

PHILIPS

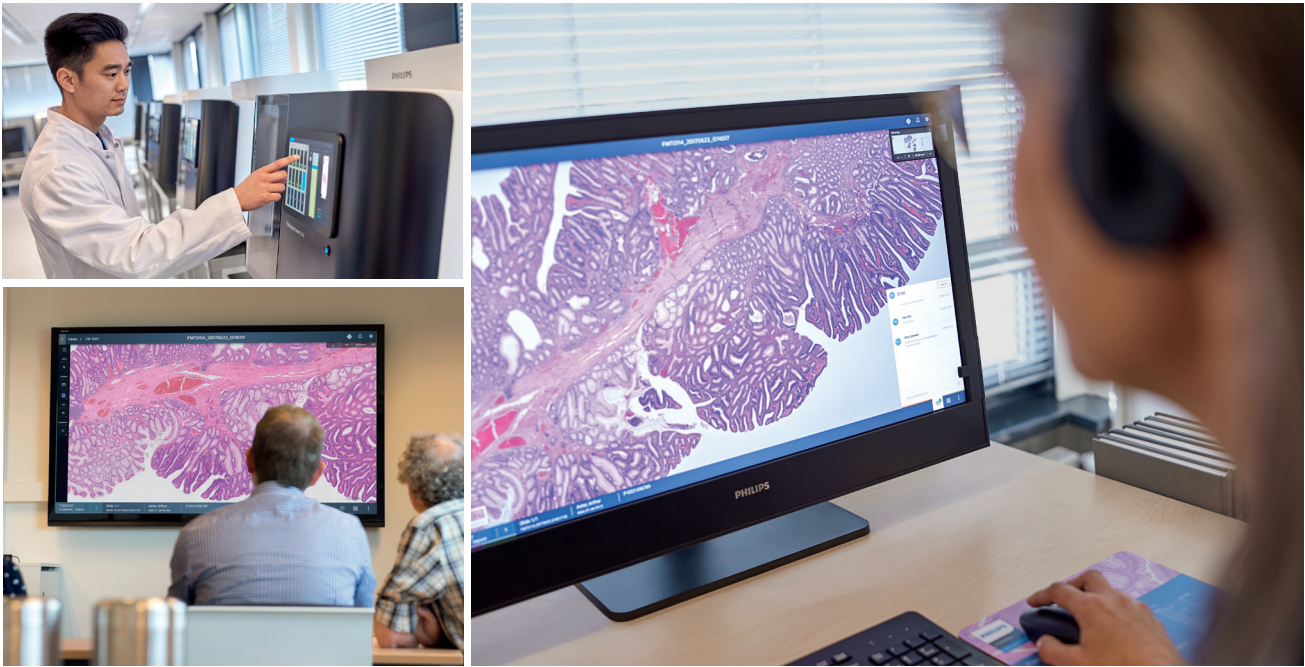
Interoperability

Vision paper



Improved care delivery through enhanced collaboration

Uncovering the true power of interoperability



Summary

Uncovering the true power of interoperability

Healthcare is a highly personal experience, eliciting strong emotions in those who deliver it and those who receive it. Challenges and barriers that impede data exchange and communication can negatively impact the delivery of quality care and frustrate all involved. Precision medicine and personalized care can only be realized when access to relevant information is comprehensive and unfettered – when all data sources are interoperable. Only then will provider and patient truly feel the benefit of high tech and high touch.

To be effective, interoperability must be considered outside a purely technical context. It must be perceived as a seamless, flowing user experience. Thoughtfully implemented, interoperability has the power to improve human interaction by creating an enhanced, collaborative environment. In this manner, the professional to professional and professional to patient relationships can thrive.

Interoperability helps support clinical and operational pathways, and expedites those pathways toward timely, successful outcomes. Interoperability requirements must be based on optimal user experiences, not the other way around.

More than any specialized interoperability vendor, Philips truly understands the clinical, operational, and technical aspects of the healthcare process and can apply that knowledge to establish a leadership position. From their very inception, Philips products and services (imaging systems, patient monitoring, enabling technologies, informatic solutions, managed technology services, etc.) are built from the ground up with interoperability capabilities ‘designed-in’. Additionally, open standards and a vendor-neutral posture invite cohesive integration across departments, hospitals, regions, and national networks. Interoperability comes alive by leveraging this advantage in combination with continuum of care insights to provide the right information, to the right person, at the right time, on the right device, for the right purpose – precision medicine. Acting as a key player in the continuously evolving healthcare ecosystem, Philips has the solutions and agility to make a significant impact.

It is incumbent upon solution providers like Philips to support transformational experiences that account for the human element in patient-centric healthcare.

“ We need to ensure we simplify technology in such a way that the clinician can leverage it without even knowing that they are using technology.”

Mr. Leo Bodden
VP & Chief Technology Officer
New York Presbyterian Hospital
USA

Reaffirming the human element

Medical professionals find a purposeful life in the practice of healthcare. They are guided by the Hippocratic Oath, an ancient pledge of ethical conduct – a moral guide to help the sick, and abstain from all intentional wrong-doing or harm. While today's healthcare takes place in more focused care environments, often with specialized medical staff, the empathy and compassion shown by each medical caregiver to aid the infirm remains constant.

Uncovering true value

Technological advances in healthcare have been essential in advancing the provision of care. However technology is not a panacea. In fact, while the explosion of imaging and data sources has grown exponentially in recent years, the ability to aggregate this widely varied output for common good has just begun to show real promise.

The concept of 'interoperability' is typically used to define the technical integration/communication between disparate products, systems, and networks. **However the real power of interoperability stems directly from human needs and the capacity to confidently take advantage of their benefits.** What's been left unsaid is that this technology evolution is nothing without a clear understanding of how it can best be managed to demonstrate true value to the clinician. In any attempt to bring comprehensive interoperability to fruition, the human element (human interaction) must always come first.



“ Interoperability is not the starting point, it is the logical consequence of understanding the ecosystem and pathways. Healthy ecosystems encourage an environment where technology ‘gets out of the way’ for effective care management.”

A vision for success

Interoperability is not a platform. It is not software. It is not hardware. It is the ability to alleviate the frustration, aggravation, and anger/worry/fear inherent in disjointed care processes. It is the power to break down barriers to patient-centric care through harmonious collaboration, enabling clinicians to become more effective in delivering precision care, and patients to become more actively involved.

Definition, development, and implementation of solutions that leverage the promise of a unified technical world are critical for success. Care pathways must be clearly documented and the professionals who participate identified, to establish a vision of what it takes to be successful (collaboration, consultation, review, best practices, etc.). Then the tools/solutions that help satisfy this vision – this bridge between the technical and human element – will be most effective.



Transforming the care experience

It is imperative that interoperability allow all actionable patient information/data to be available to all clinicians, curated through customizable filters that provide relevant, meaningful data at the right time and place. This type of data governance is critical, illuminating a new path to precision medicine and personalized care.

It is the ease at which healthcare professionals can bring their wisdom to bear that invigorates care delivery and offers emotional satisfaction. This requires careful orchestration of clinical processes and access to a single source for:



Improved diagnostic confidence



Better treatment planning



Reduced administrative strain and staff burnout



Increased throughput efficiency



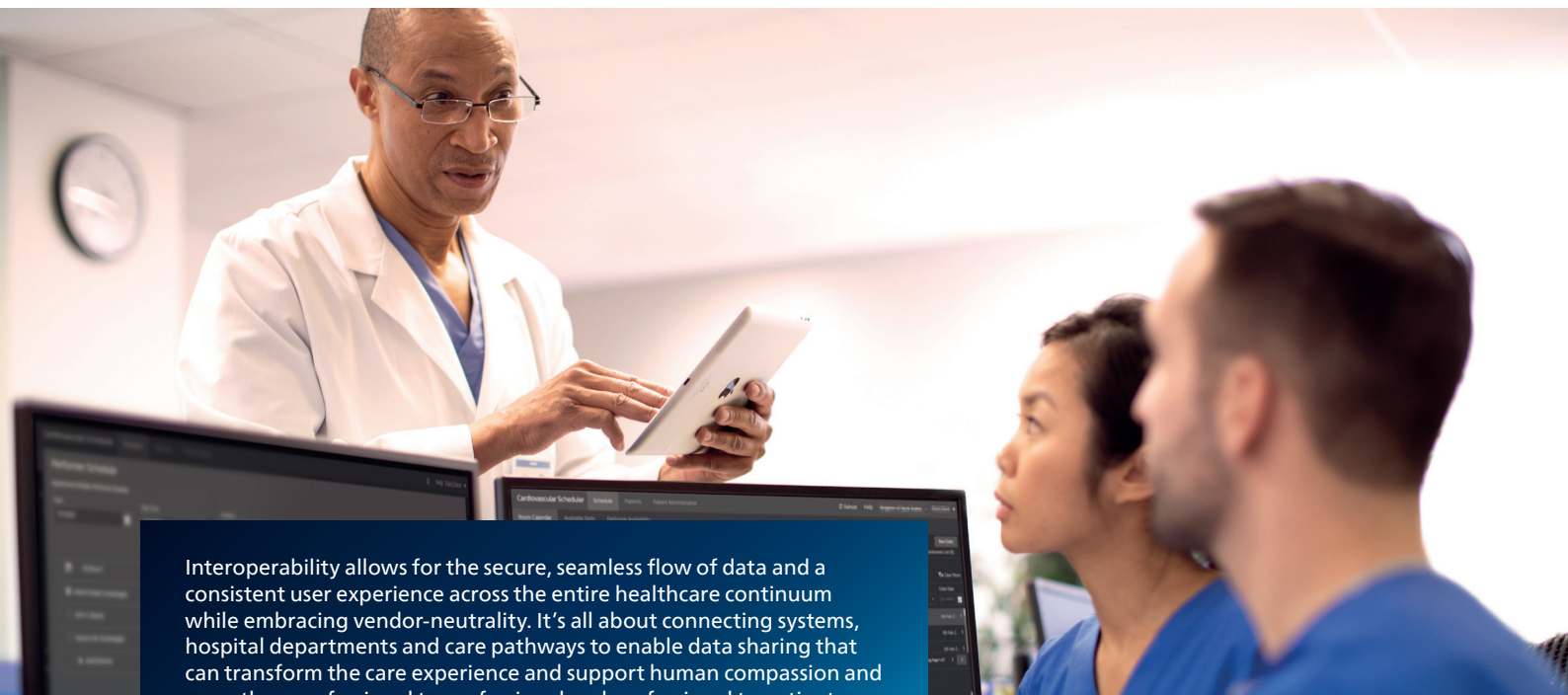
Fewer errors and repeat procedures



Reduced cost of care

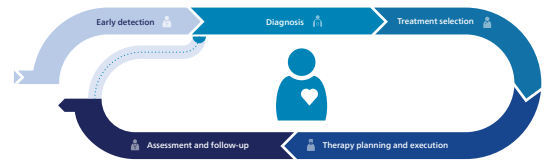


Better clinical outcomes



Interoperability allows for the secure, seamless flow of data and a consistent user experience across the entire healthcare continuum while embracing vendor-neutrality. It's all about connecting systems, hospital departments and care pathways to enable data sharing that can transform the care experience and support human compassion and empathy – professional to professional and professional to patient.

Demonstrating valuable improvement



Bringing cohesion to the lung oncology care pathway

Consider the deep-rooted complexity in lung cancer care. A lung cancer diagnosis can leave patients feeling overwhelmed and uncertain, and professional resolve amongst care providers. It is a disease for which emotions run very high. Yet, the oncology pathway is often a complex journey across specialists, departments, or even healthcare institutions.

Lung cancer is by far the leading cause of cancer death among both men and women, making up almost 25% of all cancer deaths. Each year, more people die of lung cancer than of colon, breast, and prostate cancers combined.*

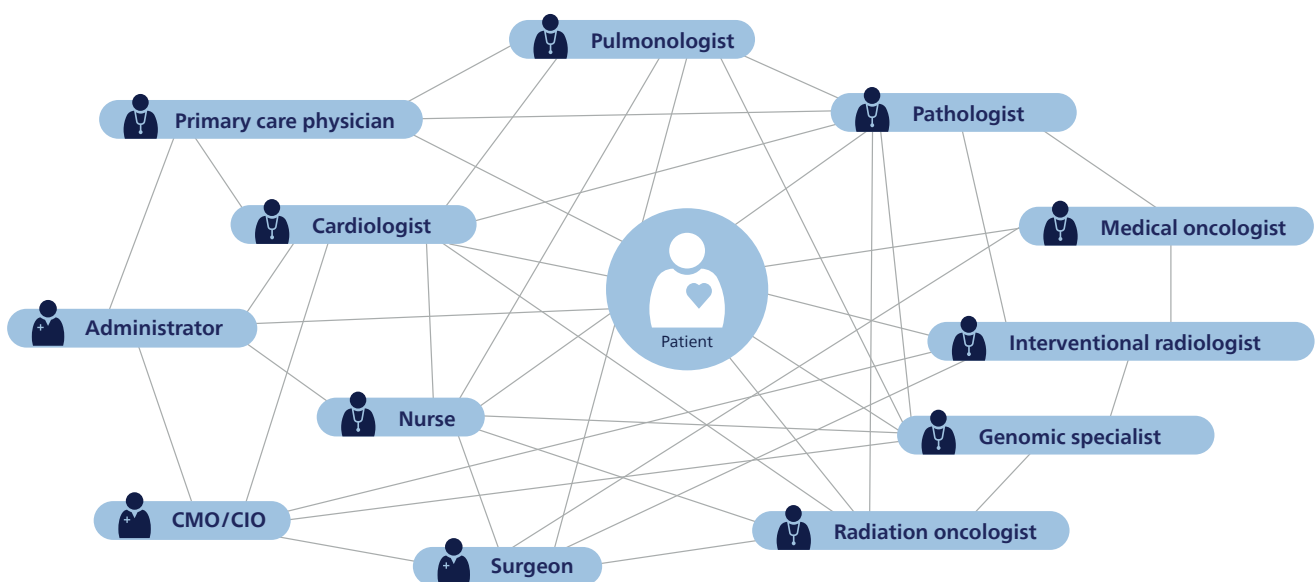
Oncology care team members certainly know how best to accomplish their goals. However, being properly informed by the most relevant, timely information required to move treatment forward, is not a given. So how can they be completely effective if they are un- or under informed? In sincere fashion, every specialist aims to offer their expert opinion, but a fractured process can hinder not help that goal.

From early detection through treatment, assessment, and follow-up, many disciplines are involved in the lung cancer care continuum, and for each, the ability to gain a clear overview of the full patient (and family) journey can be difficult.

Barriers include patient handoffs, disparate technologies, inefficient workflows, siloed data among departments and providers, variability in tumor staging and characterization, and unwarranted variations in treatment selection. Faced with such challenges, care providers can experience burnout. Emotions such as frustration, helplessness and anger can obscure the goal and lengthen/delay the process.

This confusion affects patients too. The patient must often become a self-advocate, enduring hundreds of appointments, dozens of treatments, and multiple hospital admissions – shuffling paperwork, lab results, and images from point to point as part of their journey.

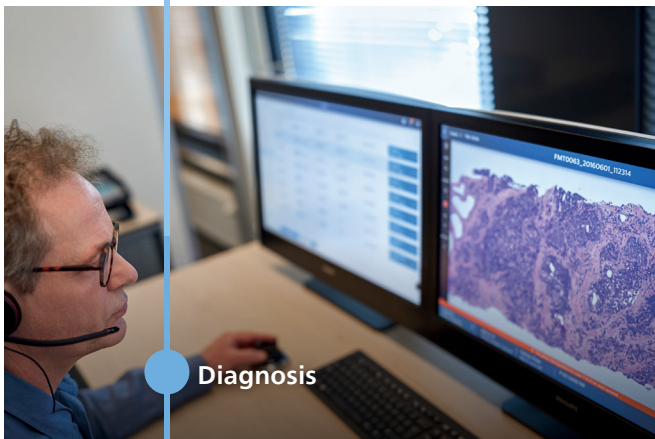
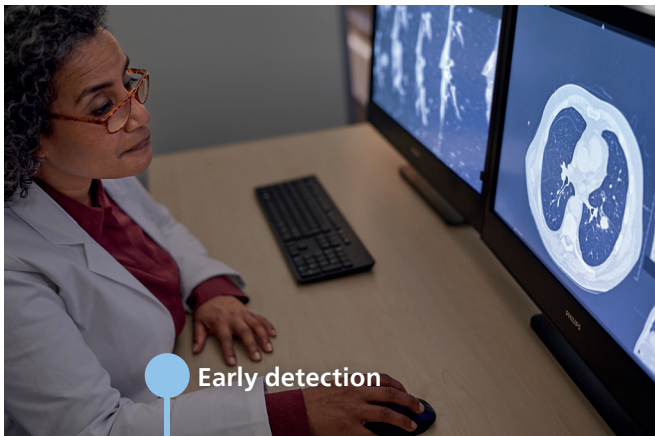
When oncology care is carefully coordinated, substantial improvements can happen. Yet, orchestration of efficient, consistent, care is only possible when interoperability becomes a reality. Clinical guidance, enabled by end-to-end integration and exchange of data, allows for smart and streamlined workflows. Specialists who are often not co-located or working in the same time zone, must know the proper data is accessible at the right time and place regardless of circumstance. Improved access advances quality of care. Connecting care providers across locations with the information they need to collaborate and personalize care, helps remove uncertainty. Clinicians feel empowered. Patients experience a coherent process.



Orchestration of efficient, consistent and quality cancer care is imperative across the continuum.

Integrated solutions for intuitive deliberation

Philips approaches oncology care with a strong resolve to lead the industry with an all-encompassing view of interoperability and a strong portfolio of closely integrated solutions to accomplish it. Each element in the portfolio complements the other to support intuitive deliberation. All are designed to help assure the right information is provided at the right time.



Achieving precision care

The Philips approach to interoperability (aligned to HIMSS Interoperability Level 4) is very effective by virtue of process orchestration and use of the healthcare cloud, artificial intelligence, machine learning, and single sign-on. The vast number of data sources collected under one umbrella, and the inclusion of management systems such as patient scheduling, combine to allow true seamless collaboration among healthcare professionals for precision/personalized care.

Two innovative Philips solutions that work together within the oncology workflow, and demonstrate interoperability success, are Multidisciplinary Team Orchestrator and Lung Cancer Orchestrator.



Multidisciplinary Team Orchestrator

This solution transforms and enhances the Tumor Board process. It streamlines preparation, improves review and analysis, and empowers a cancer care team to reach clinical treatment decisions based upon rich dashboards, diagnostic images, reports, and structured patient data.

Multidisciplinary Team Orchestrator** (MDTO) offers the unique capability to virtually connect and securely integrate multidisciplinary teams across the patient cancer journey. MDTO integrates, structures, and aggregates actionable clinical patient data from disparate systems (vendor-neutral) to facilitate collaborative diagnostic, treatment, and follow-up decisions by Multidisciplinary and Molecular Tumor Boards.

Robust dashboards provide easy access to relevant information. Contextual launch into PACS, digital pathology, genomics/molecular tumor boards, medical/radiation oncology applications, and analytics provide a comprehensive single source for informed discussion.

Lung Cancer Orchestrator

Philips Lung Cancer Orchestrator solution is an integrated lung cancer patient management system for both CT lung screening programs and an incidental pulmonary findings program that monitors patients through various steps of their lung cancer screening and treatment decision journey.

- Identify and keep more patients with incidental nodule integration
- Simplify workflows and patient management
- Integrate multidisciplinary patient data for collaborative treatment decisions

Philips is committed to advancing interoperability and open standards through participation in organizations such as the CommonWell Health Alliance and eHealth Exchange. Philips has also joined Carequality, part of the recognized coordinating entity consortium working to define the 'rules of the road' for the federal government's upcoming Trusted Exchange Framework and Common Agreement (TEFCA) initiative – the single national network structure.

Simplifying work, lowering costs, and delivering scalability.

HealthSuite Interoperability

The HealthSuite platform contains a set of capabilities that support the interoperability vision as described in this paper: HealthSuite Interoperability. Today HealthSuite Interoperability is able to connect to multiple data sources – EHRs, RIS, consumer devices, medical devices, imaging modalities, genomics, digital pathology, patient monitors, and more. Through open standard interfaces both Philips and third party applications can then interact with the data and retrieve insights to provide for a flawless end-to-end journey.

Managing diverse data sources has traditionally been done by creating many system-to-system connections. HealthSuite Interoperability handles this differently by using a single pipe approach – also referred to as a ‘hub-and-spoke architecture’. All systems are connected to a single platform that federates data, this configuration simplifies work, lower costs, and delivers scalability.

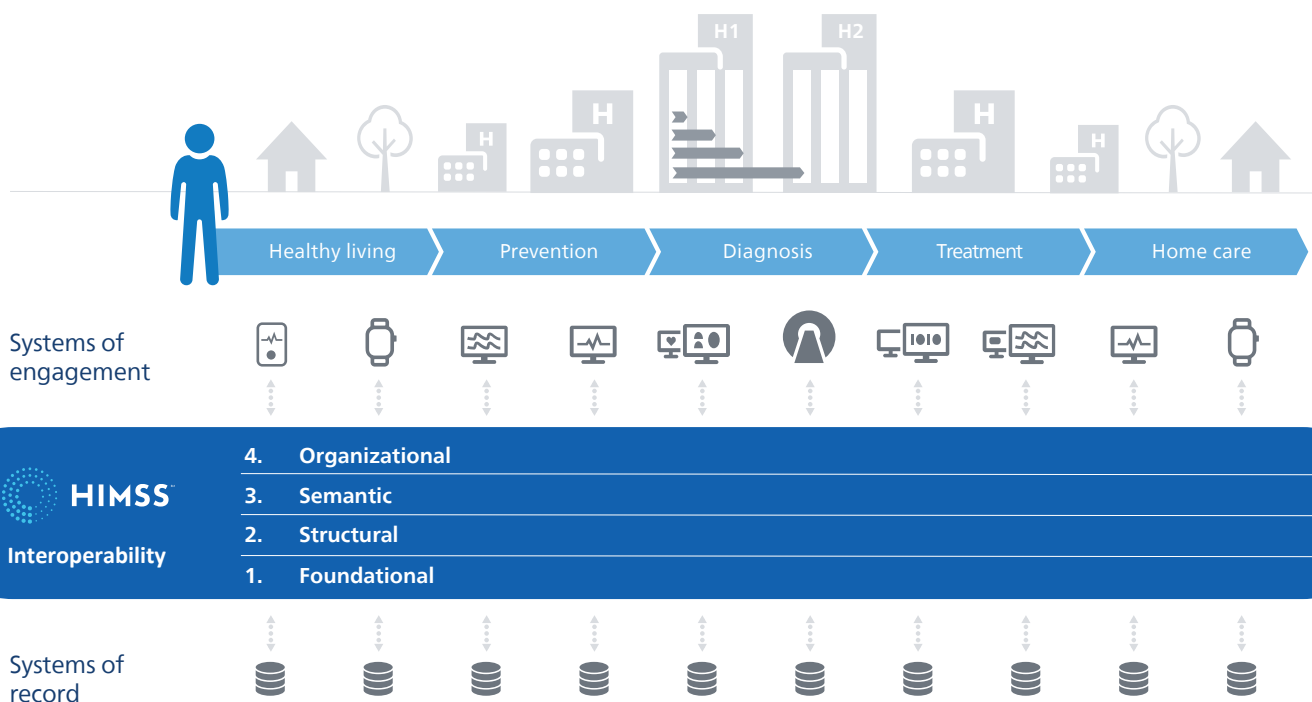
HealthSuite

In 2013 Philips began work on a cloud-based, vendor-neutral platform designed to share data not only between Philips applications, but with any third party or consumer of that data. Philips bases its interoperability on open industry standards.

HealthSuite supports the storage, sharing and analyzing of this data in a highly secure cloud environment conducive to algorithm and predictive model development conducive to algorithm and predictive model development.

Guided by HIMSS

Successful interoperability ensures that all relevant data can be accessed by all relevant applications. As a commitment to this, Philips adheres to the HIMSS interoperability model and believes that level 4 (Organizational) is the point at which true value is realized, where the right data is shared at the right time, with the right person and professional collaboration is enhanced.



Leveraging the power of AI

Hospital leaders are tasked with managing unexpected surges in patient demand, and the ability to anticipate and adapt to rapidly changing circumstances has become more essential than ever. To ensure that the right patient gets the right care in the right place at the right moment, real-time and predictive insights are necessary across the patient journey.

Artificial intelligence (AI) can help integrate data across specialties longitudinally, to support care teams with definitive diagnoses and informed selection of the best care pathway. Or, in acute and post-acute care, it can help clinical teams identify patients at risk and intervene earlier based on an assessment of multiple vital signs.

AI and interoperability are closely related. Successful interoperability feeds AI engines on one hand, while providing AI-based insights at the right time, in the right place, for the right device, on the other.

At the enterprise level, AI can help forecast and manage patient flow, based on real-time and predictive insights that inform the allocation of staff, beds, and equipment, for timely patient transitions all the way from hospital admission to discharge.

As an example, Philips Patient Flow Capacity Suite is a cloud-based patient logistics management solution that helps improve care coordination and patient transitions by combining patient insights and resource requirements to optimize care delivery at the right time, place, and setting. Patient Flow Capacity Suite features machine learning algorithms that help predict the risk of patient readmission within 30 days, and help assess whether the patient is at risk of becoming unstable or ready to be reviewed for potential discharge.

Philips is among the top three companies in the world in terms of AI-related patent applications in healthcare. Philips works closely with partners around the globe, including healthcare providers, specialized AI startups, and academia, to develop AI-enabled solutions that are firmly grounded in scientific research and rigorously validated in clinical practice. There are more than 400 Philips scientists working in data science and AI.



The partner of choice

An extraordinary 125 year history in the healthcare industry delivering hardware, software, informatics, consulting, and transformational services, puts Philips in a unique position of deeply understanding IT systems and clinical languages.

The goal is always to create the shortest path to the best care by giving clinicians the tools necessary to make a precise diagnosis for precision care and personalized treatment.

Supported by in-depth research, detailed analytics, and actionable data, combined with direct customer input, Philips arrives at solutions that are designed to overcome real-world obstacles, while always putting the patient first. And no solution is developed without consideration for inherent interoperability.

A commitment to safe, reliable patient-centric care collaboration inside and between healthcare delivery organizations is accomplished by providing a view that is fully tailored to the user's needs, delivering all required clinical information through open standards-based interoperability.

The combination of original thinking, with critical input from patients and care providers, serves as the foundation for innovations that empower the patient/professional relationship. With a visionary approach, Philips is illuminating a new path toward improved collaboration, establishing the company as the partner of choice in interoperability implementation.



Key take-aways

Consider people first,
technology second

Assure the right data at
the right time on the right
device for the right people

Be vendor neutral -
bring it all together
through solutions with
interoperability built in

Conclusion

Seamless integration

No care provider is an island. The collaborative process – the human element – is essential to ensure optimal outcomes. Technical advances are critical, but it is the intangible element of emotional and professional satisfaction that must come first. Any consideration of interoperability must include this position.

Providing the right information, to the right person, at the right time, on the right device, for the right purpose is how true interoperability works. Defining recognizable clinical and operational pathways that resonate with professional care providers, and streamlining those pathways, promotes confident care.

Crucial is the fact that Philips interoperability solutions support vendor-neutrality for seamless integration of disparate systems. And all Philips products and services are always built from the ground up with interoperability capabilities designed in.

* Key statistics for lung cancer, American Cancer Society, <https://www.cancer.org/cancer/lung-cancer/about/key-statistics.html> , accessed 01/10/22

**Disclaimer: Multidisciplinary Team Orchestrator (MDTO) is also known as the Oncology Tumor Board Collaborator. The MDTO name will be applicable as of ISPM V5.3.

