PHILIPS

Simplifying your enterprise clinical information systems with IntelliBridge Enterprise

Managing the flow of clinical data

Abstract

Due to rapid technological and legislative changes, the data collection associated with providing healthcare has increased dramatically. As the volume of patient data increases, so does the complexity of the interfaces among medical devices, hospital information systems, and the electronic health record (EHR).

Philips IntelliBridge Enterprise (IBE) provides a single point of contact between the EHR and Philips clinical solutions. This reduces the number and cost of point-to-point interfaces and offers workflow efficiencies with a goal of improving the quality of patient care.

Executive summary

Healthcare executives and professionals are under growing pressure in today's changing regulatory environment. They are mandated to reduce the cost of patient care while improving outcomes and expanding access to care, with ever-shrinking resources.

At the core of clinical decision-making is data. Clinicians not only have to do more with fewer resources but also assimilate a wide variety of information and inputs during the clinical decision-making process to provide the best potential outcomes for their patients. Accountable Care Organizations and meaningful use metrics fundamentally rely on the ability to capture and share rich clinical data. This data must be relevant, timely, and available when and where the clinical staff needs it.

Clinical devices and systems today produce a tremendous amount of data with a high degree of regularity. The number of and variety of clinical devices in a hospital can be high, causing the amount and frequency of data to increase dramatically. Typical ICU patients can have over 10 devices connected to them each producing information every few minutes or even seconds, much of which is sent to the critical care documentation system. This documentation system then sends data to the EHR, the longitudinal patient record.

Multiple systems and devices can feed into the EHR. Typical interfacing models can be highly complex and costly to maintain given the large number of department interface points which a healthcare facility has to maintain. Having to maintain more points of interfacing can potentially introduce errors or system issues. Even upgrading the software of one vendor's system can have a ripple effect on all systems connected to or receiving data from the EHR.

Accordingly, IT departments are faced with managing a highly complex interfacing environment that not only supports clinicians but seeks to improve clinical workflow. Essentially, many hospitals' IT organizations have become systems integrators and can face a variety of interoperability challenges, including:

- Potentially hundreds of different medical devices in a hospital environment with varying device drivers and compatibilities
- Differing vendors medical devices that may not interoperate with each other
- Legacy protocols used by existing information systems in place in the hospital
- Life-critical equipment with specific requirements necessary to mitigate safety risks
- Varying degrees of interoperability amongst vendors own solutions
- Varying levels of standards support such as IHE, IEEE
- Multiple connection points
- Non-plug-and-play solutions requiring extensive IT resources

An enterprise-wide strategy that focuses on using devices and systems that are easily integrated, that capture a variety of parameters, and are interoperable has many benefits, including:

- Rich data for longitudinal records
- Parameters needed to satisfy professional licensing requirements, regulations, and documentation requirements
- A path to closed-loop therapies
- Richer, more aligned data for research
- Data to potentially satisfy quality metrics, patient safety goals, and internal reporting
- Significant support of third-party devices, systems, and drivers
- Improved and scalable solutions with higher levels of IT friendliness
- Plug and play capabilities minimizing impact to the IT organization
- Ability to support server virtualization, and a shift to Cloud hosted solutions
- Secure interactions between systems at the core

Healthcare executives, CIOs, and their IT staff must work cross-functionally to understand their existing IT systems environment, the clinical and professional requirements associated with documentation, current and future electronic documentation state, and clinical workflow in order to effectively chart the course toward a solid enterprise device and systems integration strategy. Their considerations should include:

- Workflow associated with departmental documentation, medical device integration, and the organizational roadmap for data driven research and analytics
- Current and future capabilities of medical devices with respect to integration
- Inventory of existing documentation systems, including vendors and versions
- Existing and future vendor partners' interoperability strategy

Consolidating points of device and systems interfacing and leveraging standards-based platforms are ways that healthcare IT executives can minimize complexity in their IT information systems environment.

Philips Healthcare offers a path towards seamless interoperability with the Philips Medical Device Integration and IntelliBridge family of solutions. One key component of this family is IntelliBridge Enterprise (IBE), a solution designed to work across Philips solutions and reduce the number of interface points to the Clinical Information Systems (CIS) or EHR.

Industry trends today

The healthcare industry has undergone a significant amount of change in the past several years. Legislative changes, changing demographics, and growing cost pressures have all affected the industry. As a result of these changes, healthcare organizations need to find ways to do more with fewer resources.

Shifting reimbursement models due to cost pressures

The aging population, growth of chronic diseases, and shifting reimbursement models are challenging hospital organizations to change the way they deliver care. The traditional Medicare fee-for-service models were identified by the Medicare Payment Advisory Commission in 2008 as focusing on volume versus quality of care.[1]

Public and private payers can no longer fund healthcare services without looking at the metrics. They want assurance that services are of the highest quality and offer clear clinical value. Most often, that means asking for quality that can be demonstrated through better patient outcomes, care that is appropriate for the patient, and improvements in patient safety.

> To increase value for beneficiaries and taxpayers, the Medicare program must overcome the limitations of its current payment systems. A reformed Medicare payment system would pay for care that spans across provider types and time (encompassing multiple patient visits and procedures) and would hold providers accountable for the quality of that care and the resources used to provide it. This direction would create payment system incentives for providers that reward value and encourage closer provider integration, which in turn would maximize the potential of tools such as P4P and resource measurement to improve quality and efficiency.[2]
>
> — **Medicare Payment Advisory Commission, 2008**

Legislated changes

The passage of the Affordable Care Act (ACA) as well as the Health Information Technology for Economic and Clinical Health Act (HITECH) component of the American Recovery and Reinvestment Act (ARRA) are driving rapid changes for U.S. healthcare professionals.

The HITECH Act

The HITECH Act had several major implications for healthcare information technology organizations. The HITECH Act introduced incentives for the adoption and meaningful use of certified EHR technology. Initially, the law put in place incentives to stimulate the implementation of electronic charting and electronic health records, but over time the incentives will be replaced with penalties.

Subtitle D of the HITECH Act emphasizes the importance of the security and privacy of electronic transmission of protected health information. With the onslaught of electronic data capture initiatives, this component of the act has led to an increasing focus on the security and privacy of medical information systems. Even before the passage of the Affordable Care Act, the HITECH Act moved the U.S. healthcare system toward implementing technology to help capture the right data and improve efficiency and care coordination. Ultimately, the requirement to show meaningful use of the technology was designed to drive toward improved clinical outcomes.

The Patient Protection and Affordable Care Act

The Patient Protection and Affordable Care Act, more commonly known as the Affordable Care Act (ACA), was signed into law in March 2010. The law aims to decrease the number of uninsured Americans and decrease the costs of healthcare.

One of the main goals of the ACA is to focus on the quality of healthcare and give incentives to healthcare providers that reinforce quality over the quantity of services provided. A number of federal and state initiatives were designed to help achieve this goal:

- **Comparative effectiveness research:** The ACA created a non-profit Patient-Centered Outcomes Research Institute (PCORI) to conduct research that compares the clinical effectiveness of medical treatments. The law requires, however, that the findings of PCORI research may not be construed as mandates, guidelines, or recommendations for payment, coverage, or treatment or used to deny coverage.

- **Center for Medicare and Medicaid Innovation:** The ACA created the Center for Medicare and Medicaid Innovation (CMMI) at CMS. The purpose of the center is to test innovative payment and health delivery models. Many of the payment approaches included in the ACA are being operated by the Center. These include the demonstrations on accountable care organizations, bundling, medical homes, and the partnership for patients.

- **Health Insurance Exchanges:** The ACA establishes state health insurance exchanges in which individuals and small businesses can purchase health insurance coverage. Starting in 2014, the insurance exchanges will allow eligible individuals, families, and small businesses to shop for insurance coverage.

- **Essential benefits package:** The ACA requires that all health plans for individuals and small groups must provide a comprehensive set of services, called essential health benefits.

- **National quality strategy:** Under the ACA, the government has developed a national quality improvement strategy that identifies broad aims and priorities for achieving high quality, affordable care for Americans. The importance of improving the quality of healthcare and addressing shortcomings such as medical errors, inappropriate utilization, and a fragmented delivery system has been documented widely. Many efforts in the public and private sectors are underway to correct them. In passing the ACA, Congress directed the US Dept of Health and Human Services (HHS) to develop a strategy that would set goals and priorities to help guide these efforts. In March 2011, HHS released its initial quality strategy and plan for implementation. It focused on six priorities:[3]

  - Making care safer
  - Ensuring person- and family-centered care
  - Promoting effective communication and coordination of care
  - Promoting the most effective prevention and treatment of the leading causes of mortality, starting with cardiovascular disease
  - Working with communities to promote wide use of best practices to enable healthy living
  - Making quality more affordable

The plan outlines a range of changes in policies and infrastructure that are necessary to help providers, payers, and others achieve these priorities. These include, among others, changes in payment, public reporting, accreditation, quality measurement, and training.[2]

European Health Data Space Regulation (EHDS)

The European Health Data Space (EHDS) is an initiative by the European Union designed to establish a unified framework for the use and sharing of electronic health data throughout the EU. It prioritizes both the primary use of data for healthcare services and the secondary use for research, policy-making, and regulatory needs. The EHDS seeks to enhance healthcare access, promote research, and drive innovation in the health sector.

Some of the key aspects of the EHDS are:

- **Common Framework:** A common set of rules, standards, and infrastructures for the exchange and use of electronic health data.

- **Primary Use:** This refers to the use of health data by healthcare professionals for direct patient care, including access to patient summaries, prescriptions, and medical images across borders.

- **Secondary Use:** This encompasses the use of health data for research, public health, policy-making, and regulatory purposes.

- **Data Access:** Provides mechanisms for researchers, public health authorities, and other authorized entities to access health data in a secure and privacy-preserving manner.

- **Data Protection:** The EHDS is built on principles of data protection, with measures like anonymization and pseudonymization to protect individual privacy. The EHDS ensures data protection and security using EU frameworks like[4]

  - General Data Protection Regulation (GDPR)

  - Data Governance Act

  - EU Data Act

  - Network and Information Systems Directive

Health Information Exchanges (HIE)

Health Information Exchanges are IT platforms that are being set up to facilitate the sharing of information across health systems, regions, and providers to enable coordination of care and more patient-centered care. The American Health Information Management Association uses the following definition for HIEs:

Health Information Exchange (HIE) refers to the process of reliable and interoperable electronic health-related information sharing conducted in a manner that protects the confidentiality, privacy, and security of the information. The development of widespread HIEs is quickly becoming a reality. Health Information Organizations (HIOs) are the organizations that oversee HIE. For HIOs to function, they must have the capability to employ nationally recognized standards to enable interoperability, security and confidentiality, and to ensure authorization of those who access the information. The HIE implementation challenge will be to create a standardized interoperable model that is patient centric, trusted, longitudinal, scalable, sustainable, and reliable.[5]

These initiatives share a demand for data as the foundation for analysis and evaluation. Much of this data starts with the patient. It will thus become increasingly critical to capture a wide variety of data from the point of care. Clinicians may need to more regularly consider the types of data that the larger care team might need, rather than simply capturing the data necessary for their department or clinical specialty.

Technological advances

Coupled with these changes, rapid adoption of consumer technologies, such as the smartphone, is changing the landscape of healthcare delivery by increasing caregivers' ability to capture and access data. It is the responsibility of IT organizations to figure out how to provide access to this data to the right clinicians at the right time, in a secure and confidential fashion. Ten years ago, the iPad and iPhone did not exist, and clinicians were tied to their offices or desks. Now information can be viewed and input from hallway pods in hospitals or from tablets or smartphones in a clinician's pocket. Wireless device capabilities make it easier to transmit this data on a regular basis from the point of care as well. These data inputs must also be captured in the patient's record, whether at the departmental or longitudinal level.

Along with these advances in consumer technology have come similar advances in medical devices, making it easier for systems to capture an increasing number of parameters from the point of care.

The data-driven environment

The changing nature of the healthcare environment now demands the ability to identify and measure outcomes, share information across the care continuum, and improve clinical and operational efficiencies in the name of providing improved quality at a reduced cost. A data-driven environment underlies all of these imperatives. Some studies have indicated that automated data capture and enterprise- wide access to rich data may enable clinical, operational, and financial efficiencies.

Agency for Healthcare and Research Quality notes:
The Institute of Medicine report, Future Directions for the National Healthcare Quality and Disparities Reports (IOM, 2010), highlights the adoption and use of health IT as a tool to manage cost and improve the quality of care delivered. Meaningful use of an EHR, for instance, is increasingly viewed as essential to improving both the efficiency of service delivery and health care quality (Resnick and Alwan, 2010). The potential benefits of EHRs are not limited to hospitals and ambulatory care settings but are also valuable tools in hospice and home health agencies.[6]

Another study notes:
Our findings suggest that the implementation of a basic EHR, including computerized physician order entry (CPOE), shows promise in bringing about improved and more efficient nursing care, better care coordination, and safety for patients.[7]

The formation of healthcare information exchanges underscores the push for data exchange and information sharing across regions and providers.

The challenge for the health IT professional is to put together an enterprise-wide integration and interfacing strategy that contends with:

- Support for existing internal systems
  - Growing number of medical devices
  - Increasing number of measured parameters in those devices
  - Highly complex interfacing environment
  - Aging systems with outdated computer protocols
- Potential to interface with external systems such as regional HIEs or physicians' offices
- External pressures, such as the demand to meet new metrics to improve quality, satisfaction, and outcomes
- Internal expectations, such as the requirement to have an accurate, consistent, and complete record of care that can serve many clinicians

Key considerations for enterprise integration and systems interoperability

In addition to regulatory compliance and legislated directives, healthcare organizations are faced with staffing appropriately to address the convergence of information technology and healthcare technology. This convergence is driving the requirement for hospital organizations to be systems integrators – ensuring that multiple systems from different medical device vendors integrate and send data to potentially different information systems' software, which ultimately leads to the EHR, the longitudinal record that reflects all the care patients have received.

As a result, many hospitals are looking for systems that provide a high degree of interoperability and more plug-and-play capabilities, as well as partnership from their vendors when it comes to IT risk assessment, management, and systems integration. As noted above, hospital organizations face a number of challenges with respect to enterprise integration and interoperability with their clinical and hospital information systems.

Some key considerations when developing an enterprise-wide information systems interoperability strategy

What is the strategic perspective of the hospital organization with regard to electronic charting or EHRs? Is the facility pursuing a best-of-breed or best-of-suite strategy? This will help the organization plan project timelines, departmental applications and their points of interfacing, and help the dialogue with the medical device and systems vendors.

At what stage is the organization in the process of rolling out EHRs?

What is the desired workflow for electronic charting? For example, how will clinicians validate the data if validation is required?

What is the organization's method of standardization? For example, will the organization use a third-party for integration?

How many points of interfacing are required?

What are the vendors and versions of the applications being interfaced with?

What devices might need to be interfaced with?

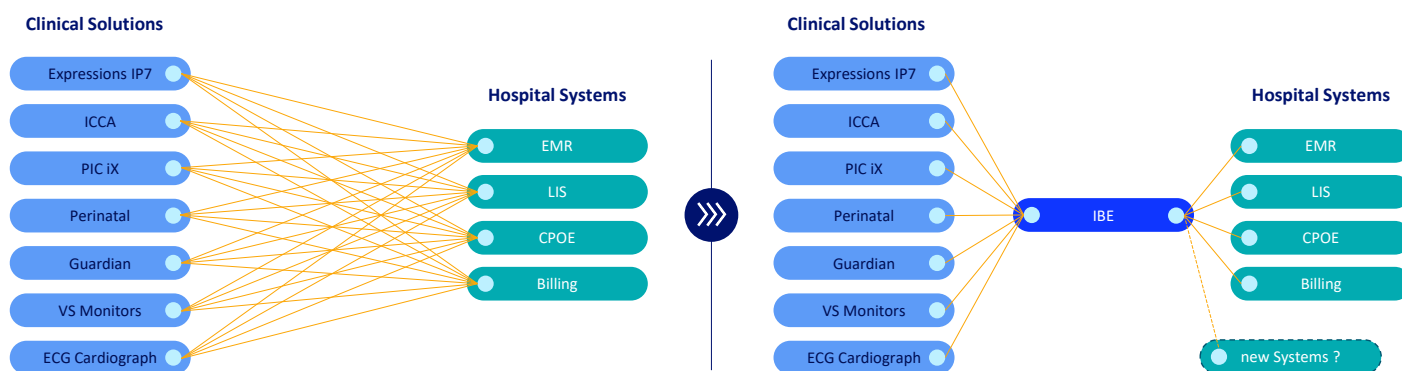**How frequently will the software systems be upgraded?**

IntelliBridge Enterprise overview

One interfacing engine, one solution

Philips IntelliBridge Enterprise offers a unified, standards-based solution for seamless bi-directional communication between your Hospital Information Systems and Philips clinical informatics solutions and medical devices, utilizing standards like IHE, HL7 v2, CDA, HL7 FHIR and DICOM.

It enables efficient data exchange, including Patient Demographics, Labs, Medications, Orders, Vital Signs, Alarms and documents. By integrating rich clinical data from Philips monitoring and clinical IT systems, IntelliBridge Enterprise enhances your EHR investment, providing essential information to support clinical workflows and decisions directly at the point of care through Philips bedside systems.

At the same time, IntelliBridge Enterprise helps you simplify the management of your clinical information systems and devices by providing a single point of contact (one interface) between your core clinical IT assets and many Philips clinical systems. By helping to simplify your IT interfacing architecture and minimize integration effort and cost, IntelliBridge Enterprise may represent an efficient, cost-effective way to provide interoperability, enhancing the value of your IT investments and improving their clinical impact.

Clinical Solutions

- Expressions IP7
- ICCA
- PIC iX
- Perinatal
- Guardian
- VS Monitors
- ECG Cardiograph

Hospital Systems

- EMR
- LIS
- CPOE
- Billing

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- new Systems ?

Philips solutions in customer environment — before IBE

- Non-standard and point to point connections
- High complexity, cost of maintenance
- Sub-optimal clinical workflows

Philips solutions in customer environments — after IBE

- One pipe solution for all **interoperability** needs
- Scalable platform with **lower cost** of ownership
- Optimized, out-of-box validated **clinical workflows**

IntelliBridge Enterprise benefits

- Simplify your IT integration with a single point of contact for most Philips systems.

- Lower your total cost of ownership by minimizing investments in point-to-point interfaces and their maintenance.

- Experience the ease of having one contact for all Philips systems.

- Deliver patient information to caregivers more quickly and efficiently, potentially reducing costs compared to multiple interfacing points.

- Take advantage of an extensible platform that allows you to add new Philips systems, IHE profiles, and product extensions, along with a comprehensive management toolset.

Current Philips IntelliBridge compatible solutions

IntelliBridge Enterprise offers an extensive collection of Interface Configurations for various Philips systems, modalities, and solutions. Here are some of the Philips products included:

- Patient Information Center (PIC iX) monitoring solution

- EarlyVue VS30 Vital signs monitoring

- Philips Event Notification system and Care Assist Mobility

- IntelliVue Guardian Software (IGS) early warning coring solution

- IntelliSpace Perinatal OB charting solution

- Expression MR Monitors and MR Patient Care Portal 5000

- Efficia Patient monitoring solutions

- Clinical Insights Manager

- IntelliSpace Critical Care and Anesthesia (ICCA)

- eCareManager Enterprise telehealth and Virtual Care solution

- Medical Device Information Platform (MDIP)

- Philips Cardiology systems (PageWriter, Stress ST80i, Holter)

- IntelliSpace ECG Management System

- Emergency Care Informatics Suite

- Cardiovascular Image and Information Management Solutions (ISCV, Xper IM, Reporting)

- Advanced Visualization Workspace (AVW)

- PerformanceBridge data platform

- IntelliSpace Precision Medicine Oncology Pathways platform

- Sleep and respiratory Care Orchestrator

- Interventional Hemodynamic application

More Philips systems are added regularly

IBE features tailored, yet pre-validated Interface Configurations for each compatible Philips product. These interface configurations are available out of the box, and thereby reducing implementation time and schedule. IBE also integrates Philips Shared Services, allowing a common staged service to persist patient data for usage across various applications, such as patient Index (Demographics, Visit information) and data pool for relevant patient data like labs, orders, medications providing more than mere data translation. IBE is designed to accommodate future data needs of clinical applications.

A suite of toolkits empowers IBE to promote FHIR standards within Philips, including Profile Analyzer tool, APIs to transform between formats and integrate with clinical data repositories, Smart on FHIR, and FHIR Façade.

Moreover, IBE supports a broad array of Integrating the Healthcare Enterprise (IHE) profiles, ensuring seamless integration among different healthcare systems and devices through standardized protocols.

Philips Integration Services also offer valuable implementation services, including project management, infrastructure consulting, procurement, interface mapping and configuration, and acceptance testing, all aimed at ensuring effective data integration. Additionally, these services include interface consulting and development for various systems and interfaces.

With Patient Information Center (PIC iX) monitoring solution

The Philips Patient Information Center (PIC iX) monitoring solution is a comprehensive, patient-centered tool designed to seamlessly integrate into your hospital's IT environment, addressing clinical challenges effectively. It captures near real-time patient data and sends it directly to your EMR from admission to discharge, even during transport. Mobile caregivers gain insight into a patient's evolving condition with advanced clinical decision support tools and smart alarms, empowering clinicians to make informed care decisions and provide support from anywhere in the hospital.

The PIC iX servers transmit data to IntelliBridge Enterprise (IBE). Besides serving as a platform for ADT inbound to the Patient Information Center, IBE enhances clinical workflows with features like waveform export. PIC iX also allows for the export of waveform strips to local systems, enabling their transfer to Hospital External Systems. IBE facilitates file transfers to HIS, EHR, or similar applications and ensures that PIC iX observation messages comply with IHE PCD 01 and ACM message profiles.

This workflow enhancement offers two key benefits. First, it enables clinicians to eliminate the manual process of printing waveform snippets, taping them to paper, and then scanning or faxing them into records. Secondly, by electronically sending data to the EHR or CIS, it potentially lowers the costs associated with printing.

When integrating Philips IntelliVue patient monitoring systems:

- Supports an Admit Discharge Transfer (ADT) interface to your monitoring environment, enabling patient matching and identification electronically
- Allows clinicians at the bedside or at the central nursing station to select the appropriate patient from the list of currently admitted patients, automatically sending the relevant ADT information to patient monitors
- Waveform snippet import directly to your EHR. This eliminates a multi-step process of printing, scanning, and attaching a waveform snippet by directly importing a selected area of the waveform into the EHR from the central station
- Relevant lab results to the point of care and enable protocols, thereby quicker decision making
- Shared staff assignment with an aim to streamline workflows, improve communication, with a goal of enhancing patient care
- Ensures that important patient monitoring records are reliably and securely saved in the patient's lifetime medical record
- Depending on the EHR system, IBE can be set up to operate in either Solicited mode or Unsolicited mode for documenting observations and vitals in the EHR

IntelliBridge Enterprise (IBE) and enterprise-level patient monitoring ecosystem

**Critical care monitoring**   **Hospital enterprise systems**
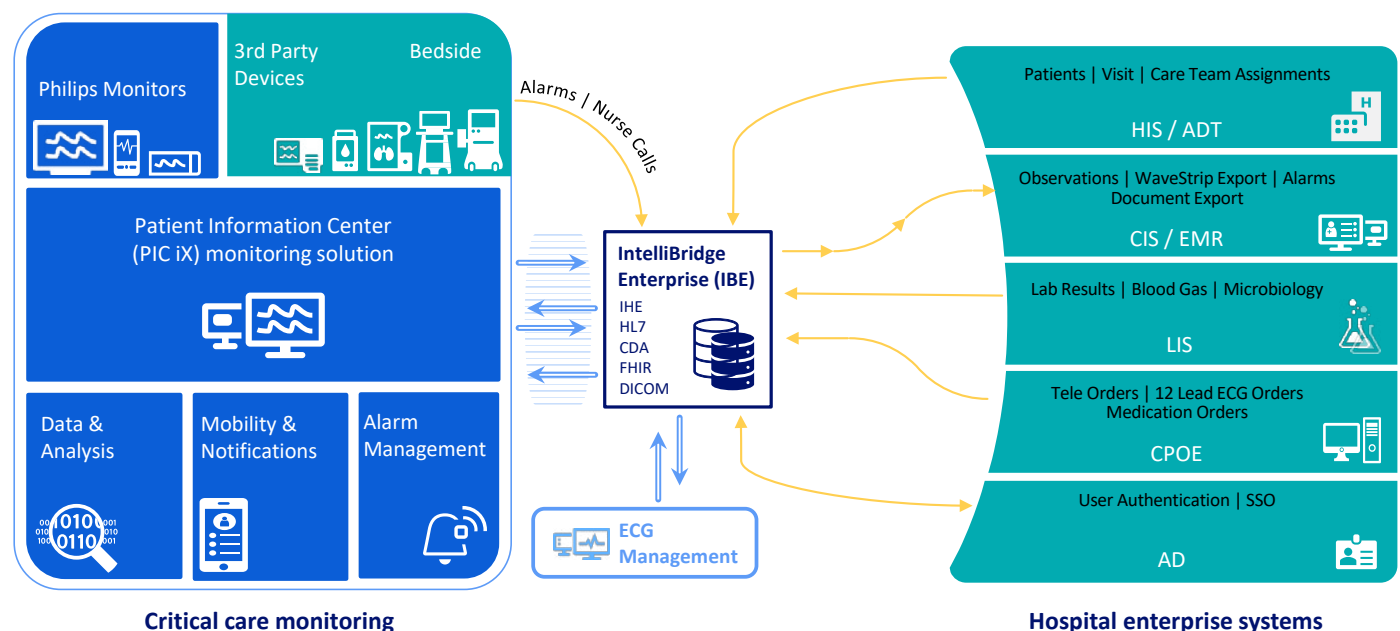
With EarlyVue vital signs monitors

The Philips EarlyVue VS30 vital signs monitors are spot check vital signs monitors used to measure blood pressure, pulse oximetry, pulse rate, and temperature. EarlyVue VS30 monitor harnesses the power of automated Early Warning Scoring (EWS) to identify subtle signs of patient deterioration, enabling you to provide proactive care with confidence. Experience early detection and intelligent intervention. Caregivers know that spending more time with patients translates into better patient care, so they constantly struggle to minimize the tasks that prevent them from providing care. While patient record documentation is one of caregivers' most important responsibilities, it can also be one of the most time-consuming activities in their day, as indicated by a 36-hospital time and motion study. This study indicates that "changes to the process and technology of documentation, communication, and medication handling, as well as the physical design of units, could benefit nursing efficiently and the safe delivery of care."[8]

The SureSigns QuickCheck feature seamlessly integrates with various workflow models, from bedside monitoring to mobile solutions. By utilizing Philips IntelliBridge Enterprise, QuickCheck ensures accurate bedside record validation, including caregiver authentication and ADT patient ID confirmation. This allows caregivers to send verified records directly to the EHR, enabling them to focus more on patient care. QuickCheck enhances clinical workflow by ensuring patient data is efficiently entered into records, with a goal of achieving better outcomes.

Additionally, IBE provides a validated Enterprise Integration solution for EarlyVue VS30 monitors with the Oracle EHR System. This solution features user authentication and patient lookup, making onboarding smoother and more efficient.

VS30 Enterprise Integration
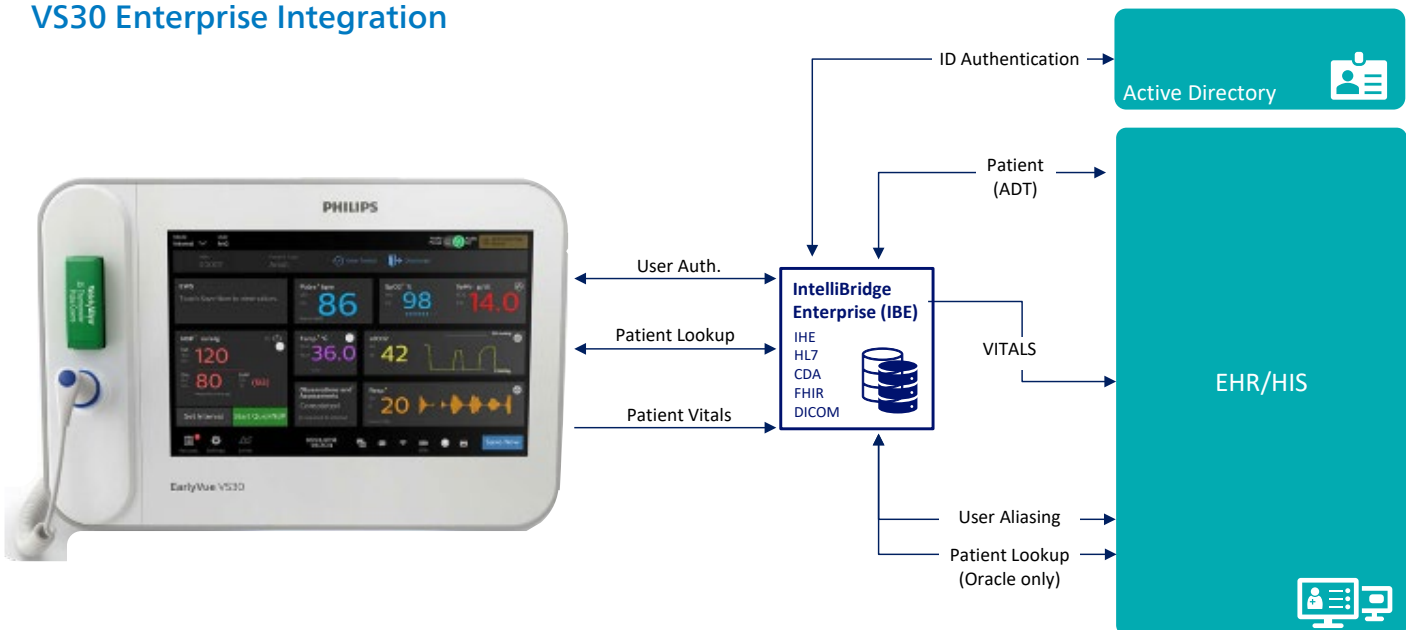
With Philips IntelliSpace ECG Management System

The Philips IntelliSpace ECG Management System is a powerful enterprise software solution that centralizes multimodality reports and study data. This allows enterprise customers to easily view, edit, and confirm reports in one system. By consolidating patient study data in a single location, it simplifies workflow and enhances the care you provide to your patients.

IntelliSpace ECG utilizes IntelliBridge Enterprise (IBE) for seamless interoperability with your HIS, ADT, EMR, and other hospital informatics solutions. This versatile interfacing engine can also be integrated with other Philips solutions. Using industry standards, IntelliBridge Enterprise connects IntelliSpace ECG with both Philips and non-Philips departmental and hospital systems, offering the advanced clinical decision support and sophisticated workflow management essential in today's healthcare environment. With easy access to resting ECG, Holter, and Stress reports, your clinical team can effortlessly integrate ECG reports into their workflow whenever and wherever they are needed.

By enabling a two-way exchange of information, IntelliBridge Enterprise streamlines communication with enterprise clinical and administrative systems for demographics, order worklists, and result distribution. On the inbound side, patient demographic data and order information enhance workflow by facilitating worklists at the ECG cardiographs, minimizing manual data entry, and improving data quality. Outbound connectivity to third-party systems ensures timely distribution of clinical reports, results, and coded information for billing purposes.
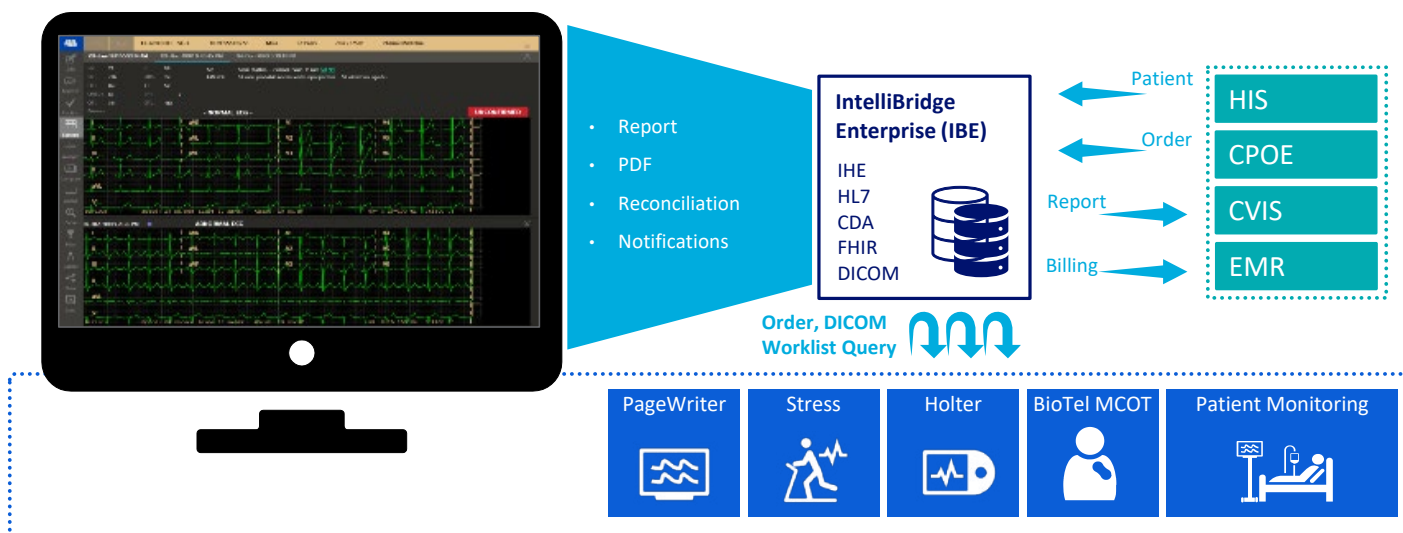
With Philips Cardiovascular Workspace

Philips IntelliSpace Cardiovascular (ISCV), commercially known as Philips Cardiovascular workspace is an integrated multi-modality image management system for cardiovascular information. ISCV allows users to combine deep clinical expertise with technological innovation to securely connect patients, care teams and data across the entire cardiovascular care continuum. The enterprise topology of ISCV can provide cardiac image viewing, reporting, and archiving functions for the cardiology labs of a large, multi-hospital healthcare organization.

IntelliBridge Enterprise enables seamless integration with EMR and HIS systems, advanced clinical tools and data liberation across your enterprise. IBE interfaces between imaging modalities and Philips ISCV by providing DICOM- based services such as DICOM Modality Worklist (DMWL) and Modality Performed Procedure Step (MPPS). IBE simplifies the connection by serving as a central point for data exchange. The data consists of demographic patient information, schedules, textual information, and text and PDF reports. IBE reduces the integration workload for your IT department, bringing multiple interfacing solutions under one provider.

In a multi-hospital environment, diverse HIS systems can send ADT and order data to a centralized ISCV and IBE configuration, which can be deployed in high-availability and multi-HIS/CIS topologies. This provides consistent, reliable access to cardiovascular data across the enterprise, improving care coordination and operational efficiency.

ISCV interfaces include:

- ADT inbound
- Orders inbound
- Results outbound (formatted and unformatted text)
- DICOM, MWL, and MPPS
- Patient query
- Remote reading in referral workflow

Additional capabilities include:

- Echo reports/results (interface)
- DICOM MWL/MPPS (throughput) performance boost to operate effectively in an enterprise environment
- M2M (Machine to Machine) service support for enhanced monitoring and support
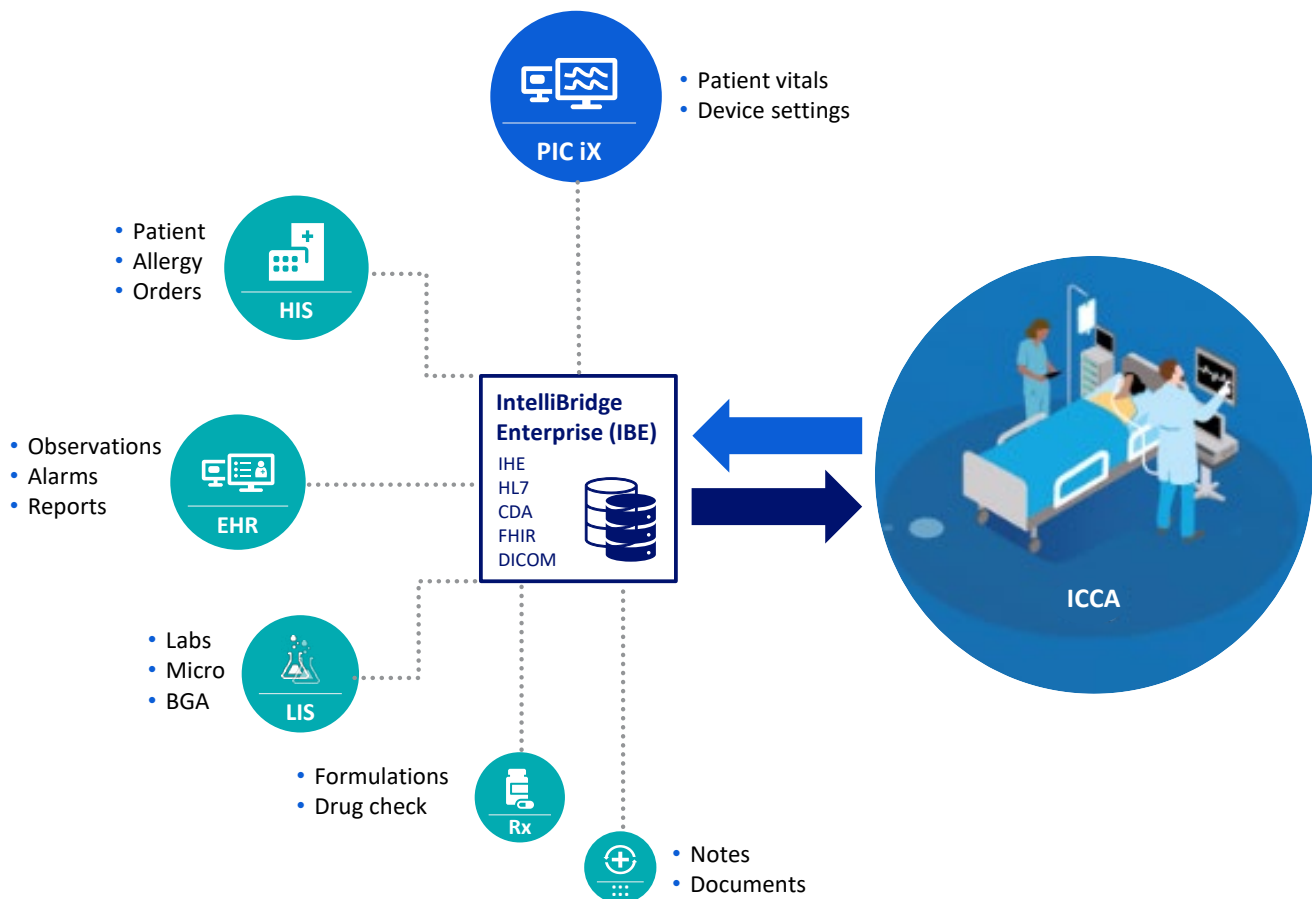

IntelliSpace Cardiovascular
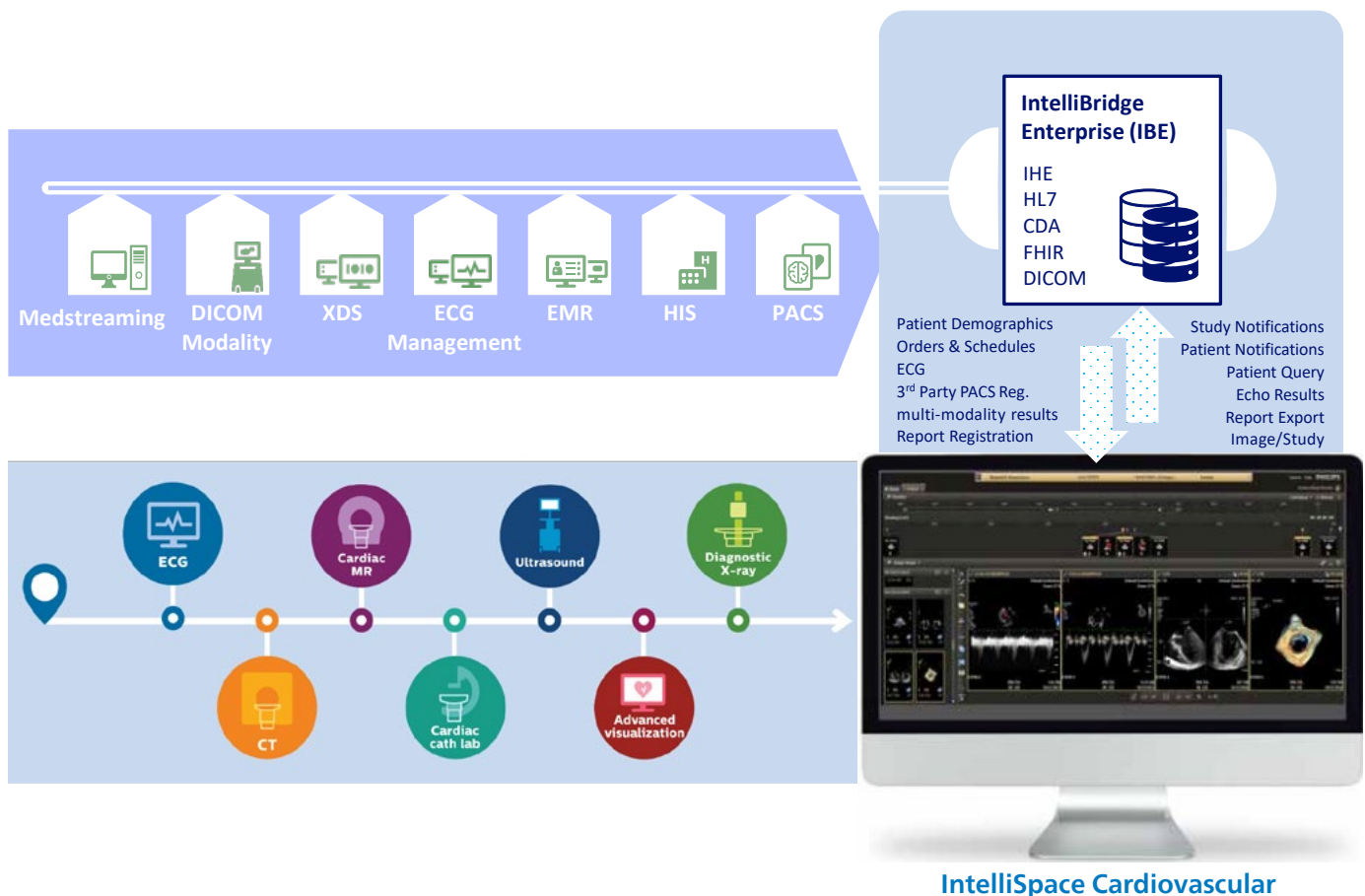
With IntelliSpace Critical Care and Anesthesia patient care solution

Philips IntelliSpace Critical Care and Anesthesia (ICCA) is a powerful clinical informatics and patient care solution designed to streamline workflows and elevate patient care. With advanced clinical decision support, ICCA facilitates structured documentation and provides analytical tools throughout the care continuum. ICCA centralizes and organizes essential patient data — such as admission documents, vital signs, lab results, and consult notes — bringing critical information to the forefront. By transforming patient data into actionable insights, ICCA empowers you to make informed decisions, spot potential adverse events, and improve the overall quality of care. Seamless information flow between the ICU flowsheet and the OR anesthesia record, enhances collaboration and efficiency. ICCA delivers advanced clinical decision support with structured documentation and analysis, supporting the care continuum across anesthesiology, critical care, intermediate care, and medical-surgical care specialties.

From the bedside, ICCA connects seamlessly with most Philips and third-party medical devices through the Medical Device Information Platform (MDIP) and the IntelliBridge System. This integration enables the export of vital sign parameters crucial for anesthesia and critical care charting. Philips IntelliBridge Enterprise (IBE) further enhances ICCA's interoperability with numerous EMRs via standard IHE, HL7, and FHIR capabilities.

IBE supports HL7 standards, allowing for smooth integration with existing hospital systems, including ADT, Allergies, Labs, Document Export/Import, Medication Orders, and Results, as well as Patient Data Export/Import. This interoperability creates a complete patient record throughout the continuum of care, enabling easy retrieval of patient data collected during transport. IBE serves as a single, standards-based connection between the EHR and Philips clinical solutions, reducing the number and cost of point-to-point interfaces while improving workflow efficiency and enhancing patient care quality. It also streamlines data collection from various sources for research, comparative effectiveness, and baselining activities. Additionally, IBE automates the export of patient interventions, including demographics, medications, problems/diagnosis, and Norm documents, to optimize workflows.

IBE integrates with Pharmacy Systems to synchronize drug formulary catalogs with ICCA. This integration, combined with Medication and Allergy information, allows for proactive Drug-Drug Interaction checks, ensuring safe medication use and minimizing unexpected side effects, reduced effectiveness, or adverse events. Furthermore, IBE acts as a FHIR Façade, to facilitate ICCA meeting its regional FHIR regulations and mandates, including the ISiK implementation guidelines.

PIC iX
- Patient vitals
- Device settings

HIS
- Patient
- Allergy
- Orders

EHR
- Observations
- Alarms
- Reports

LIS
- Labs
- Micro
- BGA

Rx
- Formulations
- Drug check

- Notes
- Documents

IntelliBridge Enterprise (IBE)
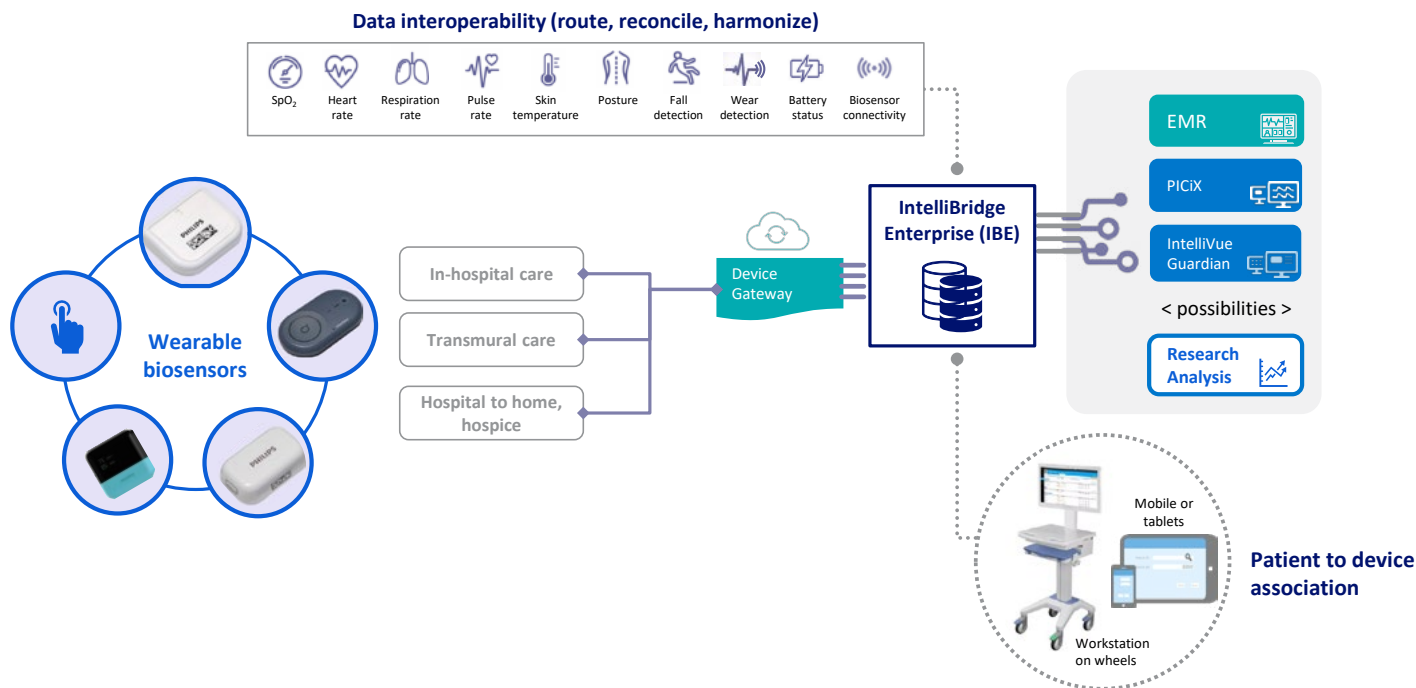IHE
HL7
CDA
FHIR
DICOM

ICCA

With Philips IntelliVue Guardian solution

The IntelliVue Guardian Software (IGS) is a Clinical Information Management System that streamlines the detection of patients on the general floor who may be at risk of deterioration. This can help prevent costly transfers or readmissions to the ICU. IGS collects and manages vital signs data from various sources, including IntelliVue Cableless Measurements, IntelliVue Patient Monitors, EarlyVue VS30 Monitors, and wearable biosensors. The IGS software facilitates data management through trending, reviewing, reporting, notifications, clinical documentation, calculations, clinical advisories, remote viewing, and printing. By utilizing a patient-oriented workflow, IGS simplifies equipment and caregiver assignments. Additionally, IGS features an Early Warning Scoring (EWS) application, providing essential assessment guidance to help you identify the early signs of patient deterioration.

IGS continuously monitors registered patients and sends observations using a standard messaging format (HL7). Philips IntelliBridge Enterprise (IBE) streamlines the communication of these observation messages between IGS and hospital external systems through a range of interface features. IBE ensures that observation messages comply with the IHE PCD 01 profile and supports an Admit Discharge Transfer (ADT) interface for automatic patient admission to IGS and patient monitors, enhancing electronic matching and identification. Lab results linked to patients are integrated via IBE, enabling the processing of rich data through available protocols for faster decision-making. Depending on the EHR system, IBE can operate in either solicited or unsolicited mode for documenting observations and vitals in the EHR.

IBE also offers a validated Enterprise Integration solution for IGS with the Oracle EHR System, utilizing out-of-the-box features like user authentication and patient lookup to streamline onboarding.

Additionally, patient physiological parameters, including vitals, posture, and activity status from various Philips and third-party biosensors, can be seamlessly integrated with IGS through IBE. To enhance this integration, IBE includes the Patient Administration Toolkit (PAT), a user interface launched from a workstation on wheels, handheld mobile and tablet devices, that allows users to assign and issue wearable biosensors to eligible patients. The PAT tool also helps maintain an inventory of sensors, providing crucial operational information such as battery status, wear detection, and activity status.

Data interoperability (route, reconcile, harmonize)

SpO₂ · Heart rate · Respiration rate · Pulse rate · Skin temperature · Posture · Fall detection · Wear detection · Battery status · Biosensor connectivity

Wearable biosensors · In-hospital care · Transmural care · Hospital to home, hospice · Device Gateway · IntelliBridge Enterprise (IBE) · EMR · PICiX · IntelliVue Guardian · < possibilities > · Research Analysis

Mobile or tablets · Workstation on wheels · Patient to device association

Conclusion: what IBE means for you

Philips IntelliBridge Enterprise (IBE) can offer clinical and financial workflow efficiencies, such as making relevant Patient demographics and clinical information available at the bedside or reporting Patient observations, waveforms snippets into the EMR. These features empower you to adapt to the evolving healthcare landscape by enhancing access to electronic data and streamlining integration between Philips solutions and your hospitals Enterprise systems.

As healthcare shifts from volume to value-based payment, the emphasis on electronic records and comprehensive data collection will grow. Thoughtful collection and analysis of clinical data can help organizations showcase patient outcomes and demonstrate meaningful use to both customers and regulatory bodies. Additionally, improvements in clinical workflow can positively impact caregivers' ability to spend more time with patients.

To effectively integrate clinical data from devices and hospital information systems into patients' EHRs, it's crucial to invest in an interoperability strategy that adopts an enterprise-wide approach rather than a fragmented department-by-department method. Historically, this is how interfacing has unfolded, resulting in increased complexity for the IT teams.

As an enterprise-based, extensible interfacing platform utilizing standards like HL7 v2, CDA, IHE, HL7 FHIR, and DICOM, Philips IntelliBridge Enterprise (IBE) can simplify systems interfacing with a goal of reducing costs. IBE serves as a single point of contact between your EHR and most Philips solutions, enhancing workflow and ensuring operational continuity with the right set of tools and services to help avoid downtime.

By committing to standards such as IHE and building a platform that can be extended, IBE can help you enhance data collection and improve workflow. By providing a single point of contact between Philips solutions and the EHR, IBE can also help simplify your integration solution, with a goal of lowering overall cost of ownership. Additionally, by enriching your data, IBE can help you navigate the challenges of a rapidly changing healthcare and regulatory environment.

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