



Patient-centric Technologies

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Technology plays a crucial role in all fields of life, including providing healthcare services to the population. Moreover, it is ever evolving and dynamic in nature. Every day, there is news about the development of new healthcare technology, which claims it is more effective than the previous one.

Healthcare professionals must remain updated and current with technological developments in their field to serve their clients, including the patients, effectively. Some patients are more technologically adept than others. The technological resources should be simple to locate and user-friendly, so patients are motivated to engage in self-care management.¹ There are multiple stakeholders involved during the various stages of development, marketing, utilization of technologies in health. They include inventors, entrepreneurs, the personnel involved in mass production/ marketing, government machinery, etc. Nevertheless, the most important stakeholder is the final consumer or user, a patient, or an ordinary person. Unfortunately, these end-users, especially patients, are often taken for granted. There is a definite need for patient-centric technology in healthcare. To go one step ahead, one should strive for human-centric technology.

What are the different healthcare technologies? They can be classified in various ways. It can be classified as per the complexity of the technology. So, it can be either simple (e.g., the face mask) or complex (e.g., the ventilator). Most of the healthcare technologies need not always be complex. Unfortunately, many people think that technology has to be complex, and as a result of this, it is becoming more and more complex day by day. The technology can also be classified as per how many times it will be used. It can be for single-use (e.g., injection syringes and needles) or used repeatedly or for multiple use (e.g., spectacles).

Another way to classify is whether the technology has to be used on-site, i.e., physically (e.g., blood pressure measurement) or it can be used on-line, i.e., remotely where the provider need not be present (e.g., consultation by the physicians involving Tele-medicine). Many technologies can be easily managed and handled by the patient or relatives (e.g., regular temperature measurement, pulse, etc.). On the other hand, many others require intervention or assistance from healthcare workers or professionals (e.g., minor surgical procedures like suturing).

Healthcare technologies can be also categorized as per their necessity and availability at the community level, sub-center, Primary Health Centre, Community Health Centre, District level, stand-alone Hospital, Specialty, or Super-specialty hospitals, etc. Technologies can be used as per the different levels of prevention. It can be used for the preventive purpose (e.g., vaccines), diagnostics purposes (e.g., laboratory diagnosis of various diseases), therapeutics purposes (e.g., provision of drugs, surgeries, etc.), and rehabilitation purposes (e.g., physiotherapy to maintain mobility and prevent further disability). When used for diagnostic purposes, it is used in patients / normal individuals to test for the disease during the incubation period or asymptomatic period.

Nowadays, Digital Health Technology Tools such as apps, smartphones, and wearable devices that remotely acquire health-related information from individuals play a critical role. The conceptual development of these tools is keeping pace with technological and analytical advancements. The challenge is how to develop robust and meaningful outcome measures based on sensor data. It is essential to encourage a scientific discourse and eventual consensus on creating novel digital outcome measures for essential clinical research and drug development.²

When can healthcare technology considered as Patient-friendly? This is a fundamental question that will help maintain the quality and efficiency of the technology used. If any technology is to be considered patient-friendly, it should and need to satisfy the following criteria based on a few 'A's. First, the '**Availability**' of the technology is essential. It is mainly geographical availability as the facilities are mostly present in urban areas but not available in urban slum pockets, remote rural areas, tribal areas, and hard-to-reach areas. Second the '**Accessibility**' of the technology. It is often observed that the technology is available, but the persons who need it cannot access it for various reasons. Third the '**Affordability**' of the technology. It might be available in the locality where the patients or users are present, but they should be able to afford it.

Fourth, the '**Appropriate**' technology is important. Here are the points to considered are whether the technology is scientifically sound/rigor, reliable and feasible, tested, adequately researched, and evaluated. Fifth, the '**Accountability**' of providers from the patient's point of view is essential. Healthcare

technology development and use requires teamwork involving medical / para-medical professionals and engineers from different backgrounds. Everyone should be accountable if something goes wrong. Unfortunately, the first persons to be held responsible and accountable are usually doctors and para-medical professionals. Sixth, the **'Acceptability'** of all the stakeholders is quite essential. The providers and the patients should be willingly accept it. The providers should not thrust technology on the patients or force them to use it.

The list of 'A's can go on, like **'Advanced'** technology involving complex or updated mechanisms, **'Adaptability'** of the technology as per the requirement of the context, **'Awareness'** about the technology of all the stakeholders in today's technologically savvy environment, etc. Various animal, patient, and community studies are carried out to develop these technologies, and there is a need to see that there are no ethical issues.

There is a need to see standard/ uniform technology across the healthcare sector. It need not be country specific. However, India should proactively become self-reliant and develop indigenous home-based technology without depending on others. India should have its own standards. Every time there should not be any need for the approval of western countries. In India, other branches of medicine (like Ayurveda, Homeopathy, Naturopathy, Siddha, etc.) need to have proper co-ordination with Allopathic medicine to maintain uniformity in the technology.

REFERENCES

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