Clinical and Nonclinical Implications of Misplaced Nasogastric Tubes

Tools for Implementation of Standardized Best Practices

By Olivia Lounsbury,◆ Jennifer Tatro, MSN, RN,† Beth Lyman, MSN, RN,‡ Donna M. Prosser, DNP, RN,* & Haylie Coffey, MSN, RN§
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The consequences of misplaced nasogastric tubes extend far beyond the clinical setting and have implications for the hospital’s reputation and economic stability. A systematic approach for nasogastric tube insertion and verification is necessary in order to prevent misplaced nasogastric tubes which are, indeed, “never events.” The Actionable Patient Safety Solutions (APSS) from the Patient Safety Movement Foundation outline best practices for implementation of nasogastric tube placement protocols in hospitals to ensure consistency across the organization and preserve patient safety at the forefront of all clinical endeavors.

Background
Nasogastric tube (NGT) placement is a common procedure used to provide nutrition, medications, hydration, or gastric decompression. Inadvertent misplacement of these tubes can lead to serious and potentially deadly consequences for the patient and result in lawsuits, fines, or a loss of reputation for the hospital within the community. Clinical complications related to the misplacement of nasogastric tubes include pneumonia, pneumothorax, feeding into the lung, esophageal perforation, and even death. The Patient Safety Authority (PSA) documented 166 nasogastric tube misplacements with 137 into the lung from 2011–2016, with 56 documented to have caused serious patient harm. One United Kingdom National Health Service (NHS) analysis found that 2% of nasogastric tubes placed in the intensive care unit (ICU) were inserted into the pulmonary system. Of these, 0.7% were associated with a significant complication and 0.3% caused death in the patient. A pediatric study of NGT placement verification methods documented that most hospitals use aspiration of gastric contents or auscultation followed by pH measurement and radiograph to verify tube placement. The multifaceted severity of this issue has been recognized in many parts of the world. For example, the U.K.’s NHS classifies NGT misplacement as a “never event” which carries a financial penalty of €10,000 to hospitals proven to have caused preventable harm.

*Corresponding author
Patient Safety Movement Foundation
†UCHealth Memorial Hospital Central
§Children’s Mercy Kansas City
Carolinas HealthCare System Blue Ridge

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While the clinical implications of misplaced NGTs are well documented, the nonclinical implications are significant. Both the senior and junior co-authors agree that nonclinical implications can include a compromised hospital reputation and economic loss. In instances such as Summerville v. Abington Memorial Hospital, a wrongful death lawsuit was settled for $12 million. The malpractice settlement was the result of a NGT misplacement into the left lung which resulted in a 5 million dollar settlement. The tube was inserted twice and the X-ray was misinterpreted. In another case investigated by the California Department of Public Health, a $300,000 fine was levied against Hancock Park Rehabilitation and Nursing Center primarily due to the staff’s failure to follow established medical protocols related to proper feeding tube placement. In addition to the well-known clinical implications, these examples demonstrate the crucial need to develop a systematic approach for hospitals to ensure that misplaced NGTs are, indeed, never events.

## Solution Introduction

The Patient Safety Movement Foundation (PSMF) is an organization of 4,793 hospitals from 48 countries that work together to develop evidence-based approaches to prevent patient harm in an effort to achieve near-zero medical errors. In 2012, the PSMF was established. In 2016, Deanna Visscher told PSMF members about how her son was donated to a critical care population when interpreting a radiograph are:

- Does the tube clearly bisect the diaphragm in the midline?
- Does the tube path follow the esophagus and avoid the contours of the bronchi?
- Does the tube cross the carina or bronchi?
- Does the tube cross the midline in the mediastinum? Is there a hila visible beneath the left hemidiaphragm rather than solely viewing the tip of the NGT?

After the NGT is in place, the APSS recommends checking the first-line method to confirm placement. The recommended cut-off is s.5. This mirrors the standard set by the NHS. The procedure to check NGT insertion is embedded within the APSS. It recommends checking NGT insertion even if the patient is receiving acid-suppressing medications. A radiograph is recommended if staff are unable to obtain a gastric aspirate and there is clinical suspicion of a mechanical deterioration after NGT placement or if an orotracheal tube is present. Measures to confirm placement and supply the APSS with current evidence-based practices for NGT insertion, verification, and ongoing utilization. The APSS recommends verifying NGT insertion using the following methods to verify NGT placement: the use of litmus paper, visualization of fluid from the tube, and observation of bubbles when the end of the tube is placed in a cup of water.

The APSS also recommends frequent and thorough education of staff when product changes occur. The APSS recommends that the senior and junior co-authors agree that nonclinical implications can include a compromised hospital reputation and economic loss. In instances such as Summerville v. Abington Memorial Hospital, a wrongful death lawsuit was settled for $12 million. The malpractice settlement was the result of a NGT misplacement into the left lung which resulted in a 5 million dollar settlement. The tube was inserted twice and the X-ray was misinterpreted. In another case investigated by the California Department of Public Health, a $300,000 fine was levied against Hancock Park Rehabilitation and Nursing Center primarily due to the staff’s failure to follow established medical protocols related to proper feeding tube placement. In addition to the well-known clinical implications, these examples demonstrate the crucial need to develop a systematic approach for hospitals to ensure that misplaced NGTs are, indeed, never events.

## Conclusion

Insertion of an NGT is common practice in healthcare settings in order to provide nutritional support and medical care. The APSS staff fail to appreciate the potential multifaceted implications of a misplaced NGT. Patient harm from the incorrect placement of NGTs can result in significant injury or death and lead to potential lawsuits or regulatory fines. Best practice recommendations state that NGT placement and verification are available, yet these practices are still not widely employed by nursing staff in critical care. In order to reduce the risk of patient harm, organizations should ensure that staff are following current, evidence-based practices for NGT insertion, verification, and ongoing utilization. The APSS recommends verifying NGT insertion using the following methods to verify NGT placement: the use of litmus paper, visualization of fluid from the tube, and observation of bubbles when the end of the tube is placed in a cup of water.

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## About the Authors

Olivia Lounsbury (olivia.lounsbury@patientsafety movement.org) is a clinical research coordinator for the Patient Safety Movement Foundation.

Jennifer Tatro is the manager of clinical quality and patient safety at UCHealth Hospital Hill, Memorial Central in Colorado Springs, Colorado.

Beth Lyman is a nutrition support nurse consultant and senior program coordinator of the Nutrition Support Committee at Children’s Mercy Kansas City.

Donna Prosser is the chief clinical officer for the Patient Safety Movement Foundation.

Haylie Coffey is director of Patient Safety & Nursing at Carolinas HealthCare System Blue Ridge.