

The future of the hospitals

How did covid-19 catalyse technology and digitalization?

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Digital is the new normal in healthcare and hospitalization. Simultaneously there is an evolution; patients are becoming partners in care. This implies a transformation, a reorganization of our care and more specifically our hospitals. Covid-19 boosts the technological evolution.

What will the future bring?

The fact that patient data is stored digitally is established for some time now. The value of this data is vital. The Integrated Electronic Health Record (EHR) system which evolved from just a data collector system into a tool in the sense of a colleague or even a mentor, is key to this data and will help us to provide real time health care. The EHR system will share the essential (clouded) data with and from all care providers (general practitioner, specialist, physiotherapist, pharmacist, dentist and health insurance fund). Indeed, the collected data must be perfectly interchangeable.

Artificial Intelligence (AI) has more and more applications in the medical world and will be integrated in the EHR system. Radiology is at the forefront of this. Diagnosis and medical imaging are areas in which AI already excels today. An AI system can analyse photos and scans by using self-learning algorithms.

AI is also suitable for exposing patterns in large amounts of data (analytics). It will contribute to an objective synthesis and adequate interpretation of data (business intelligence). As a clinical decision support tool AI will propose and so predict diseases. Also integrated biological data provided by gene sequencing and editing (phenotyping) will contribute to the lead of an anticipative (predictive) health care.

The volume of digital data in the healthcare sector is exponentially growing. It will further increase due to medical and/or lifestyle sensors registering parameters such as heart rate and physical activity. All this data needs to be integrated in the EHR system.

During the first Covid wave an extra 15 billion dollars (12.8 billion euros) a week was spent on technology worldwide. Covid boosted the development of health care applications: apps for communication improvement, or for risk screening and online sorting, or for tele monitoring. Covid speeded up the development of basic ventilator systems, drug development, rapid screening tests and vaccines.

Covid helped to develop and to realize large-scale tele- and video consultations. Telemedicine is a communication facilitator; it gives a better access on nearness of the physician and the patient due to the large number of registered demands and is more cost effective. However, we have to safeguard a good patient-physician relationship. In this matter further work is required to ensure that therapy proposed during direct-to-consumer telemedicine encounters (e.g., antibiotics) is guideline concordant.

The acquisition, processing and exchange of data must take place with due attention for the privacy of the patient and the security of his data according to the General Data Protection Regulation (GDPR).

From patient to partner in care

Over the past decade, consumers are able to arrange quite a lot on their smartphone: from ordering a pizza to booking a hotel room or managing banking affairs. This general consumer trend will also appear in healthcare in the coming decades.

Patient (and family) expects a personalised, real-time access to health care (via mobile apps). Using the new digital healthcare technologies, the patient himself will be involved in the decision-making process and in educational programs (= patient empowerment). A context of transparent communication and correct information about quality of care (e.g., by publishing public reports) is essential for good self-care.

The aging population leads to more chronic illness and multi-disease with long-term functional limitations. In senior care, the first digital care applications are already in use, whereby aged people can live independently at home for longer. In the future, healthcare providers will increasingly rely on digital healthcare technologies to monitor these patients at home, providing additional comfort in a well-known environment. The state-of-the-art EHR's will provide great opportunities to visualize and engage the social network of informal caregivers, close to the patient to cooperate in monitoring their mother, father, brother, sister or friend.

Covid-19 boosted this principle of self-care. The corona alert app on smartphones for example, will continuously scan Covid risk contacts. Once there is a risk contact, the smartphone user will be asked to follow the recommendations for Covid screening and/or for quarantine. People are invited for self-care. This principle of digital registration can be extrapolated to many other features (e.g., cardiorespiratory monitoring, continuous glucose measurement or blood pressure monitoring, ...).

(Organization of) the Hospital of the future (figure 1)

The new technologies will help to realize the shift from inpatient (hospital admission or hospital concentrated care) to an outpatient care (ambulatory care). Since decades hospitals are experiencing a shift from classical hospitalizations to more day care activities, especially for surgery disciplines. The classic (shortened) hospital admission of the patient will become a part of a care continuum. A patient focused care or proxy-care implies an optimization of coordination and continuity of care (trans mural care) with lesser fragmentation. Together with the first line general practitioner, as key person, and efficient data exchange, the patient will be empowered in his own care. The patient focused care requires new care professions (disease managers or geriatric co-managers) and the elaboration of home care facilities.

Hospitals have to collaborate and create clinical networks. This will create opportunities, stimulate better services and save costs. Proxy care needs smaller nearby general hospitals. More specialized care will be provided in centres of reference (technological centres) whilst the highly specialized care will be devoted to university hospitals. Hospitals of the future need to be more user-friendly in order to provide personalized care (= precision medicine). They will be customized with the appropriate facilities for family and visits. They will be able to provide easy interactivity with the care providers, and this from the hospital bed.

The hospital of the future will be a place for providing ambulatory services (polyclinics, day care, focused units, ...) and a bed house. It will connect homes (transitional care) and chronic care facilities. Additionally, as required, some technological platforms (radiology, emergency, ICU, surgery, ...) would be part of it. Administration and logistics could be outsourced.

Last but not least, Generation Z is connected with everyone, every time and everywhere... Not only patients expect self-service and interactivity, but also for our nurses and physicians of the future, digitization will be as "bread and butter" with high expectations towards the organization they want to be part of (or identify with). This will become a crucial element in winning the "war for talent".

To manage covid-19 pandemic, the directive board of hospitals and the government need real time reliable and accurate information about bed occupancy on ICU and number of hospitalizations. IT departments try to produce daily overviews or dashboards with all this required information. The hospital of the future with a high end EHR system will be able to monitor in real time all patient flows including their necessary care processes, from admission in emergency to discharge home and, ... even further after discharge. Business intelligence processing power is evolving and shifting fast from managing short term operational activities to mid-term tactical decision making and even beyond... strategic planning on long term.

Digitization and new healthcare technologies will redesign the future of our healthcare.

Big data is the new oil.

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Figure 1: Healthcare 2021

