Digital Early Warning System- Pilot Project Cavan

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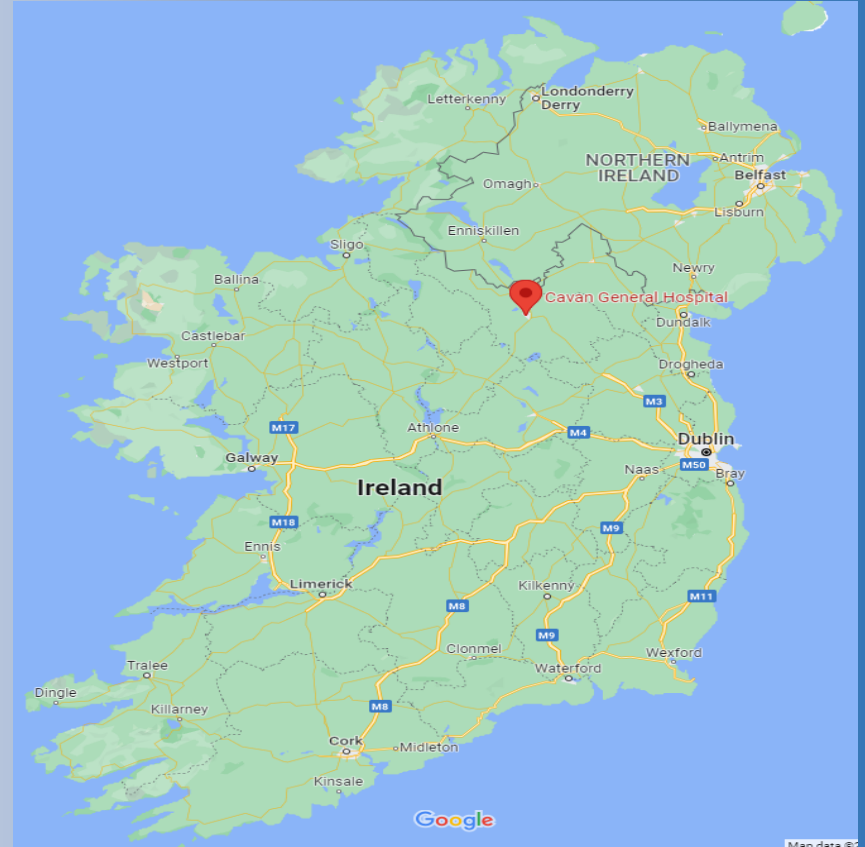
Cavan & Monaghan Hospital May 2022.
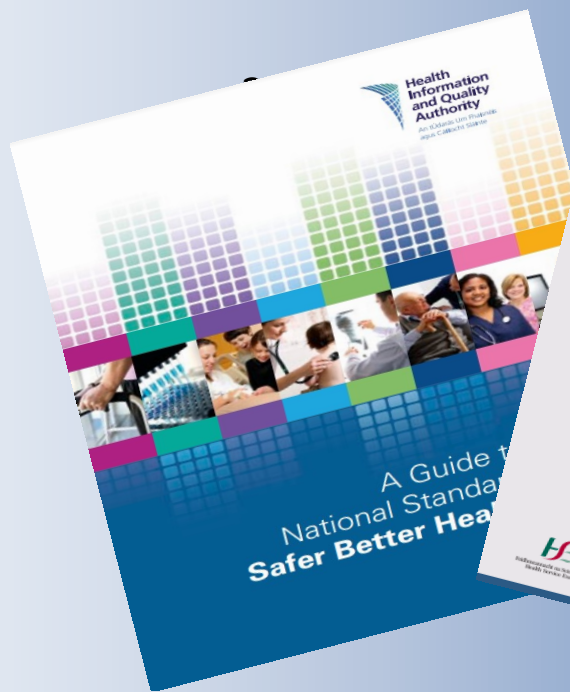
Introduction

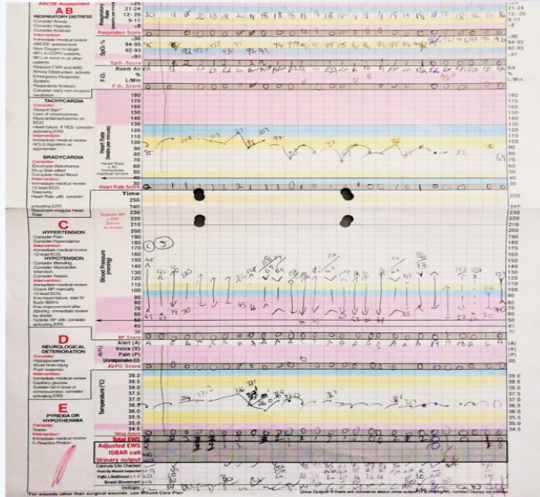Cavan & Monaghan Hospital

Level 3 Hospital

6 acute wards – medical & surgical

HSE Quality & Patient Safety

Background

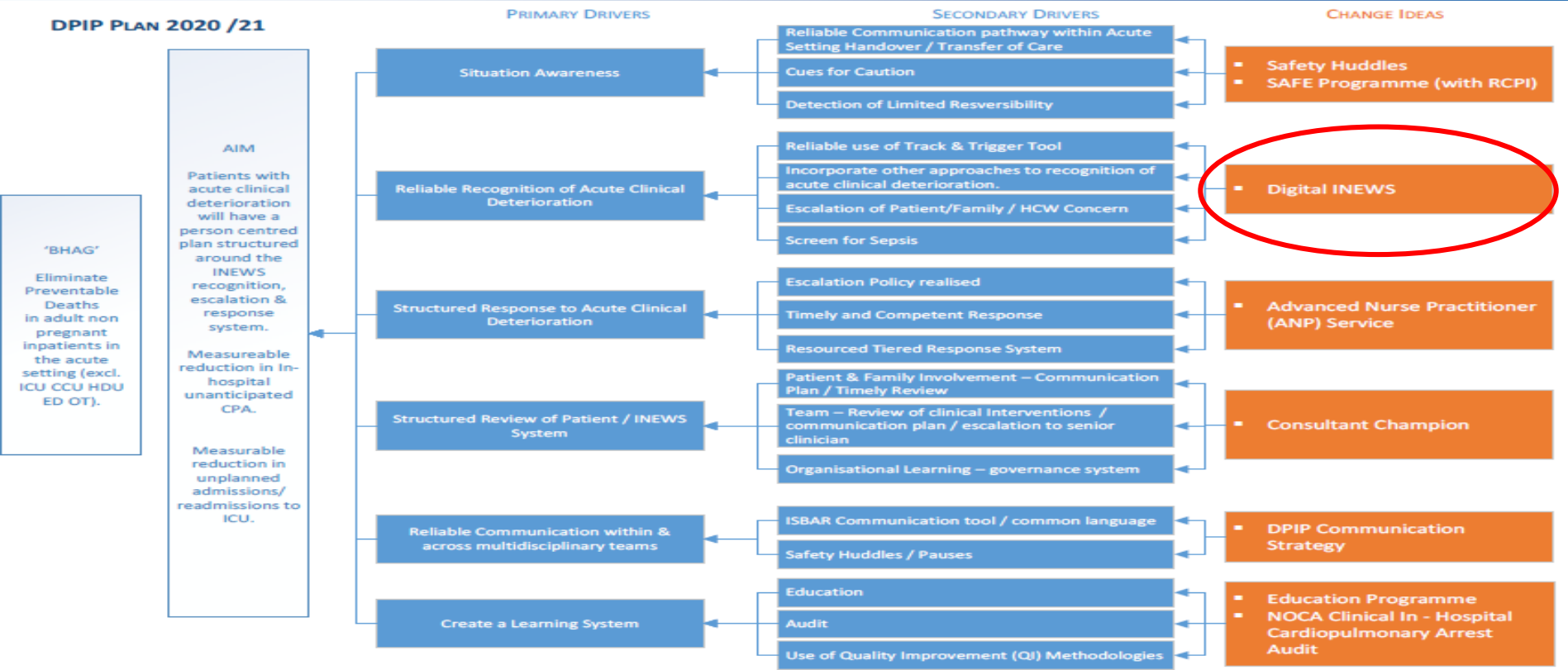2013 – 2015 HSE implemented National Early Warning systems for:

- Non-pregnant adults (NEWS)
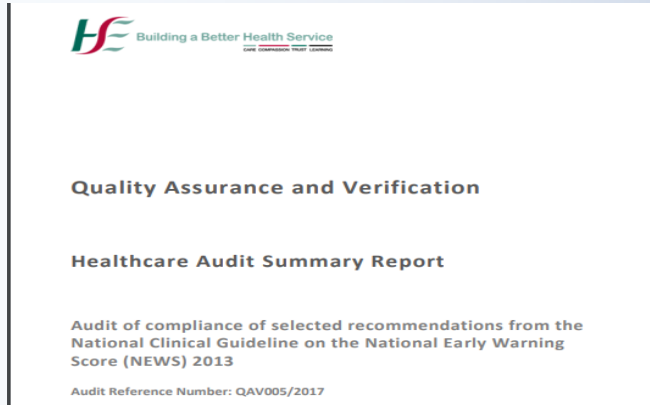- Paediatric (PEWS)
- Maternity (IMEWS)

Purpose:

- Systems to maximise patient safety & improve patient outcomes
- Early identification of clinically deteriorating patients
- Decrease mortality rates
- Decrease unanticipated CRA
- Reduced LOS (General & ICU)
- Increase patient safety & quality of care

DPIP Plan 2020 /21

'BHAG'

Eliminate Preventable Deaths in adult non pregnant inpatients in the acute setting (excl. ICU CCU HDU ED OT).

AIM

Patients with acute clinical deterioration will have a person centred plan structured around the INEWS recognition, escalation & response system.

Measureable reduction in In-hospital unanticipated CPA.

Measurable reduction in unplanned admissions/ readmissions to ICU.

PRIMARY DRIVERS	SECONDARY DRIVERS	CHANGE IDEAS
Situation Awareness	Reliable Communication pathway within Acute Setting Handover / Transfer of Care	• Safety Huddles
	Cues for Caution	• SAFE Programme (with RCPI)
	Detection of Limited Resversibility	
Reliable Recognition of Acute Clinical Deterioration	Reliable use of Track & Trigger Tool	• Digital INEWS
	Incorporate other approaches to recognition of acute clinical deterioration.	
	Escalation of Patient/Family / HCW Concern	
	Screen for Sepsis	
Structured Response to Acute Clinical Deterioration	Escalation Policy realised	• Advanced Nurse Practitioner (ANP) Service
	Timely and Competent Response	
	Resourced Tiered Response System	
Structured Review of Patient / INEWS System	Patient & Family Involvement – Communication Plan / Timely Review	• Consultant Champion
	Team – Review of clinical Interventions / communication plan / escalation to senior clinician	
	Organisational Learning – governance system	
Reliable Communication within & across multidisciplinary teams	ISBAR Communication tool / common language	• DPIP Communication Strategy
	Safety Huddles / Pauses	
Create a Learning System	Education	• Education Programme
	Audit	• NOCA Clinical In - Hospital Cardiopulmonary Arrest Audit
	Use of Quality Improvement (QI) Methodologies	

Background - Issues

Quality Assurance and Verification

Healthcare Audit Summary Report

Audit of compliance of selected recommendations from the National Clinical Guideline on the National Early Warning Score (NEWS) 2013

Audit Reference Number: QAV005/2017

Healthcare Audit

End of year Report 2017

Quality Assurance and Verification Division

NEWS Error-rate 45% (HSE QAV005/2017)

PEWS Error-rate 32% (HSE PEWS QAV008/2016)

Very poor compliance with escalation protocol

"Significant non-compliance was identified. This continues to be a theme identified through analysis of Serious Incident Investigations"

[ref. p6 'Healthcare Audit Plan 2018/2019' HSE Quality Assurance and Verification Division]

Opportunity

Improve Safety, Outcomes, Productivity and Compliance

Replacement of existing aged Vital Signs Monitors with integrated WOW's under the National Equipment Replacement Programme

Capture & record vitals signs observation electronically

Automated calculation of INEWS scores

Significant reduction in INEWS recording error-rates

Integration with a range of hospital information systems including NIMIS, iPMS, Drug management systems and eHealth architecture

Pilot Project

31 bed Acute Medical Ward

Capture electronically patient vital signs monitoring data with integration to the hospital Integrated Patient Management System "iPMS"

KEWS was the selected software for the integration pilot project in Cavan Monaghan Hospital

KEWS provide automated calculation of Irish National Early Warning System (INEWS) scores.

PLAN

- Trial of automated digital NEWS system in an Acute Medical Ward

  - ☐ Project Lead
  - ☐ Project Committee
  - ☐ Ward selection
  - ☐ Champions
  - ☐ Training
  - ☐ Duration
  - ☐ Evaluation

PLAN - Project Over-Sight

Benefits of KEWS

Wireless KEWS Mobile Cart

KEWS Software

Vital sign monitor

Barcode scanner for patient ID
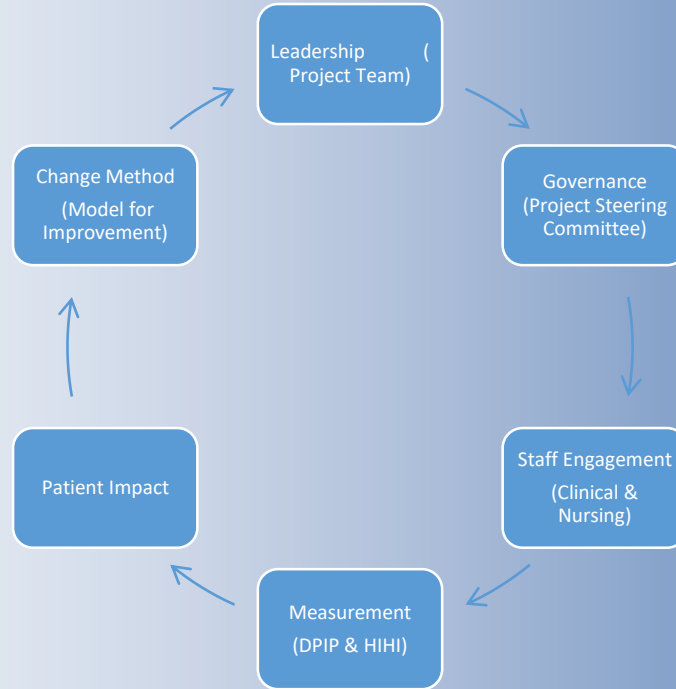
- Is Class 2b medically-approved software that is configured to reflect the standard observation chart in use in the hospital and the graphical user interface is designed to ease accurate, efficient data-entry and review.

- Allows for real time data collection to occur at the point of care.

- Automated capture of vital signs & calculation of INEWS score.

- Eliminates charting & scoring errors

- Displays escalation protocol at the bedside and centrally at the nurse's station

- Provides digital representation of observation charts (i.e. INEWS track and trigger tool).

- Colour-coded information
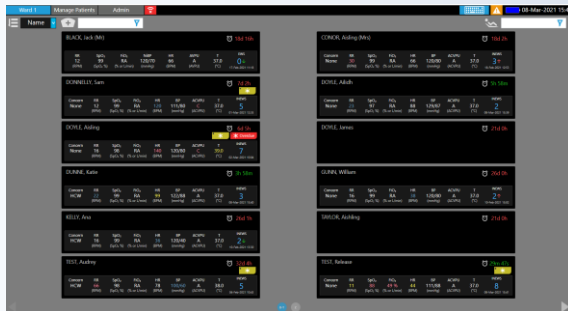
DO

- Training   - week 1
- Implemented   - week 2
- Support   - 2 weeks post implementation

PLAN/DO Staff Engagement

- Listened to staff feedback
- Provided robust training
- Onsite clinical engineering support
- Training videos
- Staff champions
- Constant staff engagement
- Support from practice development.

STUDY

Assess completeness & accuracy of observation recording & overall score totals

Independent data collection & analysis performed by Health Innovation Hub Ireland (HIHI)

Pre-implementation 20 paper NEWS charts randomly selected (anomised)

496 NEWS observations from 15 paper based charts reviewed for errors and recorded in an error analysis template/audit tool

Post implementation 13 randomly selected records from HSE server (anomised)

496 NEWS observations were reviewed for errors and recorded in an error analysis template/audit tool.

Definition of Errors

Error Type	
Type 1 Error	No impact on clinical intervention or score e.g. missing information, incorrect date/time.
Type 2 Error	Errors related to patient's clinical outcome and may impact intervention, e.g. incorrect value recorded, observations omitted, illegible entries or incorrect calculations of NEWS score.
Type 3 Error	Incomplete observation where some recordings appear to be missing therefore set of observations are incomplete.

STUDY - Data Analysis

Rate of Errors
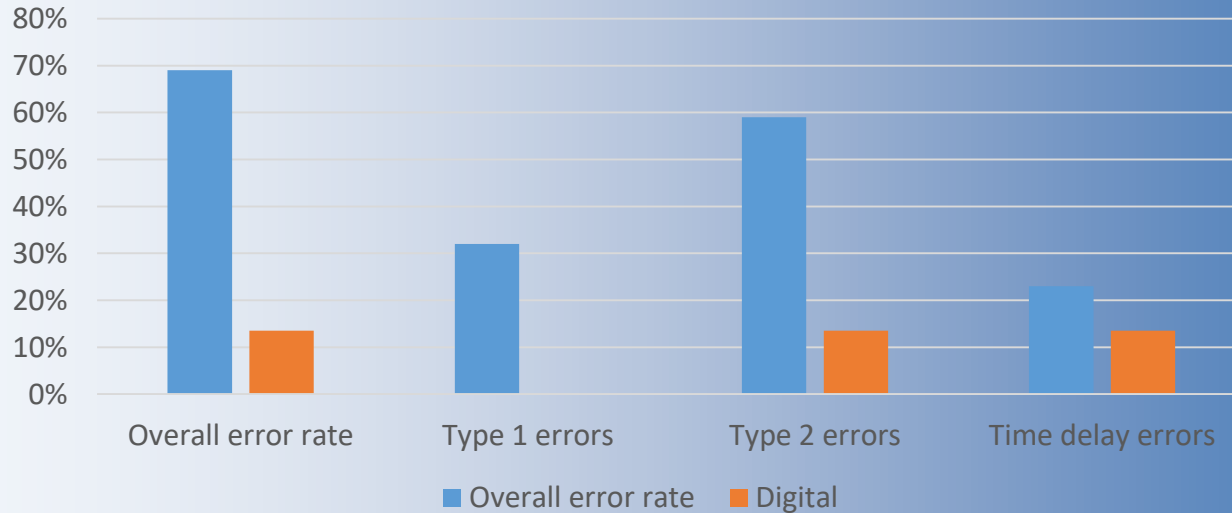
Pilot Results & Conclusion

- Error rates from recording NEWS on current paper based system unacceptably high - **59% of observations having errors that could significantly impact patients** (Type 2 errors).

- This study has demonstrated that the ocerall type 2 error rate was **reduced from 59% to 13.5% in this study.**

- Assessment of delays in time - use of digital system reduced delays from 23% to 13.5%

Benefits for Staff

- Overview of all patients at Nurses Station.
- Reminder when observations are due.
- Ease of oversight of patients under their care.
- Ability to see trends of observations.
- Aids clinical judgement.
- Removes manual calculation.
- All observations are time stamped.

Staff Feedback

Patient Perspective

- Patient information is at the beside- Bedside access to other hospital systems, e.g. Labs, NIMIS.

- All MDT staff caring for the patient have access to the same information – comprehensive decision making.

- Giving time back to nursing staff for direct patient care.

- Reduction in delayed observations.

- Deteriorating patients were always there, now better able to identify them earlier.

- Increase quality & safety of patient care.

ACT
&
more PDSA...

- Successful pilot study
- Chosen as National Demonstrator site
- Vital Signs Automation rolled out across hospital – medical/surgical/maternity
- Opportunity to implement INEWS V2
- RespiraSense successfully integrated
- System is cloud-ready (CGH system is working on remote server)

Barriers :

- ICT Hospital Network

- Hospital Bandwidth

Measurement of Clinical Outcomes

Project Aim

Demonstrate the impact of a digital INEWS system on compliance and frequency of monitoring of observations as outlined in the INEWS NCG

Outcome Measures

- Number of Pre-arrest calls

- Number of unanticipated Critical Care admissions/readmissions (Number of days between incidents).

- Number of unanticipated CPR (Number of days between incidents).

Process Measures

- Measure the frequency of monitoring of observations for patients pre and post implementation of the Digital INEWS.

Balance Measures

- Additional observations monitoring equipment required.

- Change in workload on Nursing, Medical & HSCP Teams

Data

Report writing commenced - what will digital automation tell us?

o It will display patient acuity across the hospital based on EWS.

o Highlight to clinicians number of patients with a high EWS.

o Enable clinician's to have an overview of the acuity of their patients based on EWS.

o Illustrate hospital activity monthly based on EWS acuity.

Next Steps

- We are exploring how best to support our Nursing and Midwifery staff to escalate correctly and timely, patients who have scored in accordance with the INEWS V2 escalation protocol.

- The sticker aspect of the KEWS application has proven an excellent user interface for our Maternity services. We have developed a sticker with our midwifery colleagues to form the Post Natal Daily Check.

- Further innovations have been developed for Patients with suspicion of Sepsis and there is now a draft electronic escalation available for demonstration.

Acknowledgements

- Hospital Senior Management team CGH
- Project Steering Group
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- Clinical Engineering Department
- CGH IT
- RCSI
- HIHI
- National Medical Device Office
- DPIP
- Digital Transformation
- Syncrophi

Do you have any questions for us?

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