

# Pseudocholinesterase Deficiency Treatment in the Postoperative Environment



Abe Rummell, DNP Student  
Union University College of Nursing and Health Science  
Faculty Adviser: Dr. Tracy Walker DNP, APRN, CRNA



## Introduction

Pseudocholinesterase deficiency is a rare condition that can have detrimental effects on the surgical patient population. Pseudocholinesterase deficiency can be challenging to diagnose. It can prolong neuromuscular blockade following succinylcholine dosage and require prolonged ventilation after surgery. Recovery from succinylcholine generally occurs within 2-3 min due to its rapid metabolism by pseudocholinesterase. When there are deficient levels of pseudocholinesterase in the plasma, more of the drug can reach the neuromuscular junction resulting in a prolonged neuromuscular blockade. Pseudocholinesterase deficiency is basically undetectable until the patient is exposed to succinylcholine and can remain undetected for most of the patient’s lifetime. ICU admission and ventilatory support are required following the unfortunate diagnosis until the patient can recover from the reaction. The condition and postoperative care are well documented in literature published for the anesthesia community, but the information is not readily available to the nursing community. Although rare, this condition needs to be well understood by the entire healthcare team that will care for the patient postoperatively to provide the safest evidence-based care.

## Objectives

The objective of this project is to provide an educational tool for nurses who care for patients prone to pseudocholinesterase deficiency postoperatively and in need of postoperative ventilatory support, in order to provide an evidence-based program and improve provider confidence.

## Results

Data analysis of the Likert Scale was performed to measure the level of satisfaction of the education piece. Overall, the education piece was well received. The overwhelming results were in favor of the presentation achieving its goal of increasing knowledge about the target patient population and increasing the confidence level of the bedside nurses. The results of the Likert Scale are summarized utilizing frequency analysis and expressed via a bar graph. This information can be found in Likert Scale Results image.

## Summary of Practice Recommendations

The paralytic effects of the reaction will last 6-14 hours.

- The patient will remain intubated.
- The patient will require full ventilatory support for this period.

Pseudocholinesterase deficiency has no effect on the patient's cognitive abilities.

- Follow your hospital policy on sedation for ventilated patients.
- Failure of the patient to move should not be interpreted as the patient is comfortable. Immobility itself is a potential cause of pain and discomfort. Nurses should still ensure that their paralyzed patients receive scheduled doses of analgesics and sedatives.

Furthermore, nurses should exhibit strong communication skills to provide comfort, reassurance, and emotional support. Nurses should also provide interventions to protect paralyzed patients from the risks of corneal abrasion, skin breakdown or pressure ulcers.

Most patients stay sedated on the ventilator over night and weaning parameters are measured the following morning to assess extubation criteria.

## Materials & Methods

This literature review included four case studies and three comprehensive reviews to grasp a deeper understanding of the subject. Analyses were limited to peer-reviewed articles published between 2009 and 2020 to ensure information was as current as possible. Data was compiled so that a concise education tool could guide postoperative care expectations for this population.

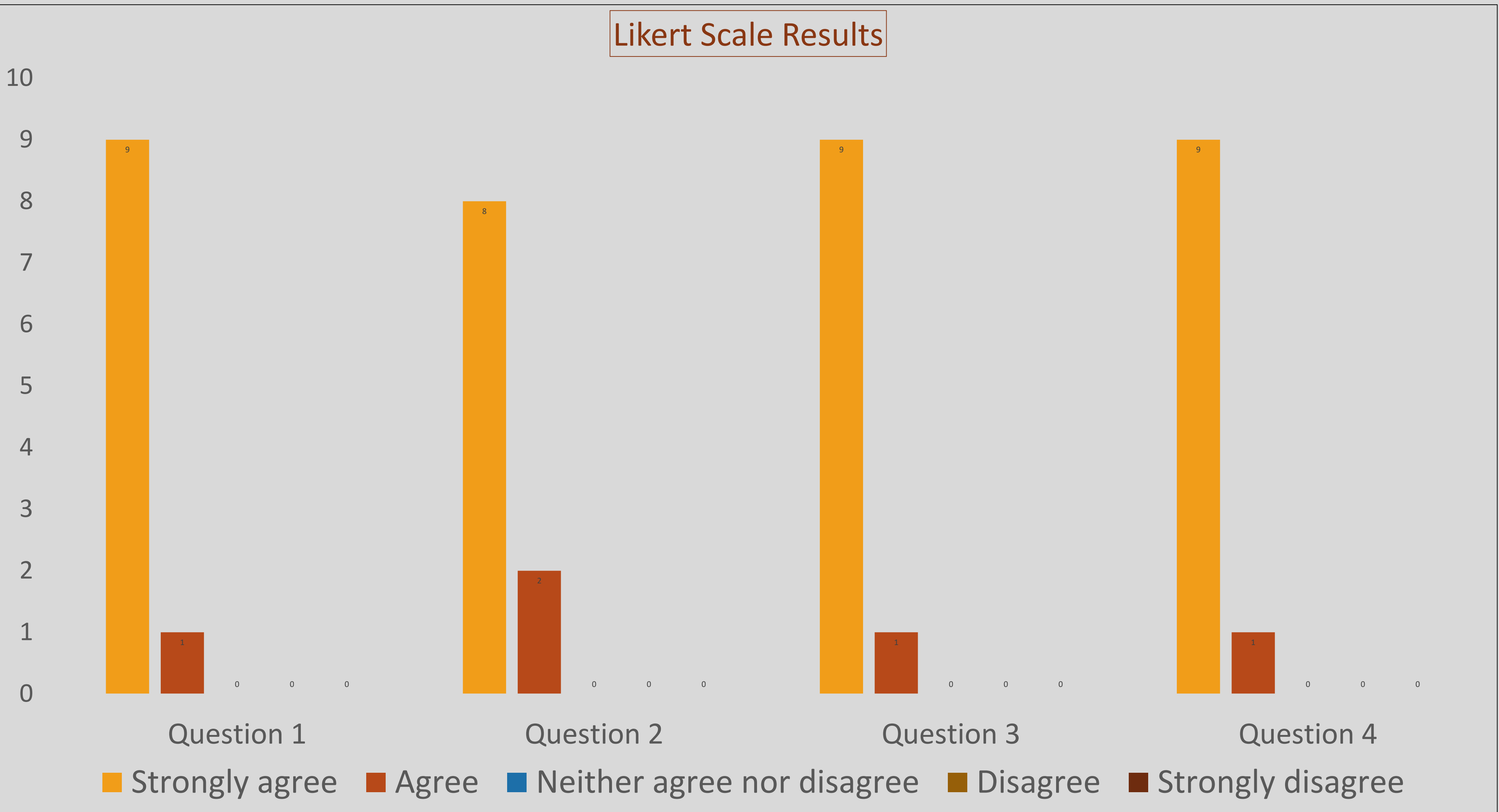
The researcher summarized the education piece into an educational PowerPoint presentation presented to a group of experienced ICU nurses for evaluation. The Institutional Review Board (IRB) granted permission for the presentation. The IRB approved exempt status, and IRB protocol was followed to recruit experienced ICU nurses currently studying anesthesia that could provide an expert evaluation of the presentation. The education PowerPoint was sent to these individuals, followed by a survey link to fill out an evaluation of the presentation utilizing a Likert scale. Participation in the assessment was completed anonymously per IRB protocol.

## Conclusion and Discussion

The study's purpose and presentation are to help fill in the nursing literature gap regarding pseudocholinesterase deficiency. The educational tool achieved that purpose by providing evidence-based education beneficial for caring for pseudocholinesterase deficiency patients and improving provider confidence. The instrument used in the study serves as an introduction to postoperative care of this unique patient population. A second education tool could be developed as a review of the material that can be reexamined as a need before caring for this patient population.

## References

References available upon request.



Question 1: I believe this presentation increases knowledge about how to care for a pseudocholinesterase deficiency patient

Question 2: After viewing the presentation, I am more confident in my ability to care for a pseudocholinesterase deficiency patient

Question 3: The material was presented understandably and, in a time, efficient manner

Question 4: I would recommend this product to those caring for a patient with pseudocholinesterase deficiency

”And let us consider how to stir up one another to love and good works,”  
Hebrews 10:24