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Health and the City

Developing Connected Healthcare Systems and Accelerating Digital Transformation

Author: Sourabh Pagaria I Executive Vice President & Head of Southern Europe I Siemens Healthineers

With urban populations increasing worldwide and technology making smart cities a reality, there is a great potential of improving healthcare services by expanding them beyond the hospital walls. Both immediate health emergencies, such as COVID-19, and long-term strategies can be addressed with new, tech-driven solutions supported by enhanced community care. HealthManagement.org spoke to Sourabh Pagaria, Head of the Southern European business of Siemens Healthineers and discussed healthcare systems in the wider urban context and the challenges and opportunities of interconnected systems.

It is believed that the future of healthcare will focus on delivering care beyond the hospital walls. Do you think this is an achievable goal?

With the increasing need to manage a larger chronically ill patient population and the need to expand access to healthcare beyond urban neighbourhoods, especially to the sub-urban and rural population, health systems and hospitals are increasingly looking at a model to deliver care beyond the hospital walls, whether this is in the form of opening satellite sites closer to communities or conducting community outreach programs like mobile screening etc.

However, one of the major barriers they face in the implementation of this strategy is workforce shortage. Hospitals are increasingly understaffed, and there is a mismatch in workforce demand and supply (Siemens Healthineers Insight Series Issue 24). United Kingdom-based publisher BioMed Central estimates a global shortage of more than 15 million healthcare workers in 2030 (Liu et al. 2017). The global trend of urbanization poses additional challenges as well. Staff shortages are particularly apparent in rural areas. Since it is particularly difficult to find skilled medical professionals to work in rural areas, the capital investments made in these satellite sites often experience downtime, which impacts the bottom line. Yet studies have shown that 57% of people think that the most important factor in deciding where to obtain care is the ability to receive timely care (kyruus.com/2020-patient-access-journey-report-lp).

There is a need to provide consistent, high-quality care across the region around the clock. To solve the myriad challenges, hospital networks need to be creative in employing digital technologies to deliver more efficient care. Telehealth not only provides the convenience that patients are looking for today, but it also connects care teams and empowers caregivers to deliver care in a more streamlined way. With the strategic use of telehealth technologies along the entire patient pathway, health systems could reduce inefficiencies and achieve their growth objectives without increasing their footprint.

What role can technology play in helping achieve this vision of providing care outside of the traditional care setting?

Technology plays a central role in enabling healthcare providers to expand access to quality care cost-effectively. Technologies like virtual consultation, remote machine operations and robotics-assisted procedures can help improve access to higher quality healthcare to the large population across the globe. Remote monitoring can make healthcare more continuous, and last but not least, technologies like AI could drive triaging, and AI-powered clinical decision support systems could help free up precious physician and specialist time which could then be used by them to provide

more emphatic and personalized care to the patients as comprehensively and productively as possible.

Do you think the new model of a bed-less or wall-less hospital can result in greater patient empowerment?

Patient empowerment is closely linked to the evolving trend of consumerism in healthcare. Consumerism is not merely about supporting hospitals, insurance companies and other involved businesses. Instead, it is mainly being driven by patients, who are increasingly turning into consumers. Furthermore, consumer-centered healthcare is becoming heavily reliant on digital technology. This rings especially true when we look at how the COVID-19 pandemic is still transforming healthcare. Telehealth adoption has fueled consumerism breaking down the traditional geographical proximity advantage for some healthcare providers and opening the field for increased competition with virtual competitors.

Self-monitoring, another catalyst in the transformation of healthcare, is not as difficult as it was once touted to be. More and more people are buying self-monitoring medical devices online. Pulse oximeters, devices that few had even heard of before the pandemic, are now being sold at unusual rates. With these tiny hand-held devices, one can measure their oxygen saturation levels at home. Self-monitoring and online reporting are not limited to COVID-19. They can easily encompass a host of other health conditions, including chronic diseases such as diabetes, hypertension, lung disease etc. With these self-monitoring tools in hand, patients can demand healthcare services that leverage these tools and help them manage their health.

With telehealth and self-monitoring being popularized among people, consumeristic healthcare post-COVID-19 will be heavily influenced by digital technology. It will involve the use of machine-learning algorithms and AI to predict prognoses, smartly distribute work to doctors and nurses and manage patient intake virtually.

Virtual consultations by doctors and clinicians are going to add to the patient experience immensely. It certainly addresses one of the major issues that patients find in their healthcare experience – a lack of sufficient interaction with their primary healthcare providers. Digital modes of healthcare dissemination will also allow for continuous contact with patients through simple text messages or video clips – modes that do not necessitate direct interaction but still improve the patient experience.

In this scenario, one element is fundamental: patients should be willing to share data to contribute to this transformation of healthcare and for the benefit of research. Availability of more data can help alter digital healthcare to better suit the patients' needs and expectations. Feedback is also very important so that future services can be better.

Can availability of patient data help in realizing the vision of intelligent home care?

We should analyze the benefits of the availability of patient data at two levels:

1. **Macro-level or population level care:** With the broad availability of patient data in a community, healthcare providers can better understand the prevalence and disease disposition patterns in the community. This information, in turn, can be used to develop the right community care plans like screening programs, awareness programs and wellness programs. Such programs could help in making the whole community healthier by preventing chronic conditions from occurring in the first place while ensuring adequate medical infrastructure is in place to treat the population. Additionally, having a broad patient data set from within a community could help train AI algorithms for better suitability and the removal of any biases in them.
2. **Micro-level or individual patient-level:** At an individual patient level, the availability of longitudinal personal medical data and history can truly enable better patient outcomes all through the care cycle. For example, continuous self-monitoring at home can enable patients to act in advance of any major medical episode and proactively reach out to their healthcare provider for timely guidance. Similarly, during the treatment phase, a patient's medical history combined with genetic data can help doctors customize care and treatment plans. Finally, during the recovery or maintenance phase of the disease, patient-level data from remote monitoring devices can enable caregivers to monitor recovery, treatment compliance, and timely intervention to ensure a proper return to health, thereby improving patient outcomes and experiences.

Virtual care will continue to be a leading strategy in healthcare. Do you think healthcare systems are ready for this change?

No doubt that this pandemic has been a major accelerator for virtual care model adoption for both patients and clinicians. However, in most parts of the world, we still have a long way to establish virtual care as a mainstream and robust care model. There are a couple of important aspects that need to be addressed at a health system level in a comprehensive way beyond implementing the required technological infrastructure:

1. **Setting up permanent and comprehensive reimbursement models for virtual care model:** While many healthcare payors instituted temporary reimbursement models for virtual visits, it is imperative to look at the reimbursement schemes more

comprehensively beyond just visits. Remote therapy and remote monitoring need to be included in the overall plans of healthcare payors and systems to enable a sustainable transition to virtual care both by physicians and patients in the short term.

2. **Adopting healthcare workflows through proactive care coordination:** This is one of the most difficult aspects of shifting from physical care to virtual care. Traditional healthcare workflows have been largely designed around a patient physically showing up at the healthcare facility and moving from department to department. However, this is not the case when a patient is remote. In this scenario, the healthcare system will have to take on more responsibility in ensuring care coordination and reach out to the patient for care. We would need to create roles like "care manager" whose sole purpose would be to "bring the hospital to the patient".
3. **Driving adoption through effective change management:** Shift to virtual care models involves driving effective change management around the adoption of new tools and workflows in both patients and clinicians. This requires consolidated efforts to familiarize, train and support them. Additionally, setting a short-term incentive structure to drive adoption would be key to enable this transition speedily. Finally, continually analyzing, measuring, and evaluating virtual care workflows and leveraging patient and physician feedback would help every healthcare institution find models best suited to their culture and needs.

Do you think changing the traditional model of healthcare will result in patients feeling disconnected from clinicians?

For as long as there have been doctors and nurses, the basic healthcare interaction has been a very human one. When a person feels sick or suffers an injury, they visit a

healthcare provider (Siemens Healthineers Insight Series Issue 19). This traditional physical way of providing care has served healthcare well for generations, but in today's world, the limitations of this system are becoming more and more apparent. Due to the increase in patient population, administrative workload and staff shortage, the doctors often find they don't have enough time to devote to patients for quality interactions. Long waiting periods in getting appointments and proper diagnosis result in delayed treatments, which often negatively impact patient outcomes and satisfaction. Hence, there must be broad-scale adoption of virtual care where doctors are supported by myriads of technological tools that help them increase their efficiency through automation of tasks, e.g. triaging chatbots or remote monitoring devices. Virtual care could truly improve patient outcomes and satisfaction.

Patients who receive home health services may still need assistance directly from clinicians/ care managers. What strategies can be used in such scenarios?

Having a proper "escalation management" system is key to the success of any virtualized process, and virtual care is not an exception to this requirement. Patients receiving virtual care services at home need to be continuously monitored to timely receive the attention of clinicians and care managers in case of adverse events. Digital technologies like AI and machine learning could play a big role here. Properly trained AI algorithms could identify and predict the occurrence of adverse health events of remotely monitored patients based on the trends from their vitals. With this information, physicians and care teams can trigger an appropriate care protocol which may include bringing the patient physically inside a hospital for intensive care (Siemens Healthineers Insight Series Issue 10).

To adjust to an innovative, virtual model, healthcare organizations will have to invest time and money. Do you think they are technically equipped and have sufficient expertise?

The digital transformation can only be successful and sustainable if healthcare leaders move beyond adopting technology solutions and begin transforming their institutions into learning health systems. This is a vital development for the future of healthcare and one that will prepare providers to respond to new COVID-19 outbreaks or other infectious disease events. How? By including data and technology that is easy to use and frees up caregivers' time, by establishing an organization committed to digital transformation, and by rigorously measuring and disseminating patient outcomes (Siemens Healthineers Insight Series Issue 12). Measuring outcomes is the basis for course correction and makes it possible to scale the right measures toward continually optimizing, expanding and advancing enterprise performance. The learning health system will be better prepared for both routine care and for extraordinary circumstances like the one we are living with COVID-19.

This transformation isn't easy; challenges to successful digital transformation include low quality of data, an inability to securely and conveniently access operational and clinical data, low interoperability of systems, and fragmented care systems in place in many countries. Enduring value-generating partnerships between healthcare providers and medtech companies can help provider organizations leverage technology to upgrade their organizations both in the near term, to better cope with the urgency of the pandemic, and in the long term, by investing in strategic digitalization efforts. In collaboration with medical technology partners, healthcare enterprises can create more value for stakeholders and deliver meaningful improvements in clinical and financial outcomes. ■

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