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Opportunities for Technology-Enabled Care: Economic and Payment Issues

Leveraging technology to meet patient and provider needs for high-valued and coordinated care to improve health outcomes

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KEY POINTS

- Technology-enabled care (TEC) provides opportunity to advance ways patients receive healthcare.
- TEC uses digital tools and software solutions to deliver improved healthcare services. TEC can include use of artificial intelligence (AI), telehealth and virtual platforms, wearable devices, and remote monitoring technologies.
- These tools allow patients and providers flexibility to see objective data from patients through digital platforms.
- AI has the potential to streamline clinical practice as well as enhance diagnosis and treatment.
- Evidence of success in cardiometabolic, musculoskeletal, and mental health conditions exists, though long-term engagement and varied intervention design remain limitations.
- Further evidence is needed to evaluate economic impacts, such as upfront costs, clinical practice operating costs, and overall health system savings.
- TEC has the potential to make health care more accessible, efficient, and effective. The impact of technology on total health spending and outcomes will depend on the incentives embedded in the payment system. Fee for service payment for TEC carries a significant risk of increasing utilization and spending, as efficiency gains from technology can translate into greater billable volume rather than lower costs.
- Payers and health care systems can test new payment models – such as for outcomes-aligned payment -- to leverage TEC interventions paired with financial incentives to encourage the adoption of TEC that improves patients' health and health outcomes.

INTRODUCTION

Technology-enabled healthcare (TEC) uses digital tools and software to improve the delivery of healthcare services and includes a range of services, such as telehealth and remote patient monitoring (RPM), as well as technologies, such as electronic health records, wearables, and artificial intelligence (AI). TEC offers opportunities to advance the way patients receive healthcare beyond traditional care delivery. TEC can support cross-sector healthcare services, a modernized health system and data infrastructure. This paired with improved financing models is needed to build a more integrated and resilient health systems capable of addressing preventable deaths and improving overall health.[1] This enables patients, caregivers, providers, and healthcare organizations to leverage digital and person-generated health data from telehealth and virtual care platforms, wearable devices, and RPM technology to inform on patient treatment plans.[2-4]

Collectively, chronic conditions, including cardiometabolic, chronic musculoskeletal pain, and behavioral health conditions, are among the leading causes of morbidity, mortality, and cost the U.S. an estimated $1.1 trillion each year in direct health care spending.[5-7] Lifestyle factors such as inactivity, poor nutrition, and substance use increase the risk of chronic conditions, while conditions like high blood pressure, high cholesterol, and obesity further contribute to the development of cardiovascular disease, diabetes, and arthritis.[8] Evidence across multiple domains demonstrates clinically meaningful improvements in health outcomes using TEC interventions, though heterogeneity in intervention design and long-term engagement remain key limitations.

The systemwide adoption and efficient use of TEC will depend on gaining quality evidence of its economic impact and implementing appropriate payment methods. TEC also has the potential to affect overall health costs. Providers will face upfront costs to set up TEC interventions but also potentially see cost savings from streamlined administrative processes and more AI integration within the healthcare system.[9] In addition, health system savings from reduced utilization are possible. While there are a growing number of promising economic studies related to AI and TEC, methodological issues limit their ability to fully inform decision making. Likewise, there are many questions concerning the best payment methods to adequately reimburse innovation while incentivizing efficient use.[10] These uncertainties provide a natural opportunity for testing value-based care (VBC) models to provide additional evidence for TEC advancements. In this Issue Brief, we describe TEC, the economic and payment issues, and the potential for value-based models of care.

WHAT IS TECHNOLOGY-ENABLED CARE?

The adoption of TEC represents a fundamental shift from traditional, paper-based healthcare systems to integrated digital ecosystems that leverage internet-connected equipment, software solutions, and hardware devices to optimize clinical decision-making, improved patient outcomes, and enhance operational efficiency.[11,12] TEC encompasses various digital healthcare delivery methods, including telehealth (e.g., telecare, telemedicine), mobile health (mHealth), digital health, and eHealth.[11] This transformation has been revolutionary, characterized by the convergence of big data, analytics, Internet of Medical Things (IoMT), and AI, to advance the development of patient-centric healthcare systems where digital and objective data become accessible to both caregivers and patients.[13] The infrastructure supporting TEC includes both software such as health apps and EHR systems, and hardware devices including mobile diagnostic tools, RPM systems, and wearable technology, all enabled by advances in mobile computing, cloud infrastructure, AI, robotic systems, and advanced analytics.[11]

At its core, TEC relies on a digital information ecosystem consisting of complex networks of digital technologies and protocols responsible for the generation, updating, transmission, and exchange of information across stakeholders along a patient care pathway.[14] This ecosystem encompasses all activities from diagnosis to treatment and follow-up, supporting both synchronous and asynchronous communications across patients, clinicians, and healthcare organizations. Furthermore, the plethora of data collected through TEC has facilitated the transformative impact of AI in healthcare delivery, creating algorithms that learn from millions of patient interactions to improve diagnostic accuracy and treatment efficacy. However, TEC encompasses a diverse array of technological modalities, each designed to address specific healthcare needs and contexts.

Types of Technology

Many opportunities exist for applying technology in support of improved chronic condition outcomes. Technology is helpful for care needs and coordination across the health system, including clinical decision support systems (CDSS), clinical information, self-management, and delivery system design. These support an informed, activated patient and a prepared, proactive practice team that can lead to good clinical, cost, and functional outcomes.[15] These enhancements can support patients within and across the care continuum as the patient moves from their community and primary care for prevention and diagnosis, to treatment with specialists, within hospitals and end-of-life care.

Telehealth and Virtual Care Platforms: Telehealth refers to the application of digital communications and information systems to facilitate remote delivery of clinical care, enable health education for both patients and healthcare professionals, support public health initiatives, and assist in healthcare management functions.[16] Telehealth encompasses two main delivery modalities: (1) live synchronous videoconferencing provides real-time, two-way audiovisual links between patients and care providers, enabling virtual consultations that closely approximate in-person visits; and (2) asynchronous videoconferencing allows transmission of recorded health history, images, and other data to health practitioners for review and diagnosis later.

Remote Monitoring Technologies: RPM uses connected electronic tools to record personal health and medical data in one location for review by providers in another location.[2] The recent expansion of RPM is driven by aging populations, the versatility of systems beyond acute care settings, and optimization of hospital resource allocation. Modern RPM systems integrate biosensors for real-time vital signs monitoring with sophisticated data visualization platforms that enable healthcare efficacy, facilitating rapid clinical decision making through intuitive access to vital signs and trends.[4] The big data generated from the wearables creates opportunities for real-time clinical decision making and intervention. RPM systems typically employ contact-based sensors to collect physiological data, which is then transmitted through wireless communications networks to centralized monitoring systems.

Wearable devices fundamentally have changed how health related data is collected and analyzed. For example, the 2018 release of the first direct-to-consumer product with FDA-approved built-in electrocardiogram functionality signaled high interest from technology companies entering the healthcare market.[17] Generally, wearable devices and digital health software transformed medical practice and clinical research by enabling continuous, real-world data collection outside traditional healthcare settings. They are a major tool in developing digital, personalized preventive medicine.[3]

Robotics and Intelligent Automation: Robotics and intelligent automation are increasingly transforming healthcare delivery by augmenting clinical capabilities and streamlining operational workflows. Service robots now perform diverse functions including medication dispensing, supply delivery, and reducing manual workload while minimizing human error. In clinical settings, surgical robots enable minimally invasive procedures with enhanced precision, while rehabilitation robots provide consistent, data-driven therapy for patients recovering from strokes or injuries.[18] These systems not only improve operational efficiency but also address critical workforce challenges by automating routine tasks, allowing healthcare professionals to focus on complex clinical decision making and direct patient care. As robotic technologies continue to evolve with increasingly sophisticated AI integration, their role in supporting safer, more efficient, and more accessible healthcare delivery will expand significantly.

Roles of Artificial Intelligence (AI)

AI assumes a multifaceted role within the healthcare sector, encompassing applications in clinical decision-making, hospital operations, medical imaging and diagnostics, as well as patient care and monitoring.[19]

Clinical Application of AI: AI technologies are making significant impacts across clinical domains. In medical imaging, deep learning algorithms analyze complex features in imaging data, improving image acquisition, providing real-time assessments of image quality, and aiding in objective diagnoses.[14] Technology can also be used in pathology and diagnostic procedures to improve options that are non-invasive, accessible, and provide early detection. In clinical settings, the use of AI has revolutionized the continuum of care, demonstrating transformative impact in cancer detection, diabetes management, cardiovascular disease prediction, and neurological disease diagnosis and management.[20] These AI applications have enhanced diagnosis accuracy, enabled early intervention, and facilitated personalized treatment strategies that improve patient outcomes.

Administrative and operational AI applications: In some cases, AI significantly reduces administrative burden through automation of routine tasks. Ambient clinical intelligence, such as real-time transcription of patient-provider interactions, uses natural language processing (NLP) technology to automate documentation of patient visits in electronic health records, optimizing clinical workflow and enabling clinicians to focus on patient care rather than data entry.[21] Large language models like ChatGPT-5 have demonstrated potential to draft responses to patient inbox messages, improving clinician well-being by reducing workload while enhancing consistency, informativeness, and educational value of response.[14]

Patient Engagement Support: AI-driven chatbots enhance patient management and healthcare workflow, offering solutions for acute care triaging, chronic condition management, and telehealth services.[22] These systems can integrate with wearable devices and ambient sensing technologies for remote monitoring of sleep, heartrate, and behavior patterns, enabling proactive interventions.[23] The integration of patient-reported outcome measures into AI-enabled processes personalizes and humanizes healthcare. AI algorithms increasingly process patient-reported outcome measures (PROM) data in real-time and suggest adjustments to care plan. Machine learning that incorporates PROM and clinical data has successfully been used to create a shared decision-making tool that provides personalized predictions of risks and benefits for total joint replacement.[14,24]

The technologies and AI applications described above represent powerful tools for transforming healthcare delivery, but their potential can only be realized through thoughtful integration into clinical workflows. Effective technology integration requires more than technical implementation; it demands comprehensive workflow redesign, stakeholder engagement, change management, and continuous evaluation.[25]

POTENTIAL IMPACTS OF TECHNOLOGY-ENABLED CARE ON PATIENT CARE

TEC can have a positive impact on patient care through improved patient-provider interactions, more streamlined diagnosis and treatment, and improved continuity of care. This section includes examples of TEC interventions for chronic conditions that have shown promising results.

Impacts of Technology on Workflow and Patient-Provider Interactions

Technology can support patient-provider interactions and the clinical workflow improving efficiency and outcomes. AI technologies can enhance care through tools that can help providers offer personalized treatment recommendations and enable patient monitoring to enhance patients' knowledge and ability to make informed decisions. For example, recent evidence suggests that patients found AI-generated clinical messages more detailed and empathic than clinician written notes.[26] However, constraints like algorithmic bias, patients' distrust in AI recommendations, and the risks of combining AI systems with the existing healthcare infrastructure hinder adoption and trust of these AI technologies. Promoting open, evidence-based AI models and enabling ethical AI implementation is likely to enhance effectiveness and credibility in helping patients manage chronic conditions.[27]

Tools and support systems improve the ability of providers to engage in high-quality care. CDSS are software programs, often integrated into EHR systems, that aim to improve quality, safety, and efficiency of care by aiding providers in complex decision-making. CDSS has been found to reduce medication or prescription errors, reduce adverse events, and improve adherence to clinical guidelines.[28] These reductions in errors and adverse events can improve the patient experience and the overall quality of care patients receive in healthcare systems.

However, there are notable setbacks in the widespread use of CDSS and shared decision-making tools within a clinical setting. Including a lack of incentives to integrate CDSS into clinical workflows, alert fatigue, information overload, and increase burden on providers.[28] While adoption is growing, there is limited evidence of widespread uptake of these tools as they require both health and computer literacy, buy-in from the provider teams, and integration into the clinical workflows.[29] These unintended consequences should be carefully considered prior to health systems implementing these support tools.

Effects on Continuity of Care, Care Coordination, and Interoperability

TEC can be impactful for continuity of care across care settings for better care coordination and outcomes. For example, TEC enables data collection outside of the clinic visit in the patient's home and community, which can improve diagnostic capabilities and treatment. RPM supports providers in patient engagement by enabling improved data sharing for care decisions and the ability for the provider to customize plans to specific patients to improve their health outcomes. Specifically, RPM may be useful to help patients avoid unnecessary office visits, reduce hospitalizations, and improve control over chronic conditions. [30].[31] While there is some evidence of clinical improvement with RPM, current studies do not establish whether these benefits are cost-effective.[32]

Other AI implementations show promise in improving continuity of care and care coordination. A recent meta-analysis showed that patient use of chatbots and centralized, automated care managers helped care coordinators provide timely services to patients in need of support.[33] Another study showed that AI offers opportunities to proactively measure vitals and assess patients to predict and detect cardiac events earlier.[34] Together, these AI implementations could have the ability to change delivery strategies across healthcare organizations.

Effectiveness of Technology-Enabled Care Interventions for Chronic Conditions

Technology-Enabled Care Interventions for Cardiometabolic Diseases

Cardiometabolic disease, including diabetes, kidney disease, heart attack, and stroke, are significant drivers of mortality and of healthcare costs in the United States.[35,36] Evidence from numerous meta-analyses supports the effectiveness of digital interventions for reducing cardiometabolic risk factors. An analysis of nine mobile-based interventions showed small to moderate reductions in BMI, waist circumference, diastolic blood pressure, and fasting plasma glucose, and an increase in HDL cholesterol.[37] A review of 15 technology-mediated diabetes prevention and weight-loss programs found a mean weight reduction and improved glycemia.[38] Among adults with prediabetes, a pooled analysis of 33 studies demonstrated significant reductions in weight, BMI, waist circumference, blood pressure, and glycemic measures.[39] Earlier web-based interventions for obesity showed short-term improvements in weight and BMI but limited long-term sustainability.[40] In hypertension, a meta-analysis found significant reductions in systolic blood pressure at 6 months and 12 months, though no change in diastolic pressure.[41] Two large-scale remote monitoring studies demonstrated clinically meaningful blood pressure reductions with 50–75% retention rates but with higher dropout rates after one year.[30,42] In one of those studies, rural Medicare participants had higher engagement and similar outcomes compared to non-rural populations.[30]

A meta-analysis of twelve international studies on type 2 diabetes showed that digital self-monitoring of blood glucose significantly improved hemoglobin A1C and fasting blood sugar compared to controls.[43] There is evidence that digital technology could improve access and use of cardiac rehabilitation, a proven intervention with persistently low enrollment due to logistical and economic barriers.[44] For example, home-based and telehealth cardiac rehabilitation were found to be superior to usual care and equivalent to center-based programs, improving six-minute walk tests, physical activity, and depressive symptoms.[45-47] For chronic kidney disease, evidence for TEC is more limited. Multiple meta-analyses found no significant impact on medication use, care delivery, or biomarkers such as creatinine, albumin, and urine protein.[48-50] Some studies, however, identified improvements in diet and nutrition, which are key for slowing disease progression.[50,51]

Another emerging area of innovation in TEC for cardiometabolic disease is the integration of AI to enhance and personalize interventions. Although the rapid advancements of AI technologies have outpaced clinical evaluation, early studies suggest promising applications.[52] AI-driven models have shown potential to improve cardiovascular risk prediction beyond traditional calculators and to personalize treatment plans, such as tailoring blood pressure control targets or predicting response to specific antihypertensive medications.[53-56] However, most current studies rely on retrospective analysis within single health systems or clinical trials, underscoring the need for prospective validation and real-world implementation studies. Beyond predictive analytics, a meta-analysis found that chatbot-based interventions produced measurable improvements in physical activity levels, fruit and vegetable consumption, and sleep quality.[57] While these findings highlight the potential for scalable, low-cost engagement tools, ensuring transparency and explainability is critical to ensure trustworthiness and clinical adoption of AI models.

Overall, TEC interventions for cardiometabolic disease consistently demonstrate moderate short-term improvements in metabolic outcomes, particularly for diabetes, hypertension, and cardiac rehabilitation. Long-term efficacy and sustained engagement remain areas for future study.

Technology-Enabled Care Interventions for Musculoskeletal Conditions

Chronic musculoskeletal conditions, defined as chronic pain affecting the muscles, bones, joints, or tendons, is a significant driver of disability and of healthcare costs.[58-60] Traditional rehabilitation models often depend on in-person visits, which can limit accessibility, especially for rural patients. TEC interventions, including telerehabilitation and eHealth-based physical therapy, are emerging as scalable alternatives. Two meta-analyses found moderate-quality evidence that TEC interventions effectively reduce pain and improve physical functioning across a range of musculoskeletal conditions.[61,62] For chronic lower back pain, a pooled analysis found that telehealth interventions alone were no more effective than minimal interventions, though benefit was observed when combined with usual care in recent-onset cases.[63] A more recent review found a small improvement in pain reduction from TEC rehabilitation interventions compared to conventional rehabilitation for chronic pain with the greatest improvement in the first month.[64] An additional meta-analysis of unguided eHealth applications found short- and intermediate-term benefits for pain intensity and small short-term effects on depression, self-efficacy, and pain catastrophizing, though not on disability or physical functioning.[65] Evidence on the effectiveness of AI-assisted digital health interventions remains limited; a recent analysis found no significant impact of AI-assisted physiotherapy interventions for patients with non-specific lower back pain.[66] Limitations across these studies include heterogeneity in intervention design and duration, small sample sizes, and the inability to blind participants, which may introduce bias.

Technology-Enabled Care Interventions for Mental Health

Mental health disorders, particularly depression and anxiety, are increasingly prevalent and disproportionately represented in healthcare spending among Medicare beneficiaries.[67] Evidence from 20 randomized control trials shows that telebehavioral health is as effective as in-person therapy for reducing depressive and anxiety symptoms.[68] Multiple meta-analyses focusing on older adults similarly demonstrate significant improvements in depression and anxiety with telemedicine-based care.[68-70] In addition, an analyses of smartphone and app-supported interventions report positive mental health outcomes, suggesting that digital modalities can extend access to care while maintaining clinical effectiveness.[71] Finally, a meta-analysis of self-administered NLP–

based interventions found them to be more effective than information or psychoeducation and no-intervention controls for treating depression and anxiety, though the certainty of evidence remains limited due to potential bias and heterogeneity.[72]

Synthesis and Key Gaps

Across conditions, TEC interventions show consistent short- to medium-term benefits for improving metabolic, physical, and mental health outcomes. However, the sustainability of outcomes beyond one year remains unclear, and engagement continues to decline over time. Evidence, heterogeneity, lack of standardized outcome measures, and limited head-to-head comparisons with in-person care constrain generalizability.

TECHNOLOGY-ENABLED CARE: ECONOMIC ISSUES

TEC, such as AI, has the potential to significantly impact both the cost of providing healthcare and healthcare outcomes. The widespread adoption and effective use of TEC will depend on decisions made by providers, payers and patients. It is critical at all levels of decision making, therefore, to be informed by the best evidence available on the overall economic impact of AI and other technology-based care enhancements. In this section we examine the current evidence related to potential impacts on costs and healthcare spending as well as potential effect on quality of care and health outcomes. The section emphasizes these issues for AI because much of the available evidence is in this area. In the following section, we discuss the payment issues that will be critical to the adoption, efficient use and overall spending impact of TEC.

Potential Cost and Expenditure Impacts

A complete economic analysis of TEC would include all relevant costs, potential cost reductions, and potential impacts on health outcomes. TEC has the potential to affect the cost of producing care at the provider level as well as spending by patients, purchasers and third-party payers. Relevant economic factors include the upfront costs to providers of implementing AI and TEC, the potential favorable impact of practice operation and costs, and the potential net impact on utilization spending.

Potential Impact on Provider Costs

The implementation of AI in healthcare systems necessitates substantial investment in both technological infrastructure and human resources. Providers will face upfront implementation costs as well as ongoing costs associated with employing AI and other digital services. These include:

- the costs of purchasing or licensing technologies
- integrating AI software with existing clinical workflows and data systems
- ongoing maintenance costs
- costs associated with training staff and educating patients on using the technologies[73]

For AI, these costs can vary substantially depending on the type of technology: generative or predictive, off-the-shelf or customized, available infrastructure (computational power and data storage), degree of integration with other systems and devices, and staff training requirements. Estimates range from $40,000 to $500,000 for generative or predicative AI and can be much higher for more complex uses such as robotic surgery.[74]

In contrast, there are a number of potential cost savings at the provider level to offset the upfront costs. These include the ability of AI to streamline administrative processes such as billing, claims processing, scheduling, and supply chain management. All these factors can reduce direct costs as well as improve staff productivity since they have more time to spend on care processes, quality, and patient satisfaction.[75]

Potential Reductions in Health System Spending

Changes in health system spending might result from two general sources: reducing administrative costs and reduced utilization from improvements in diagnostic and therapeutic interventions. It was estimated that almost one quarter of U.S. health spending is wasteful.[76] A share of the wasted spending can be attributed to the health system's high administrative costs.[75] AI and other technologies have the potential to significantly reduce these costs.

The second source of system savings would result from AI's ability to assist and enhance the clinical expertise of providers. AI can assist providers by organizing and structuring vast amounts of administrative and individual patient data collected, such as from wearable devices and implants, to personalize medical treatment plans. These newly organized data can help patients learn more about their body and conditions to take control of their health and their healthcare journey. In addition, AI algorithms can support an earlier and more accurate diagnosis of medical conditions and to minimize diagnostic errors– enabling earlier intervention and tailored treatment regimens.[77] The improved diagnostics and preventive care can prevent disease progression that increases utilization and spending. This improved diagnostics and preventive care can prevent disease progression that increases utilization and spending. In addition, improved patient safety, such as predicting sepsis or fall risk, can reduce utilization of unnecessary services. These same AI impacts can improve other measures of health outcomes such as quality-of-life indicators, patient reported health and patient reported experiences with care.

Recent systematic reviews examined the cost effectiveness and budget impact of AI use in healthcare.[73,78] The included studies varied in terms of country, diagnostic and therapeutic services studied and patient populations, and they found savings from AI resulted from improved diagnostic accuracy, reduced readmissions, and reductions in intensive care unit days. A recent study estimated that wider adoption of AI could lead to savings of 5 to 10% equating to $200-$360 billion annually in 2019 dollars.[9]

Potential Increases in Healthcare Spending from AI Use

Technological innovation, including artificial intelligence (AI), has the potential to make health care more accessible, efficient, and effective. Yet the impact of technology on total health spending and patient outcomes will depend on the incentives embedded in the payment system we implement for these services. Technology use is driven by the incentives of the people and systems that deploy it. In the dominant fee-for-service (FFS) environment, there is a strong incentive to increase the volume and intensity of billable services. Indeed, in contrast to the potential savings described above, emerging evidence suggests that FFS payment arrangements provide opportunities for spending increases that are directly related to the wider use of AI. These include increased provider capacity for billable services, coding enhancements and utilization effects for newly paid services.

One of the fastest-growing use cases for AI is freeing clinicians from non-reimbursed work (e.g., charting, billing-related activities, patient messaging). This reclaimed time—as much as 25 percent of provider workload—is frequently being redirected toward billable clinical services.[79,80] Other estimates suggest AI can increase encounter volumes by 20-29% per user, delivering an incremental $58K – $84K in annual revenue per user.[81] In addition, AI may result in coding and documentation that increase payment–for example, increasing the number of visits that are coded at a higher level.[82] A recent study found after practices adopted remote patient monitoring (RPM) their Medicare revenues increased by 20% relative to matched practices that did not adapt RPM.[32]

Similar revenue enhancing patterns can occur in value-based contexts as well as FFS, specifically in capitated or shared-risk arrangements. In such a setting, where revenues increase with identified diagnoses, AI "clinical documentation improvement (CDI)" solutions are being heavily deployed to enhance risk adjustment—improving coding completeness and thereby increasing payments.[83,84]

While many of these practices would offset the other savings from employing TEC and AI, freeing provider time for more direct patient care could also produce value through greater access to and quality of care. As discussed below, the payment arrangements implemented for AI and TEC based care would be critical to incentivize high value uses of newly freed provider time and reduce incentives for revenue enhancing coding practices.

TECHNOLOGY-ENABLED CARE: PAYMENT ISSUES

Medicare's Current Payment Policy for Technology-Enabled Care

The payment policies of Medicare, Medicaid, and commercial insurers will have a significant impact on how widely TEC services are adopted, how efficiently they are employed in practice, and whether the clinical transformation that occurs at the provider level translates into overall health system savings. In this section, we will discuss important TEC-related payment issues, including whether fee for service of alternative payment models and value-based contracting might be more appropriate.

Medicare and other payers continually face challenges with how to pay for effective new technologies. A key challenge is finding a payment method and amount that provides value to the program and its beneficiaries while encouraging the system to engage in the beneficial activity. Specifically, payment should simultaneously reward innovation, incentivize efficient use and provide adequate access to the technology by patients. Threading this needle may be particularly challenging for AI-related services. For example, as detailed above, there are upfront and continuing costs to providers using AI, but the potential for significant savings to develop over time. Moreover, if used appropriately, these services have the potential to significantly improve patient outcomes. Payment methods will have to be carefully calibrated to achieve the potential value of these services. Below, we discuss current payment methods, why FFS may not be the appropriate payment platform, and the potential for alternative payment models.

Current Medicare Payment Strategies

Medicare's current fee for service (FFS) payment methods offers several alternatives for reimbursing AI and other TEC devices. For inpatient care, the service can be bundled with the Diagnosis Related Group (DRG) payment for admission or receive an extra payment through a New Technology Add-on Payment (NTAP). Likewise, for hospital outpatient care, these services can be packaged with existing services or receive a Transitional Pass-through payment. Finally, a separate payment code could be created for the Medicare Physician Fee Schedule (MPFS). To date, payments for AI have largely been made through the MPFS and NTAP methods.[85]

Technology-Enabled Care: Fee-For-Service Payment Issues

There is a widespread belief that many of our health system problems–e.g., high cost, disappointing outcomes–are largely the result of the incentives inherent in fee-for-service (FFS) payment.[86,87] FFS rewards quantity over quality, treatment over prevention, and fragmented rather than coordinated care.

As described above, the incentives for overutilization associated with FFS payment may be particularly problematic for AI and TEC in healthcare. Paying for services—whether performed by clinicians or enabled by technology—inherently incentivizes service volume. In traditional care delivery, this incentive is constrained by the finite supply of licensed clinicians and time, but TEC is far less supply-constrained: once developed, software can scale rapidly at minimal marginal cost, allowing rapid activity growth. Within a FFS framework—such as payment per technology-enabled visit, radiology interpretation, or remote monitoring period—this scalability can drive sharp increases in spending without assurance of commensurate value. Historical experience with computer-aided detection in mammography shows how payment expansion can prompt widespread adoption and hundreds of millions in additional annual spending without commensurate improvements in diagnostic accuracy.[88] More recently, early experience with RPM shows similar challenges with activity-based payment for technology.[32,89] In general, when payment is tied to the volume of activities rather than outcomes, technologies that make care delivery more efficient can unintentionally accelerate health care spending.

There are other issues to consider as well. FFS payments are typically based on some measure of cost associated with providing the service. Calculating such payments to "thread the needle" as described above is difficult for most services – for example, in accounting for input market dynamics, changes in cost due to economies of scale and allocation of indirect costs. These issues may be compounded for technology-based care.[90] Individual service payment based on a measure of the service specific cost for providing the procedure (e.g. acquisition costs and physician time) would not capture the potential benefits of AI which should streamline and help coordinate care across all of a patient's healthcare needs. Thus, FFS payment may not reflect service specific cost reductions over time, overall practice cost reductions as described above and health system savings due to better outcomes.

It has also been pointed out that there is circularity between the level of Medicare payment, what the market will bear determining what technology companies charge providers for TEC and the payment method chosen by Medicare.[10] The higher the Medicare payment for a service, the more technology companies will charge providers for their products. In response, Medicare may choose the most generous payment method–separate payment for providing the AI-assisted service. This dynamic raises the possibility of continually escalating prices and growing incentives for overutilization.

Alternative Payment Approaches for Technology-Enabled Care

Currently, organizations capable of providing TEC do not have viable reimbursement pathways for fully employing their services. Based on the above analysis, simple expanding FFS payment methods would not be adequate to assure overall system value that is consistent with AI's potential to improve productivity and quality. Thus, it is a good time to engage these organizations in testing new methods of payment. One approach might be to continue with FFS payment but use more bundling with associated services and mechanisms such as reference pricing.[10] Another option is to include these services in payment arrangements for larger bundles of services. That is, build on the alternative payment models (APMs) already in the field such as the Medicare Shared Savings Program (MSSP) or the CMS Innovation Center's ACO and episode-based models. A third approach that could be combined with the second is to use outcome-aligned pricing (OAP). That is, base the payment on achieving certain outcomes that are responsive to TEC based care.

The latter approach could have several advantages. First, it would encourage providers to use these services efficiently since they could realize increases in net revenue from doing so. Second, it would incentivize providers to obtain better pricing structures from technology providers. Third, as physicians' have time that is freed by effective AI, alternative payment models could incentivize them to use that time in high value activities as opposed to those that enhance FFS revenues. Finally, these models would reduce incentives for upcoding services such as visits. Using OAP methods which would make all or part of the payment dependent on achieving improved outcomes and thus, would enhance incentives to focus TEC on measurable health improvements.

TESTING VALUE-BASED CARE MODELS FOR TECHNOLOGY-ENABLED CARE

The analysis above suggests there is significant potential to use testing for VBC models to help assure TEC reaches its full potential to favorably affect health care. As described above, there are obstacles to the widespread and effective adoption of these technologies into patient care. First, although there are growing number of studies related to the economic impacts and effectiveness of TEC, these studies have many limitations. Current systematic reviews show promising results but there are several gaps and weaknesses in existing studies that should be addressed in further evaluations.[73,78] Thus, the evidence base to inform decision making on employing TEC is neither conclusive nor generalizable. Second, while alternative payment models such as OAPs seem like a better approach for reimbursing TEC, we have little evidence on which of these payment schemes would be most effective for incentivizing its high value use.

Formal model tests, such as those implemented under the authority of the CMS Innovation Center, have several advantages for addressing these issues. In the current statutory payment environment for Medicare, FFS methods are being implemented for TEC and AI on a case-by-case basis, subject to all the technical and incentive issues described above. Fielding alternative payment models allows for the testing and evaluation of a variety of promising payment approaches. Another advantage to testing models including TEC is evidence creation. The model designs and rigorous evaluation methods implemented have the potential to produce high quality evidence on cost and quality impacts, effective TEC strategies and allow for the diffusion of best practices. For such an approach to be effective, however, it cannot operate alongside fee-for-service payment options for similar services that offer comparable or higher reimbursement and/or with less outcome accountability, as those alternatives would weaken incentives to participate in and adhere to an outcome-oriented model.

The CMS Innovation Center is implementing the Advancing Chronic Care with Effective, Scalable Solutions (ACCESS) to test outcomes-aligned payment for TEC. The payment approach will be tested in the Traditional Medicare program with separate clinical tracks for: (1) early cardio-kidney metabolic (eCKM) conditions; (2) cardio-kidney-metabolic (CKM) conditions; (3) musculoskeletal (MSK) conditions; and (4) behavioral health (BH) conditions. For these purposes, a CKM condition is defined as a health disorder attributable to connections among obesity, diabetes, chronic kidney disease (CKD), and cardiovascular disease (CVD), including heart failure, atrial fibrillation, coronary heart disease, stroke, and peripheral artery disease.[91] A CKM condition includes those both at risk for or with existing CVD. ACCESS is designed to increase Medicare beneficiary access to a growing ecosystem of high-value technology-enabled care organizations that deliver integrated care to prevent and treat chronic disease. ACCESS introduces a novel payment approach adapted from the commercial sector, OAPs. Model participants would receive a fixed amount, paid in installments, to manage a patient’s condition over a period of time while holding them accountable for outcomes. The fixed payment will be fully earned only if required clinical outcomes are met.

CONCLUSION

There is a substantial opportunity for TEC to improve value and health outcomes throughout the health care system. There are significant payment policy issues to address so that the potential can be realized through widespread adoption and efficient use of these technologies. Currently, organizations that can provide TEC lack viable reimbursement pathways for fully employing their services. In the current environment, Medicare has implemented FFS payment for a limited number of technologies. For the reasons described in this Brief, it would be extremely difficult to cover and appropriately price all the related services that might be employed. More importantly, FFS payment would risk overutilization and spending increases through revenue enhancing activities. Even alternative payment models that rely on current risk adjustment methods might be subject to AI assisted coding that would increase spending. On the other hand, OAP methods have the potential to incentivize use focused on improving health outcomes and value. The CMS Innovation Center's ACCESS model will provide evidence on the feasibility of OAPs and the effectiveness of TEC.

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