

Healthcare on the Path of Advancement in Technologies

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How to cite this article:

Sachin C. Narwadiya, Gulshan Karhade, Deepika Dixit. Healthcare on the Path of Advancement in Technologies. RFP Journal of Biochemistry and Biophysics. 2019;4(1):35-37.

Abstract

Healthcare is a sector which is highly demanded and used by the public. There is scope of better diagnosis, treatment and surgeries in healthcare. The healthcare industry is spread worldwide. Medical tourism enabling citizens of various countries to interact with each other and also save lives by opting better healthcare facilities. Healthcare saw major changes during past few decades. The invention of X-rays brought a visible change in this sector. The Magnetic Resonance Imaging-MRI, Computational Tomography-CT scan, Robotic Surgeries are some area of advancement in Healthcare. The invention of camera and its further advancement in output like High Definition-HD quality, Liquid Crystal Displays-LCDs, Light emitting diodes-LEDs are incorporated in the various medical diagnostic instruments. The present review study is focussing on the various advancements in healthcare with emphasis on robotic surgeries. The medicine and healthcare sector becoming more and more advanced in technology, since last many decades. As there is advancement in surgery and the technology the surgeons become more specific while performing surgery. Laser surgery is one of the examples of it. In this surgery laser light is used for surgical procedure. Use of machine like robots can now become possible in various areas of health care and medicine. The robots which can be used by doctors may be classified on basis of work they performed. The various categories that may include in the robotic doctors are Surgical Robots, Rehabilitation Robots, Bio-Robots, Tele-Presence Robots, Pharmacy Automation, and Disinfection Robots.

Keywords: Liquid Crystal Displays-LCDs; Light emitting diodes-LEDs; Robotic Surgeries; Tele-Presence Robots; Pharmacy Automation.

Introduction

The medicine and healthcare sector becoming more and more advanced in technology, since last many decades. As there is advancement in surgery and the technology the surgeons become more

specific while performing surgery. Laser surgery is one of the examples of it. In this surgery laser light is used for surgical procedure. Use of machine like robots can now become possible in various areas of health care and medicine. The robots which can be used by doctors may be classified on basis of work they performed. The various categories that may include in the robotic doctors are Surgical Robots, Rehabilitation Robots, Bio-Robots, Tele-Presence Robots, Pharmacy Automation, and Disinfection Robots. The surgical robots either carry out whole surgery or may help doctor to do some part of surgery. This type of Robot can be operational from remote place where presence of doctor is not needed and doctor can operate

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Received: 17.04.2019 | **Accepted:** 04.05.2019

surgery from distant place. Rehabilitation robots are the robots that facilitate and support the lives of infirm, elderly people, or those with dysfunction of body parts effecting movement. These robots are also used for rehabilitation and related procedures, such as training and therapy. Bio-Robots represent a group of robots intended to replicate the cognition of humans and animals. The Tele-presence robots on the other hand can allow off-site medical professionals to move, look around, communicate, and participate from remote locations. Thus, allowing the doctor to operate from remote place. The Pharmacy automation represents robotic systems to dispense oral solids in a retail pharmacy setting in a hospital. The Disinfection robot has the capability to disinfect a whole room in mere minutes, generally using pulsed ultraviolet light.

In the medicine history first time, in April 2016 Shafi Ahmed a cancer surgeon did an operation using a virtual reality camera at the Royal London hospital. It is a big step for in the field of surgery. Others also participated in the operation in real time through the Medical Realities website and the VR-Virtual Reality in OR-Optical Reality application. In this operation promising medical student from Cape Town, an interested journalist from Seattle or a worried relative, everyone could follow through two 360 degree cameras how the surgeon removed a cancerous tissue from the bowel of the patient [4-5].

This opens new horizons for medical education as well as for the training of surgeons. VR could elevate the teaching and learning experience in medicine to a whole new level. By using VR, surgeons can stream operations globally and allow medical students to actually be there in the OR using their VR goggles. The team of The Body VR is creating educational VR content as well as simulations aiding the process of traditional medical education for radiologists, surgeons, and physicians [1].

Automation in medical diagnosis

The automation is medical diagnosis of disease open up new path of advancement in medicine field. The diagnosis involves coordination in various subject areas in medicines like Medical Biochemistry, Human Pathology, Medical Microbiology, Radiology, with many sub branches like cytology, histopathology, immunology and so on. All these branches and sub branches experience the advancement with the advancement

in the camera photography. The camera is specially moulded technology in the diagnosis whether it is sono-graphy or digitized X-ray. The use of spectroscopy in Medical Biochemistry revolutionized the diagnosis in Blood and other body fluids analysis. Now the time consumption becoming lesser for analysis with increased accuracy of the diagnosis. Here are certain examples regarding automation in medical diagnosis. The example in the histopathology is important to be highlighted. In the histopathology slides and cassettes were required to process the tissue isolated as sample. Cassette markers and slide writers are now commercially available and can be utilized by all laboratories. Manual data entry laboratories would rely on manual input into these machines. Laboratories with more sophisticated systems can interface specifically with these machines, so that cassette marking and slide writing become totally automatic procedures linked to, for example, data entry and work list generation, respectively. The advent of these machines has enabled clear, concise labelling of cassettes and slides and has reduced transcription error to a minimum [2].

If we look towards the microbiology in angle of diagnosis, then it can be well observed that today, automated instruments became the essential part of many clinical microbiology laboratories. The automated equipment is also available for the detection of positive blood cultures, the antimicrobial susceptibility testing and identification of microorganisms, the screening of urine samples for bacteria, and the isolation and antimicrobial susceptibility of *Mycobacterium tuberculosis* in clinical samples. The rapid detection of microorganisms in a patient's blood is of diagnostic and prognostic importance. Blood cultures, therefore, are essential in the diagnosis and treatment of the aetiological agents of septicaemia. As septicaemia constitutes one of the most serious infectious diseases, the rapid detection and identification of blood-borne bacterial pathogens is a major function of the clinical microbiology laboratory. Consequently, automated blood culture systems have been developed and refined over the past 30 years. The first semi-automated instrument to be used, the BACTEC 460 (Johnston Laboratories Inc.), detected radioactive carbon dioxide metabolized by microorganisms growing in a liquid medium with ¹⁴C incorporated. This soon gave way to the non-radiometric BACTEC 660/730, using infra-red detection of carbon dioxide [2].

Thus, in any medical field from taking medical

history to prescribing medicines, diagnosis, pharmacy every where the technology is making its important role. Now, the doctors and surgeons job became easy due to use of technology in their job. Surgeons and doctors can have more time for their knowledge up-gradation with use of technology in their work. The telemedicine concept revolutionized the medicine delivery system. Indian villages are now connected through telemedicine with the big hospitals. The expert doctors can now able to examine patients from distant locations and prescribe treatments. Thus telemedicine is in the path to fulfill the mandate of World Health day observed on 7th April 2018 "Health for All". Healthy citizens of a country can only be the valuable assets for that country. Our deep route will become stronger, if we concentrate on Healthy Citizens of India [3].

Conclusion

In past few decades there is revolution took place in the proper use of technologies in various healthcare sectors. At present we are far behind for better healthcare to fellow citizens of this world. Many diseases still have resultant death of the patients. The diseases like Cancer,

AIDS-acquired immune deficiency syndrome, Tuberculosis are pandemic diseases. Many human beings falling prey in front of these diseases. The technological advancements even not able to help critical conditions of patients suffering from these diseases. Hence, applicable research is need of the society beyond the boundaries of the countries is the present need. Nanotechnology can be a better help in curing these diseases in future.

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