TECHNOLOGY WITH RIGHT ACTIVATION PARAMETERS AND GOOD CLINICAL RESPONSE:SAVE LIVES

- ❑ CARE REDESIGN
- ❑ WORKFORCE TRANSFORMATION
- ☑ AUTOMATION, IT, ROBOTICS INNOVATION

MEMBERS: DR FAHEEM KHAN, DR TAN CHEE KEAT, LYE SL, PATRICIA LEONG, IAN CERDANA, YVONNE LAU, YUEH LL, CLARYBELL FERNANDEZ, NICHOLAS LIM, LIEW MEI PHENG, LEONG KH

1. Define Problem, Set Aim

Background

- Ng Teng Fong General Hospital (NTFGH) which opened in 2015, annually has about 100,000 A&E attendances and 40,000 hospital admissions. As a new hospital with medical and nursing staff from across the world working together under a high workload to deal with acutely ill patients resulted in delays in recognizing deteriorating patients and failure to activate help cost lives.

- In the first year, NTFGH faced an incidence of 1.64 cardiac arrests per 1000 hospital admissions and a serious reportable event of a preventable patient death. Staff feared to call and did not know whom to call for help despite having a hospital policy "Peri-Arrest Criteria for Code Blue Activation" (PCCAA) on recognizing deteriorating patients.

Problem/Opportunity for Improvement

- Deteriorating patients who met the PACCA criteria were still missed and the Code Blue Team was not activated. In 2016 , the cardiac arrest rate was 1.2 per 10000 hospital admissions.
- This led to the drive to innovate by integrating the existing digitalized activation process with the automation of triggering of alerts from the Electronic Medical Record(EMR) system with a multidisciplinary team of clinical and non-clinical members.

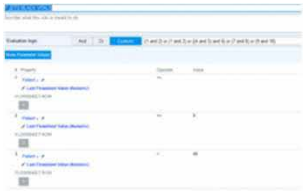
Aim

- To reduce cardiac arrest rate by 25% from 1.2 to <0.9 in NTFGH by 2019.

2. Strategy for Change

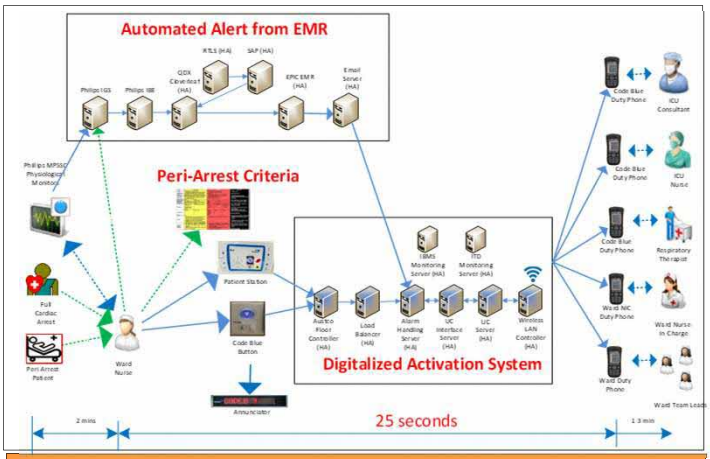
EMR Based Automated Alerts for Peri-Arrest Patients

- In-house derivation, validation and implementation of the medical Peri-Arrest criteria to build automated alert algorithm on the EMR.



- End-to-end process and system integration where the nurse validates patient's vitals on a bedside monitor which auto-flows to the EMR's built-in algorithm with necessary filters for certain locations and patients who do not need higher support care.

- Peri-Arrest criteria once met, will trigger an automated alert to a digitalized activation system which sends the alert to all code blue team members simultaneously who receive the alert within 25 seconds.



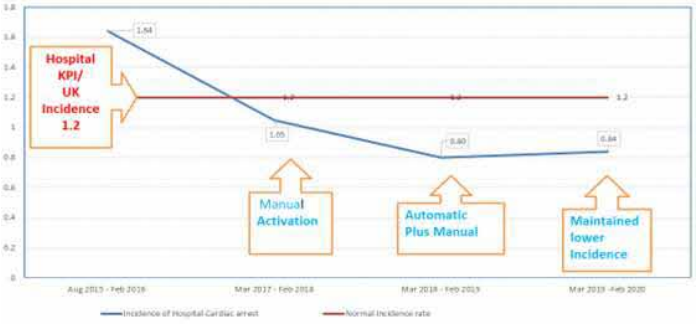
3. Interventions and Results

Improvement in Cardiac Arrest Rate

- Cardiac arrest dropped 25% from 1.2 to 0.8 per 1000 hospital admissions over a period of 12 months since implementation of "Post Automation" with only 10% increase in workload

- Increased pick up of patients in Peri arrest situation, with survival rate of approximately 70% as compared to average 20% in cardiac arrests. No SREs for preventable deaths as all deteriorating patients were captured by the system and the Code Blue Team activated.

- For Jun 2018 and Nov 2019, there were no cardiac arrests. Further, for 6 out of the 23-month implementation period there was only 1 cardiac arrest per month. Able to sustain cardiac arrest at 0.8 for 1000 hospital admissions from Mar 2018 to Feb 2020.



4. Learning Points

- Involvement of non-clinical colleagues in implementation of from the start. They are now apart of the Cardiac Life Support Committee.

- Using existing technology and infrastructure as a safety net and to automate data input and filtering functions has saved lives and allowed nurses to concentrate on patient care.

- Multidisciplinary approach and patience is the key to developing, implementing and sustaining innovation and improvement.

Ng Teng Fong General Hospital | Jurong Community Hospital | Jurong Medical Centre

Contact person: Dr Faheem Khan (Faheem_Ahmed_Khan@nuhs.edu.sg)