

Valuation of Hospitals: Technological Environment

Technological advancements have accelerated the shift of healthcare services from inpatient to outpatient settings,¹ creating both opportunities and challenges for hospitals. For instance, minimally invasive procedures often serve as alternatives to traditional, more invasive surgeries. Additionally, the integration of telehealth and artificial intelligence (AI) has the potential to enhance access to and quality of care while reducing expenditures and administrative burdens. This final installment of a five-part series on the valuation of hospitals examines the technological advancements transforming the industry.

Health Information Technology (HIT)

The rapid adoption of technological innovations has fundamentally reshaped the U.S. healthcare delivery system.² A prime example is healthcare information technology (HIT), encompassing applications such as billing software, staffing models, and electronic health records (EHR).³ Studies show that HIT implementation can lead to greater efficiency and improved quality management.⁴ For example, EHRs have driven cost savings, enhanced care quality, and improved care coordination.⁵ Hospitals in particular many benefit from EHRs, which have demonstrated efficiency gains, financial savings, and clinical improvements, ultimately supporting hospital operations.⁶

Minimally Invasive Procedures

Minimally invasive surgical techniques enable physicians to perform procedures with less disruption to patients than traditional surgical methods. These techniques require smaller incisions, reducing pain and recovery time.⁷ For high-risk patients, such as those with comorbidities, minimally invasive procedures may offer safer alternatives to traditional surgeries.⁸ As technology and training have advanced, minimally invasive methods are now used for complex procedures, including knee arthroscopy, spine surgery.⁹

There are two main categories of minimally invasive surgery:

- (1) Non-robotic, endoscopic (laparoscopic) surgery, wherein the physician performs the specified procedure through one or more incisions using small surgical instruments and video cameras; and,

- (2) Robotic surgery, which utilizes small robotic arms equipped with surgical instruments, which the physician controls via console controllers and viewing a high-definition, 3D image on the console.¹⁰

For certain high-risk (e.g., elderly) patients, minimally invasive procedures may be a safer option than traditional surgery.¹¹ As the technology and training associated with minimally invasive surgery has advanced, it has been utilized to perform more advanced procedures (e.g., valve repair and coronary artery bypass surgery).¹² Ultimately, the broadening scope of procedures that may be performed using minimally invasive methods may result in nearly all procedures being able to be performed in the outpatient setting,¹³ serving as a threat to hospitals that fail to adapt and integrate these advancements into their service offerings.

Artificial Intelligence (AI)

AI holds immense promise for revolutionizing the healthcare industry, particularly in hospitals where it can enhance patient care and streamline administrative tasks.¹⁴ Notable applications of AI include:

- (1) Clinical Decision Support: AI can process large datasets to improve diagnostic accuracy and treatment planning.¹⁵
- (2) Diagnostic Imaging: AI has been instrumental in detecting and diagnosing conditions such as lung nodules and breast cancer through advanced data analysis.¹⁶
- (3) Patient safety: AI can improve error detection, manage drug delivery, and identify potential complications earlier.¹⁷

Approximately 97% of the data captured from the 3.6 billion imaging procedures performed by hospitals every year is unused, presenting an opportunity for AI to review and synthesize what humans, with real-world time constraints, cannot.¹⁸

Despite its potential, AI adoption has been slowed by a lack of regulatory guidelines and the ethical challenges faced by providers. Nevertheless, nearly 50% of hospital CEOs and strategy leaders predict that by 2028, hospitals will have the infrastructure necessary to fully implement AI systems.¹⁹

Telehealth

Telehealth, defined as the “delivery of health care, health education, and health information services via remote technologies,”²⁰ has become nearly ubiquitous due to the shift from volume-based to value-based care. While adoption was initially limited, its use surged during the COVID-19 pandemic²¹ as technology became more accessible and affordable to providers, and payors, including Medicare, expanded telehealth coverage. The use of telehealth has become increasingly popular among providers as well, with approximately 72% of all U.S. hospitals utilizing some form of telehealth in 2021.²² Telehealth encompasses three main modalities:

- (1) *Store-and-Forward* or “*asynchronous*” telehealth, where information such as medical histories, reports, or other data are sent to a specialist for diagnosis and treatment;
- (2) *Remote patient monitoring*, where a patient’s clinical status is evaluated continuously through video monitoring, images, or remotely reviewing tests; and,
- (3) *Real-time* or “*synchronous*” telehealth, which consists of a live conversation between the patient and provider.²³

Telehealth has proven especially valuable in rural areas, where 20% of Americans live but only 11% of physicians practice.²⁴ Telehealth may be particularly

useful for patients and providers in these locations, as it may provide access to various medical specialists without having to travel great distances.²⁵ Beyond addressing geographic disparities, telehealth offers benefits such as convenience, improved patient engagement, and increased provider efficiency by reducing unnecessary in-person visits.²⁶

In the past, the common refusal of payors to reimburse providers for telemedicine services limited the adoption of telemedicine technology.²⁷ However, as the market for this technology has grown, the availability of health insurance that reimburses providers for telemedicine services has also increased. As of October 2024, 43 states and the District of Columbia have enacted private payor laws.²⁸ Further, all states have Medicaid programs that include some level of telehealth coverage.²⁹ Prior to the COVID-19 pandemic, Medicare covered certain telehealth services (e.g., remote radiology, pathology and some cardiology) as physician services, and covers physician services via video conferencing for fee-for-service Medicare beneficiaries living in rural areas.³⁰ During the public health emergency, Medicare coverage was vastly expanded; however, these expansions are set to end on December 31, 2024 barring congressional intervention.³¹ As reimbursement and regulatory frameworks evolve, hospitals are poised to leverage telehealth to improve accessibility, quality, and efficiency in healthcare delivery.

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