2020-21 SVBCP TIMES



Technology in Pharmaceuticals...

PRESIDENT'S NOTE

My dear students,

Our commitment at Saraswathi Vidya Bhavan's College of Pharmacy is to provide a safe and intellectually challenging environment that will empower students to become thinkers, creative problem solvers and inspired learners to solve in thrive in the current century. High standards and benchmarks for each student not only in academic performances, but also in co-curricular activities, and also in citizenship are the foundation of our college. It is with pride that we hold these high standards and ask each of our student to



commit for maintaining the extraordinary record of achievement and contribution that has been the legacy of SVBCP students. We have walked an incredible long journeys, in the midst of them, we have earned various honours, awards & accolades. The recent accomplishment which made us over the moon was getting 3 years accredition by National Board of Accredition. The achievements should empower you all with stronger resolve to work yet harder until college is reckoned as one of the best. I am extremely delightful that the students have successfully published the new edition of SVBCP Times. The enthusiasm and willingness of students makes me really proud. Wishing everyone a meaningful, enjoyable and memorable year 2020-21.

VISION & MISSION

TOPICS

To stand distinguished as a centre of Excellence that fosters talent, research aptitude, entrepreneurship, human values and holistic development of competent healthcare professionals to fulfill the requirements of the industry and community, at large. To provide state-of-the-art infrastructure and a teaching-learning environment that is conducive for holistic development.

To instill the values of discipline, integrity, humanity and professionalism required for the healthcare sector.

To nurture young professional leaders to work towards novel research ideas, innovation and entrepreneurial thinking for benefit of the community, at large.

- All about VapinG
 - The growing Blockchain Technology
 - Artificial Intelligence in Oncology
 - VR and AR in Healthcare
 - Wireless Brain Sensors
- Pharmaceutical IoT

Blockchain Technology in Healthcare

Blockchain Technology is defined as decentralized, distributed ledger that facilitate process of recording transaction and tracking assets in business network. It allows patients to access their medical data and connect to other hospitals and collect their medical data.

Most blockchain study focuses on electronic medical record, remote patient monitoring, pharmaceutical supply chain and health insurance claim. Med-Rec, an EHR related implementation that proposes decentralized approach to manage authorization and data sharing between healthcare stakeholder. Med-Rec uses Ethereum platform to enable patient to have knowledge on who can get to their healthcare information. Blockchain base application : MedRec and BlockHIE maintain record of patients. Counterfeit drugs have been addressed by proposing secure, immutable pharmaceutical supply chain based on blockchain technology. MIStore, is a blockchain

The consumption of E- cigarette, the device which offers nicotine containing vapor has increased far globally. It is considered as a healthier alternative to the conventional methods of smoking as per few data and research. To avoid those smoking health hazards & fight with addiction issues, the FDA constantly tries to bring nicotine replacement therapies in various forms. One of them is Electronic Cigarette method. The device provides non- combustible aerosolized nicotine which gets absorbed in the oropharyngeal mucosa. It consists of a power source, electronic heating element, and liquid nicotine cartridge which has stabilizing compound like PEG, flavours and other additives. When activated by the user, the heating element atomizes the liquid, resulting in aerosolized nicotine vapour and a visible plume. This vapour is inhaled into the lungs thereby called as "vaping" and nicotine is absorbed. The major advantage of E- cigarette remains that the combustion temperature of tobacco in a

based medical insurance industry with encrypted medical insurance data.

Working

Blockchain technology makes patient data more secure because decentralized data storage makes it harder to hack. When it comes to storage of health data having database network means a patient can have their own password that they use to verify access to record range of hospital and medical office.

Steps-

 Healthcare organization direct information to the blockchain.
 Transaction are completed and

uniquely identified.

3- Healthcare organizations and institutions can query the blockchain.4- Patient can share identity with health institute.

Applications

-Managing electronic medical record (EMR)

-Protection of healthcare data

ALL ABOUT VAPING

conventional cigarette is approximately 750°C, while it is 350°C in e-cigarettes called "heat-not-burn tobacco products" which indicates 90% less release of carcinogens and harmful products. Other components like formaldehyde, acetaldehyde, etc. are present in much less quantity in this method as compared to conventional ones. But all these proeffects does not prove E- cigarettes to be completely safe. The diastolic BP, heart-rate, respiratory impedances, airway resistance all of this still shows an increased effect in human beings after using the electronic method. The increase in heart-rate paves way for cardiac arrhythmias. As per a study, the carcinogenic chemicals were found to be there in the devices showing its effects even if in less quantity, they were proved to be hazardous. In various case reports, the electronic cigarettes are found to be associated with diseases like eosinophilic pneumonia and bronchiolitis development. Various derivatives of nitrosamine specific to tobacco and known to be carcinogenic, were

-Personal health record data management point of care genomic management

-Electronic health record data management

Future

Existing blockchain in healthcare startups will be acquired and we will see substantial consolidation of blockchain in healthcare offering. I Top blockchain companies in healthcare-

Medicalchain, Robomed, SimplyVital Health, Guardtime

Blockchain has evolved from the time it was introduced to the world through Bitcoin. A number of application have been developed as

prototype based on emerging blockchain paradigm. However, more research is still needed to be

conducted to



understand the utility of BCT in healthcare.

found in the content of e-cigarette. Ecigarette vapor was also found to be associated with an increased inflammation, oxidative stress and endothelial barrier dysfunction, DNA bond breaks, besides the development of oral cancer and lung cancer. There were environmental issues faced in these devices too because of the diffusion of certain chemicals like formaldehyde, acetaldehyde, isoprene, acetone, propanol, propylene glycol aromatic oils, and nicotine.

As to conclude, it is helpful in smoking cessation but should be kept in mind that it has some adverse effects on health like normal cigarettes; and that its success rates are low when used with intent to quit

smoking. Another important point is that e-cigarette paves the way for



smoking addiction in children and young people. Overall vaping doesn't have complete safety & efficiency.

Artificial Intelligence in Oncology

Breast Cancer Research and Treatment by AI

AI leads the way in health technology including cancer treatment. This case study is explored by Google Health researchers who have developed breast cancer detection models as AI commands high accuracy compared to humans. By training AI models, researchers conducted sample scans among women and generated accurate results. The evaluation of AI results and those of radiographers revealed similar accuracy levels and goes to show the role of AI in the health care revolution.

Indicates where AI system found cancer inside breast tissue

Cancer requires early management and the rate of diagnosis missed is **reduced by 12%** after using AI technology and illustrates the need for adoption by health professionals. Labor required to conduct breast cancer scans is another aspect in which researchers compared results from computers with those of humans with computers showing high accuracy levels. Human scan readers according to analysis diagnose cancer at a slow rate compared to computers with the difference estimated at 90%.

Application-

Understands how cancer cells become resistant to anticancer drugs, which can help improve drug development and adjust drug use.

Predict the tolerance of chemotherapy drugs and improves the identification of tumor neoantigens Helps radiologists map target areas or automatically plan radiation treatment programs.

Robots in Oncology

Robotics surgery has been done since 2000-the "Davinci

Have you ever thought about : What if your brain could talk to you as a person? Our body being in total control of and being properly understood by our brain, the brain can predict the minute defects in our body's smallest parts, an example could be of an internal injury ; a cell which is about to become cancerous, etc. Well just to think about this, we can tell that our imagination is way advanced and has reached way ahead of science and in reality it is almost impossible. But with the help of modern world's progress in the field of science and technology, medical science has started to climb that ladder of impossibilities and has reached that step where it can predict about brain's environment and that step is called as the "Wireless Brain What are Wireless Brain Sensors? Wireless brain sensors are devices

that are capable of monitoring the pressure inside the brain, brain temperature, pH and brain activity in the form of 'brain waves' reflecting the electrical transmission within the brain.

These devices detect intracranial pressure and temperature in the brain of patients undergoing severe brain injuries or even the patients of degenerative neurological disorders.

Working

Brain-computer interfaces (BCI) are neural interfaces that allow constant monitoring of the brain's electrical activity during the day and wirelessly transmit the data from the brain to external analyzing devices.

Applications

The proliferative ubiquity of neurological disorders, progressing technology and concomitant increases in lifestyle changes brings

surgical system" by US FDA. It is used in medical surgeries, laboratory research, and manufacturing.

The surgeon sits at the computer and operates robotic arms that have surgical instruments attached to them. These arms are more dexterous and can easily get to complex areas. A joystick is used to precisely control and mimics the motion of the wrist and hand.

This technique has benefits like tiny incisions, greater accuracy, less blood loss, faster healing, and less scarring. The potential disadvantages could be device malfunction patient injury, electrical arcing.

E.g., for pleural mesothelioma (cancer by asbestos exposure). This is

aggressive and difficult to treat. Treated by the surgery known as extrapleural pneumonectomy EPP. It involves removing tissue



where cancer originated but also an entire lung plus move tissues. By using robots we can make EPP safer, resulting in low blood loss and allowing the surgeon to remove more cancerous tissues.

Artificial Intelligence:

- Intelligence demonstrated by machines, similar to the natural intelligence displayed by humans
- AI is bridge between human intelligence and machine.
 Robots:
- A branch of engineering that involves the conception, design, manufacture and operation of robot.
- Robotics use the AI to improve the functionalities of the robot.

WIRELESS BRAIN SENSOR

the authentic use of such devices . Although, these devices are subject to tight controls and their capabilities are very composite, requiring exhaustive research and repeated iterations. The use of wireless brain sensors could help differentiate cognitive states in many neurodegenerative conditions. WBS also helps in monitoring brain injuries (brain trauma, brain swelling), enhancement of neural function, pain management, epilepsy and sleep assessment. The use of wireless brain sensors to detect brain activity patterns can help diagnose, study and manage conditions associated with brain dysfunction.



Virtual reality and Augmented reality

Introduction

With the advancement in technology, AR and VR have also generated their applications in the healthcare field. So, let us first understand the meanings of virtual reality VR and Augmented reality AR. VR is the computer-generated 3D image simulations which are actually fake. This technology is commonly used in the fields of healthcare for medical diagnosis, education, training etc. also in other fields such as tourism, entertainment, engineering, construction, design.

VR characteristics and applications

Human anatomy

It has potential application to study human anatomy by creating virtual images of organs or tissues, diagnose patients, progress of disease or surgery.



· Training

Train inexperienced surgeons may help reduce the errors while performing the actual surgery in future.

· VR exposure therapy

It helps to treat Acrophobia, claustrophobia, social anxiety, etc. Having an advantage of low cost, it may also cause some health drawbacks such as headaches, nausea and dizziness with its long-time use.

AR characteristics and applications

AR is the extension of VR which can expand or enhance reality.

In simple words it is a combination of VR with the real world.

• AR autism treatment

It helps children suffering from autism to understand others emotions and develop social relationship as normal people do.

IoT in Healthcare

The advent of 5G is to make the true transformative potential of smart technology and the internet of things (IoT) a reality. The use of smart technology in healthcare has been advancing steadily over the past several years, putting great devices like smart insulin pens, connected inhalers, asthma monitors and more in the hands of everyday consumers and allowing them to better manage and check their own health need. Wearable biosensors, which are small and lightweight, worn on the body, monitor vital signs such as temperature, heart rate and breathing rate also used in a recent study to monitor patients with Multiple Sclerosis (MS). Apple has launched a watch with new blood oxygen measuring functionality, and it is reportedly embarking on a series of health studies with research institutes to learn more about how changes in blood oxygen levels can signal the presence of respiratory conditions. It takes an echocardiogram using an electrical heart sensor, and check for an irregular rhythm that could mean the wearer has atrial fibrillation, a heart condition that can lead to complications such as blood clots, stroke and other heart-related issues.Automated insulin delivery (AID) systems are revolutionary for those who have diabetes. Instead of a finger prick test, the CGM part of an AID system continuously monitors glucose levels, even while they are asleep. It delivers a continuous flow of insulin into their body, one that is automatically adjusted based on the glucose levels to determine the amount by the CGM. These have been particularly essential in the context of the Covid-19 pandemic, which has prevented many family members from visiting and helping elderly relatives. The available technology ranges from wearable pendants to more extensive and sophisticated home monitoring systems that learn an individual's movements, and thus alerts caregiver if there is a huge change or if no movement is detected for an abnormal amount of time.

Our pillars of support



DR. R. VARADRAJAN Founder President, NES

From Left to Right (First Row) Meghana Kotian Smital Kulkarni Manasi Pawar Aniket Nagwekar Akshaya Aravamudhan Shruti Poojary Keerthi Nair



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