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BY

M.B.A

Paradigm in the Healthcare Industry

Currently we are observing a paradigm shift in medicine that is revolutionizing the way medical care is provided. This shift is a change in the control of healthcare. It's moving from hospitals and physicians into the hands of the patients. Healthcare providers are becoming increasingly aware that today's patients have more control over how they obtain care and pay for it. It is also being observed that healthcare is one of the largest and fastest growing industry globally.

Let us first try to understand how medicine had its roots in India:

TRADITIONS OF INDIAN MEDICINE

Traditional Systems of medicines played a significant role in health care. The Indian medicine is origin from India and incorporation through colonialism from various countries and are integrated into Indian medicine. India has the unique divergence of having five recognized systems of medicine in this category

- Ayurveda
- Siddha
- Unani
- Yoga
- Homoeopathy

Ayurveda - The ancient Indian medical system, also known as Ayurveda, is based on ancient writings that rely on a "natural" and holistic approach to physical and mental health. Ayurvedic medicine is one of the world's oldest medical systems and remains one of India's traditional health care systems. Ayurvedic treatment combines products (mainly derived from plants, but may also include animal, metal, and mineral), diet, exercise, and lifestyle.

The science of life, has been the traditional system of healthcare in India for more than 5000 years. This medical system is well-established around **2500 to 600 BC**

Siddha - The Siddha System of Medicine (Traditional Tamil System of medicine), which has been prevalent in the ancient Tamil land, is the foremost of all other medical systems in the world. Its origin goes back to **B.C 10,000 to B.C 4,000**

The word Siddha has its origin in the Tamil word Siddhi which means "an object to be attained" or "perfection" or "heavenly bliss". India being the birth place of many traditional philosophies also gave birth to Siddha. The roots of this system are intertwined with the culture of ancient Tamil civilization

The Siddha System of Medicine is contemporaneous with those of the submerged lands Egyptian, Mesopotamian, Chinese and Grecian medicines. The uniqueness of Siddha System is evident by its continuous service to the humanity for more than **5000 years** in combating diseases and also in maintaining its physical, mental and moral health while many of its contemporaries had become extinct long ago.

Unani - It was introduced in India by the **Arabs and Persians** around **11th century**.Unani system originated in **Greece**. The foundation of Unani system was laid by Hippocrates. The system owes its present form to the Arabs who not only saved much of the Greek literature by rendering it into Arabic but also enriched the medicine of their day with their own contributions. In this process they made extensive use of the science of Physics, Chemistry, Botany, Anatomy, Physiology, Pathology, Therapeutics and Surgery.

Unani Medicines got enriched by imbibing what was best in the contemporary systems of traditional medicines in Egypt, Syria, Iraq, Persia, India, China and other Middle East countries. **In India, Unani System of Medicine was introduced by Arabs and soon it took firm roots. The Delhi Sultans (rulers) provided patronage to the scholars of Unani System and even enrolled some as state employees and court physicians**.

Ibn Sina (Avicenna) and al-Razi (Rhazes) influenced the early development of Unani in India.

Yoga - India is the birthplace of Yoga. This word Yoga has been derived from a Sanskrit word "Yuj" that means bind, join or to unite. Yoga is the union of our individual soul that is known as Jivatma and Supreme universal spirit that is known as Paramatma.

The beginnings of Yoga were developed by the **Indus-Sarasvati civilization in Northern India** over **5,000 years ago.** The word yoga was first mentioned in the oldest sacred texts, the Rig Veda. The Vedas were a collection of texts containing songs, mantras and rituals to be used by Brahmans, the Vedic priests. Yoga was slowly refined and developed by the Brahmans and Rishis (mystic seers) who documented their practices and beliefs in the Upanishads, a huge work containing over 200 scriptures. The most renowned of the Yogic scriptures is the Bhagavad-Gîtâ, composed around **500 B.C**. The Upanishads took the idea of ritual sacrifice from the Vedas and internalized it, teaching the sacrifice of the ego through self-knowledge, action (karma yoga) and wisdom (jnana yoga).

Homoeopathy-The word 'Homoeopathy' is derived from two Greek words, Homois meaning similar and pathos meaning suffering.Homoeopathy simply means treating diseases with remedies, prescribed in minute doses, which are capable of producing symptoms similar to the disease when taken by healthy people.It is based on the natural law of healing-"SimiliaSimilibusCurantur" which means"likes are cured by likes". It was given a scientific basis by Dr. Samuel Hahnemann (1755-1843) in the early 19th century.

It has been serving suffering humanity for over two centuries and has withstood the upheavals of time and has emerged as a time tested therapy, for the scientific principles propounded by Hahnemann are natural and well proven and continue to be followed with success even today.

MahendraLalSircar was the first Indian who became a homeopathic physician. A number of allopathic doctors started homeopathic practice following Sircar's lead. **The 'Calcutta Homeopathic Medical College', the first homeopathic medical college was established in 1881**. This institution took on a major role in popularizing homeopathy in India. In **1973, the Government of India recognized homeopathy as one of the national systems of medicine and set up the Central Council of Homeopathy (CCH) to regulate its education and practice. Now, only qualified registered homeopaths can practice homeopathy in India.**

These are some of the different forms of medicine available in India.

Paradigm In the healthcare:

As cultural preferences shifted, more patients opted for hospice and palliative care. Heroic hospital interventions declined as more people realized they were more likely to erode quality of life than meaningfully extend it. The post-acute care world is undergoing a similar transformation. Nursing homes are shutting down as the frail elderly and their families opt for assisted living and home care. Rehab facilities are scrambling for patients, who find it is less costly and easier to visit the local gym.

 With the advance of new technologies like video conferencing, telehealth and remote monitoring, many patients are realizing the best access point for physician care is once again

their home. Many home-based interventions can be delivered by a physician assistant, nurse or home health aide, who, needless to say, get paid a lot less than doctors.

Overview of Technology Application in Healthcare and its Evolution

A peek into the evolution of technology use in healthcare exhibits a dynamic and fascinating sequence of events that led to the digital health era as we know it, keeping in view the progress in technology has been exceedingly fast-paced and is increasingly orienting towards patient-centric principles. In the 1960s, coupled with the advancements made in information and communication technology (ICT) and the dire need to make healthcare accessible in remote regions, paved the way for technological application in the healthcare arena and the birth of Telemedicine which literally means "healing at a distance"

The turn of the century witnessed a colossal upsurge of the internet and every sector including healthcare went on board to benefit from the fresh opportunities that now lay before them. This led to the rise of Electronic Health (eHealth) which is defined as "an emerging field in the intersection of medical informatics, public health, and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology"

Trends in the Digital Health Landscape Today

E-Patients, E-Physicians and Smart hospitals

In accordance with patient-centred care, a partnership has developed between the patient and provider and a patient is encouraged to proactively participate in disease management as well as being engaged in the decision-making process. Moreover, a patient now increasingly resorts to the internet to seek health information. As a result, a patient today is "empowered, engaged, equipped, and enabled" besides being digital health-savvy leading to the birth of an e-Patient.

Hospital facilities too are progressing in parallel by utilizing technological innovations to enhance the care and safety of the patient during their stay at the hospital, for instance, by installing automation systems in the building to regulate temperature, ventilation, and fixing smart locks. Interconnected clinical information systems such as Laboratory Information Systems ensure smart patient care processes. Moreover, identification systems enable authentication and tracking of patients, staff, and hospital equipment

Mobile apps

Smartphones with inbuilt health apps provide a unique opportunity for patient engagement by promoting, adopting and maintaining healthy behaviours. As of 2015, approximately 165,000 health-related apps were available and were broadly classified as 'wellness management apps' which assist in modifying behaviours related to lifestyle, diet, fitness etc., and 'health condition management' apps which facilitate dealing with disease conditions by providing information about the disease, access to care and medication reminders. Chronic conditions including mental health conditions, diabetes, cardiovascular diseases, nervous system disorders and musculoskeletal conditions are amongst the most common conditions focused on health condition management apps. Reassuringly, digital health apps have recently witnessed a substantial growth in their evidence-based efficacy with as many as 234 randomized controlled trials and 20 meta-analysis studies conducted.

Electronic Medical Records (EMR)

EMR's which can store health and medical information of a patient in digital form have widely attracted physicians; for instance, in Canada, approximately 75% of physicians have shifted to EMR use. Besides improving the communication between the health care team, it delivers them readable and organized information which reduces the risk of medical errors.

Health portals

Aimed at bridging the communication gap between the patient and providers, portals are personal healthcare-related websites that allow the patients to communicate with their healthcare team through teleconsultations. Moreover, they permit access to lab test results, schedule appointments with the doctors and refill prescriptions. A systematic review of the effect of patient portals concluded that ten out of twenty-seven studies reported positive effects in terms of medication adherence, self-care practices, improved patient satisfaction and functional status.

Artificial intelligence in healthcare

An exciting dimension to the digitalization of health care is the development of intelligent machines which exhibit cognitive actions analogous to human beings and are capable of conducting real-time analytics using algorithms. For instance, IBM Watson helps clinicians make decisions by using natural language capabilities, hypothesis generation, and evidence-based learning. This is particularly useful given the surge in Big Data and will assist in excavating information and aid the doctors in making quicker and precise diagnosis. The potential role an artificial conversation agent or Chatbot which uses speech or textual methods to conduct a conversation is being explored in healthcare to provide assistance for behaviour change in diabetes and obesity management. Additionally, Babylon Health is a conversational health service provider which uses artificial intelligence to have consultations with doctors.

Critical Views on Digitalization of Healthcare

In addition to the evidence supporting the implementation of digital tools as categorically mentioned above, it is worth looking into some of the critical views in relation to the digitalization of the healthcare sector.

- There is concern regarding the privacy and confidentiality of the patient's electronic medical records and system interoperability.
- It has been illustrated that EMR use has augmented the workload of the physicians which could lead to incidents of medical errors.
- Where digital health claims to promote greater patient-provider interaction, it is argued that the presence of a computer between the two parties may prove to have a reverse effect.
- Regular power blackouts and loss of internet connectivity is an often encountered barrier to the implementation of digital health, especially in developing countries.
- Another cause for alarm is the ocean of health information available on the internet and how any unreliable information can lead to adverse health effects.

In addition, despite a gradual rise in the body of evidence surrounding digital health tools, there remains scope for more especially the evidence that can guide the scale-up of e-Health likewise, the regulations that oversee technology use in healthcare have not kept pace with the swift advancements made in the technology arena.

Shifting the Paradigm in Indian Health Care:

Health care has progressed considerably in India. Targeted reforms have achieved improvements in key health indicators such as institutional deliveries, outpatient cases, complete immunization, availability of diagnostic and family welfare services and disease control programs.

But on the flip side, each year 39 million people continue to be pushed into poverty as they cover health care costs out-of-pocket. Only 25 percent of Indians are covered by insurance. At 4 percent of its GDP, India's health care spending lags significantly behind other BRIC nations. And the country needs an additional 1.8 million beds and 1.54 million doctors to meet its growing demands.

New operating capabilities improve care and lower cost for patients in ACOs

Reduce unnecessary or avoidable hospitalizations

Improving access to primary and specialty care providers, engaging hospitalists in adhering to transitions of care processes

Standardized care management process across the continuum

Targeting high risk patients through predictive modeling and coordinating patient care through multidisciplinary teams at the site of care

Maximize efficiency in post-acute and SNF care

Identifying clinicians to focus on SNF population and collaboratively manage transitions alongside BPCI teams, utilizing home care partnerships

IT infrastructure and data-driven claims analysis

Combining internal claims data platform and analytic resources with industry-recognized tools to report provider performance across the enterprise to provider levels

Trinity Health

Indian health care continues to face challenges of affordability, availability and quality for the following reasons:

1) Lack of appropriate government interventions: Resources are allocated poorly at government-run Primary Healthcare Centres (PHCs) in rural India: 8 percent of the centres do not have doctors or medical staff, 39 percent do not have lab technicians, and 18 percent do not have a pharmacist.

2) Chronic shortage of highly skilled doctors: Increasing population and disease burdens along with inadequate resources have led to a perpetual demand-supply gap of medical professionals and health care resources in most parts of the country, especially in rural and semi urban areas. According to a recent study, as many as 40 percent of rural postings by trained medical graduates and postgraduates in different states in India are not filled.

3) Difficulty in revenue recognition: Although many people in rural India can pay for health care services, enterprises grapple immensely with revenue recognition.

4) Inability to develop relevant technological solutions for the Base of the Pyramid: Often, enterprises fail to understand the needs and ground realities of their target segments before developing and attempting to implement innovative products and services. There have been examples of businesses with great products that have not been able to convince their customers of the need. This makes their business model susceptible to failure socially as well as financially.

5) Difficulty in replicating business models across geographies: Achieving sustainability is the overarching challenge for every entrepreneur in a country like India, where the nuances of conducting operations and procuring revenue change from one target community to the

other. As most business models are developed to suit a particular geography or community, the replicability of these business models becomes extremely hard.

6) Lack of patient capital: Enterprises, specifically the ones attempting to implement innovative market-based business models, seek capital that allows them to experiment. Lack of such patient capital makes it difficult for businesses to sustain for long.

Opportunities for Improvement in Healthcare

There are some reassuring prospects which have provided opportunities for the healthcare sector to make reforms. Firstly, in the face of the myriad of challenges confronting the healthcare sector, in a much-publicized landmark report, the Institute of Medicine suggested an approach for improvement and "crossing the quality chasm" by outlining six aims for healthcare to be safe, effective, patient-centred, timely, efficient and equitable. Among the principles that had been proposed, the one that garnered most attention was the aim for health care to be "patient-centred by providing care that is respectful of and responsive to individual patient preferences, needs and values and ensuring that patient values guide all clinical decisions". Eight dimensions of patient-centred care as outlined by the Picker Institute include:

1) Respect for patients' values, preferences and expressed need

 2) Coordination and integration of care

 3) Information, communication and education

4) Physical comfort

5) Emotional support and alleviation of fear and anxiety

6) Involvement of family and friends

7) Transition and continuity

8) Access to care.

In addition, the WHO advocated people-centred care as a broad term to include patients at every level of the health systems and defined it as "care that is focused and organized around the health needs and expectations of people and communities rather than on diseases".

Benefits of Modern Healthcare to Human Society

1. The Internet has become a main source of medical information

It goes without saying that more and more people are using the Internet to research their medical issues. This means not only looking up symptoms, but exploring treatments and medicines on the web. While it is never a good idea to skip out on the doctor completely, the Internet has made patients more empowered to make decisions about what to do next.

2. Healthcare facilities are reaching patients using social media

Healthcare facilities, particularly hospitals, are using social media to establish contact with patients, answer questions about practices, launch public awareness campaigns, and perform community outreach. Some sophisticated sites even offer instant chats with nurses and

doctors about medical issues and reminders for people to get regularly needed tests and vaccines.

3. Better treatment and less suffering

By providing new machines, medicines, and treatments that save lives and improve the chance of recovery for billions and not only do sophisticated medical practices help patients heal directly new technology has also improved research so experts can make healthcare even more effective.

4. Improved patient care and worker efficiency

Information technology has made patient care safer and more reliable than before. Nurses and doctors use hand-held computers to record a patient's medical history and check that they are administering the correct treatment. Results of lab tests, records of vital signs, and medicine orders are all electronically put into a main database that can be referred to later. And as more institutions are adopting electronic health records, patients have easier access to their own information so they too can understand what is being done to them.

5. Doctors are easier to reach and better at their jobs

Technology has also enabled doctors to use e-mail, texts, videos, and conference facilities to consult colleagues from all over the world. This practice, known as telemedicine, is especially useful for doctors and patients in rural and under-developed areas. Without moving patients, doctors can consult experts from all over the world to diagnose, treat, and research conditions without needing access to a sophisticated hospital.

6. Online databases can accurately predict medical trends

By analysing health information that users search for online, search engines such as Google have been able to accurately predict medical trends such as flu outbreaks.

Google explains its process on Google.org:

"Of course, not every person who searches for "flu" is actually sick, but a pattern emerges when all the flu-related search queries are added together. We compared our query counts with traditional flu surveillance systems and found that many search queries tend to be popular exactly when flu season is happening. By counting how often we see these search queries, we can estimate how much flu is circulating in different countries and regions around the world."

This will help medical experts respond quickly as well as take preventative measures. And as more and more people use the web to search for their own medical problems, these internet giants will have even more information to apply to scientific studies.

Can Retail Clinics Transform Health Care?

Retail clinics provide better access to care and can be more economically feasible for patients when compared with traditional clinics. Specifically, benefits were observed for preventive care or acute medical issues. As reported in a viewpoint published in *JAMA*, patient satisfaction for care received at retail

clinics is generally positive; however, increased use of retail clinic services can often dissipate the potential financial savings that retail clinics often cite.

Due to the slowing federal progress of value-based purchasing, improvement in this area relies on efforts by the private sector.

The CVS/Aetna retail clinic, for example, is posited as a potential disruptive innovator in this regard, with some hoping that this partnership will result in improved care access, lower costs, and greater care quality. A total of 1100 CVS/Aetna retail clinics are currently in operation across the country, with 9700 more stores being proposed. Growing market share as well as controlling networks represent short-term goals of many for- and not-for-profit

healthcare systems, whereas the creation of flexible and technology-driven integrated healthcare systems that reach consumers and improve care costs represents the long-term goal.

To accomplish these goals, the integration of medical records is imperative. Ultimately, the use of electronic "big data" among retail clinics may not only assist in personalized medicine, which ultimately leads to greater response to therapy and better prognosis, but may also improve patient engagement. Mobile applications, which enable patients to access their healthcare information from retail centres, may help drive greater focus among patients, all without leaving the comfort of their own homes. Greater reliance on electronic data can also help retail stores facilitate more efficient inventory management and increase their targeted marketing efforts.

Retail clinics may also soon rely on some aspects of artificial intelligence and machine learning to help reduce the need for physicians or other healthcare professionals as the point of first contact, reserving these individuals as points of contact for complex issues or difficult diagnoses.
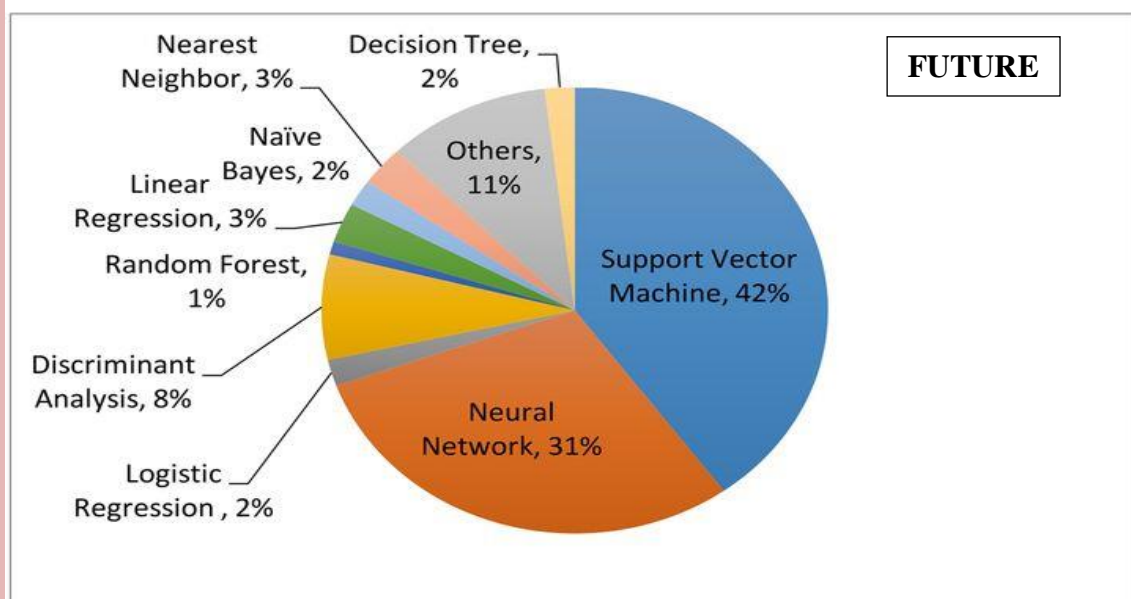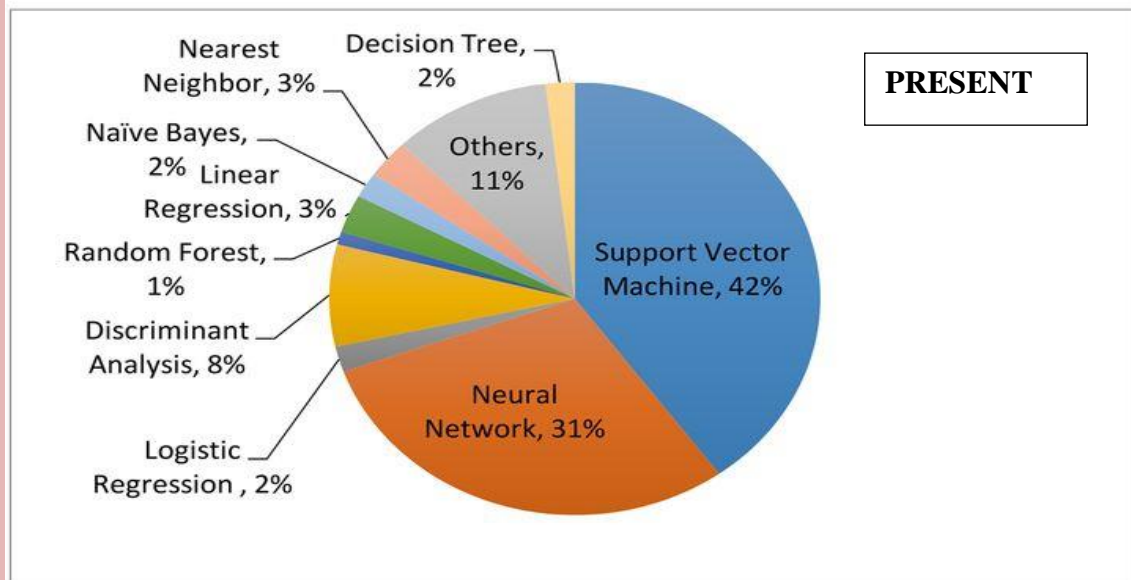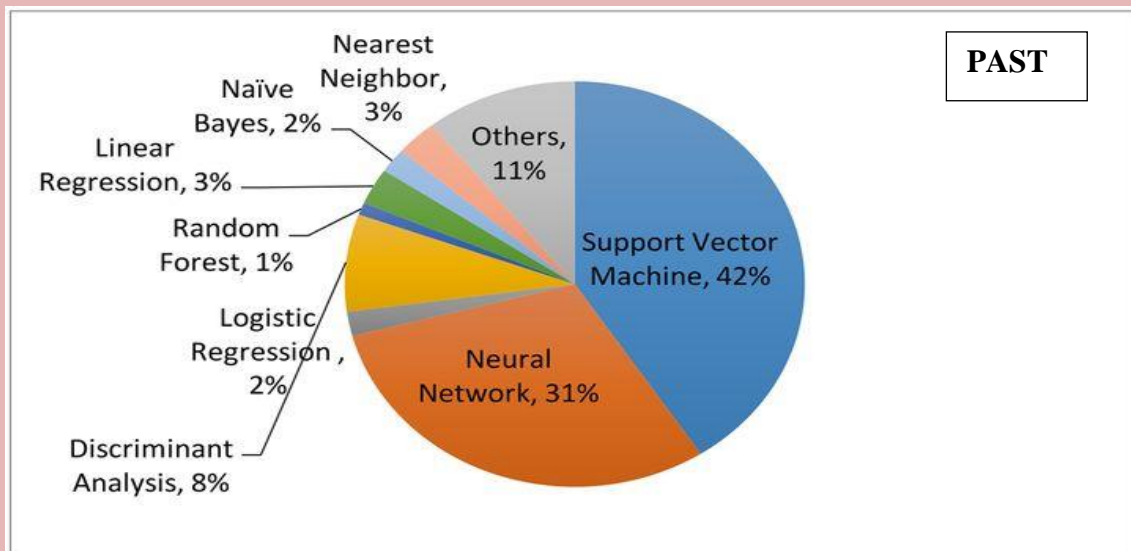
Despite the supposed increase in cost efficiency for patients, there is increased use of retail clinic services among the "worried well," resulting in greater healthcare dollars spent. The CVS/Aetna partnership's goal is to lower costs; in fact, Aetna is already seeking to expand Medicaid risk contracts, which may contribute to the value-based market. Currently, however, there are no reports from CVS/Aetna on what incentives will change that will create greater focus on improved care quality and lower costs vs. maximizing drug profits.

Overall, the ultimate success of any retail clinic initiative "will depend on ensuring highest-quality care, enhancing patient satisfaction, and reducing health care costs."

2019 Key 8 Predictions for Global Healthcare Industry

- Value-based Care Progresses as Outcomes Focus Globalizes
- AI explodes across the Healthcare & Life Sciences post Flagship Use Cases yield Positive Results
- Digital Health will come of Age with an Increased Focus on Individual Care
- Asia become the New Local Innovation focus for Global Drug and Device OEMs
- Healthcare Data Analytics shifts from Big Data to Meaningful Small Data by Hospital Specialty
- Healthcare will be a Dominant Vertical in Voice Applications
- Blockchain moves from Hype to Reality with further Commercial Implementations
- Innovative Private Insurance Models Shake up Healthcare Payer Industry

Artificial intelligence in healthcare in past, present, and future:

PAST

Nearest Neighbor, 3%
Naïve Bayes, 2%
Linear Regression, 3%
Random Forest, 1%
Logistic Regression, 2%
Discriminant Analysis, 8%
Others, 11%
Support Vector Machine, 42%
Neural Network, 31%

PRESENT

Nearest Neighbor, 3%
Decision Tree, 2%
Naïve Bayes, 2%
Linear Regression, 3%
Random Forest, 1%
Discriminant Analysis, 8%
Logistic Regression, 2%
Others, 11%
Support Vector Machine, 42%
Neural Network, 31%

FUTURE

Nearest Neighbor, 3%
Decision Tree, 2%
Naïve Bayes, 2%
Linear Regression, 3%
Random Forest, 1%
Discriminant Analysis, 8%
Logistic Regression, 2%
Others, 11%
Support Vector Machine, 42%
Neural Network, 31%

Conclusion

Ageing people increasingly demand to be able to maintain functional autonomy in the wake of limitations from chronic diseases. This demand is enabled by a stream of new technological products and services, and is causing a paradigm shift in the health care sector. Ageing people may want the best possible health for their daily functioning in terms of body, mind, and social relations. The Hippocratic paradigm is characterized by the primary role of physicians and other health care professionals. They will maintain this role in acute situations. The new emerging paradigm, here called 'Functional health', and valid for chronic situations, gives people a central role in the care of their own health, with health care professionals in the role of knowledgeable counselors. In the current transition period, harmonisation between these two paradigms may be somewhat chaotic, especially as the economic models underlying the two paradigms strongly diverge.

Proper management may ease the problems and help to maintain the confidence link between people and care professionals that is so essential for optimal prevention, cure, and care. Continuous education and information for everyone at any age is a necessary ingredient, also for health professionals adapting to their new roles. Cost transparency is needed for comparing added value to added cost, as a basis for sustainability, and provides a coherent economic underpinning to this new approach to health care to which vested interests must also be turned.

Digital revolution undoubtedly modifies the way we develop, practice, and provide medicine. This paradigm shift will directly influence the evolution of health-care systems. Technology allows a more and more precise and personalized medicine. However, over control of health could lead to a new scary bio political power. Patients should stand at the heart of the Healthcare System. Technologies that long term benefit to the patient will be accepted. Human relationship and empathy still remain essential. The efficiency of the system should be equilibrium between value-added medical service, global cost of the solution and maintaining the social bond.

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Prepared By:

Shivaranjini - II MBA

Immaculate Sandra – II MBA

Maria Nishita – II MBA

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