PHILIPS

Cardiology

Building stronger cardiac care, together

Trends in cardiology care

Better care for less cost

Healthcare priorities increasingly emphasise value over volume, a shift away from the old, 'more is better.' Outcome-based shared risk, ownership and accountability are moving the focus from product transactions to pay for value. Healthcare providers expect their solutions to deliver high-quality care at a reduced cost.

Simple and conclusive diagnosis

Diagnosing cardiac disease remains challenging with potentially multiple tests needed. The goal is more conclusive and less invasive tests, leading to less re-testing and re-scanning, for a more precise diagnosis. All of this may help cardiologists identify the right treatment plan sooner, as well as ease patient anxiety and discomfort.

More treatment options for patients

New innovative technologies that allow procedures to be less invasive offer hope to patients who may previously have been considered untreatable.

Patient care beyond the hospital

Patients with chronic conditions, such as heart failure, require ongoing management. Fortunately, advances in technology and remote monitoring allow patients, even those with implantable devices, to receive care beyond the hospital.

Staying connected to health care - remotely

The COVID-19 pandemic has accelerated the need for physicians to engage with patients regardless of their location, allowing physicians and patients to feel connected and assured that treatment plans are moving forward.

Personalised care at scale

Leveraging capabilities such as artificial intelligence (AI), precision care is made possible through an individualised approach tailored to the patient based on detailed analytics of personal data, while ensuring customised relevance to all stakeholders.

Trends in the four primary disease states

Coronary artery disease

#1 **global disease burden**

Prevalence rate 2x
any other cardiac disease

Structural heart

13% **increase in procedures**

Arrythmia

Prevalence = 37.4 **million**

Heart failure

#2 **largest prevalence at** 64 **million**

Institute for Health Metrics and Evaluation (IHME)
Cook, C. et al., The annual global economic burden of heart failure. Int J Cardiol. 2014:171(3):368-763.

The cardiology landscape

With around 18 million people dying annually from cardiovascular disease (CVD) – more than from any other cause – it's no surprise that pressure on cardiology departments around the world is increasing. Cases of total CVD nearly doubled from 271 million in 1990 to 523 million in 2019.[1] Today, 32% of global deaths are due to cardiovascular disease.[1] The number of deaths is steadily rising and has been doing so for over thirty years, adding to the strain on healthcare systems.[2]

Healthcare providers also have the challenge of reducing costs while improving patient outcomes. The costs of cardiovascular disease in the US alone are expected to grow 101% by 2035.[3] Patients today require more attention and more clinical options due to the complexity of cardiovascular diseases, yet many systems are already facing staff shortages.[4,5]

At the same time, patients, along with payers and administrators, expect maximum efficiency from care teams.

Faced with these challenges, cardiology departments require both innovative approaches and advanced technologies enabled by strategic industry partnerships to improve the way care is delivered at every point in a patient's journey.

The demand for efficient and integrated cardiovascular care is growing, along with care that can be provided when and where it is needed. **Personalised, efficient, and clinically smart cardiac care that drives optimal outcomes is the cardiac care of the future.**

Cardiology departments face considerable challenges

Every **36** seconds someone in the U.S. dies from heart disease[6]

Escalating cost of care

101% Expected growth in cost of cardiovascular disease in the USA from 2015 to 2035[8]

Staff pressures

30% of cardiologists found dealing with so many rules and regulations the most challenging parts of their job[11]

Heart disease is the **#1** killer of women globally, taking more lives than all forms of cancer combined[7]

Diagnostic limitations

60% of patients selected for coronary angiography show no obstructive disease[9]

Early detection

20-40% of heart attacks occur in undiagnosed CVD patients[12]

Heart disease is the #1 cause of death in the world, representing **32%** of all global deaths[1]

Burden of chronic illness

25% of heart failure patients are readmitted within 30 days

Accessing information

44% of health systems cannot access images, measurements and calculations from CVIS in their EMR today[13]

Positioning cardiology departments for a better future, today

At Philips, our purpose is to improve people's health and well-being through meaningful innovation. Never has this approach been more important in cardiac care than it is today. We strive to understand the challenges healthcare providers face and believe that by collaborating with you, we can tackle the toughest problems and arrive at innovative solutions that will deliver the greatest value.

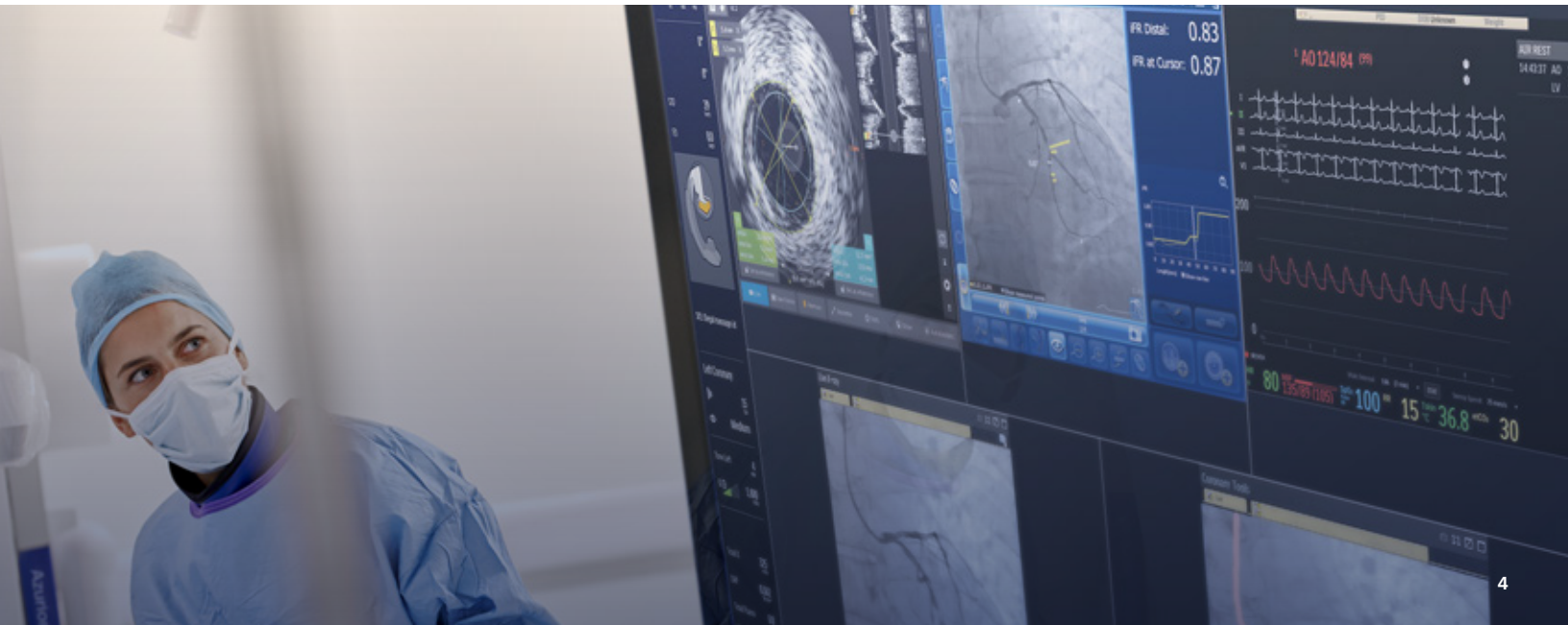
Through this collaboration, we apply innovative technologies, services and software to support the delivery of optimal care while also achieving the Quadruple Aim: better health outcomes, improved patient experience, improved staff experience and lower cost of care.

We help care providers deliver improved heart care at every phase of a patient's journey. This means clinically smart diagnostic solutions, streamlined workflows and actionable insights, all of which can help achieve a confident diagnosis. We know that optimal cardiac care begins when patients are directed to the most appropriate care setting, receive the least invasive treatment and only remain in the hospital as long as necessary. During treatment, Philips cardiology solutions work together to provide comprehensive and timely clinical insights that can improve outcomes, while enhancing treatment planning and reducing time spent.

We help to proactively identify potential cardiac events and deteriorations in a patient's condition to reduce the potential for an acute event. But should an acute event occur, we offer solutions for that as well. Our remote-based programs for emergency care, chronic disease management and readmission management can help contribute to improved patient care while helping healthcare providers meet clinical and business needs. From pre-diagnosis to treatment to monitoring and connecting with patients once they're back home, we not only offer advanced, integrated solutions, but also training, services and programs that are designed to help patients return to an active, healthy life.

This future of cardiology is being written right now. We're privileged, and proud, to be a part of it together with you.

To provide the greatest benefit to cardiac care, the entire patient experience and care pathway must be optimised and connected at each step. Early, timely and accurate diagnosis fuels insights that help put patients on a path to precise treatment, which, in turn, fuels rapid recovery or ongoing care management, both of which are monitored closely even once the patient returns home. This is how Philips sees the path to personalised, efficient and clinically smart cardiac care.



Personalised, efficient and clinically smart cardiac care that drives optimal outcomes throughout the patient journey

What's needed is a connected care ecosystem of integrated solutions for cardiology that includes the unique application of innovative technologies, including automation, AI and smarter workflows so clinical teams can focus on patient care – confidently, efficiently and effectively. And, to get there, integrated cardiac care solutions will have to become:

- **Clinically smart**
  Using solutions that augment expertise across the cardiac care continuum, with robust insights and advanced technologies that enable the right care at the right time for even the most complex patients
- **Effortlessly interoperable**
  With integrated imaging, devices, informatics and service solutions that help improve outcomes, optimise resources, and help lower the cost of care
- **Patient centric**
  Enabling personalised care in the most appropriate setting for every cardiac patient, with user-friendly tools and streamlined workflows that relieve pain points for staff, alongside options that increase comfort for patients

Health care providers strive to improve efficiencies and outcomes in cardiology to deliver on the Quadruple Aim. We work with you to create the right solution, consisting of products and services, for an efficient, seamless and unified cardiology experience at each step in the care journey.

Delivering on the Quadruple Aim

Better health outcomes

Care teams need to deliver improved health outcomes and reduce the risks associated with cardiac disease which starts with confident decision making. We help accomplish this by providing smart diagnostics that convey comprehensive patient insights, advanced technologies for minimally invasive cardiac interventions, and remote monitoring for patient engagement across settings.

Improved staff satisfaction

Healthcare workers are challenged to care for a growing number of complex patients, while maintaining efficiency across the care pathway. We help build efficiency by providing interoperable, user-friendly systems that streamline workflows and improve collaboration, efficiency and safety.

Improved patient experience

Patients increasingly prefer health services coming to them and fitting into their daily routines. We focus on helping to reduce patient discomfort and streamline the patient journey by providing innovative solutions and comprehensive cardiac care management across all settings.

Lower cost of care

Healthcare providers continually face pressure to reduce care costs, even as these same costs are expected to grow over 100% in the next 13 years. We partner with you to define cost-effective solutions and deliver clinical innovations and unique business models that enable the efficient use of resources across the entire cardiac care pathway.

Building better cardiac care, together

Clinically smart solutions amplify expertise across the cardiology care continuum

Robust insights and advanced technologies enable the right care at the right time for even the most complex patients. Our deep clinical understanding propels this innovative application of technology across the cardiac continuum to advance care and improve efficiency.

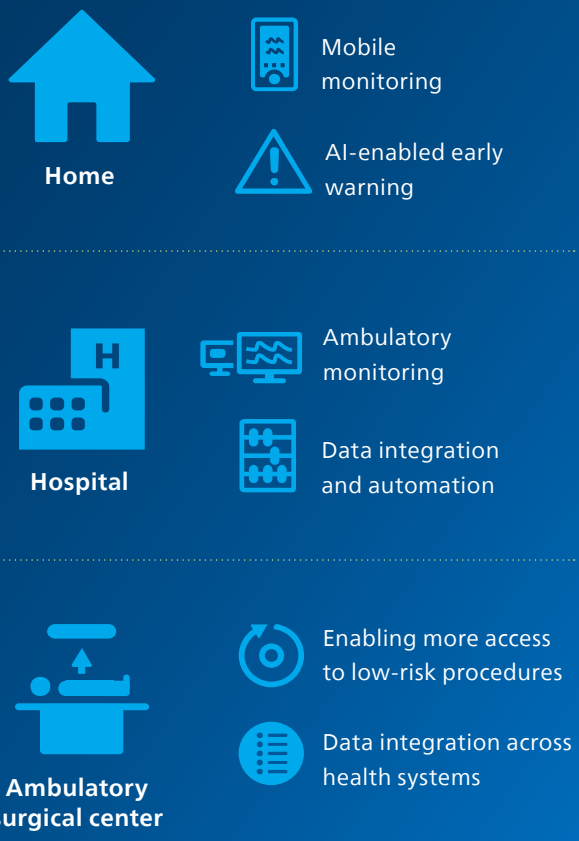
We deliver intelligent and intuitive technology and systems that work together end-to-end to bring the most clinically valuable insights to care teams, supporting shared decision making to strengthen the team's clinical confidence and efficiency.

For example, one of the largest challenges in cardiac care is that overburdened clinicians spend precious time navigating different systems and facilities to track essential patient data, including increased study requirements, which may not align with the diagnostic questions that need to be answered. Imaging specialists are in short supply and can be further burdened with workflows that are inefficient. And shortcomings remain in the communication processes that connect the members of a heart care team for vital collaboration. Through purposeful integration of solutions, automation, AI and user-friendly tools, we help enhance the diagnostic process by delivering accurate and meaningful data in an efficient and accessible way.

We're also helping to innovate procedures by combining interventional angiography with smart devices and software that co-register clinical images to improve insights and confidence to help you optimise percutaneous coronary intervention (PCI) for every patient. These advanced capabilities are all controlled from one user interface at bedside to increase efficiency.

With the aim to create more efficient cardiovascular care, the cath lab of the future will strive for deeper integration of data and hardware from end-to-end, generating insights that streamline care throughout the patient's journey.

The many ways Philips is connecting care



Similarly, early signs of patient deterioration can be difficult to capture in a timely manner for optimal intervention. What caregivers need for earlier intervention is timely insight on changes in a patient's clinical status obtained by unifying large amounts of patient data from disparate sources.

We provide a customisable patient monitoring system with early warning scoring powered by AI that helps address this challenge by allowing caregivers to automatically acquire vital signs, automate early warning scoring calculations, aid in identifying early signs of deterioration, and inform responsible clinicians for early, effective intervention.

We envision a future where AI-enabled algorithms provide early warning and extend care capabilities from hospital to home for every patient.

Continued

Effortless interoperability through actionable data

A connected ecosystem of interoperable solutions enabling single-point access for actionable data will address one of the toughest challenges for cardiology teams: how to make decisions quickly and confidently based on patient data from multiple different sources. What's needed is a way to connect patients, care teams and data across the entire cardiovascular care continuum.

This kind of effortless interoperability aggregates large amounts of data and presents the most relevant insights, empowering clinicians to turn clinical findings into a decisive, actionable plan. At Philips, we're building toward a future of even more seamless access to comprehensive data throughout the care journey. For example, today we can combine data from across systems and devices and provide a chronological view of patient cardiac exams and diagnostic data.

The data that become available through integration must also be translated into actionable insights, presented on a single user interface. In the interventional suite, for example, we're helping bring data together and optimise the insights for timely decision-making during and after procedures. Integration is providing uninterrupted and comprehensive patient monitoring during the entire cath-lab workflow, from pre- to post-procedural areas.

Actionable data to help optimise operational efficiency can ease any pressures on caregivers to manage more patients in the same amount of time. Our goal is to create a holistic view of workflows – from scheduling to diagnosing to treating and beyond. Looking at every step and the sum of the parts can help drive value-based care. Patients, care providers and the healthcare system at-large are all the better for it.

Continued

Patient centric care for everyone

Philips is driving the vision of patient centric care for everyone by partnering with healthcare providers to enable care in less acute settings using new technologies to care for patients, wherever they are. Whether it is a hospital room, office, another healthcare facility, home or community center, care must be delivered wherever the needs are. This is a trend that's here to stay.

In the United States, for example, ambulatory surgical centers are increasingly performing percutaneous coronary interventions (PCIs) due to financial, operational and patient care benefits for this procedure at these centers. While more specialised/high-risk procedures will continue to be performed in hospitals, this trend of shifting care to lower cost settings will help improve patient access to care.

For elective procedures, data and automation can enable agile, efficient and personalised care across care settings for even complex cases. This means patients are in the hospital or clinic only as long as they need to be and allows for continuity of care afterward.

We're committed to helping patients receive optimal care in the best setting, which is often a less acute setting. Our ambulatory monitoring, for example, allows patients to move from the cardiac ICU back to the ward. Mobile monitoring at home can reduce the length of patient stay.

In many cases, care must also be provided regardless of the cardiologist's physical location. While telemedicine has become an increasingly important mode of care delivery, cardiologists need to have a comprehensive suite of tools available to help analyse and interpret patients' images and data, prevent unnecessary trips to the hospital while still providing seamless care. These solutions can improve workflow quality and consistency for optimal patient care and provider experience.

Heart failure patients, for example, often must visit the hospital for follow-up care. If patients feel well, they may not see a need to make a trip to the hospital unless a problem arises. If healthcare providers can collect a patient's data and offer ongoing care without requiring a hospital visit, it's a win for the patient and the healthcare provider. Remote cardiac monitoring makes this possible.

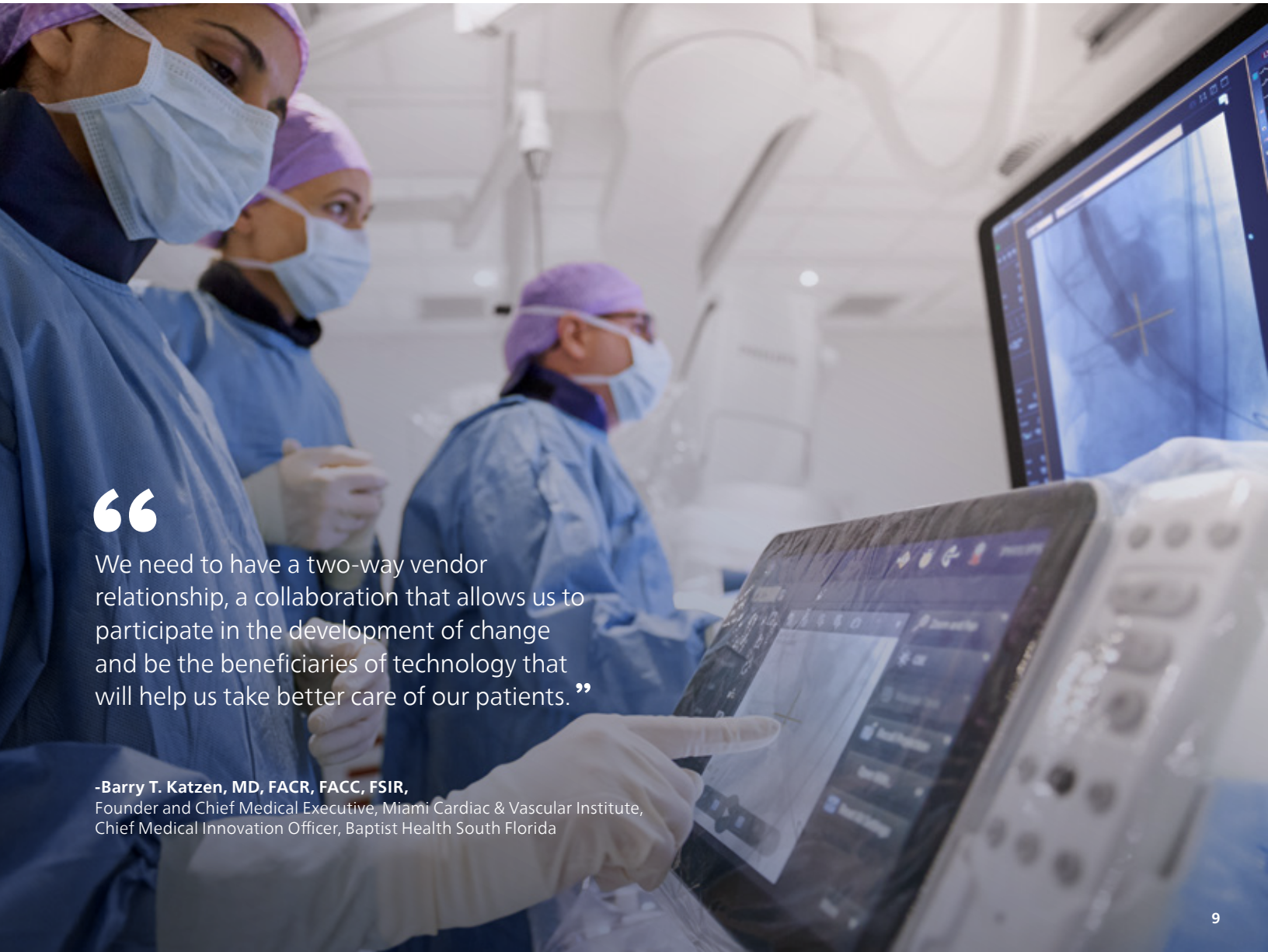
Innovations in post-acute monitoring for patients who have experienced heart failure, arrhythmias or structural heart disease help keep them closely connected to their care team regardless of location. AI-enabled early warning patient monitoring systems are customisable, combining software, clinical decision support algorithms and mobile connectivity to help healthcare systems identify patient needs sooner and respond faster. It has been shown that the use of an early warning system resulted in a 35% reduction in serious events for cardiac patients.[14]

Collaborating for the future

Philips partners with healthcare providers to create the right solution, consisting of products and services, to support an efficient, seamless and unified cardiology experience. This approach helps ensure that everyone, from patients to physicians to administrators, receives the best care, support and reliability from start to finish.

Our co-creation process consists of four phases:

- **Discover**
  Gain deeper insights and common understanding of the problem area, examine healthcare provider segments through qualitative and quantitative analysis
- **Frame**
  Narrow the focus of the problem and identify opportunities
- **Ideate**
  Create innovative paths to solutions and promote generation of ideas using a variety of creative techniques
- **Build**
  Display ideas and create measurable outcomes for healthcare providers by simulating how the care team will use the solution



“We need to have a two-way vendor relationship, a collaboration that allows us to participate in the development of change and be the beneficiaries of technology that will help us take better care of our patients.”

-Barry T. Katzen, MD, FACR, FACC, FSIR,
Founder and Chief Medical Executive, Miami Cardiac & Vascular Institute,
Chief Medical Innovation Officer, Baptist Health South Florida

Case study: The value of strategic partnerships in collaboratively building a cardiology enterprise that delivers on the quadruple aim

Innovation never happens in isolation. The very best work is done in close partnership with others.

The value of such partnerships is keenly felt in cardiovascular care, which is a long-term, high-cost effort that calls not only for ongoing clinical innovation to optimise outcomes, but also for workflow and business innovation to improve operational efficiency. Strategic partnerships with companies that provide innovative technology and services are increasingly important as health systems seek to reduce unwarranted cardiovascular care variation, address concerns about technology obsolescence and cybersecurity, and navigate the shift to population-based reimbursement models and outpatient care where appropriate.

For the team at Miami Cardiac & Vascular Institute (MCVI), part of Baptist Health South Florida, a long-term, productive relationship with Philips has been in place for over 30 years. A tenured Philips team continues to collaborate with MCVI to identify its strategic cardiovascular care vision and uncover the root causes of the issues they are facing. The result? Innovations that have optimised IT management, facility design, clinical workflow efficiency, capital cost reduction and variable inventory management.

Data metrics are guiding the work and measuring the success of the partnership with MCVI. These metrics include operational key performance indicators (KPIs) like reduced room turnaround time, intra-procedure time, variable supply costs and patient wait times. They also include clinical operation KPIs such as reduced procedural complication rates, coronary artery bypass graft surgery (CABG) failure rates at 30 days, and unscheduled PCI readmissions. Teams collaborate to optimise interventional lab utilisation, streamline operations, and address changing reimbursement and cost structures, among other goals.

For more details, please see our customer story.

Summary

Philips is committed to strengthening the cardiac care system and playing our part in building one that better serves patients across their entire care experience. To do so, we are dedicated to partnering with you to continue breaking down physical, clinical and operational barriers to care.

The burden of cardiovascular disease continues to rise. Demands to become both more efficient and deliver better outcomes will continue to grow, so we must continue to deliver innovative solutions through partnership. There are many opportunities for innovation that can streamline cardiac workflows for greater efficiency, ease workloads for overburdened care providers and provide better quality care for all your patients. These innovations will lead to cardiac care without boundaries that is able to manage the burgeoning chronic and acute care populations and effective enough to deliver quality cardiac care in any setting around the world.

Philips strives to understand your challenges and processes and will work with you to identify solutions across every department that touches cardiology.

Are you interested in learning more? Let's talk about the future of cardiac care that we can create, together.

For more information, visit **www.philips.co.uk/cardiology**

1 https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)#:~:text=Key%20facts,to%20heart%20attack%20and%20stroke.

2 Cardiovascular disease burden, deaths are rising around the world. Accessed September 28, 2021. https://www.acc.org/about-acc/press-releases/2020/12/09/18/30/cvd-burden-and-deaths-rising-around-the-world

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