



Modified Early Warning System: A Multidisciplinary Response Pathway

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BACKGROUND

- In 2015, 20% of the serious safety events at Vidant Health were due to a delay in care or treatment¹
- Changes in measurable physiologic factors are present for hours prior to a patient's catastrophic decline resulting in unexpected ICU admissions, cardiac arrest, and death²
- Early recognition of these physiological changes through utilization of a Modified Early Warning Scoring (MEWS) system has shown to be effective at reducing overall hospital mortality³

1. VH Modified Early Warning System (MEWS) Huddle Sheet, July 2016.
2. Considine J, Street M, Botti M, et al. Multisite analysis of the timing and outcomes of unplanned transfers from subspecialty to acute care. *Australian Health Review*. 2015;39(4):387-394.
3. Smith MEB, Chiovaro JC, O'Neil M, et al. Early warning system scores for clinical deterioration in hospitalized patients: A systematic review. *Annals of the American Thoracic Society*. 2014;11(9):1454-1465.

PROJECT AIM

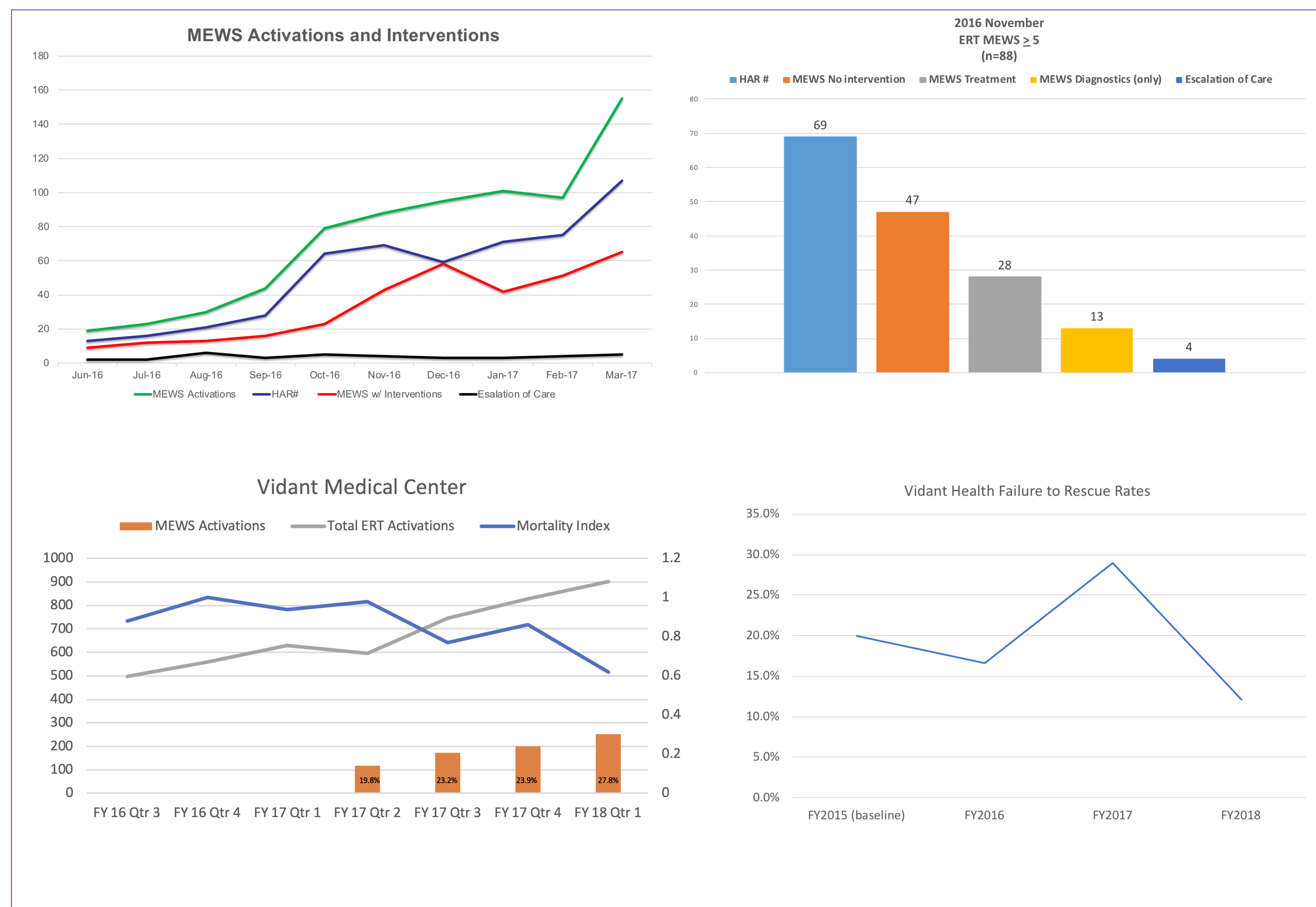
- Globally, to improve patient outcomes through early recognition and intervention with potential clinical decline
- Specifically, we aim to leverage the EHR to decrease serious safety events due to a delay in care by 5% from baseline and improve mortality index

PROJECT DESIGN/STRATEGY

- PDSA 1:** multidisciplinary committee formation, density analysis, warning score selection
- PDSA 2:** education planning, IT build, pilot unit selection
- PDSA 3:** pilot went live June 2016 on general medicine unit at VMC and VBEA, analysis of BPA frequency, interventions, and ERT data
- PDSA 4:** workflow modification, automatic 5 score

Modified Early Warning Score									
	5	3	2	1	0	1	2	3	5
Heart Rate	< 40			40-50	51-100	101-110	111-129		> 130
Respiratory Rate		< 8	8	9	10-17	18-20	21-25		> 25
Temperature			< 35.1	35.1-36	36.1-38	38.1-38.5	> 38.5		
Systolic BP	< 80		80-90	91-100	101-180	181-200	201-220	> 220	
LOC		U	P	V	A				
MEWS	0-2		3		4		≥ 5		
ACTIONS	<ul style="list-style-type: none"> Continue routine/ordered monitoring 		<ul style="list-style-type: none"> VS frequency q1h for 3 hours, confirm MEWS every hour If MEWS unchanged, resume routine VS If MEWS escalation, restart protocol 		<ul style="list-style-type: none"> Actions for MEWS 3 Apply pulse oximeter Apply cardiac monitor Inform attending and develop plan of care 		<ul style="list-style-type: none"> VS frequency q30min for 2 hours, confirm MEWS every 30 min Actions for MEWS 4 ERT activation 		

RESULTS/OUTCOMES



DISCUSSION

- Significant downward trend in mortality index. However, other quality projects occurring simultaneously (ie. sepsis efforts).
- Vidant score calculation differ from national by including automatic 5. During pilot, patients transferred to ICU with low MEWS.
- Escalation of care doesn't represent a failure in treatment/management. Earlier response can hopefully avoid escalation or reduce time spent at a higher level of care.
- While a down trending mortality index is encouraging, there is an upward trend in ERT activations.
- Multiple activations on same patient which cause multiple BPAs.
- Response protocol can be further modified to meet specific needs of unit.

NEXT STEPS

- Combined SIRS BPA and MEWS BPA
- Emergency Department rollout
- Pediatric specific early warning score

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