Transforming transitions of care

Extending care beyond the hospital and into the home

Introduction
Extending where care is delivered has never been more critical

The transition to prioritizing home-based care has been underway, driven by an aging population, a rise in chronic conditions and an evolving reimbursement and readmission penalty landscape.[1-3] However, the ongoing COVID-19 pandemic has given new urgency to the shift toward non–hospital-based care delivery, both in providing chronic care at home as well as in continuity of care following hospitalization to avoid readmission.[4-6]

Today's climate has stretched health systems to the brink, with staff shortages and workflow inefficiencies exacerbating the stress already felt by healthcare teams. In the US, up to 55% of physicians state that COVID-19 has increased their feelings of burnout,[7] and those sentiments are felt by colleagues around the world. In China, up to 50% reported symptoms of depression,[8] and in Italy, nearly 50% reported symptoms of posttraumatic stress.[9]

Furthermore, as COVID-19 cases surge and fluctuate, people are avoiding the hospital and postponing necessary exams, screenings and tests. In England, emergency department (ED) visits fell by 25% in the week after the lockdown (March 23-29), and compared with the last week in February, visits were down 50%.[10] A similar trend was also reported in Europe, Canada and Australia.[10] In the US, 10 weeks after COVID-19 was declared a national emergency, visits to the ED for heart attacks dropped 23%, visits for strokes dropped 20% and visits for uncontrolled high blood sugar dropped 10%, in large part due to concerns about COVID-19 transmission.[11] By avoiding the hospital, people are also avoiding care, which can have serious, if not deadly, consequences. This imbalance may place an even greater burden on health systems going forward, further intensifying human, financial and technical resource challenges.

Yet as challenges and complexities continue to grow, so do expectations. Health systems are under pressure to offer patients and care providers state-of-the-art technologies and workflow solutions that keep care connected and nimbly extend it across care settings to address a range of conditions and needs while achieving better outcomes, improving the patient and provider experience and lowering costs.

Indeed, a transformative shift to extend where care is delivered is critical during the pandemic and beyond. Telehealth, artificial intelligence (AI)–enabled decision

Transitions of care during COVID-19: lessons learned

Perspectives from Cindy Gaines, MSN, RN, Philips Clinical Transformation Leader, Connected Care, and Ray Costantini, MD, MBA, Co-founder and CEO Bright.md
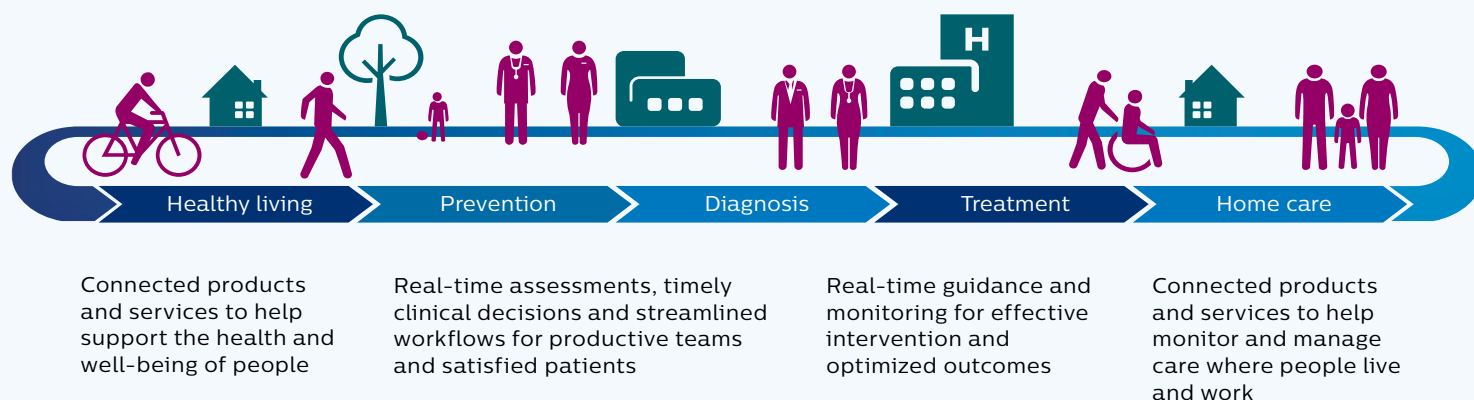
Care delivery can be transformed through:

- **Communication:** Improving provider satisfaction and patient outcomes through a connected ecosystem underpinned by cybersecurity for easier access to necessary data that informs operational decision-making and helps clinicians better serve patients

- **Collaboration:** Unlocking the digital front door to connect and share information across care locations to streamline transitions, with the goal of improving the patient and provider experience

- **Coordination:** Utilizing data to understand your patient population and anticipate their needs to be better equipped for a future crisis

- **Consideration:** Recognizing the evolving patient-provider dynamic to deliver services that help patients navigate the complex process of healthcare and access care wherever and whenever it's needed

support tools and interconnected devices to track patients along their journey all play an important part in transitioning care.

Health systems have much to gain by adopting a transitions-of-care approach

Chronic conditions are rising, yet ED visits are declining due to COVID-19[10,11] and staff shortages are mounting. Extending where and how care is delivered can help address these challenges in a cost-effective way.

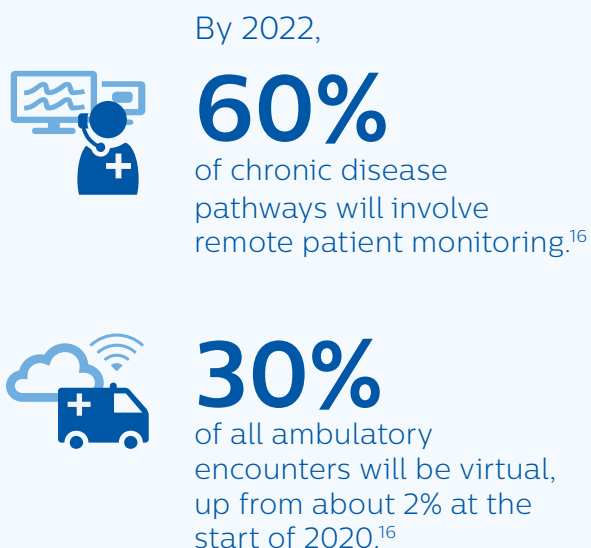| Healthy living	Prevention	Diagnosis	Treatment	Home care
Connected products and services to help support the health and well-being of people	Real-time assessments, timely clinical decisions and streamlined workflows for productive teams and satisfied patients	Real-time guidance and monitoring for effective intervention and optimized outcomes		Connected products and services to help monitor and manage care where people live and work

Going virtual with telehealth

Virtual visits have accelerated in the wake of COVID-19. They bring care to the home, allowing for remote screening and helping to proactively manage patients in low-acuity settings.[4] Use of telehealth conserves equipment and hospital space, limits the risk of exposure for hospital-based healthcare teams, limits potential patient exposure by allowing them to receive care from the comfort of their home and reduces the

overall cost of care.[12,13] In one study, telemedicine reduced care-related costs of chronic heart failure by nearly 40% compared with costs of usual care.[14]

According to the American Hospital Association, health systems must increase the maturity of their telehealth capabilities to remain competitive and meet growing patient demand.[13] As healthcare providers look beyond the COVID-19 pandemic, they will require solutions that can simplify and integrate into clinical workflows and provide frictionless consumer and patient experiences.[15]

Philips has been a leader in telehealth across acute care and postacute care settings for over three decades, helping health systems extend care to more settings. With its expertise and collaboration, Philips can help health systems deploy and scale telehealth solutions, extending the capacity of healthcare teams and consistency of patient care to enhance the health of patient populations. This type of virtual care helps deliver the right resources at the right place to support both inpatient and outpatient care. Emory Healthcare in Atlanta, Georgia, USA, was challenged by the need to manage the growing number of intensive care unit (ICU) patients due to a nationwide shortage of highly skilled critical care nurses and intensivists. Emory Healthcare confronted these challenges by using Philips tele-ICU program to expand access to critical care services.* With experienced intensivists and ICU

By 2022,

60%

of chronic disease pathways will involve remote patient monitoring.[16]

30%

of all ambulatory encounters will be virtual, up from about 2% at the start of 2020.[16]

*Results from case studies mentioned in this paper are not predictive of results in other cases. Results in other cases may vary.

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At Ysbyty Gwynedd, General Hospital, Bangor, Wales, UK, use of Philips early warning scoring software reduced serious adverse events by 35%, reduced cardiac arrest by 86% and helped alleviate administrative burden for nurses, freeing up their time for patient care.[18]

nurses available around the clock across their acute settings, Emory Healthcare improved continuity of care and quality, resulting in patients who are healthier at discharge and more likely to move to home. Over a 15-month period, Emory Healthcare realized an estimated savings of $4.6 million, increased discharge to home healthcare by 4.9%, decreased discharge to nursing homes or long-term care hospitals by 6.9% and decreased the rate of 60-day inpatient readmissions by 2.1%.[17,*]

Leveraging AI to improve health outcomes[18]
Through the use of AI, healthcare can move beyond the current model of reactive sick care toward proactive care. AI-enabled decision support tools, such as patient monitors and early warning scoring software, turn data into clinically relevant, actionable insights and information. Data from multiple clinical parameters are incorporated into innovative, intuitive views that allow clinicians – at bedside or off-site – to catch trends and signs of deterioration in a patient's condition at a glance. This aids in clinical decision-making, leading to better patient outcomes with the goal of improved population health.[19] At Ysbyty Gwynedd, General Hospital, Bangor, Wales, UK, Dr. Chris Subbe recognized that the general clinical staff were missing signs of deterioration in patients due to high cognitive loads and that a connected system

linking bedside teams with the oversight of a critical care trained specialist would present opportunities for safer care. Using Philips early warning scoring software, along with professional services to improve clinical workflow, Ysbyty Gwynedd achieved a 35% reduction in serious events, an 86% reduction in cardiac arrest, a 24% reduction in ICU admissions and a 66% reduction of ICU mortality among patients transferred to the ICU.[18,*]

Empowering the flow of information to improve continuity of care
Interoperability, where data flows easily and securely across every component, is essential to extending care. This ability has the potential to improve the clinical decision-making process across the health continuum by giving healthcare providers access to the right data at the right place and the right time. Philips strives to make interoperability and security a core element of health systems around the world. Philips not only participates in the Global Consortium for eHealth Interoperability, advocating to make policy-based interoperability road maps a reality, but was also an early adopter of HL7's Fast Healthcare Interoperability Resources (FHIR) specification, a standard for organizing and describing healthcare data for ease of exchange between systems. Philips supports open standards and also works toward their implementation,

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"In the shift to demand-driven health care, telehealth becomes the patient's first – and most frequent – point of access for urgent care, triage for emergent conditions, specialty consults, post-discharge management, medication education, behavioral health counseling, chronic care management and more."[13] – AHA Market Insights Report
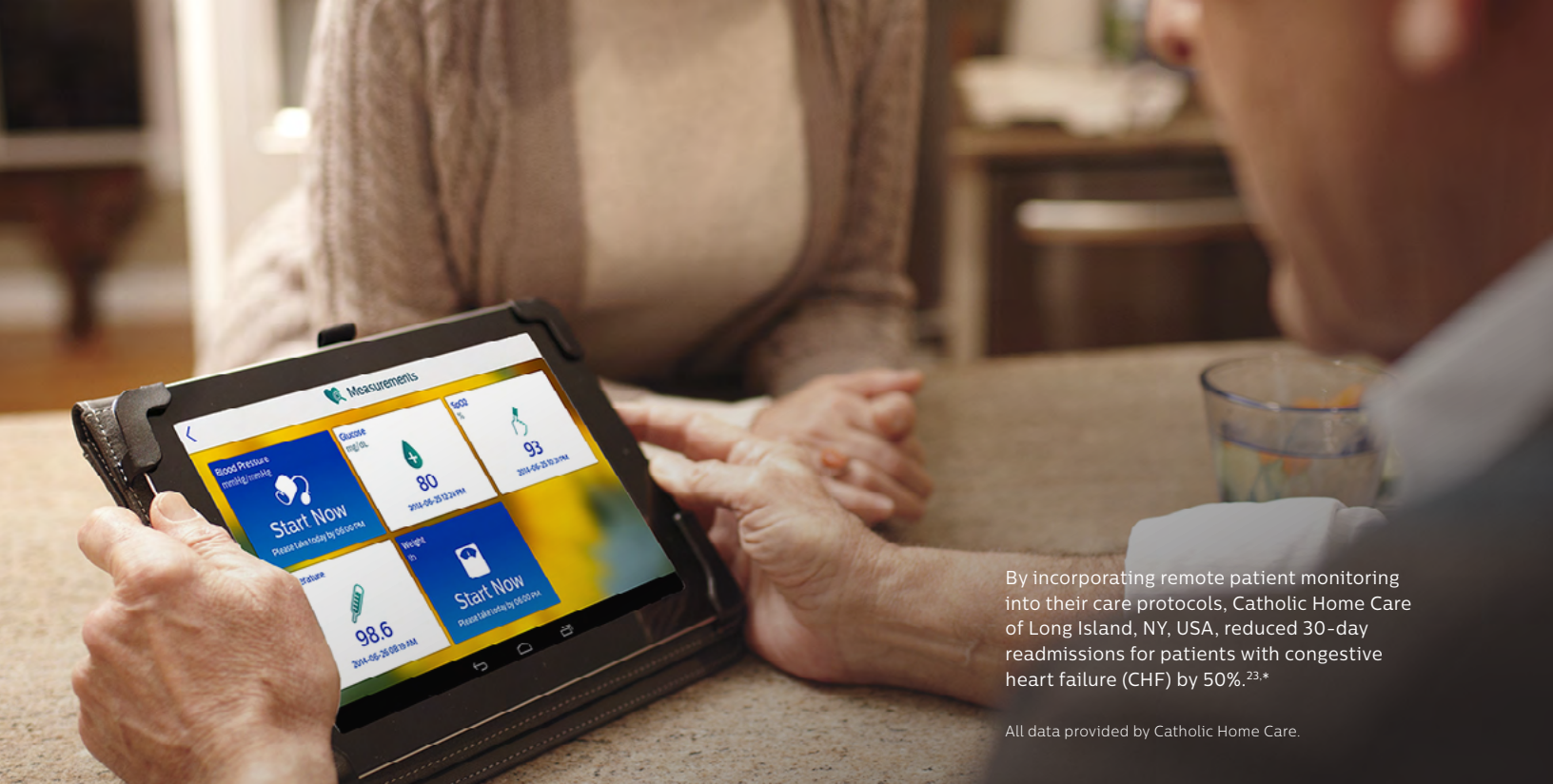
By incorporating remote patient monitoring into their care protocols, Catholic Home Care of Long Island, NY, USA, reduced 30-day readmissions for patients with congestive heart failure (CHF) by 50%.[23,*]

All data provided by Catholic Home Care.

supporting health systems at every level. This allows systems and departments to communicate with each other and exchange clinical information inside and outside the enterprise, helping partners and customers to collaborate and create an effective care collaboration ecosystem.

Philips is also committed to ensuring our technologies meet rigorous international security standards. Philips HealthSuite Digital Platform is certified by HITRUST.[20] This extensive set of external compliance certifications and attestations provides objective evidence of compliance to security and privacy regulations such as ISO 27001/18, SOC2. And Philips is proud to be the first medical device manufacturer to be granted the Underwriters Laboratories (UL) product cybersecurity testing certification, which combines cybersecurity testing elements of the established UL 2900-2-1 standard for Software Cybersecurity for Network Connectable Products, as well as security principles from international standards (ISO 13485 and ISO 14971).[21] By performing to these specifications, Philips

can better help facilitate the systemwide availability and cybersecurity of patient data and diagnostic images for clinical staff, thereby facilitating timely and effective care.

Protecting sensitive health technology and patient information across devices, systems and settings is critical for implementing a transitions-of-care strategy. Solutions must be modular and open to allow for integrated care delivery and the addition of capabilities over time. To support an open environment that enables data sharing across a patient's journey, Philips is highly invested in adhering and contributing to the evolution of industry standards, and implementing a 'security by design' mindset.

Collaborating with health systems to deliver ongoing value

Delivering on quadruple aim objectives can be challenging, especially when financial constraints create barriers to securing the right technologies and support to drive meaningful improvements. Transforming how and where care is delivered requires a partner with a shared vision, complementary expertise and a flexible range of innovative business models that provide access to data-driven, outcomes-based solutions and strategic consulting. Philips collaborates with customers to uncover the root causes of their challenges and customizes and implements tailored solutions to meet their unique needs. Ongoing consultative support and program management underpin these strategic relationships and support customers in their goals of improving clinical, operational and financial performance, leading to enhanced patient care and staff satisfaction.

73%
of healthcare professionals across 19 countries say connected technology is important to improving the prevention of medical issues.[22]

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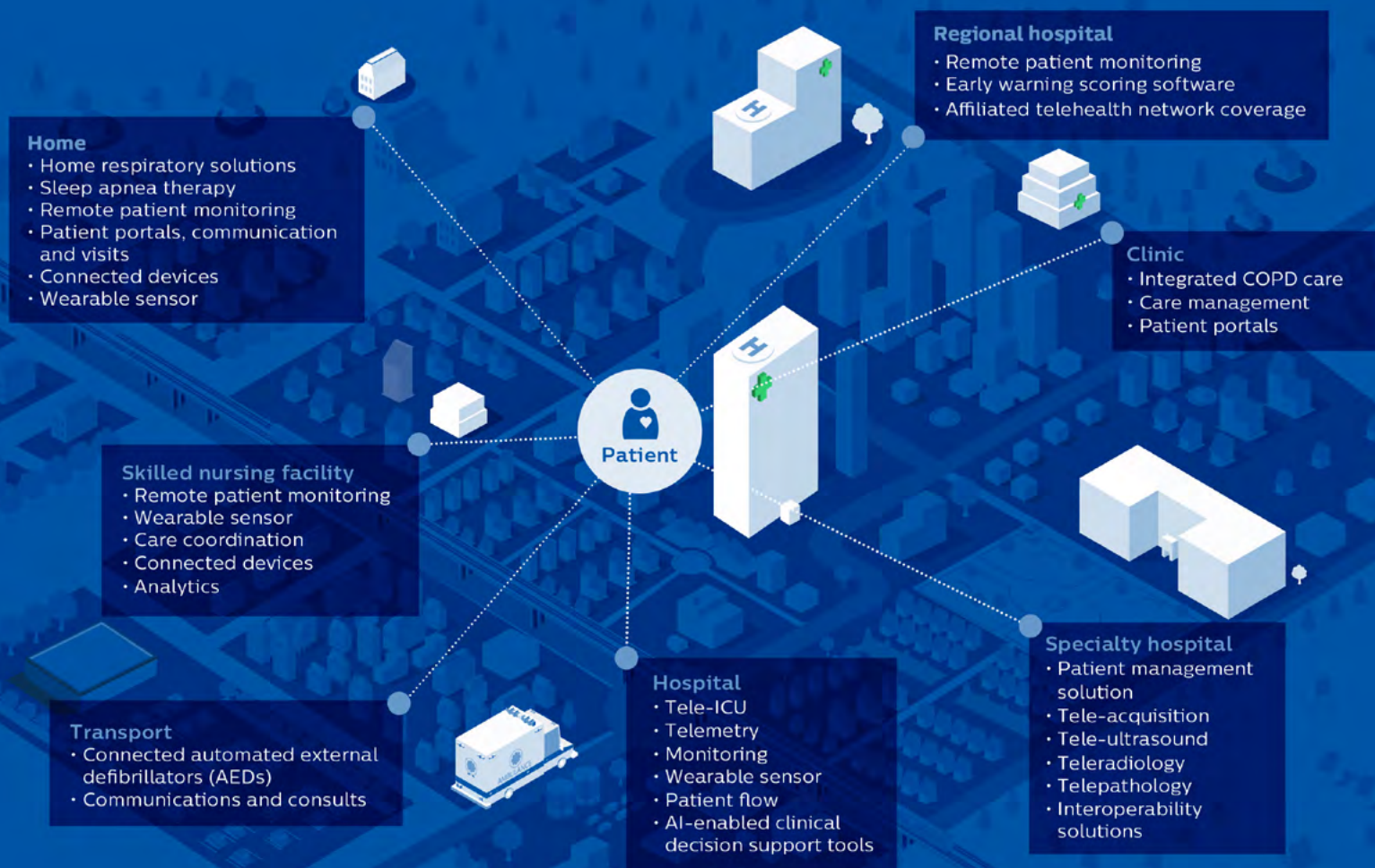# Philips has the technology and expertise to bring chronic care into the home

The Philips suite of connected care solutions aims to deliver precision, accuracy and quality to help healthcare organizations shift care from the hospital to the home. By expanding access to care, creating increased efficiencies and focusing on the prevention, management and treatment of chronic conditions, these solutions may help enhance clinical and financial outcomes.[24,25]

Expands access for flexible patient care
Telehealth solutions allow patients to receive the care they need in low-cost settings that are convenient and comfortable for them.

Philips remote patient monitoring solutions provide healthcare teams with the tools they need so they can remotely track the health of their patients at home, collaborate with the patients' doctors and help detect problems before they lead to readmissions. Providers assign patients to specific care protocols and interventions that are tailored to condition or acuity level, which can include measuring vital signs, completing surveys, watching educational videos and participating in video visits with the virtual care team.[26] Philips solutions are well suited for helping to manage patients with COVID-19, as well as those with

The many ways Philips is connecting care

Regional hospital
- Remote patient monitoring
- Early warning scoring software
- Affiliated telehealth network coverage

Home
- Home respiratory solutions
- Sleep apnea therapy
- Remote patient monitoring
- Patient portals, communication and visits
- Connected devices
- Wearable sensor

Clinic
- Integrated COPD care
- Care management
- Patient portals

Patient

Skilled nursing facility
- Remote patient monitoring
- Wearable sensor
- Care coordination
- Connected devices
- Analytics

Transport
- Connected automated external defibrillators (AEDs)
- Communications and consults

Hospital
- Tele-ICU
- Telemetry
- Monitoring
- Wearable sensor
- Patient flow
- AI-enabled clinical decision support tools

Specialty hospital
- Patient management solution
- Tele-acquisition
- Tele-ultrasound
- Teleradiology
- Telepathology
- Interoperability solutions

In Canada, a pilot program is underway utilizing Philips early warning scoring to wirelessly monitor patients' vital signs in the ward and at home. [27,28,*]

Bridging the gap from hospital to home

Researchers at the Population Health Research Institute of Hamilton Health Sciences (HHS) and McMaster University in Canada are helping to bridge the gap between hospital and home for patients who undergo major surgery. A pilot program for their monitoring solution is underway to compare its effect versus that of standard care on the 45-day risk for a composite of hospital readmissions and ED/urgent care visits (no hospital admission required) in patients who undergo cardiac or major vascular surgery. This monitoring solution utilizes Philips early warning scoring to wirelessly monitor patients vital signs in the ward, and a hospital-to-home system to track a patient's vital signs from home and alert the hospital team to any signs of deterioration.[27,28,*]

Medical-grade clinical accuracy can also be achieved with a Philips BioIntelliSense BioSticker. This discreet device is ideal for at-risk patients with chronic or complex conditions. For patients at home or in a nonhospital setting, a wearable sensor offers a 'stick it and forget it' approach with 30 days of continuous vital sign monitoring. In addition, a wearable sensor can enhance remote patient monitoring programs with continuous biometric monitoring of skin temperature, respiratory rate at rest, heart rate and coughing frequency.[29]

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prevalent chronic conditions, who may not require critical care but may need routine monitoring.

Catholic Home Care, a division of Catholic Health Services of Long Island, launched a remote patient monitoring program in partnership with Philips in 2015 to better manage 30-day readmission rates of patients with an acute exacerbation of CHF. The Catholic Home Care team focused on identifying and improving all factors directly impacting 30-day readmission of CHF patients, incorporating remote patient monitoring into their care protocols and standardizing practice variability in the management of patients. This resulted in a 50% reduction in 30-day readmissions for CHF patients** and spurred expansion of remote patient monitoring to include other patient populations.[23,*]

May help increase operational and clinical efficiencies
Today's overstretched healthcare teams need support to enable quick decision-making at all points of care. In the acute care setting, Philips customizable patient monitoring systems combine software, clinical decision support algorithms and mobile connectivity to help clinicians identify potential or imminent patient deterioration for early intervention.[30] Predictive analytics can also help clinicians identify suitable patients for transfer or transition to care outside the hospital, improving overall efficiency.[31] Philips remote

patient monitoring helps care teams intervene early, potentially reducing readmissions through early identification of signs and symptoms.[26]

Supports management and treatment of chronic conditions with a focus on preventive care
By providing care in patients' homes and without the limitations of hospital space, healthcare providers have the opportunity to manage and treat chronic conditions, such as diabetes and hypertension, while also placing greater focus on preventive care, which may reduce readmissions.

The COVID-19 crisis has elevated the need for home respiratory care. Patients with chronic conditions and/or preexisting respiratory diseases are at higher risk for severe illness from COVID-19.[32] Philips home respiratory solutions offer adult and pediatric patients both invasive and noninvasive therapies with advanced technology and user-friendly interfaces to help them, their home care providers and caregivers navigate respiratory care in the home.[33] By moving respiratory care to the home, hospitals can free up beds, conserve personal protective equipment (PPE), protect vulnerable patients from other viruses and support reduced hospital readmissions. In a recent survey of more than 4,000 adults in China, India, Russia and the

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**All data provided by Catholic Home Care.

58% more people reported using their PAP therapy every night* when they used Philips sleep apnea therapy adherence mobile app.[36]

United States to gather insights on global awareness of respiratory conditions, 56% of COPD patients reported COVID-19 has made it difficult for them to get COPD treatment, and 79% of informal caregivers cited the pandemic as a key factor that influenced the amount of care they provided to the COPD patient.[34] Philips integrated COPD care can help better manage the care of patients with COPD by focusing on robust data aggregation and analytics, expanding and improving screenings, providing better care transition management and care coordination pathways, and empowering respiratory therapists.[35]

This initiative resulted in an 80% reduction in acute 30-day readmissions and a >70% reduction in total all-cause acute care events by initiative end – driving a savings to the hospital of approximately $1.3 million and $4.4 million, respectively.[35] And Philips continues to expand its home care portfolio for COPD patients with noninvasive ventilation therapy that makes it easier to analyze and share information.

Similarly, adherence to positive airway pressure (PAP) therapy is necessary for those with obstructive sleep apnea. Philips sleep apnea therapy helps patients lead healthy lives with solutions designed to increase adoption and long-term use as well as enhance efficiencies. In fact, 58% more people reported using their PAP therapy every night* when they used Philips sleep apnea therapy adherence mobile app,[36] and 79.5% of Philips Patient Adherence Management Service (PAMS) patients with sleep apnea met the

90-day Centers for Medicare & Medicaid Services (CMS) compliance guidelines.[37]

By extending the reach of patient care, Philips connected care solutions provide actionable insights that empower healthcare providers to confidently guide patient care across multiple settings, drive better health outcomes and, ultimately, reduce hospital readmissions.[17,18,23]

Patients benefit from increased engagement
Philips connected care solutions motivate patients toward better health and greater self-care by empowering them to become more engaged in their own health throughout their journey. When patients must travel to imaging or other critical appointments, patient no-shows or patients who are poorly prepared are a significant cause of operational inefficiencies.[38] In radiology, patients who are not properly prepared often require repeat exams, which can increase costs. Philips patient management solution uses automated text messages, email and voicemail to deliver targeted and timely educational and instructional messages to patients, helping them prepare for appointments, be on time and follow their care plans.[39] Use of engagement tools reduced no-shows in certain procedures by 41%[37] and increased portal adoption by 231%, with 98% of subscribers choosing not to opt out.[39,**] If patients can engage in their care before they arrive, they will show up educated and adequately prepared – creating a smoother and more efficient process for everyone.

*In a retrospective review conducted by Philips Respironics of the EncoreAnywhere database (white paper) that compared mobile app patients (n=71,157) to users who did not use it (n=56,711) over a period of 90 days, 19% of mobile app users used their therapy 100% of the nights over 90 days versus 12% for the Standard Care users, a relative increase of 58.33%.[36]

**Based on internal data.

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Philips home respiratory solutions offer adult and pediatric patients both invasive and noninvasive therapies with advanced technology and user-friendly interfaces to help them, their home care providers and caregivers navigate respiratory care in the home.[33]

Summary

At Philips, we believe health has always been a connected whole. That's why we're committed to creating a healthcare system that's connected, too. A deliberate and smooth hospital-to-home transition provides a more streamlined and personalized approach to patient care. AI-enabled clinical decision support tools help healthcare providers identify illness to improve health outcomes. By collecting, organizing, planning and acting upon data, we can help keep patients with chronic conditions and/or comorbidities out of the hospital and comfortably at home, supported by the necessary infrastructure and appropriate personnel.

For healthcare providers, shifting care management for patients with chronic conditions from hospital to home may alleviate workload, reduce unnecessary paperwork, inform how staff is allocated and reduce burnout, especially by keeping those patients out of the hospital during subsequent phases of treatment. And for hospital-based care teams, telehealth solutions extend care to the home, limiting the risk of exposure to COVID-19 or other illnesses. Further, when care transitions to the home or other lower-risk

settings and remote patient monitoring are employed, there is a reduction in hospital readmission rates and, ultimately, a reduction in overall cost of care.[14,23]

However, implementing a transitions-of-care approach requires the right partner. As a global leader in telehealth, interoperability and cybersecurity, and consultancy services, Philips brings together decades of experience and innovative technology to help you design, implement and finance solutions to achieve your organizational goals. Our partnerships with health systems around the world focus on mutually beneficial goals and outcomes. These collaborations continue to inform, shape and enhance our solutions so we can help you address your most pressing challenges.

We are more committed than ever to putting our intelligence and our connected, secure solutions to work. We look for opportunities to break down silos, smooth workflows, help support patient care and hasten the healing. Streamlined and efficient healthcare impacts us all, so let's work together to make it happen.

Contact us today to learn more about what our connected care solutions can do for you.

"...the relationship we have with our customers is fundamentally changing...
We want to partner with you in thinking about how to improve people's lives further.
We want to share with you our expertise in health and well-being, technology, information systems and business processes – and, more and more, we will be judged by the results that you achieve." –Frans van Houten, CEO, Royal Philips

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