AROGYA

Department, School of Health Sciences Vol. 1, Issue 1, October, 2023

AROGYA

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THE NEOTIA UNIVERSITY
ज्ञानम् आत्म प्रदीपाय
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School of Health Sciences, The Neotia University

Message from
Vice Chancellor's Desk

It is a great privilege for me to write an introductory note in the first issue of the e-magazine 'AROGYA' of the School of Health Science. The issue is publishing at the juncture of emerging of the New Education Policy-2020 (NEP-20) which proposes the integral approach to build up students with learning of multi-disciplinary subjects in conjunction with the core program of studies. The School of Health Science of our University running the program like i. Applied Psychology, ii. Medical Laboratory Technology, iii. Medical Radiology and Imaging Technology, iv. Physiotherapy, v. Optometry, vi. Operation Theatre Technology etc. to develop human resources on the above areas to serve the nation. The perception on health has evolved over the time. It is the normal condition of the living body that could be disrupted from time to time by the disease as well due to the development of internal pressure like stress. According to the World Health Organization (WHO) health is the integral part of physical, mental, and social well-being and to keep these in good conditions there need trained personalities who can help the common people in overcoming the unwell situation. Systematic activities to prevent or cure health problems and to promote good health are undertaken by health care practitioners / providers. In the first decade of the 21st century, the conceptualization of health as an ability opened the door for self-assessments to become the main indicators to judge the performance of efforts aimed at improving human health. It also created the opportunity for every person to feel healthy, even in the presence of multiple chronic diseases or a terminal condition, and for the re-examination of determinants of health. The word 'AROGYA' has the special significance from the ancient time as the opportunity for healing from the health disruption. As a result, health centres and hospitals are termed as 'AROGYA NIKETAN', the homes for healing. The Arogya Niketan need health experts who can help the people to get relief from their diseases and overcome from the disruptions. In ancient India many people dedicated their life in understanding the cause for diseases and their possible medicine through AYURVED. The Ayurvedic practitioners regard physical existence, mental existence, and personality as three separate elements of a whole person with each element being able to influence the others. This holistic approach used during diagnosis and healing is a fundamental aspect of Ayurveda. The extracts from the medicinal plants used to treat the diseases. Another part of Ayurvedic treatment says that there are channels in the living organs those are transporting fluids and maintaining health balance. The blocking of these channels causes health disruptions. The channels can be opened up by massage treatment using oils and steam. This was the emergence of physical medicine. The School of Health Science of our University developed the academic programs to develop those are very much useful in developing 'ARAGYA NIKETAN'. The present volume of the e-magazine will contain the articles on the subject matters mentioned above. The entire community of the university will put their perceptions and thoughts on the magazine of health sciences. I believe the articles in 'AROGYA' will open up avenues of healing.

Dr. Biswajit Ghosh
Vice Chancellor
The Neotia University

Message from
Dean's Desk

Congratulations to every student, Faculty members and corporates who submitted their articles for the magazine 'AROGYA' 2023 edition published by the School of Health Sciences, The Neotia University. It was the inspiration received from our Honorable Pro-Chancellor and Honorable Vice Chancellor for publishing this type of magazine where the future Paramedics and Allied Health Professionals can get the opportunity to showcase their writing skill. AROGYA is the result of that inspiration. It is true that due to the paucity of the space all submitted works could not be published. With this issue, School of Health Sciences achieved the first milestone of AROGYA publication. The entire work has been crystallized after the rigours peer review process, with the tedious efforts by my fellow colleagues from this School.

This magazine tried to give scope to the students and Faculties to showcase their writing talent through different topics covering artificial intelligence & their applications in radiological procedures, avenues of maintaining good eye health, molecular diagnostics, mental health, scenario of OT technology, Ayurveda, various common yet dangerous health issues & their remedial measures, to name a few. I am assuring that this magazine proves that the future paramedics not only serve the society but may also be the good writers. The knowledge and skills gained through the participation in AROGYA will be useful, not only for future practice, but also if the students plan to embark on Post-Graduate studies or consider for pursuing an academic career.

From the Faculty's side, they are encouraged to teach and assist the students to improve their writing skills in every day - every assignment and even test or exam which is the part of the regular process. Ultimately, all Allied Health Science students will have to write a dissertation in the final year, after the completion of their internship. This is the opportunity; do your best, at least aim at to develop the writing habit for the submission to AROGYA.

I am giving my heartfelt thanks to all the Faculty members of the School of Health Sciences for their continuous support for successful publication of this magazine "AROGYA -23"

All the best!

Message from **Editor**

I, along with the Associate Editors, am happy to publish the 1st Issue of the Magazine, 'AROGYA' from School of Health Sciences (SHS). It is dream initiative of our Honorable Dean, School of Health Sciences. This platform provides our students & Faculties the opportunity to showcase their writing talents. Also it sums up the various events conducted throughout the year in SHS. We sincerely thank Mr. PJ Agrawal Sir for his continuous support. We also sincerely thank our Honorable Vice Chancellor, Prof. Dr. Biswajit Ghosh Sir for his continuous guidance & also for introducing the name of the Magazine. We are forever indebted to our Honorable Dean, School of Health Sciences, Dr. Soumen Mukherjee Sir, from initiative to guidance, to support, to encouragement – for everything. We also thank the Design Team for their efforts. We are deeply indebted to our sponsors who made this venture financially successful. Our utmost thanks goes to the Esteemed Faculties, who despite their busy schedule, made the effort to contribute in this venture. Lastly, a big shout out to our beloved students, who made significant contributions through their write ups & also various events conducted by SHS. We sincerely hope that, this venture will be informative & enlighten the readers in the field of Healthcare sector.

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Dr. Haimanti Goswami

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Dr. Swarnava Biswas
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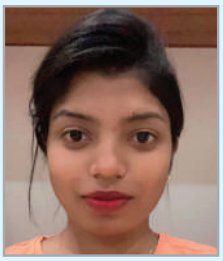

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School of Health Sciences

Ms. Divya Rana
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Section i:

Faculties

Will Disruptive Technologies Change the Future of Indian Healthcare?

Dr. Soumen Mukherjee

Associate Professor & Dean, School of Health Sciences

The Indian healthcare sector has been drastically transformed because of a variety of cutting-edge technologies such as telemedicine, electronic medical records and home-based care transitioning from hospital-based care, drone technology, genome sequencing, digital tools and artificial intelligence. Improving this technology creates the impact on the patient care by reducing the operation expenses

Technology is the most powerful driver in 5G era when many disruptive innovations in healthcare is dependent on some form of technology. Any new technology, from wearables and mobile phone apps to big data and artificial intelligence (AI) in diagnosis, has the potential to change in healthcare delivery system. The digital disruption in healthcare is recognised by consumer demand which includes wearable technologies, injectable, digital medication, organ development, stem cell deployment, 3D printing, etc. These disruptive technologies change the future of Indian Healthcare along with digital hospitals, Electronic Medical Records, robots and Internet of Things (IoT). This aimed at improving the quality of outcomes and regulatory compliance.

Consumer devices, wearables and apps

Wearable technology (WT) and mobile applications (apps) are assisting in the continuous health monitoring of people suffering from a variety of diseases, both psychological and physical. WT and apps can be especially beneficial in the ageing population for tracking the progression of specific symptoms, providing motivational engagement and assisting telemedicine with remote monitoring. Everyone in our society is now accustomed with Smart Watch. WT and apps are two pillars of Health research. Apps can geo-locate lost people with neurodegenerative impairment, compile patient-reported outcome measures and patient-reported experience measures and automatically evaluate early symptoms of some neurodegenerative diseases. WT has the ability to monitor physical activity along with the vital parameters. It can track physical activity during the day by counting steps, which is useful in some rehabilitation or degenerative diseases and also track heart activity to ensure that the wearer's activity keeps the heart rate in a healthy and risk-free range and check sleeping patterns to ensure proper rest. WT and apps have boosted a number of solutions with the aim of improving the health and quality of people's life.

AI and ML in Healthcare

Machine learning (ML), artificial intelligence (AI) and other modern statistical methods are opening up new avenues for monetizing previously untapped and rapidly expanding data sources for patient benefit. Potential applications include improving diagnostic accuracy, more reliably predicting prognosis, targeting treatments and increasing health system operational efficiency. For eg., deep learning-based algorithms

improve accuracy in diagnosing retinal pathology compared to that of specialist physicians, or NLP is used as a tool to extract information from structured and unstructured text embedded in electronic health records. AI applications can handle patient intake, scheduling and billing. Chabot respond to patient inquiries. AI can collect and analyse survey responses thanks to its natural language processing capabilities. AI will most likely be used more to reduce healthcare costs and free up doctors and staff to focus on patient care. This technology now makes able to scatter the healthcare services in the remotest area.

IoT

As IoT technology advances, the Internet of Medical Things (IoMT) is transforming the healthcare industry by improving patient health and virtually connecting doctors and patients and also bridging the gap between the primary and tertiary healthcare delivery system. The Internet of Medical Things (IoMT) is a network of interconnected devices that collect real-time data. The Internet of Medical Things is one of the key applications of IoT for healthcare, positively impacting the industry and having the potential to solve medical issues. IoMT will not only be able to prevent future diseases, but it will also be able to cure those that have already occurred. The technology has been designed as wearables so that patients can be monitored without having to visit the doctor.

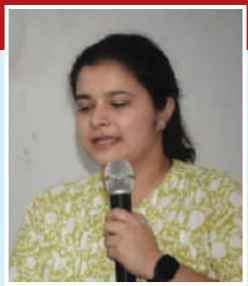
Growth in Virtual Care

Electronic health records (EHRs) have become an increasingly important part of patient care. However, the massive amount of EHR data can be used for much more than just patient health records and can be used to conduct research, improve care, build AI applications and create new business opportunities. As a result, healthcare providers must be aware of the issues concerning EHR security.

COVID-19 has undoubtedly accelerated telemedicine delivery and it is true that the market share of telemedicine is increasing day by day. If it works, doctors will be compensated for telehealth consultations and many patients prefer it still is not acceptable to the major portion of the healthcare consumers of our country. However, telemedicine is heavily reliant on internet connectivity and some areas of the United States remain underserved.

Security of data, billing transparency and access to medical records are all part of a major shift in healthcare that ensures patients have all of the information they need to make informed decisions. The challenges of the data security which we had already had been experienced since the incidents happened in the All India Institute of Medical Sciences, New Delhi. Other upcoming reforms include the implementation of online pricing tools that will allow patients to see their out-of-pocket expenses.

Diverse Patient's Perceptions Against Radiography Modalities



Divya Rana

Assistant Professor,Department of Radiology & Medical Imaging Technology

The world of radiology emerged long time ago with the discovery of x-rays by Wilhelm Conrad Roentgen, in the year 1895, where by this event healthcare professional got access to see the internal images of bones, that appeared to be the greatest evolution in the field of medical diagnosis. Accuracy in diagnosis came in picture, where before this event doctors used to initiate treatments on basis of their experience & knowledge, that somewhere was lacking the precise approach in treatment, but, after the innovations in radiology field keeps on occurring, the treatment of patients uplifted in a right manner, the quality of treatments keeps on enhancing with the new diagnostic modalities & tests. After x-rays, the outbursts of new radiology modalities keep on increasing, fluoroscopy, ultrasound, CT & MRI kind of machines set the diagnosing field at the advanced level.

When the technology touched the medical field, it started doing its work with efficient work flow of serving the mankind, as everything came with pros & cons, radiology field was also surrounded by some irrational myths which was carried along by people in the world. Many different radiology modalities still face them no matter how advanced the time being. In earlier times, MRI used to know as "NMR" machine, whose full form used to be Nuclear Magnetic Resonance, but during the world war-II time period, since humanity was terrorized by nuclear weapons, people were afraid to get NMR scans, since it was involved with the term "nuclear", but reality was MRI or NMR deals with the nucleus of hydrogen atom of human body because of that it was named that way. This was only the starting of meaningless fear & myths. Other than the name factor, the size of machines also appears to scare many. Many of the patients who visits radiology department for scans be it x-rays scan, CT scan, MRI scan, radiographer often encounters with the question of "what if this machine falls off on us". Many don't know which modality use which type of radiation, for example, some of patients often ask the radiographer that x-ray machine uses magnetic field to work. Some don't know the importance to ask the lead aprons or shield for radiation protection as their rights.

The myths, wrong information & facts always comes in frame when people are not exposed to right information or they don't know fully, many people still now are not fully aware about the radiology or radiography field. Many still misleads radiography course with radio jockey which for me as being the member of radiography field appears to be bizarre. The awareness to the radiography world & its modalities is being crucial in many ways as world is constantly being surrounded by diseases. People should be aware that following the instructions of radiographer during the scans is important for their own treatment, so that radiographers can acquire proper radiographs & according to that doctors & radiologists can interprets them. People need not to become experts in machine operation, but at the very least they should be aware of the advantages that their respected scans & tests will bring them. This will not only be going to spread awareness regarding radiology field but people will be aware of different health related risks, factors one can suffer from their minor acts which they usually neglects'.

How Body Composition is Correlated to Cardiovascular Fitness?

Dr. Chinmoyee Baruah Hazra

Assistant Professor, Department of Physiotherapy

Physical fitness is a general state of health and well-being and more specifically, the ability to perform. Physical fitness is generally achieved through correct nutrition, exercise, hygiene and rest. Physiologically fitness means the capacity for skilful performance and rapid recovery. However, with automation and changes in lifestyles physical fitness is now considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy to resist diseases and to meet emergency situations. Despite many clear benefits of active lifestyle lack of physical activities are common. Thus changes in lifestyle as well as food habits leads to alteration in body composition. This alteration in body composition is the leading cause of various diseases.

Cardiovascular disease is a leading cause of global mortality, accounting for almost 17 million deaths annually. The rate of cardiovascular disease is accelerating worldwide and one of the causes is the dramatic increase in the prevalence of obesity with its related complications of hypertension, hyperlipidemia, diabetes etc. The greater the obesity level, the body fatness or the abdominal obesity the greater the risk of developing cardiovascular disease. Other risk factors of cardiovascular disease include physical inactivity, elevated psychosocial stress and inappropriate diet. Body composition analysis gives us a clear idea of an individual's cardiovascular fitness. Certain body compositions are mentioned below:

1. Body Mass Index(BMI) is used to assess weight relative to height and calculated by dividing body weight in kilograms by height in meter squared (Kg/m2). It gives an approximation of total body fat and that's what increases the risk of diseases that are related to being overweight or obese. BMI is said to be always inversely related with physical fitness i.e higher the BMI lower the physical fitness.
2. Waist Circumference(WC) (in cm) will be measured at the mid-point between the lower margin of the last palpable rib and the top of the iliac crest. WC reflects the abdominal visceral fat, which plays a major role in increasing disease risks.

DISEASE RISK

Classification	BMI (Kg/m2)	Obesity class	Men ≤ 40in. (102 cm) Women ≤ 35in. (88 cm)	Men>40in. (102 cm) Women> 35in. (88 cm)
Underweight	< 18.5	-	-	-
Normal	18.5-24.9	-	-	-
Overweight	25.0-29.9	-	Increased	High
Obesity	30.0-34.9	i	High	Very high
	35.0-39.9	ii	Very high	Very high
Extreme obesity	≥ 40	iii	70% Extremely high	Extremely high

3. Waist-to-hip ratio(WHR) is the circumference of the waist divided by the circumference of the hip. It is an indicator or measure of health, the risk of developing serious health conditions and also correlates with fertility. According to WHO protocol, the waist circumference (in cm) should be measured at midpoint between the lower margin of the last palpable rib and top of the iliac crest and

the hip circumference (in cm) should be measured around the widest portion of the buttocks. People who carry more weight around their waist (an apple-shaped body) are at higher risk for diseases than those who carry more of their weight in their hips and thighs (a pear-shaped body). The WHO states, WHR above 0.90 for males and above 0.85 for females is the indicator of health risk. WHR has been shown to be better predictor of cardiovascular diseases. Thus, any decrease in WHR is a positive step toward healthier body fat distribution and increase physical fitness.

4. Waist-to-height ratio(WHtR) was first proposed in mid 1990s. It is defined as waist circumference divided by height, both measured in the same units. WHtR is an indicator for detecting central obesity and health risk associated with it. It was found that WHtR, was significant in predicting all cause of mortality. Higher values of WHtR indicate higher risk of obesity related cardiovascular disease; it is correlated with abdominal obesity. Males WHtR ranging from 0.43-0.52 and females 0.42-0.48 are categorized as healthy. A study revealed that combination of tall height and high aerobic fitness levels had highest risk of developing atrial fibrillation risk, which was 70% higher relative to those with short height and low aerobic fitness level.

5. Neck circumference(NC) (in cm) is measured at the level of laryngeal prominence (Adam's apple) in the midline formed by the thyroid cartilage at approximately C4. It has been used as a surrogate measure for the upper body subcutaneous adipose tissue distribution. Evidences showed that NC was independently associated with metabolic syndrome, obstructive sleep apnea syndrome and cardiovascular diseases. Males with NC value of 38.5 cm and females with 34.5 cm are considered to be the optimal cutoffs for identifying visceral obesity. And also cut off of 32.5 cm among females and 35.5 cm among males was best critical cut off to screen cardiovascular risk. It has been concluded that individuals with normal neck circumference had higher physical activity than those with higher neck circumference.

An Ode to Nobel Prize in Physiology 2023

Dr. Haimanti Goswami

Assistant Professor, Department of Physiotherapy

In 2023, Nobel Prize in Physiology or Medicine Prize was jointly awarded to Katalin Karikó & Drew Weissman 'for their discoveries concerning nucleoside base modifications that enabled the development of effective mRNA vaccines against COVID-19'. This work started in early 2020 to develop an effective vaccine to control the COVID 19 pandemic, one of the greatest health attacks in the history of mankind.

Vaccines are a great, useful tool for disease control that works by generating immune response. Vaccines are usually of different types: live vaccines (involving whole germ/infectious agent), protein or vector based vaccines (involving viral components or proteins on viral surface).

However, the current breed of vaccines come with the requirement of large scale cell culture, which is largely dependent on huge infrastructural resources. This poses a great challenge to fight against pandemic & triggered the necessity of developing new vaccines with lesser involvement of cell culture.

1980 onwards, researches in the field of RNA, especially mRNA attained significant height. 1990 onwards, mRNA was found to invoke inflammatory responses. Katalin Karikó was interested in the field of therapeutic applications of mRNA, while Drew Weissman was interested in dendritic cell mediated in immune surveillance & activation of vaccine-induced immune responses. Their works jointly progressed towards a break-through response of in regulation of immune response after the manipulation with the bases in mRNA.

With the onset of COVID-19 pandemic, their works gained huge momentum with in vitro chemical modification of bases leading to generate significantly effective immune response paving the way of effective mRNA Vaccines against COVID 19. T

Their works historically contributed to the ground-breaking success to control COVID-19 outbreak & also opened up possibilities of developing vaccine mediated control of several other diseases.

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The Silent Scapular Dyskinesia

Dr. Kusum Agarwal

Assistant Professor & In-Charge, Department of Physiotherapy

The inappropriate movement of the scapula during shoulder movement is named as scapular dyskinesis & is a frequently neglected reason for pain & dysfunction. The scapula is a critical part of the upper appendage kinematic chain & is an essential part of the gleno-humeral function; which is a significant determinant of the proficiency & viability of the upper limb. We give an outline of the complex territorial life structures of the shoulder support & how this permits the scapula to go about as a both a dynamic & static stabilizer to the upper limb. We investigate the typical biomechanics & the etiology, the study of disease transmission & obsessive events which can upset the ordinary capability & lead to scapula dyskinesis. Scapula dyskinesis is an inadequately grasped condition & gives a test to the clinician in both determination & the executives. We give an outline of the clinical evaluation which is probably going to recognize the wellspring of the pathology & guides the treatment which is generally restoration of the muscular build with engaged & concentrated physiotherapy.

The causes of scapular dyskinesis can be split into 3 groups:

Shoulder-related.

Neck-related.

Posture-related.

Shoulder related:

The shoulder pathologies are the most well-known beginning of objections. Practically all shoulder pathologies are gone with a level of dyskinesis. The most widely recognized pathologies that are related with some type of scapular dyskinesis are: (1) acromioclavicular instability, (2) shoulder impingement, (3) rotator cuff injuries, (4) glenoid labrum tear, (5) clavicle fracture & (6) nerve related. The normal trait of this large number of pathologies is the aggravation of the scapulo-humeral rhythm.

The trapezius & the serratus anterior muscles have been connected to the improvement of dyskinesis in both shoulder impingement & shoulder unsteadiness. In impingement, the upper & lower trapezius alongside the serratus anterior have altered their activation pattern, with the trapeziae showing a more noteworthy strength of activation contrasted with the serratus anterior.

Rotator sleeve arthropathy advances the expanded activity from the rotator sleeve muscles, supraspinatus & infraspinatus, & from the upper trapezius when compared to symptomatic patients

Neck-related:

There are two subtypes of neck pathologies that can influence the shoulder: 1) “mechanical neck pain” disorders & 2) cervical nerve root-related conditions. “Mechanical neck pain” disorders are characterized collectively of pathologies influencing the joints (degenerative changes) & muscles (for example weakness or instability) of the neck. It has not yet been laid out how the symptoms get alluded to the shoulder, yet one can see the value nearby such designs to the area. It has been proposed that body posture influences muscle strength. As a matter of fact, due to the western way of living & the broad utilization of PCs, patients gain a “slumped” pose. Accordingly, the cervical & upper thoracic spines lose their normally occurring shapes.

Alternately, the connection between nerve pathologies (for example nerve root compression or avulsion) at the neck & shoulder-related complaints is deeply grounded. All the nerves that provide sensory & motor supply to the shoulder originate from the brachial plexus, particularly from the C5 & C6 roots, & the accessory nerve (it crosses over from the upper portion of the spinal cord & the lower portions of the brain towards the sternocleidomastoid muscle) . Pathologies emerge when the nerves improperly actuate at least one nerves around the scapula & thus muddle the rhythm of scapular developments comparative with the primary skeleton or the upper limb

Posture-related causes of scapular dyskinesis:

Excessive thoracic kyphosis & cervical lordosis changes the resting position of the scapula. Competitors are more helpless to these changes. Contingent upon their game, they foster core muscle imbalance that modify spinal curvatures & soft tissue tensions

Assessment

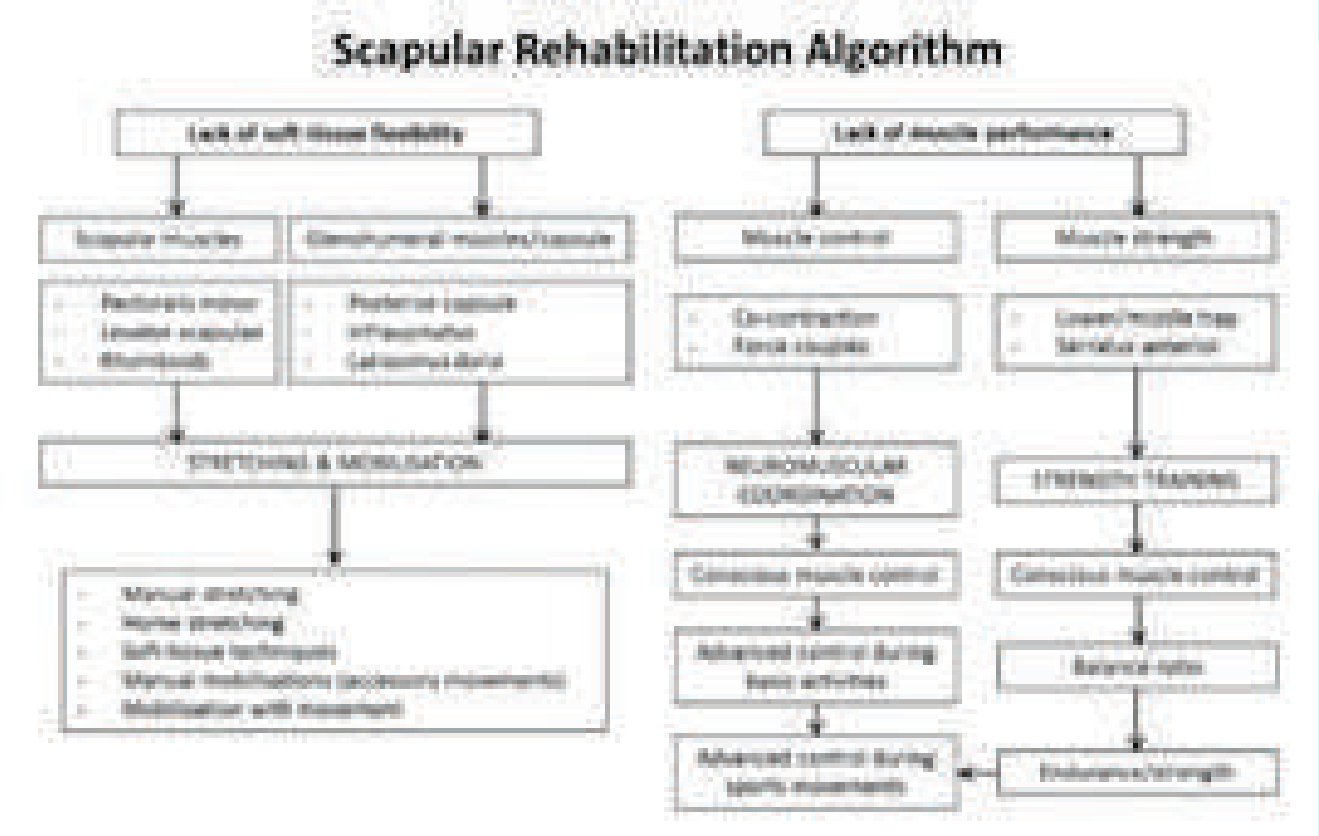
The clinical assessment of the scapula is done using Manual Techniques called SAT & SRT

Manually assisted movements of scapula: two tests are involved in this step, the scapular assistance test (SAT) & the scapular reposition (retraction) test (SRT). The SAT involves the examiner pushing the inferior-medial border of the scapula outwards & upwards whilst stabilizing the upper medial border when the patient has his humerus elevated. This test assesses how different the pain is perceived. In a positive test the pain is reduced & it is usually positive in patients with painful arc or shoulder impingement.

In SRT the examiner has to position & stabilize the medial scapular border with one h&, whilst the patient is asked to elevate his arm isometrically (no change in the angle of the joint) against the examiner's other h&. Again the test is positive when this maneuver reduces the pain felt by the patient. This test is also positive if the patient's strength is increased during the isometric elevation of the arm. The scapular reposition test is sufficiently specific & sensitive in rotator cuff injuries

Treatment

The principal idea of this stage is simultaneous enactment of muscles to perform exercises of day-to-day existence. The remedy ought to incorporate both "open-chain" & "close chain" exercises. The activities should be repeated under different weight bearing circumstances.Again the test is positive when this maneuver reduces the pain felt by the patient. This test is also positive if the patient's strength is increased during the isometric elevation of the arm. The scapular reposition test is sufficiently specific & sensitive in rotator cuff injuries



Physiology of Happiness

Dr. Satabdi Ghosh

Associate Professor & In-Charge, Department of OT Technology & Anesthesia

"Happiness is not a possession to be prized, it is a quality of thought, a state of mind."

-Daphne du Maurier

'Happiness' is a state that every human being is chasing for! We can get happiness from different things & actions, e.g. by seeing delicious food, traveling to our desired destination, achievement in workspace, being with our near & dear ones or friends etc. In short, anything that can bring good feelings to our mind can make us happy. Currently we all are celebrating the success of ISRO for successful landing of Chandrayan 3 at the south pole of Moon. We, all Indians, are really happy for this success.

Is there only role of mind in happiness?

Is happiness only related to mind? - If your answer is 'no', you are absolutely right. Along with mind brain plays an important role in happiness (Frijda 2010). Surprisingly, all our activities like thoughts, feelings, love, mood, emotion & even happiness are regulated by human brain. Brain areas like ***prefrontal cortex, amygdala, hippocampus, anterior cingulated cortex, & insular cortex*** play important role in happiness (Dfarhud et al. 2014). Limbic system also plays important role in regulation of our emotions (Dfarhud et al. 2014).

Neurotransmitters & Happiness:

Neurotransmitters, chemical messengers of our nervous system, are the magic chemicals that can regulate our happiness (Figure 1). ***Dopamine, serotonin, nor-epinephrine & endorphin*** are those neurotransmitters which bring the feelings of happiness (Dfarhud et al. 2014). Each neuro-transmitters are coded by a special & particular gene. Therefore, it is evident that gene plays a major role in happiness.

Endocrine glands, Hormones & Happiness:

Endocrine glands which secret hormones can also influence our happiness (Figure 2). The major endocrine glands related happiness is pituitary & adrenal. ***Oxytocin*** commonly known as *'love hormone'* & ***melatonin*** are related to happiness (Dfarhud et al. 2014). Other hormones.

Oxytocin:

A hormone released from pituitary gland & functions through its receptor in brain. Oxytocin can regulate happiness by facilitating social behaviour as social behaviour has a positive & strong relationship with happiness (Dfarhud et al. 2014).

Melatonin:

A hormone released from pineal gland mainly regulate sleep is also a regulatory hormone for happiness (Dfarhud et al. 2014).

Cortisol:

This hormone is secreted from adrenal gland & commonly known as 'stress hormone'. Few studies indicated that low level of cortisol is related to happiness (Dfarhud et al. 2014).

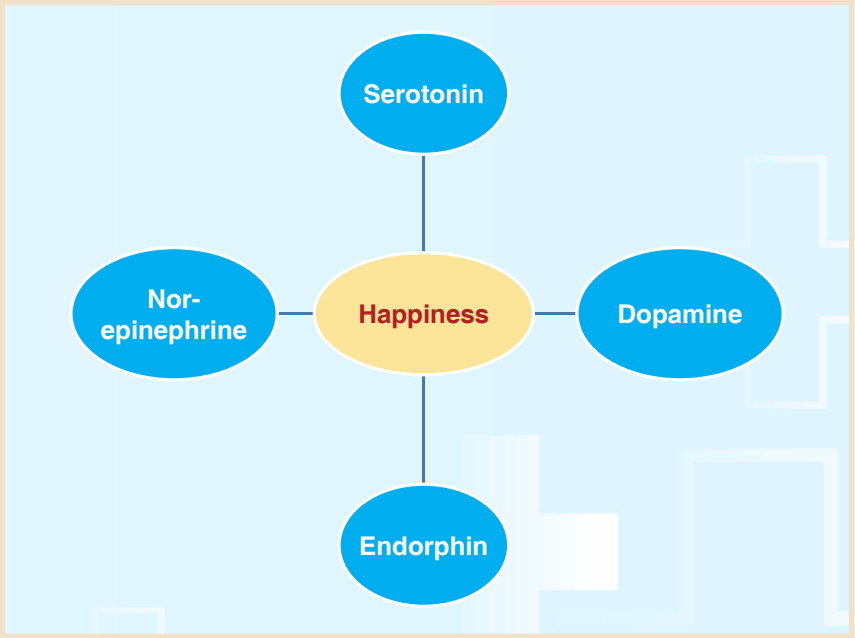
Adrenaline: This hormone is secreted from adrenal gland & responsible for fight-or-flight response. Urinary adrenaline found to be predictor for happiness (Dfarhud et al. 2014).

Other factors influencing happiness:

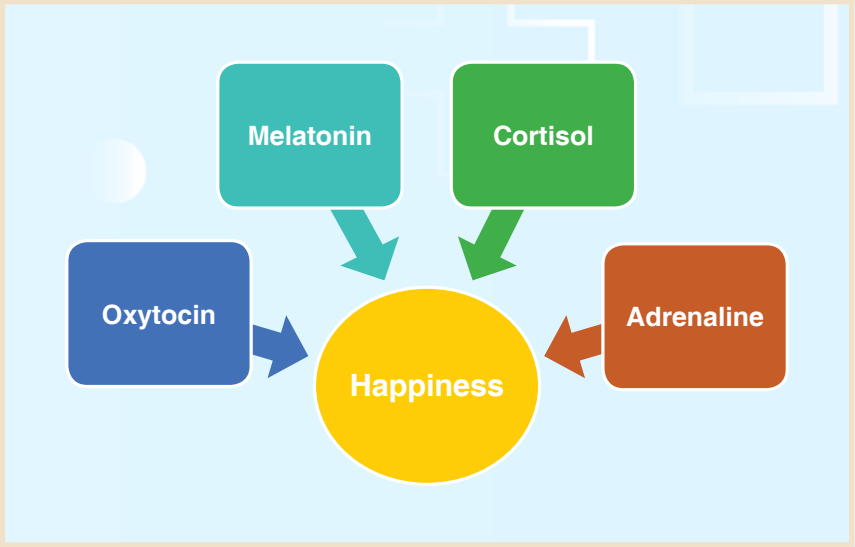
Along with the above-mentioned factors some other factors can also trigger happiness, e.g. exercise, proper sleep, positive mood, optimism etc.

In conclusion happiness is regulated by some non-modifiable & modifiable factors. We can modify the modifiable factors to keep ourselves happy.

So, stay positive & be happy always.



[Figure 1: Happiness & Neurotransmitters]



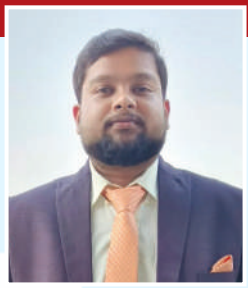
[Figure 2: Happiness & Hormones]

Mental Health is Universal Human Right

Saheli Sarkar

Visiting Faculty, Department of Applied Psychology

Digital Twins in Healthcare: Bridging The Gap Between Data and Wellness



Dr. Swarnava Biswas

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In our busy world, technology is always changing different parts of our lives & healthcare is no different. One of the most interesting new ideas in healthcare is the idea of "digital twins." Some people may find the word "digital twins" hard to understand at first, but in healthcare, they are like having a virtual copy of a real patient or medical device. Using data, sensors & advanced algorithms, this technology makes a digital copy of a health situation or piece of medical equipment that can be used to monitor the real thing. This writing aims to explain the idea of digital twins in healthcare in a way that is easy for everyone to understand.

Imagine that you have an artificial twin that looks just like you & is healthy. It gets information all the time from things like wearable tech, electronic health records & even real-time body measures. This digital twin looks at all of this data to get information about your health. It can keep an eye on your heart rate, blood pressure & glucose levels, among other things, to get a full picture of your health. If something is wrong, your digital twin can let your healthcare provider know. This way, they can start treating you right away, which could avoid serious health problems.

Also, digital twins are very important for making medical devices. Take the case of a new medical device, such as a mechanical heart valve. In the past, making & testing these kinds of devices would take years of making actual prototypes & testing them on animals, which was both unethical & took a lot of time. Engineers can use digital twins to make a virtual copy of the heart valve & test how it works in different situations. This speeds up the planning process & makes sure it is safer & more accurate. Health care digital twins are like test dummies; they save time, money & lives.

Digital twins can also be used for predictive analytics, which is a very useful tool. These digital copies can find patterns & trends in a patient's health data that may mean problems are about to happen by constantly checking it. For example, your digital twin might notice that your cholesterol levels are slowly going up & using past data, guess that you are more likely to get heart disease. This information could lead your doctor to suggest changes to your lifestyle or give you medicine, which would eventually stop something terrible from happening.

At the end of the day, digital twins in healthcare are not just a plot device from a thriller. Inventions like these are real & have the ability to change how we take care of & improve our health. By making virtual copies of patients & medical devices, these digital twins make it easier to find health problems early, speed up the development of medical devices & improve predictive analytics. As technology keeps getting better, digital twins are likely to become an important part of our healthcare, giving us a more personalized & data-driven way to stay healthy. Digital twins are all about using data to make healthcare better, safer & more effective for everyone, even though the term may sound hard to understand.

Section ii:

Students

Radiology & Artificial Intelligence

Abir Chatterjee

BRMIT, 3rd SEM

Introduction

Artificial intelligence has been revolutionizing the medical domain. Modern artificial intelligence aims to solve practical healthcare problems by learning deeply the visualized data and make a huge impact of technology in healthcare particularly the use of AI in Radiology.

Radiology is the field of Medical Science that uses radiation to generate medical imaging (to detect deformities and tumors. AI algorithms can automatically detect complex anomalous patterns in image data to provide an assistive diagnosis for patient.

AI applications in Radiology

- **Neurological abnormalities**

  Neurological disorders occurred when certain brain parts stop functioning correctly like Alzheimer's and Parkinson disease. Artificial Intelligence can extract meaningful information from brain image data that helps to detect irregular brain development. **Research of Mount Sinai Health System** claimed that AI techniques could be used to identify the cause of Alzheimer's.

- **Classification of Brain tumors**

  The conventional method of the examine of brain tumors is very time consuming. MRI machine identifies and classifies brain tumors, whereas the AI technology identify this within some minutes with high accuracy.

- **Detection of Breast cancer**

  Breast cancer is detected by a low kVp technique, called mammography. The manual verification process accompanies the risk of human error and misdiagnosis is quite common. AI tools can enhance mammography examinations. **Radiology Society of North America (RSNA)** published a study that shows there is a high risk to detect breast cancer by examining mammograms & 87.6% of the screen detected cancer scored the highest risk.

Advantages

- **Increased accuracy**

  AI algorithms can analyse radiographs with accuracy. Radiologists can use AI Technology as a helper to detect any abnormalities which may be missed by human vision.

- **Saving time**

  AI system can process medical images very quickly which helps diagnosis and planning stages of treatment for the patient.

- **Standardization**

  The analysis of medical images by AI technology is standardized. It is potentially variable in radiology interpretation.

- **Teaching and training**

  AI Technology can be used to identify the teaching cases, rules of the reference image and the feedback on interpretation, which improves learning experience and increases the skill level for radiologists.

Disadvantages

- **A lack of human judgement**

  AI algorithms analyse medical images based on the visualized data only. This technology is unable to analyse clinical context and patient history. So for the diagnosis, human judgement and professional skill are still essential components.

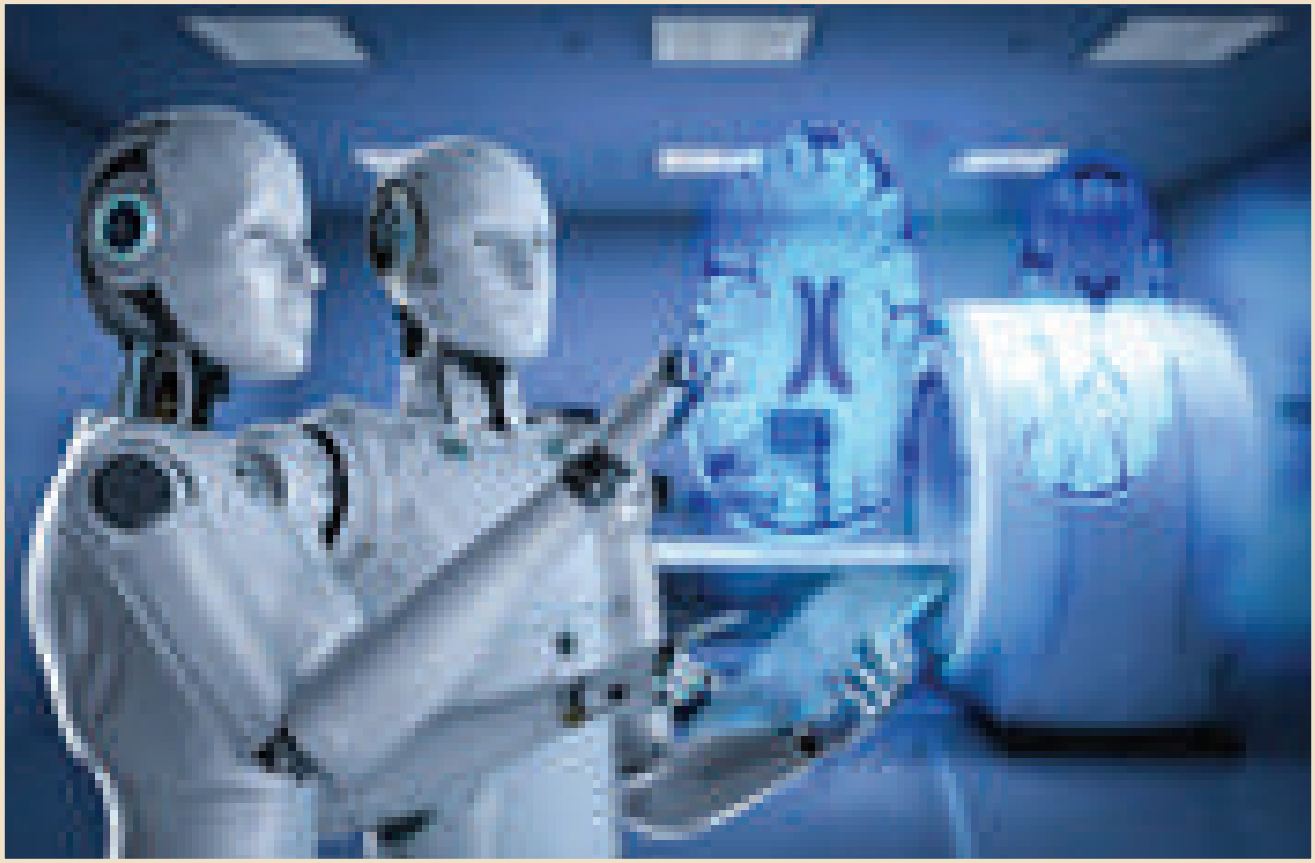
- **Obstacles in the form of regulations and laws**

  Artificial intelligence algorithms in radio-diagnosis may be obstacles in the form of regulations and laws like patient safety, ethical use of AI and the data privacy of patients.

- **Cost**

  One of the major drawbacks to applying AI technology in radio diagnosis is, there is necessity for a large financial investment in infrastructure the creation of the software and the maintenance of the full system

In conclusion, AI has the potential to greatly improve the radiology field, but it is more important for the radiologist to carefully judged & consider the ethical implication before adopting this AI Technology in the highly increasing medical field.



Good Eye Sight is a Gift (Tips For Healthy Eye & Healthy Vision)

Anusree Patra

BOPTM, 7th SEM

Taking care of our eyes should be priority. Healthy diet, regular eye screening & certain lifestyle changes can detect common eye problems like amblyopia, suppression, latent binocular vision problem, AMD (Age Related Macular Degeneration) etc & also to prevent vision loss, eye diseases & blindness. Children- aged 2 - 5years should have a vision screening to find common condition Several eye diseases are more prevalent in certain racial & ethnic communities. Aging is also an important factor.

Certain foods are vital for maintaining a good eye health.

Best Foods to Boost our Eye Health:

Fish: cold water fish like salmon, sardines are rich in omega 3 fatty acids; help to protect against macular degeneration.

Leafy greens: spinach, kale is packed full of lutein & xeropthalin; help to stop the development of macular degeneration & cataracts.

Eggs: vitamins & nutrients in eggs, including lutein, Vitamin A protect against night blindness & dry eyes.

Fruits: citrus fruits, like oranges, lemon, grapefruit & bennies are rich of Vitamin C, which reduce the risk of cataract & macular degeneration.

Nuts: pistachios, walnuts, almonds are rich in omega 3 fatty acids & vitamin E; boost eye health.

Vegetables: carrots, tomatoes, belt-peppers, straw bennies pumpkin, corn - good source of vitamin A & C.

Legumes: lentils, beans, peas a good source of zinc; help to protect retina & lower the risk of developing macular degeneration & cataract.

Vitamins & The Eyes:

Vitamin C: found in citrus fruits, oranges, lemon, grape-fruit & limes, also spinach, tomato, banana, peach, etc; decreases risk of cataracts.

Vitamin A: present in foods like carrot, sweet potato, spinach, broccoli, egg, liver, milk, papaya, etc; essential for visual pigment synthesis. All-trans-retinal vitamin A deficiency (VAD) leads to Xeropthalmia. WHO approximates that 228 million children worldwide are effected by VAD, making it the leading cause of childhood blindness (lead to Retinitis Pigmentosa).

Vitamin E: found in nuts, vegetable oils, peanuts, butter, fortified cereals & sweet potatoes; its deficiency cause peripheral retinopathy due to nerve damage. Studies have indicated adding vitamin E to the diet can delay cataract formation. & progression of AMD.

Important of Eye Exams:

This is more than just a vision Screening. An eye care professional (optometrist) places drops in each eye, to dilate the pupil. This illuminates the back of the eyes so that they can see signs of any damage or diseases. Most people don't realize their vision could be improved with glasses. Dilated eye exam is the only way to detect the disease in their early stages which maybe preventable.

Use of Protective Eyewear:

Eye injuries during can happen while playing games. Wearing protective eyewear, using safely glasses, goggles to prevent damage of eyes tissues. Wearing sunglasses help to protect from UVA & UVB radiation induced damage.

No Smoking:

Smoking is as harmful to eyes; can lead to develop serious eye diseases like vision loss or blindness, degeneration, blindness, macular degeneration, cataract. Smokers with diabetes are at greater risk of developing diabetic retinopathy, that damage blood vessels in eyes. also to develop dry eyes syndrome.

Taking A Break:

It is important to take a break for a short span when using a phone, computer or any electronic device. Too much of screen exposure increases eyestrain which can be reduced with the 20-20-20 rule like every 20 min look away about 20 feet in front of you for 20 seconds.

" The eye is the lamp of the body, so if our eye is healthy, our whole life will be full of light."

Importance of Primary Eye Examination in Pediatric Age Group

Arghyadeep Haldar, Sk Mahammad Saief Ali

BOPTM, 7th SEM

The *American Optometric Association* recommends that children undergo their first eye examination between 6 months to 1 year of age. Pediatric age group patient can be divided into 3 main categories:

- Infants & Toddlers (newborn through 2 years of age)
- Preschool Children (3 years through 5 years of age)
- School-age Children (6 through 18 years of age)

Early Detection and Prevention of Eye and Vision Disorders

Major pediatric problems include:

Amblyopia: a condition where brain suppresses visual impulse from either of the eye; can be monocular or binocular; can be due to presence of any media opacities, anisometropia, any amblyogenic factor. Therefore, stimulus from the bad eye does not reach brain & brain tries to suppress the image of that eye & make it an amblyopic eye.

Strabismus: also known as crossed, where the eyes don't align properly, so they point in different directions & brain struggle to combine inputs from both eyes into a single image, known as plastic period. Vision therapy with proper correction works great here.

Table 3: Prevalence of Amblyopia and Strabismus in Children 6 Months to 72 Months (6 Years) of Age

Condition	White Non-Hispanic	Hispanic	African American	Asian
Amblyopia	1.8%	2.6%	0.8% - 1.5%	1.8%
Strabismus	3.2% - 3.3%	2.4%	2.1% - 2.5%	3.6%

[Prevalence of Amblyopia and Strabismus in Children 6 Months to 72 Months (6 Years) of Age]

Refractive Error: regular eye checkup helps to detect the present refractive status in patient's eye. A child is born with 2.5D-3D hyperopia in eyes; this hyperopic shift in eyes later gradually decreases by the process of emmetropization. Regular eye checkup is thus important.

Table 1: Prevalence of Refractive Errors in Children 6 Months to 72 Months (6 Years) of Age

Condition	White Non-Hispanic	Hispanic	African American	Asian
Myopia				
≤1.00D spherical equivalent (SE)	1.2%	3.7%	6.6%	4.0%
≥1.00D SE	0.7%		5.5%	
Hyperopia				
≥2.00D SE	25.7%	26.9%	20.8%	13.5%
≥3.00D SE	8.9%		4.4%	
Astigmatism				
≥1.50D cylindrical refractive error	6.3%	16.8%	12.7%	8.3%
≥3.00D cylindrical refractive error		2.9%	1.0%	
Anisometropia				
≥1.00D SE		4.3%	4.2%	

[Prevalence of Refractive Errors in Children 6 Months to 72 Months (6 Years) of Age]

Ocular Diseases: detection of congenital anomalies of eye like Retinoblastoma (malignant intraocular tumor), Retinopathy of prematurity (retinal neovascularization), Trichiasis (misalignment of eyelashes) Coloboma (missing part of tissue of any eye structure), congenital glaucoma etc are important because these may cause childhood blindness.

Congenital Color Vision Defect: also known as color vision deficiency or color blindness, is where a person has difficulty distinguishing between certain colors. The most common type of congenital color vision defect is red-green color blindness, where

individuals have difficulty distinguishing between the shades of red & green, due to problems with cone cells (responsible for detecting color) in retina of the eye. Though congenital color vision defects cannot be cured, but can be managed, by using color filters or lenses to enhance color discrimination which can change patient's life.

Table 4: Prevalence of Inherited Color Vision Deficiency in Children 61 Months (5 years) to 72 Months (6 Years) of Age

Color Vision Deficiency	White Non-Hispanic	Hispanic	African American	Asian
Boys	7.8%	2.9%	2.1%	3.5%
Girls	<0.4%	<0.4%	<0.4%	<0.4%

Source: Multi-Ethnic Pediatric Eye Disease Study[69]

[Prevalence of Inherited Color Vision Deficiency in Children 61 Months (5 years) to 72 Months (6 Years) of Age]

Importance of Primary Eye Checkup in Pedriatic Patients

- **Improved Academic Performance**

  poor vision can impact a child's ability to read, write, concentrate & thus negatively impact their academic performance.

- **Detection of vision related problems**

  regular primary eye examinations can detect vision problems & allow for prompt intervention, including corrective eyeglasses, contact lenses, or vision therapy.

- **Prevention of Eye Injuries**

  children are more susceptible to eye injuries than adults that can cause permanent vision loss & prevention is key in this regard.

- **Protection of Eyes**

  parents should be made aware to protect their child's eyes, like wearing protective eyewear while playing sports, using safety glasses when playing with tools & avoiding certain toys that can cause eye injuries.

- **Improved Social & Physical Development**

  poor vision can affect a child's ability to interact with their peers, participation in sports & other physical activities & enjoying outdoor activities. Good, improved vision is essential for children's social & physical development; can also boost a child's self-esteem, confidence & independence.

In conclusion, regular primary eye examinations are crucial for child's overall health & development, since early detection can prevent permanent vision loss & improve overall quality of their lives.

Adenovirus

Arzoo Khatun, Said Mondal

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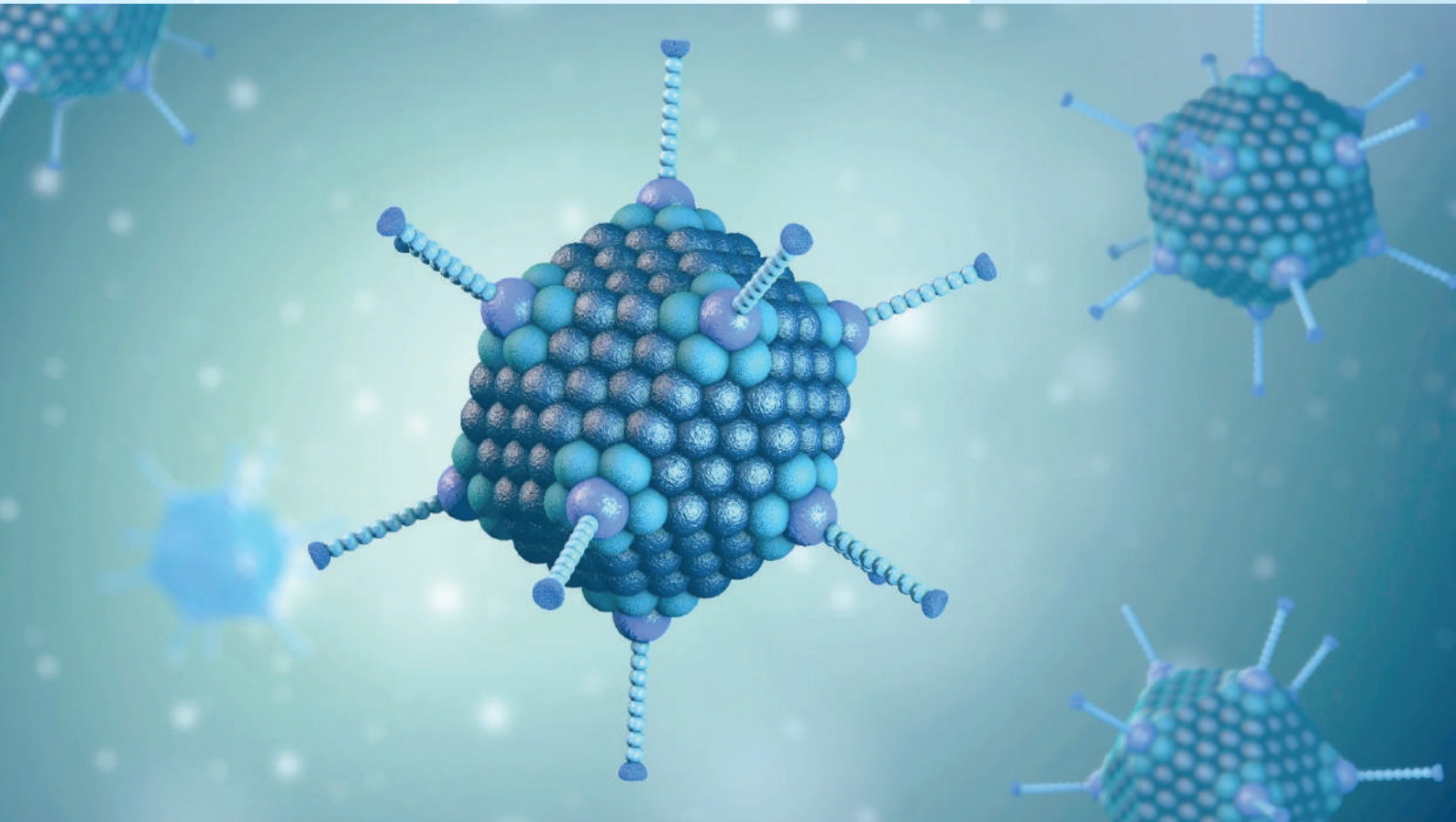
We still haven't come out totally from our pandemic situation where now we are again facing a another big problem. Adenovirus now have, likely started to spread & is commonly affecting children. It is a common virus that can cause a range of cold or flu like infections. 50 types of Adenovirus can infect human. This virus occurs throughout the year, but it tends to peak in the winter & early spring. Children ages 6 months to 2 years who are in child care are more likely to become ill with these viruses.

Adenovirus infection in humans are generally caused by Adenoviruses types B, C, E & F. Spread of this virus occurs mainly when an infected person is in close contact with another person. This may occur by fecal oral route, airborne transmission or small droplets containing the virus. Less commonly, the virus may spread via contaminated surface. Other respiratory complications include acute bronchitis.

Adenovirus symptoms may generally include: Common cold or flu-like symptoms, fever, sore throat, acute bronchitis (inflammation of the airways of the lungs, sometimes called a "chest cold", Pink eye (conjunctivitis), inflammation of the stomach or intestines causing diarrhea, vomiting, nausea & stomach pain.

As per now west Bengal has registered 12,000 of Adenovirus from January to march 2023, where mortality rate is slowly increasing. Therefore, we should take care of our health & for that Good h& washing is the most important thing that we should practice to prevent adenovirus infections. It is also important to clean & disinfect toys & other objects, because Adenoviruses can survive for a long time on surfaces.so we should never leave our habits that we all kept during COVID period. This natural habits lead us to live a healthy life & keep us away from this kind of harmful virus.

Same like corona virus, Adenovirus infections cannot be treated with any approved antiviral drugs or methods. Most adenovirus infections are minor, & symptoms can usually be handled with rest & over-the-counter painkillers or fever reducers. While there is an adenovirus vaccine. Therefore, keeping safe to ourselves & our near & dear ones should always be our priority by making them a regular healthy habits of being healthy.



Congenital Heart Disease (CHD) in Newborns

Bhumi Kumari Gupta
BOTTA, 1st SEM

Congenital Heart Disease (CHD):

CHD - a defect with heart's structure present at birth, like:

- A hole in heart wall
- Issues with blood vessels, heart valves

Types:

1. Cyanotic congenital heart disease
2. Acyanotic congenital heart disease

(1) Cyanotic congenital heart disease: Cyanotic heart - problems with insufficient oxygen supply in blood. Babies born with cyanotic heart disease generally have a blue-colored tinge to areas such as fingers, toes & lips. They may also experience symptoms of:

- breathlessness
- chest pain
- palpitations
- fainting
- fatigue

(2) Acyanotic congenital heart disease: Babies may be asymptomatic with problems with high blood pressure & higher blood supply to lungs (pulmonary hypertension), causing symptoms like:

- breathlessness
- fatigue
- dizziness
- fainting

Symptoms:

Symptoms may start as soon as baby is born or may not appear until later in life. They can include,

- Cyanosis
- Excessive sleepiness
- Fast or trouble breathing
- Fatigue (extreme tiredness)
- Tiredness during exercise
- Poor blood circulation
- Weak pulse or pounding heartbeat

Causes:

It may be related to:

- Abnormal chromosomes or genetics
- Drinking or smoking during pregnancy (or significant environmental exposures like second h& smoke)
- Illnesses of mother during pregnancy (diabetes, drug use, phenylketonuria or viral infection)

Diagnosis:

Following tests help diagnose CHD:

- Physical exam (listening to heart for abnormal sounds)
- Chest X-ray
- Electrocardiogram (ECG)
- Echocardiogram
- Heart catheterization
- Magnetic Resonance Imaging (MRI)

Treatment:

Some causes of CHD may heal themselves. Others may remain but don't require any treatment while others must be treated soon after birth. Treatment may involve:

- Catheter procedure to place a plug into the defect
- Medications to manage cardiac functions, blood pressure
- Nonsurgical procedure to close a defect using a closing device
- Oxygen therapy for better O2 supply
- Prostaglandin E1 keep open ductus arteriosus (blood vessel normally closed after birth) helping provide needed circulation
- Surgery to repair a defect, open up blood flow or redirect blood
- In severe cases, heart transplant may be necessary

Precautions to take during pregnancy:

Pregnant women must follow certain precautions:

- Informing doctor about any medications taken
- Keeping blood sugar levels under control before pregnancy, for a diabetic female
- Avoiding exposure to rubella, inn case of a lack of vaccination
- Genetic screening in case of family history of CHD
- Taking 400 µg of folic acid supplement a day during first trimester (12 weeks) of pregnancy
- Avoiding contact with infected people
- Avoiding drinking alcohol & using illegal drugs during pregnancy

Prevention:

Some lifestyle measures can help reduce risk of heart disease, including:

- Balanced diet
- Regular exercise
- Maintaining moderate body weight
- Quitting or avoiding smoking
- Limiting alcohol intake
- Managing underlying conditions

India's Rich Heritage in Medicine: A Holistic Approach to Healing

Brijesh Karr

BPT, 1st SEM

Introduction:

India's contribution to the fields of medicine dates back thousands of years, characterized by a holistic approach that emphasizes the interconnection of the body, mind, & spirit. The country's ancient healing traditions, rooted in diverse philosophies, have laid the foundation for modern medical practices. From Ayurveda's holistic principles to yoga-based therapies & advanced physiotherapy techniques, India's roots in medicine & physiotherapy continue to influence & shape healthcare practices around the world.

Historical Context & Ancient Healing Systems:

1. Ayurveda:

Ayurveda, meaning "knowledge of life," is one of the oldest healing systems in the world. It is a comprehensive system that encompasses physical, mental, & spiritual well-being. Ayurveda emphasizes the balance of bodily humors (doshas), personalized treatments, herbal remedies, & lifestyle modifications. This holistic approach to healing has laid the

groundwork for various medical practices, including physiotherapy.

2. Yoga & Meditation:

India's ancient practice of yoga & meditation not only promotes physical flexibility & mental clarity but also serves as a foundation for holistic healing. Yoga-based therapies are now integral components of physiotherapy, aiding in rehabilitation, pain management, & stress reduction.

Physiotherapy Practices:

1. Traditional Therapies:

India's traditional therapies, often rooted in Ayurvedic principles, have been integrated into modern physiotherapy practices. Techniques such as Panchakarma (detoxification & rejuvenation), Abhyanga (massage), & Swedana (steam therapy) are used to enhance physical rehabilitation & overall well-being.

2. Yoga Therapy:

Integrating yoga postures, breathwork, & meditation, yoga therapy has gained recognition as a valuable tool in physiotherapy. It aids in improving flexibility, balance, posture, & muscle strength while promoting relaxation & mental well-being.

3. Manual Therapy:

India's historical emphasis on touch therapies aligns with modern manual therapy techniques. Techniques like joint mobilization, manipulation, & soft tissue mobilization are used in physiotherapy to improve range of motion & alleviate pain.

4. Ayurvedic Herbs:

Physiotherapy practices often incorporate Ayurvedic herbs & oils for their therapeutic benefits. These substances are used in massages, wraps, & compresses to enhance the effects of manual therapies.

Holistic Approach & Modern Relevance:

India's holistic approach to medicine & physiotherapy has gained renewed attention in recent years as modern healthcare recognizes the importance of treating the whole person, not just isolated symptoms. This approach aligns with the principles of personalized care, prevention, & overall well-being.

Furthermore, India's ancient practices have paved the way for innovative research & integration of traditional techniques with modern technology. Physiotherapy clinics in India & around the world now offer a blend of evidence-based practices & holistic therapies, providing patients with comprehensive treatment options.

Conclusion:

India's roots in medicine & physiotherapy exemplify a holistic approach to healing that transcends time & geographical boundaries. From the ancient wisdom of Ayurveda to the integration of yoga & traditional therapies into modern physiotherapy practices, India's contributions continue to shape healthcare systems globally. As society seeks more holistic & personalized approaches to health, India's rich heritage in medicine & physiotherapy serves as a guiding light, reminding us of the interconnectedness of the body, mind, & spirit in the journey towards optimal well-being.

Uniting Convalescent Homes with Old Age Centres: an Equity Approach to Rehabilitation

Kausar Kalim

BPT, 7th Sem

Senior Citizens in Govt. run old age homes suffer from lack of basic health care facilities, that eventually lead to distress & trauma. Our idea is to bring together the Government-run old age centres with public or private convalescent homes through legal binding &/ or MOUS, that could play a major role in curbing this issue, leading to a mutually beneficial relationship.

Research surveys report that, integrating orphanages with old age centers mutually help both the orphans & elderly people to get love, companionship & guidance from each other.

Moreover, geriatric people in many Govt. run old age homes suffer from quick medical accessibility. Solving these problems will increase their healthcare in improvised manner.

Due to aging the old folks starts loosing balance coordination, flexibility & strength along with the problems like diabetes, cardiopulmonary, ortho or joint disorders etc. These patients can be benefited by medical professionals in convalescent home, who will help them train & recover from these physical & mental traumas; improve their confidence & independence. Easy medical accessibility & early detection would not only save life but will also be cost effective.

How old age centers benefitting convalescent homes?

1. It will increase the job opportunities for medical professionals
2. It will provide effective platforms for therapeutic researches since long term treatments, trials of new devices or therapeutic procedures would lead to new discoveries in medical field.
3. This will enhance the skill of the professionals to deal with different fields of health problems in one frame as they will get patients with ortho, neuro, cardio-pulmonary disorders, mental health issues etc under one roof, which will open door to improve the skills of new professionals.

We will conclude this solution with this binding framework between the appropriate Governing bodies through law or MOU's that would effectively help to internalize the need for equity based on age differences & private & public health care service provisions. This would help ensure targeted approach towards attaining & building a fairer & healthier world for the senior citizens.

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Artificial Intelligence in Radiology

Md Arif Rahaman

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Radiology: Radiology, also known as diagnostic imaging, is a series of tests which take pictures or images of parts of the body.

Artificial Intelligence: artificial intelligence refers to the simulation of human intelligence in machines that are programmed to think like humans & mimic their actions.

Artificial Intelligence in Radiology: Worldwide interest in artificial intelligence (AI) application, including imaging is high & growing rapidly, fuelled by availability of large datasets (big data) substantial advance in computing power & new deep-learning algorithms.

History of A.I Radiology:

Computer-aided detection (CAD) was the first application of radiology AI. CAD has a rigid scheme of recognition & can only spot defects present in the training dataset. It can't learn autonomously, & every new skill needs to be hardcoded.

Since that time, AI has evolved tremendously & can do more to help radiologists. Some of the medical digital image platforms enable users to manage different types of images, manipulate them, connect to third-party health systems, & more.

How A.I Works in Medical Imaging:

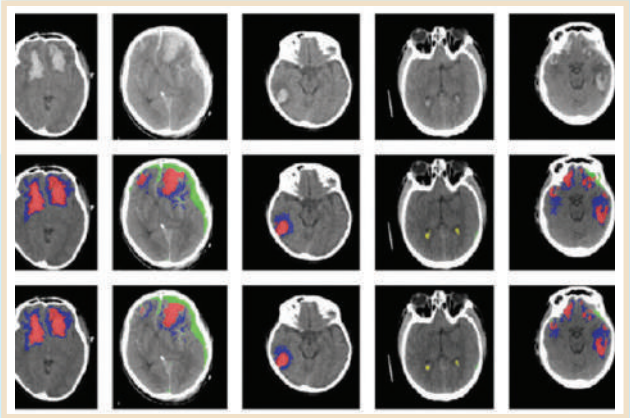
- A.I excels at recognizing patterns in large volume of data
- Identify the pre-feed landmark of anatomy, pathology or other details
- Can differentiate in between normal & abnormal anatomical structure

Advancement with Artificial Intelligence in Radiology:

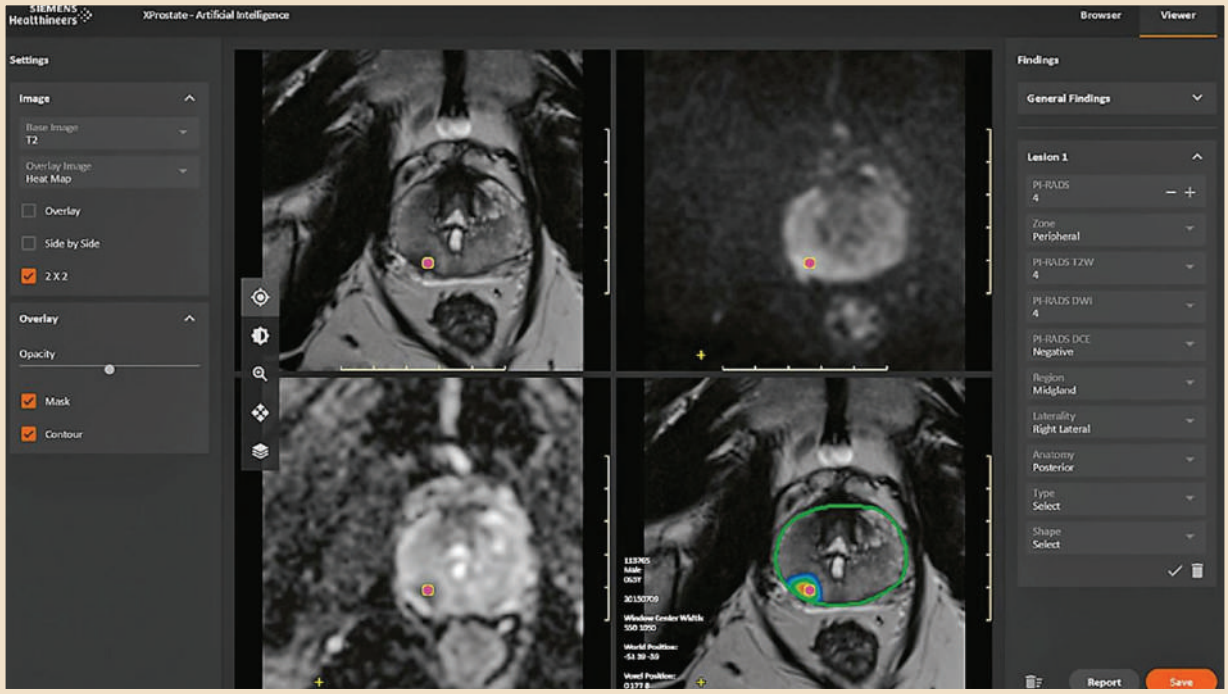
- Can help radiologist & pathologist for better diagnosis of data
- Auto image analysis
- AI can show intelligence during the procedure to auto correct the planning & positioning & scanning.
- Deep learning
- AI also can help scientific research
- AI can integrate image information, so radiologist/ physician can make decision with more confidence & plan for line of treatment

Two ways of using AI in radiology:

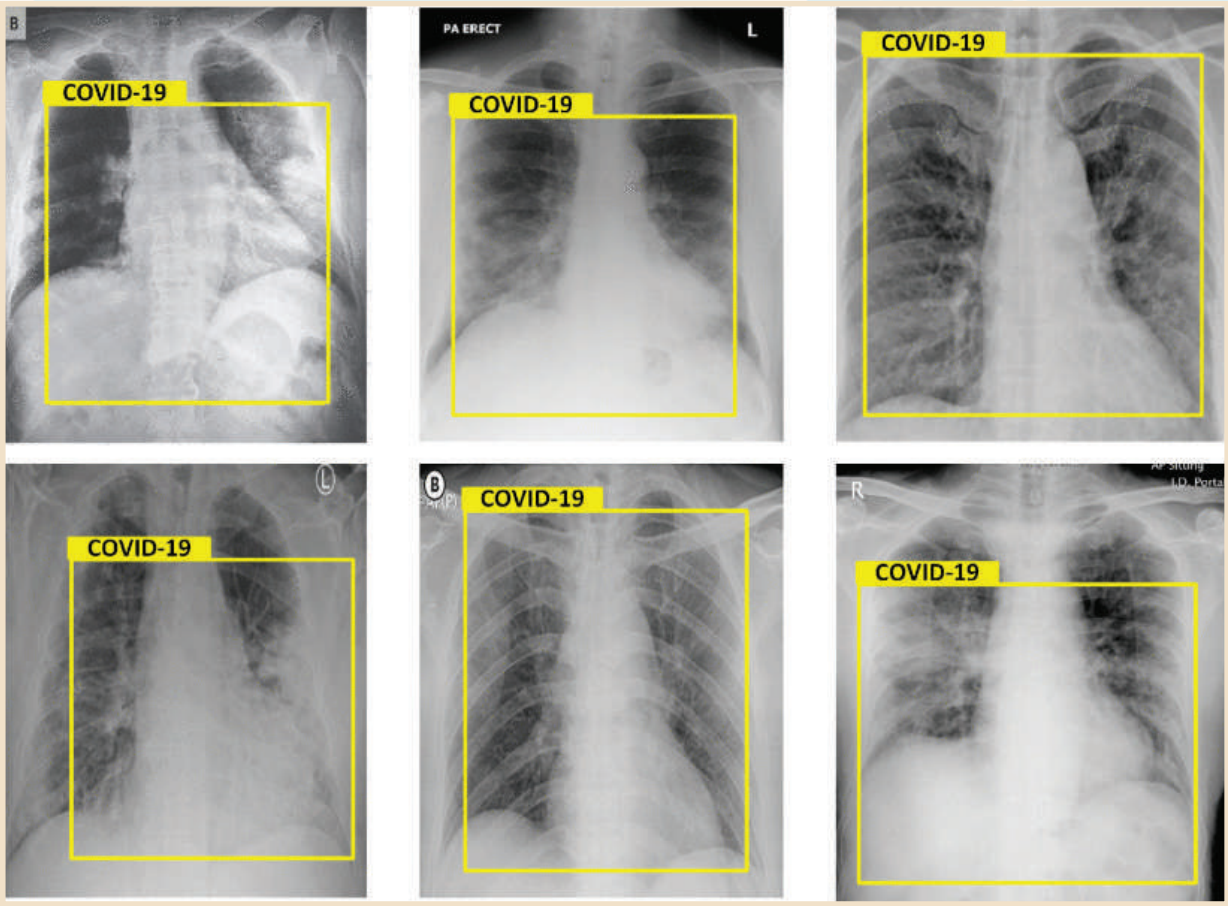
1. Programming an algorithm with predefined criteria supplied by experienced radiologists. These rules are hardwired into software & enable it to perform straightforward clinical tasks.
2. Letting an algorithm learn from large volumes of data with either supervised/unsupervised techniques. The algorithm extracts patterns by itself & can come up with insights that escaped the human eye.



AI successfully used to identify different types of brain injuries



Artificial Intelligence for MRI



AI Fight Against COVID-19 (Automatic Detection from Chest X-Ray Images Is Possible)

Pitfalls of Wearing High Heels

Pragati Tiwari
BPT 7th SEM

We all love high heels. From stilettos to wedge heels, pointed to slink back heels - all are high in trend. High heels make the leg look alluring, long & gives a charismatic aura.

History:

High heels were worn in 10th century as a way to help the Persian calvary keep their shoes in their stirrups. It helps the height upto 18 inches, lifts chest forwards & buttocks upwards raises women above contender & provide a gratifying stride for clients. This leads men to perceive women as more sexually appealing.

Soon it became a trend; more that 80% of women are found to possess a dazzling pairs of heels. But, behind the beauty & glamour parts of the heels there are few serious health issues.

Problem:

Most women have zero idea how badly these evil pairs are killing them every day. Heels provide an unnatural posture which is not only anatomically incorrect but also agonizing for prolonged duration. Continuous bending of the toes results in numerous types of damage to leg tendons & growing nails.

While walking, the back is pushed out in order to maintain a straight & standard posture but pressure on the knee increases. Upto 26% pressure over the knee & 76% pressure over the foot area increase causing osteoarthritis in near future. Higher the heels, more adverse effects they hold. In human body tendons are present to enable the flexibility of the joints & allowing the foot to lie flat. Women wearing high heels suffers from shortening of the tendon which causes tremendous pain during walking.

Pointed heels cause thickening of nerves, mainly at 3rd & 4th toes & cause numbness & pain. A hump starts to grow under the foot. Research shows that women wearing tight fitting heels develop hummer toes disorder causing muscle shortening & leaves the toe permanently bended.

Appearance of bony prominence / bunions on feet occur at big toe, increases the chance of having lumber lordosis affecting the paraspinal muscle.

According to the American Academy of Orthopaedic Surgeon, wearing heels for prolonged time causes impact around 3x the weight of a person. One of the most affected area is planter fascia causing planter fascitis.

Treatment:

1. Avoid wearing them every day & switch on to low heel shoes or flat slippers.
2. Ice application, use of NSAID (non-steroidal anti-inflammatory drugs), Ibuprofen, splints etc can improve those conditions.
3. Regular exercises like seated fascia stretch, standing cuff stretch etc are also very helpful. In extreme case, surgery is recommended; recovery takes upto 6 months.

Conclusion:

Although women go extra miles & many are wasting millions in order to look attractive & modern, even at the cost of their health. Our foot is our support. If the foot isn't happy then is it worth to be modern!! Our health is our only partner till the end. Staying healthy is more important.

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Minds Behind the Bars: Fascinating Psychology Behind Illegal Behaviour

Protyusha Mitra

BOTTA, 1st SEM

वशिषेणात्मनो धातुर्दोषक्लेशजनकस्य च।
सात्म्यं यदि समाप्नोति स्वस्थो भवति धारणीम्॥

"When a person attains mental equilibrium & balances the doshas (bioenergies) & agitations of the mind, they achieve health & stability."

Introduction:

Criminal psychology, a captivating field that delves into the minds of offenders, aims to decipher the motives & thought processes behind criminal behavior. This discipline combines principles from psychology, sociology & criminology to provide insights into why individuals commit crimes & how their psychological traits contribute to such actions.

Understanding Criminal Motives: one of the primary focuses of criminal psychology is understanding the motivation behind criminal acts. Motives vary widely, like financial gain, power, revenge or psychological gratification. By studying these motives, criminal psychologists aim to uncover patterns that can aid in crime prevention & intervention strategies.

Personality Traits & Criminality: role of personality traits in criminal behavior is an essential aspect of criminal psychology. Certain traits like impulsivity, low empathy & sensation-seeking, are linked to a higher likelihood of engaging in criminal activities. Psychopathy, characterized by a lack of remorse & empathy, is particularly noteworthy. However, these traits are not definitive predictors.

Environmental & Societal Influences: individual's environment & upbringing significantly impact their propensity for criminality. Adverse childhood experiences, lack of positive role models, exposure to violent environment increase the likelihood of criminal behavior. This understanding emphasizes the importance of addressing societal factors & providing support to at-risk individuals early on.

Role of Mental Health: it is intricately linked to criminal psychology. Many offenders have underlying mental health disorders that influence their actions. Substance abuse, personality disorders & mood disorders can impair judgment & contribute to criminal behavior. Identifying & treating these disorders within the criminal justice system is crucial for rehabilitation.

Criminal Profiling & Investigation: it's a technique used by law enforcement to create a psychological profile of an unknown criminal. By investigating crime scenes & patterns, nature of crime, Criminal Psychologists assist in narrowing down potential suspects & understanding their possible motivations.

Legal Implications & Courtroom Testimony: Criminal psychologists often serve as expert witnesses in court cases; provide insights into the mental state of the accused, evaluate whether they were mentally competent at the time of the crime & any mitigating psychological factors played a role in their actions. Such testimony can influence legal outcomes, impacting sentencing & determination of guilt or innocence.

Ethical Considerations: the field of criminal psychology is not without ethical dilemmas. Researchers & practitioners must navigate issues of confidentiality, the potential for stigmatization of certain psychological traits & responsibility to balance public safety with individual right, reliability & validity of certain psychological assessments used in criminal contexts etc.

Conclusion:

Criminal psychology offers a comprehensive framework for understanding the complex interplay of psychological, societal & environmental factors that contribute to criminal behavior. By unravelling these intricacies, criminal psychologists contribute to crime prevention, rehabilitation & the pursuit of justice. As the field continues to evolve, its insights will likely become even more integral to the criminal justice system & broader efforts to create safer societies.

Nuclear Medicine in The World of Radiology

Puja Chakraborty

BRMIT, 3rd Sem

Nuclear medicine is a specialized area of radiology that uses very small amounts of radioactive materials, or radiopharmaceuticals, to examine organ function & structure. This branch of radiology is often used to help diagnose & treat abnormalities very early in the progression of a disease, such as thyroid cancer.

In planner imaging, the gamma camera remains stationary. The resulting images are two-dimensional (2D). Single photon emission computed tomography, or SPECT, produces axial "slices" of the organ in question because the gamma camera rotates around the patient. Scans are used to diagnose many medical conditions & diseases, like:

- **Renal scans-** to examine the kidneys & to find any abnormalities like abnormal function or obstruction of renal blood flow.
- **Thyroid scans-** to evaluate thyroid function &/or evaluate thyroid nodule or mass.
- **Bone scans-** to evaluate any degeneration & cause of bone pain or inflammation.
- **Gallium scans-** to diagnose infectious & inflammatory diseases, tumors, abscesses.
- **Heart scans-** to identify abnormal blood flow to the heart, to determine the extent of cardiac muscle damage after a heart attack, &/or to measure heart function.

Diagnosis

Nuclear medicine tests use a small amount of radioactive material combined with a carrier molecule, called radiotracer; builds up in certain areas of the body, when injected in body. Radiotracers are usually given via injection, but they may also be swallowed or inhaled.

Therapy

Nuclear medicine therapy uses a small amount of radioactive material combined with a carrier molecule, called radiopharmaceutical, used to treat cancer & other conditions. These are attached to specific cells & then deliver a high dose of radiation, destroying them.

In adults, doctors use nuclear medicine to:

Heart

- Look at blood flow & function
- Detect coronary artery disease
- Evaluate treatment options such as bypass heart surgery & angioplasty etc

Lung

- Check for blood flow & breathing problem
- Assess lung function for surgery etc

Bones

- Check bones for fractures, infection
- Look for biopsy sites etc

Brain

- Detect early onset of neurological disorders
- Check for the recurring brain tumor etc

Kidney

- To determine the stage of cancer & analyze the spread, plan treatment, analyze kidney blood flow & function

The equipment includes:

1. Gamma camera: detects the energy from the radiotracer in body & converts it into an image; it has radiation detectors called gamma camera heads.

2. SPECT: the gamma camera heads rotate around patient's body to produce 3D images.

3. PET: the scanner is a large machine with round, donut-shaped hole in middle; looks like CT or MRI unit.

Limitations of General Nuclear Medicine

The procedure is time consuming, takes up several hours to perform.

Resolution of images may not be as high as that of CT or MRI.

Diabetes Mellitus

Ritam Koley

BPT, 7th Sem

Diabetes mellitus is a disease with too high blood glucose. Glucose is the main source of energy & comes from food. Insulin, a hormone made by the pancreas, helps to control glucose balance in blood acting with glucagon & helps glucose from food to get into cells to be used for energy.

Normal concentration of glucose in blood is 70-120 mg/dl in 12hrs. Fasting condition for an adult. Blood glucose level increases either due to or insulin deficiency (lesser production) or insulin resistance (non-functioning) – a condition known as diabetes mellitus.

2 most common types of diabetes mellitus-

type I, type II; also there is gestational diabetes

Type I occurs due to insulin deficiency, when our immune system attacks & destroys the pancreatic cells that produce insulin. It is usually common in children & young adults. People need to take insulin every day to stay alive.

Type II diabetes occurs when body can't use insulin well. It can develop at any age, mostly in middle-aged & older people. It is the most common type of diabetes.

Most common symptoms of diabetes are excessive thirst or urination, fatigue, weight loss, often with no symptoms. It's a chronic disease. High glucose concentration in blood affects various organs, like kidney, eye, heart, nerves; in sever stage, it results into kidney failure, heart issues, blindness, coma & death. So, we should not ignore it.

Early diagnosis is vital to maintain normal blood glucose concentration. It is measured in 3 conditions using serum of patient— at 12hrs. fasting condition, after 2hrs. of taking meal (post prandial / PP) blood glucose & random. Sample is collected in grey vial & test is performed in GOD-POD method. Normal value in fasting is 70-120 mg/dl, in PP <140 mg/dl, in random 70-140 mg/dl. If value of blood glucose is >400 mg/dl that is life threatening. Some other test also performed like HbA1C to observe the control of blood glucose, glucose tolerance test. Glucometer is used for instant test of blood glucose.

Diabetes is called as silent killer, with no permanent treatment. We just can maintain a balance of blood glucose concentration. We can manage diabetes, by maintaining a healthy life style with a proper diet including less carbohydrate & fat consumption, regular exercise & if needed, proper medications.

Abortion & its Related Issues

Santanu Maity, Soheli Sohid

BMLT 3rd SEM

Abortion is a highly controversial & emotionally sensitive topic that involves termination of a pregnancy, either naturally or intentionally, before the fetus is viable outside the womb. Abortion can be performed for various reasons, including health concerns, fetal abnormalities, or personal choice. There are different methods of abortion, including medication-induced & surgical abortion.

Despite the controversy surrounding abortion, it is a common procedure worldwide. According to the World Health Organization, an estimated 56 million induced abortions occurred globally in 2010, with 87% of these taking place in developing countries.

The legal status of abortion varies widely across different countries & regions. Some countries have strict laws against abortion, while others allow it under certain circumstances, like in cases of rape or incest, fetal abnormality or risk to the mother's life.

There are different perspectives on the morality & ethics of abortion. Some people believe that abortion is a fundamental human right, allowing women to control their bodies & reproductive choices. They argue that women should have the right to choose whether or not to continue a pregnancy & that denying this right is a violation of their autonomy & bodily integrity.

On the other h&, some people believe that abortion is morally wrong & should be prohibited. They argue that the fetus has a right to life & abortion is equivalent to killing an innocent human being. They also often argue that adoption is a viable alternative to abortion & women who cannot care for their children should carry their pregnancies to term & give the child up for adoption.

It is important to recognize that the decision of abortion is often difficult & deeply personal one. Women who choose to have an abortion may do so for a variety of reasons, including financial constraints, personal circumstances & health concerns.

The key issues of abortion are the moral status of the fetus & the right to autonomy & bodily integrity. Those who argue that a fetus is a person with a right to life from the moment of conception believe that abortion is morally equivalent to murder, while those who argue that the fetus does not have full moral status until later in pregnancy or even until birth believe that women should have the right to terminate their pregnancies for any reason.

In conclusion, abortion is a complex & controversial issue that elicits strong emotions & beliefs. While different individuals, groups & societies may hold divergent views on the morality, legality & ethics of abortion, it is important to recognize its significance as a fundamental human right & public health issue. Access to safe & legal abortion services is critical in protecting the health, well-being & autonomy of women, particularly those in developing countries facing significant barriers in accessing reproductive health care.

Is Period Shame or Blessing?

Sayan Karmakar

BMLT, 5th Sem

Menstruation, also known as menses, menstrual cycle or period is the monthly shedding of the lining of uterus. Menstrual blood, composed of blood & tissues, egg cells inside the uterus flows through cervix & vagina to out of the body. Menstruation is driven by pituitary & ovarian hormones.

Relation between Ovulation & Periods

These hormones cause the lining of uterus to thicken. This happens so that if a pregnancy would occur, an egg can implant into uterine lining. Hormones also cause ovaries to release an egg (ovulation). The egg moves down fallopian tubes, where it waits for sperm. If a sperm doesn't fertilize that egg, pregnancy doesn't occur. The lining of uterus breaks down & sheds. This is denoted as period.

Menstrual Cycle

It is a term to describe the sequence of events that occur in body as it prepares for the possibility of pregnancy each month. Menstrual cycle is the time from the first day of menstrual period until the first day of next menstrual period. Every person's cycle is slightly different.

PMS

(premenstrual syndrome) is when a girl has emotional & physical symptoms that happen before or during her period.

Duration of normal menstrual cycle

The average length of a menstrual cycle is 28 days. However, a cycle can range in length from 21 days to about 35 days & still be normal. Periods usually start between age 11 & 14 & continue until **menopause** at about age 51.

Phases of Menstrual Cycle

The average length of a menstrual cycle is 28 days. However, a cycle can range in length from 21 days to about 35 days & still be normal. Periods usually start between age 11 & 14 & continue until **menopause** at about age 51.

1. The menses phase: This phase typically lasts from day one to day five.

2. The follicular phase: This phase typically takes place from days six to 14.. During days 10 to 14, one of the developing follicles will form a fully mature egg (ovum).

3. Ovulation: This phase occurs roughly at about day 14 in a 28-day menstrual cycle.

4. The luteal phase: This phase lasts from about day 15 to day 28. Egg leaves the ovary & begins to travel through fallopian tubes to uterus.

Symptoms of periods

1. Mood changes, 2. Trouble sleeping
3. Headache, 4. Bloating
5. Breast tenderness, 6. Acne

Uses of Pads, Tampon & Menstrual Cup

- Most girls use **pads** when they first get their period.
- Many girls find **tampons** more convenient than pads, especially when playing sports or swimming.
- Some girls prefer a **menstrual cup.** Most menstrual cups are made of silicone. To use a menstrual cup, a girl inserts it into her vagina. It holds the blood until she empties it.

Impact of Menstruation in society

Because of social taboo & gender stereotypes that stigmatize menstruation as dirty, many people experience menstruations with shame & without access to the resources needed to manage their menstrual health safely. Menstruation is a human rights issue. It is also a public health & development issue.

Social Media – A Blindfolded Technology

Sayantan Chakraborty

B.Sc. Applied Psychology, 5th Sem

Social Media isn't so social anymore & we are the ones responsible for it

Remember the time when we could see whatever we wanted on our social networking sites. Strangely you might have the question "Isn't it still the same case?"

Well I'll tell you "it's not", the world of social media is now so critically focused on enhancing individual experiences that it has failed to do justice to the part of the name that reads as "SOCIAL".

Now you may debate me saying "that's a far better experience & I'm very satisfied about it & overall it's SAFER". Yes, you are mostly correct, but the term "Safety" has been sold to you in the very way The USA claimed "weapons of Mass destruction in Iraq". Even though we do enjoy the benefits of being safe from random stalkers, we also enjoy the safety of exclusively choosing who we can be visible to & in doing so we first & foremost exclude people who can act as a barrier to our "FUN" time(s). Thus eliminating the first line of defence that we have any sort of moral obligations to. Here I ask the question to "your superego" or as the layman may know it "your moral police ", "is that the safety you wanted". Well, I am not asking people to be seated in front of their computer screen & do only things related to study, jobs, career, etc. But question yourself if it's that good thing to do then why hide it from some specific "others". Today drug use is at an all-time high & what fuels this trend is may be a thousand different nothing but there will be that one Page on our social media app that advertises it as an "amazing experience", a "must" "a great stress reliever" & whatnot & you cannot deny that

Well if you're not convinced with just that, let's look into another aspect of it. Recall your YouTube home page & try to remember when was the last time you saw something you completely disagree with or something that really makes your blood boil or makes you uncomfortable at least? I am sure you can't & even if you do, it's mostly a content someone else (you know) shared with you. Then the question arises "isn't that better, it's safer", the fallacy of this issue arises if you actually question "is this safety or imprisonment" the fact that humans are creatures who can think & evaluate their environment, our power is being stripped off of us & we happily part ways with it, of understanding is restricted even before we know it. The common man will keep consuming content that he/she feels is correct & by the will of some computer codes will be fed the same as well. He / She will never know what that other side of the story is until pointed out & even then may be refuted. I can support my viewpoint with the very live example of how communal violence that has long history in our country suddenly turned into an online war of subtle battles fought on the grounds of "comment section" where each comment has hundreds if not thousands of sympathizers each compartmentalized within their social media feed that boost their belief that they are the only correct ones. A statistical study claims that feelings of communal hatred in India have increased massively since the 2010s & guess when did social media gain a firm foothold, 2012.

Surprisingly there isn't any proven remedy to it as there are no permanent solutions to maintaining peace without raging wars in order to protect it. Social Media was introduced to us with the claim of bringing together people who think alike & want to feel connected & yes that has happened in reality but the reality also suggests that, "too many cooks spoil the broth".

The Price of Imperfections: Gunderstanding the Emotional Values Of Surgical Failures

Sayoni Das

BOTTA, 1st SEM

Introduction

Surgery - the act of performing surgery is called surgical procedure or operation or "surgery". The verb "operate" means to perform surgery. Surgical procedures are performed by a pair of operators: a surgeon - the main operator performing the surgery & a surgical assistant - who provides in-procedure manual assistance during surgery. Modern surgical operations typically require a surgical team including: surgeon, surgical assistant, anaesthetist, scrub nurse (who handles sterile equipment), circulating nurse & surgical technologist (who mandate the cardiopulmonary bypass) & perfusionist. All surgical procedures are invasive, often requiring a period of postoperative care for the patient to recover from the iatrogenic trauma inflicted by the procedure. Duration of surgery can span from several minutes to hours depending on the specialty & nature of the condition.

In most cases surgeries goes in right path but some takes a dangerously wrong turn & here I am about to discuss certain situations & who are actually responsible in most cases.

Complications of major surgeries can be based on:

1. Due to Anaesthesia, 2. Due to Surgeries

Due to Anaesthesia: usually general anesthesia is very safe. However, older adults & those undergoing lengthy procedures are most at risk of negative outcomes, including:

- Postoperative confusion, • Heart attack
- Pneumonia, • Obstructive sleep apnea (condition in which individuals stop breathing while asleep), • Seizures, • Existing heart, kidney or lung conditions

Due to Surgery:

Perioperative Complications: problems arising during surgeries like:

(i) Hypotension, (ii) Blood loss, (iii) Mismatched blood transfusion, (iv) Vasodilation from a combination of premedication & anesthetic agent., (v) Hypertension (vi) Use of ketamine, (vii) Pheochromocytoma, (viii) Uncontrolled hypertension, (ix) Cardiac arrest, (x)Air embolism, (xi) Tissue hypoxia, (xii) Asphyxia

Post-Operative Complications: problems arising after surgeries.

Immediate / Early Complications

Respiration:

- Airway Obstruction caused by tongue which falls back to block the oro & nasopharynx
- Hiccough: clonic spasm of diaphragm with reflex closure of the glottis

Cardiovascular:

- Hemorrhage: Dislodgement of blood clot/loose ligature at the cut end of blood vessel
- Secondary Hemorrhage: occurs after 7 days, with necrosis of blood vessels from infection
- Cardiac Arrest

Central Nervous System:

- Failure to recover consciousness
- Convulsions: attacks of involuntary tonic/clonic movements of trunk, limbs & face with or without loss of consciousness

Gastrointestinal tract

Nausea

Peritonitis

Genito-Urinary

- Retention of urine

Wound Complications

- Hematoma, • Wound dehiscence

Conclusion:

This message is for all of you especially for patients & their families. Doctors & other Healthcare Professionals engaged in operation, work day & night for us & yes they are humans. Human makes mistakes. .I explained everything above there just to educate everyone about "operation" & some of its complications because people often blame doctors or other faculties if it goes slightly in wrong direction leaving the facts that the patient might have some complications.

Mental Health Awareness

Shivangi Chakraborty
BOPTM, 3rd SEM

Mental health is a critical aspect of overall well-being, encompassing emotional, psychological & social factors that influence how individuals think, feel & act. In recent years, there has been a growing recognition of the importance of mental health & its impact on individuals, communities & societies at large.

One of the key factors in maintaining good mental health is managing stress. In today's fast-paced world, stress has become almost unavoidable. However, chronic stress can lead to a range of mental health issues such as anxiety & depression. Finding healthy ways to cope with stress, like through exercise, mindfulness or engaging in hobbies, is crucial for maintaining mental well-being.

Another important aspect of mental health is the prevalence & understanding of various mental disorders. Conditions like anxiety disorders, depression, bipolar disorder & schizophrenia are more common than we might think. Increased awareness & destigmatization efforts have encouraged individuals to seek help when needed. Access to mental health care, therapy & medication can significantly improve the quality of life for those facing these challenges.

The relationship between physical & mental health is intricate. Regular exercise & a balanced diet contributes to physical as well as mental well-being. Physical activity releases endorphins, - the "feel-good" hormones - that alleviate symptoms of depression & anxiety. Nutritious diet rich in vitamins & minerals supports brain function & mood regulation.

Social connections play an essential role in maintaining good mental health. Humans are inherently social beings & loneliness or social isolation can lead to feelings of sadness & depression. Building & nurturing relationships with family, friends & communities provide a support system during difficult times & offer outlets for sharing emotions, seeking advice & receiving comfort.

The role of societal factors in mental health cannot be overlooked. Socioeconomic disparities, discrimination & unequal access to resources can contribute to mental health challenges. Marginalized groups often face additional stressors that impact their psychological well-being. Addressing these systemic issues through policy changes, education& advocacy is crucial for creating a more mentally healthy society.

Furthermore, the digital age has brought both benefits & challenges to mental health. While technology facilitates communication & access to information, excessive screen time & social media use had been linked to feelings of inadequacy & anxiety. Finding a balance between online & offline interactions is vital to maintaining a healthy relationship with technology.

In conclusion, mental health is a multifaceted aspect of human well-being that requires attention & care. Strategies for promoting mental health include stress management, seeking help for mental disorders, maintaining physical health, fostering social connections, addressing societal factors & managing technology use. As awareness continues to grow, societies are better equipped to create an environment that supports mental well-being & provides resources for those in need. Prioritizing mental health not only benefits individuals but also contributes to the overall health & prosperity of communities & societies.

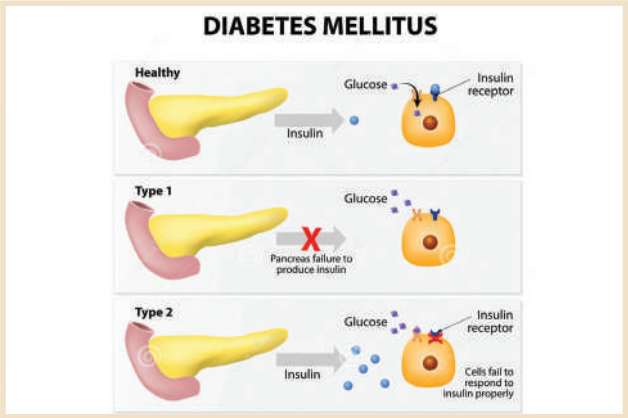
Dibetes Mellitus: Effects on Eye

Soumyabrata Mondal

BOPTM, 5th SEM

Diabetes Mellitus: Cause

Sugar is not always sweet; it may cause death if not present proper quantity & quality. Diabetes Mellitus is a condition where all the cells of the body starved of energy despite presence of abundant amount of glucose in blood. Insulin (hormone secreted from beta cells of islets of Langerhans's of pancreas) is responsible for moving glucose from blood to cell. Insulin deficiency (insufficient production) or resistance (non-functioning) results into diabetes mellitus. This disorder affects all organ along with vision.

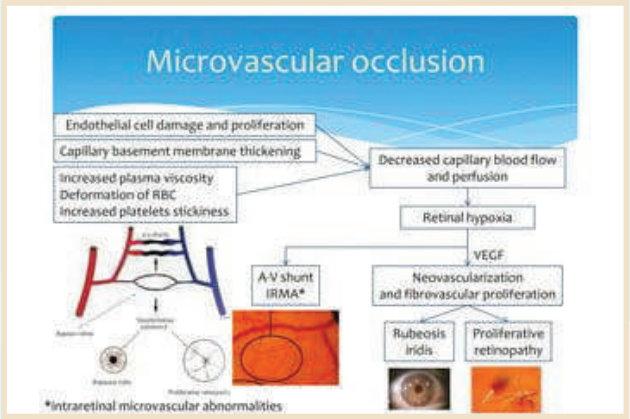


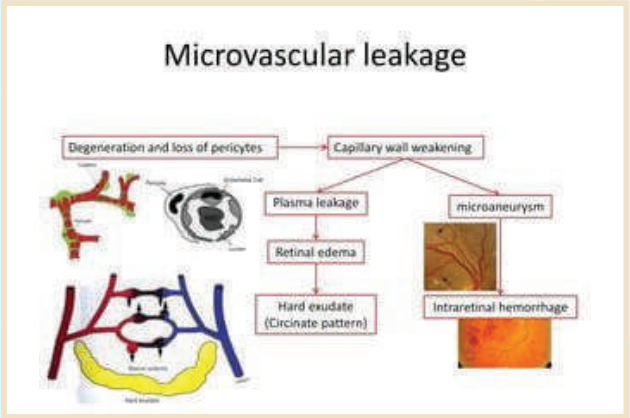
Diabetic Eye Disease: group of eye problems including: diabetic retinopathy, diabetic macular edema, cataract, recurrent styes in old age.

Diabetic Retinopathy: a microangiopathy with small blood vessels & retinal cells are vulnerable to damage from high glucose levels. At early stage, blood vessels weaken & shows localized outpouching (microaneurysm), or leak into the retina (nerve fibre layer hemorrhage) & ischemia due to loss of blood vessels. All these results into presence of ischemic neuronal debris (cotton wool spots), known as non-proliferative diabetic retinopathy. In severe case, some blood vessels are closed off, causing new blood vessels to grow & proliferate on retinal surface - a stage known as proliferative diabetic retinopathy. These new blood vessels are made with an emergency basis, so there is lack of pericytes in blood vessel wall, causing leak within retina or lead to vitreous hemorrhage. All these result into serious vision problems.

The part of retina which is responsible for central vision & color vision is called macula, which may show swelling, known as diabetic macular edema This exist in eyes who already have diabetic Retinopathy. DR includes certain risk factors, like: Duration (longer time, severe the disease), poor control of diabetes, pregnancy, hypertension, hyperlipidemia, smoking. Patients may complain of sudden painless loss of vision, floaters, blurred vision.

Diabetic Cataract: hyperglycemia is reflected in a high level of glucose in the Aqueous humor,





which diffuses into the lens. Glucose is Metabolized into sorbitol & which accumulates within the lens, resulting in secondary osmotic over-hydration. In mild degree, this affects the refractive index of the lens with consequent fluctuation of refraction accordingly with plasma glucose level, resulting in myopia. Cortical fluid vacuoles develop & later evolve into frank opacities. Classic diabetic cataract consists of snowflake cortical opacities occurring in young diabetic patients & may mature within few days or resolve spontaneously - a condition known as Snow-flake or Snow-storm Cataract.

Age-related cataract occurs earlier in DM; nuclear opacities are common & tend to progress rapidly.

Management:

1. Regular systematic checkup for blood sugar & blood pressure levels
2. Smoking should be avoided

Molecular Diagnosis

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BMLT, 3rd SEM

In recent few decades of revolution we have seen an evolution in the approach of therapy & diagnosis. Nucleic acid is a very crucial diagnostic tool through which we can detect various inherited genetic disease (e.g. cystic fibrosis, hemochromatosis, muscular dystrophy, hemophilia, anemia etc.). Since the conventional methods take more time, it may be fatal, so recent approaches come handy

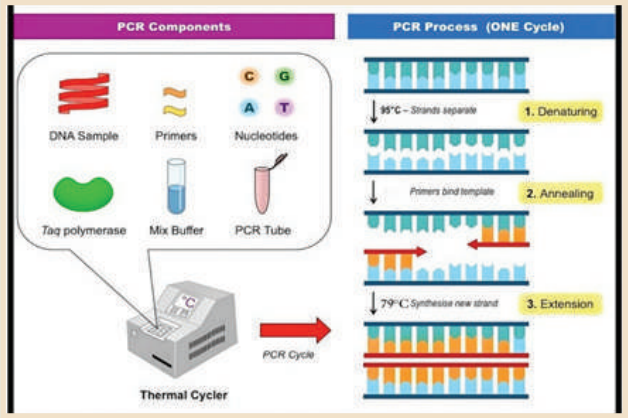
There are 3 main techniques of molecular diagnosis:

1. Molecular Probe: Generally, it's a segment of DNA, RNA or may be antigen(Ag), antibody(Ab) which actually acts as a detector of infected genes inside the cell.

At first we will isolate the DNA/RNA of Ag from the body & after the treatment of RE (Restriction Endonuclease), gel electrophoresis is done. Then by the southern blotting process, transfer it into nitrocellulose membrane. Then radiolabeled complementary sequence is bombarded & do the autoradiography. Here if Ag makes any infections, there must a possibility of mutation in gene sequence & this mutated gene is not matched in autoradiography & we will detect the infected genes.

2. PCR (Polymerase Chain Reaction):

Actually in case of AIDS, Cancer or any genetic disease, the amount of pathogenic genetic material is very less initially & to amplify it we will do PCR. Here's the process:



[Pic: 01 Polymerase Chain Reaction (PCR) in diagram]

Here's the process:-

1. At **95°C** we put the genetic material for 2-5 min for **denaturation.**
2. The **primer** (small chemically synthesized nucleotides) is added at 3' end of the two complementary DNA strand for **annealing.**
3. At **79°C DNA Polymerase** named **Taq polymerase** is taken for 2-5 min for the **extension.**

If the DNA replication is repeated many times the DNA segment is amplified to billion times.

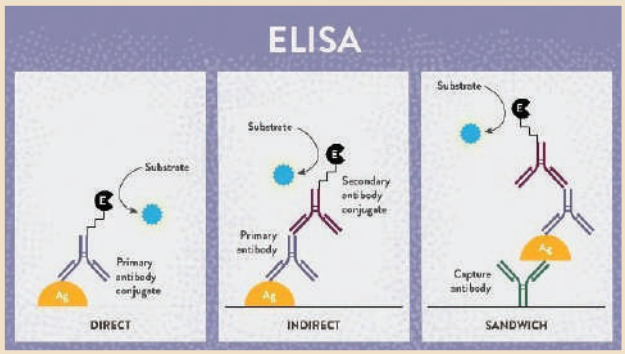
3. ELISA (Enzyme Linked Immune Sorbent Assay): In case of pregnancy (HCG test), HIV- AIDS, STD, Hepatitis etc. disease we use this technique even at an early stage where the amount of Ag of pathogen is very low.

There are 3 methods:

Direct: First we give the serum sample of Ag to the ELAISA plate, then wash it to remove unbound Ag. We put the enzyme-linked-Ab to that plate & wash it again to remove extra unattached enzyme-linked-antibody. Then after applying the substrate if the color comes it indicates the sample is affected & if the color isn't there then sample is unaffected.

Indirect: After giving sample serum of Ag to the plate then wash it to remove unbound Ag. Then we put the Ab against Ag & wash it, after that enzyme-linked-antibody complex is applied & washed it after to remove extra unattached complex. Then after applying the substrate if the color comes it indicated the sample is affected & if the color doesn't come the sample is unaffected.

Sandwich: Here we put the sample Ab to the plate & wash it to remove the unbound one. Apply the Ab specific Ag to the plate then wash it & give the Ag specific Ab & wash it again. After adding the enzyme-linked-anti-antigen complex we give the substrate. If the color comes it indicated the sample is affected & if the color doesn't come the sample is unaffected.



[Pic: ELISA in diagram]

By using these critical biotechnological techniques, various fatal disease can be diagnosed at a very early stage of attack & get the time to start the treatment accordingly.

Radiography: Pillar of Diagonosis

Swarnab Mondal, Swadhin Ranjit, Sk Mokammel

BRMIT, 5th SEM

Radiology:

the medical discipline using medical imaging to detect or diagnose diseases & guide their treatment. Through medical imaging technology (Radiography), doctors can access real-time pictures of the inside body. Except radiography, medical field is blind in any treatment in current world. Doctors specialized in radiology are called Radiologists & the Radiology Technologists usually take images of patients.

Radiology has 2 different areas, diagnostic radiology & interventional radiology.

Diagnostic Radiology:

helps health care providers see structures inside our body; includes:

- Plain x-rays
- Computed tomography (CT)
- Fluoroscopy
- Magnetic resonance imaging (MRI)
- Mammography
- Positron emission tomography (PET-CT)
- Ultrasound
- Nuclear medicine

Interventional Radiology:

helpful for inserting catheters, wires & other small instruments & tools into the body; includes:

- Angiography or angioplasty & stent placement
- Embolization to control bleeding
- Breast biopsy, guided either by stereotactic or ultrasound techniques
- Uterine artery embolization
- Tumor ablation with radiofrequency ablation, cryoablation, or microwave ablation
- Vertebroplasty & kyphoplasty
- Needle biopsies of different organs, such as the lungs & thyroid gland
- Venous access catheter placement, like ports & PICCs
- Cancer treatments

The main modalities of Radiology include:

X-Ray, CT, MRI, Mammography, Ultrasound & PET-CT

X-Ray:

a type of electromagnetic radiation with a shorter wavelength & higher energy than visible light.

Uses:

1) Medical Imaging
2) Industrial Inspection
3) Astronomy
4) Security Screening
5) Art Restoration

Disadvantage of x-ray:

1) Skin damage
2) Radiation sickness
3) Increased cancer risk
4) Genetic damage

Computed Tomography (CT) Scan:

a series of X-ray images taken from different angles around body & uses computer processing to create cross-sectional images (slices) of bones, blood vessels & soft tissues inside

Uses:

- To detect bone & joint problems, complex bone fractures & tumors.
- To diagnose cancer, heart disease, emphysema, or liver masses
- To examine internal injuries & bleeding, such as those caused by a car accident.
- To locate a tumor, blood clot, excess fluid, or infection.
- To guide treatment plans & procedures, such as biopsies, surgeries & radiation therapy.
- To check progress of treatments.

Disadvantages:

Small risk of developing cancer

Uses higher doses of radiation

Injection of contrast medium (dye) can cause kidney problems or result in allergic or injection-site reactions.

Some procedure requires anesthesia.

Magnatic Resonance Imaging (MRI):

a medical imaging technique that uses a magnetic field & computer-generated radio waves to create detailed images of the organs & tissues in the body.

Working of MRI: MRIs employ powerful magnets which produce a strong magnetic field that forces protons in the body to align with that field. When a radiofrequency current is then pulsed through the patient, the protons are stimulated & spin out of equilibrium, straining against the pull of the magnetic field.

Risks: Because MRI uses powerful magnets, the presence of metal in body can be a safety hazard if attracted to the magnet.

Unless the device is certified as MRI safe, might not be able to have an MRI. Devices include:

- Metallic joint prostheses
- Artificial heart valves
- An implantable heart defibrillator
- Implanted drug infusion pumps
- Implanted nerve stimulators, etc.

Ultrasound:

Uses:

1) View the uterus & ovaries during pregnancy & monitor the developing baby's health.
2) Evaluate blood flow.
3) Guide a needle for biopsy or tumor treatment.
4) Examine a breast lump.
5) Find genital & prostate problems

Risks:

There are no known risks.

PET CT:

A procedure that combines the pictures from a positron emission tomography (PET) scan & a computed tomography (CT) scan; done at the same time with the same machine. The combined scans give more detailed pictures of areas inside the body.

PET scans may be useful in:

Detecting presence of cancer, its spread & treatment progress of:

- Brain
- Breast
- Cervical
- Colorectal
- Esophageal
- Head & neck
- Lung
- Lymphatic system
- Pancreatic
- Prostate
- Skin
- Thyroid

Mammography:

a medical imaging technique that uses low-dose X-rays to examine breast tissue for signs of abnormalities or changes. It is primarily used as a screening tool for early detection of breast cancer in women.

Radiology's role is central to disease management, with a wide choice of tools & techniques available for the detection, staging & treatment. Diagnostic imaging provides detailed information about structural or disease related changes. Early diagnosis saves lives. Without diagnosis there can be no treatment, there can be no cure. So, we can consider radiology department to the backbone of diagnosis.

Mental Health

Tripti Ray

BPT, 8th SEM

Introduction

Worldwide recent studies focus on mental health. Mental health is related to emotional, psychological & social well-being, which helps to determine how we act & make healthy decisions. It affects every stage of life: childhood, adolescence & adulthood, old age. Mental health issues arise from various factors, like abuse, trauma & insecurity in childhood. The study shows the initiatives of WHO (World Health Organization) for mental health issues that have been neglected in many parts globally.

Discussion

According to the WHO, 5 out of 10 health issues are related to mental health. Adolescence period is a formative time during which adolescents face vulnerable situations in physical, emotional & social well-being. It is estimated globally that 1 in every 10 of 10- 19 years of age experiences untreatable mental health conditions. However, mental health is improved by healthy sleeping habits, exercising regularly, skills related to interpersonal skills & learning how to manage emotions. Other factors include quality of their home & relationship status with violence (bullying & sexual harassment), hormonal imbalance; ignorance about mental illness, misunderstanding, lack of services & stigma.

About 30% of the population globally is affected by mental health issues & get no care. The most frequent conditions among them are Depression, psychosis, & alcoholism. The mental disorder covers 9.8% of ADHD (Attention Deficit Hyperactivity Disorder), anxiety at 9.4%, behavioral problems at approximately 8.9% & Depression at 4.4% approximately. The causes of these disorders are due to adverse experiences such as trauma & abuse that includes sexual assaults & witness violence (Morres et al., 2019). Chronic conditions related to medical experiences include cancer & diabetes.

WHO aim to promote, protect & support mental health & strive to improve the availability, accessibility & quality of care for people mental health problems.

Mental illness represents significantly increasing threat to global Health, with the potential to severely disrupt economy & society. Mental health conditions that require management include personality disorders, schizophrenia, dementia, substance abuse & post-traumatic stress disorder (PTSD)

Conclusion

The research determining whether or not the negligence of mental health conditions has caused an accident is a difficult matter. In most cases, it is nearly impossible to determine the exact cause of an accident that happened long ago. However, certain factors can be considered in making this determination. Although negligence cannot be proved, it can still be argued as a factor as it relates to determining responsibility for an accident. People with mental health disorders are more likely to be harmed by negligent behavior than those without.

Section III:

Events & Achievements of SHS

Achievements

Since its inception, different Departments of School of Health Sciences conducted in various events which gained momentum after the lockdown was lifted & normal life resumed. Also our students participated in events organized by several Institutes Nationwide & won accolades. Few snippets are here to cherish & celebrate those moments:

BPT 4th year students bagged 1st Prize for Poster Presentation **(Theme: 'Illuminating Arthritis')** at Diamond Harbour Medical college on World Physiotherapy Day, 2023.

BMLT 5th SEM student developed model & presented the work at an event conducted by BIRAC

BPT 4th year students bagged 1st Prize for Poster Presentation **(Theme: 'Illuminating Arthritis')** at Diamond Harbour Medical college on World Physiotherapy Day, 2023.

BPT 7th sem students bagged 2nd Prize in Poster Presentation **(Theme: "Rejuvenating and Restoring Physical and Mental Wellbeing Post Pandemic")** organized by Department of Allied Health Science of Institute of Management Study at Jadavpur University

Events

Alaap - Students' Outreach Programme 2023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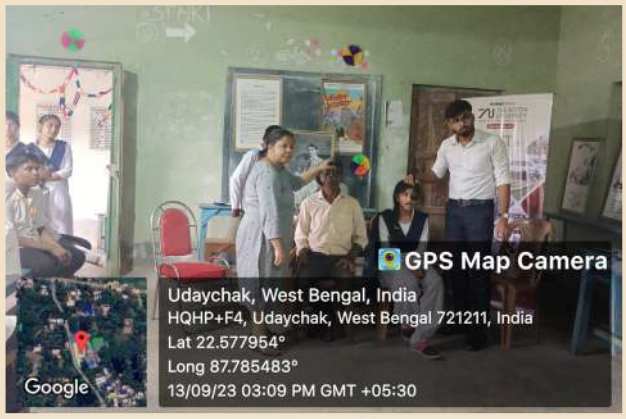
Health Camp 2023 - Free Health Checkup for Freshers' in association with Health Club & School of Nursing

International Conference 2023

Live Workshop & Eye Camp 2023 by Optometry



OPD Opthalmic Instrument workshop 2022

Rural Free Health Checkup 2023 by Physiotherapy & Optometry Departments in association with School of Agricultural Sciences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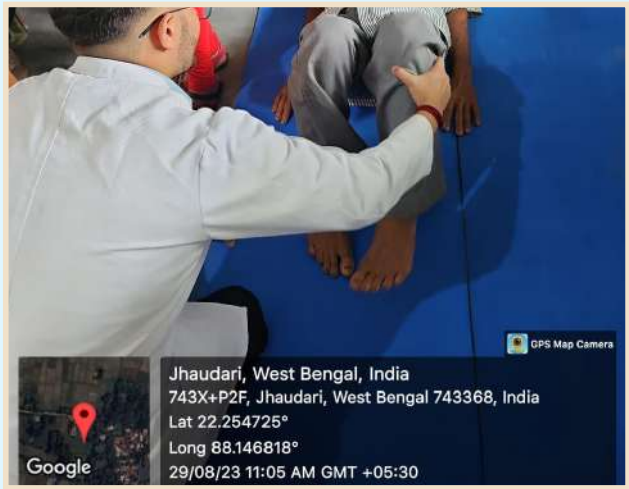
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Seminar in Jadavpur University 2023

Smart India Hackathon 2023

Street Play on Suicide Prevention Day Awareness Programme 2023 by Applied Psychology Department

Students' Outreach 2022

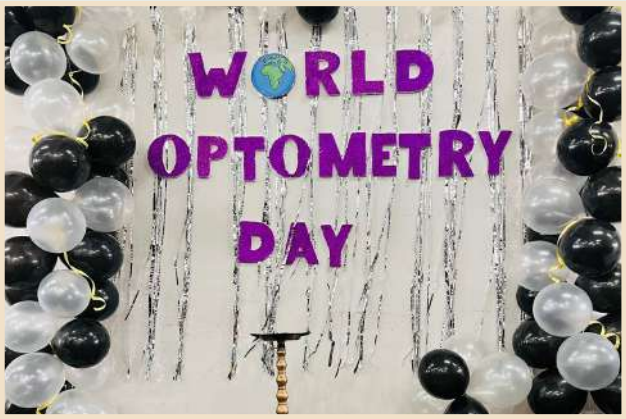
Suicide Prevention Awareness Programme 2023 by Applied Psychology Department

World Eyesight Day 2022

World Health Day 2022

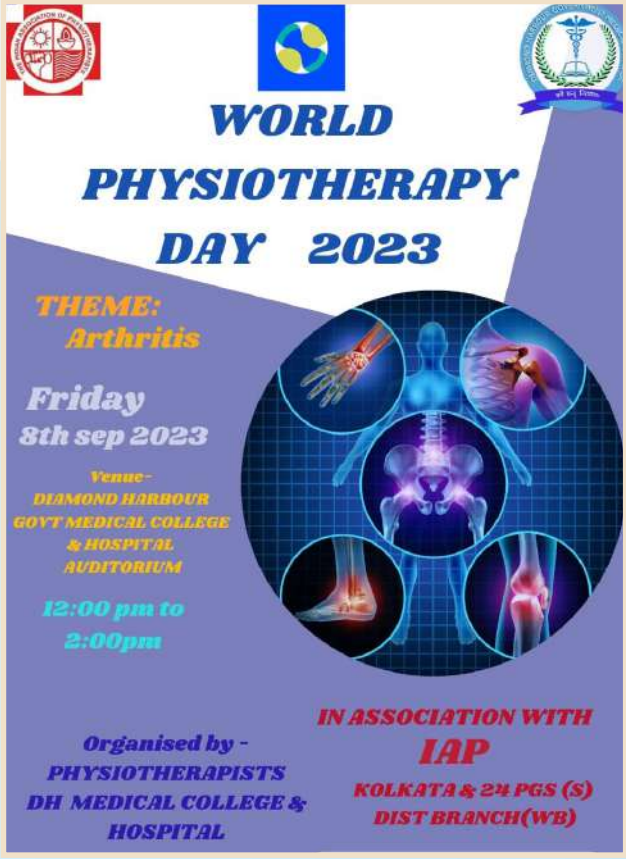
World Heart Day 2023 in association with School of Nursing & NSS

World Optometry Day 2022



World Physiotherapy Day 2022

World Physiotherapy Day 2023



World Radiology Day 2022

Oath Taking Ceremonty of Physiotherapy Students

Physiotherapy Workshop by BTL Corporation

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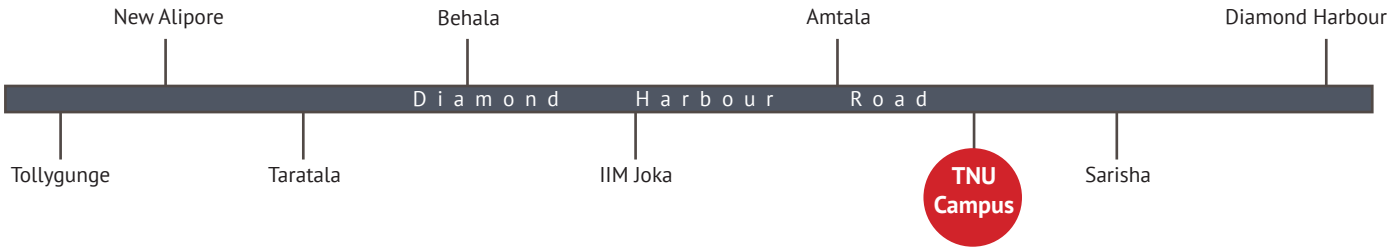

AmbujaNeotia

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