How does the utilization of an Automated Early Warning Score (EWS) improve patients outcome?

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Abstract

Statement of the Problem: Automated Early Warning Scores is a newly developed clinical decision tool that is used to streamline and improve the process of obtaining a patient's vital signs so a clinical decision can be made at an earlier stage to prevent the patient from further deterioration. This technology provides immediate update on the score and clinical decision to be taken based on the outcome. This paper aims to study the use of an automated early warning score system on whether the technology has assisted the hospital in early detection and escalation of clinical condition and improve patient outcome. Methodology & Theoretical Orientation: The hospital developed and adopted the Modified Early Warning Scores (MEWS) Scoring System (Figure 1) and MEWS Clinical Response (Figure 2) into Philips IntelliVue Guardian Automated Early Warning Score equipment and studied whether the process has been leaned, whether the use of technology improved the usage & experience of the nurses, and whether the technology has improved patient care and outcome. It was found the steps required to obtain vital signs has been significantly reduced. The nurses are using the convenient equipment more frequently to obtain patient vital signs. The number of deaths, and length of stay has significantly decreased as clinical decisions can be made and escalated more quickly with the Automated EWS. Conclusion & Significance: the automated early warning score equipment has helped improve work efficiency by removing the need for documenting into patient's EMR. The technology streamlines clinical decision-making and allows faster care and intervention to be carried out and improves overall patient outcome. As the use of the technology is simple and convenient, the vital signs is taken more often which translates to better care for patient.

Figure 1. Modified Early Warning Score (MEWS) Scoring System for Adults

Early Warning Signs	Pink (2)	Yellow (1)	Normal (0)	Yellow (1)	Pink (2)
Pulse/heart rate (bpm)	<50	50 - 59	60 - 100	101 - 120	>120
Respiration rate (breath/min)	<10	10 - 13	14 - 20	21 - 30	>30
Systolic Blood Pressure (mmHg)	<60	60 - 70	71-138	139 - 219	>220
Oxygen saturation (SpO₂)	<86	86-92	93 - 100		
Temperature (°C)	<35	35 – 35.9	36 – 37.2	37.3 - 38	> 38
Mental status	Unresponsive to call/stimulus	Opening eyes to only call/stimulus	Alert		
Urine Output (ml/kg/hr)	<0.3		0.3 – 0.5		>0.5

Figure 2. Clinical Response for MEWS Score

Score	Clinical Response
0 - 1	No action required
2 - 7	1) RN to re-assess the patient immediately, in 15min, 30min, 1hr or 2hr 2) RN to increase frequency of monitoring to 15min, 30min, 1hr or 2hr 3) RN to escalate clinical care using ISBAR communication tool.
8 - 14	1) RN to re-assess the patient immediately 2) RN to contact the primary consultant or MO (if consultant is unavailable) 3) RN to remain with the patient and start continuous monitoring of vital signs 4) MO or RN to consult primary consultant on further action.

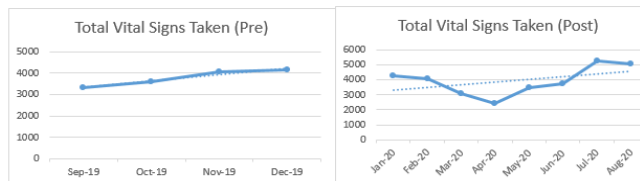Figure 3 Total number of Vital Signs Taken before and after AEWS Implementation

Figure 4 Average number of times Vital Signs is taken per patient before and after AEWS Implementation

Figure 5: Conventional EWS Flow

Figure 6: AEWS Flow

Figure 7 Average number of vital signs taken per patient after implementation

	Pre Implementation	Post Implementation	
Period	July to November 2019	January to May 2020	Difference
Number Of Code Blue In Ward	1	2	100%
Death In Ward	10	6	(40%)
Unplanned Admission to ICU	39	42	7.7%
Total ICU Days (for Unplanned admission ICU cases)	160	150	(6.25%)
Average Length Of Stay (for unplanned admission to ICU)	4.1	3.5	(14.6%)
Death In ICU	9	8	(11.1%)

Biography

Phang Moon Leng is the Chief Clinical Officer of Oriental Melaka Straits Medical Centre. Ms Phang began her career in the healthcare industry since 1991. Her wide-ranging experiences include the administration of both medical and non-medical divisions. Academically, Ms. Phang holds a Master's Degree in Business Administration and is a certified nursing graduatant. Moreover, she is also a seasoned expatriate, serving faithfully as healthcare administrator in various locations for many years. Upon her return to Malaysia, she joined Gleneagles Medini, Johor as the Senior Operations Manager, overseeing the licensing, commission, and operations of the hospital. Subsequently, she then moved to Parkway Pantai Holdings to serve as the Senior Nursing Quality Improvement Manager.

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