

Committee: World Health Organisation (WHO)

Topic: Ethical aspects involving the use of information technology in new surgical applications and methods

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Position: Deputy President

Personal Introduction

Dear delegates,

My name is Stavroula Sargenti and I am honored to serve as a deputy president for this years WHO committee in CS MUN 2022. I am 15 and I attend Ionios School. I have participated in many conferences as a delegate and I have also chaired for a conference this May. In my first conference I was really excited and a bit nervous as I was not familiar with the procces. By the end of it I was feeling much more safe and I was dreading the next one. Knowing that some of you might be newcomers, my biggest advice is that you believe in yourself. If something does not go the way you want it just remember that its not the end of the world and that we have probably been through that at some point too.

This year's topic is very interesting and it's a current issue that many scientists are looking into. I believe that with this study guide and the correct research you will be able to come up with some very creative resolutions. I hope you find this material helpful and I'm looking forward to see you all! Good luck!

Yours truly,

Stavroula Sargenti (sstavroula6@gmail.com)

Topic Introduction

Information technology (IT) is the use of any computer or other physical devices to create, process and exchange all sorts of electronic data. IT has existed since around 3000 BC at one of its earliest forms however the term was not discovered until



1958. Currently information technology has over 70 different types with unique capabilities.

Regarding healthcare in general, IT has a very crucial role, as it provides a central database to manage all of the patient's data online. Also, it ensures that the procedure is being done safely and under the correct circumstances. In surgeries, the use of information technology is very common (health informatics) from direct use in surgeries to electrically generated notes. Everything relevant to the care of the patient is collected and stored using surgical informatics.

IT ethics is the study of the ethical issues arising out of the use and development of electronic technologies. Its goal is to identify and formulate answers to questions about the moral basis of individual responsibilities and actions, as well as the moral underpinnings of public policy. ¹Some of the major ethical concerns that have arisen are personal privacy, access right, harmful actions, patents, copyright, trade secrets and liability, piracy and it is important to tackle such an issue as IT is becoming more and more integrated into the medical practice and certain guidelines must be set.

Definition of key terms

Artificial Intelligence

Artificial intelligence (AI) is intelligence demonstrated by machines, as opposed to the natural intelligence displayed by animals including humans.²

¹ Dopico, Alex. "Home." *Janet*, 2 May 2020, <https://janet-panic.com/what-is-administrative-ethics-in-public-administration/>.

² "Artificial Intelligence." *Wikipedia*, Wikimedia Foundation, 8 Aug. 2022, www.wikipedia.org/wiki/Artificial_intelligence.



Information Technology

The development, study, or use of electronic equipment, especially computers, for storing and analyzing information³

Health Informatics

Health (medical) informatics is the intersection of information science, computer science, and health care. This field deals with the resources, devices, and methods required to optimize the acquisition, storage, retrieval, and use of information in health and biomedicine.⁴

Telemedicine

The remote diagnosis and treatment of patients by means of telecommunications technology.⁵

Background Information

History of telemedicine

Telemedicine in the 19th century

Telemedicine started with the use of the oldest forms of telecommunication, like the radio, the telephone, and the telegraph. More specifically, during the civil war, people would report injuries and diseases as well as order medical treatment and consultation with the use of the telegraph. This was done out of need, as moving around was difficult, however it is considered as one of the oldest forms of telehealth.

³ "Information-Technology Noun - Definition, Pictures, Pronunciation and Usage Notes: Oxford Advanced American Dictionary at Oxfordlearnersdictionaries.com." *Information-Technology Noun - Definition, Pictures, Pronunciation and Usage Notes | Oxford Advanced American Dictionary at OxfordLearnersDictionaries.com*, www.oxfordlearnersdictionaries.com/definition/american_english/information-technology.

⁴ "The History of Information Technology: Complete I.T." *Complete IT*, 2 Mar. 2021, <https://www.complete-it.co.uk/the-history-of-information-technology/>.

⁵ "Telemedicine: Meaning & Definition for UK English." *Lexico Dictionaries | English*, Lexico Dictionaries, <https://www.lexico.com/definition/telemedicine>.



In 1879 it was discussed, that the use of the telephone would reduce office visits which is what sparked up the beginning of what we know as telemedicine today.

Telemedicine in the 20th century

After 1940 we have noticeable development in telemedicine. In 1948 the first radiologic images were sent via cellphone from one medical staff to another 24 miles apart from one another. In 1959 physicians at the university of Nebraska shared neurological examinations with their students across campus using a two way television while five years later special interactive televisions were made in order to allow physicians to transmit psychiatric consultations up to 112 miles away.

Telemedicine today

Today most citizens have basic access to telemedicine with their mobile devices. This has made the communication of patients and doctors easier, it has reduced office visits and has minimised crowding at the hospitals. Also with the new advanced technologies caregivers can monitor their patients closely with the use of home-use medical devices. During the pandemic this has been extremely useful, as doctors can send the diagnosis without the patients visiting the office.

The use of IT in the medical practice

X-rays were discovered in 1895 by Wilhelm Conrad Roentgen and just a year later, American surgeon, Emil Grubbe used it to treat a breast cancer patient. In the first decade of the 20th century, radiation therapy was used mainly to treat skin cancers; however this sometimes proved to be ineffective as they would be inaccurate. This lead to the development of more advanced models such as the Conformal radiational therapy (CRT) which uses computerised tomography imaging to precisely map out a tumour in 3D. Another variety is conformal proton beam radiation therapy, which uses positively charged subatomic particles called protons instead of X-rays.⁶ Protons can deliver less of a radiation does to the tissues surrounding the tissues, ensuring less damage.

⁶ "The Medicine Book, Big Ideas Simply Explained 9780241471258." *Ebin.pub*, 2021, <https://ebin.pub/the-medicine-book-big-ideas-simply-explained-9780241471258.html>.



In 1924, German psychiatrist Hans Berger, performed the first human electroencephalogram (EEG). This way, he was able to record brain activity by detecting the electrical signals fired by neurons.⁷ Then, the third great technological leap forward had occurred- the invention of the electron microscope. This enabled scientists to examine much smaller elements of the nervous system, including synapses. Magnetic Resonance imaging (MRI) and computed tomography (CT) scanning, allowing for further exploration of the nervous system.⁸ This fuelled research on behaviour, brain function, the efficacy of drugs for neurological conditions, brain surgery and the causes and effects of diseases such as epilepsy and Alzheimer's. Later in 1935, neurophysiologist, William Grey Walter used an electroencephalogram (EEG) to diagnose a patient with a brain tumour. This technique measured electrical activity- brain waves- in the human brain and is now currently used as a diagnostic tool. EEG techniques have increased in sophistication since Walter first developed his model, but the basic concept is still the same. However, other tools have been developed to analyse the human brain's health. Positron emission tomography (PET) measures the brain's metabolic activity, while functional magnetic resonance imaging (fMRI) records changes in blood flow. This all contributed to better diagnoses and better treatment for the patient.

The heart is a vital organ in the body and without it no oxygen could be supplied to the body. However, there are individuals who have bradycardia- slow heartbeat- following, for example, a heart attack. As a result, in 1951, John Hopps, a Canadian engineer developed the first effective pacemaker. This was bulky and external and had to be carried on a trolley. 7 years later, aided by the invention of small batteries and tiny transistors to control signal, Rune Elmqvist, engineer, and Åke Senning, surgeon, created a pacemaker that could be implanted in the chest.

One of the main advancements of surgery, was the keyhole procedure, The keyhole procedure allowed the surgeon to view insides of a patient through a keyhole, without making visible scarring. In 1981, Kurt Semm, a German gynaecologist,

⁷ "The Medicine Book, Big Ideas Simply Explained 9780241471258." *Ebin.pub*, 2021, <https://ebin.pub/the-medicine-book-big-ideas-simply-explained-9780241471258.html>.

⁸ Ibid



performed the first appendectomy using the keyhole technique. Now, keyhole procedures include laparoscopic, arthroscopic and thoracoscopic. Technological advancements in the 1980s- especially the advent of 3D videoscopic imaging- made keyhole surgery safer and more precise.⁹The invention of the 3D ultrasound in 1986 allowed for non-invasive mapping of bones and joints. Assisting the diagnosis and treatment of disorders, it has also facilitated better training in orthopaedics. Key-hole surgery, instead of the recommended amputation after detection of malign bone cancer, alongside the 3D ultrasound allowed for treatment instead of immediate amputation.

Benefits of telehealth

There are a plethora of benefits to IT being integrated into the medical practice . In order for the providers to distribute care more efficiently they use modern forms of telehealth. This way they do not need to increase the number of staff and office space and they can provide a consultation whenever the patients need it. AI also assists providers with the treatment and the diagnosis of an individual. The patients are also benefitted from this service. They will not need to transport to visit the doctor and therefore save the money they would inevitably cut costs of getting there and therefore have more of a disposable income. An individual can schedule an appointment online whenever they have the time which means that they will not miss out on their working hours or during important events.

Moreover, the advancement of technology in Medicine, allows for a greater enrichment of the human body and its functions, which could facilitate diagnosis. With the facilitation of diagnosis, the care for the patient would ameliorate as new surgical techniques are more readily available and complementary post-operative care would be provided.

⁹ “The Medicine Book, Big Ideas Simply Explained 9780241471258.” *Ebin.pub*, 2021, <https://ebin.pub/the-medicine-book-big-ideas-simply-explained-9780241471258.html>.



Disadvantages of telehealth

Policy makers cannot keep up with the industry as its developing rapidly. There has been a huge uncertainty of the reimbursement policies, the privacy protection and healthcare laws. Alongside that, laws regarding telemedicine are different depending on the country or state. Also, doctors and patients of older age might find it difficult to adapt to this new system and mismanage it. Although technology has become much simpler to use, there is still room for improvement and errors still occur. Lastly, technology is expensive and not all healthcare providers can afford advanced services. Apart from the machines, special healthcare experts are needed as well as technicians and other specialists to educate the public and this may take a long time to close the shortage of such workers.

Information Technology in patient records

IT can be found in many forms in the healthcare system and the first one is the electronic health record (HER). An EHR or a persons electronic medical record (EMR) is a persons official digital health record that is being shared with the needed healthcare agencies. Another important form of IT is the personal health record (PHR), which is a persons self-maintained health record, that is usually not shared with the healthcare agency. Next, we have the health information exchange (HIE) which is a group of healthcare organizers that enter an interaction pact and agree to share data amongst themselves or between various IT healthcare systems.

Major countries and organizations involved

United Kingdom (UK)

The United Kingdom's National Health Service (NHS) is a very well developed system that makes the UK's health system almost unique in comparison with the other European countries. The NHS provides free universal healthcare to all citizens. The United Kingdom, unlike other countries, was comparatively underdeveloped before the covid 19 pandemic. At the peak of the crisis, the UK Secretary of State for health Matt Hancock declared that the general practitioners for this service should see patients distantly by default. This decision has showed to improve the number of virtual



GP appointments from 25% to 71%. However, such statistics have not only been seen in the virtual GP appointments, but also in other NHS services through the pandemic. Regarding laws, at the moment there aren't any laws or regulations that are directly referring to telemedicine, however there are a few regarding the healthcare providers. The regulator responsible for the healthcare workers is The Care

Quality Commission (CQC), which requires that all providers must make sure that the care they provide meets the requirements of the health and social care act 2008 as well as similar regulations.¹⁰

Somalia

Somalia's health system has been in a very weak state for decades because of the constant humanitarian conflicts that have led to the decolonization of 2.6 million Somalis. With the covid 19 pandemic, the situation had gotten worse since most frontline careers have very limited experience when it comes to seriously ill patients. This lack of diagnostic resources alongside the very limited modern medical knowledge can result in very serious issues in case of a public health crisis. Seeing that, the government has provided the majority of the hospitals in Somalia with access to the digital health system to help the healthcare experts, improve and strengthen the capacity and provide remote diagnosis and treatment. According to Somalia's national development plan 2020-2024 there are approximately 6,000 healthcare workers. As the population of Somalia is 15 million, this is equivalent to 4 healthcare workers per 10,000 citizens which is well below average. However, with the new project proposed by the International Organization for Migrants (IOM) the healthcare system has started to rapidly improve. The project includes the use of cameras and different digital devices such as tablets for the rapid diagnosis of a patient as well as the connection of international experts with Somalian doctors for a better result. Introducing telemedicine in Somalia's healthcare system will help the local doctors access a new

¹⁰ "Telehealth in the United Kingdom: Considerations for Providers." – *Publications | Morgan Lewis*, <https://www.morganlewis.com/pubs/2021/02/telehealth-in-the-united-kingdom-considerations-for-providers-cv19-lf>.



aspect of medicine, one that will help them cover more patients and be more effective at the same time.

Argentina

In Argentina the main reason for the introduction of telemedicine was the optimization of medical appointments. There was a lack of knowledge, experts and confidence in the telemedicine field when it was first introduced. However, in the process there was a development. Within a year 82% of the appointments were teleconsultations, 98% of the medicine descriptions were being done remotely and 60% of clinic test prescriptions were also done remotely. With this big leap in telemedicine professionals got familiar with the services and a new baseline solution to face the pandemic was discovered.¹¹

Timeline of events

<u>1816</u>	The stethoscope is invented by the French doctor Rene Laennec
<u>1895</u>	Wilhelm Conrad Rontgen, a German physicist, discovered the x-ray
<u>1903</u>	Dr Willem Einthoven, a Dutch doctor and inventor, invented the first electrocardiogram.
<u>1943</u>	Dr Willem Kolff, a pioneer, built the first dialysis machine to aid people with kidney failure.
<u>1958</u>	An external cardiac pacemaker was implanted in a patient for the first time by Åke Senning in Stockholm. ¹²

¹¹ "Telemedicine: Good Practices from Latin America." International Social Security Association (ISSA), <https://ww1.issa.int/analysis/telemedicina-buenas-practicas-en-america-latina>.

¹² Parsonnet, Kirk Jeffrey and Victor, et al. "Cardiac Pacing, 1960–1985." *Circulation*, 19 May 1998, <https://www.ahajournals.org/doi/full/10.1161/01.CIR.97.19.1978#:~:text=The%20First%20Implantable%20Pacemakers,40%2Dyear%2Dold%20patient>.



<u>1960</u>	Cardiopulmonary resuscitation (CPR) is presented for the first time
<u>1971</u>	Dr. Godfrey Hounsfield, an electrical engineer, made the first commercial Computed Tomography (CT) scanner
<u>1974</u>	Dr Raymond Damadian, a physician and inventor, invents the Magnetic Resonance Imaging (MRI).
<u>1982</u>	The first artificial heart, made of aluminium and polyurethane was received by Barney Clark, as he had congestive heart failure.
<u>2001</u>	The first laparoscopic procedure was performed by Georg Kelling, a surgeon.
<u>2003</u>	The Human Genome Project was completed.
<u>2015</u>	More than 80% of the hospitals were using electronic health records according to a report from the National Coordination for Health IT. ¹³

Previous attempts to solve the issue

Telemedicine Regulations

Over the past years there have been several attempts of setting regulations on telehealth, with most of them being successful. However, since technology is evolving every day, its difficult for them to be accurate all the time. This results in lack of certainty upon the issue and therefore makes the process less trustworthy.

Central Ethics Committee (CEC) message

The Central Ethics Committee (CEC) identifies and discusses ethical challenges arising in medicine by taking account of developments at the national and international level and promoting the exchange of information and collaboration with

¹³ "More than 80 Percent of Docs Use Ehrs." *Healthcare IT News*, 18 Sept. 2015, <https://www.healthcareitnews.com/news/more-80-percent-docs-use-ehrs>.



relevant institutions. The CEC released a message which reads as follows: ¹⁴. This message ratifies the importance of the patient-physician relationship and clarifies that, in pandemic times or not, telematic consultation modalities must be agreed on by both parties and in accordance with the criteria of the physician, who must have sufficient time in the healthcare schedule to ensure the requirements of quality and kindness. The CEC reinforces the requirement of ensuring legal security as it relates to the implementation of telemedicine given that multiple legal and ethical questions arise in relation to medical actions carried out via telemedicine and the professional liability of the physician in the event of an erroneous non-face-to-face diagnosis.

World Medical Association (WMA) statement

The World Medical Association (WMA) is an international organization representing physicians¹⁵. The organization was created to ensure the independence of physicians, and to work for the highest possible standards of ethical behaviour and care by physicians, at all times. ¹⁶ This segment included the definition of telemedicine, as well as preamble clauses which mention the development and implementation of information and communication technology, face-to-face consultation, the delivery of telemedicine services and the principles of medical ethics. Furthermore it elaborates on the principals of physicians respecting ethical guidelines when practicing telemedicine, autonomy and privacy of the physician, responsibilities of the physician and quality of care. Finally, it ends with a list of recommendations regarding the subject.

¹⁴Gil Membrado, C, et al. "Telemedicine, Ethics, and Law in Times of Covid-19. A Look towards the Future." *Revista Clinica Espanola*, Elsevier España, S.L.U. and Sociedad Española De Medicina Interna (SEMI)., 2021, www.ncbi.nlm.nih.gov/pmc/articles/PMC8133381/.

¹⁵ "WMA - The World Medical Association-About Us." *The World Medical Association*, www.wma.net/who-we-are/about-us/.

¹⁶ "WMA - The World Medical Association-WMA Statement on the Ethics of Telemedicine." *The World Medical Association*, www.wma.net/policies-post/wma-statement-on-the-ethics-of-telemedicine/.



Relevant UN Resolutions, Events, Treaties and Legislation

Cigna Global Health

Cigna Global Telehealth is an organization that's cooperating with the UN. It gives the patients access to licensed doctors around the world in order to prepare them for an upcoming appointment, hospitalization or to provide diagnosis to a non-emergency condition.

International Society for Telemedicine and eHealth (ISTeH)

The International Society for Telemedicine and eHealth is an organization that works as a host for the international telemedicine and eHealth systems. It also assists the creation of new organizations on this field, as many of them take this organization as the example. It's close to the World Health Organization (WHO) and the International Telecommunication Union (ITU) and this organization is open to councils, individuals, associated societies and corporations.

International Council of Nurses (ICN) Telenursing Network

The ICN Telenursing Network is an organization dedicated to help, train and collaborate with the nurses as well as their supporters who are interested in telenursing from around the world. Their job is to promote and involve further nursing in telehealth and improve the timelines and quality of healthcare services

Possible solutions

Education

Firstly, what needs to be done is for everyone to understand how the process works. We need to ensure that the patients have a full knowledge of what they consent to as well as know how safe the handling of their data is. Older people need special guidance with this new service as they are unfamiliar with it and need more time to adapt to it. Specialists need to be available at all times, to solve questions and listen to the concerns of the customers using this network.



Spreading Awareness

Another solution is for major organizations to mention it more and make this process well known to everyone. All countries must be involved in this to fully function. Each country individually needs to educate its citizens and promote this relatively new system to everyone. The media plays a big role in this as it has a lot of influence on the public.

Research

Extensive research needs to be done upon the topic. The research done in the past years has brought IT at a very important position in the healthcare sector and we want to expand that. More research means that the process becomes more clear and therefore more safe for more people to trust it. Alongside that, the researches done should also be published in order to be used in future investigations or study material.

Different platforms

A secure cyberspace is needed for the safety and the protection of the patient data. Therefore, the government needs to create a safe platform especially made for the storage of the data that will be strictly accessed by the healthcare staff. Each patient will have their own medical account on this platform that will be strictly private, and their corresponding doctor will be the only one to access the data of each patient.

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