Is Sophistication and Deployment of Technology is A Bane or Boon with Respect to Patient Safety in Health Care.

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ABSTRACT: It is the belief of the public that sophistication and technology especially in healthcare will improve efficiency quality safety and reduce the cost of procedures but unfortunately only few people who have greater understanding of technology and its use in healthcare consider that the introduction of technology and sophisticated equipment by reducing the professionalism, it creates an environment for errors and adverse events in healthcare procedures. We are aware that around 5000 types of medical devices that are in use in healthcare sector are being used by millions of healthcare providers and professionals globally. The problems that arises with these sophisticated equipment are inevitable. Though it is an admitted fact that technology holds much promise in healthcare procedures but the same technology will have its own pitfalls such as

a. Poor technology design that does not adhere to human factors and ergonomic principles.
b. On the other hand poor technology and poor design of the equipment may interface the patient or environment.
c. Inadequate planning and introduction by healthcare providers in any healthcare facility will cause more harm and less safety.
d. In addition to the introduction of technology and sophisticated equipment invariably it should be backed up by maintenance and service; failing which the purpose of this technology and sophistication gets defeated. The aim of this review article is to make an extension analysis of deployment of technology and sophistication in healthcare will improve the patient safety or will have a negative impact. The objective is to explore from the existing literature and find out the deployment of technology and sophistication with respect to healthcare procedures can make good with respect to patient's safety or will it have any adverse impact on patient's health.

As already mentioned above there are numerous sophisticated equipment that are in use in healthcare procedures and every day more sophistication thereby more number of equipment are being introduced and some are not time tested. Even the healthcare professionals and providers are not in a position to say the equipment is safe and eco friendly.

Patients care technology has become increasingly transforming the way paramedics, nurses conceptualized and delivery system. Before the introduction of technology and sophisticated equipment, the paramedics, nurses used to rely more on their senses of sight, touch, smell and hearing and observation to monitor patient's status of health and to identify any changes whether they are supporting the patients recovery or otherwise. Because of this technology, these healthcare professionals, paramedics and nurses mainly relying on their results of the equipment that they are putting into operation instead of assessing, making and evaluating the real picture of the patient. This is considered to be an unsafe practice because all the sophisticated equipment to the best of my knowledge and belief will function in a set designed program and travel accordingly; any variation or change in the health of the patient cannot be detected if the situation is not included in the traversed program of the equipment. This will cause unsafe health practice and at times leads to fatal; if not identified early.

Technology has the potential to improve healthcare but it is not without any risks; so to say use of technology and introduction of sophistication has been described as both part of the problem and part of the solution for safe healthcare. It is the considered opinion of the many healthcare professionals who are well versed with technology and sophistication that problems may arise on the use of more number of devices and complexity of each device and the poor interface between technologies, in addition pharmaceutical industries are introducing technologies in a half hazard manner though much amount is spent on research and development on the equipment, yet due to competition and marketing of the product, the manufacturers and healthcare providers are equally responsible in introducing half hazard manner. This equipment that leads to unsafe, unethical healthcare practices. Hence, that no body is against use of technology because in emergency cases and in chronical cases the technology will provide faster relief and solutions instead of manual consideration.

It is the considered opinion of the people connected with healthcare that technology should be introduced, sophisticated equipment are to be used by giving more importance to the safe utility of the devices because they are being used on humans but at the same

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time none should not solely depend on the equipment but the healthcare professionals should apply their mind and experience to pin point the exact nature of the ailment with the help of the results that are being obtained from the equipment instead solely depending upon the results of the equipment is not desired. Hence, use of technology and experience of the professionals should run parallel complimenting each one with other keeping in mind the universal safety norms, safety of the patient as priority. Hence, the very purpose of introduction of technology and sophistication of equipment gets nullified.

KEYWORDS: Deployment of Technology and Sophistication in Healthcare, Patient care Technology and Safety, Robotic Radical Prostatectomy, Da Vinci Si Surgery System, Accessing to DNA sequencing.

AIM: The aim of this review article is to make an extension analysis of deployment of technology and sophistication in healthcare will improve the patient safety or will have a negative impact.

OBJECTIVE: The objective of this study is to explore from the existing literature and find out the deployment of technology and sophistication with respect to healthcare procedures can make good with respect to patient's safety or will it have any adverse impact on patient's health.

INTRODUCTION
Globalization of healthcare and the opening up of economy and government liberalization policies towards foreign healthcare facilitators/investors to make inroads into healthcare in India as joint ventures with the existing/new healthcare organizations witnessed a phenomenal increase in private healthcare activities in India. Many reputed organizations who are otherwise well established entered into healthcare sector on their own or with foreign participation to make private healthcare sector in line with that of healthcare sectors in developed nations.

In this travel, latest technology and sophistication of healthcare procedures by introducing the technical advancement that is presently available in the developed nations a challenge in the present healthcare procedures superseding professionalism. For example, the deployment of Artificial Intelligence, Machine Learning, Surgery by Robotics, Advanced Tools to undertake complicated Procedures are the order of the day. This is due to lack of skilled hands, to reduce the recovery time and fast recovery after procedures, less medication are the some of the benefits that accrued with the deployment of technology. In addition, computerized diagnostic equipment to identify the ailment/suffering of a patient in a shortest period will make ample time for the healthcare professional to take a decision; In addition the introduction of MIS (Minimum Invasive Surgery), Key Hole Surgery (a technique that reduces the cutting of the body instead making a small hole and introducing the equipment to the whole for the procedures so that the wound will be cured in no time). Surgery by robotics in critical procedures where the deployment of human hands is difficult and raises complications. Though the benefits are more the other side of the impact of sophistication in healthcare procedures and healthcare facilities cannot be under looked. Where there is sophistication and deployment of technology there exists the safety of the patients because any amount of error in the sophistication or the equipment the loss will be colossal; the reason being for all this technology and sophistication the human brain behind it to control, to run and complete the task is very important. Sometimes due to some unavoidable circumstances if complication arises during procedure equipment cannot deviate from the said program which is detrimental to patient safety.

LITERATURE REVIEW
In an article titled "**Less is (sometimes) more in cognitive engineering: the role of automation technology in improving patient safety**" written by K J Vicente, Department of Mechanical and Industrial Engineering, Canada. The author rightly pointed out that, "**There is a tendency to assume that medical error can be stamped out by automation. Technology may improve Patient safety, Cognitive Engineering Research findings in several complex safety critical systems including both aviation and healthcare, show that more is not always better**." A nice statement made out in an appropriate manner because it is not always worth and better to have more sophistication because more sophistication means more critical technology and that arises less safety. Especially in healthcare sector where the subject matter is human beings and their well being any amount of error because of more technology will not reversely action because sophistication will run in a set defined process but human body because of it is patient centric cannot be taken it for granted that it will react in the same manner; meaning if the path of the sophistication cannot interact with the path of the human suffering unusual complications may leads to safety question. The present day of healthcare facility though fully equipped with automation to diagnose the suffering and ailment of a patient. Any technical error either in the program if they are computer programmed or mishandling of the technicians or error in detection or error in results will have greater repercussions on the health of the patients at times it will be fatal.

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In another article titled "**Patient care Technology and Safety**" Chapter 50 written by Gail Powell-Cope, Audrey L. Nelson, Emily S. Patterson, published in a book "**Patient safety and Quality: An evidence based Handbook for Nurses, Rockville(MD): Agency for Healthcare Research and Quality (US)**", 2006 Apr. Some important questions are discussed.

The general notion in the public is that by deploying technology and sophisticated procedures will improve healthcare efficiency, quality, safety and cost. On the other hand few people considered that these same technologies though they are as good as mentioned above can also make errors in their functioning with the result adverse events will come in. It is estimated that around 5000 healthcare devices are in use by millions of healthcare providers around the world at the same time device related problems are in evitable. Though it is a well known factor that technology holds much more promise and benefits in healthcare sector, there are certain pitfalls in the use of technology in healthcare such as

a. Poor technology design that does not adhere human factors and ergonomic principles.

b. Poor technology interface with the patient or environment.

c. Inadequate plan for implementing a new technology into practice and finally

d. Inadequate maintenance plans.

As already pointed out deployment of technology and making sophisticated healthcare procedures but they are becoming complex when compared to nursing care is conceptualized and delivered. When we go back before the era of deployment of technology, the paramedic and healthcare professionals mainly used to rely on their sense of sight, touch, smell and hearing to monitor patient's health status in detecting the changes in their health. However due to the passage of time these paramedical staffs sense of knowledge were replaced with technology designed in detecting physical changes of the patients healthcare conditions. As an example, the pulse oxymeter before its use in healthcare, the paramedics/healthcare professionals used to rely on subtle changes in mental status and skin color to detect early changes in "**Oxygen Saturations**" and they used arterial blood gases to confirm this situation. On the other hand the introduction of this pulse oximeter, the healthcare professionals and paramedics are used to identify the decrease of oxygenation before clinical symptoms appear in the patient; with this the diagnosis and treatment both are in correlation with each other because the detection and procedure are used to take place simultaneously.

It is not denied that introduction of technology in healthcare procedures to treat the patients has the potential to improve the patient's care it is not without risks. Many argue that technology and its deployment in healthcare will have both solutions and problems and some professionals feel that these technologies and sophistication that are being used in healthcare are not full proof and without errors. In the same article, it is also discussed that "**Patient care technologies of interest to nurses range from relatively simple devices, such as catheters, and syringes to highly complex devices such as barcode medication administration system and electronic health records**".

To define broadly the technology in healthcare that include clinical protocols and other paper based tools but the introduction of electronic health records, computerization of healthcare administration including billing, accounts, financing, maintaining supply chain or sophisticated by reducing manpower at the same time with minimum errors which is necessary in an healthcare facility ambience which is more important because that much area can be used for healthcare and minimum area for other non procedural functions.

The deployment and use of technology by paramedics will have a good result in preventing errors and adverse events (medication errors, miscommunications, delays in procedures such as failure to rescue, nosocomial infections, pressure ulcers, falls and complications of immobility. However, the introduction of technology had its unidentified side effects and openings for failures. In this context, a learned author by name Samore and Colleagues observed that, "**devices most commonly associated with adverse events were foley catheters (57% of adverse events involving devices), arterial catheters (17% of such events), central venous catheters (17% of other events) peripherally inserted central catheters (7% of such events) – all devices used by paramedics in the direct care of patient**". In an pediatric healthcare facility "**implementation of computerized provider order entry system intended to reduce hand writing and transcriptions errors was unexpectedly associated with increased mortality, presumably due to a reduced ability by nursing personnel to anticipate the need of patients prior to arrival of the patients**". In another research, it was pointed out that, "**although bar coding medication administration was believed by most nursing personnel to decrease medication errors was also believed to reduce the ability for physicians to review the accuracy of medication administration and decrease the ability to deviate from routine medication administration sequences**". In another example, it is pointed out that, "**in an effort to prevent hip fractures from falls from bed some healthcare facilities used non-height-adjustable low beds to prevent such bedfalls as a safety measure. However, this kind of deployment though minimizes and increases the safety of the patient but on the other hand the paramedics especially nurses has got some side effects because they have to provide care to the patients by bending on their knees that increasing for the staff risk of back and knee injuries**". Such injuries though unintended consequences of technology are cannot be identified before hand and there an unavoidable aspect of deployment of technology however, on the other hand the deployment of technology will always have their pitfalls and failures and the only way is in due course of time the side effects or safety to the patients can be reduce to minimum if they cannot be totally eliminated.

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Patient safety especially in healthcare facilities will be seen as a major pressing issue but achieving 100% patient safety when technology is used and sophistication is introduced is extremely difficult. As already mentioned patients want need and ailment/suffering are different though the ailment is common and depends upon the age, sex, marital status, environmental growth, geographical indications are some of the factors that will have more impact when technology is deployed because of the fact as mentioned the want need of a patient is centric.

In a recent study titled "**Development of a Novel Fetal Heart Rate Monitor for Multiple Gestation Pregnancies**" written by Andrew Thade, Roman Ramirez, Dr. Christopher Ennen, Dr. Natasha Sheybani, Dr. Kristen Naegle, a research was conducted in the University of Virginia, Department of Biomedical Engineering, it was established beyond doubt that how technology and sophistication can be implemented keeping the safety factor intact was narrated. This is a innovative study relating to,

"**For monitoring FHR (Fetal Heart Rate) is through the use of a Doppler US fHR Monitor presently. While adequate for single fetus gestations, this device has shortcomings in multiple gestations pregnancies. Standard Doppler fHR Monitors currently do no allow for accurate measurements of multiple fetus in gestation. This is due to the fact that both hearts being measured reside in the same sample volume of the US Transducer, leading to inaccurate measurements for both fetuses.**"

To remove this shortcomings the University of Research Scholars of Virginia made an attempt successfully to develop a new technology for monitoring fHR of multiple fetus during gestation period.

In order to successfully developed and improved upon the current Doppler US fHR monitor, "**used clinically, there must be a way to satisfy test both the standard device as well as our NOVEL monitor. There is little known regarding an accurate ultra sound gel phantom that mimics the layers of tissue pertinent to pregnant individuals. We additionally were concerned with the establishment of how fetal heart beats would be created. Therefore the first aim of the project involved the Novel Gel Panthum system that provides a method for testing both standard clinical fHR monitors as well as our proposed improved fHR monitor**". This technological development has given an advantage of the function of the monitor even for number of fetus in gestation period as of a single fetus in gestation period.

This development of a new technology that can successfully monitor number of fHR during gestation period in a similar manner, the way a single fHR in a gestation period can measure. That means the development of technology and deployment of sophistication in a gestation period measurement of fHR is physically impossible and at the same time to safeguard the health of the mother and the fetus. Hence, in this case this development has immensely helped multiple fHR's during gestation period is provided safe free. So as to get a correct picture of the heart of the fetus so that in the healthcare professionals can have a good information on hand to take appropriate decision to correct any abnormalities of the fetus. However the researchers of the project mentioned that, "**implementation of better hardware would increase the efficacy of this device and make it full proof**". Hence, such type of innovations taking into account the safety measures will have greater impact and reduce the stress and strain and mental agony both the patient and the healthcare professionals.

This is relating to "**Information Technology that is being used in healthcare coupled with patient safety**". In a new phenomena that attracted the healthcare professions.

The potential of IT solutions to improve patient safety that is developed in developed countries will benefit from the technological interventions in the shortest possible time. Although IT solutions have remarkable results in other fields healthcare also getting the benefit of healthcare solutions not only to the healthcare professionals but also to the patients and healthcare environment. For this not only deployment of Information Technology in healthcare but it needs certain governmental regulations in the respective countries of that respective governments to be introduced for proper implementation. Otherwise, Cyber Security problems that are hacking every field where Information Technology is used can make their way into healthcare also to disturb the systems. In my opinion not only disturbing the systems biological warfare can also take place if stringent laws are not provided in each every country and Cyber Crime should be made punishable even with a death penalty. In this context, it is worth mentioning that, "**The World Health ORganisation (WHO) Patient Safety established the Information Technology for Patient Safety Expert working Group to examine the role of Information Technology in improving Patient Safety in healthcare. The working Group included representative from high, middle and low income countries with expertise from clinical medicine, academia, government, health services management and industry. This report by the working group provides an overview of the inter play between IT and issues of Patient Safety.**" Information Technology will have greater say in healthcare sector because procedures and safety of a patient needs accurate at the point of information for a proper decision so that the patient will

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be safe. While going through the literature an article was published titled **"Patient Safety-what is it, importance+tips for hospitals"** published in www.questionpro.com has categorically mentioned what is patient safety and its importance and other related matters in healthcare?

Patient Safety:
"**Patient Safety is the practice of reducing and preventing Patient harm where they are getting healthcare services. It means creating a safety culture inside healthcare facilities and implementing strategies that reduce the risk of medical errors, infections and other unpleasant incidents that could harm patient's well being (Health).**"

Improvement of Patient Safety will create an environment of,
a. Prevention of medical errors
b. Infection Control
c. Medication safety
d. Communication and Handover
e. Patient engagement
f. Staff training and competency
g. Safety culture and finally
h. Continuous improvement by providing systems for reporting and analyzing adverse events and near misses, leading to improvements in healthcare procedures and patient safety.

No one can forget the importance of Patient Safety when it comes to providing and enhancing quality of healthcare that is imparted to a patient during the Patient's sojourn in any healthcare facility because the motto of any healthcare facility/provider/professional is not only to give proper procedures to improve patient's health but also safety of the patient is equally important if not more while a patient is in healthcare facility.

Patient Safety if not addressed properly will cause Patient harm that includes medical errors, inadequate communication, systematic issues and resource limitations, inadequate patient assessment, healthcare associated infections, healthcare related factors, technological equipment failures and finally inadequate sophistication. In this regard, it is important to note that a full proof patient safety in healthcare the technology and sophistication that is being introduced to improve healthcare procedures and at the same time safety measures should be included in the sophistication as well as technology and the equipment.

In another article titled, "**The Vital role of technology in improving Patient Safety**" written by Wayne Miller, Healthcare Director EMEA, Zebra Technologies on 11th December, 2019, the author rightly mentioned that,

"**The right application of technology can enhance clinician communication, improve medication safety, reduce medical errors and improve the patient overall experience**."

The demand of healthcare services globally presents clinicians, paramedicals and professionals challenges ranging from securing patient data, supporting aging population, short staffing, meeting targets and most important when things go wrong public wrath. This is evident from the reports that are coming globally when anything goes wrong for which the healthcare professional has no role, it has become a practice of the patients and their accomplice to put the blame on the healthcare professional and target them. In addition medical errors are the cause of death after heart diseases and cancer. It is astonishing to note that medical errors are not only in developing and under developed countries but also in developed nations where in US according to John Hopkin study more than 2.5 lakhs deaths in US will occur due to medical errors. The WHO estimates that, "**The strategies to reduce the rate of adverse events in the European Union could help prevent more than 7.5 lakhs harm-inflicting medical errors every year, leading to over 3.2 million fewer days of hospitalization, 2.6 lakhs fewer incidents of permanent disability and 95000 fewer deaths per year as a result it is no surprise that calls for safer health systems and high quality legislations are growing.**" In this record, technology has a role to play but the right application of technology will always enhance clinician communication, improve medical safety, reduce medical errors and improve the overall patient experience. The digital transformation of healthcare globally is use of printing technology and mobile computers so as to reduce human errors and to ensure use of data to its maximum benefit and cost effective. It is understood that one of the major causes of medical errors is poor quality of information because many of the healthcare facilities record patient data in hand written form that increases the risk of wrong medicine being administered by the para medics to the patient due to improper understanding of illegible hand writing. To improve the situation scanning and printing technologies are used to collect and print information of the patients accurately with no loss of time to identify and protect the patients.

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In a recent incident in Delhi, in an new born baby care hospital in New Delhi, 7 babies were killed due to fire accident. According to the police, Non application of safety measures like "**Oxygen Cylinders kept in the Two storey building exploded due to which the adjacent buildings were damaged according to Fire department**".

Fire fighters also faced challenges during the rescue operation as the lane was narrow with lower head electrical wires"
Several people had gathered at this spot and were recording videos. Many of them came close to those trying to douse the flames, and there was no water source and low hanging electrical wires. This is due to the lethargyness of the government agencies who have sanctioned the licenses to the baby care centre in a residential area without any proper safety measures especially when the inmates or infants. In this regard whom to be blamed whether the healthcare provider or the government agencies or the Police department who have their own draw backs in allowing the baby care centre to run in a fishy manner without taking any precautions nor deployment of any sophisticated equipment to contain such calamities. If the facility is adequately support by technology or sophistication these things would not have happened.

In an interesting topic in the vital role of technology in improving patient safety, a report published in 2019, it was mentioned that better use of data and capturing the data and analyzing it with the help of technology especially in healthcare system is one way of utilizing technology in healthcare in a manner that it gives maximum output. With this utilization of data with the help of technology so that errors can be minimized get more clarity there by reducing medical errors, diagnostic errors, those are the matters that are affecting the healthcare of patients because of those errors and if the data is utilized in a more scientific manner these errors can be minimized if not eliminated thereby lives of the patients can be saved. Today technology can drive efficiency, safety, productivity and visibility across Global healthcare thereby many can be saved, errors can be reduced and even the medical litigation costs can be reduced; this gives a better understanding hope of the common man who is otherwise afraid of healthcare facilities.

In another development approximately in 1952 inspired by Morse Code, another invention that is "**Bar Code**" that can enhances processes in healthcare facilities and in addition pharmaceutical sector where the use of hand written documents are predominant. Use of hand written documents will have the effect of errors that can be eliminated and will make the data full proof by introducing Bar Code System and Scanners can be introduced along with a Patient Identity Management Solution to near accuracy and to match the patients records and results without any loss of time thereby an immediate attention can be drawn on medication and procedures. This kind of technology namely "**Bar Code**" will give an ample time for the healthcare professionals without any loss of time to make immediate decisions regarding medications and procedures so that Patients lives can be saved. The introduction of healthcare mobility solutions the care teams in an healthcare facility can communicate and multiple patients in getting better procedures. This kind of sophistication will enable the healthcare professionals to share the information to make the work flow easier and improve efficiency by reducing false alarms. However, any amount of technology introduction and sophistication of the present applications in healthcare there is always a challenge persists in healthcare, as is being seen in another sectors is Cyber Attack. So unless otherwise the government or any agency that is closely linked and monitoring the functioning of healthcare facilities (hospitals) has to develop "**Anti-Cyber Attack System**" to safeguard the healthcare procedures, patients records and other vital information of the patients that are to be kept isolated and cannot be reached by others than the authorized persons according to Indian Legal System is the order of the day.

DISCUSSIONS AND ANALYSIS

In an healthcare facility/healthcare procedures the paramount task that comes into picture is primarily Patient Safety and the Safety of Healthcare professionals and other para medical staff. Any negligent act that leads to unsafe procedures are to be curbed otherwise the loss will be colossal and at times loss of life. Hence, even WHO is giving importance healthcare safety.
Patient Safety has become an important policy for any healthcare facility and the healthcare providers are bound to follow strictly and adhere to the rules and regulations that are framed by internal and international bodies; the normal tendency of human is "to err is human" ; but this paradigm has changed for blaming the others for errors either to cover their individual deficiencies or weakness in the systems that lead to such events. In healthcare procedures, anesthesia is one of the first healthcare specialties that adopted techniques and lessons drawn from the aviation industry namely stimulators. The practice of using stimulators to test the techniques and technologies in aviation industry is to create such conditions that may arise during the procedures and to test whether this technique or technology is an answer to that situation if so, to what extent.
A review of the literature that is existing on technology, sophistication, safety vs healthcare has brought out many situations that are still unaddressed. That is why the World Health Organization's (WHO) **Patient Safety Wing** has a long standing interest in "**what technology can do to improve the safety of Patient care**" (Donaldson LJ, Fletcher MG. The WHO world alliance for patient safety towards the years of living less dangerously. Med J Aust 2006, 184 (Suppl 10) – S69-72.)

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With respect to the subject matter that is technology, sophistication vs Safety in healthcare will have to make a thorough discussion from the following, namely,

i. Understanding Patient Safety:

In the era of developments sophistication of technology in healthcare systems, procedures in applications, patient safety has taken the lead and it has become an important policy that caught the eyes of healthcare providers and professionals alike. Two decades back the publication of an article titled "**To err is human**", the entire system of looking the matters in healthcare with the introduction of technology and sophistication has changed a lot and instead of blaming the individual for the error to identifying the weakness or misgiving the system that lead to the adverse events. In this regard anesthesia is one of the first healthcare specialties to adopt techniques and lessons from the aviation industry (stimulators). The use of stimulators and the stimulation programs in the aviation industry in identifying and studying the application of human factors. Engineering to clinical practice have brought in major changes sophistication of healthcare facility. Though much advancement is made in healthcare technology and safety in healthcare facilities, lot of changes have been made that is use of stimulators and stimulation environment on hand results of technology and sophistication in healthcare facilities before they are put into use. So as to minimize human errors. As already mentioned above, communication is one important aspect the other important aspect is anesthesia because anesthesia procedure of an anethest is very crucial before and after procedures of a patient because unless otherwise sophisticated technology is being used. Errorless sophistication technology is used to identify and design the sue of anesthesia in accordance with patients requirement and also the suggestions and recommendations of healthcare professionals because from the time of application till the patient comes to conscious it is the responsibility of the anethest. Hence, the technology that is being sued in identifying the quantum, quality and criteria of anesthesia that is being applied to a patient in that environment where the patient has to undergo procedure should be well recognized so that the result will be safe Hence the use of technology in application, identification of the material whether it is gaseous, liquid and the type of anesthesia whether it is local, total or particular portion of the body should be decided instead of manually in technology by giving proper information collected from the healthcare professionals and also in line with the conditions of the patients body etc. This error less functioning of all these aspects will be easy and less strain if a proper technology is used by feeding the exact environment of the patient to the equipment so as to get errorless results that can be dependable in implementing.

ii. Bone Marrow Transplantation:

Bone Marrow Transplantation is highly skilled professionals with technological acumen can only do this and India is one of the top most destinations in Bone Marrow Transplantation for the Cancer Patients to prolong their life. Bone Marrow is the soft spongy tissue found inside the bones only specialist with sophisticated technology equipment who are well versed in stem cell therapy can take out from a healthy body and transplanted into the Cancer Patient. The stem cells in the bone marrow produces three important types of blood cells such as red blood cells, white blood cells and platelets which are necessary for any living body. This is complicated procedure to replace the dead or non functioning cells with healthy functioning cells from bone marrow to save the patient and bring the patient to normalcy.

iii. Robotic Radical Prostatectomy:

This type of highly sophisticated precision intervention is available in certain cities of USA and this technology was brought to India by Dr. Mahesh Desai, a renowned doctor in robotic surgeries.

iv. Da Vinci Si Surgery System:

This innovative healthcare intervention is used at CRS, which provides 3D high definition vision and 360 angular movement to the health professionals and enable them to perform even the most difficult surgeries very effectively and efficiently.

v. Muljibhai Patel Neurological Hospital:

One of the best hospitals in India and Center for Robotic Surgery and is one of the most popular center for Endow Urology and Nephrology treatments. They are having 35 years of experience in Kidney care and own,

"**The Prestigious Indian Merchant chambers Rama Krishna Bajaj National Quality Trophy**," in 2011 and they also well experience in Kidney Stone surgeries, Kidney Transplants and such related Robotic Surgeries.

vi. Increasing connectivity among healthcare professionals:

With the development of digital platforms, high technology and introduction of sophisticated equipment and new technologies has made it easier for the healthcare professionals to connect one another in order to share the information. This kind of sharing by using digital platforms worldwide to made the healthcare professionals to conduct the more complicated surgeries with the help of others is a plus point but any break down in this program will have havoc. Hence use of technology and sophisticated equipment will give good to the mankind provided they are made full proof otherwise instead of gaining profit the loss to humanity by way

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of harms are more. Hence, use of technology should be coupled with safety norms and with minimum harm to the patients otherwise the very purpose of introduction of technology and the aim gets nullified.

vii. Advancement in Nano Technology:

The advancement of Nano Technology which is nothing but Nano equipment that are necessary in healthcare. Though expensive but used in complicated and critical procedures. A Nano Robo can actually swim through fluids in the body including the blood stream and surface of the eye. This kind of Nano Tools increase the professionals accuracy and gain entry otherwise formally it is inaccessible. New utility of 3D Printing, the advent of 3D Printing and its intervention in healthcare has been particularly beneficial in healthcare to reduce the cost of procedures. By using this technology, the health professionals can print out synthetic skin, implants and prosthetics, this technology also creates realistic models for the professionals.

viii. Accessing to DNA sequencing:

Once a highly prohibitive cost technology has been brought down to an affordable cost by using latest developments. This technology used to find out the DNA sequencing to the healthcare professionals also in crime detection to identify the person. This will help for healthcare professionals to treat number of ailments that are connected with genetics.

ix. Remote health examination:

This concept is especially beneficial to those patients who cannot visit regularly to healthcare facilities, the idea is

"**The chair occupied by the patient read all of patient's basic vitals and transits the data to a physician. The chair makes it possible for patient to obtain regular, basic checkups without leaving the comfort of their home**."

x. Cord Blood Bank and Stem Cell Therapy:

A new concept, the Cord of New Born Baby is preserved in sophisticated banks so that the cord blood cells can be used for future ailments that are incurable with other methods to the persons that means Cord Blood of just born babies with all the details of parentage are deposited in Cord Blood Bank that serves as a medicine for future ailments.

In a startling example, in an Australian case where, sophistication and technology has done more harm than benefit. In an healthcare facility in Australia, this incident has happen,

Instances where a just cavity fire had broken during a procedure and is a strange case happened many times during emergency procedures under combined inhaled and intravenous general anesthesia to repair a small tear in Aorta (the main blood vessel that transports blood between the heart and rest of the body). In Australia, in an healthcare facility it was observed that a 60 year old patient with this problem mentioned above and the healthcare professionals made the emergency surgery. During the procedure there was a complication, the patient who had previously been treated for pulmonary disease at a different hospital, had an enlarged right lung, with several permanent air pockets known as 'Bullae'). The lung had struck to his sternum which the surgeons need to crack through get to his heart. Inspite of their best efforts, they punctured one of the Bullae in the lung and the air began leaking out. To counteract this flow of oxygen, the anesthetic inhalant was increased by 100% but apparently it was big leak and the doctors were able to Sevoflurane Anesthethic as it seeped into the air through the patient lung. This Sevoflurane was now mixed with strong concentration of highly oxidizing oxygen, making the condition volatile. But a fire does not start out of no way, even when such gases are leaking out of the patient that is where the last unlucky ingredient comes in the process the theme was also using an electro-cautery device, a surgical tool that uses heat to seal wounds. Apparently the device was sitting a bit too close to a dry surgical pack near the patient's chest. When a spark from the electro cautery device landed on the dry surgical pack in the highly oxygenated air, the whole burst into flames. Although the event was unusual, it is not the first time that happened to a patient, there are such incidents reported where the chest cavity fire had broken during procedures involving Thoracic Surgery and Pass Surgery but in all these the elements are common i.e. electro-cautery devices, dry surgical pack and increased flow of oxygen in the anesthetic in these situations. The main observation by the healthcare professionals in this situation is 'It is the belief of the doctors that a combination that surgeons need to be aware of and take particular care'".

xi. Technology oriented healthcare facilities:

India is fast developing

a. The role of technology in Patient Safety in an healthcare environment

Use and application of right technology, sophistication in any healthcare and the procedure that are adopted in the patients will improve / enhance communication of the clinicians, improve medication safety and reduce medical errors either in procedure or in medication to improve patient safety thereby to improve the overall healthcare of the patients who can be discharged with a smile on the face of the patient. While going through the global demand in healthcare services number of factors that presents clinicians and healthcare professionals and paramedics, technicians, range of challenges from pre procedural to post procedural stages. In this regard, the important aspects are getting patient's health data, short staffing, meeting the targets, and unfortunately dealing

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with the problems that arise when things go wrong which causes patient's safety norms. Patient safety is a global phenomena and in one study it is estimated that in high income countries (advanced countries) one in ten patients is affected or harmed in one way or other while getting healthcare and in which nearly 50% of such situations are preventable. In another report on global situation the cost of medication errors has estimated to the tune of 42 billion pounds is also observed by one study that healthcare errors are the third leading causes of death after heart diseases and cancer globally.

A recent study by John Hopkins Study claims that 2,50,000 thousand deaths in USA every year due to medical errors only. The World Health Organization (WHO) estimates that,

"Strategies to reduce the rate of adverse events in the European Union could help prevent more than 7,50,000 harm-inflicting medical errors every year leading to over 3.2 million fewer days of hospitalization, 2,60,000 fewer incidents of permanent disability, 95000 fuel deaths per year".

In this regard it is not surprising to call for safety or safer health systems in addition high quality legislation on patient safety are growing and the order of the day globally.

As already mentioned above right application of technology, right use of equipment and sophistication healthcare facilities will always enhance healthcare professional's communication, improve medical safety, reduce medical errors. So that overall experience can be proved. While analyzing the digital transformation of healthcare facilities the other important aspect is use of printing technology, mobile computers to help reduce human errors and the particular data that is collected is put into maximum benefits in a cost effective manner.

Better use of data and analysis means better healthcare system. In another advanced invention of bar coding in healthcare 1952, enhancement of process in healthcare facilities and pharmaceutical sectors where reliance is on hand written documents, a potential error causing environment to eliminate such things instead of manually documenting treatment, barcodes and scanners can be introduced along with patient identity management solution to have immediate access to the patient records, medication and procedures, giving less mistakes while the patient receives right healthcare. The system of barcode is even being used to monitor the health of the institutions from physical assets like an MRI machine to the staff, can help enhance real-time data sharing, information with the respective persons so that the healthcare facility can run more efficiently, effectively to reduce patient's harm and increase patient safety.

b. Technology has applied to Patient Safety in Healthcare

There is always a relationship between technology and patient safety in healthcare because any lapses on the part of the machines, functioning of the machines, operative deficiencies, inappropriate results will have greater impact on the safety of the patients, because presently the healthcare professionals are more dependent on the technical evaluation and results rather than their own observations may be due to lack of time attending number of patients to meet the targets of providers.

Hence, the equipments are the sophistication should be designed in such a fashion that the sophistication should be error less; to this design or the programmer should have a thorough knowledge of the situation of the patient where the instrument is being used and failure to do so what are the repercussions on the patient safety. To this there are number of themes that have emerged in this regard namely,

"a. The importance of communication between the patients and the stake holders with respect to patient's healthcare takes predominantly dominant part. Any lapse in communication will effect the patient safety which is paramount.

b. The values of pathways cheque lists and guildelines with respect to patients respective procedure are to standardized so that there cannot be any ambiguity and all the loop holes in this regard are to be tightened with respect to use of technology and equipment on the patient during procedures. Otherwise the stake holders may escape by taking the loop holes either in the law or in the preparation of details.

c. The use of computerized physician order entry (CPOE should be designed make it full proof to help the paramedics and the technicians to administer error less medication.

d. The latest introduction of electronic health records in place of written ordinary health records (documented) to document the decisions taken with respect to patient's ailments, procedures and before and after care till the patient is discharged. These Electronic Health Records cannot be tampered nor misused nor cannot be replaced because the concerned information can be obtained from the master computers, hard disks that are controlled and put in security."

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Medication an important task in healthcare facility/procedures before and after the procedures to keep the patient in a guided program for the improvement of his health and bring the patient to the normalcy. In this regard, the application of technology to enhance patient safety must be considered to enhance patient safety with respect to the clinical processes in which presently technologies are utilized with the help of appropriate equipment within the parameters of care and safety of the patient. This kind of application is more important when serious and complicated health issues arise wherein minute to minute attendance to look after the progress of a patient is necessary for which technology plays an important role to control the situation because with minimum effort and time the results and patients health either progress or decline can be achieved without any loss of time.

c. How much an Artificial Intelligence can help Patient Safety in Indian Healthcare
d. Use of Technology to improve quality and safety of Patient's healthcare
e. Innovative development of robust safety protocols for Radio surgery with respect to Patient Safety.
f. Use of Nano Technology in healthcare facilities and healthcare procedures keeping in mind the safety protocols:

The term Nano Technology was first used by Norio Taniguchi, 1974 and it was brought into more practice by Feyman's K. Eric P Dexier used this Nano Technology term in 1986 in his book "Engines of Creation". Now presently, Nano Technology is being used widely and healthcare sector is no exception.

Nanotechnology may be able to create new materials and devices with diverse applications, such as in nanomedicine, nanoelectronics, biomaterials energy production, and consumer products. However, nanotechnology raises issues, including concerns about the toxicity and environmental impact of nanomaterials,[9] and their potential effects on global economics, as well as various doomsday scenarios. These concerns have led to a debate among advocacy groups and governments on whether special regulation of nanotechnology is warranted.(www.wikipedia.com)

There are useful instruments by using Nano Technology are Scanning Tunneling Microscope that enabled visualization of individual atoms and bonds and was successfully used in manipulate individual atoms. The microscopes developers by name Gerd Binning and Heinrich Rohrer at IBM during Research Laboratory that gave them noble prize.

Commercial products based on Nano Technology began emerging. In other fields but not in healthcare until the use of Nano Technology has become part and parcel of infusing this type of technology in healthcare.

Some of the important tools that are developed specifically used in healthcare facility are,

1. DNA Nano Technology utilizes Watson Krick base pairing to construct well defined structures out of DNA and other neucleic acids.

2. Approaches from the field of classical chemical synthesis (both inorganic and organic synthesis) aim and designing molecules with well defined shap.

3. More generally, molecular self-assembly seeks to use concepts of super molecular chemistry and molecular recognition in particular to cause single molecule components to automatically arrange themselves into some useful conformation.

4. Atomic microscope tips can be used as a Nano Scale Write Head to deposit a chemical upon a surface in a desired pattern in a process called "dip pen nanolithography" . This technique fits into the larger subfield of Nano Lithography.

5. Molecular beam Epitaxy allows for bottom-up assemblies of materials, most notably semi-conductor materials commonly used in chips and computing applications, stacks, gating and Nano wire lasers.

In healthcare facilities Nano technology applications are used in endoscope and telescopic capsules with a tiny camera inside that can be swallowed by a patient which will sent pictures of the entire internal body systems after a prescribed period and it will come out through bile. In the context of utilization of Nano Technology in healthcare extreme care should be taken and unless otherwise it is proven 100% safe no trials can be made because they come at time fatal.

g. Patient safety in laboratory medicines.
h. Patient safety and health informatics in addition to find out the role of informatics in promoting patient centered care.
j. Human factor in Patient Safety in relation to Technology
k. The role of Pharmacogenomics in Drug Discovery and Development
l. Introducing stimulators which are predominantly used in Aviation Industry to get accurate results (laboratories role on the diagnostic team)
m. Reporting of Patient Safety events, so that more sophistication and technological development can be introduced.
n. Application of Technology to Patient Safety
o. Healthcare facility IT sophistication profiles with respect to Patients Safety.

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The important aspect with respect to technology and safety lies in the hands of information technology. Hence, the governments are any regulatory body of healthcare in any country should focus on strengthening the IT laws with respect to healthcare and imposing heavy penalties and making the person who violates Information Technology in healthcare more serious with stringent punishments so that the others cannot repeat it. In this regard, health information technology has to play a major role in improving the quality and safety of any healthcare facility. In this regard, the government of the respective countries and the regulatory bodies of healthcare should work together in tandem with both private and public healthcare facilities to study the problems and the remedial measures and should collect the information, suggestions, to take decisions in this regard. Though many steps have been taken by the advanced countries in this regard, still is not seen in developing nations like India where expenditure on healthcare is a staggering amount. For any country the goal of health information technology act should provide affordable care to improve quality and reduce costs but could also concentrate on "**incentivized to be high value, data driven, patient centered, and effectively managed over an acute to long term care communication.**"

In this regard, in India the Information Technology Act defines,

"**An Act to provide legal recognition for transactions carried out by means of electronic data interchange and other means of electronic communication, commonly referred to as "electronic commerce", which involve the use of alternatives to paper-based methods of communication and storage of information, to facilitate electronic filing of documents with the Government agencies and further to amend the Indian Penal Code, the Indian Evidence Act, 1872, the Bankers' Books Evidence Act, 1891 and the Reserve Bank of India Act, 1934 and for matters connected therewith or incidental thereto**"
(THE INFORMATION TECHNOLOGY ACT, 2000 (No. 21 OF 2000), MINISTRY OF LAW, JUSTICE AND COMPANY AFFAIRS (Legislative Department))

A seen from the Information Technology passed by the Parliament of India one can make easily make out the importance of information technology and same thing would be implemented in healthcare also with necessary modifications (Inclusions and Exclusions) to suit the present healthcare environment so that not only the Cyber attack but also the safety of the patients, professionals, inmates can be made more safe by giving teeth to the present act by way of imposing heavy penalties, imprisonment, even life term depending upon the gravity of crime and its effect on the safety of the patients.

p. Use of technology and sophistication to reduce manpower and to increase efficiency is a bane or boon in healthcare.

r. Cyber attacks on healthcare technology, A growing threat in healthcare facilities
As is seen in every sector use of technology and sophistication that is causing a growing threat in the form of Cyber Attacks and healthcare is no exception and it is safe either in the developing countries or developed countries or under developed countries. In the words of President and CEO of the American Hospital Association, the Cyber attacks in healthcare are growing very fast and it has become very difficult for the administration in disbursement of claims, by the effected persons and disruption and processing of millions of patients prescription and services, delaying access to medication and care . The same is the case even in Indian Healthcare System where the Cyber attacks are increasing as that of increasing technology and sophistication. Unlike the other sectors, the Cyber attacks on healthcare facilities will have adverse impact on the patient's health which is paramount in any healthcare facility and patients health and safety. In another study, the more serious vulnerability in healthcare concerns about resources. The latest survey of the healthcare information and management systems society shows that US Healthcare organizations allocate an average of 7% of spending on Cyber Security. However, the main problem is unlike other sectors, healthcare sector will not have that much amount on resources that can be spent on Cyber attacks to make healthcare facility free from Cyber attacks and to save the revenues and the problems faced by the patients and the staff of the facility.
A study revealed that Cyber Criminals use sophisticated technology in attacking the health records, systems and procedures to paralyze the functioning of healthcare facility so that they can demand a ransom from the healthcare facilities / providers because time is more essence of the situation than money.
Hence, all healthcare facilities and providers should make sure that the Cyber Security can be implemented properly and such criminals entry into the technology of the facilities can be made impossible and before anything happens the system and the technology that is being used by the facility should give a safety alarm so that the facilities alert themselves and no untoward damage is caused either to the facility or patient or to the secret documents. Hence it is enough introduction of technology and sophistication and also it is the duty of healthcare facilities to make sure that the technology and sophistication are full proof so that any untoward incidents by the criminals of the Cyber Attack can be thwarted without any loss of time.
Following are some of the examples where in use of technology has made tremendous impact on healthcare procedures but I should say that they are not without safety measures.

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In all these examples, the outlining feature is how to improve the safety of the patients and professionals due to unavoidable circumstances.

a. Technology driven healthcare procedures:

A classic example of how technology and healthcare professionals together can treat knee problems and put patients back on their feet. A software generates a digital image of the patient knee joint with indepth data relating to bones and the surrounding soft tissues to treat the knee problem. However, the problem being if the software generated images are improper or not reflecting the truth situation of the knee using that technology and technical reports will cause problem to the patient and at times leads to fatal. According to Dr. Chandra Sekhar Dhar, Senior Consultant, Orthopedic Surgeon at Calcutta Research Institute,

"**This is an innovate development of IT in Orthopedic Surgery. In this method an intra red technology is applied to produce a moving digital image of the patients knee joint as it is moved during the operation, that image made available to the surgeon to guide to the operation. Surgical Instruments can also be incorporate into the map so that the position of the instrument and the progress can be monitored and controlled in completing the procedure**".

In this regard, Apollo Hospitals have opted for '**Brain Lab Softwares of Germany**' . These procedures gives more accuracy in fixing and less is the chance of Neurological damage and it is less invasive and painful and chances of infection are remote and the patient can be discharged faster. However, use of technology means the equipment are being operated by Electricity, hence all the precautions to be taken keeping in mind of all safety measures.

b. Robotic Surgery:

Presently Robos are used in complicated and intricate procedures where surgeons hands cannot penetrate, and in such cases presently the healthcare professionals are using robots for such complicated procedures, because it is less invasive, less infectious and faster relief. Next to CAS use of Robos in Surgery is fast entereing while the surgeons will control the surgery; however any misjudgment or lack of knowledge about computer programming which is essential for surgeons also will defeat the purpose for which it is being used.

c. Treatment option for Vericose Veins:

According to Dr. Shiva Shankar, Consultant Interventional Radiologist, "**The aim of varicose veins treatment by any mechanism (Surgical or Non Surgical) is to close or repair the deceased and incompetent superficial Vericose Veins**. **Deep Veins and Superficial Veins only returned about 10% can be sacrificed without serious harm**".

Recent advances has improved Lasers making Laser Surgery a preferred Procedure of intervention of Vericose Veins. By Laser the whole lining of the patients superficial Vericose Veins is destroyed. Hence, chances of New Collateral Veins to grow is almost zero. The Laser energy seals the abnormal vein completely and permanently. The side effects are very few and radio frequency ablation of the Vericose Veins is less invasive on open surgery. However this is not without other problems connected to safety unless the safety measures are taken in use of laser technology, the speed, the impact of the laser should be properly calculated so that the other parts of Vericose Veins are not damaged does leading to paralyzing that part of the body.

d. Key Whole Surgery:

"**Before the introduction of the Key Whole Surgery, minimal access surgery(MAS), minimally invasive surgery (Miss) and Laproscopic surgery,the introduction of technology sophistication in this field of imaging technique especially fiber optic and micro surgery along with micro chip cameras**".

With the introduction of this type of surgery namely Key Whole Surgery, the Surgeons are able to see magnified images of the content of the abdominal and chest cavities and the insides of this Viscera, the images that are collected from the tiny camera sent through the key whole are projected in large scale including 3D images. This combined with production of small instruments and miniaturized stapling machines are made possible through minimal access and endoscopic surgery. The advantage of Key Whole Surgery because there is no larger cutting except a small Key Whole, a patient can resume work at the earliest with minimum discomfort. However the back drop of the procedure is the tiny cameras that are used will have some malfunctioning or should not sent proper images, the result and surgery will be disasters. Hence while adopting Key Whole Surgery a thorough examination of the patients ailments, the instruments that are used and their functionality are to be properly checked before put into operation. In India, Surgeries like Gallstones, Appendicitis are conducted through digital laparoscopic surgery which is more beneficial to diabetic patients.

e. EECP – Enhanced External Counter Pulsation:

EECP is an advanced state of the heart machine designed in USA that can increase blood supply in the patient's arteries of the heart and thus avoid the need for bi-pass surgery because bi-pass surgery is a 50-50 chance of recovery, loss of blood, more number of days hospitalization and after surgery the patient should be at rest for a minimum period of one year.

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EECP is,

"**It is completely Non Invasive, has no risk to life or No hospitalization or No anesthesia and is completely painless and costs 1/4th of the cost of surgery or angio plasty (latest technology vs bypass).**

Patients are the foundation of our medical practiceand that is obvious and that they must be satisfied by in or out of the facility Challenge for healthcare often, long term duration of interaction, height and emotional levels, anxiety, fear, pain, the purpose is to meet these needs and the aim is to reduce demand via effectiveness through professional competence."

f. Lasik Surgery:

It is a precise and controlled removal of Corneal Tissue by special re shape the cornea and change it focal power. This surgery should be carried out to the people above 18 years of age and not advisable for people with diabetes, rheumatoid, arthritis, lupus, glycoma, herps or cataract. It is only sued to realign the vision for long and short distances.

g. Pin Whole Surgery:

A break through procedure for brain hemorrhages,

"**an alternative to traditional brain surgery in which the skull has to be opened and the advantage is only a short hospital stay and no blood loss, no infection, no pain and less recovery time. New technologies delivered to the brain via the blood stream through the small tubes called catheters and are guided more powerful brain scam, a novel method technologically developed to close linking vessels in the brain to save the patient either going into coma or part of the body is being paralyzed. However, all safety measures should be taken while conducting this type of surgeries with the use of technology and sophisticated equipment else the loss will be more than the advantage.**"

Pin Whole Brain Surgery is also called Minimally Invasive or Endovascular Neuro Interventions.

The main advantages of using this technology is no blood transfusion, not needing to expose the brain to the external environment, less bleeding, thus reducing the risk of infection according to Dr. Gigy Kuruttulam, Intervention Neurologist, Kerala.

h. Test Tube Babies – In-vitro Fertilization (IVF) and Intra Cytoplasmic Injunction (ICTI):

A boon to the woman who cannot have natural pregnancy and with this method of technology lacks of parents are having smile on the face as they are blessed with children. This is wonderfully a new technology that opened a new era in the lives of childless woman otherwise hapless women who pride all the means, methods, medicines could not get results.

This technique in brief is,

"**The embryo when developed in a laboratory at a particular stage is introduced into the mothers womb where it grows in a normal fashion. After the gestation period, the baby is surgically brought out and from the stage of introducing embryo into the mother's womb till fully developed Baby is surgically brought out. The whole process is monitored under the close observation of an embryologist and infertility scientist. However, this technology is not without any drawbacks because it depends upon the development of embryo outside the mother's womb quality and observations are needed else instead of giving good results it may be fatal to woman and is also not without pain**".

i. Organ Tissue Transplantation:

A latest development in transplantation of organ single or multiple has opened a new era in the lives of heart disease patients whose lives are counted in days and months. The transplantation of Organ and Tissues or multiple organs is astounding development in the use of technology for those patients who have no hope of living longer, it is a really a stunning example of how sophisticated technology can be put into operation through surgical procedures for the benefit of mankind. In this procedure, heart from the Donor is removed and replaced with the defective heart of the recipient. This is called "**Autographs: Organs that have been successfully transplanted include the heart, kidneys, brain, liver, lungs, pancreas, intestines, thymus (a lymphoid organ situated in the neck of vertebrates which produces T-lymphocytes for the immune system. The human thymus becomes much smaller at the approach of puberty)**".

Tissues, including bones, tendons, cornea, skin, heart valves, nerves and veins and other organs that are transplanted in the present situation in this field of healthcare procedures is multi organ transplantation namely heart & lungs, heart & liver, liver & intestines etc. This is remarkably a technological development but it also having its own demerits and the professionals should take all precautions while matching the organ or donor or recipient, time taken for removal and replacement and creating an infection free atmosphere till the donor and recipient come to the normalcy in this equal care should be taken not only recipient while the donor also in the case of Kidney Transplantation. Any lapses in the procedures, in matching the organs, and such other functions the results will be disasters.

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CONCLUSION

The first step towards understanding the impact of technology and technological development and its implication in healthcare facility and procedures and the effect on Patient Safety, one has to understand the safety protocols and how to address them. After going through the literature on the subject matter with respect to Indian Healthcare System which is nascent stage. One has to look into the healthcare environment in India, the prevailing safety systems and technology that is being used presently.

Healthcare sector is a fast growing industry without leaps and bounds and indiscriminate use of technology has to be taken into consideration in this concluding remarks. Technology and Sophistication are so vital in the present environment not only in healthcare sector but in other fields also because of the fact that speed quality, error free judgment of the basic needs. As we are aware technology and sophistication should be the lifeline of healthcare facility because of growing complications in health mainly due to environmental changes, indiscriminate use of natural resources, lack of fresh air, drinking water, living conditions globally has necessitated. Introduction of Technology and Sophistication in healthcare.

The father of the nation of India Mahatma Gandhi rightly said,

"HEALTH IS WEALTH BUT NOT PIECE OF GOLD AND SILVER"
And
"AN HEALTH NATION IS A WEALTHY NATION",

So that how technology protocols will improve healthcare without compromising safety protocols to the Patients/Care givers/Professionals/facilities. It is true that no sector will shine without Technology and Sophistication because of time, space, human resources to meet the demand. In healthcare sector, the demand is ever increasing whereas the supporting system namely supply is limited because healthcare professionals cannot be produced overnight to meet the situation challenges, Technology and Sophistication are the only answer. However, the point for consideration is how far use of Technology and Sophistication that can meet the demand without sacrificing quality and safety in procedures, Patient Satisfaction, Safety of Patients, Professionals and Inmates. Hence, it is always a point that can be kept in mind that one should accept that Technology and Sophistication and Human Power should go parallel side by side otherwise if one overwrites the other they will be a chaos in healthcare. Hence in my opinion the healthcare providers should keep in mind that not to depend more on technology or keep their fingers crossed with limited human resources but they should balance technology on one side and human resources on otherside because technology alone cannot deliver the goods unless it is being properly put into operations by the humans. Hence, in an healthcare facility it is duty of the providers to see that sophistication to be linked to professionals who are exponents in their own fields so that the primary objective of safety can be kept intact to see a smile on the face of the patients.

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