

Flexing the art of science

Monitoring Solutions



GE HealthCare



**To develop a complete mind:
Study the science of art; Study the art of
science. Learn how to see.
Realize that everything connects to everything
else.**

Leonardo da Vinci



Enterprise patient monitoring challenges

Shortage of qualified staff & higher patient to caregiver ratios:
Intelligent devices and informatics



Connecting complex care teams:
Understanding care team dynamics, quickly navigating complex treatment and care pathways



Recognizing and preventing patient deterioration:
ICU/OR, intra-hospital transport, recovery, L&D, telemetry and ward



Reliable patient insight:
Accurate clinical data and algorithms you can trust



Rapidly evolving patient populations and disease trends: Flex acuity and operational flexibility... at scale



Care optimization, alarm fatigue, routing: Make alarms and vitals universally accessible and relevant



GE HealthCare: Monitoring Solutions

Monitoring Solutions



One unified monitoring solution for every patient need, at every point of care



Enable clinical and operational flexibility now and into the future



Help your teams navigate dynamic patient needs



Improve clinical outcomes with patient monitoring excellence to support your care decisions

One unified monitoring solution
for every patient need,
at every point of care

Patient care needs

Our products and solutions currently deliver seamless and personalized care across these patient needs regardless of location.




Stabilization & Triage

We offer solutions that help providers quickly understand patient conditions, stabilize high-risk situations, and manage data to inform the best next steps.




Surgical & Procedural Care

We help bring surgical and non-invasive procedures beyond traditional operating rooms by providing the devices and processes needed across the patient's complete care journey.




Critical Care

We bring critical care right to the patient by enabling continual care and management across the NICU, ICU, or PICU.



Observation

By monitoring patients beyond traditional care centers, we can help care providers keep a more watchful eye on degradation, respond faster, and ensure they are on track to improve patient outcomes.



Chronic Condition Management

By offering solutions for patients at home or beyond the clinic, we help care providers gain a near real-time view of degradation, identify patient needs faster, and ensure a clearer path to improvement.

Patient care needs



Stabilization & Triage




Surgical & Procedural Care



Critical Care



Observation



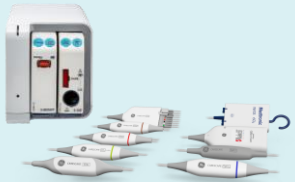
Chronic Condition Management

Multi-parameter Monitoring



- Max. flexibility – FlexAcuity™
- Individualized Care
- Connected Data / Workflows
- Full range of acuity
- Simplification / Ease of use critical
- Dependability / Reliability

Parameters and consumables



Cardiac Telemetry



Vital Signs / Spot Check



Mobile Continuous



Edison

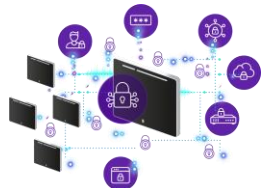
Remote Patient Monitoring / Continuous Cardiac Monitoring



Enterprise Monitoring



Connectivity



Patient monitoring as IoMT (Internet of Medical Things)



Patient-centered monitoring

Wearables



Flexible & scalable infrastructure

Edge compute



Caregiver insights

AI/Analytics

A bridge to the latest technology

Connecting today and tomorrow for driving outcomes

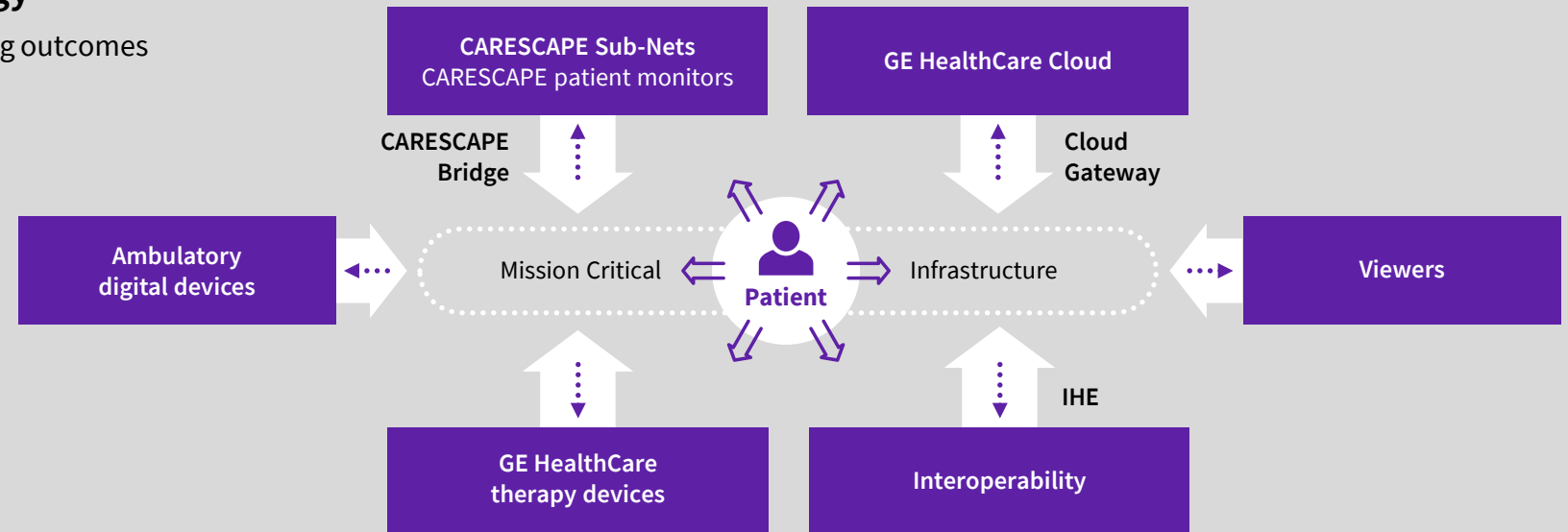
Analytics, command and control

Real-time

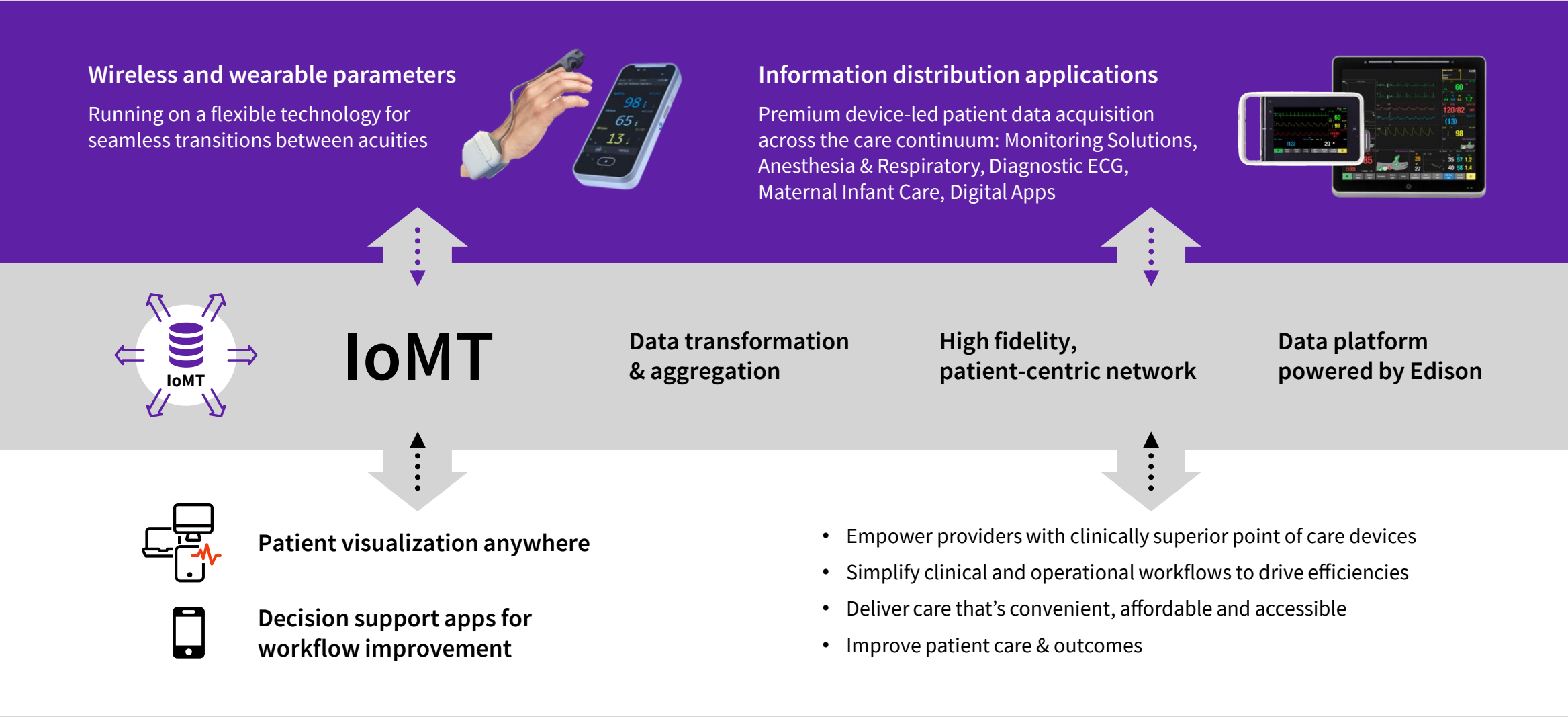
- ¼ sec skin-screen, 1/100 sec sync
- Deterministic
- 8 sec to call crisis

Scalable

- >10,000 devices across systems
- 1 to 28 parameters
- Up to 1TB of data/hosp/day



IoMT is GE HealthCare's mission critical network for the future



Imagine the future through lens of three key stakeholders

Bedside nurse imagine...



Personalization

Badging into any device for a customized, compliant view for you



Automation

Safe & automated patient handovers during transfers, without the hassle of physical media exchange



Analytics

Decreased fatigue, improved care with insightful analytics on patient deterioration & alarm management, provided directly on the medical device or your mobile device

Unit director imagine...



Data liquidity

Clinical fidelity data is captured in one longitudinal record, accessible ubiquitously by authorized users and systems



Interoperability

Monitoring system supports simple enterprise-wide interoperability for workflow digitization initiatives



Analytics

Predictive analytics derived from monitoring and therapy devices, delivered to caregivers and summarized at a unit level

System quality leader imagine...



Scalability

One enterprise level platform, running over the WAN (Wide Area Network), without compromising real-time mission critical monitoring



Automation

Safe & automated patient handovers during transfers, without the hassle of physical media exchange



Analytics

Clinical and operational analytics and management dashboards available to assess and improve clinical workflows for improved safety and efficiency

Early detection of deterioration

USE CASE

Protecting Med-Surg Patients



It's not that patients suddenly deteriorate, it's that caregivers suddenly notice.

USE CASE: Protecting Med-Surg Patients

Early detection of patient deterioration to optimize patient safety on the wards is critically important

Globally, eight patients per minute die within 30 days of surgery each year.

(Lancet 2019¹)



For many patients there is ample time prior to cardiac arrest to provide potentially life-saving interventions.

(CHEST 2012²)



Sepsis interventions are time-sensitive and must be instituted early to achieve better outcomes.

(J Intensive & Crit Care 2016³)

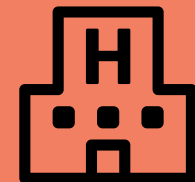


Most post-operative deaths occur on the wards.

(Lancet 2012⁴)

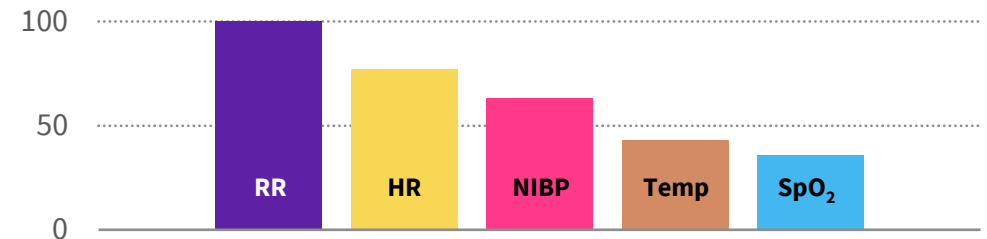
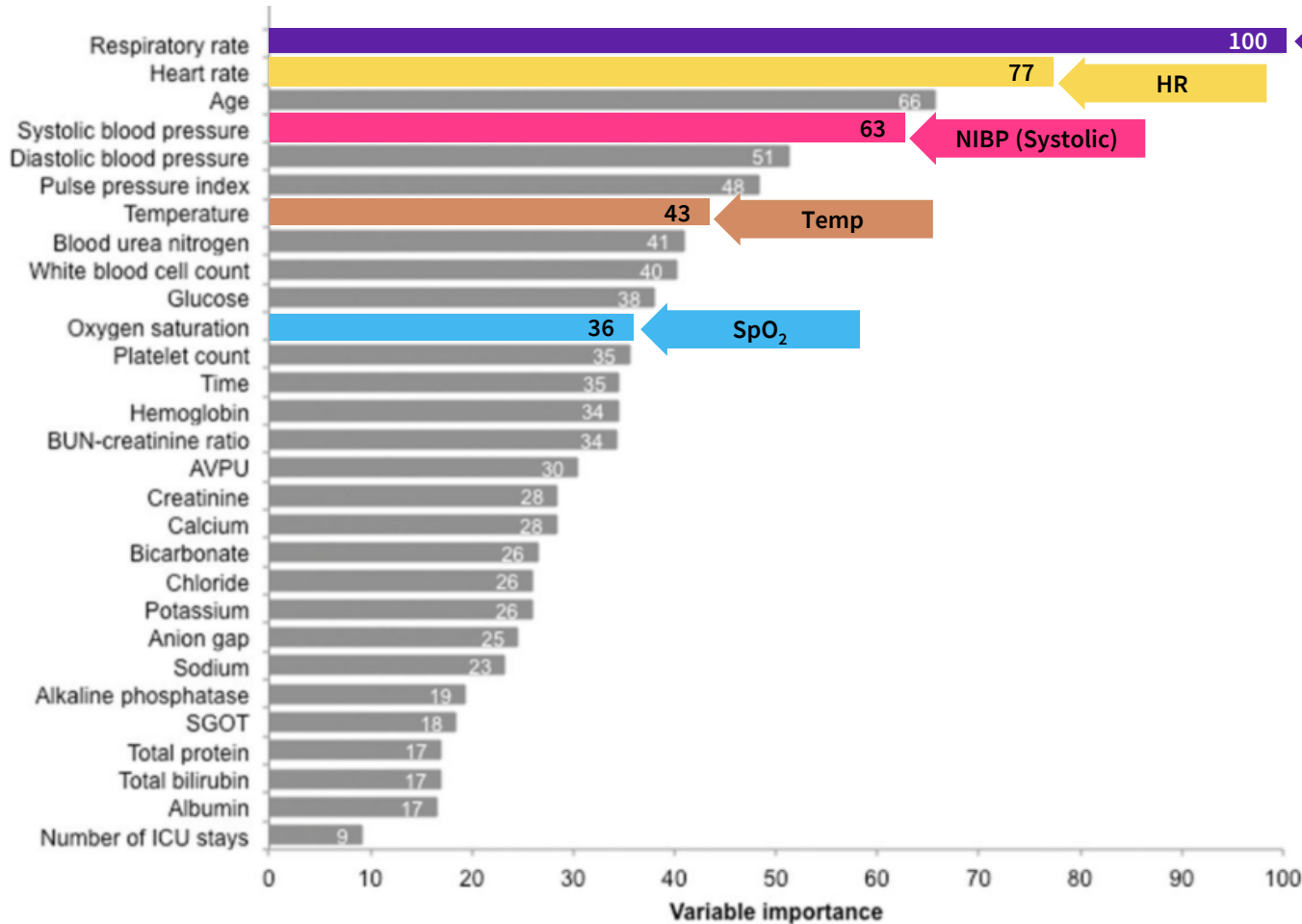
In one study, over half of adult in-hospital cardiac arrests occurred on the general wards.

(Resuscitation 2014⁵)



USE CASE: Protecting Med-Surg Patients

Respiration rate is the leading indicator of deterioration



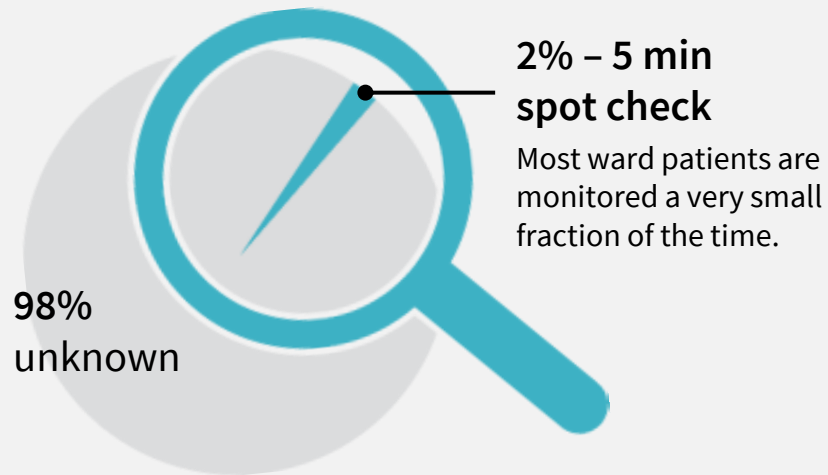
Multicenter Comparison of Machine Learning Methods and Conventional Regression for Predicting Clinical Deterioration on the Wards

Matthew M Churpek, MD, MPH, PhD^{1,†}, Trevor C Yuen, MS¹, Christopher Winslow, MD², David O Meltzer, MD, PhD¹, Michael W Kattan, MBA, PhD³, and Dana P Edelson, MD, MS¹

USE CASE: Protecting Med-Surg Patients

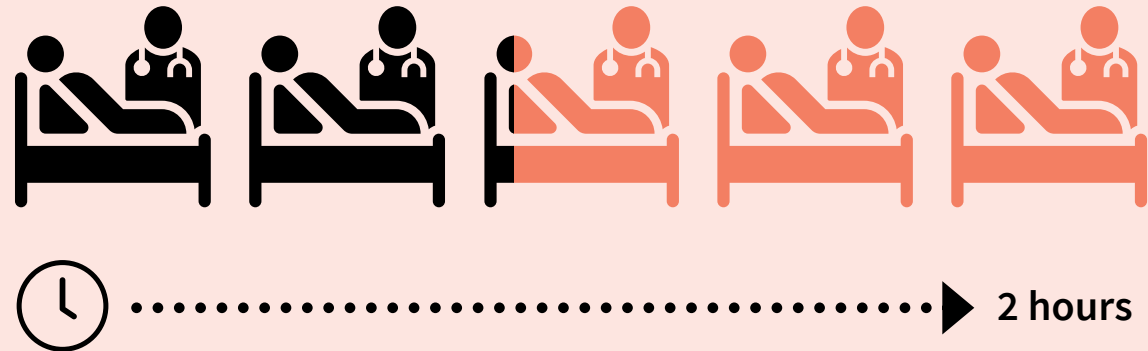
Relying on manual spot checks is suboptimal and can increase the risk of patient deterioration & safety issues

In one study, nurses doing spot checks missed 90% of hypoxemic events¹



1) Anesth Analg 2015⁶

Respiratory events can occur despite regular spot checks



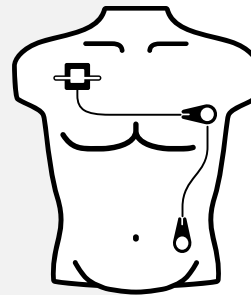
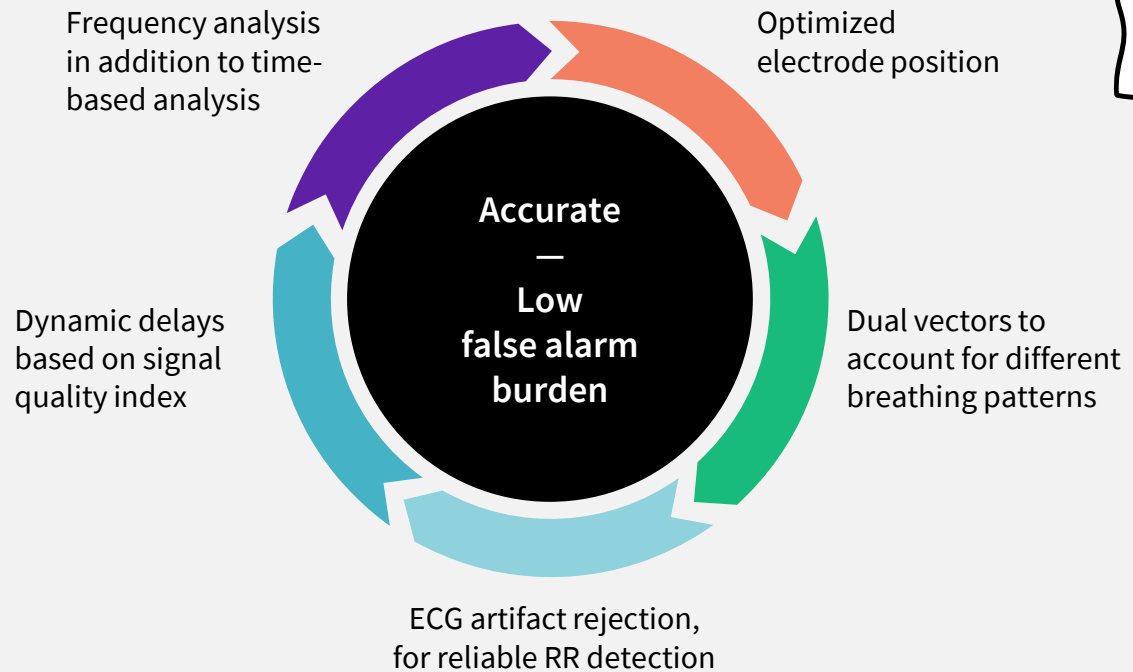
In another study, at least 42% of patients had been checked by the nurse within two hours of a respiratory depression event¹

1) Anesth Analg 2015⁶

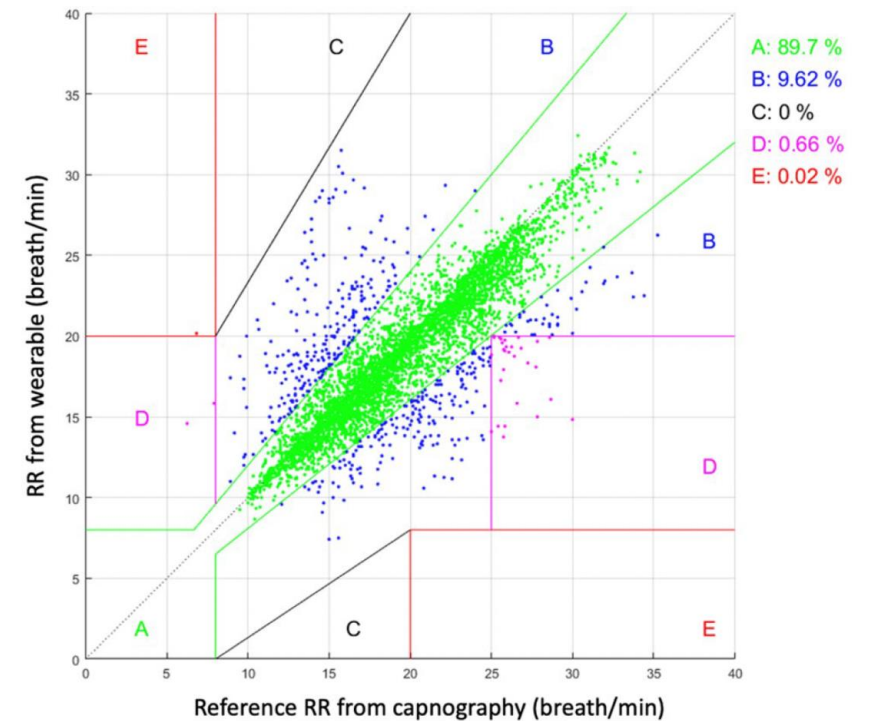
USE CASE: Protecting Med-Surg Patients

Reinventing the respiratory rate parameter

Breakthrough design



Greater than 99% accuracy¹²



Portrait™ Mobile ecosystem

Patient-centered monitoring



Wireless SpO₂
reusable



Wireless respiration
Semi-disposable



Bedside charger
Portrait Mobile patient monitor & rechargeable batteries



Portrait Mobile
— wireless bedside monitor

MBAN

Flexible infrastructure



Storage



Security



Parameters



User/org. identity/profile management



Device identity/profile management



Alarm management

Edge services




Wi-Fi




On-premise computing infrastructure


Provider-centered data



Ward-optimized viewer software solution
24 patients per display

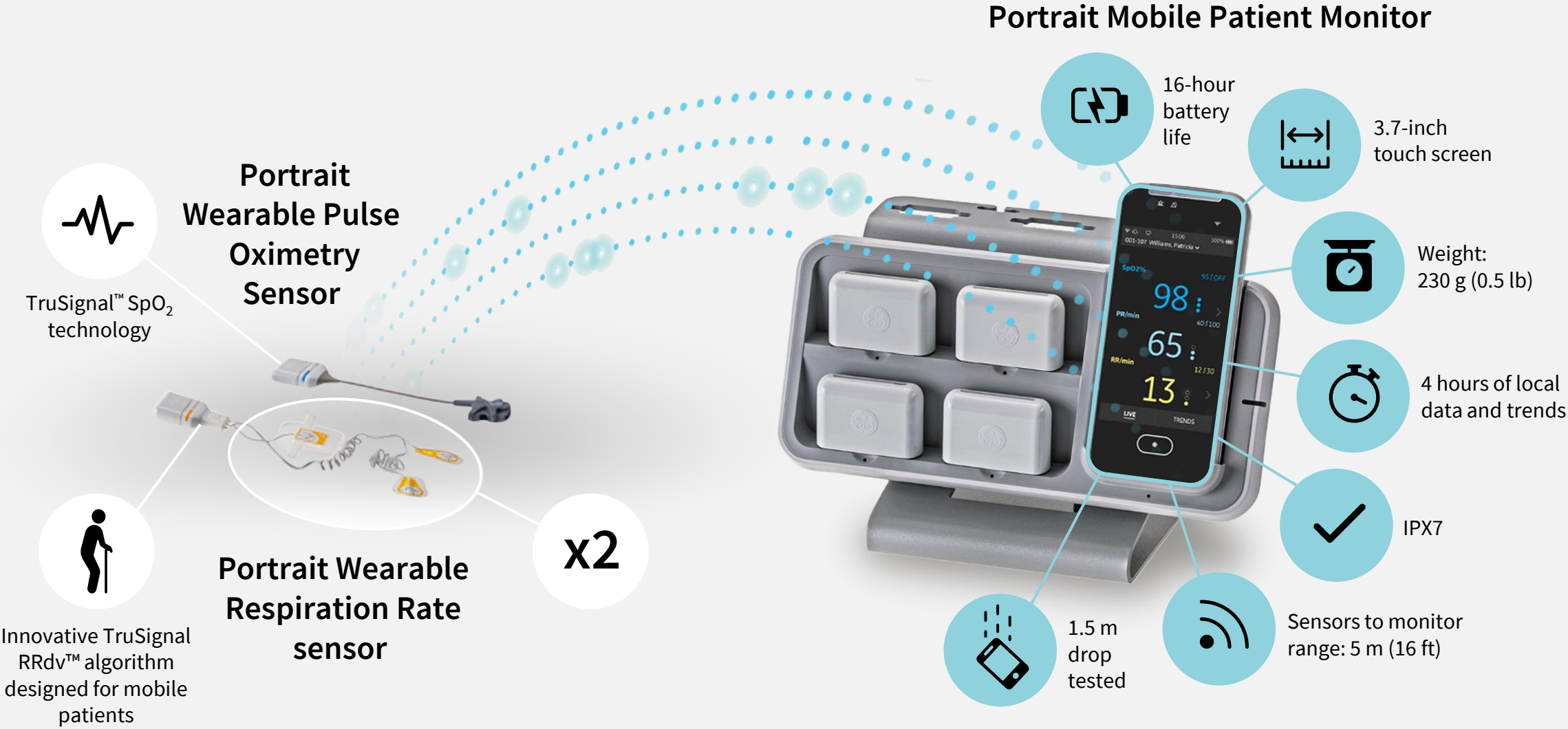


IHE-based alarm notifications



Portrait Clinical Alarming Unit

Portrait™ Mobile monitoring solution



Portrait™ Mobile — Usability study results



90% agree that they feel **more reassured** about their patient's condition when continuous monitoring is used versus vital signs spot check measuring.



99% agree that Portrait Mobile can help in **earlier detection of patient deterioration** than routine observation.



96% of nurse reports give Portrait Mobile an overall rating of **good or very good**.



76% agree they are **more confident** in assessing respiratory function using Portrait Mobile.



Greater than **99%** measurement accuracy¹²

Unique TruSignal RRdv™ technology has been shown to be very accurate when compared to capnography.



“I had no problems at all. I didn't even notice they were there.”

Hospital ward patient, when asked about the sensors' comfort¹³

Portrait Mobile, Usability study results¹³

Monitoring Solutions

Enable clinical and
operational flexibility
now and into the future

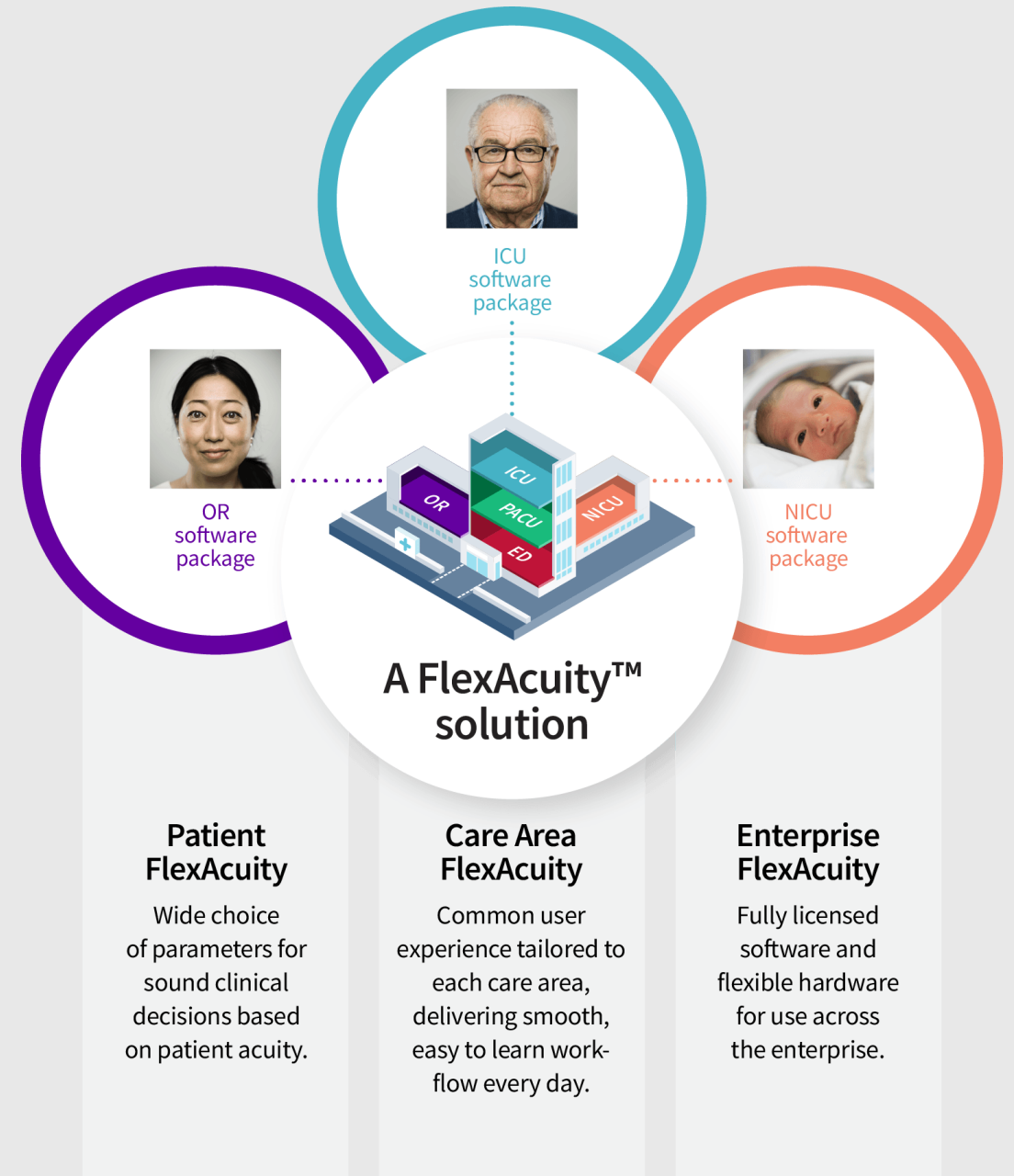
A FlexAcuity™ solution

Clinical flexibility for better patient care

Patient FlexAcuity — Individualized care

Care Area FlexAcuity — One user experience

Enterprise FlexAcuity — Deploy when and where required





NICU software package



**Premature
baby**

- ✓ Histograms, TruSignal SpO₂, DINAMAP™ SuperStat NIBP, OxyCRG, EK-Pro v14 ECG arrhythmia algorithm

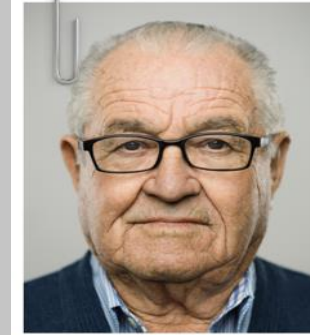
OR software package



**OR patient,
female 48**

- ✓ AoA concept (Entropy, NMT, SPI*)
- ✓ Airway gases, Patient Spirometry

Critical care software package



**CCU patient,
male 82**

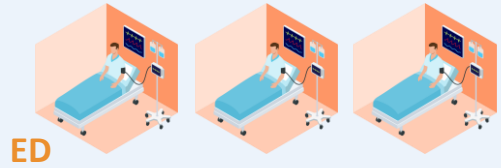
- ✓ EK-Pro v14 ECG arrhythmia algorithm, TruSignal SpO₂
- ✓ Continuous ST-segment monitoring of up to 12 leads

Patient FlexAcuity™

Every patient is unique. We have a full solution with **parameters** and **algorithms** that flex to those needs.

*SPI is not 510(k) cleared. Not available in all markets.

Normal Enterprise Monitoring Allocation



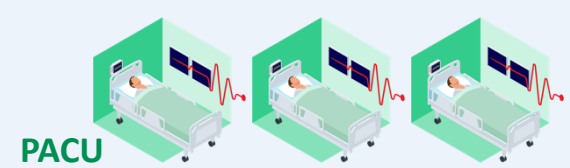
ED



OR

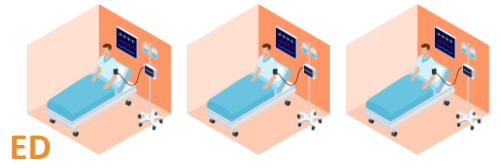


ICU

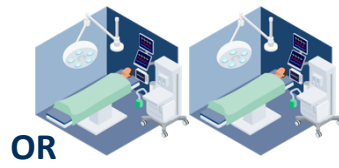


PACU

COVID Surge Monitoring Allocation



ED



OR

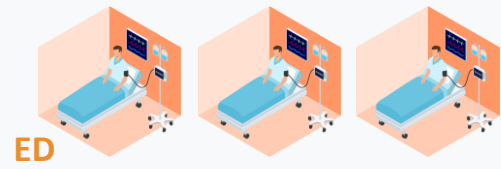


ICU



PACU

Mass Trauma Monitoring Allocation



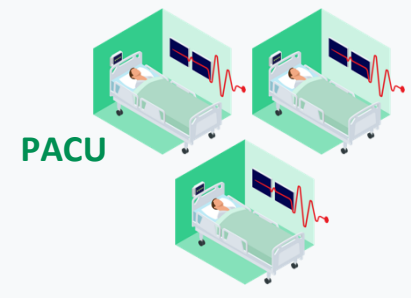
ED



OR



ICU



PACU


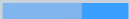




Enterprise FlexAcuity™



Allows for quick reconfiguration and movement of monitors with Enterprise licensing to respond quickly to care events.

Care Area FlexAcuity™ — across all care needs



Care Area FlexAcuity™

-  ECG – 3, 5, 6, 10 lead set
-  SpO₂ – GE HealthCare TruSignal™, Nellcor™, OxiMax™, and Masimo rainbow SET® with optional SpHb®, PI and PVI®
-  CO₂ – LoFlo™ from Respirationics and Microstream™ capnography from Medtronic
-  rSO₂ – INVOS™ technology from Medtronic
-  Temp – Dual Channel
-  Pressure – 2 x Dual Channel

-  **Entropy & NMT**
(Adequacy of Anesthesia Concept)
-  Respiratory modules for OR and ICU

Monitoring Solutions

Digital cardiac workflow efficiency

Patient acquired. Physician empowering.

MUSE™ NX fully integrates KardiaMobile® 6L personal ECG data into your existing workflow.



ALIVECOR®

Not all products or features are available in all markets.



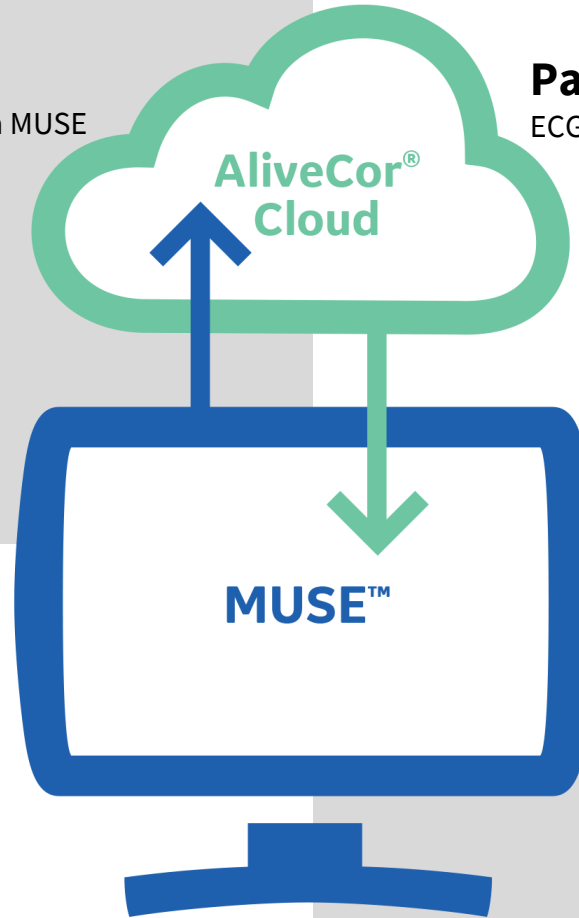
ECG ordered in EMR

Order is sent to the AliveCor cloud via MUSE



Patient records ECG

ECG is sent to MUSE via the AliveCor cloud



Physician reviews report

KardiaMobile 6-lead report sent to the patient's record in the EMR via MUSE



6 Lead ready for review

Physician reviews and confirms 6-lead ECG report



Physician



1

Physician decides to add patient to monitor for a definitive period

EMR



Order for KardiaMobile® 6L ECG via HL7

2

Automated >



GE MUSE™
at Hospital

Order forwarded to AliveCor via HL7

Automated >

3

Patient App



5

Patient installs the app and enters the connection code received via email (one-time set-up)

< Automated

4

Patient account is created and connection code is sent to patient via email

AliveCor
Cloud Platform



Automated >

7

Native ECG is sent to MUSE via HTTPS transfer

Patient takes an ECG which is captured by the App

6



EMR



9

MUSE pushes the report to EMR

MUSE processes the report and assigns it to the order

8

< Automated

GE MUSE™
at Hospital



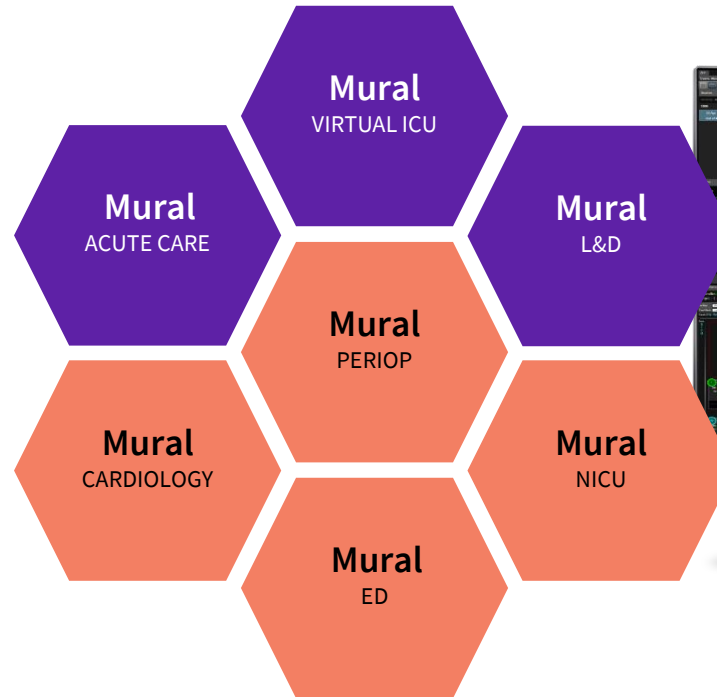
Monitoring Solutions

Surveillance digital solutions

GE HealthCare's Mural™ solution

Decision agility driven by real-time clinical decision support and insights

- Integrates data from multiple systems and devices into a single view
- Provides a real-time¹, comprehensive look at patients' status across a selected care area, hospital, or entire health system
- May help clinical teams deliver responsive and compliant care by digitizing hospital defined protocols, care pathways, and Early Warning Scores²



- Existing Clinical Programs
- Programs under development or exploration

Prioritizes clinicians' attention to patients at risk based on hospitals defined protocols²

Helps drive compliance with hospital defined care bundles and protocols²

Modular and configurable offering can extend to new use cases across care areas, hospitals or an entire health system

¹ Requires real time HL7 data feed from clinical devices. *Enabled by DECISIOInsight® - a standalone medical device

² Enabled by DECISIOInsight® - a standalone medical device, based on hospital defined protocols.


GE HealthCare's Mural™ solution

Decision agility driven by insights




- 1) Enabled by DECISIOInsight® - a Class II medical device.
- 2) Requires real time HL7 data feed from clinical devices.


Remote surveillance
Enable remote specialists to provide support to bedside teams




Automated surveillance across patient population




One-click patient context management




Read and writeback clinical notes to the EMR



Patient Room Presence with high fidelity audio/video



Real time² patient waveform viewing



GE HealthCare's Mural™ solution

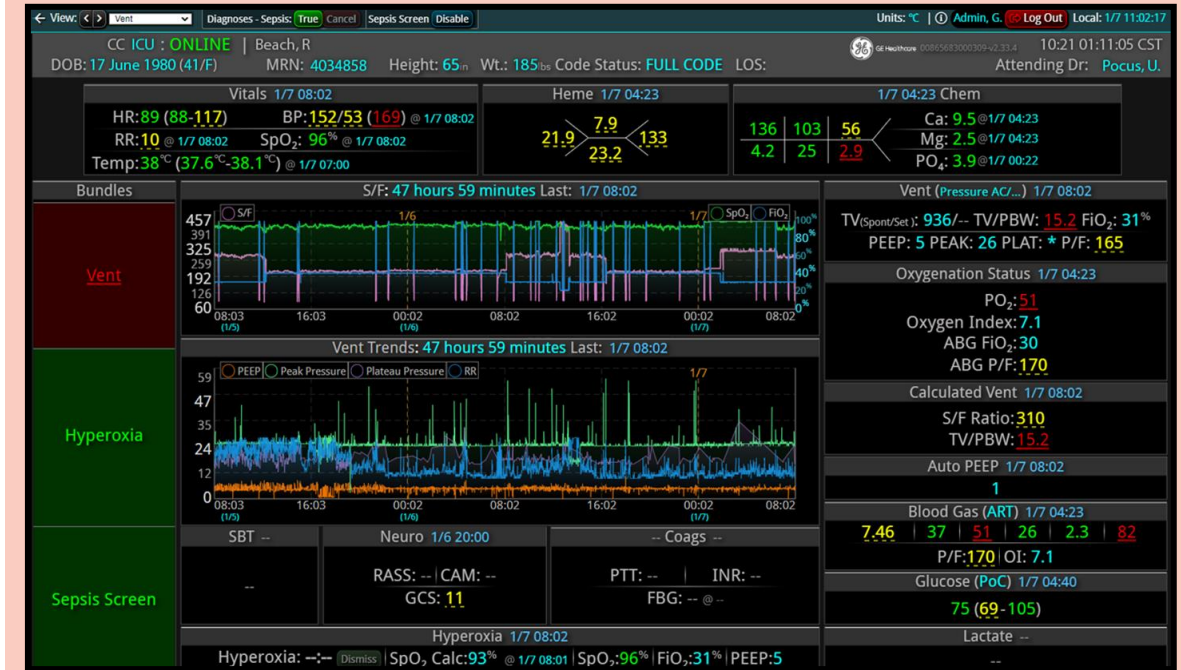
Decision agility driven by insights

Embedded on-unit surveillance

Improve efficiency and collaboration among clinical teams within a unit



Population surveillance



Patient snapshot

GE HealthCare: Monitoring Solutions

Monitoring Solutions



One unified monitoring solution for every patient need, at every point of care



Enable clinical and operational flexibility now and into the future



Help your teams navigate dynamic patient needs



Improve clinical outcomes with patient monitoring excellence to support your care decisions



GE HealthCare