

John Morrish

Visensia – The Safety Index



VISENSIA[®]

The Safety Index[™]

Visensia improves clinical safety by examining the correlation between the physiological vital signs and predicts patient deterioration over 6 hours in advance of critical instability. Resources can be allocated to the patients in the most need and appropriate discharge times can be objectively determined. Emergency triage can be upgraded thanks to Visensia's predictive capability. Visensia addresses some of the emerging issues with Early Warning Scores



Oxford University spin-out with industry leading expertise in intelligent monitoring algorithms

Company background

Technology background

- Industry leading data fusion technology developed in cooperation with Oxford University
- Protected by 12 patents
- FDA and CE cleared
- Proven technology: Already applied for monitoring jet engines at Rolls-Royce



Founders background

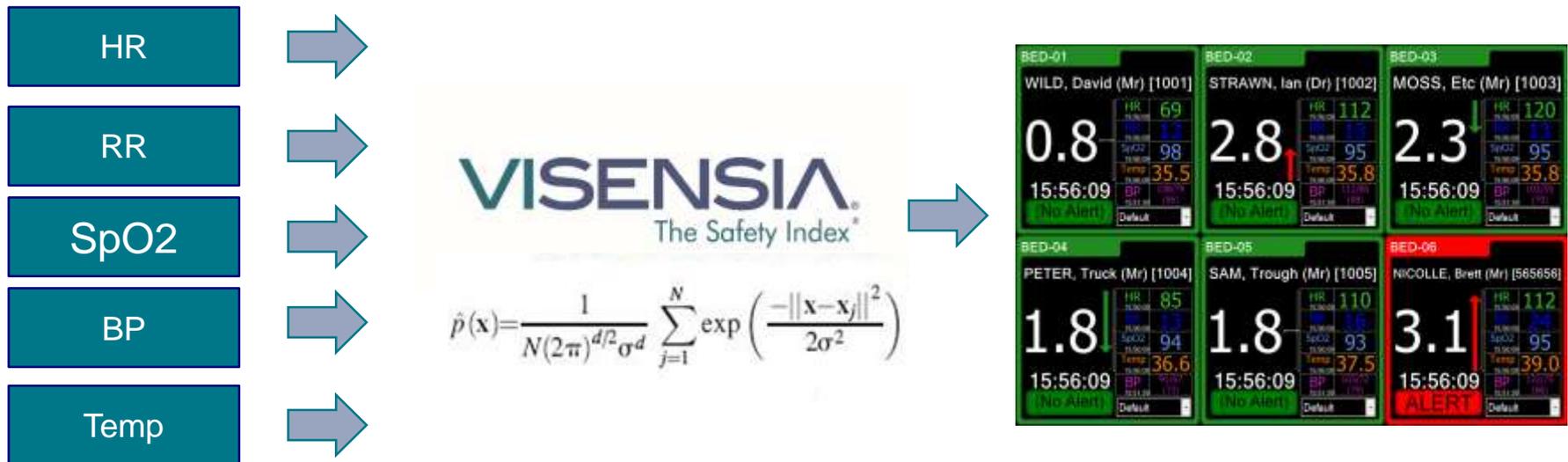
Prof. Lionel Tarassenko - Oxford University

Chair of Electrical Engineering
Director, Institute of Biomedical Engineering



- Rolls-Royce Chairman's Award for Technical Innovation (2001)
- Rolls-Royce Award for Most Valuable Patent (2008)

How Visensia Works



- Visensia uses data fusion technology
- Fuses vital sign data into an index from 0.0 to 5.0
- The Algorithm takes into account correlations between vital signs in addition to single vital sign movements (“single channel”) that are usually the basis of alerts

Visensia® Index: Unique, patent protected and FDA cleared physiological monitoring technology

Product overview

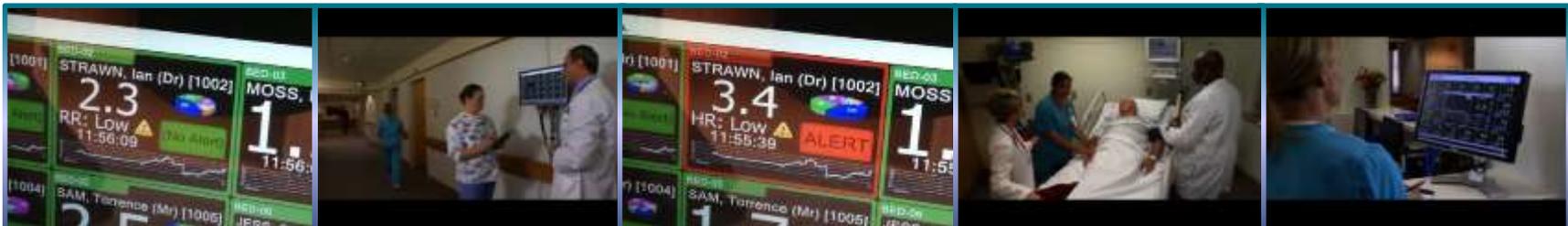
VIENSIA
The Safety Index™

What it does

- Combines five vital signs into one simple, easily readable index from 0.0 to 5.0
 - “0.0” means “perfect health”
 - ”3.0” or greater means “patient deteriorating, go to bed”
- Uses patent protected algorithm based on 3,500 hours of data from 150 high-risk patients
- Software that integrates into existing hospital infrastructure

Recognition & validation

- Award-winning patient safety innovation
- Patent protected
- FDA cleared
 - The only FDA cleared patient health index of its kind, no other patient health index is cleared for issuing alarms*
- CE marked
- Clinically validated
- Cerner Certified



Observer Drills Down and Initiates Action

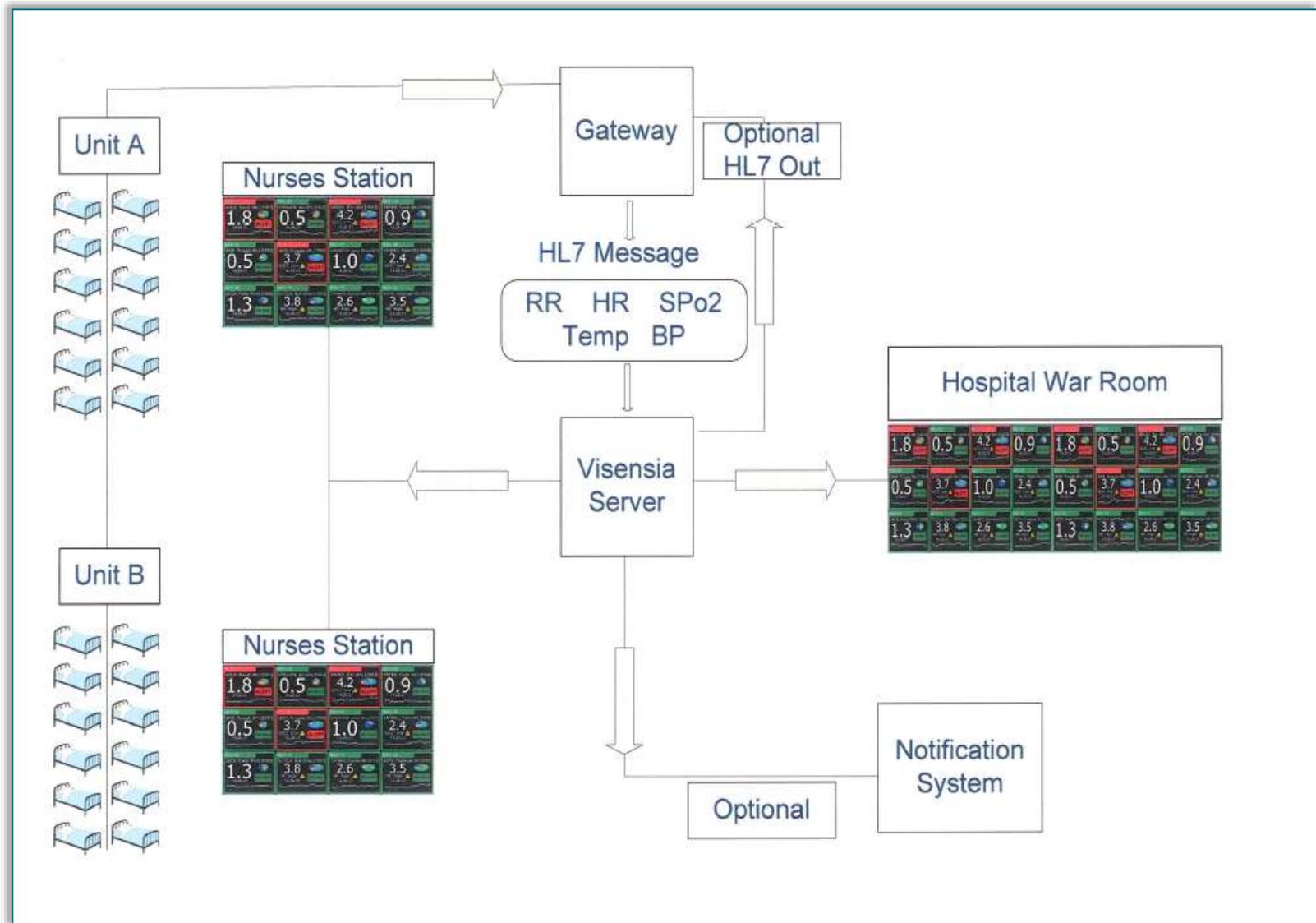


- Automated Alerts
- Risk Stratification – VSI
- Enhanced periodic vitals trend indicator
- Overview for Ward or Hospital
- Configurable displays matched to environment

- Contribution to abnormality – Pie Chart
- Trending for VSI and Individual Vital Signs
- Reports monitor single channel alarm status
- Aids compliance – periodic data entry
- Notifications of missing vitals



Localised and Centralised view of Patient Risk



The only *FDA Cleared* “Data Fusion” software for the advanced detection of Patient Deterioration

Features:

- Predicts Patient Deterioration – providing truly advanced early warning of critical instability
- Automated Alerts – highlighting a patient’s move away from normality and the need for vigilance
- Single Channel Warnings – displayed alongside the vital sign data and VSI helping reduce alarm fatigue
- Trend Data – including the Patient Trend Indicator, detailing the rate and direction of the VSI change
- VSI Contributions – displays each of the vital signs and their contribution to the VSI

Benefits:

- Identifies crisis earlier
 - ✓ Average 6.3 hours advance warning of critical instability
 - ✓ Average 9.4 minutes earlier warning than single channel alarms
- Improves communication and workflow
 - ✓ By displaying a visual trend and ranking for each of the five vital signs and their contribution to abnormality, Visensia enables caregivers to identify small trends before they become serious problems
- Accelerates response times
 - ✓ Having a reliable pre-crisis alert tool for clinical teams can improve response time system-wide, leading to enhanced patient safety and outcomes
- Helps reduce alarm fatigue
 - ✓ 79.3% Sensitivity ; 80.5% Specificity
 - ✓ Only 1.6 false alerts per 100 hours of monitoring



Clinical Data: Pittsburgh Study, Phase 3

Trial at University of Pittsburgh Medical Center (UPMC)



Current practice with
Visensia index recorded but
not acted on.

Powerful direct comparison

319 patients in 8 weeks

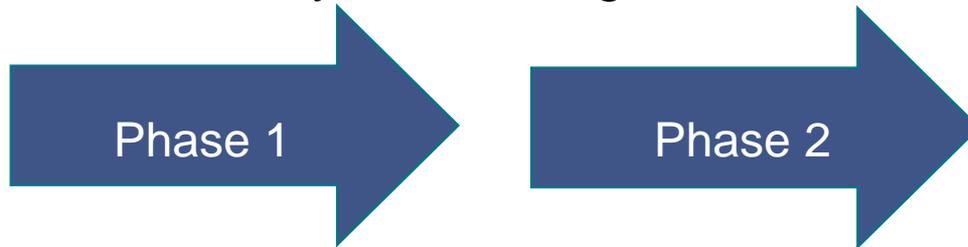
**All 7 MET events were
detected by Visensia in
advance (mean 6.3 hours).**

**Six unexpected
deaths**

SCA: Single channel alert

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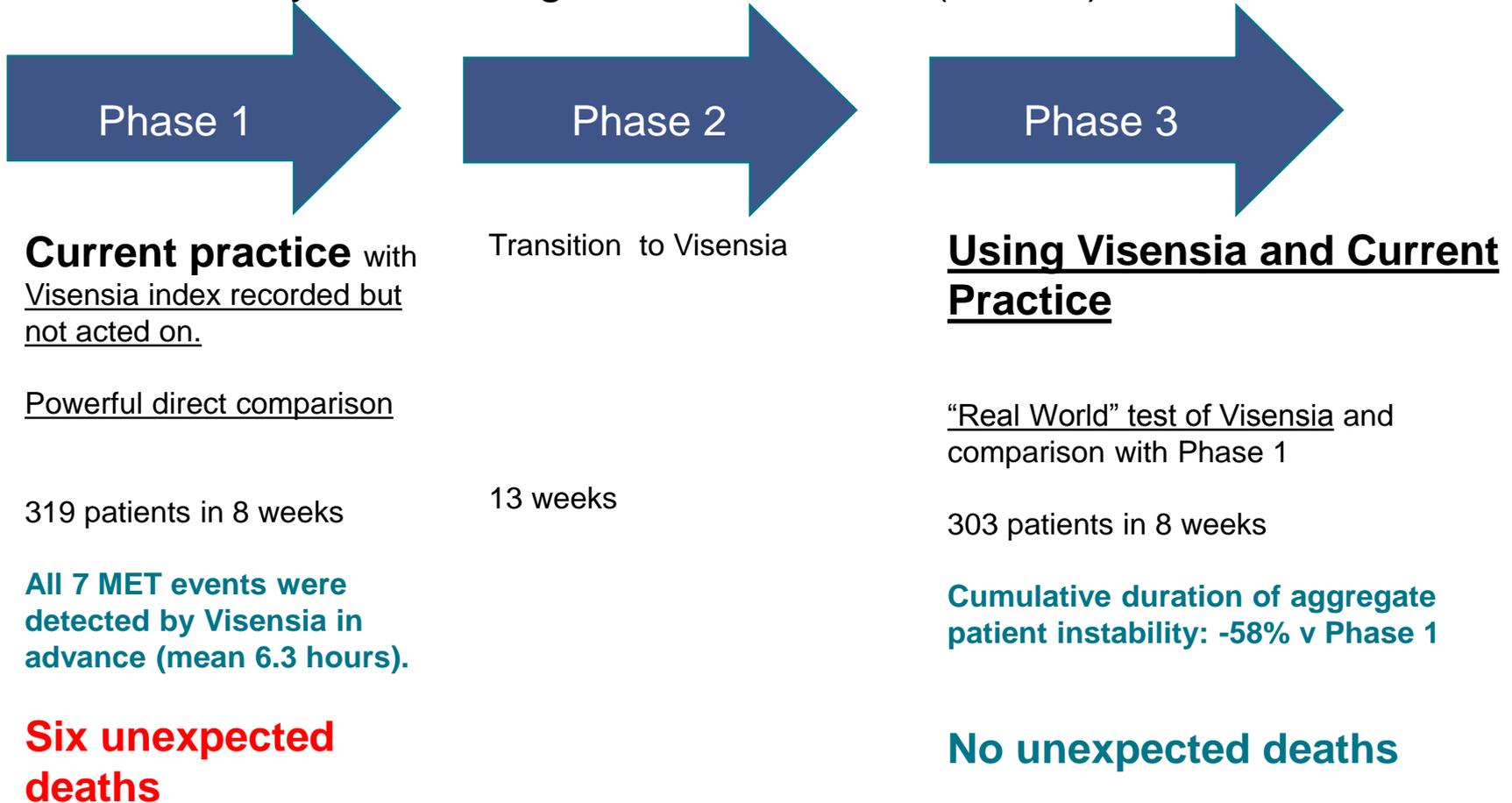
Transition to Visensia

13 weeks

SCA: Single channel alert

Clinical Data: Pittsburgh Study, Phase 3

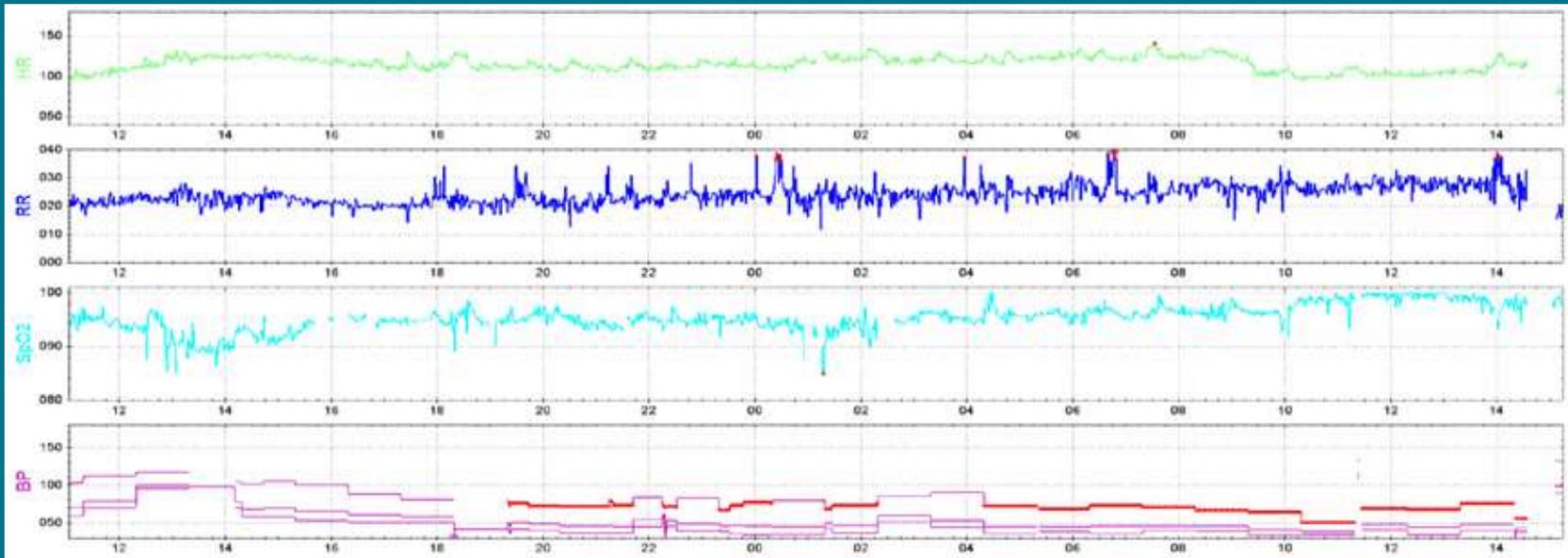
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SCA: Single channel alert

Individual Vital Signs can miss deterioration

Single Channel – thresholds highlighted in “Red” in red



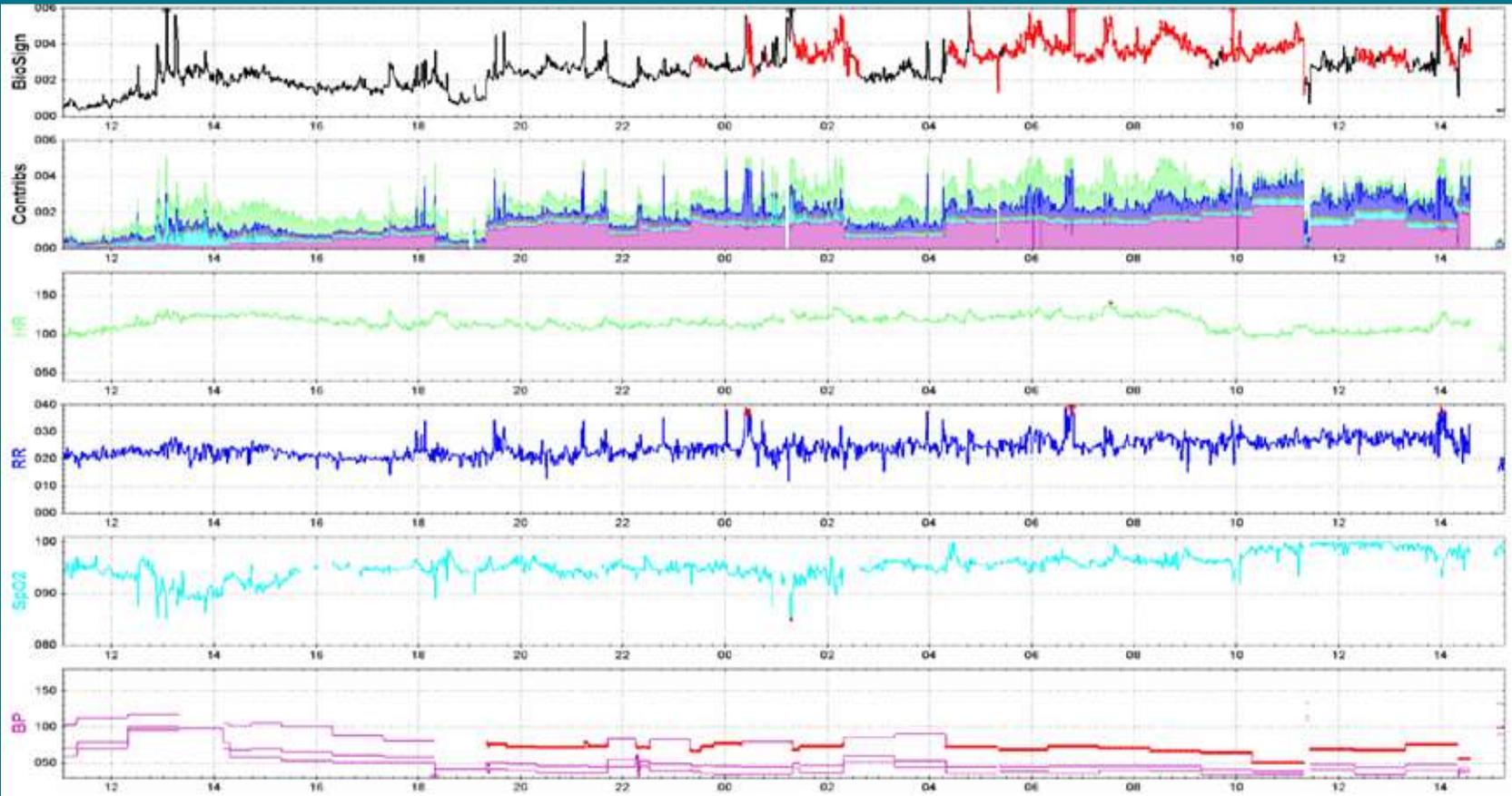
Visensia – The Safety Index perspective

Visensia initially alerted
(recording blinded to clinical staff)

ICU transfer



VIENSIA
The Safety Index



St. Joseph's Pontiac

Four Year Pilot Study Results: July 2014



Robert Jones - Director of IT and Dr Fabian Fregoli –
Vice President of Quality and Patient Safety with Visensia and VISI device

“The **Visensia** system analyses the data along with the patient's medical records and **helps predict medical problems before they occur.**”

So far, **code-blue responses (patient emergency) have declined 37.5 percent** in the medical-surgical unit of the hospital. Dr Fregoli said it will take several more months of data to show results across the entire hospital.

"We are installing this (across the hospital) now," he said. "This tells us how patients are doing and when we need to intervene."

However, during the nearly four years of pilot study with Visensia, Dr Fregoli said, **there has been a 34.5 percent reduction in mortality rates and nearly half a day reduction in length of patient stay.**

This was especially significant because **there was a 22 percent increase in the severity of illness of patients during that period.**”

Visensia Clinical Benefits

- Earlier alerting up to 6 hours before single channel systems enables earlier intervention
- Reduces unexpected and preventable patient mortalities
- Provides clear clinical and trigger process – clear doctor call protocol
- Enables needs based patient prioritisation to ensure patient receives correct resources and it treated in the optimum place.
- Allows better informed discharge decisions and handling of discharge pressure
- Using Patient Acuity Dashboard, patients acuity state can be monitored anywhere, away from the bedside
- Improves compliance with vitals signs data collection by nurses and removes errors in manual transcription and early warning score miscalculation
- Reduces nurse shift and staffing ratio variability
- Reduces alarm fatigue as Visensia alerting well before traditional alarming
- Puts additional nursing experience at the bedside – ‘like a nurse with 25 years experience’

Visensia for Care Areas

■ ICU

- Optimises nurse allocation
- Patient prioritisation in case of staff shortages
- Provides objective, predictive based discharge criteria and minimises bounceback

■ HDU

- Optimises nurse allocation
- Provides objective, predictive based discharge criteria
- Improves HDU patient stay planning

■ Med/Surgical Wards

- Optimises nurse allocation
- Helps reduce higher levels of unexpected deaths
- Provides objective, predictive based discharge criteria

■ A+E

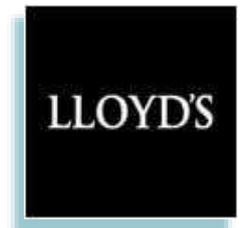
- Enhances triage due to predictive capability and improves patient prioritisation and throughput

Visensia® Index reduces the hospital's risk profile and insurance premium

Beazley insurance premium reduction

- Beazley, a leading Lloyds of London medical malpractice underwriter with over 600 hospital insureds in the US
- Has endorsed Visensia Index, promoting its adoption by its clients with reductions in the insurance premium, following a study conducted by senior medical experts
- Study details:
 - 2100 Beazley claims provided
 - 700 claims reviewed of which 131 analysed by expert
 - 55 claims probable or very probable to have been avoided if the claimant had installed Visensia Index

beazley



Beazley concluded that a system-wide implementation of Visensia Index would lead to dramatic reductions in the risk profiles of its client hospitals

Addressing the emerging issues with Early Warning Scores

Track & Trigger (EWS Systems)	VISENSIA
Fails to take homeostasis into account so can give a falsely positive picture	Homeostatis is built into the Visensia model
Does not consider relationship and correlation between vital signs	Correlates and responds to the relationship between the vital signs
Based purely on retrospective data analysis	Predicts patient deterioration up to 6 hours in advance of traditional methods
Can sacrifice sensitivity to achieve higher specificity	79.3% Sensitivity, 80.5% Specificity
Higher rate of undetected events to reduce number of false alerts	Only 1.6 false alerts per 100 hours of monitoring
Nurse may wait for patient to get worse before calling doctor	Provides clear, objective basis for escalation to medical team

VIENSIA
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Continuum of Care

First Responders: Paramedics

A&E / ER

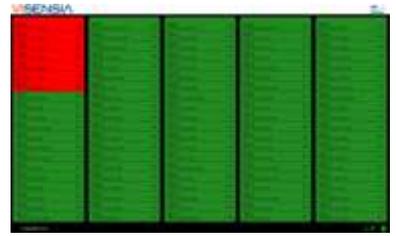
VIENSIA
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Health, Wellness, Consumer and Personalisation

eICU HDU, SDU, General Wards

Ambulatory & Home Monitoring

Telemetry Monitoring and Ambulatory Patients 30 day post hospital discharge



Thank you

Any questions ?