PHILIPS

Position paper

Fostering clinical confidence for a stronger healthcare system

Introduction

Clinical confidence is the bedrock of quality healthcare. It helps to foster first-time-right diagnosis and timely treatment to improve patient management across care settings and pave the way for better, more predictable outcomes. Clinical confidence enables care teams to perform at the top of their license – doing what they do best in providing highly skilled and deeply compassionate care to their patients.

Too often, though, these dedicated teams are stretched to the breaking point, asked to do far too much with far too little. Never has this been more evident than during the COVID-19 pandemic, as frontline clinicians struggle to sustain what are clearly unsustainable levels of stamina, and as they rapidly adopt new ways of providing care during an unprecedented time. This is a time when clinical teams are worrying about the world outside and the world of challenges inside their units, when they struggle to protect themselves from a deadly virus yet yearn for the human connection they once shared with each other and with their patients. This is a dehumanizing time that is taking a deep toll on teams for whom helping other human beings is often more than a career; it is a calling.

Now is the time for the health systems that surround these essential teams to recognize their struggles, to identify the contributing factors, and to find every way possible to relieve their burdens, helping to restore their confidence in the careers they chose. This will help to build a better, stronger, more resilient healthcare system that serves all of us, including the most vulnerable among us.

Unraveling the complexity of care delivery

To deliver on this mandate, a wide range of healthcare stakeholders must work together to unravel the complexity of care – to empower delivery of accurate diagnoses and improve experiences for patients as well as to reduce clinical variation across teams, especially when overstretched clinicians and staff turnover make standardization all the more important. While the role of the clinician will always be the determining factor in delivering quality care, technology can help by carrying some of the burden. To achieve this, information needs to be correct and complete, and processes must support collaboration – real time or asynchronous, from near and far, one to one or one to many. This will enable clinicians to readily glean insights to inform clear, consistent care pathways for both a single patient and across large patient populations.

Performing while transforming

The urgency is pressing and the opportunity immense. Just as clinical teams are under tremendous pressure to both perform and transform in the midst of the COVID-19 crisis, health systems must aim beyond yesterday's norm to foster higher levels of confidence and care. This can happen with the help of technology that engenders confidence from input to output, education that focuses on skill building and services that provide easier access to expertise and that foster greater consistency across the clinical enterprise.

In this guide, we explore ways to bolster clinical confidence by putting technology to even more productive and intelligent use, addressing the pressing challenges clinicians are facing and supporting them at a time when their burdens and burnout have reached unsustainable levels.

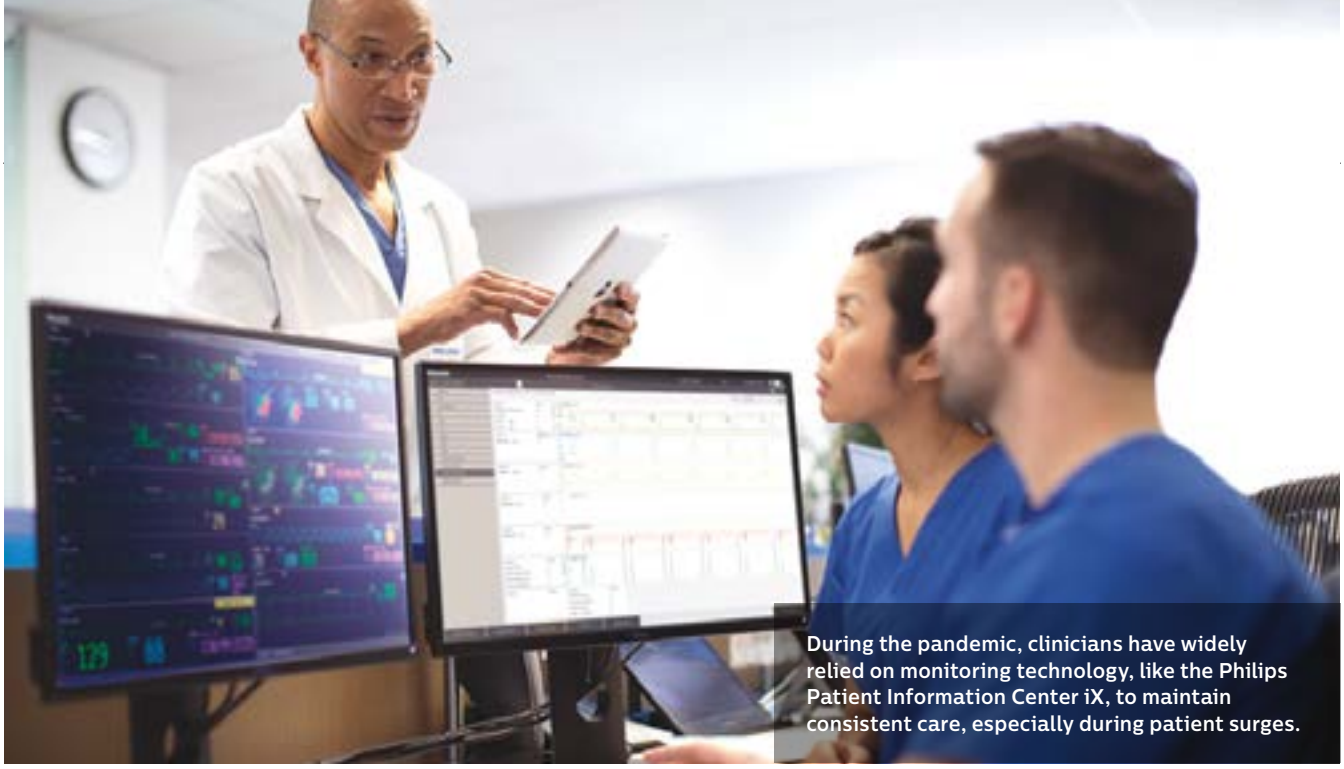
A powerfully simple case for bolstering clinical confidence

Rising challenges can put clinicians' abilities – and healthcare – at risk.

At a time of pressing needs, mounting complexity and unsustainable workloads threaten to worsen clinical burnout and heighten risk to the care systems on which we all rely.

Clinical confidence can counteract, bringing balance to the system.

We can and must do more to help, shifting burden to innovative technologies and adopting new ways of working so clinical teams can have fewer distractions and greater confidence to focus on what they do best. Our health systems – and all of us – will be better for it.



During the pandemic, clinicians have widely relied on monitoring technology, like the Philips Patient Information Center iX, to maintain consistent care, especially during patient surges.

Rising uncertainty, **waning confidence**

In the pandemic, clinicians of every specialty have been thrust into a battle against the unknown, a battle with life-altering, life-threatening consequences. In what is referred to as a once-in-a-century public health crisis, some are serving in clinical areas far outside of their expertise, such as pediatricians striving to save grandparents.[1] Others are called to serve earlier than they would have in normal circumstances, such as medical students graduating early to bolster the workforce in hard-hit areas.[2] And thousands of clinicians have left retirement to answer the call from government leaders, returning to serve at a perilous time.[3]

Even for acute care clinicians who are more accustomed to fast-paced complexity, the stakes with COVID-19 are too high and the answers too few. Uncertainty in etiology, management, prognosis and outlook with COVID-19 compounds the stress clinical teams feel.[4] Information is incomplete, ambiguous or unreliable[4] – and time is short as patients overflow in triage and ICUs. This has led to untraditional and sometimes suboptimal sources for guidance. A study on clinical decision-making during COVID-19 found, "In the absence of evidence to guide decisions, a struggle between clinical intuition, emotions, rational thinking, and a constellation of low-quality information sources influenced patient care."[5]

Health technology helps but needs to be optimized and integrated

Throughout the COVID-19 crisis, health technology has largely helped clinical teams in both customary and revolutionary ways. But technology has also hindered at times when clinicians find themselves using technology in new ways, under trying circumstances, without proper training to navigate an unknown illness. A recent HIMSS survey found that clinicians have widely utilized virtual care, remote monitoring and predictive analytics, among other technologies, but have emphasized the need to improve integration between new solutions and existing workflows so platforms can exchange information seamlessly and information can be easily accessed.[6] The need for new platforms to follow current standards was also noted as being important for ensuring that data-sharing features are available and working. Having actionable data and scalable solutions, as well as support for implementing new technologies, also made the list of priorities.[6]

Collaboration matters even more in a crisis

Collaboration matters now more than ever, and too often there is precious little time for it adding to the burden and burnout teams are feeling. In some cases, clinicians have sought collaboration via the internet. Unlikely as it might have seemed at the start of 2020, Twitter turned

Uncertainty surrounds both the etiology and management of COVID-19, causing a negative impact on healthcare teams and healthcare systems.[4]

into a consultation room of sorts to discuss diagnosis and treatment of patients with COVID-19. Unorthodox, yes, but the gaping void of information needed filling. Cynda Rushton, professor at the Johns Hopkins School of Nursing and Berman Institute of Bioethics, created the Frontline Nurses WikiWisdom Forum, a virtual safe space where nurses can share challenges and experiences, as they shift from caring for the individual to maximizing scarce resources for many.[7]

The confidence-burnout connection

A loss of clinical confidence is both a contributor to, and a result of, burnout. When clinicians do not feel confident they have the right information, tools or resources to make clinical decisions, they may feel frustrated that their work is less effective than it may otherwise be. And it may indeed be less effective. Studies have shown that clinical burnout is detrimental to patient care.[8] Thus, when clinicians are burned out and do not have the clinical confidence they need, their quality of care lessens.

When that happens, they lose even more confidence – and clinicians, patients and the system suffer. Invariably, job burnout affects not only the individual clinician's well-being and performance, but can affect the quality of healthcare services that are provided.[9]

COVID-19 has painfully exacerbated the situation. The *Medscape National Physician Suicide and Burnout Report 2021* found that burnout among critical care physicians jumped from 44% to 51%,[10] underscoring the need to restore balance to their lives and foster greater clinical confidence to help them navigate complex and challenging times. But, as Rushton alludes to, that need existed before coronavirus took over our lives.

Burnout is a persistent issue for the industry. Even prior to the pandemic, 42% of physicians,[11] 38% of nurses[12] and 36% of radiology technicians[13] experienced burnout. As *Advisory Board* notes, clinical burnout of this magnitude necessitates that executives prioritize and "reaffirm their commitment to investing in clinical workforces," especially given the immense burden on frontline clinicians.[14]

Five persistent factors that contribute to clinical burnout

1 Workflow inefficiencies

Inefficiencies slow patient care and waste clinicians' time, which can add to their workload and decrease their confidence in the system. In imaging alone, there is up to $12 billion in potential waste likely due to patient no-shows, wrong tests, repeat exams, poor image quality and more.[15]

2 Growing complexity of data

According to IDC, "Healthcare data will experience a compound annual growth rate of 36% through 2025."[16] This data boom can result in cognitive overload for clinical teams, putting the onus on them to gather more information, keep current and get trusted, evidence-based answers to their questions, particularly those related to cutting-edge information and developments that can have a daily impact on medical decisions.[17]

3 Increasing volume of patients

The populations requiring care are growing at extraordinary rates. By 2050, the US population ages 65 and older is projected to reach 89 million – more than double the 40.5 million elderly people in 2010.[18] Between 2010 and 2030, there will probably be an additional 27 million Americans with hypertension, 8 million with coronary heart disease and 3 million with heart failure.[18]

4 Healthcare consolidation

While the financial benefits of consolidation for the institutions are widely assumed – although questioned of late[19] – less discussed are the effects on clinicians and others: absenteeism, job dissatisfaction and burnout resulting from several factors, including increased stress due to multiple changes in systems management, HR management, job insecurity and newfound employee competitiveness between former competing facilities.[20] In 2019, there were 1,588 closed or announced healthcare consolidation deals.[21] Now, experts predict an acceleration of mergers and acquisitions in the wake of COVID-19. Due to strained finances, 50% of hospital administrators say their organizations are highly likely to make one or more acquisitions in the next two years.[22]

5 Pressure to control costs

Shrinking margins and rising expenses that outpace revenues are forcing healthcare providers to reduce costs.[23] This can limit the number of tests and procedures a physician orders, which can lead to diagnostic uncertainty.[24]

And, should we face another public health crisis, we now know how hard it can be on clinicians. Long hours made longer. High death tolls. Uncertainty for patients and themselves. And, eventually, the cleanup required once the crisis ends.

Forty percent of unanticipated hospital deaths happen in the general ward.[25] With consistency in patient monitoring, clinicians can help prevent critical events before they happen.

Confidence – and a lack of it – can be contagious

When a clinician's confidence falters, the ER nurse wonders if he has the right information to triage high-risk patients correctly, the radiologist worries whether her first diagnosis will be the right diagnosis and the cardiologist questions if his patients are getting the correct intervention. A paucity of confidence rarely stops with a single clinician; rather, it can engender uncertainty for adjacent clinicians along the care continuum, each wondering whether his or her colleagues not only got it right but got it right the first time.

Building confidence into the new normal

Clinical confidence has always mattered, but it is being mightily tested now – as we are thrust into an uncertain future, yearning as we do for a return to the normal we once knew. It may be better to think of not simply returning to normal, but of learning from all that has happened so we can revise our ways of being.[26] COVID-19 has shown us there is ample reason and opportunity to revise how we help clinical teams do what they do best. By cultivating greater clinical confidence among our clinical teams, our healthcare system can emerge better, stronger, more resilient than it was before the pandemic.

Clinical confidence advances better healthcare from end to end

More clinical confidence can lead to:

- First-time-right diagnosis
- Early-stage disease intervention
- Early deterioration detection and intervention
- Reduced variation of care
- More predictable outcomes

The 'new normal' must focus on clinical confidence

At this time of great uncertainty and consequence – as well as in the elusive 'new normal' – we must design and create a new healthcare ecosystem together that places clinical confidence at the forefront, because:

Clinical confidence matters to the individual

For the radiologist, cardiologist, sonographer, nurse, technologist and more, clinical confidence affects the next sound and timely decision, which sets in motion the very next step toward better patient experiences and outcomes.

Clinical confidence matters to the broader clinical enterprise, too

The many sound and timely decisions clinicians make add up not only to better care and outcomes for individual patients and populations of patients but to better, more consistent performance for the organization as well.

The Philips DigitalDiagnost C90 is designed to boost diagnostic confidence by producing digital images with more homogeneous black backgrounds, reduced noise and automatic enhancement of small details.

At Philips, we're more inspired than ever to support clinical teams with purposeful innovation

The resolve and resilience clinical teams are demonstrating are inspiring but are also evidence of the unsustainability – if not sheer impossibility – of the efforts they are being asked to make. It further fuels our determination to put innovative technology into clinicians' hands and to bring expertise to their enterprise, easing their way while providing better diagnostic and treatment possibilities for their patients. Artificial intelligence (AI) is surely one of those innovations. When leveraged to speed repetitive and pattern recognition tasks and to drive big data insights, AI can preserve clinicians' intellectual acuity to generate diagnostic and treatment insights more confidently and quickly. Philips is invested in building an ecosystem of secure, scalable and integrated digital solutions that make use of AI's unique capabilities.

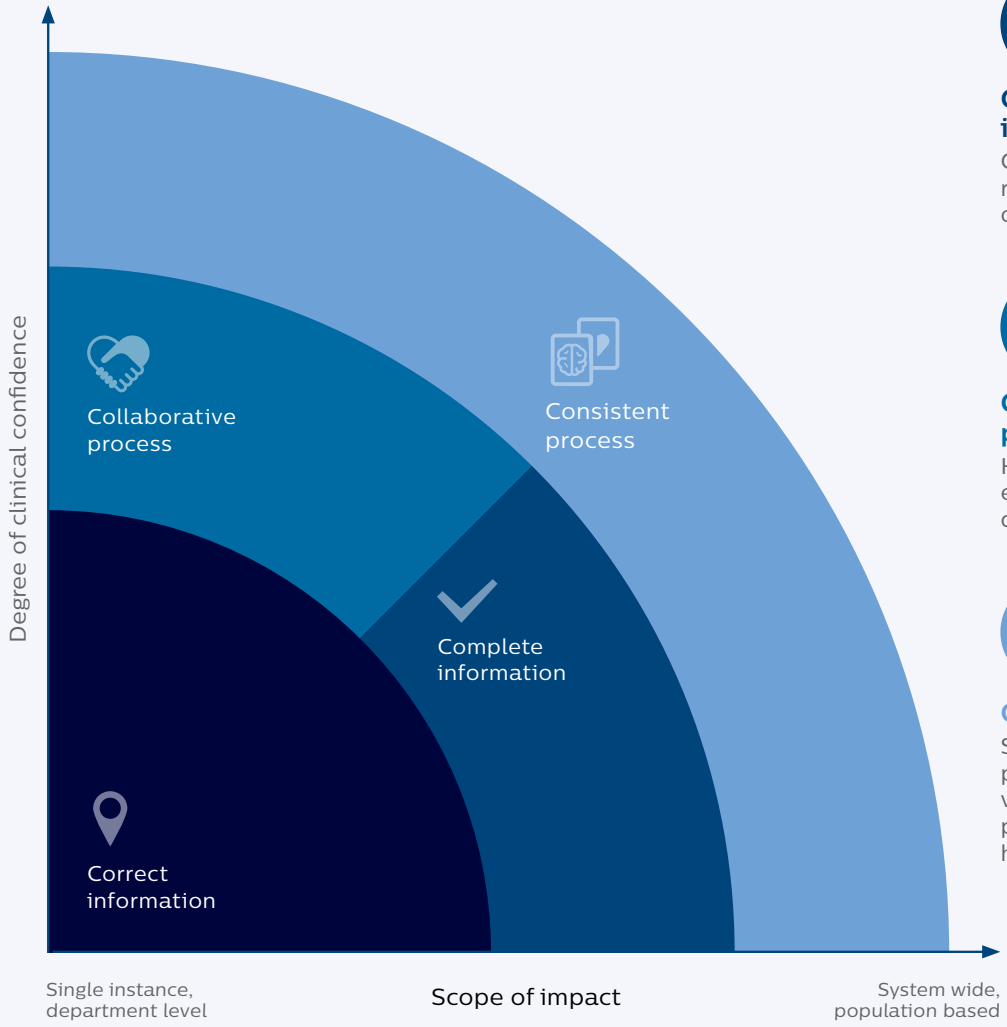
Through purposeful innovation, we can support faster collaboration and decision-making, make better use of valuable clinical resources and free clinicians to spend more time on patient care.

As we design and deliver the technology and services that can foster clinical confidence, we are guided by our 4C framework of correct and complete information with collaborative and consistent processes. This framework enables us to help our health system partners to uncover technology gaps that can stifle performance and, importantly, to identify opportunities to reduce cognitive load and boost their teams' clinical confidence. It is a framework well suited to this time, a time of exponential technology growth during a crisis that is sorely testing our health system's limits.

Measured difference: On page 14, we shine a spotlight on how consistent measurements via technology contributed to insights about the life expectancy of COVID-19 patients.

The 4Cs of clinical confidence: correct, complete, collaborative, consistent

Amplifying confidence across the healthcare enterprise



Correct information
Precision, clarity, accuracy and security of data

Complete information
Comprehensiveness, readiness and relevance of information

Collaborative process
Human and technology-enabled clinical decision support

Consistent process
Smart, clinical protocols, reducing variation in care pathways, population health management

By amplifying clinical confidence, we broaden the impact from a single decision to the management of patient populations across the enterprise.

We aim to put our innovative solutions to productive use, increasing clinical confidence by providing correct and complete information as well as supporting collaborative and consistent processes. And we strive to broaden the impact – increasing confidence in, for example, a single cardiologist caring for a single patient with ischemic heart disease, in a multidisciplinary care team in a single hospital caring for many patients, and then in a comprehensive health system managing care for populations of patients.

Correct information

Precision, clarity, accuracy and security of data

For the correct information they need, clinical teams turn to our:

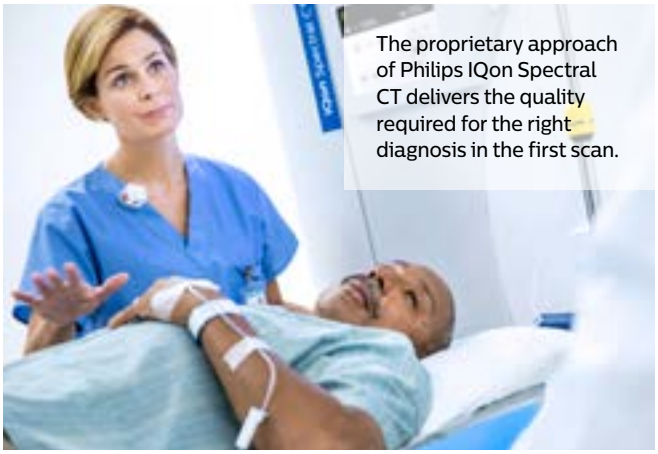
Innovative diagnostic imaging solutions
Our next-generation image processing software provides superb images of all anatomical areas, along with homogeneous black backgrounds, reduced noise and automatic enhancement of small details, delivering outstanding and fast digital imagery. With our live cameras, teams can detect patient movement and incorrect collimation early and before an exposure has been taken, reducing the need for retakes.

In fact, 94% of users of the **Philips DigitalDiagnost C90** think the live camera images at the workstation help avoid retakes.* Images from the C90 also deliver the quality level necessary for confident decision-making, such as 16.8%[27] more actionable lung scans using the Philips Bone Suppression feature. **Learn more >**

First-of-kind, detector-based CT solution
Our innovative CT solutions deliver multiple layers of retrospective data in a single, low-dose scan, a solution that is integrated with current workflows for high diagnostic quality that can improve clinical confidence and enable clinical teams to make the right diagnosis with the first scan.

Radiology teams around the country rely on **Philips IQon Spectral CT** for greater accuracy in less time. For instance, they no longer measure kidney cysts or their attenuation value. With Spectral CT, they scroll through the lined iodine images and if there is no uptake, they can confidently report the lesions are benign cysts. Radiologists using conventional CT may miss 30% to 40% of gallstones, which are isodense to bile. With Spectral CT, gallstones are visible because they have a different, effective anatomic number than bile.[28,**] **Learn more >**

Robust cybersecurity measures
With our cybersecurity approach, we put the power of Philips people, processes and technologies to work to protect the confidentiality, integrity and availability of both clinical and personal data across the entire care life cycle. At Philips, 'security by design' is an end-to-end mindset, where security principles and controls are integrated into all aspects of product development and testing.



The proprietary approach of Philips IQon Spectral CT delivers the quality required for the right diagnosis in the first scan.

To ensure clinicians can trust the information they receive, Philips implements security standards that meet or exceed regulatory requirements and industry best practices. Our cybersecurity approach is aligned with recognized standards such as NIST 800-53, ISO/IEC-27000 series, and HITRUST. In 2020, Philips became the first medical device manufacturer to receive a new Underwriters Laboratories (UL) product cybersecurity testing certification. We have long been committed to the ongoing effort to continuously improve our processes and systems to minimize the risk to the patients who depend on our solutions and services. **Learn more >**

Outstanding trade-in programs
With our trade-in programs, health systems have achievable ways to keep their technologies current, their life cycle plan well managed and information as correct as possible. With the assurance that comes with access to new technology integrated into workflows and supported by the clinical education to put that technology to use, clinicians can focus on performing at the top of their license.

Mammoth Hospital, Mammoth Lakes, CA, will attest to that. Instead of buying a new CT system, the organization opted for a **Philips SmartPath upgrade**. "The upgrade was an extremely good option for us," says Gary Myers, the hospital's CEO. "It presented a very high-value option where we really appreciated this great new technology at a fraction of the price of replacing it." And the enhanced performance created opportunities for Mammoth to develop new services.[29] **Learn more >**

**Based on four images on average per examination validated by clinicians in a Philips' development environment.*
***Results from case studies are not predictive of results in other cases. Results in other cases may vary.*

The first of its kind, Philips Lumify is a tele-ultrasound solution with real-time collaboration that fits in the palm of your hand.

Spotlight

Confidence during crisis: correct information can minimize infection risk

Standard operating procedures can suddenly become dangerous when dealing with a disease as contagious as COVID-19. Resuscitation of an infected patient who goes into cardiac arrest is a timely example.

"CPR is aerosol generating," explains Dr. Max Bursey of Augusta University Medical Center, Augusta, GA. "Even if they're intubated, there's still a risk they may become disconnected, and there would be a significant aerosol generation with a large number of staff members in the room, so there's a lot of exposure potential." How do clinicians balance the competing needs for patient resuscitation and staff safety?

Having correct and timely information right where it is needed can make a critical difference to clinical teams. For Dr. Bursey, it comes down to the right information at the right time, using Philips Lumify handheld point-of-care ultrasound. "Because the tablet-based system is so portable, I essentially use it as an extension of my physical exam on almost every patient that I see," he says. In cases of cardiac arrest, he monitors the patient's heart with Lumify during CPR to immediately identify if and when to cease resuscitation, thus minimizing exposure risk for staff.

Lumify is one of six Philips ultrasound systems that received 510(k) clearance by the FDA – an industry first – to manage COVID-19–related lung and cardiac complications. It provides high-quality images that aid rapid decision-making, such as knowing whether to continue CPR. And its small footprint makes it easy and quick to disinfect with minimal cleaning supplies, which, as Dr. Bursey points out, have been in short supply for many institutions during the pandemic.

Complete information

Comprehensiveness, readiness and relevance of information

For the complete information, clinical teams turn to our:

Event surveillance solutions
Our event surveillance solutions support clinical decision-making by documenting clinically significant patient episodes for review, correlating up to four parameters from our patient monitors as part of a more complete approach to patient monitoring and assessment.

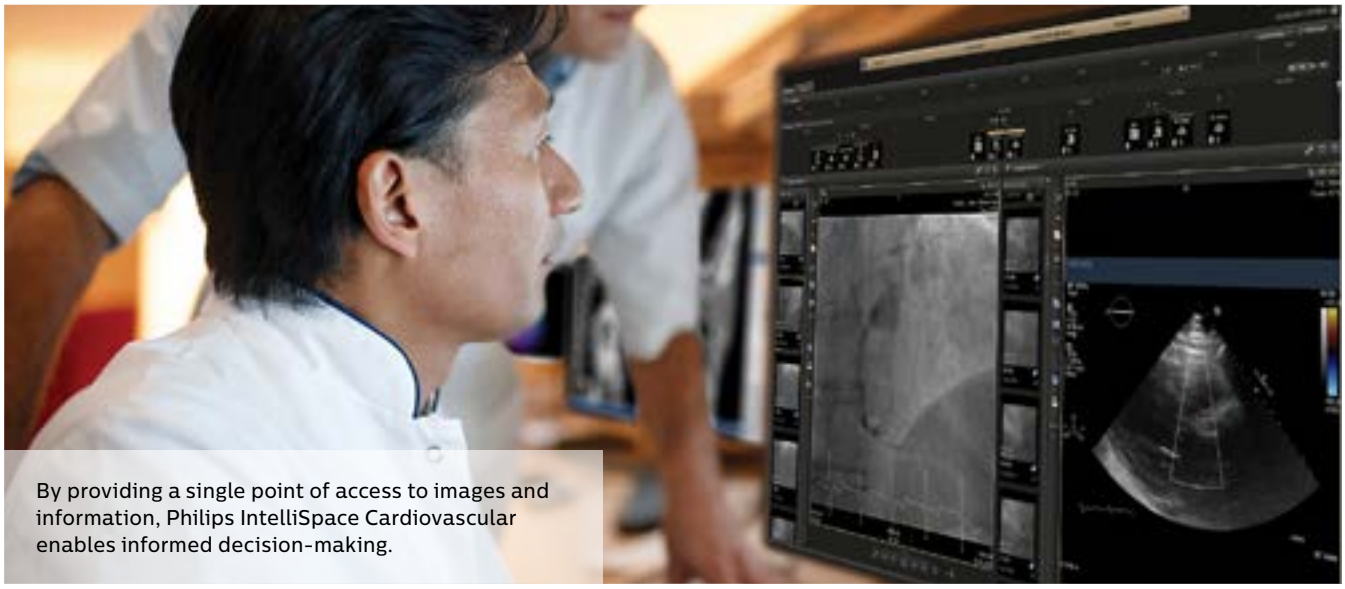
At Städtisches Klinikum München, Munich, Germany, Johannes Planck, MD, has found that **Event Surveillance** advanced decision support "allows for accurate analysis of changes in the patient's condition and displays related trends. This helps to support and validate clinical decision-making."[30] **Learn more >**

Multimodality image and information management
Our solutions for cardiac care serve as a single point of access to a wide range of intelligent clinical applications for analysis, advanced visualization and quantification. A Cardiology Timeline of complete patient data enables the team to drill down for the information needed to evaluate appropriate treatment plans and can be viewed through a customizable interface that informs clinicians in ways that are meaningful to them. The system also communicates diagnostic guidance warnings of omissions and conflicting data, alerting staff to review or correct interpretations.

This kind of full-information access has optimized how cardiac teams work at CarolinaEast Health System, New Bern, NC. Before CarolinaEast implemented **Philips IntelliSpace Cardiovascular**, Dr. Alex Kirby, Cardiac Cath Lab Medical Director and Heart Center Cardiologist, "used to have to run from the cath lab to the EKG department looking for differences in prior studies to be able to rapidly make wise decisions for a cardiac patient in the emergency department." Now, with IntelliSpace Cardiovascular, which earned the title Best in KLAS Cardiology 2020, Dr. Kirby says, "I have all of this information in one place. It's a quick turnaround time to be able to communicate with the emergency room team as well as the patient and family about what is going on and what we're going to do." **Learn more >**

Clinical alarm management solutions
Our solutions include analysis, consulting, training and reporting services paired with configurable alarm technologies to alert clinical teams when vital signs reach chosen thresholds and to remain silent when events are nonactionable, helping to control clinical alarms in critical care environments. By enabling users to manage and prioritize alerts, alarm fatigue may be reduced so clinical teams can focus on what matters most.

Giving clinicians control over monitoring alarms, like with **Philips Alarm Advisor**, can reduce nonactionable alarms[31] and gaps in alarm protocol and enhance patient safety with possible fewer missed true positive alarms.[32] **Learn more >**



By providing a single point of access to images and information, Philips IntelliSpace Cardiovascular enables informed decision-making.

Collaborative process

Human and technology-enabled clinical decision support

For easier collaboration, clinical teams turn to our:

First-of-kind, integrated tele-ultrasound solution
We offer first-of-kind, integrated tele-ultrasound. Live communication via an app-based portable, handheld ultrasound puts exceptional imaging in clinicians' hands at the bedside and everywhere they need it.

Case in point: With an unresponsive patient in transport to hospital, paramedics collaborated with an EMS physician in real time using **Philips Lumify powered by REACTS**. After reviewing the cardiac monitor, the physician instructed them to stop chest compressions and begin vasopressor therapy. According to Jenna White, MD, Associate Professor, Department of Emergency Medicine, University of New Mexico School of Medicine, Albuquerque, who documented this case, the communication via Lumify positively impacted clinical decision-making and "very likely, patient outcome."[33]

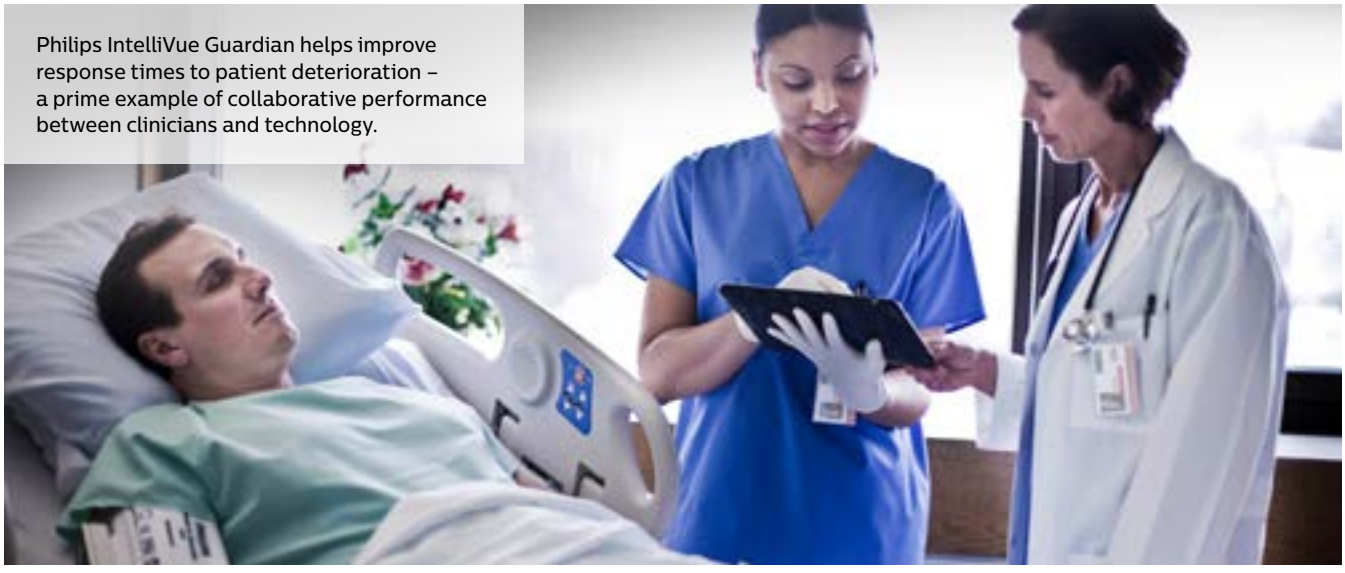
Military medics also put the accuracy of handheld Lumify to work in the battlefield to both triage soldiers at the point of care and then collaborate with other clinicians to coordinate care. **Learn more >**

Real-time collaboration within ultrasound technologies
Real-time collaboration within ultrasound technologies provides necessary expertise. With video, voice, image and text exchange, clinical teams near and far gain real-time guidance and decision support that help optimize and standardize patient care – and for collaboration with Philips technical and clinical support teams when needed.

Through Philips EPIQ or Affiniti ultrasound system, **Collaboration Live** makes real-time expert consults highly accessible, empowering clinicians to perform with greater confidence. In daily use, 92% of healthcare providers who were first-time users believed Collaboration Live was easy to use, whether it was to consult on exams, standardize care across locations or participate in remote learning.* **Learn more >**

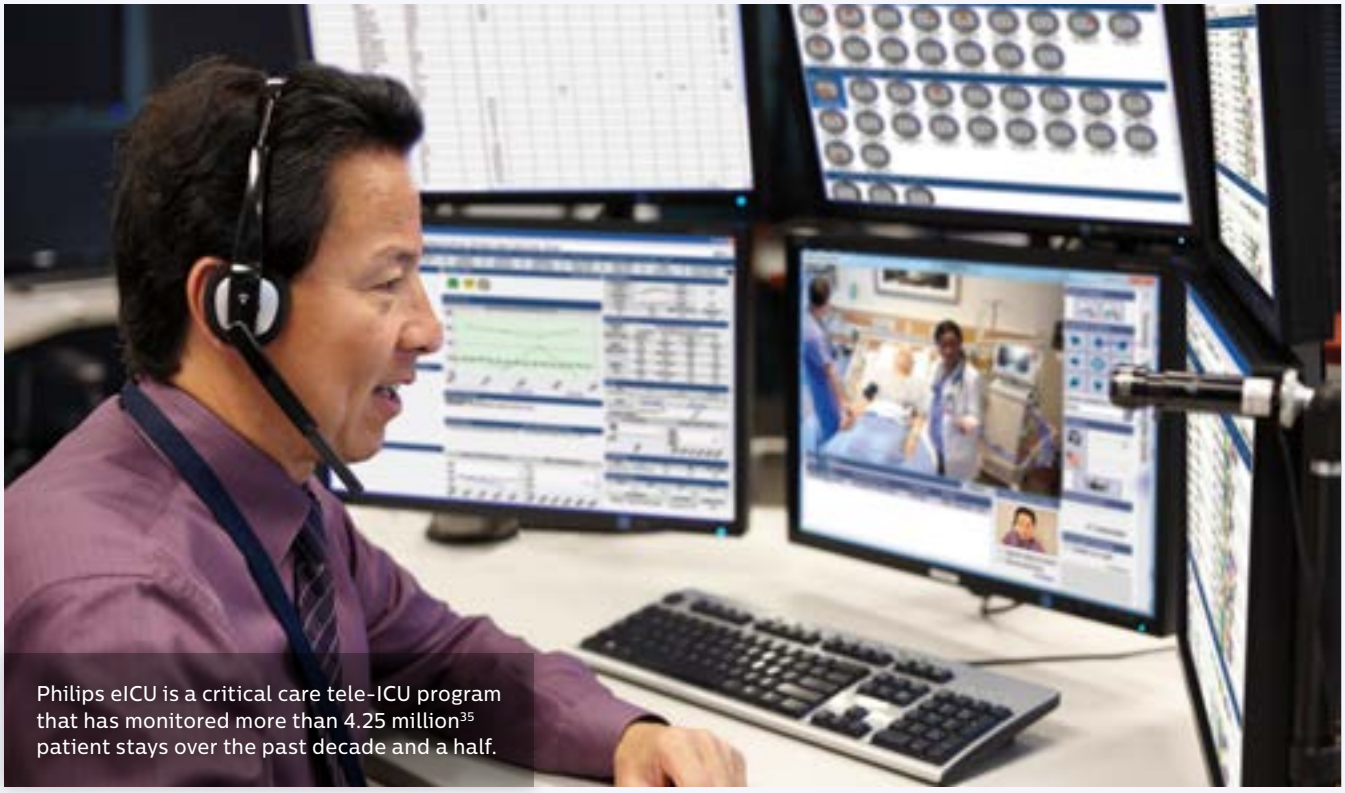
Rich predictive analytics capabilities
We make rich predictive analytics possible. These enable general care and other clinical teams to interact and gain insights from the rich information available within the technologies themselves.

At the 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. So he sought a connected system that linked bedside teams with the oversight of a specialist trained in critical care to build opportunities for safer care. **Philips IntelliVue Guardian Software Early Warning Scoring** became that system. By automatically spot-checking patient monitoring, the hospital reduced serious events by 35%, intensive care mortality by 40% and cardiac arrest by 86%.[34] **Learn more >**



Philips IntelliVue Guardian helps improve response times to patient deterioration – a prime example of collaborative performance between clinicians and technology.

*Based on responses from 12 participants.



Philips eICU is a critical care tele-ICU program that has monitored more than 4.25 million[35] patient stays over the past decade and a half.

Spotlight

Confidence during crisis: collaborative analytics help handle critical care overflow

There's nothing slow about COVID-19. Patients with COVID-19 can rapidly develop severe pneumonia, wreaking havoc on them and in the hospitals caring for them, especially in ICUs. Just after Thanksgiving 2020, fewer than 15% of ICU beds were available in hospitals serving more than 100 million Americans.[36] And beds aren't the only shortage. Staff are overwhelmed by the demand of treating the disease, which requires a great deal from ICU nurses in particular. A single, extremely ill COVID-19 patient can require many hours of an ICU nurse's shift, leaving little time for anything else.[37]

This kind of intense stress can compromise any team's ability to monitor and respond to critically ill patients, no matter how dedicated the team is. For Sutter Alta Bates Summit Medical Center in Berkeley, CA, extending its usage of Philips eICU via iPads helped the institution handle a surge of 200 COVID patients in its ICU in August 2020.[38]

At the core of eICU is **Philips eCareManager** software, a 510(k)-cleared technology. It takes all patient data and translates it into meaningful information that helps providers identify patients most at risk at any given moment and then allocates resources accordingly. Coupled with the system's predictive analytics, eICU serves as a kind of clinical collaborator for informed decision-making. "You can actually predict adverse events simply by recognizing adverse trends that the system is telling you to look at," says Karsten Russell-Wood, Portfolio Leader, Post Acute & Home at Philips.

These monitoring capabilities, which include high-definition cameras, data visualization and advanced reporting, also helped protect Sutter staff. With COVID, "people discovered that the ability to access people remotely applied not only from 300 miles away...but also from five feet away. We could use our software to not have to go into the room," says Dr. Adam Seiver, a longtime Medical Director for Sutter's Sacramento eICU hub and current Medical Leader for Philips Therapeutic Care and Hospital Respiratory Care.

Consistent process

Smart, clinical protocols, reducing variation in care pathways, population health management

For greater consistency, clinical teams turn to our:

Innovative partnership and business models
Our Enterprise Monitoring as a Service solution (EMaaS) provides standardized patient monitoring for all acuity levels and settings as well as continuous management and performance improvement services through a per-patient-per-acuity fee model, enabling better performance visibility, utilization transparency and other improvements across the enterprise. This solution eliminates up-front costs and includes ongoing clinical workflow optimization, continuing education and asset management services, all of which contribute to improving consistent utilization of standardized technology across the enterprise.

With EMaaS, Jackson Memorial Hospital, a teaching hospital in Miami, FL, standardized their patient monitoring technology – including **IntelliVue transport and bedside monitors**, **IntelliBridge Enterprise interoperability solution**, and the **IntelliVue Patient Information Center iX (PIC iX)**. The result: Nursing staff gave the model an almost 90% satisfaction rating, up from 8% prior to deployment.* This standardization made clinical documentation of vital signs and cardiac wavestrips more accurate and efficient by enabling the automation of data transmission, resulting in 5 minutes saved on vitals charting per critical care patient each 24-hour period** and 8 hours a day saved for the central monitoring unit telemetry technicians through automated measurement and export (wavestrip).*** Through EMaaS, Jackson gained the consistency in care it sought while lessening the burden on staff. **Learn more >**

Clinical services offerings
Our clinical services offerings harness insights from around the world. They include review of workflows, processes and technologies to implement best practices across clinical domains to optimize staff education and use of technologies, reduce variation in care, and smooth workflows and patient flow, all so clinical confidence is bolstered and performance is improved. With our global footprint, we can help clinical teams gain access to meaningful innovation, deep clinical expertise and data analytics for personalized, actionable insights.

Ongoing education for clinical staff is a linchpin not just for accurate and consistent use of technologies, but also to recognize the full potential of those technologies in supporting confident and effective patient care, so it was vital that clinical training continued in spite of the pandemic. Altogether, more than 26,000 customers received virtual education from Philips Clinical Services in 2020, thanks to 700+ new virtual courses, which run the gamut from basic system training to non-product-specific applications education. And the team showed up in person, too, for more than 21,000 critical on-site visits.**** **Learn more >**

Centralized tele-ICU
Centralized tele-ICU solutions make care by intensivists more accessible across hospital systems. And this drives consistently higher level of care, and this drives a consistently higher level of care, which can, in turn, lead to better outcomes and a lower cost of care. Data is captured in real time to inform intensivists who can identify patients most at risk at any given moment and allocate resources accordingly to rapidly intervene. Data is also analyzed over time, giving organizations the potential to identify best practices, consolidate and standardize care, reduce transfers while maximizing bed utilization and support on-site staff. As a centralized database, it ensures care teams, both bedside and remote, always have access to the same information for effective and consistent care coordination.

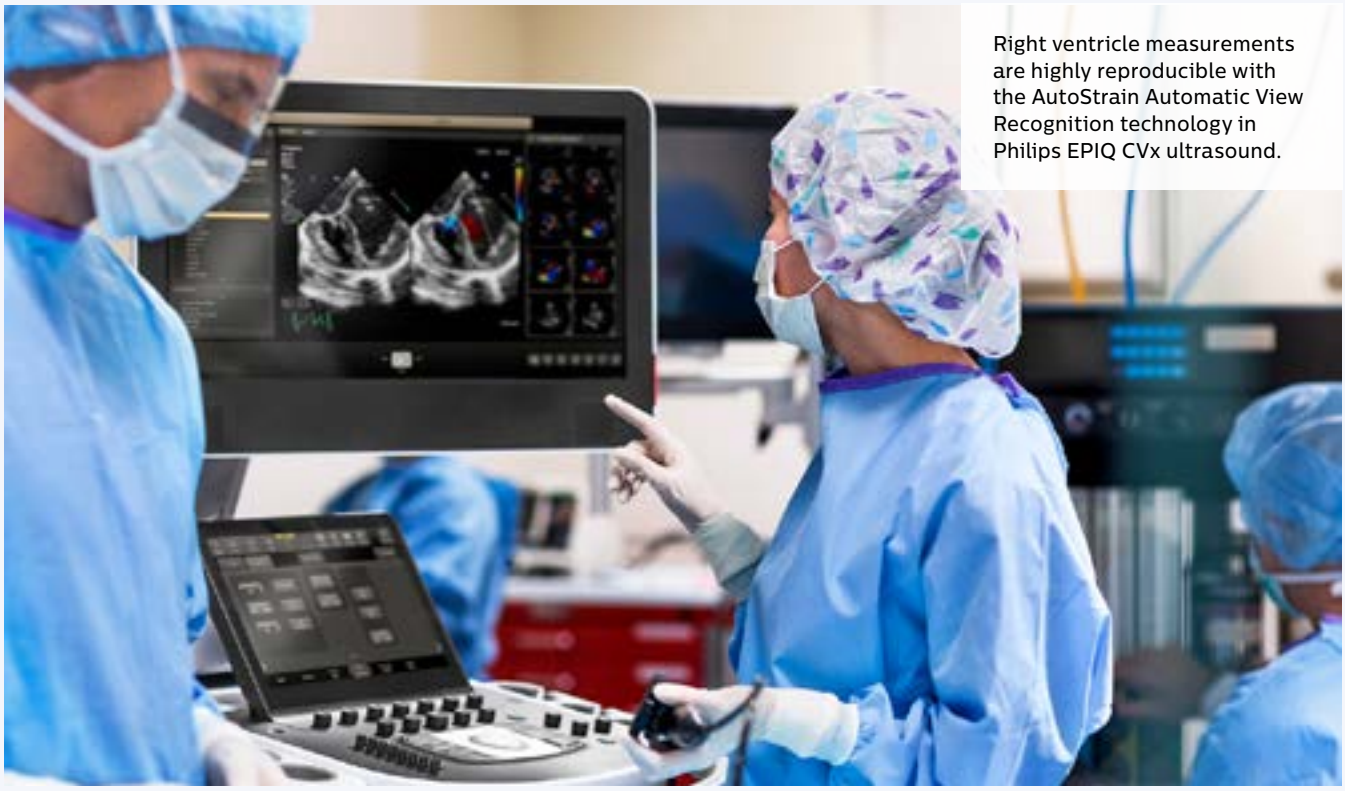
AMITA Health (formerly Presence Health) in Chicago implemented **Philips eICU** in 2005. Chief among the advantages of the telehealth system was a reduction in the variation of care delivery.[39] According to Kathy Johnson, RN, MHA, System Director, TeleHealth Operations, it "has been a vehicle that, through continuous communication, has enhanced and improved clinical outcomes. This program has transformed critical care delivery across our health system." **Learn more >**

Consistency in patient monitoring yields greater accuracy and confidence

5 minutes saved
EMaaS saved the staff at Jackson Memorial Hospital in Miami, FL, 5 minutes on vitals charting per patient every 24 hours.**

82% satisfaction jump
Nursing staff satisfaction with the patient monitoring system jumped from 8% to almost 90%.*

**Almost 90% of the clinical team surveyed in critical care units indicated they were somewhat satisfied or highly satisfied when asked to rate their overall satisfaction with the current patient monitoring system at Jackson Memorial Hospital. **Results from baseline and post time & motion studies conducted by Philips and Jackson Health internal teams in the high acuity units (SICU A, SICU B, CCU). ***Baseline and post time & motion studies in the Central Monitoring Unit (Tele Tech time spent on print, cut, paste and interpreting wavestrips). This data is exclusive to Jackson Memorial Hospital. ****Philips internal data.*



Right ventricle measurements are highly reproducible with the AutoStrain Automatic View Recognition technology in Philips EPIQ CVx ultrasound.

Spotlight

Confidence during crisis: consistent measurements increase certainty

Everything about coronavirus has been uncertain, especially in the early days of the pandemic, when patient outcomes felt like a coin toss. Fortunately, frontline clinicians have used new ultrasound technology to put together significant pieces of the puzzle.

One discovery is the effect of COVID-19 on the heart. The virus can manifest in either ventricle, but it is the right side where connection to survival was first found. "Making a good assessment of right ventricular size is important," says Dr. Roberto Lang, director of non-invasive cardiology, University of Chicago. Citing a study of 105 COVID-19 patients at a New York hospital, March 26, 2020 to April 22, 2020, Dr. Lang points out that 31% of patients were right ventricle (RV) dilated, and of those, 41% died by the end of the study. Of the other 69% in the study, only 11% died.[40]

While RV strain is not a new measurement for cardiologists, there is renewed interest in it because, as Dr. Lang says, "Now we have excellent semi- and automated software to obtain this parameter. This parameter is easy to acquire and extremely reproducible." The reproducibility, in particular, gives physicians the consistency necessary to make confident insights and expectations.

Winner of the 2020 IMV ServiceTrak award for cardiovascular ultrasound, **EPIQ CVx premium cardiology ultrasound system**, part of the Philips FDA-cleared ultrasound portfolio for use in managing COVID-19–related lung and cardiac, offers automated applications for 2D assessment of the heart as well as robust 3D right ventricle volume and ejection fraction measurements. The ultrasound's AutoStrain Automatic View Recognition technology, which was validated on more than 6,000 clinical images with a 99% success rate,[41] enables consistent reproducibility and saves up to 1.75 minutes compared to manual methods, with no adjustments necessary.[42]

Summary

At Philips, we know that a stronger healthcare system calls for having clinical teams that are well supported by the systems that surround them. Now more than ever, we must design and deploy innovative technologies that relieve our clinicians of growing and unnecessary burdens, so they in turn can bring even greater clinical confidence to the care of their patients.

Confidence is contagious. With each first-time-right diagnosis based on correct and complete information, each productive collaboration among clinical teams and each consistent clinical protocol and successful intervention, clinical confidence begets confidence. It can ripple out from a single clinician to multidisciplinary teams across care settings, leading to better, more predictable outcomes for a single patient and entire populations of patients.

Confidence is purposeful. It is a result of ongoing efforts by clinical teams who have invested years in academic and on-the-job training to gain the knowledge and skills that underpin clinical confidence. Long before the pandemic, and surely more so now than ever, these teams face an onslaught of challenges – rising burden and burnout chief among them – that can chip away at that hard-earned confidence. And at this breakneck pace, these teams are tiring and are yearning for a greater connection to their colleagues and their patients.

Confidence is powerful. Stakeholders in the broader healthcare ecosystem each have a role to play in nurturing clinical confidence, helping to make it a powerful force in the quality of patient care and in the reduction of clinical burnout. At Philips, we do this by designing practical solutions to support clinicians' expertise in the context of their specific clinical settings. Our 4Cs of clinical confidence – correct and complete information, collaborative and consistent processes – independently usher in confidence. In combination, they can enable clinicians to perform their jobs at the highest level. At a time when clinical teams are more essential and more vulnerable than ever, we earnestly believe that they deserve every consideration and innovation we can bring to them. Serving clinical teams well serves us all – and at Philips, we are actively engaged in making more possible for them every day.

This guide showcases how Philips focuses on purposeful innovation to imbue customers with clinical confidence, which leads to improved patient care.

Subscribe for updates

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

By providing clinicians with correct and complete information, plus collaborative and consistent systems, we can give them the confidence to perform their jobs at the highest level.

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