BACKGROUND

• With rising patient acuity in hospitals, telemetry is a widely used resource that has the potential to provide real-time information about life-threatening conditions helping guide clinicians’ management decisions. However, this relies on comfort with and correct interpretation of electrocardiographic monitoring. Multiple studies of both physicians and nurses have demonstrated poor performance in assessment of rhythms from ECG monitoring making education a crucial aspect in the utility of telemetry.

• In 2017 the American Heart Association published an update on practice standards for electrocardiographic monitoring in hospital settings, which specifically addresses education of staff. It recommends the need for both didactic and hands-on learning, and from web-based to peer to peer teaching. However, there remains no standardized practice on telemetry training, especially for medical residents, who are part of the first-line in telemetry evaluation.

• Among a sample of our Internal Medicine residents, 90% reported no formal telemetry teaching, and 50% had no formal or informal telemetry education. Only 50% of residents reviewed telemetry daily.

• Our goal was to design and implement cardiac monitoring education for medical residents in order to help residents feel more comfortable with and be better equipped to navigate and assess telemetry. Through formal education, our overarching aims is to improve patient care through telemetry monitoring and appropriate telemetry utilization.

AIM

• Our aim was to design and implement cardiac monitoring education for medical residents in order to help residents feel more comfortable with telemetry and assess telemetry.

• Our objective was to create and pilot a telemetry education video among Internal Medicine residents (from March to May 2018) resulting in a 75% increase in ability to demonstrate essential telemetry skills as determined by a pre and post video assessment.

INTERVENTION

• We created an eight minute video, narrated by cardiologist Dr. Yair Lev, which reviews the basics of navigating telemetry – trend review, wave review, and alarm review.

• Example tasks included how to find patients, use trend review, check R-R irregularity, adjust time frames and scale, use wave review and alarm review, use calipers, and assess for the artifact.

• Our team assessed telemetry navigation and evaluation skills among Internal Medicine residents in real-time by seeing if they could complete different tasks on a telemetry monitor within the frame of clinical scenarios.

• Following the initial evaluation, residents were given a link to watch the telemetry video. They were then reassessed with the same evaluation within 1 week.

• Residents were scored based on a binary system of ability or inability to complete each task. Qualitative data regarding comfort with telemetry (1-unsatisfactory, 10-excellent) was also gathered pre- and post-video.

RESULTS

• There were 20 participants. Each participant watched the video 1 time only.

• Subject characteristics:

| 13 PGY 1, 5 PGY 2, 2 PGY 3 |
| 10% had formal telemetry training (3/20) and 90% had informal telemetry training (18/20) prior to the intervention |

• 50% (10/20) report looking at telemetry every day, 25% (5/20) look most days, 25% (5/20) look some days

• Comfort level with telemetry pre-test: mean 6.1, median 6.5, mode 7

• Comfort level with telemetry post-test: mean 8.5, median 8.5, mode 9

• Data was analyzed using a T-test for the change in pre- and post-intervention measures. There was a statistically significant effect for both:

| Test score: f(19)=10.27, p<0.0001 |
| Subjective comfort: f(19)= 6.67, p < 0.0001 |

• Our data demonstrate that residents who reviewed the telemetry video were able to show improved skills on evaluating cardiac rhythms.

DISCUSSION

• The objective post-test mean was 99.6% (p<0.00001), demonstrating excellent telemetry proficiency after the intervention in virtually all participants. Additionally, the subjective comfort with telemetry interpretation improved to likert 85 post-intervention, from a baseline 6.1 (p<0.00001).

• We believe the subjective increased proficiency may be of clinical importance, as confidence in individual skills may lead to more frequent discussion of telemetry findings on rounds, with subsequent benefit to patient care.

• We did not reach our targeted aim of a 75% increase in ability to demonstrate essential telemetry skills, however this most likely reflects a higher baseline performance than anticipated.

• Possible limitations of our current intervention include the lack of ability to test for long-term retention, and that the PGY 1 residents were already 9-11 months into residency training.

• We intend to repeat the same assessment in PGY 1 trainees within 1-3 months of starting residency with a second assessment 2 months later to test retention. We anticipate a greater overall improvement in telemetry proficiency, with the added benefit of earlier competency in an essential skillset.

• The telemetry video will be included as a resource in the formal Internal Medicine curriculum moving forward.

• Although beyond the scope of our current project, we believe it would be interesting at an institutional level to study how telemetry utilization and documentation changes after a telemetry education initiative.

REFERENCES

