

Implementation of Education for a Mechanical Ventilator Weaning Protocol for Tracheostomy Patients

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INTRODUCTION

Tracheostomy

- One of the oldest medical procedures performed in history
- Comprise a small number of overall hospitalizations but are costly and highly resource-intensive
- Adverse events associated with tracheostomies make up approximately half of all airway related deaths and hypoxic brain injury in ICUs

Problem

- Despite a consistent population of tracheostomy patients and a hospital approved mechanical ventilator weaning policy, a mechanical ventilator weaning protocol is not utilized in the Neurology-Neurosurgical Intensive Care Unit (NNICU) at Barnes Jewish Hospital (BJH).

Team Members

- Heather Gunter NNICU Nurse Practitioner
- NNICU Clinical Nurse Specialist
- NNICU Attending Physician
- NNICU Clinical Nurse Educators
- Clinical Educator for Respiratory Therapy Department

Aim

- Develop and implement education on the BJH mechanical ventilator weaning protocol (MVWP) for tracheostomy patients for NNICU physicians, nurse practitioners, registered nurses, and respiratory therapists in order to assess staff knowledge, perceptions, and barriers.

METHODS

PLAN:

PICOT: Do critical care staff (P), who use a ventilator weaning protocol for tracheostomy patients (I), recognize potential complications during the weaning process (O)?

Participants: NNICU physicians, nurse practitioners, registered nurses and respiratory therapists at BJH

1. Develop and then distribute a pre-survey for participants prior to scheduled education from 11.28.22 – 12.11.2022.
2. Begin utilizing the BJH mechanical ventilator weaning protocol for tracheostomy patients in the NNICU on 12.12.2022.
3. Develop and then distribute a post-survey for participants from 1.1.2023 – 1.15.2023.

DO

- Data Collection via Pre and Post Surveys

STUDY

- Utilizing REDCAP, data analysis was performed with descriptive statistics

ACT

- The team decided to adopt the implementation of the BJH hospital policy mechanical ventilator weaning protocol for tracheostomy patients in the NNICU, with the caveat that more education will be required in the setting of current hospital policy change related to mechanical ventilation weaning hospital wide.

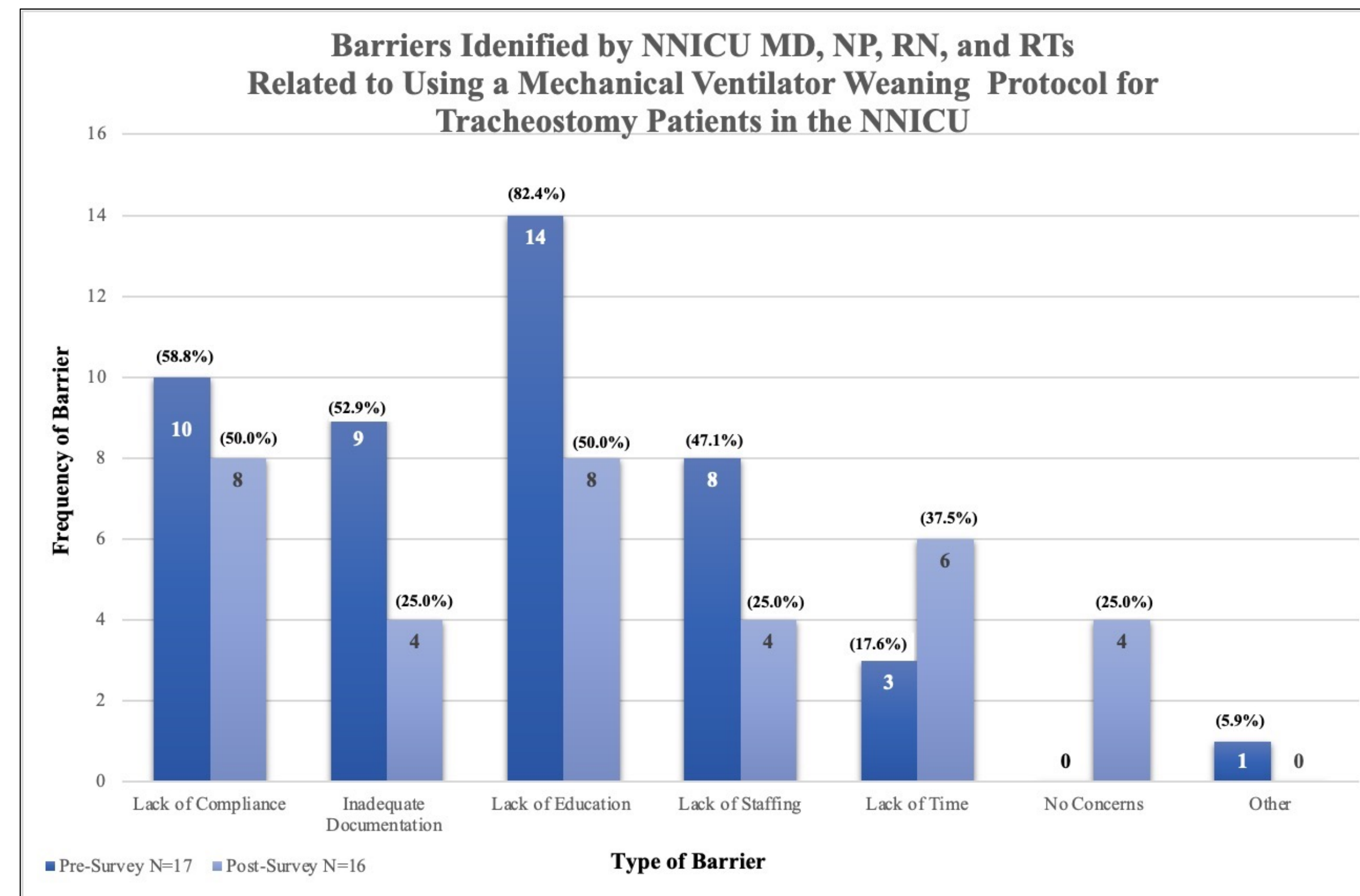


Table 1. Barriers identified by survey participants (physicians, nurse practitioners, registered nurses and respiratory therapists).

RESULTS

- 17 participants completed the pre-survey (MD) n=5, (NP) n=2, (RN) n=10, (RT) n=0
- 16 participants completed the post-survey (MD) n=3, (NP) n=4, (RN) n=2, (RT) n=7
- 53% of pre-survey participants had 5 years or less of experience compared with 25% of post-survey participants
- 47.1% of pre-survey participants had never used a MVWP for tracheostomy patients
- 75% of post-survey participants agreed they understood how to implement the MVWP for tracheostomy patients
- 100% of pre and post survey participants agreed with the need for a MVWP for tracheostomy patients in the NNICU
- 100% of pre and post survey participants agreed a MVWP for tracheostomy patients promotes interdisciplinary care and patient safety
- 82.7% of pre survey and 82.4% of post survey participants agreed a MVWP for tracheostomy patients would prevent tracheostomy related complications

RN subgroup:

- 90% of pre compared with 100% of post survey participants agreed the MVWP promoted consistency among nurses
- 100% of pre and post survey participants agreed the MVWP promote consistency among providers, helps to identify stressors, and supports confidence

MD/NP subgroup

- 100% of pre and post survey participants agreed a MVWP promotes consistency and communication among the healthcare team

RT subgroup: unable to make comparisons as no RT completed the pre-survey

Participant Identified Barriers:

- A reduction in identified barriers was noted after education: lack of compliance pre (58.8%) to post (50%), inadequate staffing pre (52.9%) to post (25%), lack of education pre (82.4%) to post (50%) and lack of staffing pre (47.1) to post (25%)
- An increase in the barrier frequency lack of time from pre (17.4%) to post (37.5%)

Table 2. Excerpt of Survey Questions

Survey Component	Pre-survey N=17	Post-survey N=16
Participant years of experience	Mean 7.5, SD 7.82	Mean 11.44, SD 8.47
A mechanical ventilator weaning protocol for tracheostomy patients is needed in the NNICU	100% of participants agreed	100% of participants agreed
A mechanical ventilator weaning protocol for tracheostomy patients promotes interdisciplinary care	100% of participants agreed	100% of participants agreed
A mechanical ventilator weaning protocol for tracheostomy patients promotes patient safety	100% of participants agreed	100% of participants agreed
A mechanical ventilator weaning protocol for tracheostomy patients prevents tracheostomy related complications	82.7% of participants agreed	82.4% of participants agreed

IMPLICATIONS FOR PRACTICE

- Most participants identified the need and their willingness to utilize the MVWP for tracheostomy patients in the NNICU
- The barriers of lack of compliance and education gave participants the most concerns, highlighting the need for future education sessions and ongoing reinforcement of the protocols; chart audits could be utilized to assess for compliance
- Longer periods of the protocol's use would offer opportunities for further QI projects related to patient metrics such as ventilator days, length of NNICU stay and the potential for reduction of tracheostomy related complications
- A new policy related to SAT/SBT daily trials was implemented in February 2023 which is system wide for Barnes Jewish Healthcare and ties into the weaning protocols for intubated patients as well as tracheostomy patients. This is a new QI measure for BJC within each ICU and compliance metrics will be reported similar to CAUTI and CLABSI rates.

LIMITATIONS

- Small sample size
- Despite completing the education, there were not any RT participants who completed the pre-survey despite completing the educational PowerPoint
- Unable to validate participants who completed the post-survey did indeed complete the educational PowerPoint

REFERENCES



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