

A Survey Evaluation of Student Registered Nurse Anesthetists' Knowledge, Experience, and Perceptions of Endotracheal Cuff Pressure Monitoring

Kailyn Hinrichsen, BSN, RN; Janet Dewan, PhD, CRNA; Daniel King, DNP, CRNA; Kisha Thompson, PhD, CRNA; Terry Wicks, DNP, CRNA



BACKGROUND

- Endotracheal tube (ETT) cuff pressure (CP) > 30 cm H₂O impairs tracheal capillary blood flow and CP > 50 cm H₂O completely occludes blood flow, with tracheal mucosal damage occurring in only 15 minutes.
- Manometer use decreases adverse outcomes associated with under- and over-inflation.
- Up to 83% of subjective measurement methods have been found to result in unsafe CP.

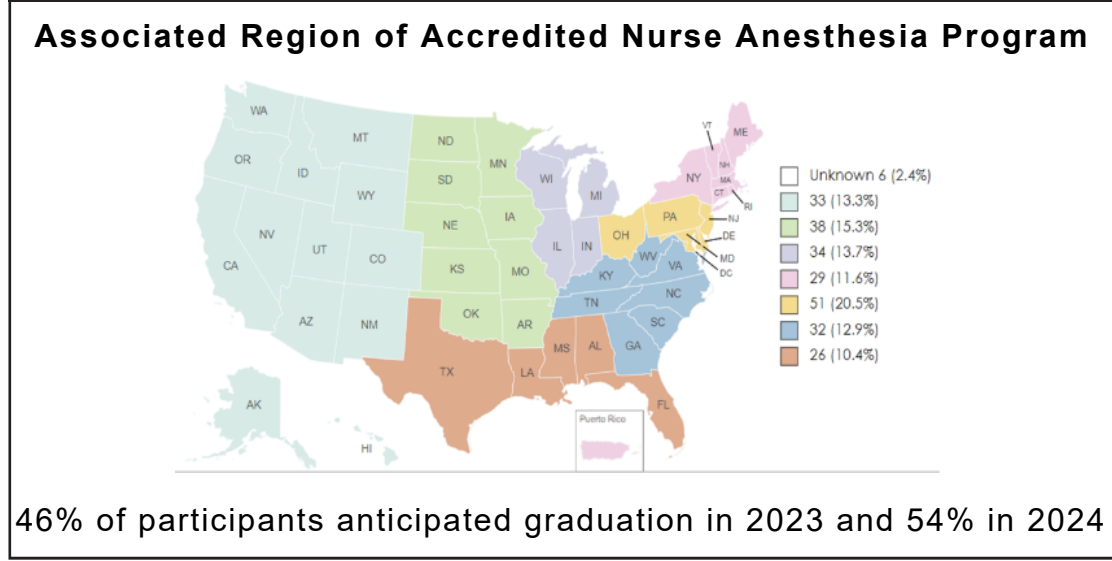
PURPOSE

- To evaluate Student Registered Nurse Anesthetists' (SRNA) knowledge, experience, and perceptions of endotracheal cuff pressure monitoring and manometer use.
- To make recommendations for SRNA curricula based on identified knowledge gaps and barriers to best practice.

METHODS

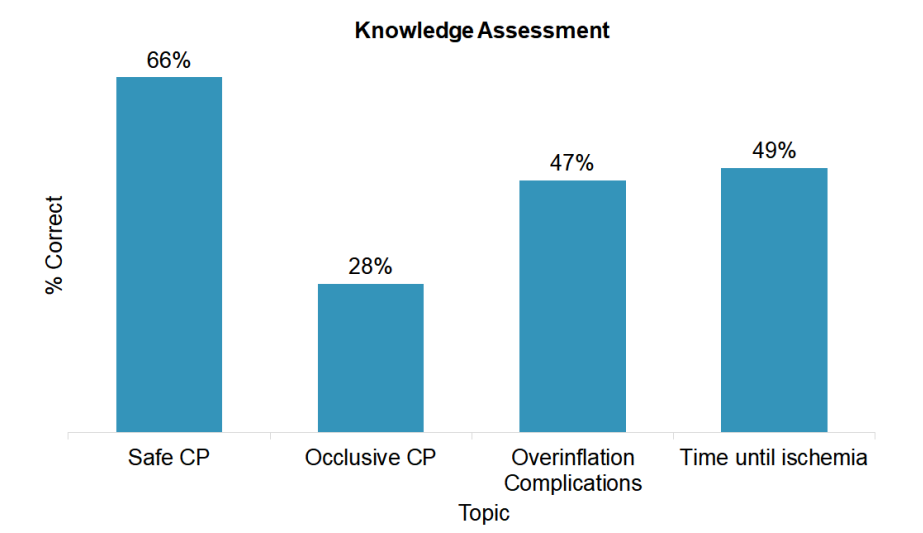
- Inclusion Criteria**
- Current enrollment in an accredited CRNA program in the U.S. including Puerto Rico
 - Anticipated graduation from the program in 2023 or 2024
- Survey Methodology**
- 20-item survey reviewed by 8 experts for content validity
 - Sent to 130 program administrators with a request to distribute to their SRNAs
 - Open for 30 days, April - May 2023
 - Data collected via Qualtrics® XM and analyzed with IBM SPSS® Statistics (Version 28)
- Approved by Northeastern University IRB #23-03-14

RESPONDENT DEMOGRAPHICS, n = 249



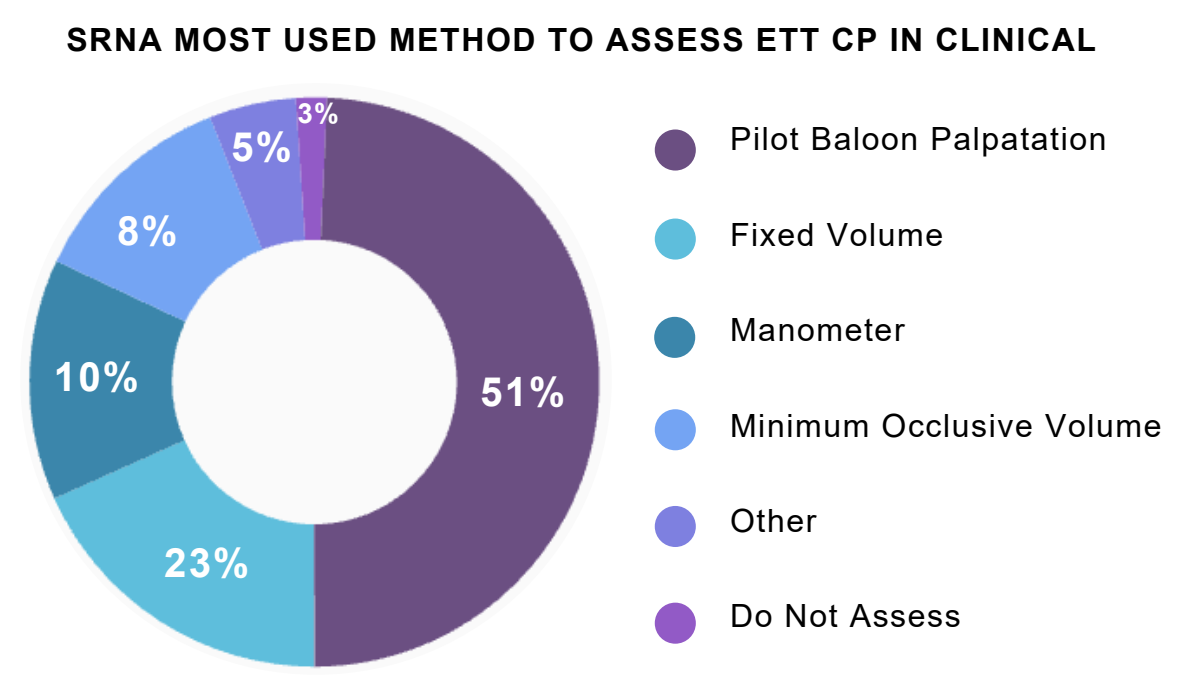
KNOWLEDGE

In the didactic setting, 69% of SRNAs indicated they were taught to use a manometer to assess cuff pressure, while **61% also reported learning pilot balloon palpation.**



Each column represents one question asked about the topic listed. Participants had the option to choose 'Not taught' to reduce the likelihood of guessing.

EXPERIENCE



Barriers to Manometer Use in Clinical

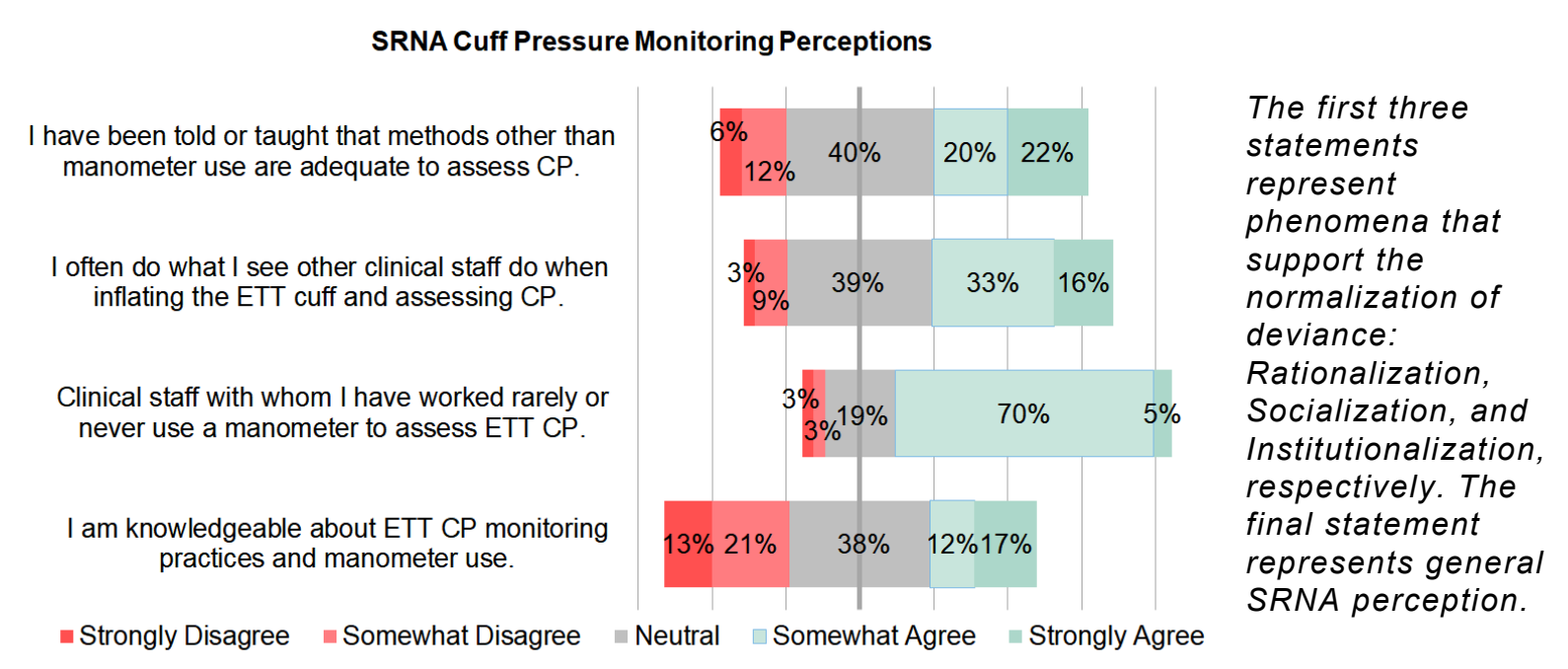
Select all that apply:	frequency	%
No Access	167	70%
Inconvenient Access	125	53%
Not supported within the work culture	110	46%
Not confident using a manometer	45	19%
Other (thematic analysis)	16	7%

Themes that emerged in qualitative analysis include:

- 1) manometer use being an uncommon practice
- 2) manometers being used for the pediatric population
- 3) manometers being used routinely

PERCEPTIONS

Two-thirds of SRNAs were educated to use a manometer and correctly identified safe cuff pressure, but **only 29% felt knowledgeable** about ETT cuff pressure monitoring and manometer use.



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DISCUSSION

- Knowledge**
- Only 4% answered all four knowledge questions correctly indicating a lack of comprehensive knowledge on CP monitoring
 - 72% believed CP should be checked with pediatric patients
- Experience**
- 87% reported never using a manometer or using it for < 25% of intubated cases
 - 36% inflated the cuff with 8 to 10 mL of air
- Perceptions**
- Rationalization – 42% have been told that methods other than manometer use are adequate to assess CP
Top rationales include: 1) uncertain where to find a manometer, 2) no policy, and 3) lack of knowledge
 - Socialization – 49% agreed they often do what they see other clinical staff do when inflating the ETT cuff
 - Institutionalization – 75% agreed that clinical staff rarely or never use a manometer

RECOMMENDATIONS

- ✓ Incorporate an easy-to-integrate educational tool into didactic/simulation learning that includes information on tracheal perfusion pressures, the time it takes for tracheal mucosal damage to occur, circumstances that affect cuff pressure, and complications associated with overinflation
- ✓ Encourage faculty to demonstrate the inaccuracy of pilot balloon palpation
- ✓ Develop a proposal with a cost-benefit analysis for purchasing manometers for the program and/or affiliate clinical sites
- ✓ Provide preceptor training regarding ETT CP monitoring and ensure that manometers are stored in clinically convenient locations



Scan for complete survey results and references.