The Digital-First Future of Health Care

BCG

BCG

Boston Consulting Group partners with leaders in business and society to tackle their most important challenges and capture their greatest opportunities. BCG was the pioneer in business strategy when it was founded in 1963. Today, we work closely with clients to embrace a transformational approach aimed at benefiting all stakeholders—empowering organizations to grow, build sustainable competitive advantage, and drive positive societal impact.

Our diverse, global teams bring deep industry and functional expertise and a range of perspectives that question the status quo and spark change. BCG delivers solutions through leading-edge management consulting, technology and design, and corporate and digital ventures. We work in a uniquely collaborative model across the firm and throughout all levels of the client organization, fueled by the goal of helping our clients thrive and enabling them to make the world a better place.

We need to do something different. Health care systems around the world are struggling with rising demand, increasingly prevalent chronic disease, inequitable access, and a strained workforce. Labor and operating costs are rising sharply for many providers; consequently, they struggle to meet demand. In many countries, patient satisfaction is falling fast. And financial returns are diminishing; countries are getting less from every dollar spent. **(See Exhibit 1.)**

The fix—in part—is to shift care from hospital care to primary and community health care. But this care—the front end of health care—remains underfunded and underutilized, and the traditional patient journey is fragmented and ineffective. So, patient outcomes are poor, and the proportion of total spending on acute care continues to rise.

To improve health care access, quality, and outcomes and lower costs and the workforce burden, health care systems need to reimagine and supercharge that front end.
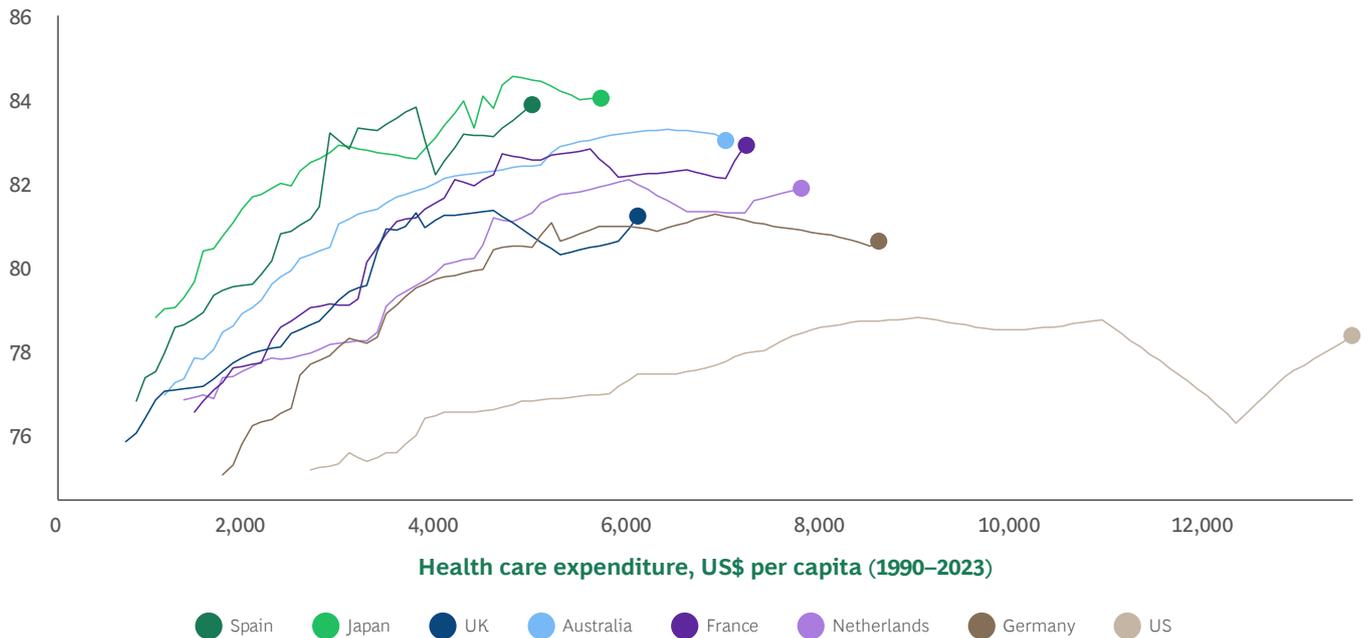
First, they must create a patient journey that is proactive, redirected, and proximate. **(See Exhibit 2.)**

Then, they need to digitize it. Digital tools will facilitate access and availability, alleviate the strain on health systems, and improve patients' choice, experience, and outcomes. A digital front end supports the prevention, diagnosis, and treatment of acute diseases; management of chronic conditions; and recovery. Patient journeys will be connected, creating a seamless, data-driven continuum.

EXHIBIT 1

Health Care Expenditures Are Rising, but Returns Are Diminishing

Life expectancy at birth (years)

Health care expenditure, US$ per capita (1990–2023)

● Spain ● Japan ● UK ● Australia ● France ● Netherlands ● Germany ● US

Sources: Data from 2000 through 2023, OECD and World Bank data; BCG analysis.

EXHIBIT 2

Three Principles for Addressing Health System Challenges

Proactive

Promote patient participation and health system preventive methods to improve outcomes

Redirected

Develop innovative pathways to improve operational and clinical efficiencies

Proximate

Bring care to the community to reduce health inequalities and improve patient experience

Source: BCG analysis.

The Impact of a Digital Front End

A digital-front-end solution has the potential to significantly lower costs, shift care closer to home, and reduce the workload on services that are already stretched.

All health care systems have their own unique challenges. An effectively implemented digital front end can help ameliorate many of the most pressing issues—patient access, urgent-care capacity, and increased costs—while enabling greater sustainability for the future. However, the specific combination of tools within a digital-front-end solution may differ depending on the health system. **(See the sidebar, "The Impact of an Effective Digital Front End: A Case Example.")** Nonetheless, many health care systems have implemented individual digital tools, such as online booking and chatbots, to meet real needs.

Far more than the sum of its parts, a digital front end supports a whole new model of patient-centered care. **(See Exhibit 3.)**

What could this look like in practice? Consider one scenario, illustrated in **Exhibit 4**: an elderly woman living alone who has had a urinary tract infection (UTI) for a few days. All too often, the symptoms worsen, leading to a fall, emergency care, hospitalization, and often long-term care.

Thanks to digital and AI, a novel pathway is possible. The woman's wearable and home smart devices flag low mobility, high pulse, high urinary frequency, and mild confusion via voice analysis.

Consequently, the AI algorithm notes the infection, recommends antibiotics, and flags the high risk of falling. An auto alert notifies a community health worker, who prioritizes a home visit, confirms the assessment, and prescribes the antibiotic. An AI home assistant reminds the woman to take her antibiotics as prescribed and tracks medication adherence. The home monitoring system tracks her recovery and risk of falling and updates family or other designated representatives regarding her symptoms and progress. So, instead of living in isolation and possibly ending up in a nursing home, the woman fully recovers and returns to her usual routine.

The Impact of an Effective Digital Front End:
A Case Example

BCG's analysis of one UK health care system's activity flows and services shows that double-digit improvements are possible. (See the exhibit below.)

Case Example: Impact seen from individual interventions across different European health systems

20%
appointments redirected to self-care for appropriate management
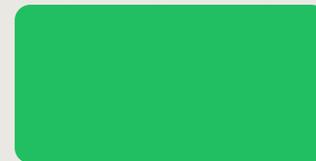
Primary care clinic

14%
appointments freed up using intelligent triage

Emergency department

25%
cases managed more effectively through novel digital pathways

Hospital outpatient unit
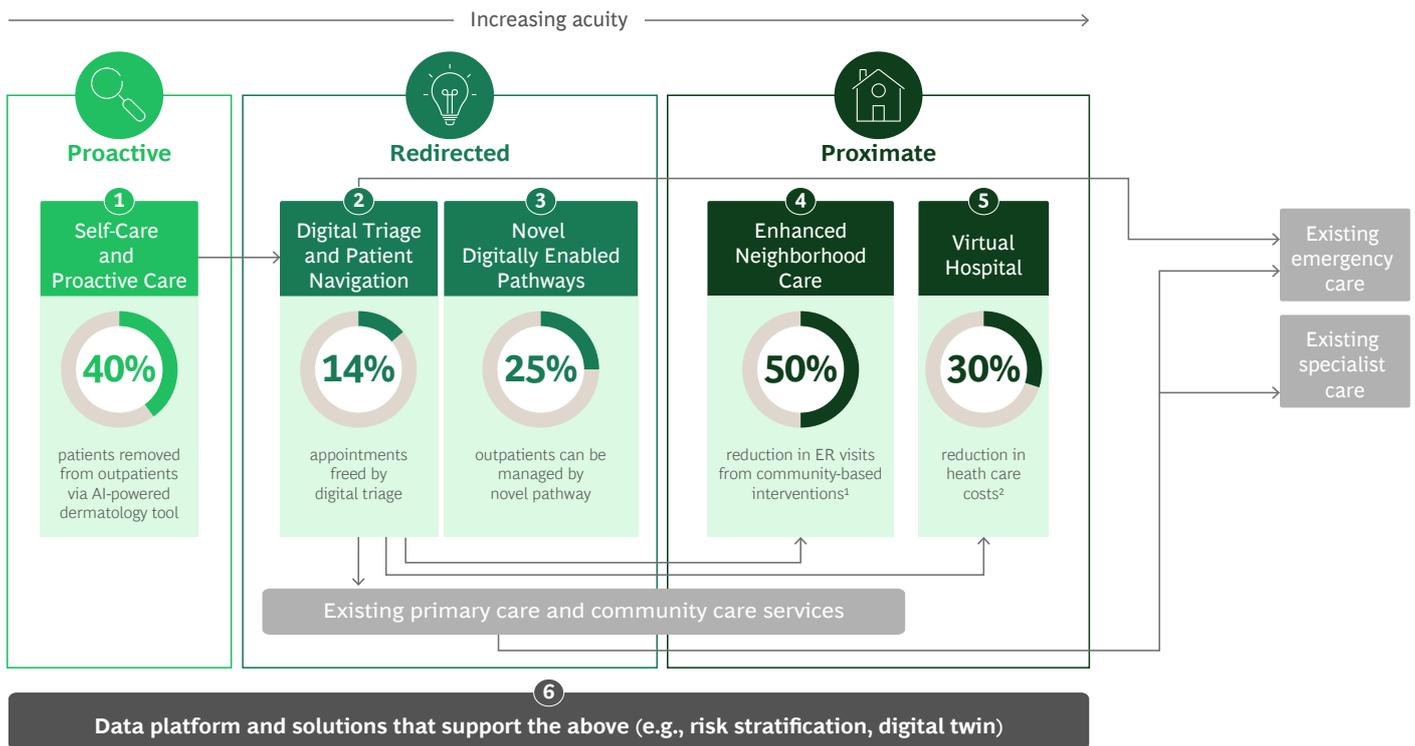
Release of
13%
capacity across primary and acute sevices at a lower cost per unit

Source: BCG analysis.

EXHIBIT 3

The Digital Front End Enables a Patient-Centered Approach

Increasing acuity →

Proactive

Redirected

Proximate

1 Self-Care and Proactive Care

40%

patients removed from outpatients via AI-powered dermatology tool

2 Digital Triage and Patient Navigation

14%

appointments freed by digital triage

3 Novel Digitally Enabled Pathways

25%

outpatients can be managed by novel pathway

4 Enhanced Neighborhood Care

50%

reduction in ER visits from community-based interventions[1]

5 Virtual Hospital

30%

reduction in heath care costs[2]

Existing emergency care

Existing specialist care

Existing primary care and community care services

6 **Data platform and solutions that support the above (e.g., risk stratification, digital twin)**

Source: BCG case experience.
[1]"Impact of community-based digital health intervention on asthma resource utilization," *World Allergy Organization Journal*, December 3, 2018.
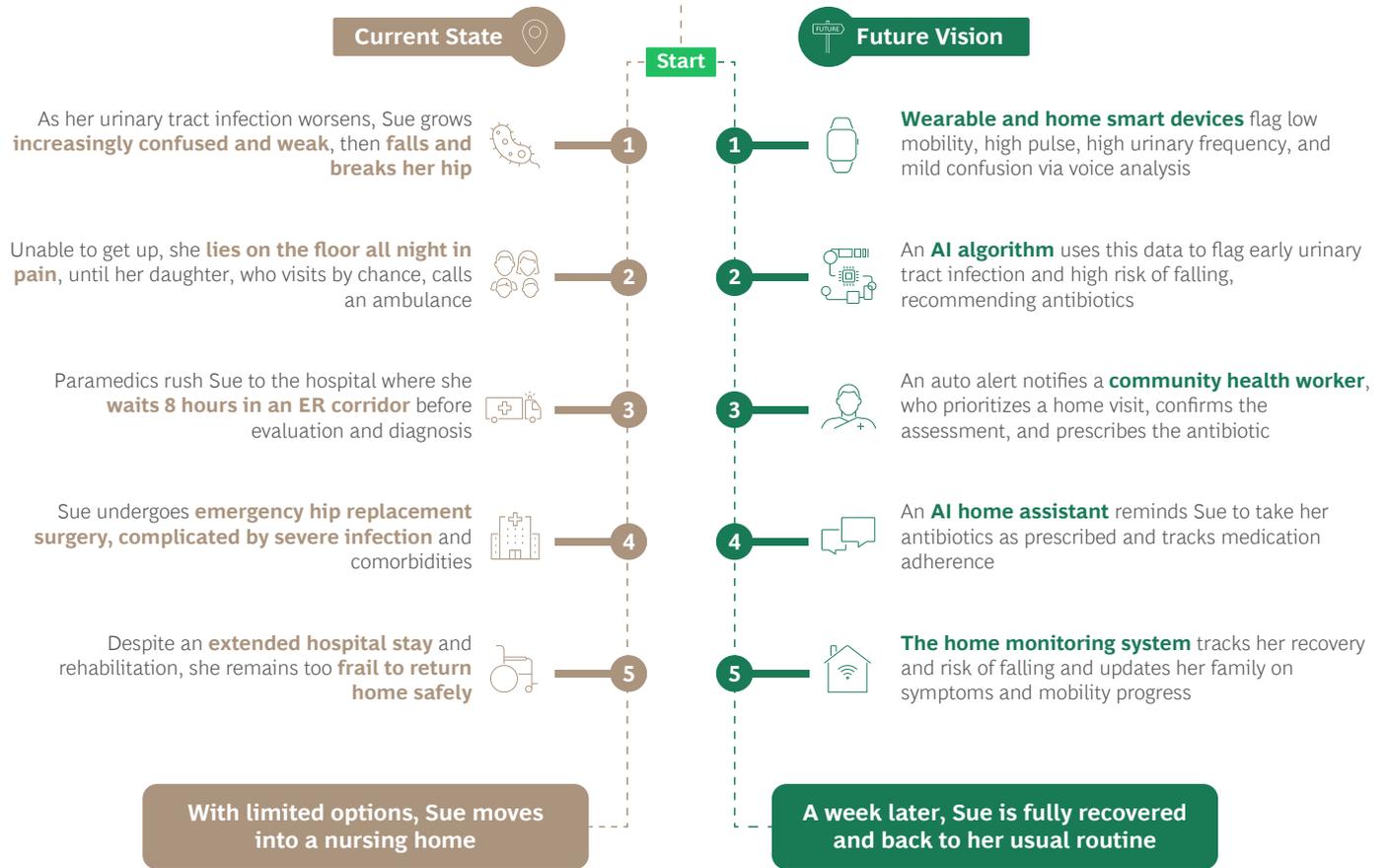[2]"Inpatient-level care at home delivered by virtual wards and hospital at home: a systematic review and meta-analysis of complex interventions and their components," *BMC Medicine*, April 2, 2024.

EXHIBIT 4

A Real-World Example of the Value of a Digital Front End

Scenario: Elderly care

Sue, an elderly woman living alone, has been unwell for a few days

Current State

Future Vision

Start

1 As her urinary tract infection worsens, Sue grows **increasingly confused and weak**, then **falls and breaks her hip**

1 **Wearable and home smart devices** flag low mobility, high pulse, high urinary frequency, and mild confusion via voice analysis

2 Unable to get up, she **lies on the floor all night in pain**, until her daughter, who visits by chance, calls an ambulance

2 An **AI algorithm** uses this data to flag early urinary tract infection and high risk of falling, recommending antibiotics

3 Paramedics rush Sue to the hospital where she **waits 8 hours in an ER corridor** before evaluation and diagnosis

3 An auto alert notifies a **community health worker**, who prioritizes a home visit, confirms the assessment, and prescribes the antibiotic

4 Sue undergoes **emergency hip replacement surgery, complicated by severe infection** and comorbidities

4 An **AI home assistant** reminds Sue to take her antibiotics as prescribed and tracks medication adherence

5 Despite an **extended hospital stay** and rehabilitation, she remains too **frail to return home safely**

5 **The home monitoring system** tracks her recovery and risk of falling and updates her family on symptoms and mobility progress

With limited options, Sue moves into a nursing home

A week later, Sue is fully recovered and back to her usual routine

Source: BCG analysis.

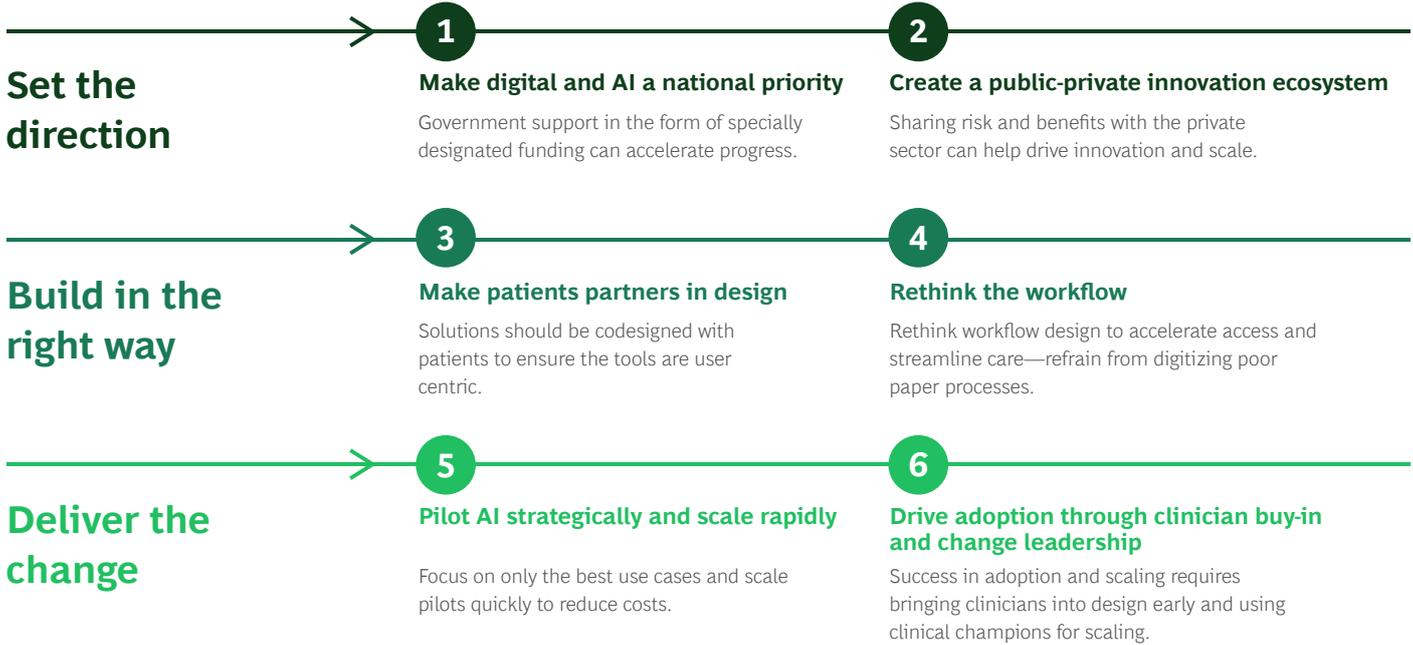# Lessons from Global Leaders

Over the past few years, leading health care systems worldwide have increasingly been implementing elements of a digital front end to improve the patient journey. Their new health care models deliver proactive support for patients at higher risk, embrace novel pathways, and provide care to patients in their communities. These models, although early in development, are beginning to demonstrate benefits in many countries.

- **Denmark.** Consistently ranked among the most digital in the world, Denmark's health care system has had the Sundhed.dk portal, a self-help platform, since 2003. Today, the country's health care system is undergoing the most significant overhaul in two decades. It includes a DKK 2 billion (approximately $316 million) investment to expand digital solutions outside the hospital, with remote monitoring and other features, and build a national data platform. The goal is to strengthen primary and chronic care, reduce regional inequalities, and improve access to health care.

- **Finland.** In 2024, DigiFinland, a special-purpose entity, launched the Finnish national AI ecosystem for social and health services, a network of public, private, and nongovernmental organizations. The initiative is supported by €3 million (about $3.5 million) in funding from the Ministry of Social Affairs and Health. Health care professionals and AI developers from the 200-plus member organizations are working together to create real-world solutions.

- **Singapore.** Singapore's National University Health System (NUHS) has designed a "superapp" to engage patients in managing their health care. The app, which can be used across the NUHS's 14 institutions, enables users to manage appointments, coordinate remote care, access medical records, and more. Uptake has been strong, with 1.4 million downloads and 25,000 active daily users in just three years.

- **Australia.** Australia decided to upgrade and scale Healthdirect, the government-funded virtual health service, an AI-powered clinical decision support system used by the country's national help line. After selecting a system that provided the most accurate triage output, Healthdirect launched the solution internally, with the nurses who provided feedback that was used to improve the solution. The next step was to add AI to the consumer-facing online symptom checker. As a result of this technology and new virtual pathways such as telehealth appointments and virtual emergency departments, Healthdirect has diverted half of its emergency calls to less acute services and granted free health care access to approximately 30 million people.

- **US.** Care provider Ascension Health developed a digital experience that would simplify engagement for both patients and clinicians. Created from the consolidation of data from dozens of different electronic health record systems as well as Ascension-owned and third-party digital products and data sources, it enables patients to find, manage, and pay for care. The solution was a great success because it focused on both clinicians and consumers. In addition to involving consumers in the product design, the effort included a go-to-market team to lead communications and change management and to engage with clinical and operational stakeholders.

- **UK.** The NHS App is being expanded as the national digital channel for routine health care interactions in the UK. Some 14 million people use it each month (71 million logins), including 6 million prescription orders and 22 million general practitioner record views. Recent policy shifts plan for it to become the NHS "front door," with development of further expanded functionality across all care settings including AI-enabled intelligent triage as well as comprehensive remote and digital health care services.

From the efforts of leading health care systems, we've distilled six lessons that health care systems can use to build, and drive the adoption of, digital-front-end solutions. **(See Exhibit 5.)**

EXHIBIT 5

Lessons for Health System Leaders

Set the direction

1 **Make digital and AI a national priority**
Government support in the form of specially designated funding can accelerate progress.

2 **Create a public-private innovation ecosystem**
Sharing risk and benefits with the private sector can help drive innovation and scale.

Build in the right way

3 **Make patients partners in design**
Solutions should be codesigned with patients to ensure the tools are user centric.

4 **Rethink the workflow**
Rethink workflow design to accelerate access and streamline care—refrain from digitizing poor paper processes.

Deliver the change

5 **Pilot AI strategically and scale rapidly**
Focus on only the best use cases and scale pilots quickly to reduce costs.

6 **Drive adoption through clinician buy-in and change leadership**
Success in adoption and scaling requires bringing clinicians into design early and using clinical champions for scaling.

Source: BCG analysis of international case examples.

Unlocking the Full Potential of a Digital Front End

For providers and health systems looking to implement digital front-end solutions, the process can often feel like a daunting and risky proposition. To help, we have identified areas that must be carefully considered to ensure progress and impact.

- **Digital and AI Strategy: Determine Which Processes to Automate, How to Launch, and How to Scale.** Do you build incrementally or launch in a "big bang"? What is your operating model to enable scaling?

- **Tech Infrastructure, Architecture, and Analytics: Current and Target State (Infrastructure Integration, Data Platform Build, Vendor Selection, and Cloud).** Should you build, partner, or buy to address capability gaps?

- **Data: Fully Standard and Interoperable Health Data Flow with Integrated Data Insights on Public Health Outcomes and Social Determinants.** What are the existing and required data access points into the health system? What is the data governance required for sensitive data?

- **Funding and Incentives: Value-Based Incentives for Sustainable Systems and Solutions for Digital Adoption and Collaboration.** How can funding be sourced? How to ensure that all parts of the pathway are incentivized to act appropriately?

- **Hybrid Health Care Delivery: A Balance of Human-Centric Solutions and Implementation Capabilities with Digital Tools and Capabilities.** How to design and implement best-in-class hybrid pathways? How to ensure clinician and patient buy-in to the future approach?

- **Regulations and Policies: Awareness of Digital Regulations and Policies to Evaluate Vendors and Assess the Risks of AI-Enabled Solutions.** What are the local guardrails for developing and deploying solutions? What monitoring and evaluation framework should be in place?

The future of health care is here, and it relies on a digital-first model. However, to grasp this future, health care providers and systems need to be bold, strategic, and focused. Posing these questions is a first step on this journey.

About the Authors

Ben Horner
Managing Director & Partner
London
horner.ben@bcg.com

Stephen Sutherland
Partner & Director – Health Care Transformation
London
sutherland.stephen@bcg.com

Matthew Huddle
Managing Director & Partner
New York
huddle.matthew@bcg.com

Cassandra Yong
Partner
London
yong.cassandra@bcg.com

Victoria Morton
Associate Director – Health Systems Operations & Change
London
morton.victoria@bcg.com

For Further Contact

If you would like to discuss this report, please contact the authors.

BCG