

# **A New Model of Tracheostomy Care: Closing the Research–Practice Gap**

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## **Abstract**

Performance improvements have brought about fundamental changes in the past year at Walter Reed Army Medical Center (WRAMC), where a concerted effort is underway to put current research into clinical practice. Tracheostomy care and suctioning became the pilot procedure for these changes in November 2002. What began as a unit-level initiative quickly developed into a Department of Nursing project. The focus of the project is adapting the hospital's existing performance improvement model to better facilitate evidence-based practice. Initial surveys on tracheostomy care conducted throughout the hospital showed an inconsistent level of knowledge and a variation in clinical practice. These inconsistencies represented a patient safety threat in the form of nosocomial infections, prolonged hospitalizations, airway complications, and even death. To address these issues, the Nursing Performance Improvement and Nursing Research Departments entered into a research collaboration. Representatives from these departments worked with clinical experts to develop a plan and timeline for conducting a tracheostomy care project with the goal of implementing evidence into practice and thereby improving patient safety at the hospital. The group completed initial data collection in April 2003 and then began work on the evidence-based procedure. A literature review was completed using online search engines such as MEDLINE<sup>®</sup>, the Cumulative Index to Nursing and Allied Health Literature (CINAHL<sup>®</sup>), the Cochrane Collaboration, Medscape<sup>®</sup>, the American Association of Critical-Care Nurses (AACN) practice guidelines, and the Joanna Briggs Institute. Pertinent articles were identified and evaluated by two independent reviewers. The Agency for Healthcare Research and Quality (AHRQ) levels of evidence were used to grade more than 30 articles. The results of this search were used to develop a WRAMC Department of Nursing Procedure for tracheostomy care, which was completed in September 2003. This new model of evidence-based nursing performance improvement has been in use at WRAMC for 2 years at the time of this writing, and it continues to close the research-practice gap. The WRAMC Department of Nursing is presently developing similar evidence-based procedures for pressure ulcer prevention, deep vein thrombosis prophylaxis, and for enteral feeding.

## **Introduction**

Performance improvement has evolved over the past two decades from quality assurance, to quality improvement, to performance improvement. While different in their subtleties, the common thread running through each of them is the

improvement of safety for patients. As the process of performance improvement has changed, the amount of research relevant to nursing procedures has grown. The application of this scholarly research by clinical staff nurses has become a priority, due to its anticipated positive effects on patient safety. During the past 5 years, systemic change with an emphasis on evidence-based practice has been encouraged.<sup>1</sup> At the same time, studies and papers documenting the discrepancy of available research as it relates to the practice of clinical nursing continue to be published.<sup>2-4</sup> This discrepancy has been labeled the “research–practice gap.” The Department of Nursing at Walter Reed Army Medical Center (WRAMC) has made systematic changes during the past 2 years and has adapted the process of performance improvement to help narrow the research–practice gap. The Nursing Performance Improvement Department has been the impetus for this change and the pilot project chosen to demonstrate the effectiveness of this new approach to nursing at WRAMC is tracheostomy care and suctioning.

## **Methods**

In the years leading up to this change, performance improvement strategies were put into practice on each individual patient care unit. The head nurse for each unit would designate a staff nurse as the performance improvement facilitator. This individual would attend 3 days of lectures on performance improvement processes before returning to work on the floor. Staff nurses regarded performance improvement as an additional duty carried out in an isolated environment. Performance improvement meetings were held each month for the Department of Nursing staff, where each facilitator would present the details of his or her current project, describe the progress made, and seek help if needed. The primary focus of the unit-level projects was data collection and chart audits. Changes to this system were needed before a departmentwide implementation of evidence-based care could be undertaken.

In November 2002, the newly appointed director of performance improvement began laying the groundwork for a fundamental change in the performance improvement process at WRAMC. This change involved a refocusing of the resources available to the Department of Nursing. Involvement increased, beginning with the upper echelons of the leadership structure. Research utilization became the cornerstone of all nursing performance improvement projects. Within the first few months, these changes began shifting the paradigm of performance improvement and invoked a new outlook and attitude among staff nurses. The clinical topic of tracheostomy care and suctioning was chosen for the pilot project on the basis of its significant patient safety implications. An informal clinical survey of this procedure found widespread disparities and variations in technique. Far from being a benign procedure, tracheostomy, suctioning done incorrectly, can lead to nosocomial infections, hypoxia, bradycardia, and dysrhythmias.<sup>5-7</sup> An interdisciplinary team was formed at WRAMC to develop and introduce the hospital’s first evidence-based nursing procedure.

The interdisciplinary team included clinical staff nurses from different areas of the hospital, members of the nursing performance improvement office, nurse researchers, and physicians. This team met on a regular basis to accomplish three objectives: outline the current practice of tracheostomy care, gather the available evidence on this nursing procedure, and develop an evidence-based nursing procedure.

The tracheostomy team was divided into two groups to accomplish these objectives. One group focused on collecting the available tracheostomy care and suctioning research. A literature search of online databases, such as Cumulative Index to Nursing and Allied Health Literature (CINAHL<sup>®</sup>), MEDLINE<sup>®</sup>, American Association of Critical-Care Nurses (AACN) practice guidelines, the Joanna Briggs Institute, and the Cochrane Collaboration, was organized and conducted. Once all the available literature had been collected, two nurses read and graded the research using the Agency for Healthcare Research and Quality (AHRQ) recommendations (Table 1).

**Table 1. AHRQ scale of research grades and levels**

<b>Grade of research</b>	
<b>A</b>	Strongly recommend; Good evidence
<b>B</b>	Recommend; At least fair evidence
<b>C</b>	No recommendation for or against; Balance of benefits and harms too close to justify a recommendation
<b>D</b>	Recommend against; Fair evidence is ineffective or harm outweighs the benefit
<b>E</b>	Evidence is insufficient to recommend for or against routinely; Evidence is lacking or of poor quality; Benefits and harms cannot be determined.
<b>Level of evidence</b>	
<b>Level I</b>	Meta-analysis of multiple studies
<b>Level II</b>	Experimental studies
<b>Level III</b>	Well-designed, quasi-experimental studies
<b>Level IV</b>	Well-designed, non-experimental studies
<b>Level V</b>	Case reports and clinical examples

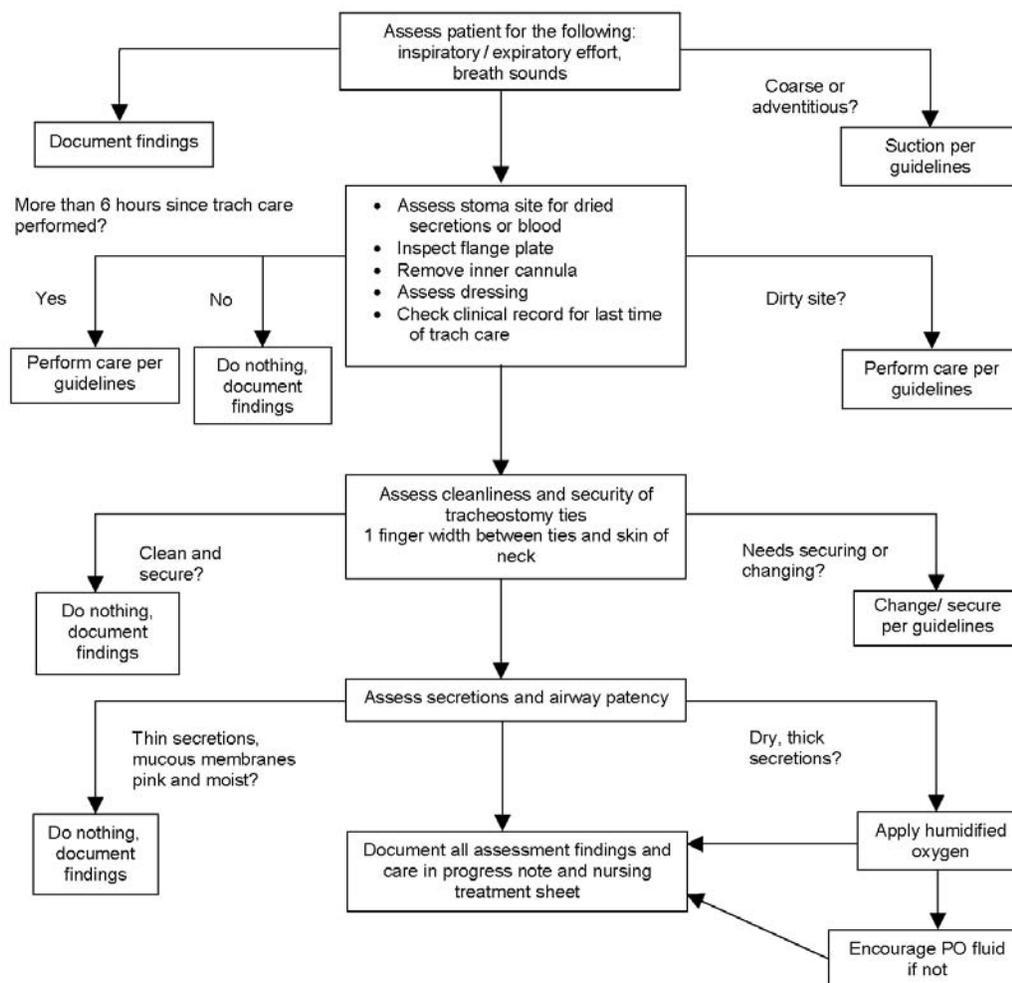
Each study was graded by at least one doctoral nurse researcher. The group then organized all of the graded data to serve as a guide as the procedure was being written (Table 2). The second group gathered clinical data related to the environment of care, nursing documentation, and a staff knowledge assessment. The environment of care was assessed with the use of an inventory of the tracheostomy supplies available at each patient's bedside.

**Table 2. Tracheostomy care literature review**

<b>Author</b>	<b>Subject</b>	<b>Grade</b>
Elpern, et al. (1994)	Aspiration	IV A
Young, et al. (2000)	Aspiration with cuffed tube	II E
Peruzzi, et al. (2001)	Aspiration with dye	III A
Henrich, et al. (1997)	Bedside procedure	IV B
Burns, et al. (1998)	Cannula changes	III B
Crimlisk, et al. (1996)	Cuff management	IV E
Davis, et al. (2002)	Cuff management	III B
Ackerstaff, et al. (1995)	Humidification	IV B
Shelley, et al. (1986)	Humidification	IV E
Cowan, et al. (2001)	Inner cannula	II E
Johnson, Wagner, Sigler (1987)	Inner cannula	IV C
Clarke (1995)	Literature review	V E
Schwenker, et al. (1998)	Professional knowledge	IV E
Ackerman, Mick (1998)	Saline instillation	II B
Ackerman (1993)	Saline instillation	III B
Akgul, Akyolcu (2002)	Saline instillation	II E
Blackwood (1999)	Saline instillation	V D
Bostick, Wendelgass (1987)	Saline instillation	II E
Hudak, Bond-Domb (1996)	Saline instillation	III E
Ji, Kim, Park (2002)	Saline instillation	II B
Kinloch (1999)	Saline instillation	III B
O'Neal, et al. (2001)	Saline instillation	III C/D
Harris, Hyman (1983)	Sterile vs. clean	IV B
Celik, Elbas (2000)	Suctioning	II B/E
Day, et al. (2001)	Suctioning	III A
Hess (2001)	Suctioning	IV B
Isea, et al. (1993)	Suctioning	II B
Odell, et al. (1993)	Suctioning	IV E
Raymond (1995)	Suctioning	IV B
Ridling, Martin, Bratton (2003)	Suctioning	II A
Sole, et al. (2003)	Suctioning	IV B
Swartz, et al. (1996)	Suctioning	IV E
Wood (1998)	Suctioning	V E

The group reviewed the charts of any inpatient who had received a tracheostomy. Finally, staff nurses at WRAMC were given a knowledge assessment test on tracheostomy care and suctioning. After completing a thorough literature review and collecting the staff knowledge data, work commenced on the written procedure. Using an algorithm (Figure 1) to draft the procedure helped to delineate specific clinical decisions that a nurse would need to make during tracheostomy care. Full explanations and available research were included for five major sections of the algorithm, including: emergency procedures, dressing changes, suctioning, tracheostomy tie changes, and special considerations.

Figure 1. Tracheostomy care and suctioning algorithm



Once the procedure had been written, we involved the Nursing Education and Staff Development (NESD) Department in an effort to incorporate the new model into our nursing orientation program. The NESD staff also made the evidence-based procedure part of the annual nursing competencies required by the Department of Nursing. After the approved procedure had been finalized, three units were selected to pilot test the implementation phase. Each unit was

contacted and its staff members received education on tracheostomy care and suctioning. This implementation phase was used to adapt the ongoing projects in nursing performance improvement.

Tracheostomy care and suctioning was the first procedure used to demonstrate our model of performance improvement. Ongoing and future projects funded through the TriService Nursing Research Program (TSNRP) include pressure ulcer prevention, deep vein thrombosis prophylaxis, and enteral feeding precautions to reduce aspiration. The selection criterion for a nursing procedure focuses on its ability to improve patient safety and outcomes.

## **Discussion**

The development of an interdisciplinary team for the purpose of implementing the procedural changes added depth and diversity to the performance improvement process. Each member of the team contributed their professional expertise and helped to sustain the process momentum.

A traditional outline method was used initially to write the procedure. They found that tracheostomy care was not a linear process; rather, the process more closely resembled an algorithm model in the way each health care provider exercised their clinical judgment. After numerous failed attempts to clearly convey the process, the group adapted the style. We incorporated the major parts of the procedure into an algorithm with detailed descriptions and supporting research attached to each point.

As we near the end of this pilot project, we have learned many lessons from the adaptation process, some of which were learned thanks to the strong resources available to us at WRAMC. We now see the value of completing future performance improvement projects in a shorter length of time. As we repeat the process with various patient safety topics, we will strive to implement the procedural changes more quickly, while using the available resources more efficiently. Moreover, we will organize assessment tools for use before and after each implementation, to better evaluate the effect of any changes.

## **Conclusion**

Patient safety is expected to be the highest priority for health care providers. Using an existing performance improvement model, in conjunction with redesigned department-level performance improvement efforts, we have refocused our patient safety efforts at Walter Reed Army Medical Center. Together in partnership, the nursing performance-improvement team, nurse researchers, and clinical staff nurses worked to align existing nursing procedures with the best evidence-based practices, and to reduce variance. Tracheostomy care and suctioning was chosen as the pilot procedure and the target for change. Using the lessons that we have learned we hope to adapt more nursing procedures, in a

more efficient manner, thereby serving to narrow the research–practice gap while further improving patient safety.

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