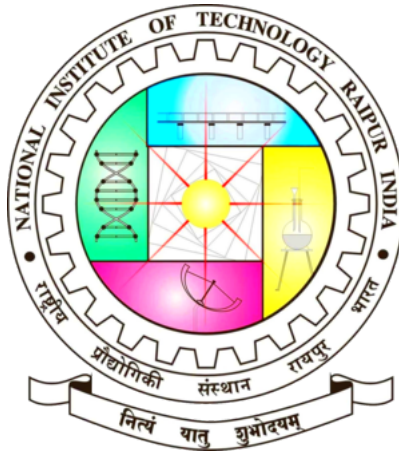


NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR



NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR
B. TECH.: 1 SEMESTER, BIOMEDICAL ENGINEERING
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EMERGING TECHNOLOGY FOR HEALTHCARE

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1 Emerging Technology For Healthcare

1.1 Introduction

Health technologies range from devices, systems, and procedures to vaccines and medications that help deliver high-quality care, reduce costs for hospitals and patients, and streamline operations. It can be any software or IT tool that improves administrative productivity, eases workflow, and enhances the quality of life.

New technology in healthcare includes supportive, educational, information, organizational, rehabilitative, therapeutic, preventive, and diagnostic solutions that improve patient access and healthcare provider capabilities. Virtual concierge, artificial intelligence, voice search, and virtual and augmented reality are promising emerging technologies for Future.

1.2 Healthcare Technologies to be Excited About

Emerging technologies in the healthcare are being introduced at a rapid pace, bringing with them the promise of improved treatment options and more efficient care. This is especially important for healthcare facilities that are seeking solutions to deal with staffing shortages or other limitations. Some of the healthcare technology advances to watch going forward include:

1.2.1 Artificial Intelligence

With the potential to radically transform healthcare, artificial intelligence can help professionals make better judgments and reduce human error and the risk of preventable scenarios. From radiology tools and immunotherapy for cancer patients to identifying infectious disease patterns, advanced technology helps develop more efficient and precise interventions. As learning algorithms evolve and become more accurate, they are likely to significantly impact healthcare services, including diagnostic approaches, treatments, and care processes.



Figure 1: AI In Healthcare

1.2.2 3D Bioprinting

The invention of 3D printing is another new technology in the healthcare industry that is proving to be transformative. This new field of 3D Bioprinting enables physicians to print artificial limbs, organs, joint replacement parts, and bio tissues. In addition, in the field of pharmacology, there are ongoing experiments for printing pills and other medications. Lastly, 3D printers can also help create medical devices and surgical tools.

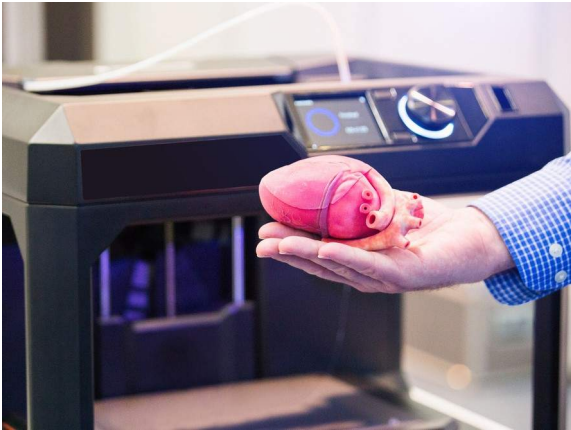


Figure 2: 3D Bioprinting

1.2.3 Robotics

The field of robotics has made great strides as well, making it a top healthcare tech trend. Medical robots can help surgeons perform very precise and targeted procedures and therapies. Though the doctors still control the surgery, robots take away the possibility of human errors and can potentially reduce infections. Healthcare robots are also poised to take over clerical and routine tasks to free up nursing and other healthcare professionals to focus more on direct patient care.

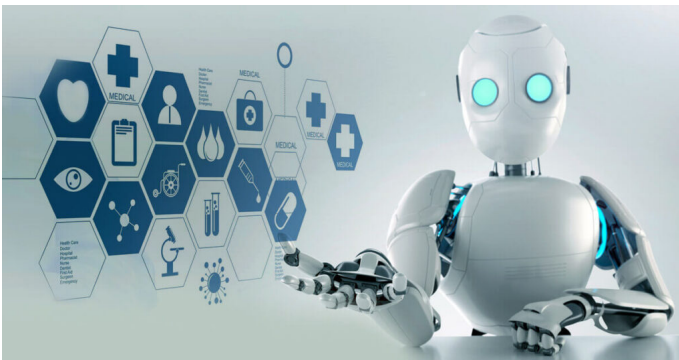


Figure 3: Robotics In Healthcare

1.2.4 Virtual Reality

Also an emerging technology in healthcare, virtual reality (VR) is an innovative tool with many applications, from teaching autistic children communication and social skills to engaging patients in activities and games for rehabilitation purposes.

VR solutions can manage hot flashes through cognitive behavioral therapy and relieve pain through meditation training. Some applications use Google Glass and augmented reality for clinical and medical documentation support, including reminder, order, and referral assistance.



Figure 4: Virtual Reality In Healthcare

Based on HIPAA compliant cloud infrastructure, VR solutions help healthcare providers to create patient summaries and notes, answer physician requests, pend orders and create referral letters. Virtual reality can be used across various settings such as surgery centers, hospitals, emergency rooms, home visits, medical offices, urgent care clinics, pop-up clinics, and telemedicine.

1.2.5 Electronic health records

Emerging health information technology has made it possible to maintain health records in a centralized, cloud-based portal, which provides health care professionals and patients with instant access to medical histories. As such, healthcare providers have all the information they need at their fingertips, which can be crucial in the case of an emergency, if there is a language barrier, or if a patient is unable to communicate. This type of healthcare tech is also ideal for when doctors from different hospitals or medical offices need to collaborate about patients who have complex medical files or diagnoses to determine the most optimal way to treat their condition.



Figure 5: *Electronic Health Record*

1.3 Emerging Technologies as the Future of Healthcare

As practices and hospitals increasingly use mobile devices to access information, from medical records and history to research and drug therapies, they are better equipped to diagnose and treat patients. New technology in healthcare plays a crucial role in preventing complications, avoiding unnecessary surgeries, improving quality of life, and sustaining health.

Innovations help improve the quality and efficiency of care, develop new therapeutic approaches, treatment options, and drugs, and even predict the onset of epidemics. From ankle braces and adhesive bandages to advanced solutions such as robotic prosthetic limbs and remote heart failure monitoring and diagnostic devices, emerging technology in healthcare contributes to better patient outcomes and improved public health.

1.4 Conclusion

The future of medicine and patient care will increasingly rely on health technology, which is why healthcare organizations must embrace emerging healthcare technologies to stay relevant in the coming years. By exploring healthcare tech trends and becoming an early adopter of new innovations, healthcare providers can provide cutting-edge care.