A Time to Talk about Technology – Discussion about Medical Technology with the ATIME Group at The Ottawa Hospital

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ABSTRACT

In recent years, the use of technology in medicine has become increasingly common. Medical technology has the potential to introduce innovative solutions to clinical problems and supplement current methods of medical education. Advancements in Technology In Medical Education (ATIME) at The Ottawa Hospital is dedicated to discovering and sharing advances in technology with the medical community, as well as promoting the appreciation and use of technology in the next generation of physicians.

RÉSUMÉ

Au cours des dernières années, l'utilisation de la technologie en médecine est devenue de plus en plus commune. La technologie médicale a le potentiel d'introduire des solutions innovatrices à des problèmes cliniques et de compléter les méthodes actuelles en éducation médicale. Advancements in Technology In Medical Education (ATIME) à L'Hôpital d'Ottawa est dédié à la découverte et au partage des progrès en technologie avec la communauté médicale, ainsi que voué à la promotion de l'appréciation et de l'utilisation de la technologie dans la prochaine génération de médecins.

INTRODUCTION

Technology in medicine is a growing field that impacts almost every aspect of medical practice. While most medical students recognize its importance, many have only a superficial knowledge of current technologies and their medical applications. In hopes of shedding some light on the topic, the New Engineering and Technology in Medicine Interest Group (NEAT) at the University of Ottawa, Faculty of Medicine, discussed ideas with the Advancements in Technology In Medical Education (ATIME) group within The Ottawa Hospital (TOH), which is centered on promoting awareness and use of technology in medicine.

WHO AND WHAT IS ATIME?

ATIME was formed two years ago as a part of the Department of Innovation in Medical Education (DIME) at the University of Ottawa. ATIME is led by Dr. James Chan, an internal medicine physician at the Ottawa Hospital, and the group currently consists of 18 members (and growing) including physicians, residents, researchers, medical students, undergraduates, and non-healthcare individuals who are interested in the role of technology and its application to medicine. NEAT Medicine had the opportunity to speak with a select group of these members: Dr. James Chan, Dr. Robert Bell, Dr. Kyle Walker and Tim Wood.

ATIME's mandate is to connect the hospital and university by bringing together individuals who are passionate about advancements in technology and its application to the medical profession. ATIME is built on three major foundations: 1) sharing of ideas in the world about technology, 2) supporting each other in introducing new technologies in clinical practice or medical education, and 3) shaping the next generation of physicians who will be proficient in technology and its application to medicine.

WHY WAS ATIME FORMED?

Two and a half years ago, Dr. Chan recognized that a potential problem in implementing medical technologies was the overlap of ideas between several groups within the same hospital. He was thus inspired to create ATIME as a central hub for sharing ideas about medical technology amongst hospital staff. Over time, ATIME hopes to implement a system to help developers navigate the challenges of app development and technology implementation in healthcare, such as dealing with intellectual property, lawyers, and obtaining hospital support. One of ATIME's accomplish-

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ments is the development of an electronic platform for health and wellness at TOH. It allows open dialogue between staff to promote wellness by sharing their experiences about maintaining a healthy work-life balance. ATIME was also involved in the implementation of eHandover at TOH, an app that improves continuity of care during handovers at the hospital.

TECHNOLOGY AND ITS ROLE IN MEDICINE

Is technology changing the way medicine is practiced clinically? Five years ago, all staff at The Ottawa Hospital received iPads to access OACIS – the hospital's management system of electronic health records (EHR). However, no formal training was provided on how to use the iPads effectively to access OACIS. Thanks to the app-based nature of tablets and smartphones, ATIME members have put the iPad to good use with handy tools such as Read (centralized database of medical literature), Calculate by QxMD (clinical criteria calculator), and eClinicalMobile (secure access to patient records). Other non-medical apps frequently used include ToDo, Dropbox, and Evernote. Combining these tools simplifies workflow, reduces errors, and allows for more effective retrieval of information. For example, Read by QxMD is a personalized system that allows for ongoing retrieval of articles of interest. It searches multiple journals for a specific area of interest (denoted by keywords) and provides the user with a list of the most recent articles published in the field. From there, the user can organize, and download full PDF's to their device for use on their own time.

We asked ATIME about the process of inventing a new technology and introducing it to clinical practice. ATIME notes that there are many examples of widely used technologies in the medical field. In ophthalmology, doctors are able to show patients an image of their retina using a device that exports the photo to a computer/iPad. Another example of the use of technology in medicine is portable bedside ultrasound machines. While technology may seem lucrative in this field, unfortunately, not all innovative ideas are successfully implemented into day-to-day clinical practice. To continue down the pipeline successfully, new technologies must be financially viable before they are supported by the hospital. From a hospital perspective, any time spent on developing a technology is time taken away from clinical duties. ATIME's advice for introducing new technology is to be prepared for setbacks but have a strong proposal that makes financial and logistical sense.

TECHNOLOGY AND ITS ROLE IN MEDICAL EDUCATION

Advances in medical technology can have many applications in medical education. Education is an area in which innovative tools can be implemented to enhance student learning and supplement current methods of teaching. For example, Stethee™ is an electronic wireless stethoscope that vibrates to the heartbeat and uses colors to indicate arrhythmias. Stethee™ is currently in development and born from KickStarter™, a crowd-sourced funding initiative. Innovative technologies like these have the potential to revolutionize the way medical students are trained by providing students with a medium to practice their skills before going into a clinical setting. When asked about technologies such as Stethee™, Dr. Chan explains that these technologies can be used during bedside teaching. Another example of the use of technology in medical education is Harvey® The Cardiopulmonary Patient Simulator used in the University of Ottawa Simulation Center. Harvey® provides medical students with the opportunity to learn to identify pathological cardiac conditions on physical exam; it mimics S3 and S4 heart sounds and murmurs in addition to presenting with associated physical findings such as thrills and heaves. Practice sessions with simulators like Harvey® enhance clerkship readiness and imbue students with confidence when examining patients during their rotations.

Technologies aimed solely at medical education mitigate many issues surrounding patient safety and confidentiality. In the wards, apps that keep track of patient data or bedside ultrasound machines must all go through certification to ensure it is secure and safe with respect to patient data. In medical education however, teaching tools such as 3D anatomy visualization, Harvey®, and Stethee™ can be used without having to certify the device for patient safety. In essence, it is easier to bring these technologies onto the market since patient care will not be compromised. Without the risk of breaching patient confidentiality or compromising safety, developing tools for medical education purposes is a simpler process than those being developed for clinical use.

WHAT DOES THIS MEAN FOR FUTURE TRAINEES?

Ideally, students should be introduced to technologies as early as possible in their training. This would allow time for students to learn how to integrate technology into everyday workflow. This generation of medical trainees will play a key role in pushing technology forward within the medical field. With the advent of multiple start-up companies focusing on health related products, it is imperative that medical students and trainees learn how to evaluate these technologies and their potential use in clinical practice. All change requires a time period of implementation before the benefits of the change can be seen. In hopes of seeing similar advancements, such as the iPad implementation at the TOH, medical students and trainees need to be receptive to novel and unconventional ideas.

CONCLUSION

It is important to encourage students to embrace medical technology, as they will shape the role of technology in the practice

and teaching of medicine and patient care in the future. Over time, with increasing exposure, knowledge, and use, students will feel comfortable using technology in a clinical setting and are more likely to incorporate technology in their day-to-day routine as physicians in the future. Technology already plays a large role in the way medicine is practiced at TOH. In the future, we expect technology to have an increasingly important role in patient care. Medical technology can introduce innovative solutions to clinical problems and supplement current methods of teaching. Groups such as ATIME are leading the way in the incorporation of more technology in medicine. *Expect to see more of ATIME and their work in the future!*

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