patients to maintain their daily living activities. Patients should be offered hearing aids. The disease shows a slowly progressive but benign course. Most of the reported patients survived for over 30 years after the onset of the disease.

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Abstract - Physio -06

Effect of alcohol on nervous system

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Short-term effects of alcohol can take on many forms. The drug alcohol, to be specific ethanol, is a central nervous system depressant with a range of side-effects. Cell membranes are highly permeable to alcohol, so once alcohol is in the bloodstream it can diffuse into nearly every biological tissue of the body. The concentration of alcohol in blood is usually measured in terms of the blood alcohol content. The amount and circumstances of consumption play a large part in determining the extent of intoxication; for example, eating a heavy meal before alcohol consumption causes alcohol to absorb more slowly. After excessive drinking, unconsciousness can occur and extreme levels of consumption can lead to alcohol poisoning and death (a concentration in the blood stream of 0.40% will kill half of those affected. Alcohol may also cause death by asphyxiation from vomit. The long-term effects of alcohol (ethanol) consumption range from cardioprotective health benefits for low to moderate alcohol consumption in industrialized societies with higher rates of cardiovascular disease to severe detrimental effects in cases of chronic alcohol abuse. High levels of alcohol consumption are associated with an increased risk of alcoholism, malnutrition, chronic pancreatitis, alcoholic liver disease, and cancer. In addition, damage to the central nervous system and peripheral nervous system can occur from chronic alcohol abuse. The long-term use of alcohol is capable of damaging nearly every organ and system in the body. The developing adolescent brain is particularly vulnerable to the toxic effects of alcohol. In addition, the developing fetal brain is also vulnerable, and fetal alcohol syndrome (FAS) may result if pregnant mothers consume alcohol. Depression, anxiety and panic disorder are disorders commonly reported by alcohol dependent people. Alcoholism is associated with dampened activation in brain networks responsible for emotional processing. Evidence that the mental health disorders are often induced by alcohol misuse via distortion of brain neurochemistry is indicated by the improvement or disappearance of symptoms that occurs after prolonged abstinence, although problems may worsen in early withdrawal and recovery periods. Psychosis is secondary to several alcohol-related conditions including acute intoxication and withdrawal after significant exposure. Chronic alcohol misuse can cause psychotic type symptoms to develop, more so than with other drugs of abuse. Alcohol abuse has been shown to cause an 800% increased risk of psychotic disorders in men and a 300% increased risk of psychotic disorders in women which are not related to pre-existing psychiatric disorders.

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Abstract - Physio -07

Stress

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Homeostasis is a concept central to the idea of stress. In biology, most biochemical processes strive to maintain equilibrium, a steady state that exists more as an ideal and less as an achievable condition. Environmental factors, internal or external stimuli, continually disrupt homeostasis; an organism's present condition is a state of constant flux moving about a homeostatic point that is that organism's optimal condition for living. Factors causing an organism's condition to diverge too far from homeostasis can be experienced as stress. A life-threatening situation such as a physical insult or prolonged starvation can greatly disrupt homeostasis. On the other hand, an organism's effortful attempt at restoring conditions back to or near homeostasis, often consuming energy and natural resources, can also be interpreted as stress. In such instances, an organism's fight-or-flight response recruits the body's energy stores and focuses attention to overcome the challenge at hand. Cognitive symptoms: Memory problems, Inability to concentrate, Poor judgment, Pessimistic approach or thoughts, Anxious or racing thoughts, Constant worrying. Emotional symptoms: Moodiness, Irritability or short temper, Agitation, inability to relax, Feeling overwhelmed, Sense of loneliness and isolation, Depression or general unhappiness. Measuring stress level independent of differences in people's personalities has been inherently difficult: Some people are able to process many stressors simultaneously, while others can barely address a few. Such tests as the Trier Social Stress Test attempted to isolate the effects of personalities on ability to handle stress in a laboratory environment. Other psychologists, however, proposed measuring stress indirectly, through self-tests. Stress is a person's response to a stressor such as an environmental condition or a stimulus. Stress is a body's method of reacting to a challenge. According to the stressful event, the body's way to respond to stress is by sympathetic nervous system activation which results in the fight-or-flight response. Stress typically describes a negative condition or a positive condition that can have an impact on a person's mental and physical well-being.

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Abstract - Physio -08

Stem cell therapy

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Stem cell therapy is an intervention strategy that introduces new adult stem cells into damaged tissue in order to treat disease or injury. Many medical researchers believe that stem cell treatments have the potential to change the face of human disease and alleviate suffering. The ability of stem cells to self-renew and give rise to subsequent generations with variable degrees of differentiation capacities, offers significant potential for generation of tissues that can potentially replace diseased and damaged areas in the body, with minimal risk of rejection and side effects. There are two types treatments: Autogenic stem cell therapy: This method uses the patient's own stem cells (adult stem cells) which are obtained from the blood, bone marrow etc. Allogenic stem cell therapy: This therapy uses donated stem cells. The disadvantage in this therapy is that in a number of cases these donor stem cells may be rejected. This method of stem cell therapy has not yet been legalised in India. A number of stem cell therapies exist, but most are at experimental stages, costly or controversial, with the notable exception of bone-marrow transplantation. Medical researchers anticipate that adult and embryonic stem cells will soon be able to treat cancer, Type 1 diabetes mellitus, Parkinson's disease, Huntington's disease, Celiac disease, cardiac failure, muscle damage and neurological disorders, and many others. Nevertheless, before stem cell therapeutics can be applied in the clinical setting, more research is necessary to understand stem cell behavior upon transplantation as well as the mechanisms of stem cell interaction with the diseased/injured microenvironment. The development of gene therapy strategies for treatment of intra-cranial tumours offer much promise, and has shown to be successful in the treatment of some dogs; although research in this area is still at an early stage. Using conventional techniques, brain cancer is difficult to treat because it spreads so rapidly. Researchers at the Harvard Medical School transplanted human neural stem cells into the brain of rodents that received intracranial tumors. Within days, the cells migrated into the cancerous area and produced cytosine deaminase, an enzyme that converts a non-toxic pro-drug into a chemotheraputic agent. As a result, the injected substance was able to reduce the tumor mass by 81 percent. The stem cells neither differentiated nor turned tumorigenic.

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Abstract - Physio - 09

Blood disorder

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Blood is living tissue made up of liquid and solids. The liquid part, called plasma, is made of water, salts and protein. Over half of your blood is plasma. The solid part of your blood contains red blood cells, white blood cells and platelets. Blood disorders affect one or more parts of the blood and prevent your blood from doing its job. They can be acute or chronic. Many blood disorders are inherited. Other causes include other diseases, side effects of medicines, and a lack of certain nutrients in your diet. Iron deficiency anemia. In the United States, about 17% of anemia cases among the elderly are attributable to iron-deficiency. Iron is the key oxygen-binding element in hemoglobin, a red blood cell component that allows for oxygen transport and dispersion throughout the body. Also, low iron levels are associated with impaired red blood cell production. Moreover, occult bleeding from the gastrointestinal tract an important cause of iron-deficiency anemia in men and postmenopausal women, and gastrointestinal bleeding is found in about half of all patients with iron deficiency anemia. Leukopenia is a condition of reduced white blood cells (leukocytes). Neutrophils, the most abundant leukocytes, are involved in killing pathogens; thus, leukopenia is associated with an increased risk of bacterial and fungal infections. The myelodysplastic syndromes (MDS) are another group of blood disorders that affect around 2,000 people in the UK. Usually people with MDS make far too many blood cells, but these are mostly defective and not able to do their jobs properly. In fact most of these cells are destroyed before even entering the blood stream meaning that people with MDS have far too few cells in their blood. Aplastic anaemia is another rare blood disorder that results in not enough blood cells being produced. However, unlike MDS and MPN, this disorder does not result in the production of cancerous or abnormal blood cells, rather a lack of healthy blood cells.

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Abstract - Physio - 10

Hashimotto Disease

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Hashimoto's disease is a condition in which your immune system attacks your thyroid, a small gland at the base of your neck below your Adam's apple. The thyroid gland is part of your endocrine system, which produces hormones that coordinate many of your body's activities. Diagnosis begins with a physical examination and medical history. An enlarged thyroid gland may be detectable during a physical exam and symptoms may suggest hypothyroidism. Doctors will then do several blood tests to confirm the diagnosis. The ultrasensitive TSH test is usually the first test performed. This blood test is the most accurate measure of thyroid activity available. Generally, a TSH reading above normal means a person has hypothyroidism. In people who produce too little thyroid hormone, the pituitary makes TSH continuously, trying to get the thyroid to produce more thyroid hormone. The T4 test measures the actual amount of circulating thyroid hormone in the blood. In subclinical hypothyroidism, the level of T4 in the blood is normal, but as the disease progresses, T4 levels drop below normal. Treatment generally depends on whether the thyroid is damaged enough to cause hypothyroidism. In the absence of hypothyroidism, some doctors treat Hashimoto's disease to reduce the size of the goiter. Others choose not to treat the disease and simply monitor their patients for disease progression. Hashimoto's disease, with or without hypothyroidism, is treated with synthetic thyroid hormone. Doctors prefer to use synthetic T4 such as Synthroid rather than synthetic T3 because T4 stays in the body longer, ensuring a steady supply of thyroid hormone throughout the day. The so-called "natural" thyroid preparations made with desiccated animal thyroid are rarely prescribed today. The exact dose of synthetic thyroid hormone depends on a person's age and weight; the severity of the hypothyroidism, if present; the presence of other health problems; and the use of other medications such as cholesterol-lowering drugs that could interfere with the action of synthetic thyroid hormone. Doctors routinely test the blood of patients taking synthetic thyroid hormone and make dosage adjustments as necessary. A normal, healthy thyroid and metabolic state can be restored with the use of synthetic thyroid hormone.

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Abstract - Physio - 11

Salivary bio markers and its application

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Three necessary prerequisites: (i) a simple method for collecting biologic samples, ideally noninvasively; (ii) specific biomarkers associated with health or disease; and (iii) a technology platform to rapidly utilize the biomarkers. Saliva, often regarded as the 'mirror of the body', is a perfect surrogate medium to be applied for clinical diagnostics. Saliva is readily accessible via a totally noninvasive method. Salivary biomarkers, whether produced by healthy individuals or by individuals affected by specific diseases, are sentinel molecules that could be used to scrutinize health and disease surveillance. The visionary investment by the US National Institute of Dental and Craniofacial Research, the discovery of salivary biomarkers, and the ongoing development of salivary diagnostic technologies has addressed its diagnostic value for clinical applications. The availability of more sophisticated analytic techniques gives optimism that saliva can eventually be placed as a biomedium for clinical diagnostics. Analysis of inflammatory biomarkers in saliva could offer an attractive opportunity for the diagnosis of different systemic conditions specifically in epidemiological surveys. The aim of this study was to investigate if certain salivary biomarkers could be used for detection of common systemic diseases. A randomly selected sample of 1000 adults living in Skåne, a county in the southern part of Sweden, was invited to participate in a clinical study of oral health. 451 individuals were enrolled in this investigation, 51% women. All participants were asked to fill out a questionnaire, history was taken, a clinical examination was made and stimulated saliva samples were collected. Salivary concentrations of IL-1β, -6, -8, TNF-α, lysozyme, MMP-8 and TIMP-1 were determined using ELISA, IFMA or Luminex assays. Saliva as a diagnostic fluid has significant biochemical and logistical advantages when compared with blood. Biochemically, saliva is a clear liquid with an average protein concentration of 1.5 to 2 mg/mL. As a consequence of this low protein concentration, it was once assumed that this was a major drawback for using saliva as diagnostic fluid; however, current ultrasensitive analytic detection techniques have eliminated this barrier. Saliva specimen preparation is simple, involving centrifugation before storage and the addition of a cocktail of protease inhibitors to reduce protein degradation for long-term storage.

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Abstract - Physio - 12

High altitude physiology

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The effects of high altitude on humans are considerable. The percentage saturation of hemoglobin with oxygen determines the content of oxygen in our blood. After the human body reaches around 2,100 m (7,000 feet) above sea level, the saturation of oxyhemoglobin begins to plummet. However, the human body has both short-term and long-term adaptations to altitude that allow it to partially compensate for the lack of oxygen. Athletes use these adaptations to help their performance. There is a limit to the level of adaptation; mountaineers refer to the altitudes above 8,000 metres (26,000 ft) as the "death zone", where no human body can acclimatize. Altitude sickness also known as acute mountain sickness (AMS), altitude illness, hypobaropathy, "the altitude bends", or soroche is a pathological effect of high altitude on humans, caused by acute exposure to low partial pressure of oxygen at high altitude. It commonly occurs above 2,400 metres (8,000 feet). It presents as a collection of nonspecific symptoms, acquired at high altitude or in low air pressure, resembling a case of "flu, carbon monoxide poisoning, or a hangover". It is hard to determine who will be affected by altitude sickness, as there are no specific factors that correlate with a susceptibility to altitude sickness. However, most people can ascend to 2,400 metres (8,000 ft) without difficulty. The available amount of oxygen to sustain mental and physical alertness decreases with altitude. Available oxygen drops as the air density itself, the number of molecules (of both oxygen and nitrogen) per given volume, drops as altitude increases. However, the percentage of oxygen in air, at 21%, remains almost unchanged up to 21,000 metres(69,000 ft). The RMS velocities of diatomic nitrogen and oxygen are very similar and thus no change occurs in the ratio of oxygen to nitrogen. Dehydration due to the higher rate of water vapor lost from the lungs at higher altitudes may contribute to the symptoms of altitude sickness. At higher altitudes, our bodies make adjustments: creating more red blood cells to carry oxygen through the bloodstream, pushing air into normally unused portions of the lungs and producing citrate synthase, a special enzyme that helps the oxygen found in hemoglobin make its way into body tissue. High altitude also triggers an increase in our heartbeat, breathing and urination. The low humidity and low air pressure at high altitudes causes moisture from your skin and lungs to evaporate at a faster pace and your body's increased exertion requires even more water to keep it hydrated.

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PHYSIOLOGY (POSTER PRESENTATIONS)

Abstract - Physio -01

Cystic fibrosis

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Cystic fibrosis (CF), also known as mucoviscidosis, is an autosomal recessive genetic disorder that affects most critically the lungs, and also the pancreas, liver, and intestine. It is characterized by abnormal transport of chloride and sodium across an epithelium, leading to thick, viscous secretions. The hallmark signs and symptoms of cystic fibrosis are salty tasting skin, poor growth and poor weight gain despite a normal food intake, accumulation of thick, sticky mucus, frequent chest infections, and coughing or shortness of breath. Males can be infertile due to congenital absence of the vas deferens. Symptoms often appear in infancy and childhood, such as bowel obstruction due to meconium ileus in newborn babies. As the children grow, they must exercise to release mucus in the alveoli. Ciliated epithelial cells in the patient have a mutated protein that leads to abnormally viscous mucus production. The poor growth in children typically presents as an inability to gain weight or height at the same rate as their peers and is occasionally not diagnosed until investigation is initiated for poor growth. The causes of growth failure are multifactorial and include chronic lung infection, poor absorption of nutrients through the gastrointestinal tract, and increased metabolic demand due to chronic illness. Doctors diagnose cystic fibrosis based on the results from various tests. The most commonly used test is a sweat chloride test, which measures the concentration of chloride in sweat. Direct genetic testing to identify the CF mutation is also used. Most U.S. States screen newborns for cystic fibrosis. Cystic fibrosis has no cure. However, treatments have greatly improved in recent years. Treatment may include nutritional and respiratory therapies, medicines, exercise, and more. Early treatment for cystic fibrosis can improve both quality of life and lifespan.CF is due to a mutation in the CF gene on chromosome 7. The CF gene encodes a protein known as the cystic fibrosis Trans membrane regulator (CFTR). The abnormal CFTR protein in patients with CF leads to disruption of chloride channels on the cells.CF is characterized by the production of abnormal mucus that is excessively thick and sticky. The abnormal mucus leads to blockages within the lungs and airways. This leads to repeated, serious lung infections that can damage the lungs. The buildup of mucus makes it easy for bacteria to grow. This leads to repeated, serious lung infections. Over time, these infections can severely damage your lungs. The thick, sticky mucus also can block tubes, or ducts, in your pancreas (an organ in your abdomen)

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Abstract - Physio -02

Atherosclerosis

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Atherosclerosis (also known as arteriosclerotic vascular disease or ASVD) is a specific form of arteriosclerosis in which an artery wall thickens as a result of the accumulation of calcium and fatty materials such as cholesterol and triglyceride. It reduces the elasticity of the artery walls and therefore allows less blood to travel through. This also increases blood pressure. It is a syndrome affecting arterial blood vessels, a chronic inflammatory response in the walls of arteries, caused largely by the accumulation of macrophages and white blood cells and promoted by low-density lipoproteins (LDL, plasma proteins that carry cholesterol and triglycerides) without adequate removal of fats and cholesterol from the macrophages by functional high-density lipoproteins (HDL). It is commonly referred to as a hardening or furring of the arteries. It is caused by the formation of multiple plaques within the arteries" Atherosclerosis starts when high blood pressure, or high cholesterol damage the endothelium," says Richard Stein, MD, national spokesperson for the American Heart Association. "At that point, cholesterol plaque formation begins. Cholesterol invasion, Bad cholesterol, or LDL, crosses damaged endothelium. The cholesterol enters the wall of the artery. Blockage in the coronary arteries, which are responsible for bringing oxygenated blood to the heart, can have symptoms such as chest pain of angina and shortness of breath, sweating, nausea, dizziness or light-headedness, breathlessness or palpitations. An abnormal heart rhythm called arrhythmias, where the heart is either beating too slow or too fast, is also considered a symptom. Carotid arteries are used to supply blood to the brain and neck. Blockage in them present symptoms such as a feeling of weakness, not being able to think straight, difficulty in speaking, being dizzy and difficulty in walking or standing up straight, blurred vision, numbness of the face, arms, and legs, severe headache and losing consciousness. They can stay within the artery wall. There, the plaque grows to a certain size and stops. "Because they don't block blood flow, these plaques may never cause any symptoms," says Stein. They can grow in a slow, controlled way into the path of blood flow. Eventually, they cause significant blockages. Pain on exertion (in the chest or legs) is the usual symptom. The worst-case scenario: plaques can suddenly rupture, allowing blood to clot inside an artery. In the brain, this causes a stroke; in the heart, a heart attack.

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Abstract - Physio - 03

Hypertension

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Hypertension (HTN) or high blood pressure, sometimes called arterial hypertension, is a chronic medical condition in which the blood pressurein the arteries is elevated. Blood pressure is summarised by two measurements, systolic and diastolic, which depend on whether the heart muscle is contracting (systole) or relaxed between beats (diastole). This equals the maximum and minimum pressure, respectively. Normal blood pressure at rest is within the range of 100-140mmHg systolic (top reading) and 60-90mmHg diastolic (bottom reading). High blood pressure is said to be present if it is often at or above 140/90 mmHg. Hypertension is classified as either primary (essential) hypertension or secondary hypertension; about 90–95% of cases are categorized as "primary hypertension" which mIn the UK, about half of people aged over 65, and about 1 in 4 middle-aged adults, have high blood pressure. It is less common in younger adults. Most cases are mildly high (up to 160/100 mm Hg). However, at least 1 in 20 adults have blood pressure of 160/100 mm Hg or above. High blood pressure is more common in people: With diabetes. About 3 in 10 people with type 1 diabetes and more than half of people with type 2 diabetes eventually develop high blood pressure. With certain lifestyle factors that is, those who: Are overweight. Eat a lot of salt. Don't eat sufficient fruit and vegetables. Don't take enough exercise. Drink a lot of coffee (or other caffeine-rich drinks). Drink a lot of alcohol. A substantial body of evidence strongly supports the concept that multiple dietary factors affect blood pressure (BP). Well-established dietary modifications that lower BP are reduced salt intake, weight loss, and moderation of alcohol consumption (among those who drink). Over the past decade, increased potassium intake and consumption of dietary patterns based on the “DASH diet” have emerged as effective strategies that also lower BP. Of substantial public health relevance are findings related to blacks and older individuals. Specifically, blacks are especially sensitive to the BP-lowering effects of reduced salt intake, increased potassium intake, and the DASH diet. In non-hypertensive individuals, dietary changes can lower BP and prevent hypertension. In uncomplicated stage I hypertension (systolic BP of 140 to 159 mm Hg or diastolic BP of 90 to 99 mm Hg), dietary changes serve as initial treatment before drug therapy.

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Abstract - Physio - 04

Anemia

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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 many types of anemia. All are very different in their causes and treatments. Iron-deficiency anemia, the most common type, is very treatable with diet changes and iron supplements. Some forms of anemia like the anemia that develops during pregnancy are even considered normal. However, some types of anemia may present lifelong health problems. 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 conditions such as ulcers, hemorrhoids, gastritis (inflammation of the stomach), and cancer, Use of nonsteroidal anti-inflammatory drugs (NSAIDS) such as aspirinor ibuprofen, which can cause ulcers and gastritis Anemia is a medical condition in which the red blood cell count or hemoglobin is less than normal. For men, anemia is typically defined as hemoglobin level of less than 13.5 gram/100 ml and in women as hemoglobin of less than 12.0 gram/100 ml. Anemia is caused by either a decrease in production of red blood cells or hemoglobin, or an increase in loss or destruction of red blood cells. Some patients with anemia have no symptoms. Others may feel tired, easily fatigued, appear pale, a feeling of heart racing, short of breath, and/or worsening of heart problems. Anemia can be detected by a simple blood test called a complete blood cell count (CBC). The treatment of the anemia varies greatly and very much depends on the particular cause. In severe anemia, there may be signs of a hyperdynamic circulation: tachycardia (a fast heart rate), bounding pulse, flow murmurs, and cardiacventricular hypertrophy (enlargement). There may be signs of heart failure. Chronic anemia may result in behavioral disturbances in children as a direct result of impaired neurological development in infants, and reduced scholastic performance in children of school age. Restless legs syndrome is more common in those with iron-deficiency anemia.

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Abstract - Physio - 05

Fetal circulation

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The fetal circulation is the circulatory system of a human fetus, often encompassing the entire fetoplacental circulation which includes the umbilical cord and the blood vessels within the placenta that carry fetal blood. The fetal circulatory system uses two right to left shunts, which are small passages that direct blood that needs to be oxygenated. The purpose of these shunts is to bypass certain body parts – in particular, the lungs and liver – that are not fully developed while the fetus is still in the womb. The shunts that bypass the lungs are called the foramen ovale, which moves blood from the right atrium of the heart to the left atrium, and the ductus arteriosus, which moves blood from the pulmonary artery to the aorta. Oxygen and nutrients from the mother's blood are transferred across the placenta to the fetus. The enriched blood flows through the umbilical cord to the liver and splits into three branches. The blood then reaches the inferior vena cava, a major vein connected to the heart. Most of this blood is sent through the ductus venosus, also a shunt that passes highly oxygenated blood through the liver to the inferior vena cava and then to the right atrium of the heart. A small amount of this blood goes directly to the liver to give it the oxygen and nutrients it needs. Waste products from the fetal blood are transferred back across the placenta to the mother's blood. Persistent fetal circulation (PFC), also known as persistent pulmonary hypertension of the newborn, is defined as postnatal persistence of right-to-left ductal or atrial shunting, or both in the presence of elevated right ventricular pressure. It is a relatively rare condition that is usually seen in newborns with respiratory distress syndrome, overwhelming sepsis, meconium and other aspiration syndromes, intrauterine hypoxia and ischemia, and/or neonatal hypoxia and ischemia. This condition causes severe hypoxemia, and, as a result, has significant morbidity and mortality. Improved antenatal and neonatal care; the use of surfactant; continuous monitoring of oxygenation, blood pressure and other vital functions; and early recognition and intervention have made this condition even more rare. In modern neonatal intensive care units, anticipation and early treatment of PFC and its complications in sick newborns are commonplace. Thus, severe forms of PFC are only seen on isolated occasions

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Abstract - Physio - 06

Human heart formation by stem cells

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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 multicellular 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 but also maintain the normal turnover of regenerative organs, such as blood, skin, or intestinal tissues. Stem cells are a class of undifferentiated cells that are able to differentiate into specialized cell types. Commonly, stem cells come from two main sources: Embryos formed during the blastocyst phase of embryological development (embryonic stem cells) and Adult tissue (adult stem cells). Both types are generally characterized by their potency, or potential to differentiate into different cell types (such as skin, muscle, bone, etc.).

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Abstract - Physio - 07

Reuse of placental blood

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The placental circulation brings into close relationship two circulation systems: the maternal and the fetal. The supply of blood to the placenta is influenced by various factors, especially by the arterial blood pressure, uterine contractions, tobacco abuse, medications and hormones. Placental blood flow is increased at term and amounts to 500 ml/min (80% of the uterine perfusion). In humans, the placenta averages 22 cm (9 inch) in length and 2–2.5 cm (0.8–1 inch) in thickness, with the center being the thickest, and the edges being the thinnest. It typically weighs approximately 500 grams (1 lb). It has a dark reddish-blue or crimson color. It connects to the fetus by an umbilical cord of approximately 55–60 cm (22–24 inch) in length, which contains two umbilical arteries and one umbilical vein. The umbilical cord inserts into the chorionic plate (has an eccentric attachment). Vessels branch out over the surface of the placenta and further divide to form a network covered by a thin layer of cells. This results in the formation of villous tree structures. On the maternal side, these villous tree structures are grouped into lobules called cotyledons. In humans, the placenta usually has a disc shape, but size varies vastly between different mammalian specie In humans, the placenta averages 22 cm (9 inch) in length and 2–2.5 cm (0.8–1 inch) in thickness, with the center being the thickest, and the edges being the thinnest. It typically weighs approximately 500 grams (1 lb). It has a dark reddish-blue or crimson color. It connects to the fetus by an umbilical cord of approximately 55–60 cm (22–24 inch) in length, which contains two umbilical arteries and one umbilical vein.[4] The umbilical cord inserts into the chorionic plate (has an eccentric attachment). Vessels branch out over the surface of the placenta and further divide to form a network covered by a In preparation for implantation of the blastocyst, the uterine endometrium undergoes "decidualisation". Spiral arteries in decidua are remodeled so that they become less convoluted and their diameter is increased. The increased diameter and straighter flow path both act to increase maternal blood flow to the placenta. The relatively high pressure as the maternal blood fills intervillous space through these spiral arteries bathes the fetal villi in blood, allowing an exchange of gases to take placethin layer of cells. This results in the formation of villous tree structures.

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Abstract - Physio - 08

Deep sea diving

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Deep diving has different meanings depending on the context. Even in recreational diving the meaning may vary: In recreational diving, a depth below about 30 metres (98 ft), where nitrogen narcosis becomes a significant hazard for most divers, may be considered a "deep dive" in recreational diving certification agencies, Deep diving, or Deep diver may be a certification awarded to divers that have been trained to dive to a specified depth range, generally deeper than 30 metres (98 ft). The Professional Association of Diving Instructors (PADI) defines anything from 18 metres (60 ft) to 30 metres (100 ft) as a "deep dive" (other diving organisations vary), and considers deep diving a form of technical diving. It is defined by the level of the diver's diver training, diving equipment, breathing gas, and surface support: In technical diving, a depth below about 60 metres (200 ft) where hypoxic breathing gas becomes necessary to avoid oxygen toxicity may be considered a "deep dive". In professional diving, a depth that requires special equipment, procedures, or advanced training is a deep dive. Deep diving can mean something else in the commercial diving field. For instance early experiments carried out by Comex S.A. (Compagnie maritime d'expertises) using hydrox and trimixattained far greater depths than any recreational technical diving. The open-sea diving depth record was achieved in 1988 by a team of Comex divers who performed pipe line connection exercises at a depth of 534 metres (1,752 ft) in the Mediterranean Sea as part of the Hydra 8 programme. These divers needed to breathe special gas mixtures because they were exposed to very high ambient pressure (more than 50 times atmospheric pressure. Deep diving obviously has more consequences and dangers than basic open water diving. Nitrogen narcosis, or the “narks” or “rapture of the deep”, starts with feelings of euphoria and over-confidence but then lead to numbness and memory impairment similar to alcohol intoxication

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Abstract - Physio - 09

Blood transfusion

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Blood transfusion is generally the process of receiving blood products into one's circulation intravenously. Transfusions are used for various medical conditions to replace lost components of the blood. Early transfusions used whole blood, but modern medical practice commonly uses only components of the blood, such as red blood cells, white blood cells, plasma, clotting factors, and platelets. Units of packed red blood cells are typically only recommended when either a patient's hemoglobin level falls below 10g/dL or hematocrit falls below 30%; recently, this 'trigger' level has been decreased to 7-8g/dL, as a more restrictive strategy has been shown to have better patient outcomes. This is in part due to the increasing evidence that there are cases where patients have worse outcomes when transfused.[2] One may consider transfusion for people with symptoms of cardiovascular disease such as chest pain or shortness of breath. A unit (up to 500 ml) is typically administered over 4 hours. In patients at risk of congestive heart failure, many doctors administer a diuretic to prevent fluid overload, a condition called Transfusion Associated Circulatory Overload or TACO. Acetaminophen and/or an antihistamine such as diphenhydramine are sometimes given before the transfusion to prevent other types of transfusion reactions. Blood is most commonly donated as whole blood by inserting a catheter into a vein and collecting it in a plastic bag (mixed with anticoagulant) via gravity. Collected blood is then separated into components to make the best use of it. Aside from red blood cells, plasma, and platelets, the resulting blood component products also include albumin protein, clotting factor concentrates, cryoprecipitate, fibrinogen concentrate, and immunoglobulins (antibodies). Red cells, plasma and platelets can also be donated individually via a more complex process called apheresis. In developed countries, donations are usually anonymous to the recipient, but products in a blood bank are always individually traceable through the whole cycle of donation, testing, separation into components, storage, and administration to the recipient. This enables management and investigation of any suspected transfusion related disease transmission or transfusion reaction. In developing countries the donor is sometimes specifically recruited by or for the recipient, typically a family member, and the donation immediately before the transfusion.