

Local Problem

- In 2020 a high incidence of iatrogenic pneumothorax was noticed at TJUH after internal jugular central line insertion
 - Accepted rate is 0.1%
- With long periods of time between ICU rotations, residents suffer from significant procedural skill decay
- The COVID-19 pandemic brought with it an increase in the number of central lines placed
- During the COVID-19 pandemic, there has been a lack of large group training opportunities due to social distancing constraints

Year	5-MICU Incidence of IAP	5-MICU Number of US-Guided IJ CVC	5-MICU IAP%	Hospital PSI06 Observed Rate (per 1000 cases)	Hospital PSI06 Expected Rate (per 1000 cases)	O/E Ratio
2018	0	320	0.00%	0.26	0.24	1.08
2019	1	328	0.30%	0.40	0.24	1.69
2020	4	484	0.83%	0.20	0.24	0.82
2021 (Jan-April)	0	108	0.00%	N/A	N/A	N/A

AIM Statement

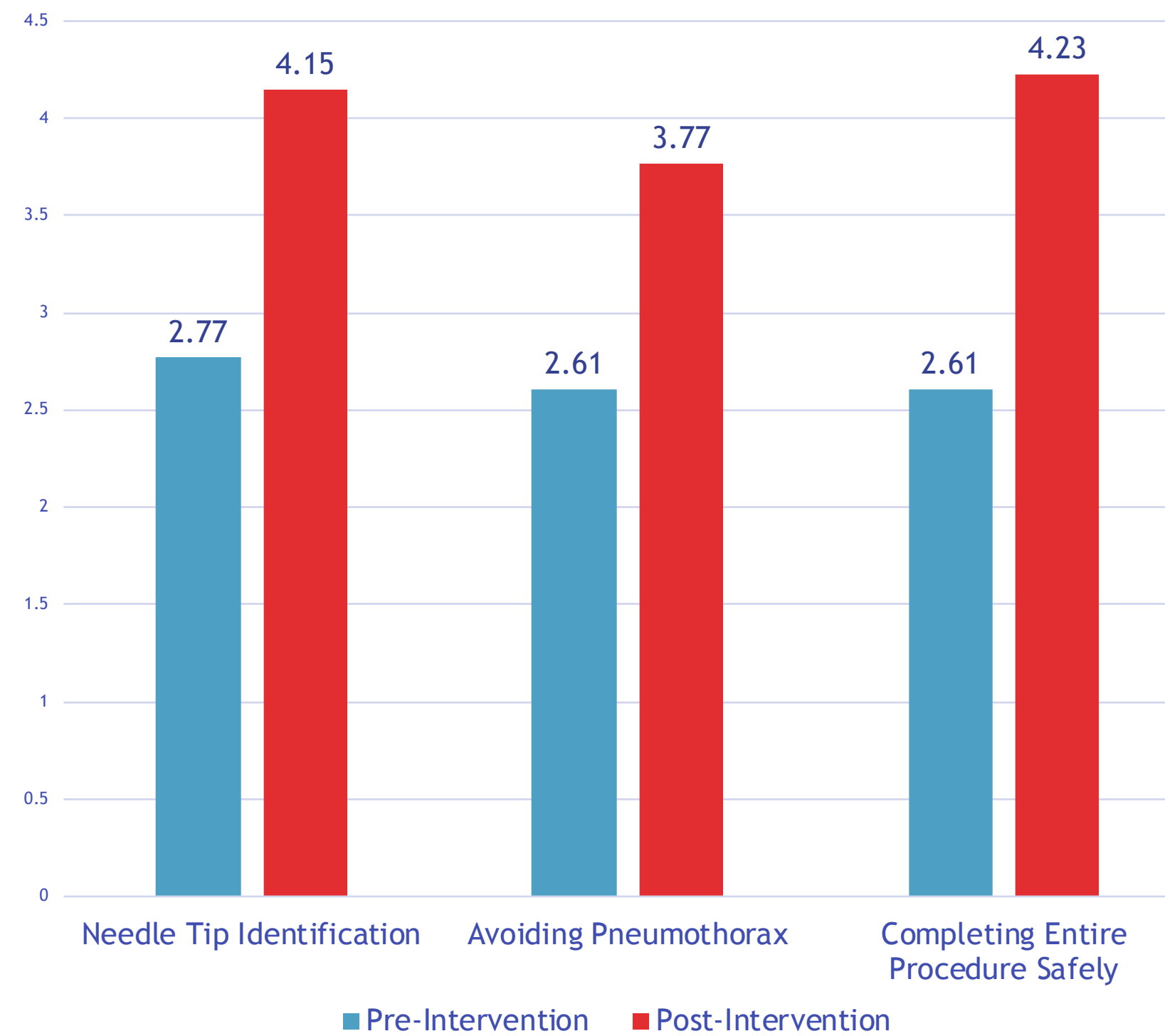
By December 31st 2021, our intervention will improve rates of iatrogenic pneumothorax after US-guided internal jugular central line insertion by 50% of baseline, as measured by chart review via Epic EMR.

Educational Intervention

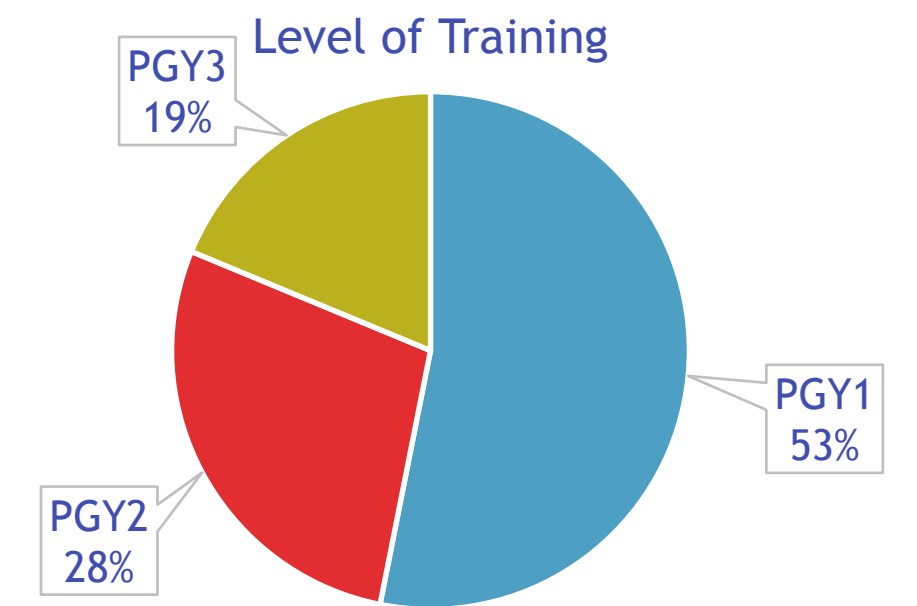
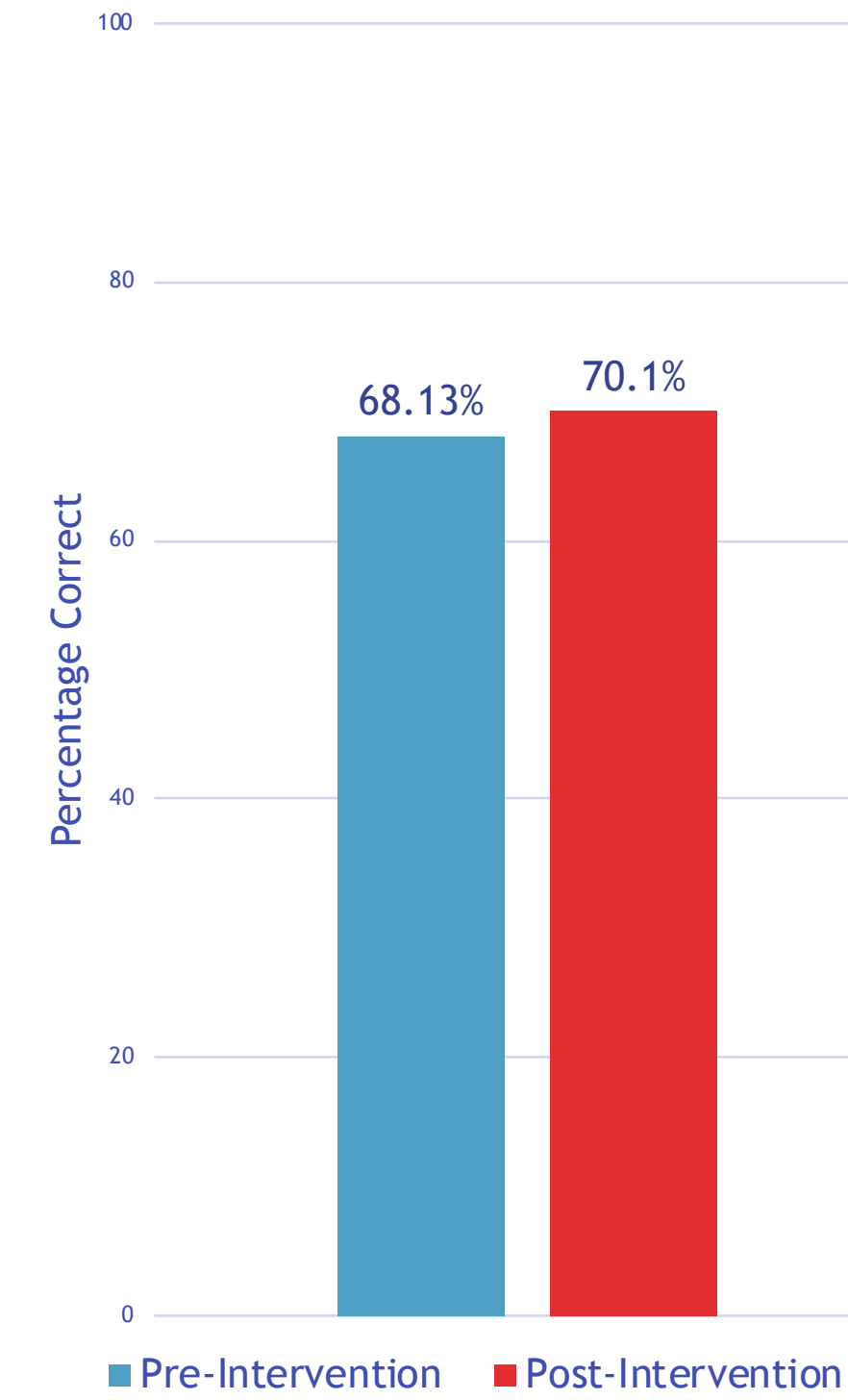
- Initiated in January 2021 (ongoing)
 - 32 residents have completed the training to date
- “Microskill” focus on ultrasound technique
- “Just-In-Time” educational format timed with each resident’s return to the MICU to prevent procedural skill decay
- Socially-distanced guided simulation session with a simple, easily cleanable, durable ultrasound model
- Pre/Post session assessment on RedCap database

Results

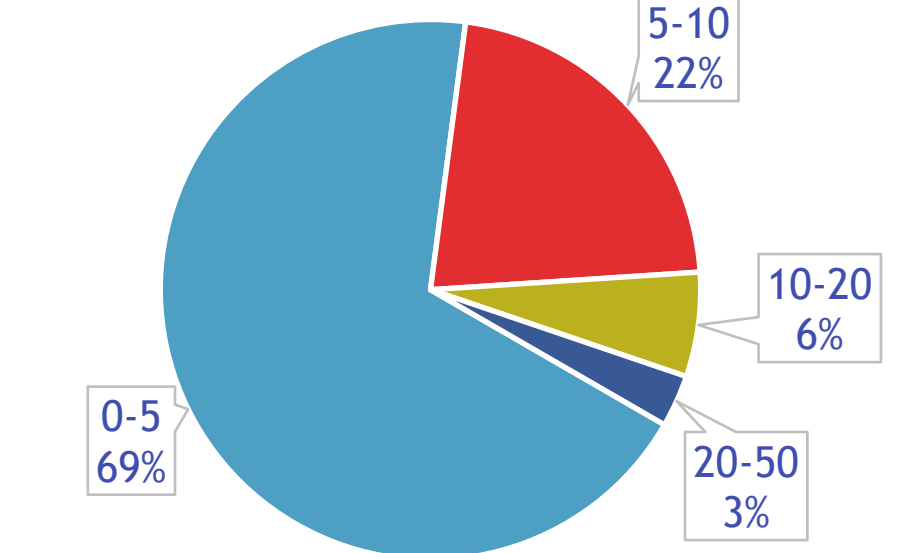
Procedure Confidence Rating (0-5)



Knowledge Assessment



Career Number of Central Lines Placed



Resident Survey Results N = 14				
	Mean	Standard Deviation	Z	p-value
Needle Tip Identification (Pre-Intervention)	2.70	1.20	-3.11	0.0019
Needle Tip Identification (Post-Intervention)	4.15	0.53		
Avoidance of Iatrogenic Pneumothorax (Pre-intervention)	2.40	1.33	-2.97	0.0030
Avoidance of Iatrogenic Pneumothorax (Post-intervention)	3.77	0.80		
Complete Procedure (Pre-Intervention)	2.40	1.15	-3.21	0.0013
Complete Procedure (Post-Intervention)	4.23	0.58		

Conclusions

- The rate of iatrogenic pneumothorax secondary to ultrasound-guided central venous catheterization of the internal jugular vein fell from 0.83% in 2020 to 0.00% so far in 2021 (January-April)
- The educational intervention resulted in a significant self-reported improvement in resident confidence in needle tip identification, avoidance of iatrogenic pneumothorax, and overall procedure safety

Supplemental Information

