ECONOMIST IMPACT

Achieving the potential of outpatient care in the US

Key points

- Outpatient care and facilities are expanding in the US as more care shifts from hospital-based and inpatient settings.
- The shift has been enabled by advances in technology and surgical techniques, and innovative healthcare delivery methods, driven by factors including the lower cost of care and reduced resource utilization in outpatient versus inpatient settings.
- Outpatient sector growth has the potential to alleviate the heavy patient burden seen in hospitals. For example, urgent care centers and "free-standing" emergency departments have helped to redirect some patients away from overcrowded hospital-based emergency departments.
- However, providing equitable access to outpatient services remains an issue in the US. The covid-19 pandemic has highlighted the need to expand the use of alternative care delivery methods and new technologies.
- In this article, we explore technologies and innovations that can be utilized to address the current issues in outpatient care delivery in the US. These include:
  - Telemedicine to improve access to outpatient care services for rural populations, increase the efficiency and convenience of care, and reduce unnecessary hospital admissions by helping patients manage their conditions remotely.
  - Mobile health clinics based in specially equipped vehicles provide access to a range of outpatient services in under-served areas, including rural areas and those which lack access to digital health services due to poor connectivity. Philanthropically funded mobile health clinics can also allow the vulnerable and disadvantaged to receive care.
- Point-of-care-testing allows essential investigations to be brought out of the laboratory and nearer to the patient, producing rapid test results and facilitating timely patient diagnosis and treatment in the same setting.
- Minimally invasive surgical techniques and ambulatory surgical centers allow an increasing range of procedures to be performed in an outpatient setting, enabling quick discharge in the majority of cases. Pressure on hospitals is reduced, procedures can be more convenient to the patient, and they are more cost-effective than in-patient surgery.
- To achieve the full potential of outpatient care and enable the integration of these technologies and innovations into the outpatient system, system-wide change will be needed. Flexible financing and reimbursement systems are needed to accommodate these new technologies and innovative approaches while encouraging a value-based approach to care. Greater ability for data sharing between patients, providers, and payers using standardized electronic health records (EHRs) could strengthen the impact of these new technologies and innovations and streamline care pathways.

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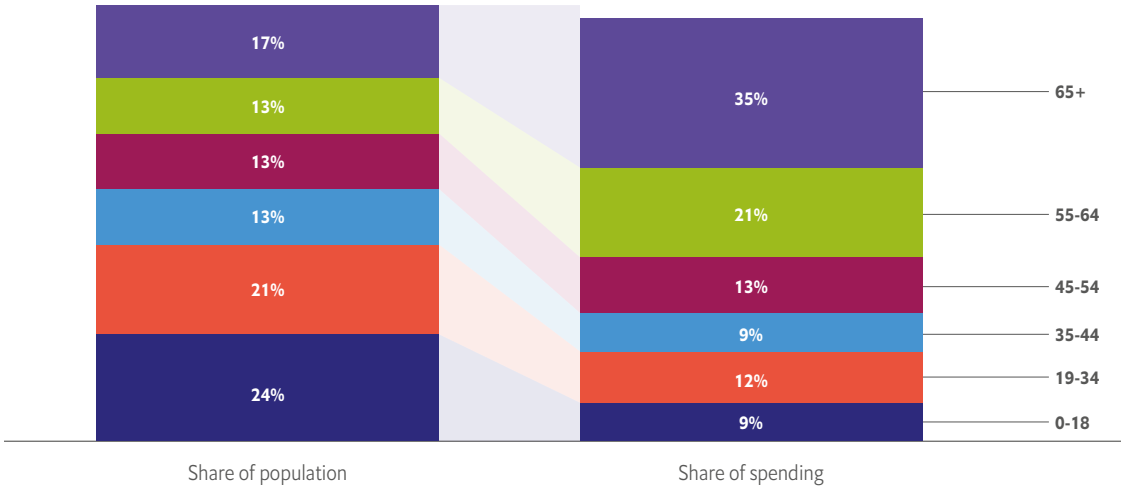
Background

Changes in population demographics are increasing the demand for healthcare services in the US. A key driver behind this surging demand is the country's ageing population. According to World Bank data, the current population of the US is more than 330m, over 17% (about 56m) of whom are over 65 years old.[1] By 2030 this is expected to rise to 21% (73m).[2] With greater age comes greater vulnerability to poor health, hence the demand for healthcare continues to be on an upward trajectory. Adults aged over 65 account for a disproportionate and significant share of healthcare spending in the US, equating to 35% of total expenditure (see Figure 1).

Healthcare delivery has evolved owing to the epidemiological transition from predominantly infectious diseases to non-communicable diseases. As people live longer in ill health due to chronic diseases such as diabetes and heart disease, they require long-term management through medication and lifestyle changes. There is also a push towards improving preventive care to avoid these costly diseases.[3] In addition, people are busier, and they are seeking ways to access less fragmented care in more convenient locations and outside of traditional working hours.[4,5]

These and other trends have meant that the bulk of care is moving away from being

Figure 1 - Share of total US health spending by age group, 2019.[6]



Key types of outpatient facilities[4,7-12]

Ambulatory surgical centers
Dedicated facilities providing solely same-day surgical care.

Ambulatory oncology centers
Facilities providing specialized cancer care such as prevention, monitoring, treatments and rehabilitation.

Ambulatory infusion centers
Centers specialized in delivering treatments that are administered as intravenous infusions, such as chemotherapy or immunotherapy.

Urgent care centers
Walk-in clinics providing urgent care for non-life-threatening illness or injuries.

Primary care practices/clinics
Often the first point of contact where patients are seen by a primary care physician for diagnosis, prevention and management, and can be referred to specialist care if needed.

Retail clinics
Walk-in clinics located in retail outlets such as supermarkets or malls, often alongside a pharmacy. They provide preventive care and assessment and basic treatment of uncomplicated conditions such as colds, sore throat, skin rashes or muscle aches.

Free-standing emergency departments
Facilities that provide emergency care but are not situated within hospitals.

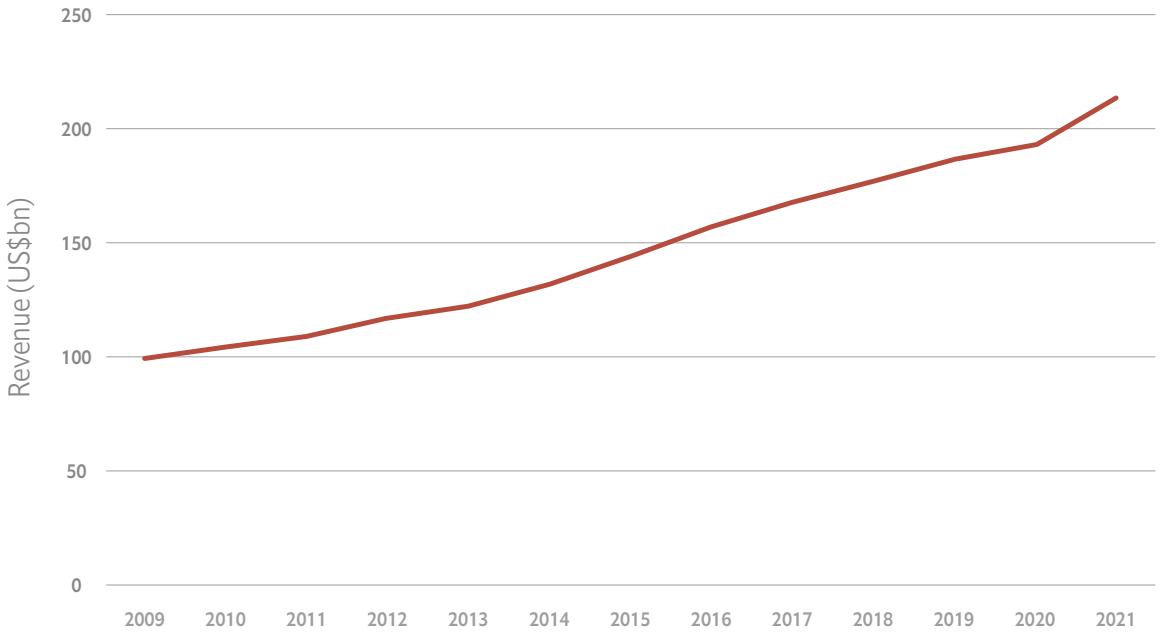
administered within the walls of hospitals and into outpatient settings.

Outpatient care refers to any healthcare consultation, procedure, treatment or other service that is administered without an overnight stay in a hospital or medical facility. It can be delivered in physical facilities (see summary of key types above) or people's homes.

There has been a considerable expansion of outpatient facilities in recent years.[13] For example the number of urgent care centers (UCCs) in the US rose from 6,100 in 2013 to 9,616 in 2019—growth of more than 50%.[13] Outpatient care revenue has also shown steady growth, and is currently double the amount of what it was a decade ago (Figure 2).

Outpatient care is less expensive than inpatient care, as it is less resource intensive, requiring less staff and equipment, and no overnight stays.[5] These lower costs also appeal to patients, who also value the greater convenience of access and better patient experience of outpatient services. For instance, the Urgent Care Association's Benchmarking Report 2019 found that UCCs offered accessible and timely services.[15] The vast majority of UCCs (92%) reported that it took no more than 30 minutes for a patient to see a provider and nearly all patient encounters (97%) lasted no more than an hour.[15] This is a stark contrast from hospital-based emergency departments, where only 70% of saw a provider within an hour in 2019.[16] Although this is due in part to emergency departments dealing with

Figure 2 - Trends in total revenue for outpatient care centers, 2010-22.[14]



Source: US Census Bureau

more serious cases than UCCs, overcrowding also plays a role. As such, the market and demand for UCCs is growing, providing crucial relief to overcrowded emergency departments.[17]

"[It started as] the idea that you could do things outside of the hospital a bit cheaper," says David Blumenthal, president of the Commonwealth Fund, of the drivers of the shift to outpatient care. "[But more recently] there's been a convenience aspect to it, as well as a technology evolution, which has made [procedures that were initially only carried out] in hospital centers possible to do safely in non-hospital settings." Michael Barnett, assistant professor of health policy and management at the Harvard T. H. Chan School of Public Health, suggests that this is even changing the way that hospitals themselves operate, as it is "much more profitable for hospitals to do outpatient procedures [and] build hospital outpatient departments than to manage the same care in an inpatient setting."

David Levine, assistant professor of medicine in the Division of General Internal Medicine and Primary Care at Brigham and Women's Hospital, supports moving a "core set of care" to the outpatient setting. This includes hospital-level care in the home. Dr Levine conducted a trial which showed reduction in the cost of treatment for selected patients who could be given acute care in a home hospital.[18] These patients had an almost 70% reduction in 30-day readmission rates and improved physical activity compared with similar hospitalized patients.

This article will explore some of the new technologies and innovations that are currently facilitating this movement of the US healthcare system towards a greater use of outpatient care. These include:

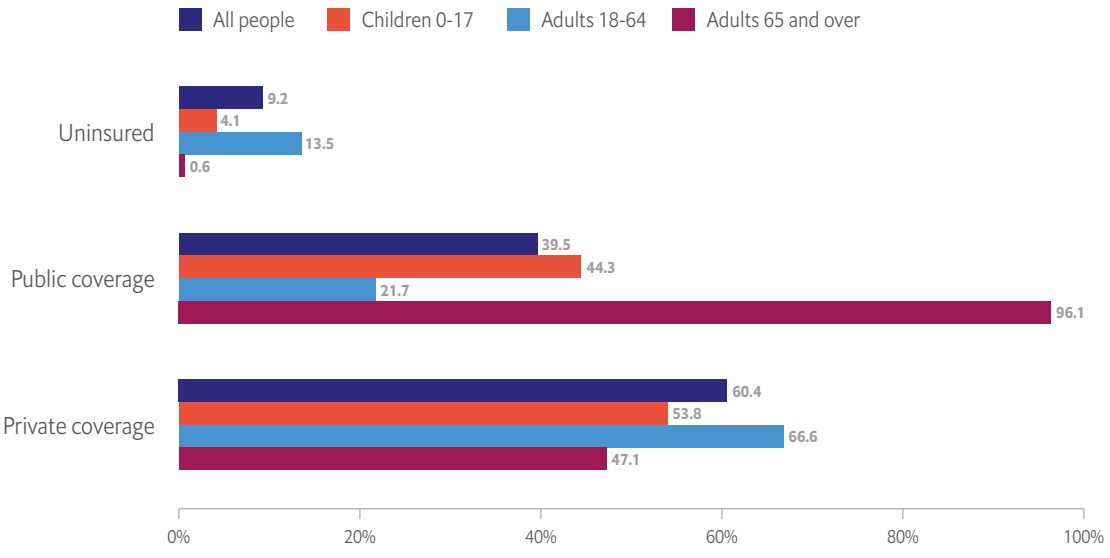
- Point-of-care testing (POCT), which optimizes resource use by enabling rapid diagnosis and timely treatment.
- Advances in minimally invasive surgical procedures, enabling certain surgeries to be performed as day-cases at ambulatory surgical centers, allowing the patient to return home a few hours after their procedure.
- Digital healthcare, enabling patients to consult with healthcare professionals via video/telephone from their homes, optimizing outpatient access to healthcare providers.
- Mobile health clinics, providing diagnostics, screening and preventative care to underserved populations.
- We explore how these innovations and technologies can be optimized by outpatient care providers along the various phases of a patient's journey, including diagnosis, treatment and surgery.

Challenges within outpatient care

Access to healthcare

Despite being the largest economy globally, the US still faces challenges in ensuring that its entire population has good access to healthcare. Although health policies such as the Affordable Care Act (2010) have improved health coverage, the current reality is that over 30m Americans (9.2% of the population) of all ages are uninsured and lack basic coverage for healthcare (Figure 3).[19] Older adults (those over the age of 65) are eligible for Medicare, the federal insurance program, which covers the costs of inpatient care as part of Medicare A and outpatient care as a part of the Medicare B plan.[20] Poorer health coverage is more prevalent among people of color, those of lower socioeconomic status, and marginalized groups such as migrants and homeless people.[21] Consequently, these groups face poorer health over their lifetimes.[21]

Figure 3: Percentages of people who were uninsured or had public or private coverage, by age group, 2021.[19]



NB Some individuals are covered by both public and private plans, thus figures do not always add up to 100%.

The challenges of accessing healthcare are not limited to the uninsured. Those living in rural geographies make up 15% of the US population, and approximately two-thirds of rural America is identified as having shortages in healthcare professionals, otherwise known as "healthcare deserts".[22] Rural populations have poorer access to preventative care and, as a result, poorer health outcomes than their city-dwelling counterparts.[23] Many of the services needed can be provided through primary care, but primary care is poorly funded, making it a less attractive specialty for physicians, who are also incentivized to remain in more lucrative urban settings.[22,24] In 2021 it was estimated that an additional 14,858 primary healthcare providers would be required in these "healthcare deserts" to overcome the shortage.[22]

Impact of covid-19 on delivery

The covid-19 pandemic caused a rapid rise in demand for acute healthcare, shocking health systems globally as they grappled with treating the sudden influx of severely ill patients. Many health systems were insufficiently prepared and reacted by diverting available resources towards the pandemic response and emergency care. This, plus lockdowns, led to difficulties in accessing non-emergency care, the impacts of which are still being felt today.

Delays and backlogs in services such as elective surgeries, cancer care and the management of non-communicable diseases have resulted in poorer health, delayed recovery and potentially increased risk of death in some cases.[25] The US was projected to have a cumulative backlog of more than 1m joint and spinal surgeries as of mid-2022, requiring 16 months to tackle.[26] Minimally invasive procedures such as cataract removal were estimated to have a backlog of 1.1m-1.6m cases.[27]

The ripple effect of the covid-19 surge period spread beyond the obvious impact on patient-facing services, making itself felt across the entirety of the health ecosystem. For example, laboratory services were particularly impacted, as they faced significant capacity issues that resulted in slower test turnaround and delayed diagnosis.[28]

Global health systems have learned valuable lessons in rebuilding resilience and efficiencies, but much more needs to be done in the wake of the pandemic. Now more than ever, health technology and innovations have an important role in addressing the challenges that remain.

Addressing these challenges through innovation and technology

Digital technology (telemedicine)

Advancements in digital health technology have been at the forefront of the healthcare discussion since the covid-19 pandemic catapulted the use of digital tech to heights never seen before. Telephone and video calls became the main outlets to communicate with families, friends and colleagues during times of isolation. Telemedicine, in particular, became more widely accepted by both patients and healthcare professionals as a way to access care.

In April 2020, amid the height of the pandemic, hospitals in the US experienced an 80% reduction in in-person visits, with mass migration to teleconsultations.[29] Teleconsultations also increased in ambulatory care; for example, in one large health system in New York they increased from below 50 a day to 1,000 a day.[29] Lower acuity emergency care is now capable of being delivered virtually, and UCCs have seen an increased uptake of telemedicine consultations since the beginning of the pandemic. Interviews with clinicians suggest that teleconsultations are beneficial to patients because of their convenience—patients do not have to leave home or take time off work to attend, and can access timely care.[30] They may also avoid some of the costs associated with in-person visits.[30]

As a result of its convenience for patients and success during the trials of the pandemic, it is likely that telemedicine use in outpatient care will continue to be used to complement in-person care in the future.[30] As the world moves forward post-pandemic, telemedicine also offers the opportunity to address the persistent challenges of accessing outpatient care. In rural health deserts, where provider shortages exist, telemedicine use can enable patients to access these services and build relationships and trust with their healthcare providers.[31] The use of telemedicine has the potential to increase efficiency and safety by helping people better manage their conditions and medicines, reducing unnecessary emergency department visits and facilitating timely hospital discharge.[32]

Dr Barnett raises the point that telemedicine services benefit "people who are very busy [during working hours], people who live far away, or for whom transportation is very taxing, difficult or expensive." He also mentions that healthy individuals who are proactive about their healthcare and do not need close management may find telemedicine services more convenient. Telehealth may also be particularly useful in certain sectors, he explains:

"I do think telehealth is here to stay, but it's going to remain [a relatively] smaller segment of overall care that's being delivered, except potentially in places like mental health, where I think adoption is going to be much larger."

However, telemedicine is not without its challenges. In the US, lack of connectivity to the internet or cellular service is one barrier preventing adoption and use of telemedicine services. Although connectivity and ownership of laptops and mobile devices has improved, connectivity remains an issue in some areas of the country.[33] According to a survey by the Pew Research Center, despite improvements in connectivity in rural areas only 72% of rural residents in the US reported having access to broadband internet at home in early 2021, compared with 77% of urban residents.[34] Dr Blumenthal states that many rural areas, including those that are relatively well off, lack the infrastructure for internet access: "[There are] not enough users make it worth the investment [for the] cable providers. So it has to be done by the government."

Disparities in the ability to access and use telemedicine services may perpetuate health inequalities between populations. Analysis of the weekly National Household Survey 2021 by the Assistant Secretary for Planning and Evaluation's Office of Health Policy found that uninsured people and those from the north east, mid-west and southern regions of the country were less likely to use telemedicine services.[35] Furthermore, there was evidence of disparities in how different groups access telehealth.[35] Some vulnerable or underserved groups such as Black, Latino or Asian individuals, those with lower household income, lower levels of education, older individuals, and the uninsured were significantly less likely to use video consultations.[35] This may reflect access to broadband or video-enabled devices. Not using video prevents clinicians from noting any visual cues, and research needs to be done to assess the impacts of this on the quality of care.

Those who are less digitally literate, and those with disabilities or cognitive limitations, may also find difficulty accessing, navigating and using telemedicine services. In particular, challenges with digital literacy can disproportionately impact the elderly and those living in poverty.[36] Patients' main concerns and barriers to using digital health platforms include their need for improved digital skills and confidence.[37] "It is up to us as the healthcare establishment to figure out how we make [telemedicine and digital health platforms] more accessible to patients, particularly in the outpatient setting," says Dr Levine.

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David Levine, assistant professor of medicine, Division of General Internal Medicine and Primary Care, Brigham and Women's Hospital

The government is aiming to address this "digital divide" as part of its "Internet for All" initiative, which has allocated US$65bn to ensure that all Americans can access affordable, reliable and high-speed internet.[38] It aims to fund the infrastructure needed for such connectivity, make the internet more affordable, and provide digital skills training and education to low-income populations.[38]

Innovative approaches can also help to optimize the role of telemedicine in the delivery of high-quality care. Dr Levine describes one such approach, which addresses some of the limitations of telemedicine by combining it with in-person care. "Home-based primary care is taking on a new flavor," he says. "There's now even companies that are driving a medical assistant, someone with very little training, who can take vitals, try to read medication labels, maybe give an injection for a vaccination, [and] essentially facilitate the physician [using] a tablet… It could be an exciting way to bring home-based primary care back into the mainstream, for the right patient population."

Mobile health clinics

Technology is also increasing access to outpatient care by facilitating the expansion of mobile health clinics, which provide various outpatient services (urgent care, primary care, health screenings, preventative care, pediatric and dental care) using customized motor vehicles.[39,40] The mobility of these clinics allows them to reach underserved populations, particularly those in rural geographies and those who do not have the connectivity or digital literacy to use telehealth services.

Mobile health clinics are also being used to provide essential care to the uninsured and migrant groups, regardless of financial, insurance or legal status. This is largely due to financial support from philanthropic organizations and the federal government.[40] An evaluation quantifying the reach of 291 mobile health clinics found that 56% targeted uninsured patients, 55% targeted low-income populations, 38% targeted the homeless and 36% targeted rural patients.[40] According to a 2020 report, there were approximately 2,000 active mobile health clinics across the US, providing up to 6.5m visits annually.[41]

Mobile health clinics improve patient outcomes by adapting healthcare delivery to the needs of the community, with a greater focus on health prevention, disease management, diagnostics and screening. This allows optimization of patient care in an outpatient setting, and can limit the patient's need for avoidable emergency department visits and hospitalizations. For example, the Breathmobile Program, a mobile health clinic that treats children and young people with pediatric asthma who are of low-socioeconomic status, reported a 66% decrease in emergency department visits and an 84% decrease in hospitalizations over a one-year period.[42] Upscaling the use of mobile health clinics that target remote and vulnerable populations in the US may be a key mechanism in addressing ongoing access challenges.

Point-of-care testing

The traditional model of medical test processing in outpatient care was primarily based in central laboratories. Health professionals took a sample from the patient, which was then shipped to a laboratory for processing. Alternatively, the patient would need to go to another location to be tested. Processing or analyzing the tests would take at least a few days before the results reached the health professional. The patient might then need to visit their healthcare provider again to receive the results and discuss their options for treatment.

Innovations in point-of-care testing (POCT) have allowed a range of tests to be carried out and processed rapidly during physician visits, meaning that the results can be used to direct patient care in real-time and streamline the patient journey.[43] For this reason, POCT has become more and more popular in outpatient care and it has contributed to growth of the outpatient health sector.[44] For example, Troy Dinkel, chief medical officer and president of the Urgent Care Group, has observed the usefulness of POCT in urgent care when added to other diagnostic modalities including imaging. "[POCT] is very helpful [for shifting care to outpatient settings] and [it is] used extensively," he says. "We plan to roll out more [POCT] capabilities across the states that we serve."

POCT can benefit many segments of outpatient care. For example, in freestanding emergency departments POCT for key blood markers in patients with signs of sepsis or stroke can provide results that inform rapid and appropriate treatment, potentially reducing the patient's risk of suffering severe illness, complications or death.[45-47] In urgent care, the use of POCT can increase diagnostic certainty and improve decision-making, leading to appropriate treatment and referral and reducing unnecessary visits to hospital emergency departments.[45] In the physician's office POCT can be used for the diagnosis and monitoring of chronic conditions to inform more timely clinical management.[48] In rural areas, which are often under-resourced and have limited diagnostic facilities and workforce expertise, POCT can support access to diagnosis.[49] POCT also enables better antibiotic stewardship by reducing unnecessary antibiotic prescriptions.[50]

Kathleen David, associate director of near-patient testing services at TriCore Reference Laboratories has also witnessed the benefits of POCT across differing outpatient settings. She highlights the benefit of POCT in outpatient oncology clinics where patients need to have blood tests to ensure that they are well enough to go ahead with their next round of treatment. "[Which patient wants] to go [into the clinic] twice and wait for an hour or two for results to come from a lab? They want those results right away." POCT can provide these rapid results, meaning that treatment can be provided in the same appointment if the results are favorable.

Alongside the benefit of more streamlined patient care, POCT has the potential to improve patient satisfaction within outpatient care. Studies have suggested that patients having POCT in primary care report greater satisfaction, owing to its convenience compared with laboratory testing.[51,52] In addition, patients also reported greater involvement in their disease management, as faster test turnaround

encouraged better engagement with their physician.[52] Nowadays, "people are more sophisticated about healthcare and they know that [point-of-care tests] exist, and they're asking for them," says Ms David. "They want to know what's behind [physician decisions]."

POCT has real potential to improve patient care across a range of outpatient settings, yet it faces barriers to wide-scale implementation, often the result of reimbursement and regulatory challenges.[46,53-55] The US lacks a consistent reimbursement structure around POCT, as it varies by type of test and insurer.[56] Some common POCT applications have already received reimbursement cuts under the 2014 Protecting Access to Medicare Act (PAMA), as the reimbursement rates reflect costs in high-volume labs where costs are lower than for POCT.[56] Although the cost per test for POCT may be more expensive for POCT than traditional laboratory testing, Ms David suggests that "it could lead to other financial benefits".[46,57,58,50] For example, POCT may help to avoid costs associated with hospitalization, referrals to specialist care, and additional tests.[50,56]

Federal regulation can also play a key role in ensuring that all POCT maintains good quality standards. Simpler POCT falls under the Clinical Laboratory Improvement Amendments (CLIA) "waived" category, and can be performed by facilities with a Certificate of Waiver.[59] These "CLIA-waived" facilities need to agree to comply with manufacturers' instructions for the tests and allow unannounced inspections.[59] More complex POCT is categorized as either of moderate or high complexity, and the facilities performing such testing have to comply with more stringent quality control requirements than CLIA-waived facilities.[59] There have been suggestions that CLIA-waived facilities should require stronger regulation to ensure the quality of the POCT that they provide.

Results of POCT can be less reliable if there is poor handling and maintenance of POCT equipment by untrained staff.[60] As such the International Organization for Standardization (ISO) has put forward standards for quality and competence in performing POCT.[61] The American Association for Clinical Chemistry also provides guidance on the management of POCT.[62] Ms David emphasizes the importance of having coordinators specialized in POCT who can be responsible for oversight and coordination of POCT, as well as providing training for staff in using POCT, and ensuring that POCT is being performed correctly and in a quality-controlled manner.

When implemented and managed properly, the use of high-quality POCT can expedite the patient care pathway by improving accessibility and turnaround of diagnostic testing in outpatient care.

Minimally invasive surgery and ambulatory surgical centers

Innovations have transformed the surgical sphere with the evolution of minimally

invasive surgeries, allowing for procedures to be performed in ambulatory surgical centers (ASCs). ASCs focus on providing same-day surgical procedures, including cardiovascular, orthopedic and gastrointestinal procedures, endoscopic surgery, and cosmetic surgery, among other procedures. There is little downtime following the procedure, as most patients quickly gain sufficient function that an overnight stay is not required and they can instead recover at home.

The ASC market has a projected global compound annual growth rate of 6% between 2018 and 2023.[63] In the fields of cardiology and orthopedics, an average of 64% of surgical procedures are already performed in ambulatory settings in the US.[63] Dr Barnett notes that there has been increased uptake of outpatient knee surgeries as well as a "longstanding movement towards laparoscopy and minimally invasive surgery that enables [people to be treated] as an outpatient."

Costs are reduced in ASCs as there are no overnight stays. ASCs are also less expensive than "day surgeries" that are performed in a hospital. For instance, one study found that performing the same pediatric orthopedic day-surgery at an ASC instead of a hospital resulted in savings of between 17% and 43% for the provider.[64] This was largely due to reduction in the time it took to complete the surgery, reducing both the surgeon's and anesthetist's time required.[64] Reductions in the resources used and total time for surgery can also result in lower prices to the patient.

ASCs can be a more convenient alternative for patients, as elective surgeries are scheduled, delays are minimized, and the centers are often more conveniently located than hospitals.[63] They also have the potential to redirect the flow of patients requiring surgical procedures away from overcrowded hospitals that are high-risk zones for hospital-acquired infections. In addition, they have been shown to improve patient outcomes for some surgeries by reducing post-operative complications.[65] For example, research published in Bone and Joint Surgery, a medical journal, found that patients who underwent ankle fracture surgery in an outpatient setting had lower rates of post-operative urinary tract infection, pneumonia, venous thromboembolic events and bleeding in comparison to similar patients who had the surgery within in-patient hospital settings.[66]

Patient archetypes

Below are some patient archetypes that illustrate some potential benefits of these innovative outpatient approaches.

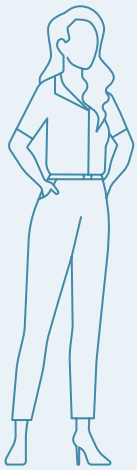
Patient archetype 1: POCT and urgent care center

- Thirty-six-year-old working professional with two school-aged children, living in New York City
- Has been experiencing a sore throat, which came on quickly a few days ago, and also has a fever
- Works in a stressful and fast-paced job that requires frequent travel, and when she is not working, she is busy taking her children to activities

ANNA

Innovative approach:

Anna attends an urgent care center, as her symptoms have not improved with over-the-counter medications. She sees a nurse practitioner who asks her questions about her symptoms and her medical history, and takes her vital signs. The nurse practitioner also takes a swab sample from Anna's throat and uses a POCT device to test the swab. Within minutes, Anna is diagnosed with a Streptococcus A infection. The nurse practitioner prescribes antibiotics and advises Anna to seek medical care if her symptoms do not improve after completing the course.



Optimal use of outpatient engagement and resources:

- → Diagnosis and treatment received in one sitting without multiple visits to the clinic
- → POCT enables fast and accurate test results within the clinic setting
- → Urgent care centers offer flexible and accessible appointments for busy working professionals outside of normal working hours
- → Urgent care centers relieve pressure on emergency departments

Patient archetype 2: Telemedicine and mobile health clinics

- Forty-five-year-old farmer, living in rural South Dakota
- Has had moderate asthma for the majority of his adult life, with a history of severe exacerbation
- Is a single parent of two young children and struggles to find someone to look after them when he has to go into hospital
- Cannot afford to leave his farm for long periods of time

MIKE

Innovative approach:

The nearest doctor's office or hospital is a 45-minute drive away from Mike, making it a minimum two-hour round trip for each visit. Mike has been hospitalized five times owing to exacerbation from irregular inhaler use. His doctor has recently switched him from a metered dose to a dry powder inhaler, but Mike is having difficulties using his new inhaler.

Instead of allowing his condition to worsen, he decides to book an online consultation with his doctor. Via video link, his doctors give him tips for improving his inhaler technique and managing his condition. Mike's doctor recommends that he attend a new mobile health clinic set up by their integrated delivery network. Mike starts regularly visiting the clinic when it is nearby and they monitor his condition using peak flow meter and spirometry and share the results with his doctor, bringing him in for a teleconsultation if needed.

Optimal use of outpatient engagement and resources:

- → Remote consultation allows fast and effective care
- → Averting exacerbation and hospital admission through preventative care
- → Efficient and safe prevention of medication misuse
- → Convenient and time-saving for patients with chronic conditions who require regular care

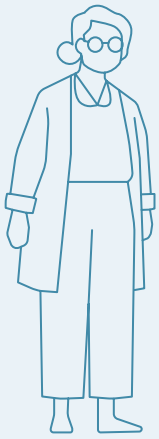
Patient archetype 3: Ambulatory surgical center

- Sixty-five-year-old, experiencing knee pain following a recent fall
- Recently retired, lives at home with her husband
- Enjoys active hobbies and playing with her grandchildren, so she wants to get back to being fully mobile as soon as possible

SUSAN

Innovative approach:

Susan sees a physician for her knee pain and is diagnosed with a meniscus tear. She successfully undergoes keyhole meniscus repair surgery at an ASC instead of being admitted to the hospital for the procedure. Before going home on the same day, Susan sees a nurse who educates her on the post-op recovery, including looking out for signs of infection and blood clots, and how to mobilize with crutches. When Susan is at home, she receives physical therapy to improve her mobility and regain independence: this varies between video consultations and home visits. Later that week, Susan receives a video consultation with her surgeon where she discusses her progress post-surgery and any concerns. She adheres to her rehabilitation exercises and gradually builds up her mobility. By three months after surgery she can start to return to her normal activities.



Optimal use of outpatient engagement and resources:

- → Advances in surgery have led to minimally invasive procedures with less downtime and better patient outcomes
- → ASCs allow patients to return home on the same day as their surgery
- → ASCs less time taken and fewer resources (such as anesthesia) used than inpatient surgery, as the patient recovers at home
- → Lower risk of hospital-acquired infections, therefore optimizing patient outcomes
- → Digital consultations enable health professionals to monitor the patient for risks while being more cost-effective than an inpatient stay

Looking ahead: releasing the full potential of outpatient care

The innovations in technology and healthcare delivery discussed above have the potential to further facilitate a shift in care from inpatient to outpatient settings, as well as optimizing outpatient engagement and use of resources in the US. Use of innovation and technology in the outpatient space can lead to better patient outcomes and experience, better value-for-money healthcare, and improved access to services. An enhanced outpatient system with a diversification of services and delivery of care can expand healthcare access and improve patient outcomes for many Americans, particularly the elderly, rural dwellers, those of low-socioeconomic status and marginalized population groups.

However, there is an opportunity to further implement such innovations and technology to support the expansion of outpatient care. To achieve this, better evidence is needed on the role of these innovations in reducing hospital admissions and optimizing patient care within the outpatient setting. From an economic perspective, the integration of these innovations and technologies can lead to more affordable care, therefore encouraging patients to shift to outpatient services where possible. The affordability of these innovations can also benefit providers working under payment models, such as Accountable Care Organizations (ACOs), who are rewarded with bonuses for keeping the cost of care low and penalized for providing low-value, high-cost care.[67] However, political, financial and reimbursement systems must change with the times to approve and reimburse new technologies and innovative care delivery mechanisms that are proven to reduce the costs of care and improve patient outcomes.

With the complexity of the fragmented US health system, financing and reimbursement systems must be flexible enough to accommodate the growing number of innovative services and approaches to care. This should also reflect the growing societal need and preference for outpatient care. Payers and reimbursement systems should proactively identify and provide coverage for delivery systems that offer more cost-effective outpatient care and better patient health outcomes. This is particularly important as the system moves from fee-for-service towards a more value-based approach to care.[68]

The adoption of technology in outpatient care has been accelerated since the covid-19 pandemic. During this time, changes to the Health Insurance Portability and Accountability Act (HIPAA) privacy requirements have encouraged greater health coverage of telemedicine services by insurers, as well as greater Medicaid and Medicare access, owing to the increased demand for remote services.[69,70] Reimbursement for telemedicine services has improved for the Medicare program, and state governments have made further modifications relating to provider licensing, reimbursement rates, online prescribing and written consent.[70-72] However, reimbursement policies across private insurers are significantly more varied at the state level.[70]

A lot of the leniencies that have been introduced into the regulatory structures are very much bound to the public health emergency and so once that ends, nobody really knows what's going to be happening.

David Levine, assistant professor of medicine, Division of General Internal Medicine and Primary Care, Brigham and Women's Hospital

Dr Levine says that it remains to be seen whether these changes in policy and reimbursement will continue past the pandemic: "A lot of the leniencies that have been introduced into the regulatory structures are very much bound to the public health emergency and so once that ends, nobody really knows what's going to be happening. There may be a cliff on all of these new kinds of innovative services we've started to introduce."

Reimbursement rates for new technologies and innovations that are efficient and cost-effective, should be set with the intention of attracting and motivating providers to use them. For example, Dr Barnett states that, if it is reimbursed at a lower rate than in-person consultations, the use of telemedicine "might go down to a single-digit percentage" after the pandemic. He notes that there are ongoing debates about "whether or not [telemedicine] should be reimbursed at an equal level [to in-person care]."

Additionally, the significant PAMA reimbursement cuts may discourage providers from using POCT, owing to the higher cost of these tests.[56] Many providers may no longer see POCT as a cost-effective tool and it may be delivered at cost or with a very small margin to the provider.[56,73] Ultimately, if providers are discouraged from using POCT, patients will be faced with additional barriers to clinical testing, which could disproportionately impact those in rural and underserved areas, and the potential benefits of rapid testing in streamlining patient care in outpatient settings would not be realized.[73] Stakeholders such as the American Medical Association and the American Association for Clinical Chemistry are calling for the collection of additional data to get a better understanding of costs of testing in different settings before decision makers set reimbursement rates.[56,73]

One prominent barrier to enhanced collaboration is the lack of integrated IT systems and EHR that facilitate data sharing across providers. According to Dr Levine, there have been successful health information exchanges across the country, "but, at best they're regional, if not just city based, and they are so segregated from one another." A national EHR system that is accessible to patients and providers would streamline administrative procedures, encourage appropriate care, promote less resource use and could translate into improved patient outcomes.[74]

Dr Blumenthal, a former National Coordinator for Health Information Technology, states that, in the US, "digitization enables a level of coordination that we have never seen before". However, there "has to be interoperability between the technologies used by different providers in the outpatient domain," he says. He argues that interoperability across the

healthcare sector, not only in digitization, would enhance the quality of care and reduce the cost of outpatient services.

"Maintaining a central health information repository would make everything faster," adds Dr Dinkel. "[For example] it would mean the primary care doctor knows exactly what was done in urgent care." Standardized electronic tracking can also aid in enabling correct billing and reimbursement for services and tools used. But this would need to be incentivized by the federal government, says Dr Levine. "Short of a central mandate, I don't think the market would push itself to share the data."

Data suggest that if a standardized EHR system were implemented and use was encouraged by providers, patient uptake would be high. For example, an Office of the National Coordinator for Health IT data brief shows that uptake among individuals offered a patient portal was high, with six in ten accessing it at least once during the year.[75] Additionally, 71% of patients who were encouraged to do so by their providers accessed the portal, compared with only 48% of people who were not.[75]

If implemented, such strategies may allow technologies, such as telehealth and POCT, and innovations in healthcare delivery mechanisms, such as those seen in mobile health clinics and ambulatory surgical centers, to achieve further impact. However, achieving interoperability and coordination across providers, payers, government and patients will not be easy. Healthcare providers and payers are profit motivated, and Dr Blumenthal says that there is little incentive to share information with competitors. In addition, Dr Levine emphasizes the need to train healthcare practitioners to use digital systems. "There's basically a whole generation of physicians who retired early because of the EHR," he says.

Centralized data repository systems also generate privacy concerns. Dr Dinkel states that a "secure health information exchange" is essential to ensure that there are no risks of privacy being violated or information falling into the wrong hands.

Conclusion

Care is increasingly shifting from inpatient to outpatient settings. Where patient outcomes can be maintained or improved in the outpatient setting, the trend provides an opportunity for cost saving, reduced resource use and time saving. It can also take the load off overburdened inpatient settings and emergency departments.

However, challenges exist in accessing outpatient care, yet recent experiences from the covid-19 pandemic have shown that the uptake of new technologies and modes of care delivery present new opportunities to make outpatient care more accessible, efficient and cost-effective. Providers, payers and patients should take advantage of the momentum that has been building to integrate further and upscale the use of these technologies and delivery systems in outpatient care.

Telemedicine use in the outpatient setting, which was accelerated during the pandemic, can be especially useful in improving access to outpatient services, particularly for populations living in rural areas. It increases convenience for patients and can help them to manage their conditions remotely, potentially preventing unnecessary hospital admissions.

Mobile health clinics in specialized vehicles provide access to outpatient services, which can also benefit rural communities and those living in underserved areas. They could be particularly instrumental for groups with low digital literacy or those living in areas of low connectivity, where telemedicine utility is limited. They also offer a mechanism to reach vulnerable and disadvantaged populations.

POCT can allow rapid diagnosis, which enables fast treatment. This can, in turn, prevent unnecessary hospital admission and aid in distinguishing the source of a health issue in people who have multiple health conditions or vague symptoms. Finally, ambulatory surgery has gained popularity. ASCs provide numerous benefits, including cost-effective and time-saving care, convenience to the patient and reduced pressure on hospitals.

The integration and upscaling of these technologies and innovations in outpatient care in the US have a long way to go. For this to succeed, system-wide changes are needed. For example, financing and reimbursement systems must be flexible to accommodate new technologies and innovations that benefit patients and reduce overall costs.

Collaboration between providers, payers, and patients is essential to streamlining patient care and improving the impact of these innovations. Low-cost care packages, integrated health clinics and integrated IT systems using standardized EHRs may facilitate such collaboration.

Ensuring more comprehensive access to and utilization of outpatient services will promote better health outcomes and reduce costs for patients and the healthcare system. Improving the implementation of technologies and innovations that transform care delivery will broaden access and offer a promising future for outpatient care in the US.

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