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Case study

Virtual hospital ward rounds involve wider number of clinical experts and families

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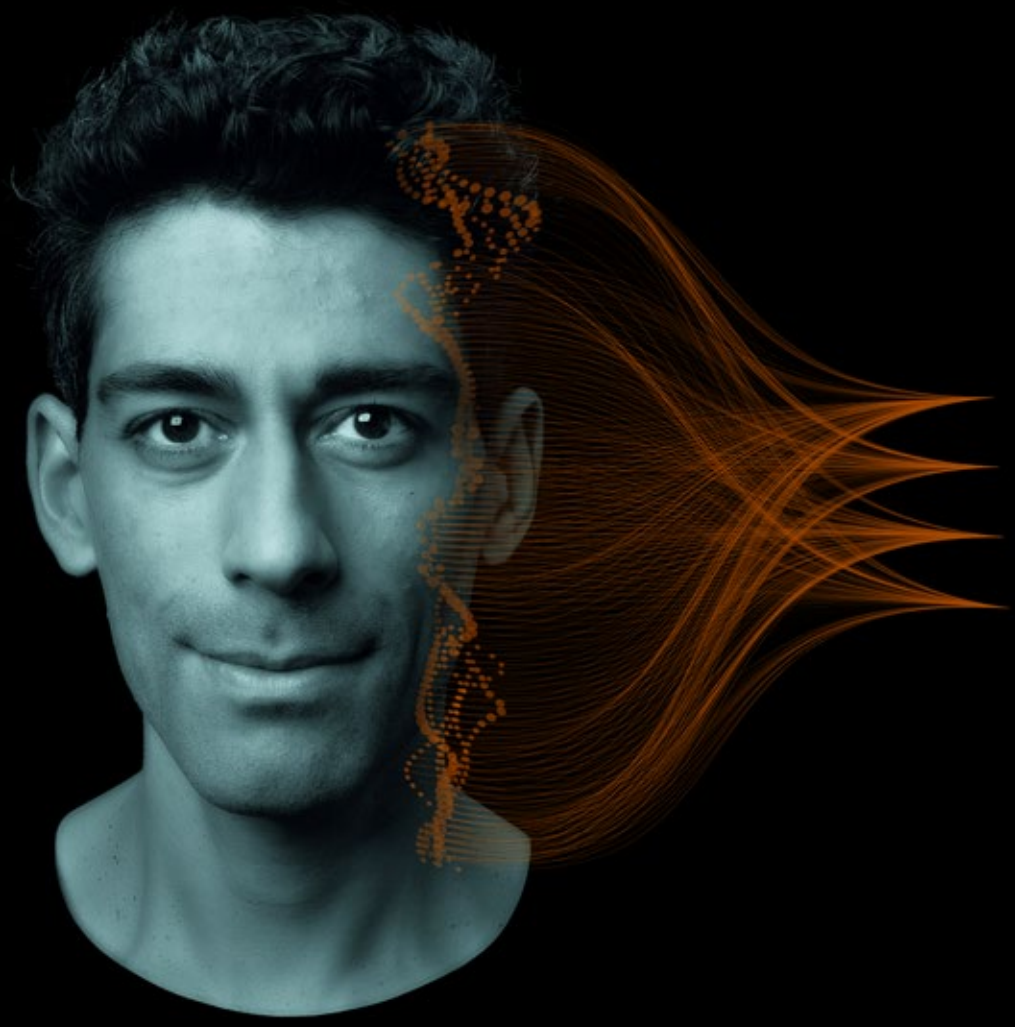

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Foreword by Siemens Healthineers

Siemens Healthineers strives to understand the broader changes taking place through hospitals and how they may bring in changes to improve working practices, and to share these insights with our community.

One of the transformative developments changing every facet of the healthcare sector is digitalization. Digitalization has been redefining our lives for several decades now, and the recent pandemic has served to accelerate many of these changes. It is essential that healthcare providers, patients, and all stakeholders understand the scope and breadth of these changes, and learn how to use them for their benefit – to expand precision medicine, transform care delivery and improve patient experience.

In the article below, part of a series, written by the Economist Intelligence Unit and based on extensive, first-hand research, we are exploring how changes such as digitalization are impacting our world. The article analyses how "virtual ward rounds" are being carried out in hospitals and to better connect care teams and patients by involving a wider number of clinical experts and families.

This article is the third in a series that will present original insights based on exclusive research and interviews with global healthcare leaders, prepared by the Economist Intelligence Unit. Complementing this, Siemens Healthineers has analyzed survey data, prepared by The Economist Intelligence Unit, to further explore future digital transformation in hospitals. For more information on Siemens Healthineers Insights, please visit:
siemens-healthineers.com/insights-series

Dr. Ralph Wiegner,
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Executive summary

- The coronavirus pandemic has enabled the take up of many aspects of telemedicine that had only a niche appeal before 2020, and virtual hospital ward rounding is likely to remain of interest to many physicians and patients after the pandemic is over. Yet, virtual rounding cannot be seen as a one-size-fits-all service. Hospitals that understand the needs of both patients and healthcare providers are most likely to put virtual rounding to the most efficient use.

- Virtual rounds can be used in both in-patient settings and to monitor care in the community, including in nursing homes. Physicians in the UK have used the technology to supervise the care of frail elderly patients who have been discharged from hospital.

- Benefits of virtual rounding during the coronavirus pandemic have included preserving scarce personal protective equipment (PPE) and limiting the number of healthcare staff who are required to self-isolate due to exposure to infectious patients. It also allows a broader range of specialists and support staff to consult on patient care remotely. The technology also allows families to dial in to rounds remotely, helping them to improve their understanding of a relative's condition and see them in cases where face-to-face visits are not possible.

- Virtual rounds can present challenges, though. They deprive most participants, including medical and nursing students, of the opportunity to do a physical examination on the patient although they can also act as teaching tool. In addition, the technology is not suitable for all patients, and the investment costs can be high for smaller hospitals.

- Future opportunities for the technology include allowing larger tertiary medical centres to provide expertise and supervise care remotely at community hospitals. Virtual ward rounds could also help to make hospital care more cost-effective by sharing expertise across hospital facilities as needed.

Virtual hospital ward rounds involve wider number of clinical experts and families

Virtual hospital ward rounds have been a feature of some medical specialities for around two decades. But as the novel coronavirus spread rapidly in early 2020, the importance of restricting the exposure of the health workforce to infectious patients pushed the needle for this form of telemedicine.

Traditional in-person hospital ward rounds involve a range of healthcare staff including clinicians, discharge co-ordinators and medical students, who travel from bed to bed making observations, or clustering around computer screens to assess test results, all the time increasing the risk of covid-19 transmission. To reduce this risk, a number of larger hospital systems adapted quickly to introduce virtual rounds. That this process of adoption happened with relative ease could encourage further scaling up of the service after the pandemic is finally over.

Virtual rounding, as it is often known, is an established way of parachuting additional, and sometimes geographically distant, expertise into a patient's hospital room since digital platforms began to make remote consultations possible.

Before the pandemic, in some primary care systems, including in the UK, virtual rounding allowed general practitioners, social workers and other health providers to consult on and monitor frail elderly patients in the community, or to allow specialists to give remote expert opinion where a fast diagnosis might affect outcomes, such as in cases of suspected stroke.[1]

In 2019 researchers in Canada launched a study of a pilot project, the Telemedicine Rounding and Consultation (TRAC) model, to examine efforts to relieve the problem of over-occupancy at two paediatric hospitals in Alberta by increasing the number of patients cared for in regional paediatric beds via telemedicine. The researchers, who aimed to identify potential barriers and enablers to the TRAC approach, suggested that it could be used by others to develop similar telemedicine-based interventions in Canada and other parts of the world.[2]

As the covid-19 pandemic has spread across countries, the technology has been used to serve a number of functions simultaneously: virtual rounds have become a way of keeping patients and medical staff safe, making care more efficient and preserving scarce personal protective equipment (PPE). Whether or not hospitals will continue to take up virtual rounds in the future is likely to depend in part on how long the pandemic continues, and the extent to which telemedicine is adopted more widely.

A strategic take up of virtual rounding could make it easier for healthcare systems to provide care more widely, across greater distances and in a more cost-effective way. According to the OECD, this could help to address the growing gaps between the demand for and availability of health workers needed to care for patients.[3] In addition, proponents say, wider use could allow sharing of expertise between countries and between tertiary and regional medical centres, as well as providing more patient-focused care, especially in areas such as paediatrics. In this case study, we look at how two hospitals are using virtual rounding.

Connecting experts and families

According to Lee H Schwamm, C Miller Fisher Chair of Vascular Neurology and director of the Centre for Telehealth at Massachusetts General Hospital in Boston, prior to the outbreak of covid-19 in early 2020, there were two fundamental models of ward rounds in existence: traditional face-to-face examinations and a separate programme of video conferencing-enabled observation and consultation by physicians for patients located at remote hospitals. For teams of doctors, students, case managers and social workers visiting patients at their bedside, rounds have been a "wonderful teaching tool, very focused on case study learning and very immersive," says Dr. Schwamm.

Yet, virtual rounds have been employed in specialities such as neurology for around two decades, Dr. Schwamm notes. The ability to rapidly access medical expertise in a timely manner has been a key driver of virtual ward rounds, even against a larger backdrop where telemedicine had yet to ramp up. Under Massachusetts General's TeleStroke programme, community hospitals without a staff neurologist who are treating patients with suspected strokes can call on a remote specialist to consult virtually with the attending physician or nurse.[4, 5] Similarly, digital intensive care units (ICUs), which allow an ICU physician to monitor patients at many hospitals, have been active for a number of years.

Virtual ward rounds also provide opportunities for providing more patient-centred care, especially through the inclusion and engagement of family members when doctors are discussing medical information or results – although they have not always proven suitable. For example, Thomas Jefferson University Hospital in Philadelphia initiated virtual rounds in the system's oncology wards around five years ago to connect patients with family members, but found that the service was less popular than anticipated.

Sick cancer patients were less happy about appearing on camera with relatives when they felt that they did not look "presentable", according to Judd Hollander, an emergency room physician and senior vice-president of healthcare delivery innovation at Jefferson Health. There was also less of a need to transmit information to family members of oncology patients, who generally had more liberal visiting hours. A 2016 study of the new service found that fewer than half of patients approached about virtual rounds were interested in participating.[6]

By contrast, Dr. Hollander observed, the virtual service had much stronger take up among the families of surgical patients. "Whether they were down the hall in the waiting room or in Texas, the post-surgical nurse could show the patient waving at the family," he said, noting that the virtual contact allowed family to get a quick update on the surgical outcome and "know that Mom is ok by seeing her with their own eyes," without crowding post-surgical units. "That has been wildly popular."

Covid-19 requires new ways of working

The use of virtual rounding during the covid-19 pandemic has not only allowed hospitals to limit the exposure of their workforce to a virus that initially spread largely as an unknown quantity, it has also allowed medical staff to preserve an element of human connection with patients. In particular, the system made it easier for nurses – who have often needed to be heavily masked while in close proximity to patients – to have unmasked contact with patients for an hour or more outside their room, through the use of virtual intercom systems attached to IV equipment, thereby reducing patients' social isolation.

"We wanted to limit exposure to this infectious agent that we didn't understand," Dr. Schwamm says. For a single healthcare professional exposed in March 2020, he notes, it would take four to five days to get the test results back, meaning that one infectious patient could "knock out" as many as five team members from a ward round. "We didn't have a lot of gowns and masks available, so we didn't want people to go into the room if they didn't need to."

Figuring out how to make systems work in covid-19 wards was the next challenge for Massachusetts General Hospital. Clinicians had to decide the absolute minimum number of healthcare professionals needed in a patient's room, to ensure that the hospital did not use more of its PPE than necessary. Medical and nursing students were the first group shifted to the virtual platform, followed by pharmacists, discharge co-ordinators and others, until the bedside team consisted of a camera-enabled laptop or desktop computer on wheels, accompanied by two physicians – an attending physician holding a camera device and a resident examining the patient.

In a June 2020 editorial in *The Lancet*, Dr. Schwamm observed that the lack of personal contact involved in virtual examinations, which has been one of the chief criticisms of telemedicine more broadly, has become its key attribute in an environment that prizes safety and the capacity to maintain a sufficient supply of healthcare workers. He pointed out that even health professionals who were self-isolating could contribute to virtual rounds.[7] "The challenge was not in the concept; it was in the execution," said Dr. Schwamm. "We had the technology, but we needed to change how people practiced, where they were located, and how they communicated, which are all highly personal and fundamental barriers to adoption."

Virtual rounds have a number of advantages, including the fact that the digital interface allows more team members to round simultaneously, and the fact that physical space constraints are not a limit to the number of staff able to consult on individual patients. This was vital during the early days of the pandemic, when the degree of infectiousness was unclear and providers were quarantined after any potential exposure. Virtual rounds also provide all remote participants with access to images, results and other information from the comfort of their own laptops – rather than forcing them to crowd around a small screen, the opposite of social distancing, as had been the case before.

In the case of Jefferson Health, during the first wave of covid-19 the focus was on getting patients in remote contact with family members to reduce isolation, as well as conserving the hospital workforce during the pandemic. The organisation quickly bought 1500 tablets and built servers to allow doctors and family members at its 14 hospitals to initiate a virtual meeting.

"Getting the devices (such as tablets) and distributing the devices was a challenge," Dr. Hollander admits. But a bigger issue was making sure that the hospital was protecting all of its staff. "We created a policy saying you could never ask someone else to go into the room to enable the use of devices, just so you didn't have to go in the room yourself."

At Massachusetts General Hospital, "We shrunk the footprint of the people who were walking around, as rounds became an experience now happening largely online," Dr. Schwamm said. The system imposed few limitations when compared to a traditional ward round, he thinks, other than the fact that residents could not use their stethoscope to listen to the patient in person. Otherwise, there have been no changes to how tests are ordered and how notes are written up during virtual rounds.

Massachusetts General Hospital, like other large teaching hospitals, already owned a licence for collaboration software; as staff already had passwords and the platform was already part of the hospital's set of corporate employee remote work software tools, training materials already existed and the training needs were minimal. Laptop sound quality could be variable, especially if a participant was standing a few feet away from the microphone or if two people were next to each other, although the system tended to work better if team members used a smartphone with earbuds.

Not all specialities have found the new system to be useful. Indeed, surgeons, who tend to conduct traditional ward rounds more swiftly and with fewer people on the team, are seen as one group unlikely to embrace virtual rounding. In addition, in the absence of existing technical and support infrastructure and a software application to support virtual rounding, smaller hospitals might find it harder to move to such a system quickly, says Dr. Schwamm.

Yet, use of the platform has remained strong at both Massachusetts General Hospital and Thomas Jefferson University Hospital – even since June 2020, when the first wave of the pandemic began to subside – owing to the advantages of using virtual rounding to leverage experts such as healthcare co-ordinators and other peripheral ward round participants.

Future opportunities

Further expansion of the system is likely to depend heavily on the course of the pandemic in the months to come. If the current situation persists, virtual rounding could remain a key part of healthcare professional and trainee education, Dr. Schwamm says."You could make the argument that the single most important development would be to virtualise covid-19 rounds at major teaching hospitals, so that Massachusetts doctors can learn in real time from doctors in another hard-hit country, or community hospital providers can learn from teaching hospitals how best to manage these complex patients."

Only a handful of studies have attempted to evaluate the impact of virtual rounds on patient care, but existing research suggests that potential adopters need to understand what the technology can and cannot achieve. A 2014 trial of virtual ward models of care after hospital discharge, which included some elements of hospital care in the community, found that virtual wards did not significantly reduce the rate of readmission to hospital or death.[8] Some of the obstacles that the study identified – including incompatible electronic health records, lack of continuity of clinicians, difficulties integrating with primary care and lack of patient contact – are likely to be surmountable and are less relevant to virtual rounds taking place completely within the hospital.

"The goal now is to consolidate inpatient-facing applications onto one platform," Dr. Schwamm says, adding that, "the concept here is to design the 21st-century hospital, with a digitally connected room and remotely monitored patients so that patient care encounters are not limited by time, space, geography or availability of providers." The ability to integrate a number of applications onto existing virtual round platforms and leverage machine learning and artificial intelligence to identify early deterioration or patient needs could increase uptake.

Meanwhile, at a time of rapidly expanding healthcare costs, the potential for economies of scale through the sharing of medical expertise is an important draw of virtual rounding. This approach can allow health systems to staff their network hospitals more efficiently by sharing expertise across multiple facilities on demand, and making expert decisions sooner and avoiding unnecessary costly testing, Dr. Schwamm observes.

"Our job is to figure out, in a financially responsible way, how to modernise our current practice of medicine and to digitally upscale this environment," he adds, noting that such a model allows physicians to quickly "beam in" specialist input during rounds. "Just-in-time delivery of expertise has the potential to help us deliver the best care we can. We have to get better at being more cost-effective and learning how to disseminate what we have learned more broadly."

This modernisation also applies to training and education, Dr. Schwamm says, "allowing us to broaden the audience of student learners at lower cost and expose them to a much wider variety of first-hand experience with medical conditions." He notes that this is an especially important tool in supporting efforts to increase the diversity of talent entering medical and health professional training, as it will allow hospital systems to engage with a much larger pool of learners from diverse backgrounds and geographies.

At Thomas Jefferson University Hospital, specialists do not need to come to the emergency room at all to deliver expertise to the patient. "All the workflows can be managed around [virtual care], which brings economies of scale," Dr. Hollander says. "One physician can manage several locations at a time."

Yet, success in implementing such systems will also depend on how willing hospital systems are to experiment and identify the ways in which virtual rounding can be most valuable to patients and staff. Figuring out how to pay for the necessary infrastructure investments will be a challenge for some hospital systems too. This is especially true in the US, Dr. Hollander says, where many insurance companies still refuse to recognise virtual rounds as delivery of care and are therefore reluctant to reimburse for it.

This case study was edited by Elizabeth Sukkar of The Economist Intelligence Unit.

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