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Valuation of Senior Healthcare: Technology

As noted in the first installment of this five-part series, senior healthcare options have dramatically expanded in the past decade, and seniors have more long-term care choices than ever before to meet varied care needs and income levels. These myriad options also have varying operational needs that can be addressed through diverse technological solutions. The final installment in this five-part series on the valuation of senior healthcare will discuss emerging technological trends in senior care services.

Telemedicine utilization has grown exponentially over the past few years, significantly outpacing the growth of other points of care.[1] As payors, providers, and consumers become more familiar (and comfortable) with this expanding technology, providers have begun to utilize telemedicine to improve patient outcomes, patient satisfaction, employee morale, and reimbursement.[2] Telemedicine is a broad category encompassing a number of methods that use technology to enhance the delivery of healthcare services.[3] Some of the most common modalities include live video, remote patient monitoring (RPM), and mobile health (a/k/a mHealth).[4]

Live video is the most commonly-used telemedicine modality and involves a real-time, two-way interaction between a provider and a patient, caregiver, or other provider.[5] Recently, there has been an increase in the number of senior care facilities utilizing live video to reduce unnecessary hospitalizations. Typically, when a doctor is not on-site at a senior care facility and a patient's condition changes, protocol suggests that the patient be transferred to the hospital.[6] Because less than 10% of senior care facilities have physicians on-site at all times, patients are transferred to the hospital more often than is medically necessary.[7] Studies suggest that up to two-thirds of these hospitalizations are unnecessary and could be avoided if senior care facilities had better access to physician consults and the ability to more accurately assess acute changes in a patient's condition.[8] To address this need, senior care facilities are contracting with telemedicine companies.[9] Instead of transporting patients to the hospital when their condition changes, staff arrange for the patients to meet with an emergency medical technician (EMT) or physician through live video, to determine if transportation to the hospital is necessary.[10] Live-video consultations can improve the quality of care provided to patients by avoiding hospitalizations that are stressful and costly to the patient and his/her family.[11] Additionally, reducing unnecessary hospitalizations through live video consults can help senior care facilities avoid increased administrative expenses, lost bed days, and Medicare penalties caused by unnecessary hospitalizations.[12]

In addition to avoiding hospitalizations, senior care facilities are leveraging access to live-video physician consults to reduce the need to transport patients off-site for specialist appointments. Transporting patients to specialist appointments can be costly and disruptive to patients' lives. By utilizing live-video physician consults in senior care facilities, annual cost savings to the provider (both physician offices and senior care facilities) of up to $305 million can be achieved.[13]

In addition to live video consultation, senior care facilities are using RPM and mHealth to improve patient outcomes, address staffing shortages, and promote patient independence.[14] RPM is a form of telemedicine that securely sends patient health information, collected from a variety of sources, to a healthcare provider at another location.[15] RPM is often used in conjunction with mHealth to provide real-time vitals to the remote healthcare provider. mHealth encompasses the provision of healthcare services and collection of health data through electronic devices worn by an individual that collect, and send to a remote provider, real-time data.[16] These wearables include well-known devices such as Fitbit or smartwatches, as well as specific medical devices equipped to collect information such as blood pressure, temperature, blood oxygen saturation level, and electrocardiogram (ECG) reports.[17] RPM allows for remote providers to monitor senior care facility patients' condition in real-time, using data transmitted from wearables.[18]

Experts cite inadequate ability to assess changes in patients' conditions as a contributing factor for unnecessary hospitalizations of skilled nursing facility (SNF) patients. RPM allows for a remote provider to continuously monitor a patient's condition and alert SNF personnel to any concerning changes.[19] Shifting from a reactive to a proactive approach in senior care can significantly reduce hospitalizations and improve patient outcomes.[20] Research suggests that use of RPM could

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reduce hospitalizations by up to 60%, significantly improving patient outcomes.[21]

In addition to reducing hospitalizations, RPM in senior care facilities has the potential to address the significant staffing shortages being faced by the senior care industry.[22] The stress of the patient workload is cited as a contributing cause of the staffing shortage;[23] RPM addresses some of this stress by providing reassurance to staff through the remote oversight of their patients' conditions.[24] Knowing that there is a resource to help identify crucial changes in a patient gives staff additional confidence, significantly improving employee morale.[25]

RPM and mHealth are also being used by senior care facilities to promote patient independence. A continuing care retirement community (CCRC) opening later this year has announced plans to use RPM and wearables to promote independence among memory patients.[26] Using wearables equipped with real-time location management capabilities, memory patients, who may have otherwise been under close supervision and unable to freely utilize the entirety of the facility, will have the ability to independently walk about the facility.[27] If a patient wanders beyond their defined boundaries, CCRC staff will be notified.[28] Other facilities have been using mHealth to extend the time that patients spend in an independent living community before moving to a higher level of care.[29] Using in-home sensors placed in the living room of a patient's home and under the patient's mattress, information on the patient's heart rate, respiration rate, overall cardiac activity, walking speed, and movement patterns can be collected.[30] This information can be used to indicate pending health complications and assess a patient's fall risk.[31] A study found that patients monitored using these in-home sensors had an average length of stay in an independent living community of 4.3 years, compared to the national average of 1.8 years.[32]

Expansion of the field of telemedicine has also allowed for innovation in the delivery of senior care. For example, the last few years has seen the emergence of *telehospice*, remotely-delivered hospice services.[33] Under this new branch of hospice services, several existing hospice providers have launched a telemedicine program to provide a less-invasive alternative with the benefit of specialized physicians and personalized end-of-life assistance, without the need for as much in-person involvement.[34] Originally, telehospice services were designed to primarily target rural populations and populations that have historically under-utilized hospice care for social, cultural, or spiritual reasons.[35] However, in recent months, to protect vulnerable palliative-care patients from exposure to COVID-19, hospice providers have begun to offer telehospice services to patients outside of the original target market of rural populations and populations that under-utilize hospice services.[36]

The impact of COVID-19 on the adoption of telemedicine is not limited to hospice agencies. In response to the *Center for Disease Control and Prevention's* (CDC's) recommendation to utilize telemedicine to limit senior patients' exposure to COVID-19 and the removal of restrictions surrounding Medicare reimbursement for the use of telemedicine in SNFs, the demand for telemedicine technology by senior care facilities has grown rapidly.[37] While the expansion of telemedicine utilization in senior care facilities is a response to COVID-19, it is expected that adoption of this technology will continue to grow long after the end of the pandemic.[38]

In addition to increased telemedicine utilization, adoption of artificial intelligence (AI) technology and predictive analytics by senior care facilities is expected in the future. Deep learning neural nets are being used to learn patterns in senior patient behavior that may predict future health complications such as depression, urinary tract infections, and increased fall risk.[39] Additionally, in recent years, a team at the Stanford AI Laboratory developed a predictive algorithm to identify patients in need of palliative care earlier, which could improve quality-of-life for terminal patients as well as become a more proactive alternative to referrals for hospice providers.[40] The development of these technologies shows promise for the application of AI and predictive analytics in senior care delivery.

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