



Workload effects on response time to life-threatening arrhythmias

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Introduction





Introduction





Methods

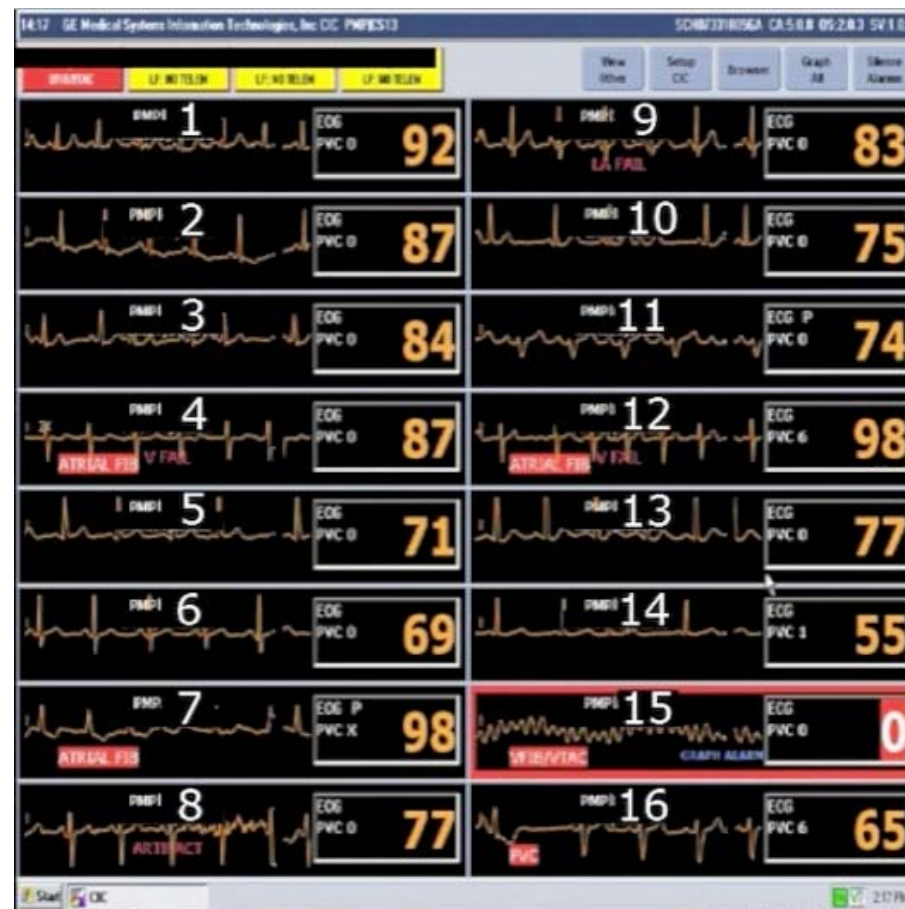
Study design

- Randomized trial
- Independent variable
 - Patient load: 16, 24, 32, 40, and 48 patients
- Dependent variables
 - Response time to a simulated ventricular fibrillation
 - Participants requiring 20 sec or longer to respond
 - Task performance
 - Rhythm interpretation
- Participants
 - 15 remote telemetry technicians
 - 27 nurses from cardiac units



Methods

Simulation design





Methods

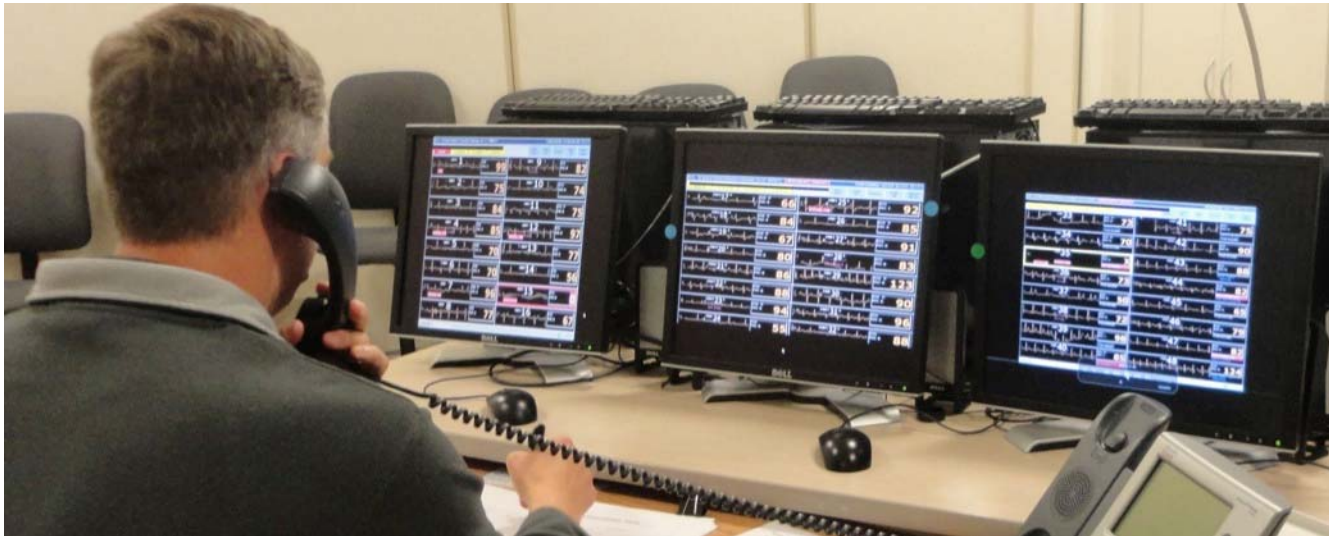
Simulation design

Patient Event	Required Tasks	Weight
Tachycardia (a 30-bpm increase from baseline)	Call HUC	5
	Make phone call within 1 minute	4
	Ask to speak to the patient's nurse	3
Bradycardia (< 45 bpm)	State correct problem	4
	Print rhythm strips	1
Converting to a different rhythm, e.g., Afib	Send 1 strip to the patient's nurse	1
	Document the patient's number, the current time, the nurse's name, and the rhythm	1



Methods

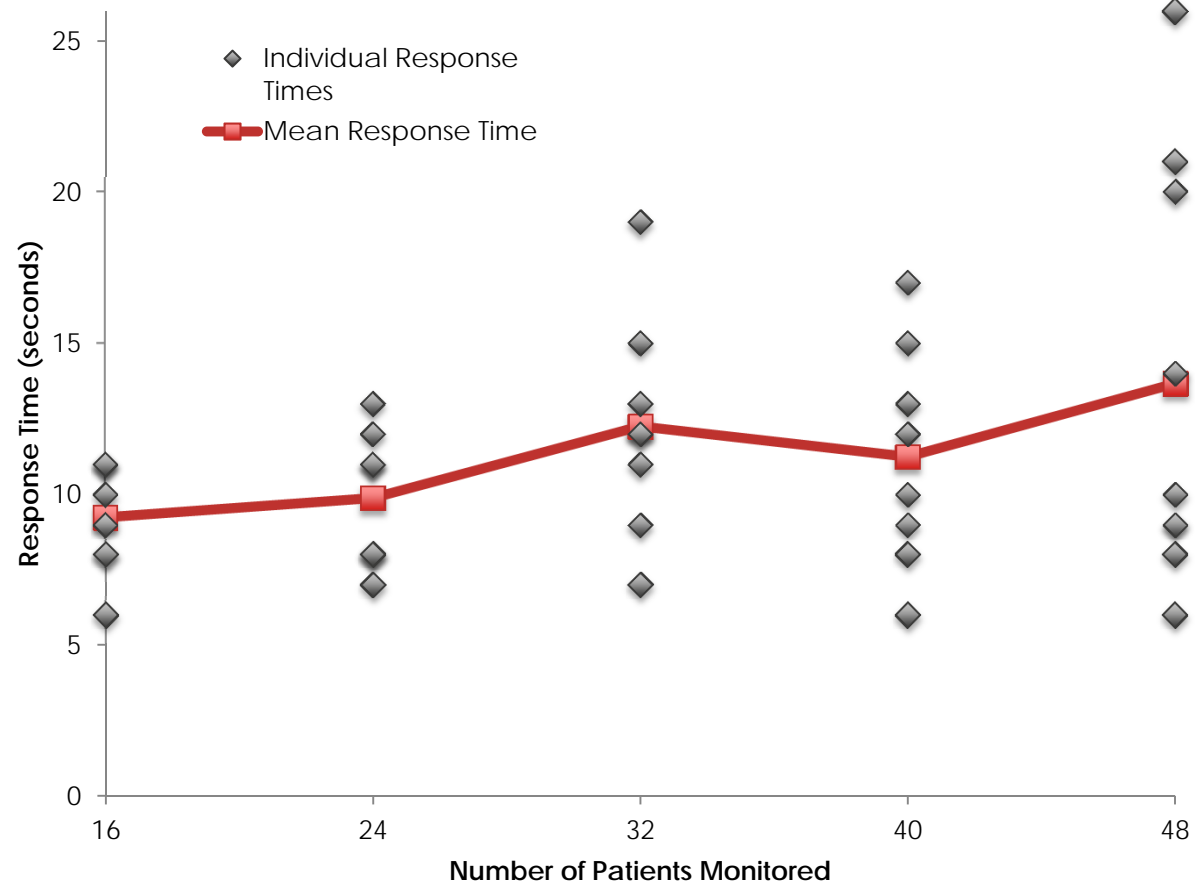
Simulation design





Results

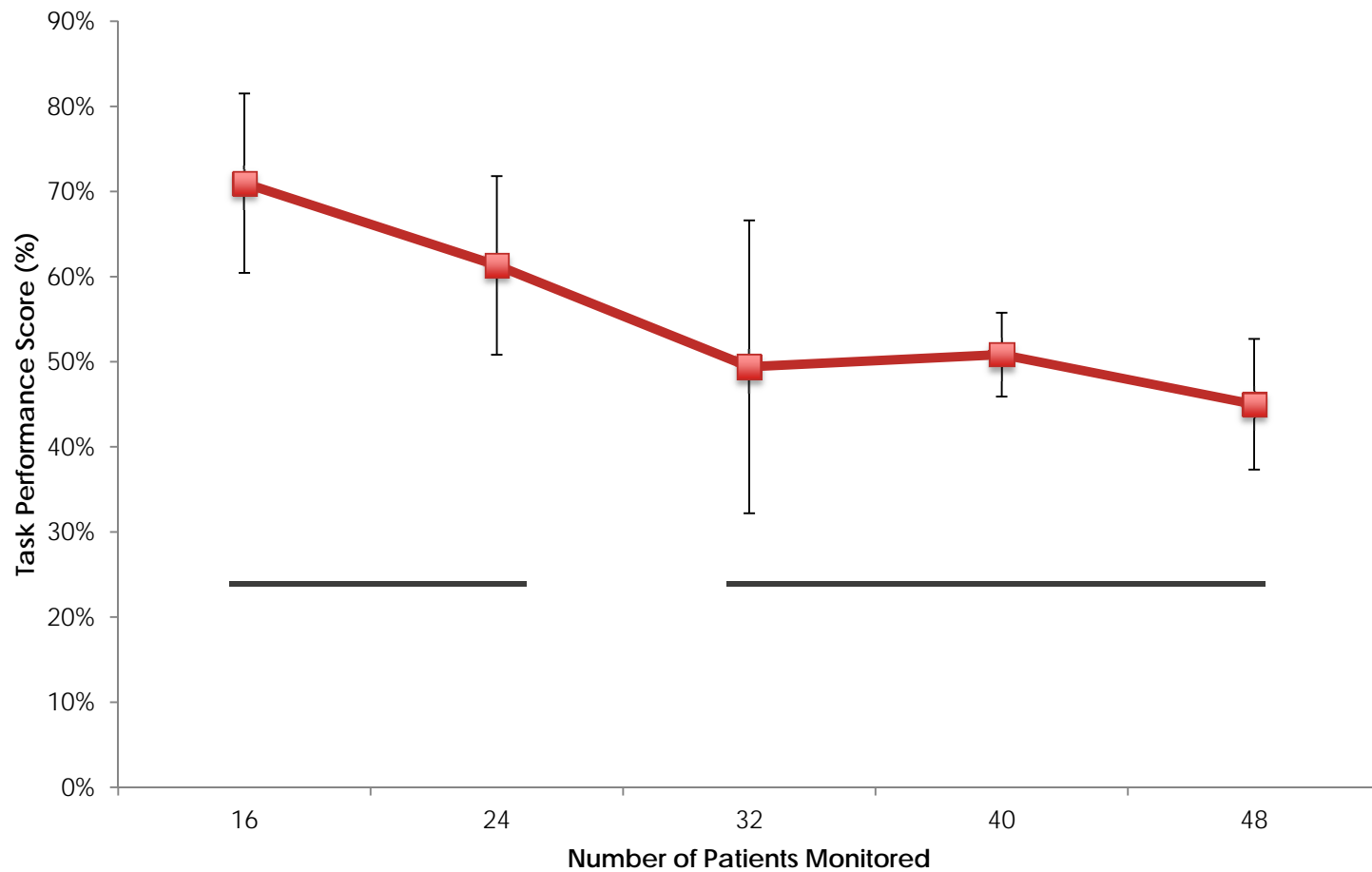
Response time





Results

Task performance





Results

Survey

	Strongly Disagree/ Disagree	Neutral	Agree/ Strongly Agree
The experiment was long enough to accurately assess my workload	1	0	39
The lethal rhythm (VF) was realistic (similar to a real VF)	1	0	41
The waveforms were clear enough to interpret	3	5	34
The pace of patient events was realistic (technician responses only)	0	1	14
My documentation tasks were realistic (technician responses only)	0	2	13
The phone conversations were realistic (technician responses only)	1	0	14
Overall, the experiment was realistic (similar to real cardiac monitoring) (technician responses only)	1	2	12



Discussion

- Response times to the simulated arrhythmia increased as patient load increased
- More “outliers” in 48-patients group
- Task performance decreased as patient load increased



Thank You



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Ongoing Trinity Health Research: Identifying Best Practices in In-Hospital Monitoring

- Develop and validate metrics of monitoring quality
 - Rapid recognition and response to emergent events
 - Early detection of deterioration to prevent emergent events
- Define characteristics of monitoring system design that impact monitoring effectiveness
- Conduct case-based (units) observational research to identify characteristics that are sufficient or necessary for high quality monitoring
- Contact: Melanie Wright, wrightmec@sarmc.org