

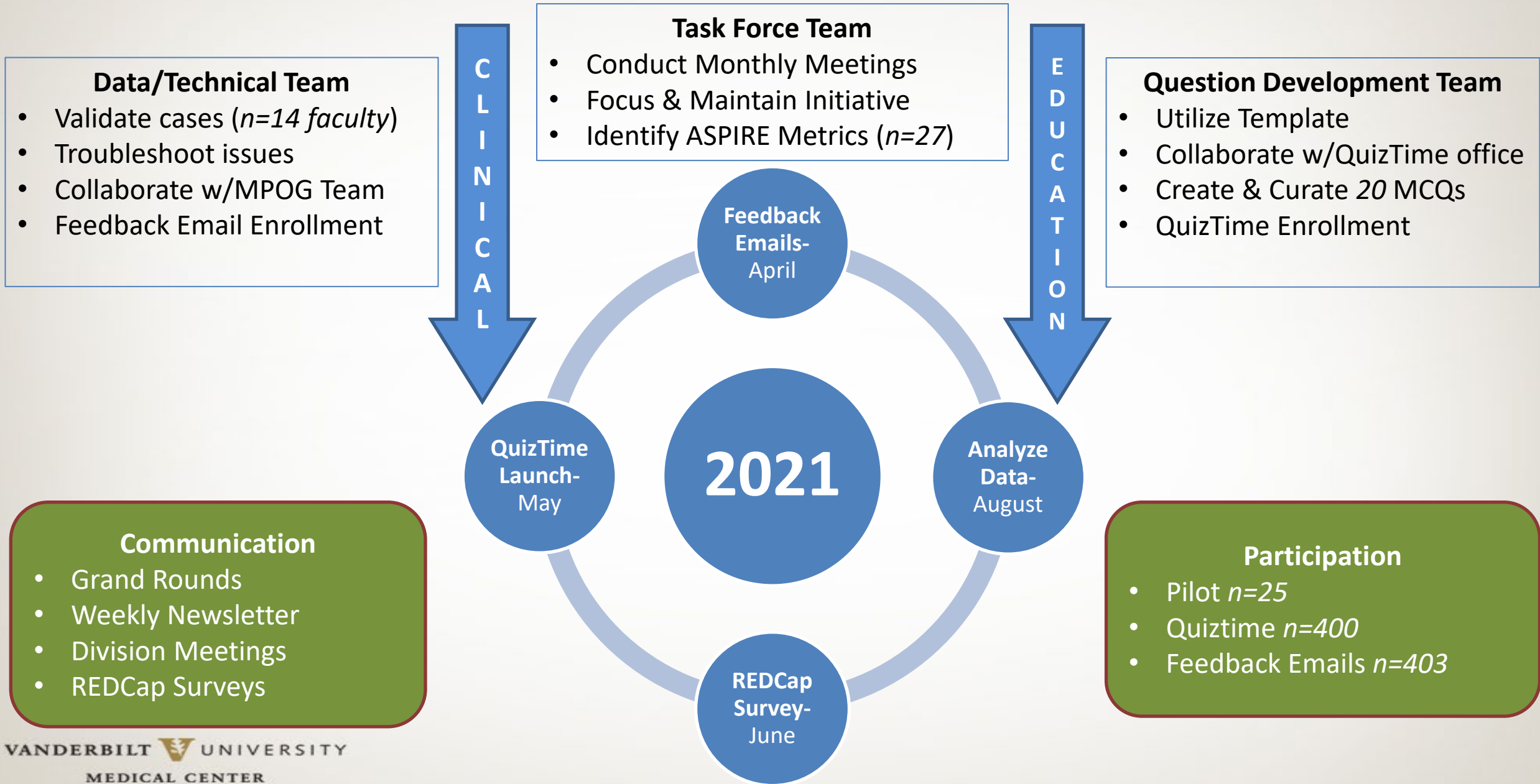
Improving Neuromuscular Blockade Monitoring Compliance via QuizTime

Leslie Coker Fowler, EdD

Vanderbilt University Medical Center

Department of Anesthesiology

ASPIRE Quality Improvement Program



Why and Who?



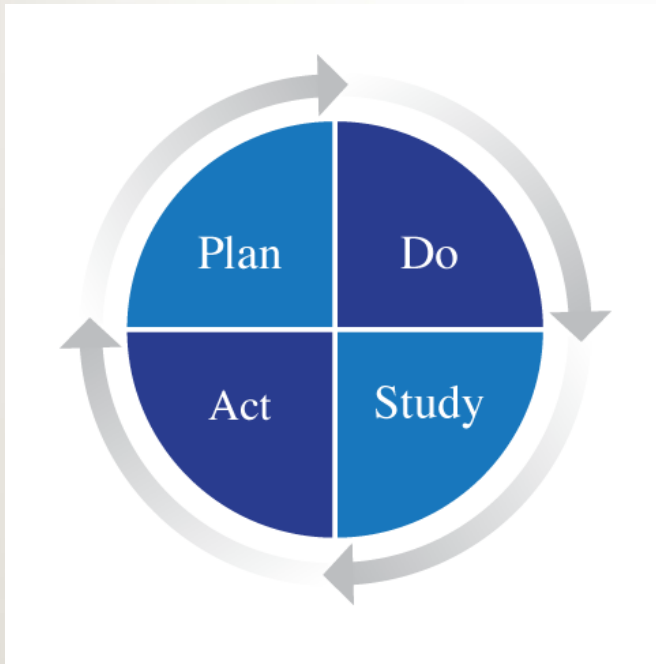
Phase I: Pilot (n=25)

Phase II: Entire department (n=400)

- Attending physicians
- CRNAs
- Residents and Fellows

What and When?

Current Departmental
Practice Data

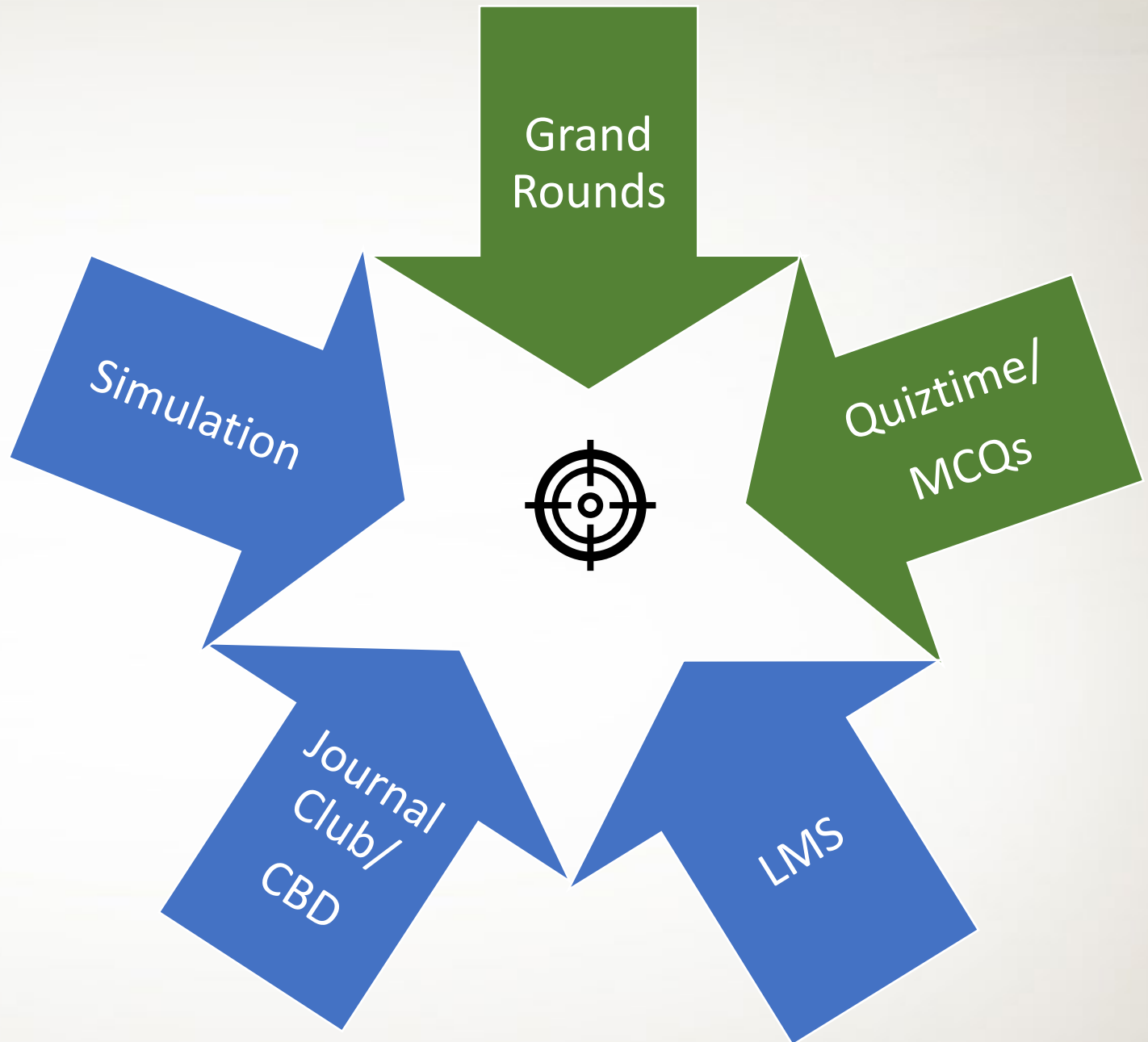


Targeted Education

****NMB 01****

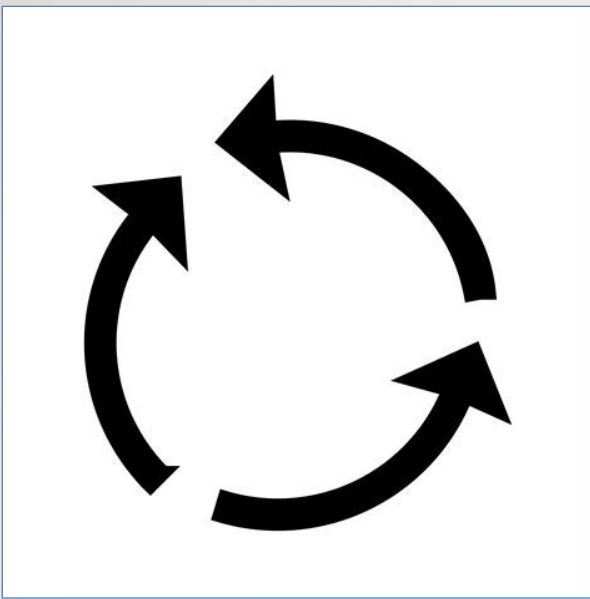
How?

Traditional and novel methods of education delivery



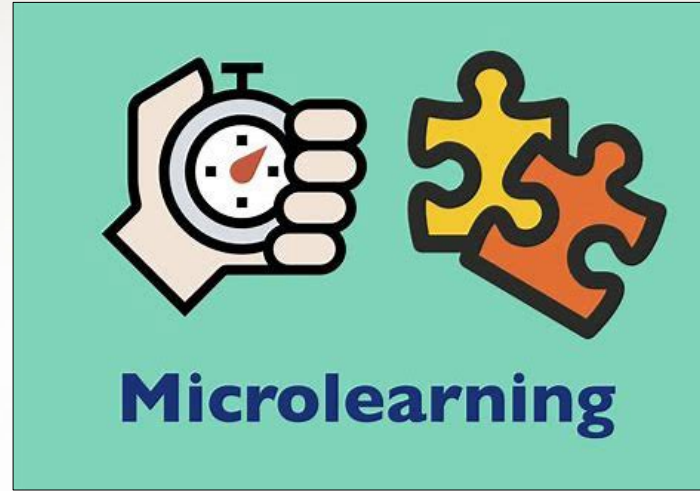
2021 Rollout & Timeline

- January 18: Validation of use cases completed
- January 22: VUMC data uploaded into the MPOG central database
- January 27: a 3-month pilot rollout began, including QuizTime
- January 29: Introduction to ASPIRE Metrics, survey sent out to pilot group
- March 31: Pilot rollout ends, feedback analyzed
- April/May: Departmental-wide rollout to all providers, including QuizTime
- August/September: Performance monitoring, collecting feedback, data analysis



Spaced Education

Evidence-based educational concepts



Retrieval Based Practice



- Learning takes place over time, with rest periods
- Small doses of learning, content when convenient
- Recalling from memory, strengthens connections



ASPIRE Quality Improvement Task Force

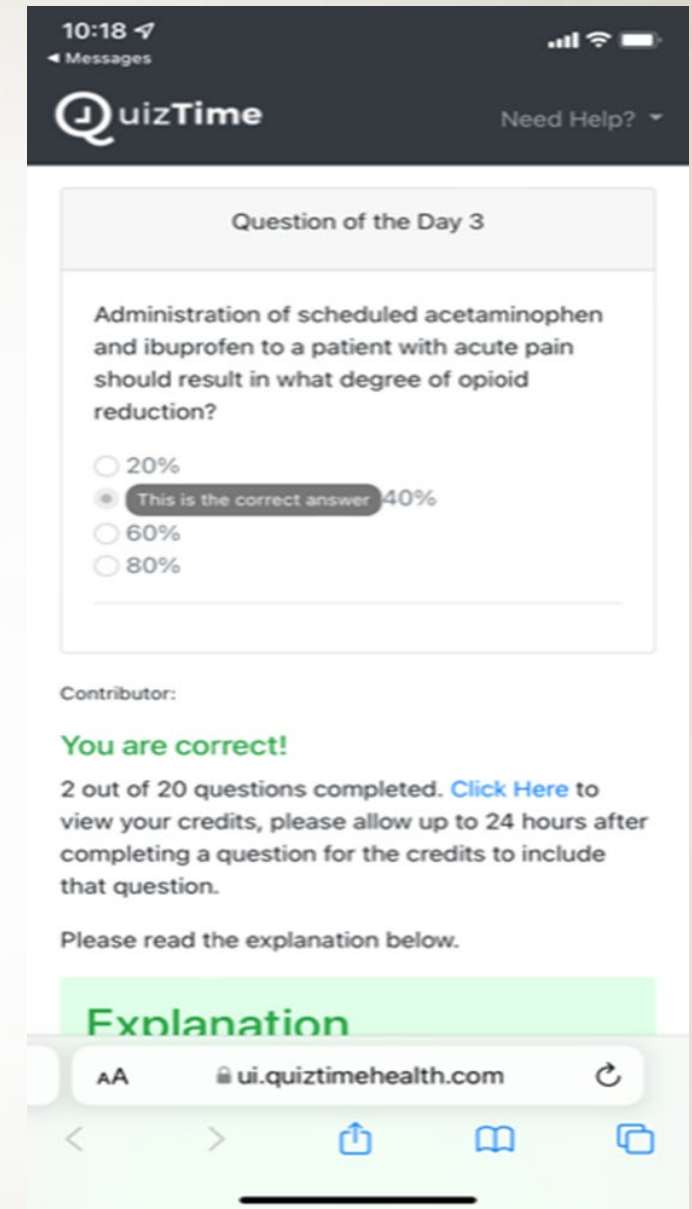
Neuromuscular Blockade Monitoring (NMB 01) Module

May 10th-June 4th

- 1 Multiple Choice Question/day (n=20)
- Monday-Friday
- Email or Text
- 1 AMA PRA category 1 credit™

If you are not receiving MCQs or would like to opt out,

Email leslie.c.fowler@vumc.org



Learning Experience Design

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QuizTime Need Help?

Question 3

What is the effect on MAKE 30 (major adverse kidney events at 30 days after admission) of administering Lactated Ringers to adult patients with sepsis as compared to 0.9% saline?

- Increased rate of MAKE 30 with Lactated Ringers
- Decreased rate of MAKE 30 with Lactated Ringers
- No difference in the rate of MAKE 30 between groups

You are correct!

1 out of 5 questions completed. [Click Here](#) to view your credits, please allow up to 24 hours after completing a question for the credits to include that question.

Please read the explanation below.

[Navigation icons]

2:10 [status icons]

Explanation

Key Point

Based upon the recently published SMART trial, administration of balanced crystalloid solutions (Plasmalyte-A, Normosol, Lactated Ringer's) causes a lower rate of MAKE 30 as compared to administration of 0.9% saline, especially in patients admitted to the hospital with sepsis.

Rationale

While the exact cause is unknown, administration of balanced crystalloid solutions (Plasmalyte-A, Normosol, Lactated Ringer's) causes a lower rate of MAKE 30 as compared to administration of 0.9% saline, especially in patients admitted to the hospital with sepsis. This was recently demonstrated in the SALT-ED and SMART trials, which together randomized ~28,000 patients to receive either 0.9% saline or a balanced crystalloid solution. The studies did show similar findings to prior research concerning the biochemical alterations associated with 0.9% saline administration - namely, higher chloride values and lower bicarbonate values, the former of which

[Navigation icons]

2:10 [status icons]

did show similar findings to prior research concerning the biochemical alterations associated with 0.9% saline administration - namely, higher chloride values and lower bicarbonate values, the former of which has been strongly associated with renal injury.

References

Self WH, et al. Balanced Crystalloids versus Saline in Noncritically Ill Adults. N Engl J Med. 2018;378:819-828

Semler MW, et al. Balanced Crystalloids versus Saline in Critically Ill Adults. N Engl J Med. 2018;378:829-839

Acknowledge Explanation

Give Us Your Feedback!

How have others answered this question?

[Navigation icons]

2:10 [status icons]

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Give Us Your Feedback!

How have others answered this question?

You have completed your question. There is no further action required at this time.

Thank you for using QuizTime.

[Navigation icons]

Learning Experience Design

2:09

ui.quiztimehealth.com/quiz/

QuizTime Need Help?

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Your answer was incorrect
Please read the explanation below.

Explanation

Key Point

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Acknowledge Explanation and Attempt Again

Give Us Your Feedback!

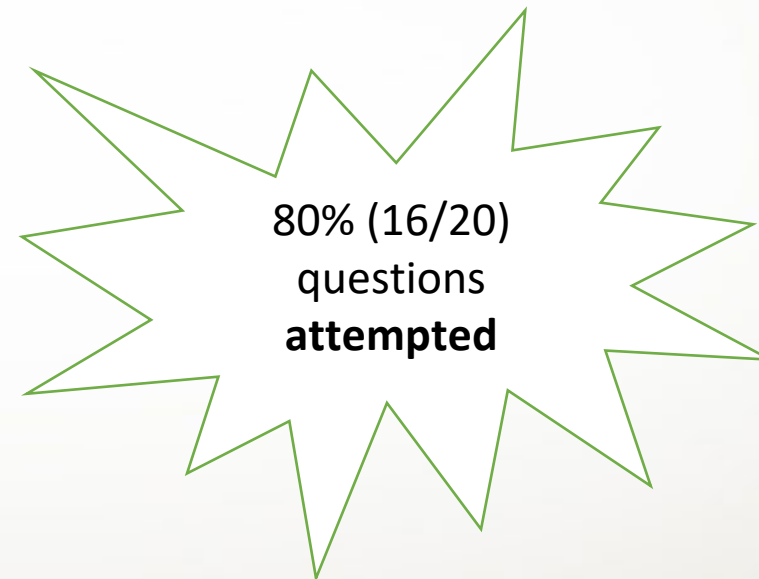
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Enrollment versus Participation

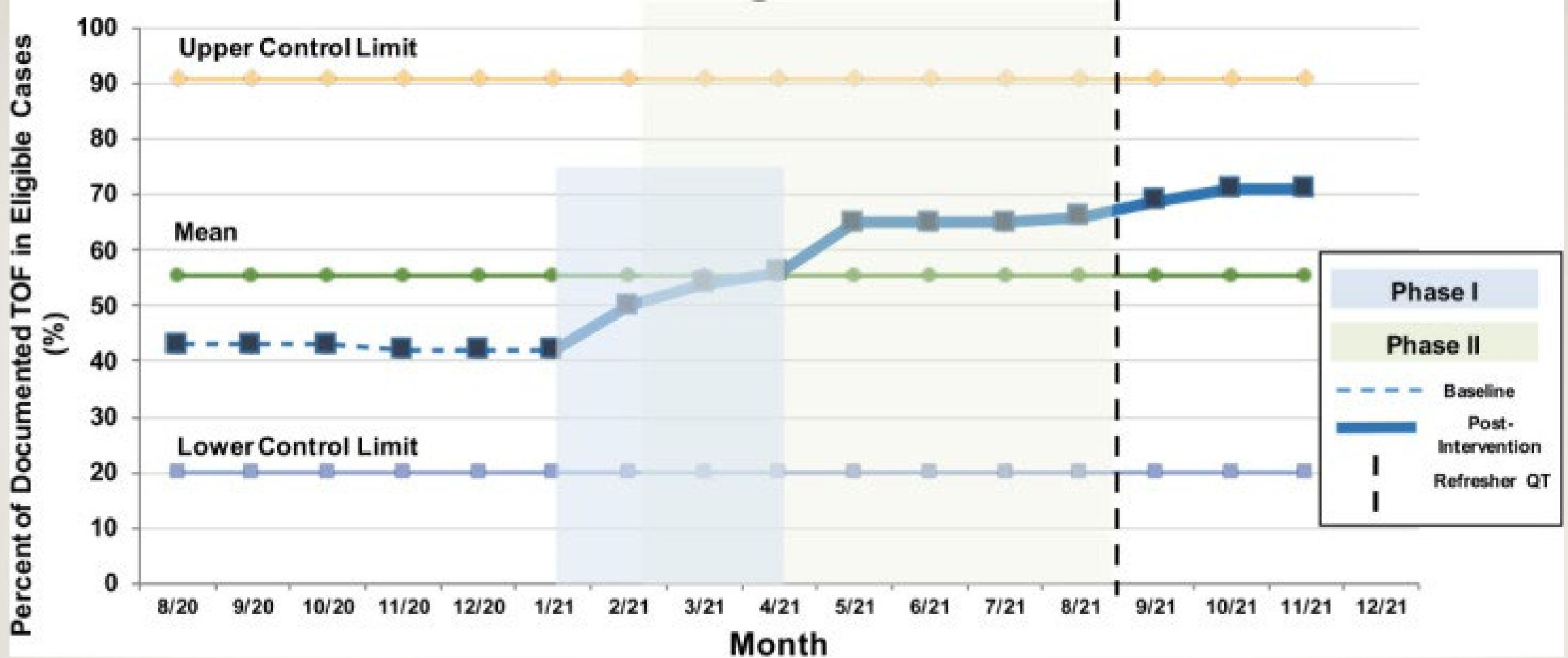
- Phase I (n=25)
- Phase II (n=400)
- Phase I (n=24) 96%
- Phase II (n=292) 73%

Learners eligible to claim continuing education credit.

- Phase I (n=11) 46%
- Phase II (n=132) 45%



TOF Monitoring Over Time



TOF monitoring rate increased from baseline (shown as the horizontal dashed line) over the course of Phase I (blue box) and Phase II (green box). The vertical dashed line depicts the time the Refresher QuizTime was implemented. The solid line depicts postintervention improvement in TOF, with continued increase after Phase II concluded.

Entity
Vanderbilt University Medical Center

Time Period
 Past 12 Months

- Additional Filters
- + Location
 - > Case Attributes
 - > Demographics

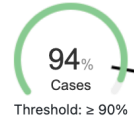
NMB-01: Train of Four Measured [More Info](#)

Percentage of patients with a documented Train of Four (TOF) after last dose of non-depolarizing neuromuscular blocker.

Providers [Case List](#)

Data current as of 10/11/2024

Overall Score



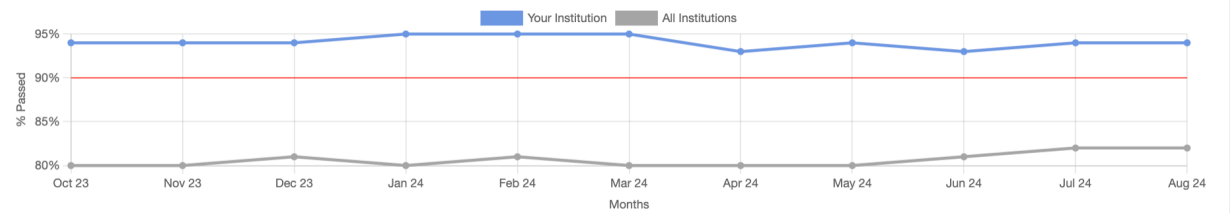
Result Counts

Result	Case Count
Passed	30,551
Flagged	1,966
Excluded	85,000
Total	117,517

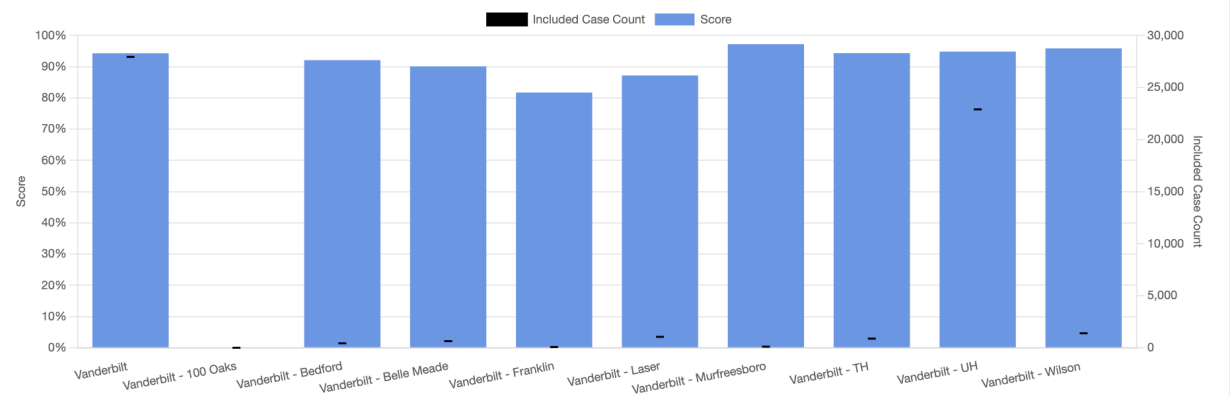
Result Reasons

Result	Reason	Case Count
Passed	Train of Four measured	30,551
Flagged	No Train of Four measured	1,966
Excluded	Patient remained intubated	58,040
Excluded	No NMBs administered	26,851
Excluded	Invalid case	42
Excluded	ASA 5 or 6	35
Excluded	Lung transplant	32
Total		117,517

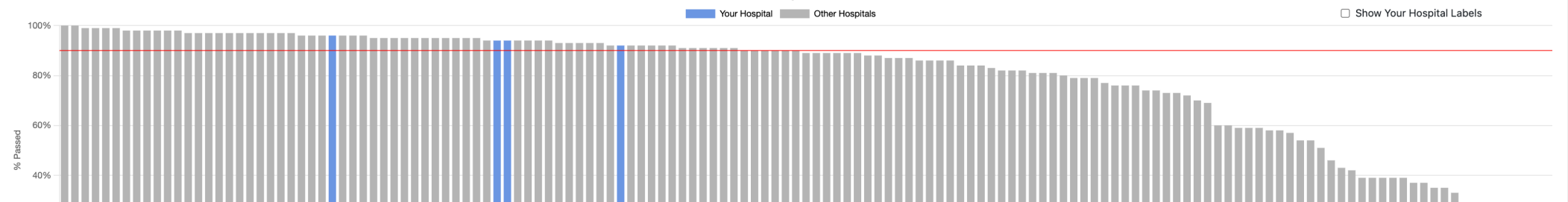
Performance Trend



Breakdown by Location



MPOG Hospitals



References

- Kerfoot BP, Turchin A, Breydo E, Gagnon D, Conlin PR. An online spaced-education game among clinicians improves their patients' time to blood pressure control: a randomized controlled trial. *Circ Cardiovasc Qual Outcomes*. 2014;7(3):468-474. doi:10.1161/CIRCOUTCOMES.113.000814
- Magarik M, Fowler LC, Robertson A, et al. There's an app for that: a case study on the impact of spaced education on ordering CT examinations. *J Am Coll Radiol* . 2019;16(3):360–4.
- McEvoy MD, Dear ML, Buie R, et al. Embedding learning in a learning health care system to improve clinical practice. *Acad Med* . 2021;96(9):1311–4.
- McEvoy MD, Fowler LC, Robertson A, et al. Comparison of two learning modalities on continuing medical education consumption and knowledge acquisition: a pilot randomized controlled trial. *J Educ Perioper Med* . 2021;23(3):E668.
- Santapuram P, Coker Fowler L, Garvey KV, et al. Improving Compliance With Institutional Performance on Train of Four Monitoring. *J Educ Perioper Med*. 2023;25(1):E698. Published 2023 Jan 1. doi:10.46374/volxxv_issue1_Kertai