Insight Series

An enterprise approach to unify healthcare

UpToDate Point of Care Report

Insights for healthcare leaders on transforming care, unifying teams, and driving better outcomes for patients and healthcare organizations.

Issue Three
Systems thinking for evidence-based care teams

Wolters Kluwer

Healthcare challenges are systemic—as are the solutions

For healthcare administrators and leaders, the goals are clear: improved care, founded in evidence and ethics, with lower costs and more efficient operations. However, in the face of challenges like rising costs, staff shortages, the use of artificial intelligence (AI), and shifting patient expectations, the burden is often placed on burned-out clinicians, care teams, and professionals to improve outcomes and quality.

The good news is care delivery can be designed differently. Systems thinking is an approach that can help leaders analyze the current environments, interconnected elements, and workflows clinical teams are operating within and identify sustainable opportunities for care improvement.[1] Leaders need to shift away from fixing individual pressure points to improving team-based collaboration that creates better alignment and brings the patient more fully into the care journey. Additionally, this can extend beyond the clinical setting and into the community through partnerships and virtual care to support better patient experiences and improve reach.

This issue of the UpToDate® Point of Care Report supports this systematic approach to care improvement by featuring insights from global users and providers. Data from evidence-based information solutions integrated across care workflows can act as a source of truth—especially in the age of AI—and create a foundation to interconnect teams, patients, locations, and organizations. Approaching clinical information sharing with systems thinking can help transform healthcare through more aligned decision-making.

Topics in this issue include:

- Understanding systems thinking as a framework for improving healthcare operations.
- The current state of fragmented, siloed clinical information across organizations, including AI sources.
- Aligning teams as a strategy for better, more standardized patient care.
- How evidence within care team workflows can be a systemic solution.
- Strategies for building out team-centric care founded in evidence.

"Systems thinking is about designing for the outcome we want—better, more efficient care. By shifting our focus from addressing individual care issues to creating a sustainable, interconnected journey, we can improve patient experiences and outcomes at an organizational level."

Holly Urban, MD, MBA, Vice President,
Business Development-Strategy,
Clinical Effectiveness, Wolters Kluwer Health

Systems thinking: A framework for operational improvement

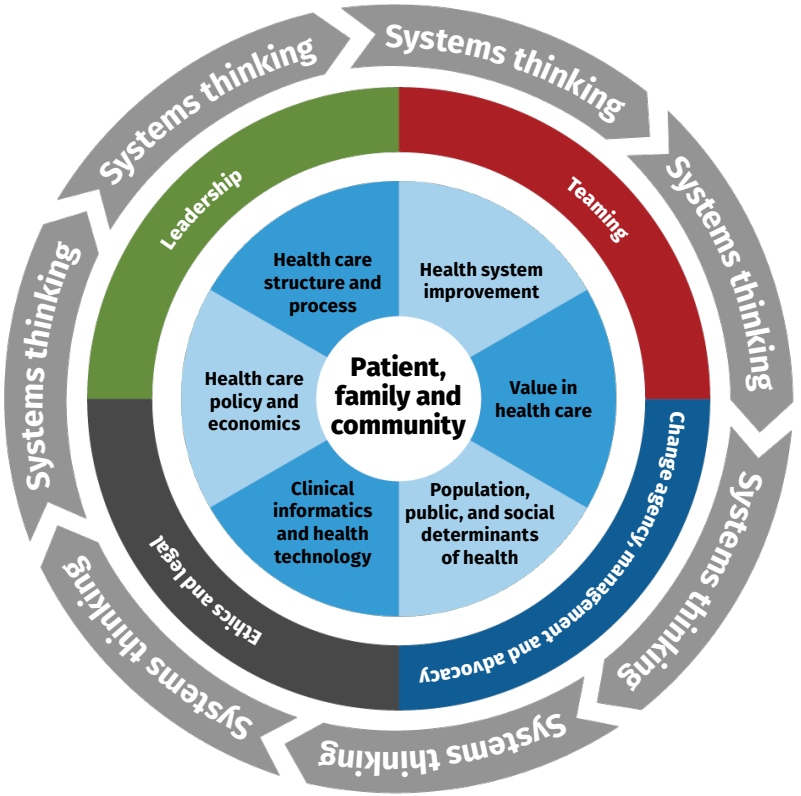
Systems thinking is a conceptual approach for leaders to elevate beyond the daily individual pressure points and address organizational challenges to improve outcomes and operations. It considers actions or changes made in one area of a system will likely affect results in another area.[1] This is an iterative process that identifies triggers, considers the wider ecosystem, and seeks continual improvement.

The healthcare industry is a complex arrangement of people, equipment, processes, and institutions working together. A systems view can help reframe how care is delivered, identify root causes of inefficiencies, and support improvements for better patient health.[2]

Identifying trigger points and interconnecting challenges across the patient journey—like the need for consistency in clinical information between care teams, patients, and community partners—can generate strategies to make incremental changes and leverage existing enterprise tools like electronic health records (EHRs) to create a more connected care experience. However, this needs to be done intentionally and differently from other industries focused more purely on operations—for healthcare, quality and safety are the primary outcomes and must be at the center of all decisions.[3]

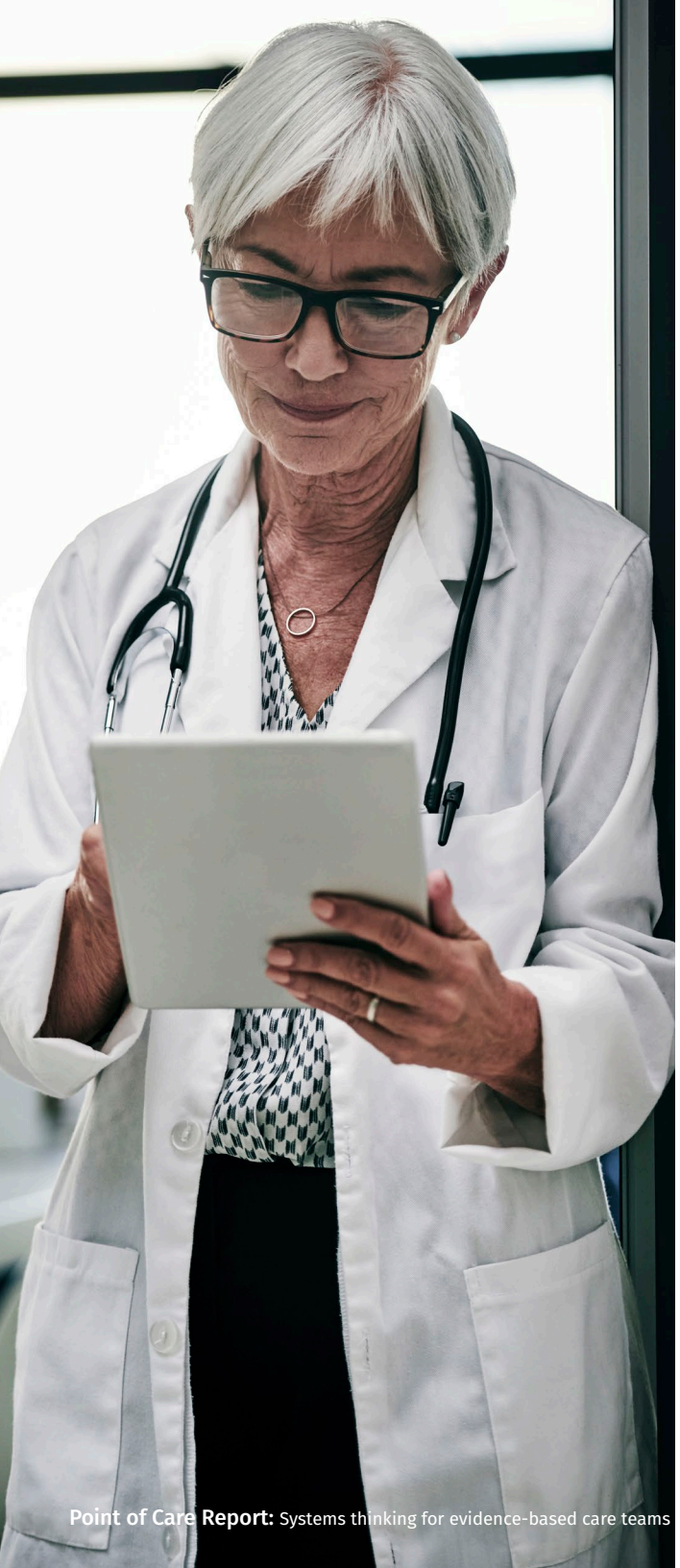
Systems thinking for healthcare

Systems thinking connects the core competencies of a healthcare organization with the goal of improving the care delivery for better patient experiences and health outcomes.[4]



How systems thinking is applied:[5]

1. Seek multiple perspectives
2. Assess current state conditions—demand, capacity, resources, and constraints
3. Analyze the interconnections between elements and workflow
4. Understand why and how the current state exists
5. Explore routine workflows for adjustment opportunities



Systems thinking can give practical direction to leaders

Leveraging systems thinking can provide frameworks and guidance for leaders to consider a more efficient, proactive approach to care. The World Health Organization (WHO) identified a series of global case studies where systems thinking strategies have identified challenges or implemented policies and plans related to preventive care and noncommunicable diseases (NCDs). These include:[6]

- The Public Health Department in Austin, Texas, partnered with the Centers for Disease Control and Prevention (CDC) to model chronic disease risks and align with community action.
- The Australian Systems Approaches to Physical Activity (ASAPa) used a whole-of-systems approach to promote physical activity at the population level.
- New Zealand looked at systemic barriers and equitable interventions to improve vegetable and fruit intake in children.

Practically applying systems thinking to healthcare workflow challenges requires leaders to take a step back, identify trigger incidents, and consider broader operational improvements across the care journey. Examples of trigger scenarios can include:[7]

Public health events: The COVID-19 pandemic exposed healthcare system vulnerabilities. A systems thinking approach can enhance future preparedness by identifying critical points of failure, analyzing patient flow and isolation procedures, and optimizing resource allocation.

Heart failure chronic disease management: Heart failure is one of the most common causes of hospitalization.[8] Systems thinking can help identify at-risk patients, address social determinants of health, and provide patient education to prevent hospital readmissions.

Unwarranted variations in care: Variations in patient care can lead to inconsistent outcomes. By standardizing evidence-based practices and encouraging shared decision-making, providers support more equitable and effective care delivery.

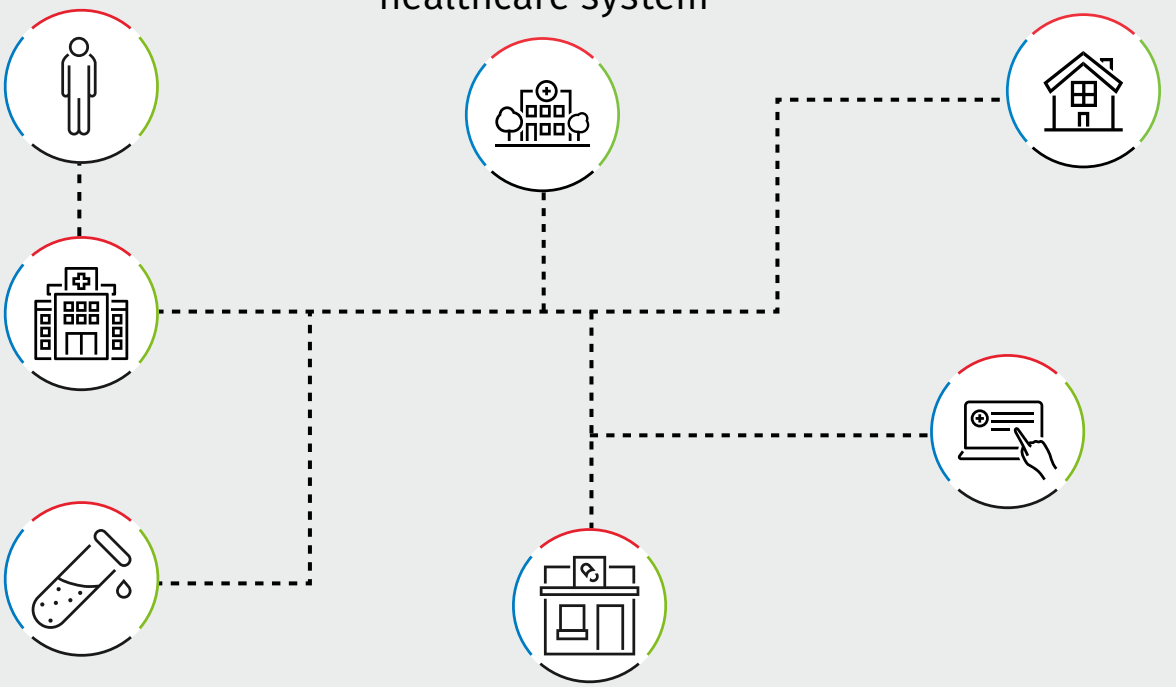
Leveraging systems thinking can provide frameworks and guidance for leaders to consider a more efficient, proactive approach to care.

Systems thinking can help address fragmented information silos

One trigger for many health systems is inconsistent clinical and drug information referenced across care teams and patients. While clinical information sources are plentiful, using different solutions among care teams, patients, and partners creates information silos and workflow disruptions within a healthcare system.[9] Rural locations and disparate resources create the risk of misaligned care information for patients, and the proliferation of health misinformation and disinformation available online, including through (AI) sources, only adds to this confusion.[10]

Additionally, as care extends beyond the clinic to retail, virtual, and remote settings, so does the information fragmentation. Medication errors are a common source of patient harm, and many times, pharmacists play a separate role from the local health systems and communities in which they operate.[11] The growing availability of new settings—including retail clinics, online chat programs, and more—creates additional opportunities for fragmentation.

Clinicians need consistent care recommendations, treatment options, and patient education readily accessible to avoid adding strain to their workflows—especially as global staffing and burnout challenges persist.[12] Information needs to be available at the point of care, consistent with patient education materials, and available through existing workflow technology like EHRs and mobile devices so teams can have standardized evidence.



Many patients experience a fragmented healthcare system, receiving inconsistent care information across locations and access points.

Global shortage of **11 million** health workers by 2030, including **4.5 million** nurses[12,13]

40%-80% of medical information provided by healthcare practitioners is forgotten immediately[14]

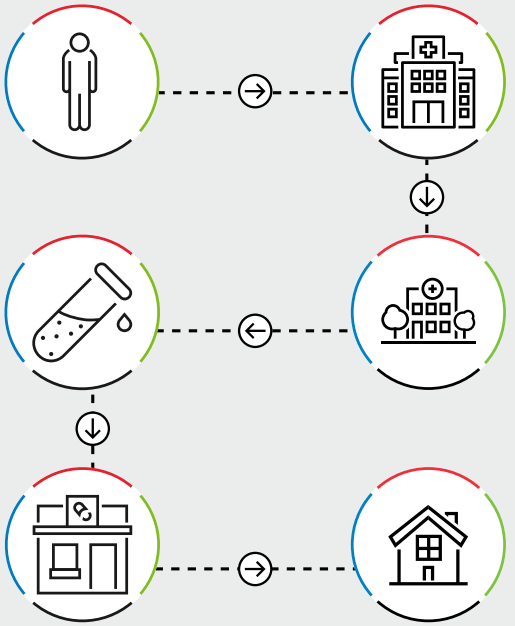
Medication errors cost **$42 billion** annually, many are considered preventable[11]

Interconnecting teams to support systemic care gaps

The modern patient experience is highly dependent on a mix of providers and professionals—primary care physicians (PCPs), specialists, nurses, care managers, retail pharmacists, ambulatory staff, and more. Some people may only interact with their PCP annually, while others see numerous specialists and teams in different locations—hospitals, specialized clinics, pharmacies—especially if managing a chronic disease. Still others may require virtual care and home-based services.

For leaders, implementing a more systemic, team-based approach to care delivery with aligned clinical information in EHRs can help unite teams for a more consistent and improved patient experience.[15] Instead of addressing individual challenges at the point of care within each clinician specialty, a team of specialists collaborate around a specific patient case to determine the best way forward. This can be especially helpful in complex health scenarios, especially those involving chronic, cancer, or aging illnesses, and can help provide a more seamless experience, better outcomes, and help alleviate clinician burden by redistributing efforts.[16]

Interconnected
healthcare system



Systems thinking can help leaders design an interconnected, aligned healthcare experience for patients with consistency across teams and locations.

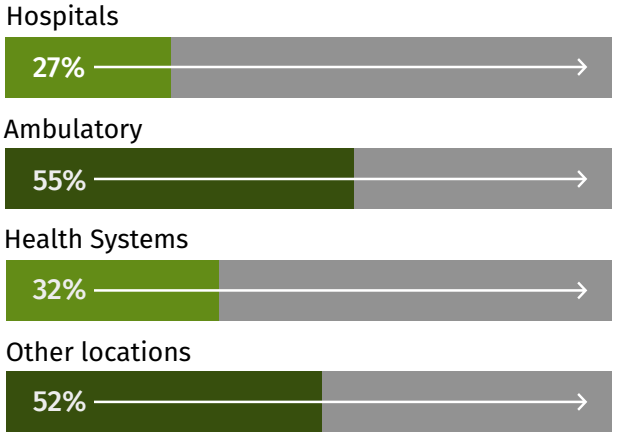
Organizations can see multiple benefits from team-based care[17]

Patient level
Enhances self-management and health outcomes

Interpersonal level
Improves providers' performance and shared decision-making

Organizational level
Leads to more efficient utilization of healthcare resources

Location growth in UpToDate decision support users, 2019-2024



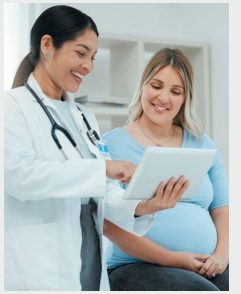
Involving and empowering patients as part of the care team

As the care team of specialists centers on a patient and their health condition, bringing the patient into the conversation as a key health partner can help increase engagement and encourage care plan adherence.[18]

Having multiple perspectives in the conversation—including the patient themself—can also be helpful in determining the best course of action.[19] An NHS survey from the UK showed **40%** of people want to be more involved in decisions about their own care, and a Wolters Kluwer survey of patients showed **80%** had follow-up questions after a care appointment.[20,21] Bringing the patient into the care team conversation and equipping them with trusted health content can help them feel more invested in their treatments, improve the patient-clinician relationship, and provide a specialized team to support questions.[22]

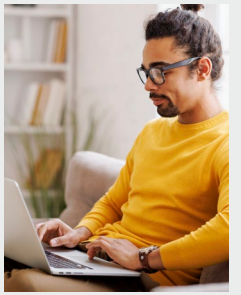
A McKinsey survey of US Health consumers responded to which sources they trust the most for accurate health and wellness content:[23]

- **64%** Hospital systems and doctors
- **51%** Health information websites
- **36%** Independent medical authorities
- **32%** Health insurance companies



40%

of people want to be more involved in decisions about their own care[19]



80%

of patients have follow-up questions after care appointments[21]

"Patients today are used to personalized, seamless interactions across all industries, from streaming platforms to online shopping. They expect no less from their healthcare providers. Technology has the potential to bridge the gap between clinical care and patient expectations by providing tools that foster real-time collaboration, reduce inefficiencies, and empower people to take an active role in their health."

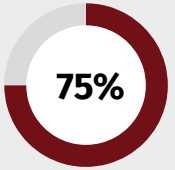
Amanda Heidemann, MD, FAAFP, FAMIA, Senior Clinical Content Consultant, Clinical Effectiveness, Wolters Kluwer Health

Chronic disease highlights the need for a team-based approach

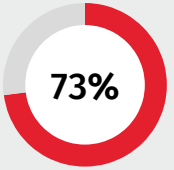
One of the largest challenges for health systems is the prevalence of NCDs, or chronic diseases, which arise from a combination of genetic, physiological, environmental, and behavioral factors, and can place significant financial strain on health systems. The WHO notes chronic diseases were responsible for **75%** of non-pandemic deaths in 2021—at least **43 million** people.[24] In the United States, these diseases are the leading cause of illness, disability, and death, affecting **60%** of Americans and, along with mental health, contributing to **90%** of the nation's $4.5 trillion annual healthcare spending.[25,26]

It takes a team approach to address chronic disease. Patients often require seeing multiple providers, clinical experts, nurses, pharmacists, and support staff over the course of their treatment to manage care plans and medication adherence. The nursing role is crucial—one study of nurse-led case management showed patients experiencing heart failure had fewer hospitalizations and lower mortality.[27] Consistent information embedded in workflows from providers, nursing care managers, and extended support staff can provide standardized NCD guidance between different clinic visits. Additionally, health plan and reimbursement companies seeking to lower long-term costs and improve outcomes can support their member populations through care management education and outreach efforts.

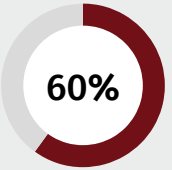
Chronic disease by the numbers:[24,25]



of global non-pandemic deaths in 2021



of global NCD deaths are in low- and middle-income countries



of Americans are affected by chronic disease

of the US annual healthcare spending is on chronic and mental health conditions

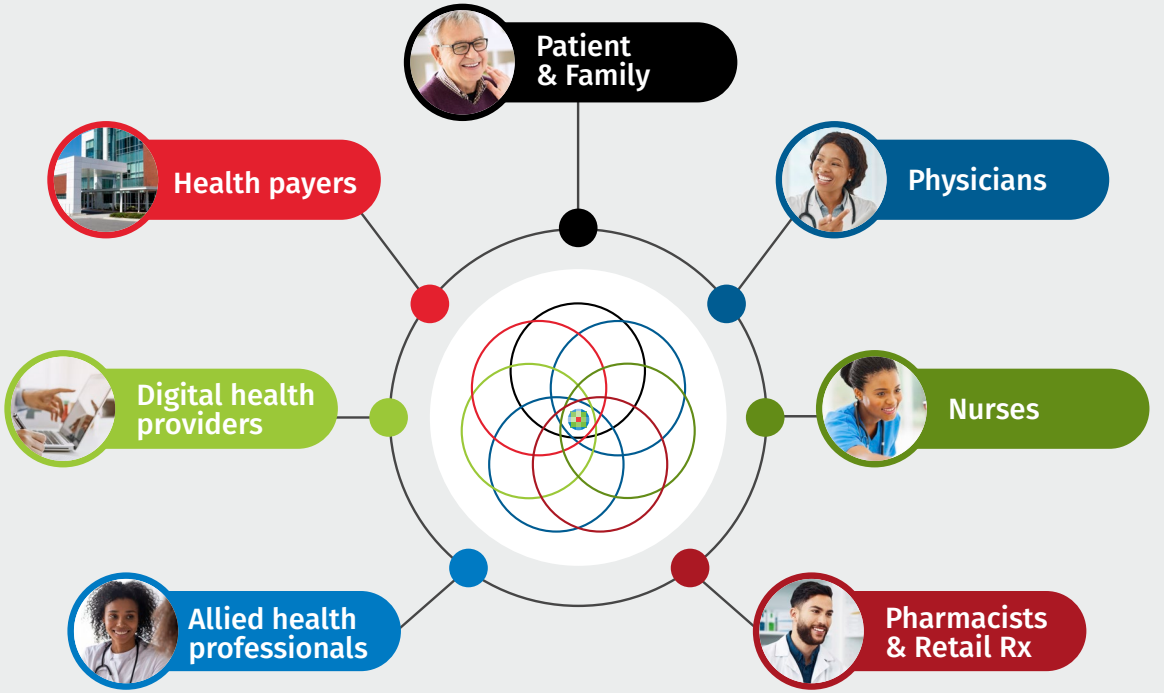
"When you're looking at systems, you're looking at how the entire care journey is going to go. What can we do to make that a seamless journey, not just a diagnosis? Not everyone comes in knowing they have cancer. Their journey actually starts with their primary care doctors or in an emergency room. When I think systems, how do people get into the system? How do they get care?"

Don S. Dizon, MD
Professor of Medicine and Professor of Surgery, Brown University

Evidence as the foundation for aligning care teams and patients

Whether care teams are supporting an individual patient or an entire population, evidence as a centralized resource and source of truth is critical. Harnessing existing workflows and system technologies—plus expanding access beyond the care setting—to allow clinical information to flow more freely can help unify care teams, their patients, and partners. With trusted, evidence-based content at the center of the care team, everyone can reference consistent information, medication formularies, and treatment pathway recommendations, leading to more standardized approaches.

Trusted, evidence-based content
at the point of care



The patient needs to be a part of the care team for optimal outcomes.

Country-wide access connects urban and rural teams to clinical evidence

100,000 **Clinical questions answered by Mongolian clinicians within the first three months of UpToDate access**[28]

4.8 million **UpToDate searches by clinicians across Spain in 2023**[29]

Insights from the point of care indicate expanded team usage

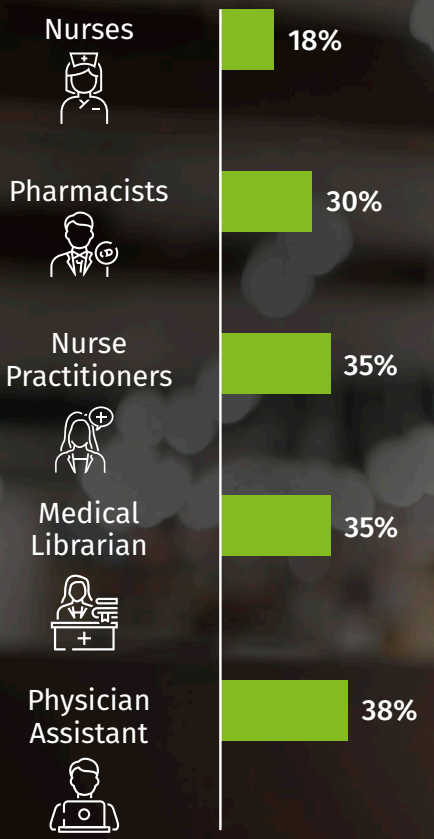
Within the UpToDate clinical decision support (CDS) platform, analytics indicate usage is expanding from the traditional physician and medical resident user to include additional members of the care team. The share of these users—such as nurse practitioners, physician assistants, pharmacists, and medical librarians—increased over the course of five years from **28.56%** in 2019 to **31.47%** in 2024.

With enterprise-wide usage, clinicians can reference the same source of information, medication guidance, and care pathways. As more organizations onboard extended care team members into decision support, care recommendations can become more standardized across locations and silos can be broken down.

Top five UpToDate care pathways in 2024, by usage

1. Abnormal liver tests: Evaluation – **74,008**
2. Complicated UTI in adults: Antibiotic selection **68,440**
3. Cellulitis: Antibiotic selection – **62,582**
4. Simple cystitis in female adults: Antibiotic selection – **47,826**
5. Hyponatremia in adults – **46,125**

Users of UpToDate are rapidly expanding across the care team. Percentage in change from 2019-2024:

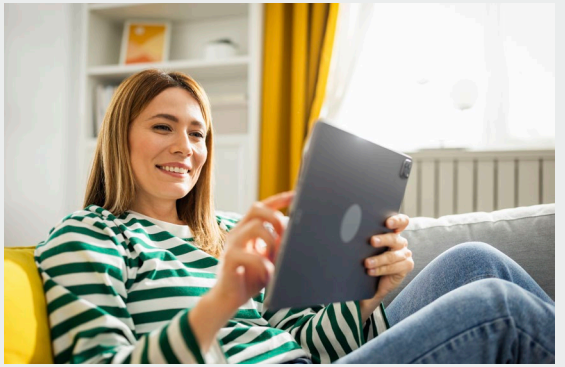


Patient-focused content can extend evidence to populations

Having evidence-based content at the center of the care team also allows them to extend education to patients to support their health journey. This can be particularly helpful in rural areas where care access may be less prevalent, and nursing and ambulatory staff can help patients manage their health journey in between clinic visits. Despite increases in online health information, **77%** of people look for health and wellness content that has been clinician-reviewed.[18] Providing aligned educational materials can help increase trust and answer follow-up questions instead of resorting to internet searches.

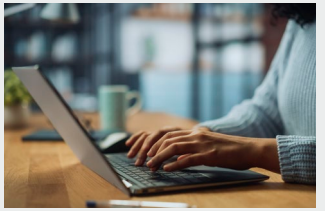
Healthcare organizations across the ecosystem can help support people's care journey and medication adherence by providing content through different mediums such as portals, printouts, and mobile apps. A McKinsey survey found that **64%** of US health consumers trust hospital systems and doctors for accurate health and wellness content, and **32%** trust health insurance companies.[23] Health media was found to be most effective when consumers are learning about their conditions or managing their health at home.

Additionally, as consumers continue to manage new and complex drug therapies and prescriptions, like GLP-1 injections and polypharmacy, digital evidence-based content can help pharmacists, nurses, care managers, and prescribing clinicians support consumer medication adherence.[30] Medication non-adherence affects **40%-50%** of patients with chronic disease, causing at least 100,000 preventable deaths and $100 billion in preventable medical costs each year.[31]

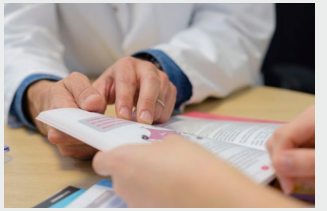


- Virtual home health and virtual office visits will grow between **5%-10%** by 2028.[32]
- From 2023-2024, clinical teams increased usage of UpToDate patient education materials by **9%**.
- **65%** of patients who watched an UpToDate multimedia engagement program kept their blood pressure under control, compared to **53%** who did not.[33]

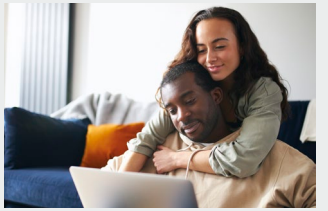
Content outreach strategies from health organizations include:[18]



Cleveland Clinic
has an extensive content library about diseases and conditions.



Mayo Clinic
sells over-the-counter health products and provides content on diseases, health conditions, and healthy lifestyles.



Kaiser Permanente
allows members to download self-care apps already evaluated by clinicians.

Strategies for interconnecting teams for better patient care

Health leaders can look to team-based care models as a form of systemic change and implement a series of strategies to help connect the care team beyond individual care touchpoints. Ultimately, this can help move towards a proactive healthcare model grounded in evidence.

Five strategies to systemically build out evidence-based interconnected teams

1. Implement consistent, evidence-based information across teams
2. Create integrated and aligned solutions and workflows
3. Harness enterprise-wide analytics
4. Build out community and extended partnerships
5. Enable preventative care initiatives

"Healthcare is an inherently collaborative experience—among patients, clinicians, and care teams. Strengthening those connections across the care continuum has always been our ultimate goal."

Jason Burum, Vice President and NA Provider Segment General Manager, Clinical Effectiveness, Wolters Kluwer Health

Strategy #1
Implement consistent, evidence-based information across teams

At the core of multidisciplinary team-based care models is trusted evidence. Regardless of the health condition, teams need consistent clinical information across locations and specialties to collaborate and provide consistent diagnoses, analyses, treatment recommendations, and follow-up information. Having standardized information readily available in the workflow and integrated into EHRs across care teams, specialties, and locations helps create consistent reference points for multidisciplinary teams as well as operational efficiencies.

The patient is also part of this team when they learn about treatment options, potential side effects, and long-term risks and outcomes. Receiving aligned health educational material can help guide follow-up questions and support care plan adherence, especially in remote areas. Ideally, patient education materials should be authored by the same experts clinical teams are relying on within their decision support solutions for consistent care plan adherence.

Clinical information consistency beyond provider settings

Having consistent medical and drug evidence across the entire care continuum can further improve care and identify efficiencies. Retail pharmacists can reference the same drug information as hospital pharmacists and prescribing clinicians.

For insurance organizations, referencing the same clinical information as provider teams can help build plans and policies that lead to fewer appeals and reduce provider abrasion. Benefits professionals can refer to the clinical content and understand recommendations behind requested tests or procedures. Care managers and engagement professionals can also provide aligned clinical content to member populations to help support healthy lifestyles and plan adherence while building trust by echoing the same advice members receive at the point of care.

Customer story:
Bundling and automating oncology patient content

Health systems are looking for effective opportunities to utilize care team efforts and engage patients. Allina Health Cancer Institute was able to easily bundle oncology content from UpToDate patient education, leaflets, videos, and more, and automate distribution to care teams and patients through EHRs, newsletters, and online portals. During the solution selection and implementation, they engaged the care teams and "let them drive" to understand the best ways for adoption and onboarding.

"It enhances the education that [patients are] already being provided by their nurse, advanced practice provider, or clinician. It's something that they can take home with them."

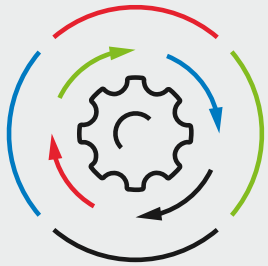
Liz Loach,
Manager of Nursing Practice in Clinical Education, Allina Health Cancer Institute

Strategy #2
Integrating aligned solutions and workflows

Breaking down information silos means identifying opportunities to integrate evidence-based information technology solutions into existing workflows. Harnessing existing tools like EHRs and ambient solutions can help smooth adoption, improve usage, and provide access pathways across teams. These partnerships can help augment clinician knowledge, alleviate burnout, and improve speed-to-answer through workflow solutions that incorporate evidence and technologies like AI.[34]

Aligned solutions across teams is also a technology resilience strategy. McKinsey notes that global cyberattacks on providers have reached an all-time high, and data breaches in healthcare incur the highest cost for any industry—**$9.8 million** per incident.[35]
One way to help build resilience is to "solve for journeys and workflows" instead of remediating individual applications or touchpoints. Identifying solutions that can integrate within EHRs and provide advanced technology to help augment care team efforts can help reinforce cybersecurity efforts in addition to advancing workflows.

These solutions can also extend beyond the care setting and into ambulatory and retail environments, helping teams reach patients where they are.
A primary care partnership between Emory Healthcare Network and CVS's MinuteClinic allows people to access primary care across 35 locations in Georgia, using an interoperable EHR to help facilitate communication between provider teams.[36]
Technology can also help keep patients engaged through automated call outreach and personalized videos and content that support their specific care journey.



"To achieve IT resilience, organizations should consider the entire patient journey and clinician workflow, instead of solely remediating individual parts, such as an application or specific infrastructure."

McKinsey & Company

Strategy #3
Access enterprise-wide analytics

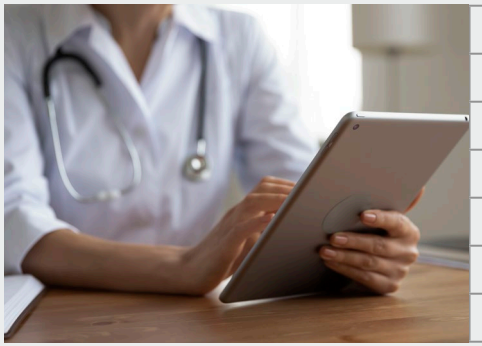
As enterprise-wide solutions are implemented, leaders can use analytics and insights to address further systemic challenges. Population-level insights into care topics and team usage can provide leaders with direction and identify areas of improvement. It can also help orient care teams on the ground—Jefferson Health's Abington Hospital in Pennsylvania uses real-time dashboards to orient the care team to unit-based and system-level priorities for a particular shift.[3]

If patient engagement strategies are deployed, leaders can analyze usage statistics, open rates, and more. With data on hand, care teams can prepare a strategy to work with a specific patient if they are from a population that is more or less responsive to engagement tactics. They can also offer more personalized options to provide healthcare information and outreach support in a way that works best for the patient.

Finally, when approaching team-based care, enterprise-wide analytics can help leaders understand where clinical knowledge gaps lie within a system. For continuing medical education (CME) credits, analytics can showcase how credits are earned and redeemed, and highlight opportunities for continued learning across organizations or within specific care teams.

From usage to impact: Analyzing CME credit redemption across care teams can help strengthen care delivery.

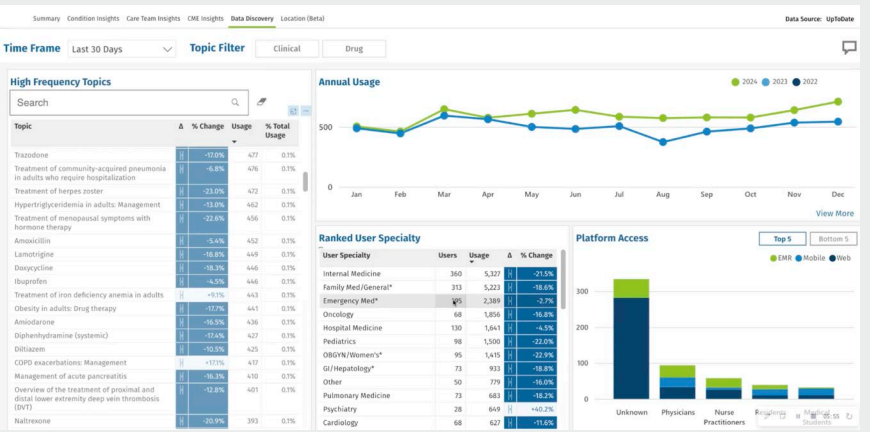
CME Credits Redeemed in UpToDate, 2019-2024



Year	CME Credits Redeemed
2019	8,311,930
2020	11,039,466
2021	11,548,162
2022	12,793,899
2023	14,662,944
2024	15,826,347

Using enterprise-wide decision support analytics, UpToDate customers are already:

- Supporting quality and regulatory compliance, saving over $100,000 in civil penalties
- Identifying educational opportunities for residency and fellowship programs
- Educating teams to help reduce surgical site infections (SSIs) and urinary tract infections (UTIs)
- Reducing risk and enhancing clinician support with MATE Act compliance



Strategy #4
Build out community and extended partnerships

People often need additional support accessing care, especially in rural settings or in communities with social drivers impeding care. Forming strategic partnerships to support community-based care teams, such as ambulatory workers, can help systems looking to improve population health.

Reaching rural patients may require long-term strategies to build infrastructure. In the 1970s, Thailand launched the Primary Health Care (PHC) initiative, aimed at supporting the more than two-thirds of Thai people who didn't have access to basic healthcare services.[37] Over two decades, they built up a community of village health volunteers to act as a link between people and health personnel, which has enabled healthier, resilient communities.

Retail organizations, such as pharmacies, can also play a part. As of 2023, nearly 50 US hospitals and health systems were partnering with CVS Health to support providers and accept referrals from patients needing higher levels of care in local communities.[36] With **58%** of Americans likely to seek non-emergency services at pharmacies, they are well positioned to provide extended community services for medication therapy, preventative screenings and vaccines, and nutritional support.[39,40]

This strategy can also help address healthcare inequities. An article in the Harvard Review of Psychiatry analyzes how health systems partnering with community health centers can help break down barriers in communities of color, especially with perinatal patients.[41] This can help reestablish and expand trust among historically marginalized populations by supporting care needs closer to where they live and work.

A Wolters Kluwer US consumer survey found:[39]

58%

are likely to seek **non-emergency** services at pharmacies

79%

trust pharmacists as **care providers**

62%

would trust local pharmacies for **adult vaccines**

"Primary care decentralization is continuing – the traditional one doctor-one patient, single point of coordination is vanishing, and this is especially evident in younger generations."

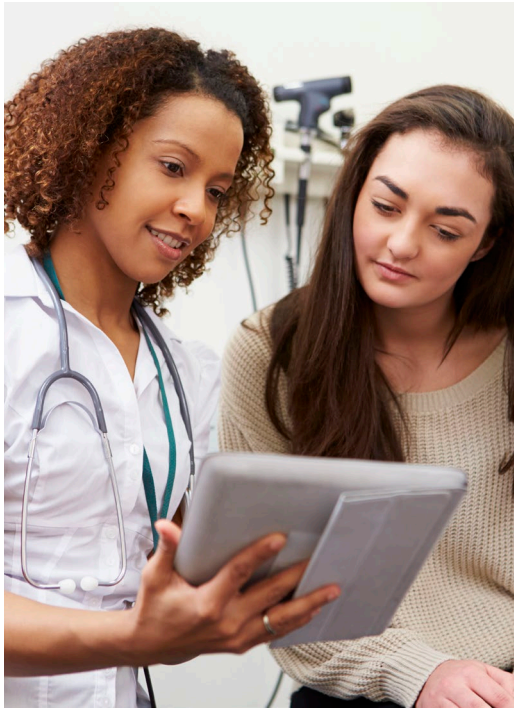
Peter Bonis, MD, Chief Medical Officer, Wolters Kluwer Health

Strategy #5
Enable preventative care initiatives

Alongside the above strategies—current evidence, embedded in technology workflows, with robust analytics, extending into the community—organizations can proactively focus on preventative care projects.

This begins with patient and member health education and healthy lifestyle initiatives. Care managers and nurses can help patients become partners in their health through proactive education outreach and help support good nutrition habits, medication routines, and care appointment follow-ups.[42] Patient populations such as those with anxiety disorders can suffer from hesitation in seeking preventative care or following up with necessary tests.[43] Technology outreach solutions can help patient and member populations partner with their own health journey and nudge the system toward a proactive model.

Finally, more continuity with PCPs is associated with lower costs and hospitalizations—health leaders can establish educational outreach and engagement plans to encourage patients and members to proactively learn about their own health conditions, answer questions, and schedule and attend follow-up appointments.[44] This creates a continual loop of patients engaging back with care providers instead of the providers tending to patients during an individual touchpoint or health crisis.



Proactive healthcare provides savings

A 2023 study of US Medicare expenditures showed patients who had regular and continuous patterns of primary care visits resulted in:[45]

- greater savings
- lower risk-adjusted expenditures
- fewer risk-adjusted emergency department visits
- fewer risk-adjusted hospitalizations

Patient engagement strategies with UpToDate have resulted in:[46,47]

26%
fewer avoidable emergency department visits and lower associated costs

75%
lower cancellation rates for endoscopy or colonoscopy screenings

1.5
full-time personnel roles saved and reallocated from patient calling time

27% and 65%
lower 30-day readmission rate, depending on engagement levels

Unified solutions to achieve what matters most

Improving health outcomes requires a holistic, strategic approach to wellness that includes the entire care journey beyond individual patient visits. The UpToDate Point of Care Report series provides healthcare leaders with valuable insights to manage critical, systemic issues such as clinical burnout, staffing shortages, health equity, and clinical workflows across the enterprise. To address these issues and create a culture of patient trust and safety, having a collaborative approach involving all stakeholders, including administrators and frontline staff, is necessary.

Join UpToDate in our mission to transform care, unify teams, and drive better outcomes for patients and healthcare organizations.

"Before implementing UpToDate Enterprise Suite, our teams were struggling with fragmented workflows and disconnected systems. It was clear we needed a unified approach to improve both clinical efficiency and operational cohesion."

Tracy Samson, RN, CEN, MSN, PhD,
IT Manager, Clinical Applications,
St. Luke's University Health Network

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More than **3 million** healthcare providers in more than **190 countries**

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Scalable interactive programs that motivate patients to take action and participate in their health

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More than **2,500** hospitals and health systems, and **43,000** retail pharmacies globally

RESOURCES:

1. Alliance for Health Policy and Systems Research. "Systems Thinking." Last modified July 29, 2021. https://ahpsr.who.int/what-we-do/thematic-areas-of-focus/systems-thinking
2. Clarkson, John, et al. "A Systems Approach to Healthcare: From Thinking to Practice." Future Healthcare Journal 5, no. 3 (2018): 151–155. https://doi.org/10.7861/futurehosp.5-3-151
3. Mate, Kedar S., Josh Clark, Jeff Salvon-Harman. “To Improve Health Care, Focus on Fixing Systems — Not People,” Harvard Business Review, July 12, 2024, https://hbr.org/2024/07/to-improve-health-care-focus-on-fixing-systems-not-people
4. American Medical Association. "Teaching Health Systems Science." Updated November 20, 2024 https://www.ama-assn.org/education/changemeded-initiative/teaching-health-systems-science
5. McNab, Duncan, John McKay, Steven Shorrock, Sarah Luty, and Paul Bowie. "Development and Application of ‘Systems Thinking’ Principles for Quality Improvement." BMJ Open Quality 9, no. 1 (2020): e000714. https://doi.org/10.1136/bmjoq-2019-000714
6. World Health Organization. Systems Thinking for Noncommunicable Disease Prevention Policy: Guidance to Bring Systems Approaches into Practice. September 22, 2022. https://www.who.int/europe/publications/i/item/WHO-EURO-2022-4195-43954-61946
7. Wolters Kluwer, “The transformative power of systems thinking in population health management”, August 26, 2024, https://www.wolterskluwer.com/en/expert-insights/transformative-power-systems-thinking-in-population-health-management
8. Zehnder, Aina R., Anna J. Pedrosa Carrasco, and Simon N. Etkind. "Factors Associated with Hospitalisations of Patients with Chronic Heart Failure Approaching the End of Life: A Systematic Review." Palliative Medicine 36, no. 10 (2022): 1452–1468. https://doi.org/10.1177/02692163221123422
9. Lau, Robin S., et al. "Siloed Mentality, Health System Suboptimization and the Healthcare Symphony: A Canadian Perspective." Health Research Policy and Systems 22, no. 87 (2024). https://doi.org/10.1186/s12961-024-01168-w
10. World Health Organization. "Disinformation and Public Health." Last modified February 6, 2024. https://www.who.int/news-room/questions-and-answers/item/disinformation-and-public-health
11. World Health Organization. Global Burden of Preventable Medication-Related Harm in Health Care: A Systematic Review. March 7, 2024. https://www.who.int/publications/i/item/9789240088887

12. World Health Organization. "Health Workforce." Accessed March 2025. https://www.who.int/health-topics/health-workforce

13. World Health Organization. "Nursing and Midwifery." Last modified May 3, 2024. https://www.who.int/news-room/fact-sheets/detail/nursing-and-midwifery

14. Lie, Hanne C., et al, "Effects of Physicians' Information Giving on Patient Outcomes: A Systematic Review." Journal of General Internal Medicine 37, no. 3 (2021): 651–663. https://doi.org/10.1007/s11606-021-07044-5

15. Will, Kristen K., Melissa L. Johnson, and Gerri Lamb. "Team-Based Care and Patient Satisfaction in the Hospital Setting: A Systematic Review." Journal of Patient-Centered Research and Reviews 6, no. 2 (2019): 158–171. https://doi.org/10.17294/2330-0698.1695

16. Jacobs, Jacquelyn, et al. "Impact of a Multi-Disciplinary Team-Based Care Model for Patients Living with Diabetes on Health Outcomes: A Mixed-Methods Study." BMC Health Services Research 24 (2024): 746 https://doi.org/10.1186/s12913-024-11062-4

17. Kongkar, Ruttanaporn, et al. "The Impact of Interdisciplinary Team-Based Care on the Care and Outcomes of Chronically Ill Patients: A Systematic Review." Journal of Multidisciplinary Healthcare 18 (2025): 445–457. https://doi.org/10.2147/JMDH.S497846

18. Broitman, Adam, Michael Elliott, Quentin George. "Health media: How consumer content informs the future of healthcare," McKinsey & Company, December 3, 2025 https://www.mckinsey.com/industries/healthcare/our-insights/health-media-how-consumer-content-informs-the-future-of-healthcare

19. US Preventive Services Task Force. "Collaboration and Shared Decision-Making Between Patients and Clinicians in Preventive Health Care Decisions and US Preventive Services Task Force Recommendations." JAMA 327, no. 12 (2022): 1171–1176. https://doi.org/10.1001/jama.2022.3267.

20. NHS England. "About Shared Decision Making." Last modified 2021. https://www.england.nhs.uk/personalisedcare/shared-decision-making/about/

21. Wolters Kluwer, "Patient education, diversity, and trust: Debunking myths about what patients want", July 12, 2023, https://www.wolterskluwer.com/en/expert-insights/debunking-myths-about-what-patients-want

22. DesRoches, Catherine, et al. "The Clinician-Patient Relationship in the Era of Information Transparency." UpToDate. Last updated November 14, 2023. https://www.uptodate.com/contents/the-clinician-patient-relationship-in-the-era-of-information-transparency#H3021808899

23. Cordina, Jenny et al. “Engaging the evolving US healthcare consumer and improving business performance,” McKinsey & Company, March 7, 2025. https://www.mckinsey.com/industries/healthcare/our-insights/engaging-the-evolving-us-healthcare-consumer-and-improving-business-performance

24. World Health Organization. "Noncommunicable Diseases." Last modified December 23, 2024 https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases

25. Centers for Disease Control and Prevention. “About Chronic Disease” Last updated: October 4, 2024. https://www.cdc.gov/chronic-disease/about/index.html

26. Centers for Disease Control and Prevention. “Fast Facts: Health and Economic Costs of Chronic Conditions.” Last updated: July 12, 2024. https://www.cdc.gov/chronic-disease/data-research/facts-stats/index.html

27. Krumholz, Harland. "Systems-based strategies to reduce hospitalizations in patients with heart failure." UpToDate. Last updated August 16, 2023. https://www.uptodate.com/contents/systems-based-strategies-to-reduce-hospitalizations-in-patients-with-heart-failure#H2122264870

28. Wolters Kluwer, “Mongolia Ministry of Health boosts rural healthcare with UpToDate national access”, June 2, 2021, https://www.wolterskluwer.com/en/news/mongolia-health

29. Wolters Kluwer, “Spain’s Health Ministry reports clinicians turned to Wolters Kluwer’s UpToDate nearly 4.8 million times in 2023”, November 13, 2024, https://www.wolterskluwer.com/en/news/spains-health-ministry-reports-clinicians-turned-to-wolters-kluwers-uptodate

30. Hartman, Christian, “Digital patient engagement is an anchor for medication adherence”, Wolters Kluwer, October 21, 2024, https://www.wolterskluwer.com/en/expert-insights/digital-patient-engagement-is-an-anchor-for-medication-adherence

31. Kleinsinger, Fred. "The Unmet Challenge of Medication Nonadherence." The Permanente Journal 22 (2018): 18-033. https://doi.org/10.7812/TPP/18-033

32. Singhal Shubham and Neha Patel, “What to expect in US healthcare in 2025 and beyond,” McKinsey & Company, January 10, 2025. https://www.mckinsey.com/industries/healthcare/our-insights/what-to-expect-in-us-healthcare-in-2025-and-beyond

33. Centura Health. Patient analysis. N=6,509. May 2014-Nov 2014.

34. Burum, Jason, “Building a healthier future together: Wolters Kluwer's commitment to strategic collaborations”, Wolters Kluwer, March 12, 2025, https://www.wolterskluwer.com/en/expert-insights/building-healthier-future-together-wk-commitment-to-strategic-collaborations

35. Shimabukuro, Brian and Sriram Sekar, “Tech resilience for healthcare providers: Inaction has a heavy toll,” McKinsey & Company, January 18, 2025. https://www.mckinsey.com/industries/healthcare/our-insights/tech-resilience-for-healthcare-providers-inaction-has-a-heavy-toll

36. Emory University. "MinuteClinic and Emory Healthcare Network Expand Primary Care Access to Georgians." February 20, 2025. https://news.emory.edu/stories/2025/02/hs_cvs_minuteclinic_ehn_primary_care_collaboration_20-02-2025/story.html

37. Department of Economic and Social Affairs, United Nations. "Village Health Volunteers: Unsung Heroes for Thailand's Health Crisis." Accessed March 2025. https://sdgs.un.org/partnerships/village-health-volunteers-unsung-heroes-thailands-health-crisis

38. Bruce, Giles. "49 Hospitals, Health Systems Partnering with CVS." Becker's Hospital Review, June 1, 2023 https://www.beckershospitalreview.com/innovation/49-hospitals-health-systems-partnering-with-cvs.html

39. Wolters Kluwer, “Wolters Kluwer’s Pharmacy Next survey shows 58% of Americans likely to first seek non-emergency healthcare at pharmacies”, May 17, 2023, https://www.wolterskluwer.com/en/news/survey-shows-americans-seek-non-emergency-healthcare-at-pharmacies

40. Wolters Kluwer, “Community-based retail pharmacy’s role in collaborative healthcare”, March 5, 2025 https://www.wolterskluwer.com/en/expert-insights/community-based-retail-pharmacy-role-in-collaborative-healthcare

41. Wolters Kluwer, “Reducing health disparities through community health center partnerships”, September 14, 2022 https://www.wolterskluwer.com/en/expert-insights/reducing-health-disparities-through-community-health-center-partnerships

42. Wolters Kluwer, “Food as medicine: Payer nutrition programs can support member health”, March 5, 2025, https://www.wolterskluwer.com/en/expert-insights/food-as-medicine-payer-nutrition-programs-can-support-member-health

43. Wolters Kluwer, “Anticipating points of hesitancy with empathetic member health education”, October 21, 2024, https://www.wolterskluwer.com/en/expert-insights/anticipating-points-hesitancy-with-empathetic-member-health-education

44. Bazemore, Andrew, et al. "Higher Primary Care Physician Continuity is Associated With Lower Costs and Hospitalizations." The Annals of Family Medicine 16, no. 6 (2018): 492–497. https://doi.org/10.1370/afm.2308

45. Sonmez, Dilara, George Weyer, and Daniel Adelman. "Primary Care Continuity, Frequency, and Regularity Associated With Medicare Savings." JAMA Network Open 6, no. 8 (2023): e2329991. https://doi.org/10.1001/jamanetworkopen.2023.29991

46. Wolters Kluwer, “CIO takes a strategic view of patient engagement to improve care outcomes and organizational goals”, August 22, 2022, https://www.wolterskluwer.com/en/expert-insights/cio-takes-a-strategic-view-of-patient-engagement-to-improve-care-outcomes-and-organizational-goals

47. Wolters Kluwer, “Engaging patients at key decision points leads to better outcomes and efficiency”, March 24, 2022, https://www.wolterskluwer.com/en/expert-insights/engaging-patients-at-key-decision-points-leads-to-better-outcomes-and-efficiency

