

A Call to Action: The Development of Enteral Access Safety Teams

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Abstract

Safety concerns regarding the verification of nasogastric feeding tube placement prompted the American Society for Parenteral and Enteral Nutrition to call for an interdisciplinary, interorganizational group to work on best practices and new technologies to address this issue in pediatric patients. This commentary calls for the development of specialized teams within hospitals to improve the quality of care provided to children and infants who require nasogastric feeding tubes. It is expands on the information presented in an article in the issue by Irving et al regarding the current status of nasogastric tube placement and verification methods. (*Nutr Clin Pract.* 2014;29:264-266)

Keywords

pediatrics; life cycle; neonates; GI access; nutrition

In 1999, the Institute of Medicine (IOM) estimated as many as 98,000 people die each year from healthcare-related errors.¹ Although a great deal of work has occurred in the past 15 years to improve safety, patients continue to experience harm as a result of clinical care and treatment. Our ultimate goal must be to eliminate harm events related to healthcare delivery, but to do so, we must understand the errors that occur and how to design systems and processes that prevent such errors. With all this emphasis on safety, it begs the question: why are nasogastric (NG) tubes still ending up in the lungs of infants and children?

NG tubes are commonplace in pediatric practice, yet significant harm events have occurred related to misplaced NG tubes. Understanding the epidemiology of NG tube misplacement is challenging. National reporting of NG tube harm events is not standardized, and methods to verify tube placement vary across organizations. To learn from and eliminate harm related to NG tube misplacement, further study is needed as well as a clear framework to base interventions. An interdisciplinary group sponsored by the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.), titled New Opportunities for Verification of Enteral tube Location (NOVEL), has formed with a mission to identify and promote best practices for accurate NG tube placement for inpatient and outpatient pediatric patients. In addition, the NOVEL group is interested in the potential of technology development that will support reliable and accurate determination of NG tube placement. In this issue of *Nutrition in Clinical Practice* is an article by Irving et al² entitled “The Challenge of Nasogastric Tube Placement and Verification in Pediatric Patients: Review of the Current Literature.” The reader is encouraged to read more about this clinical dilemma.

Regardless of the challenges, NG tube misplacement has a significant impact on patients, families, and clinical staff, and

it is imperative that we develop strategies to eliminate harm associated with the use of NG tubes. This impact is evident in the following 2 individual and unrelated events as described by a parent and a nurse.

A Parent’s Experience

My name is Deahna, and I lost my son to an avoidable medical error. On April 8, 2008, I gave birth to Grant. He was born with a heart defect that required surgery. He recovered quickly from his surgery. At 11 days old, he was within a couple of days of being released from the hospital, but he died because a nurse made a mistake placing his feeding tube. Instead of being placed into his stomach, the feeding tube was placed into his lung. All day we watched him suffer and then die before our eyes. It was a painful event that I do not want any other children or families to experience.

The day I lost my son is a day I will never forget. It was a day that questions I asked would foreshadow the events that led to his death. In the morning, the nurse felt his NG feeding

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tube needed to be replaced. As she placed the tube, I asked how she would know it was in the right place. The nurse showed me how she would put in a burst of air in the tube and listen through a stethoscope to hear the bubble in his abdomen. I asked the nurse how she could be sure that the sound was coming from his abdomen. She then showed me how fluid was removed from the tube to confirm that the tube was in his stomach. I then asked her how she knew that was stomach fluid and not fluid from elsewhere in his body. She didn't have an answer; instead she told me that I would probably need to learn how to place his feeding tube as he may go home with it and if it came out at home I'd have to replace it. She told me that if that was the case, they would teach me how to do what she did. I did not know then that my questions would come to haunt me, as the very things that I was shown to absolve my fears were proven false. He died that night because the placement was not correct despite the tests the nurse did to verify placement.

Grant only lived 11 days. I mourn my loss daily. Mostly, I mourn for the time I did not get to spend with him. Since Grant's death, I have become determined to find a better and safer method for feeding tube placements so that no other parent or person will have to experience the loss that I have. I know there has to be a better way, and I know we will find it.

A Nurse's Experience

The day started out just like any other day in my 7-year career as a bedside nurse on a pediatric medical-surgical floor. I was caring for 4 patients; one of them was a 3-week-old girl with no prior medical history who was admitted to the hospital with respiratory syncytial virus. The patient was nil per os (NPO), and the doctors wanted me to place an NG tube and start tube feeding. I placed the NG tube like I had done hundreds of times in the past with no complications and checked placement with air bolus and started the feed. The patient developed respiratory distress; a code was called. The patient was transferred to the pediatric intensive care unit, where she was intubated and extracorporeal membranous oxygenation (ECMO) was initiated.

The moment that the patient went into respiratory distress, my whole life changed. I had not missed a day of work in 7 years, but I told my nurse manager that I needed to leave and could no longer be a nurse and that I would not be back to work. I was honestly done being a nurse in my heart and in my mind. Nurses are supposed to help people, not hurt people. I blamed myself for the patient's pain and the parents' pain and suffering. I followed every protocol my hospital had for placing an NG tube and still the NG tube was accidentally placed in the patient's lung instead of stomach. The whole incident made me question not only my skills but also my knowledge. I could no longer be a nurse. I never wanted again to be in a situation where I could do any harm to a patient or patient's family. My heart was broken and I was devastated. I was overwhelmed with guilt and sadness. If it wasn't for my faith and the support

of my coworkers, managers, doctors, and administration of my hospital, I don't think I ever would have worked as a nurse again. It has been well over a year since that incident, but remembering still brings tears to my eyes. It has forever changed me.

A Call to Action

Although more than a decade has passed since the IOM's report *To Err Is Human*, harm events continue to occur.¹ These stories shared by a parent and a nurse clearly illustrate the devastating impact of such events. Families, individuals, and careers are changed forever when patients are harmed in our care. Eliminating serious safety events is our ultimate goal. But what must change to develop a healthcare system that is inherently safe?

Other high-risk systems such as the airline industry, nuclear power, and aircraft carriers have established what is described as a highly reliable organization (HRO). These systems have the potential for catastrophic events everyday, and their processes are very complex. Many of these systems experienced a significant accident or accidents that drove them to establish a culture of safety. Now these systems rarely experience a serious safety event, and errors are infrequent. The lessons learned in these organizations can be used to guide those of us in healthcare to develop our own highly reliable systems. What are the hallmarks of HROs? HROs establish processes that anticipate and prevent errors before they occur, as well as develop strategies to contain or reduce the impact of an adverse event when problems arise.³ HROs use specific principles as a framework when developing their processes. Table 1 identifies the HRO principles and how these might look in a healthcare system.

Patient safety must be paramount to all of us in healthcare. Our skill, knowledge, and service excellence mean nothing if we are unable to keep our patients safe. As we evaluate adverse events that have caused patient harm, it is valuable to use the HRO framework. These principles can guide our work as we design systems that are inherently safe and where no patient is harmed.

An HRO is needed for the placement of nasogastric tubes (NGTs) as the best practices has been a long debated subject. Over the years, a variety of best practice procedures have been outlined, yet according to the literature, there is still a wide discrepancy of which procedures are actually being used.^{2,4-6} This is certainly not a characteristic of an HRO from a professional conduct or institutional standpoint. The bottom line related to NGT placement and verification centers on safety for the patient, but the parent and nurse statements above demonstrate that even following hospital policy does not ensure a safe outcome in this instance.

In addition, the added stressor for the nurse (or caregiver) is the *certainty* that the tube is where it is "intended" to be, to serve the purpose it is intended to serve. A subgroup of the

Table 1. High Reliability Principles and Application in Healthcare Settings.

Principle	HRO Principle Definition	Healthcare Application of HRO Principle
Principles of anticipation	Preoccupation with failure —adverse events are intensely analyzed to understand what occurred, determine actions, and share the lessons learned.	Preoccupation with failure —adverse events along with the analyses and preventive actions are shared within organizations and nationally through patient safety organizations to prevent similar events.
	Sensitivity to operations —as changes occur in workload or in the complexity of processes, the system is able to flex to meet the needs.	Sensitivity to operations —team members brief each other at the beginning of a work shift on patients who may be at particular risk and where resources will be needed.
	Reluctance to simplify —when a problem arises, a quick fix is often not the answer. Interdisciplinary collaboration is essential to fully understand a problem and learn how to prevent it.	Reluctance to simplify —team members listen carefully to others' views and questioning is encouraged. Concerns of all disciplines are valued for their unique perspective.
Principles of containment	Commitment to resilience —processes are used to support early detection of problems and address them quickly.	Commitment to resilience —staff are trained to recognize the subtle signs that may indicate a change in patient status and know how to escalate the issue so it is addressed quickly.
	Deference to Expertise —complex situations are evaluated by an expert best able to address the issue. Knowledge, skill, and experience are used to drive decision making rather than hierarchy.	Deference to Expertise —Experts such as the Rapid Response Team or other content experts are brought to help analyze complex clinical situations

NOVEL project participants conducted a point-in-time prevalence study of NGT placement in children's hospitals across the United States. To date, results from 9 hospitals with a total of 1450 beds have been analyzed, showing a prevalence of NGT use at 25% of patients in those hospitals. The preliminary data demonstrate how widely used temporary feeding tubes are in the United States. Of those hospitals, 62% of the pediatric/neonatal patients had NGTs, 14% had postpyloric tubes, and 24% had orogastric (OG) tubes. The neonatal intensive care unit (ICU) accounted for 69% of the population, the pediatric ICU had 6%, and medical/surgical units had 25% (personal communication with Beth Lyman, MSN, RN, study principal investigator, March 12, 2014). The primary method of verification is auscultation, followed by pH testing, x-ray confirmation, and aspiration of contents; however, there is no consistency of practice among participating centers. Once all the data from the 137 participating hospitals are collected, the researchers anticipate similar results demonstrating inconsistency of practice. So the question becomes, what else can we do?

To address the complex issues related to pediatric venous access with competency, venous access teams were formed. To address the issues related to urgent but not yet life-threatening clinical deterioration, rapid response teams were created. Now is the time to form an Enteral Access Safety Team (EAST). These would be professionals who are specially trained in the most current techniques and best practice guidelines, focused on ensuring the appropriate tubes/sizes for the patient setting, with one main goal being insertion and verification of placement of NGTs. Other foci would include gastrostomy tubes, transpyloric tubes, and other enteral access devices.

This type of team would best fit into the Deference to Expertise category of Table 1 since these individuals would serve as a resource for bedside nurses, home care nurses, parents, and other healthcare professionals who care for children with any type of enteral tube. Such a group of trained individuals would potentially be able to promote better outcomes and improve the safety of the patient. In addition, these individuals would collaborate with industry partners and vendors to make recommendations related to materials used to create tubes, ease of use and verification, and the development of ongoing training modules, seminars, and/or procedures. The ultimate goal for caregivers of children, who have NG/OG tubes, is that no other child would suffer adverse consequences of misplaced NG/OG tubes. What better safety outcome could we ask for?

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