NORA: Where do we go from here? Six clinical challenges for the future.

Over the past 2 years, we have presented the analogy of Non-Operating Room Anesthesia (NORA) as if it were a stock. Because the growth of NORA was so new, we chose to present it in a way as to show the advantages of its growth. Now, it seems as though most programs have at least a basic familiarity with the concept of NORA. When we think of the challenges that NORA presents, we think both globally and locally. What are the "global" issues to all NORA cases, including the GI suite, nursing, recovery, pharmacy? What are the economic concerns that we face? What are the "local" issues unique to the site, such as noise, radiation, space, lighting, or the magnet? How does the hospital make money? How do we bill for services? Where do we go to get answers? How does anyone prepare for this?

Over time we were being asked to provide more and more, services to areas outside of the operating room where we are not familiar, or comfortable with on several levels. We felt at times perplexed or even overwhelmed without the security of the operating room. Questions arose, usually along three lines of thought:

1) Where are all these cases coming from, and why? Part of the reason is the evolution of technology with an aging population, and part of the reason is the economic factors driving the shift to non-operating room medicine: minimally invasive procedures, cost savings, patient expectations for an anesthesiologist to be available (with propofol), CMS reimbursement, insurers, and hospitals that want inpatients.

2) What are the issues that arise in any NORA suite? Whenever a case is done a NORA suite, multiple factors need to mesh together to provide superior patient care. In the operating room, everything is codified and rules of engagement are well defined. In the NORA suite, concerns arise from many variables, such as distance from the operating room, physician back-up, communication abilities, team individuals who do not understand anesthetic management, poor or ill maintained equipment, inefficient scheduling, inadequate supply of stock items as well as emergency equipment, inadequate physical facilities, and auxiliary staff that may not understand the procedure.

3) What do we need to know to actually do these cases? What is best for the patient? What is best for the provider? How do we staff these obligations? Who pays for our time, expenses, monitors, and auxiliary staff?

These same questions are being asked everywhere. Now, the newness has worn off. NORA is a fact of our collective lives, and the numbers will only continue to grow. We foresee six Clinical Challenges that lie before us in the NORA Suite.

1) The first set of challenges revolve around **the patient**. With improvements in technology and an aging population, we are seeing sicker and sicker patients submitted for procedures that would have been unthinkable a few years prior.

2) The second set of challenges revolve around issues of **safety, vigilance, communication, and monitoring.**

3) The third set of challenge reflect **the evolution of technology and innovation** merging with patient care that will give rise to more new and complex procedures, such as POEM (Per Oral Endoscopic Myotomy).

4) The fourth set of challenges concern the need to **raise the standards of the NORA suite** up to that of the Operating Room, with best practice guidelines and standards.

5) The fifth challenge is: How do we **educate our residents and practitioners** now and in the future?

6) Finally, with all the changes that will affect our specialty **economically**, both in shared reimbursement models and staffing needs, how do we recognize **the need for collaboration** with other specialties of medicine, such as the gastroenterologists?

1) Let's take a look at our first challenge, Patient Issues

Patients in NORA cases in general are older and have high risk. Therefore, the importance of a thoughtful pre-operative examination and discussion of expectations will be important in determining which patients are appropriate candidates for out-patient procedures, especially in the future. For example, patient issues in the GI suite will revolve around the challenge to our ability to share and maintain the airway safely. The type of cases we perform provide challenges to our abilities to maintain an adequate airway and protect against aspiration. Aspiration risk is also increased often by the presence of bowel prep, obesity or GI Bleed. Access to the airway itself may be difficult, either because it is shared, as in upper endoscopy, or the patient is prone, such as ERCP. Often, the room is dark, further decreasing our ability to monitor the patient. Hemodynamic instability is also a concern because often these are elderly patients with either a cardiac history or limited cardiac reserve, they may have been bleeding, they are often dehydrated not only from being NPO, but also from the highly osmotic bowel prep. Whenever the bowel is distended, the patient is at risk for a vagal response. Finally, an increasingly aware and educated patient population increasingly demands propofol sedation for even routine outpatient procedures, and that an anesthesiologist to be there to administer the medications safely.

2) The Second Challenge: Safety, Vigilance, Monitors, and Communication

An examination of closed claims of anesthesia for procedures outside of the operating room illuminate some of the differences and perils that we face. Patients that undergo NORA procedures are almost ten times more likely (58% v 6%) to have their procedures done under Monitored Anesthesia Care (MAC). Our patients often were at a more extreme age (50% v 19%). Our patients are sick, with 61% listed as ASA category 3-5, and old, with 38% being 70 years or older. Poor ventilation or inadequate oxygenation was the most common damaging event, comprising one third of all claims in the NORA suite, as opposed to only 2% of those in the traditional operating room. Prevention of a claim through better monitoring was judged to be a factor in almost one-third of cases, 32%, v 8% for the operating room. Death in the NORA suite occurred as a result occurred 54% v 24% in the operating room, again, with some of the NORA claims more often deemed as a result of substandard care or better monitoring.

So what is to be done? The number of these cases continue to grow every year. The NORA suite will always have the potential for poor outcomes. However, we can minimize this by focusing on a few key improvements. There is, of course, no better monitor than a vigilant anesthesiologist. He or she needs to have the resources, the training, and the monitors, including CO2-capnography as well as pulse oximetry, to provide safe effective care. Anesthesiologists will also need to lead in training anesthesiologists in NORA, and perhaps airway management for staff. We need to develop minimum standards for sedation and monitoring in the NORA setting. Last, it is important for the team to be able to develop skills needed to communicate any issues or concerns in real time, all with the goal of vigilant safe patient care.

3) The Third Challenge: Technology

The evolution of Improved Technology merging with patient care for new and complex procedures Advances in technology, broadened skills of proceduralist, and an aging population have led to new procedures are being developed across the spectrum of NORA. One example of such a procedure is Per Oral Endoscopic Myotomy, or POEM. POEM is a less invasive procedure designed to treat achalasia.

POEM is a part of the Natural Orifice Transmural Endoscopic Surgeries or NOTES procedures. Under general anesthesia, with positive pressure ventilation, the esophagus is insufflated with CO2 and a myotomy incision is made through the Gastroesophageal (GE) Junction. POEM provides several challenges to the NORA team involving equipment, communication, and safety that we all need to become familiar with. With improved technology and better equipment, who knows what other new types of procedures await us? The point is this: the challenge before us is that over the next several years, many other new and complex procedures will be developed that we as anesthesiologists will need to understand and overcome in order to provide the best service to the practitioners as well as providing the safest, best quality care for our patients.

4) The fourth issue is rising the standards of NORA to that of the operating room by establishing best practice standards and guidelines.

The rapid expansion of NORA cases is happening across the nation, both academically and in private practices. With this growth comes obvious opportunities as well as obvious challenges. Questions such as "What do I need to know? How do we do anesthetize these sick patients? What kinds of meds (or equipment, or staffing, or ancillary support, etc.) do we need? Is the jet-ventilator important? How do we perform pediatric cases? And what about the economic issues? What staffing models work best? How do we bill and collect?" These conversations are happening in hallways and conferences room across this country, and, until recently, there were no uniform answers to these questions.

This brings us to SONORIA. For a variety of reasons, communication, cooperation, and collaboration with the other specialists in the NORA suite has the potential to be problematic, but that communication, that cooperation, and that collaboration has also never been more important, both for the care of our common patients as well as our mutual economic well-being. SONORIA was formed to be a bridge among specialties to work and collaborate on the issues that we together face. Because SONORIA strives to include all the stakes holders, Anesthesiologists, Radiologists, Pulmonologists, and Cardiologists, it is uniquely positioned to be an effective voice to all interested parties, a platform to address our unique needs, and a forum to exchange information between the specialties. SONORIA will enable us to work with others outside of our specialty to advance and provide information. It will work with others in medicine, such as the AACD, to be a clearinghouse, a resource for answers. The challenge, and indeed, the opportunity is to bring NORA standards, such as monitoring and best practice methods, up to the present on a level that is equal to that of the operating room. Groups such as the AACD and SONORIA can provide the leadership that our specialties need to establish the protocols necessary for safe, efficient, effective practice. SONORIA then leads us to the fifth challenge:

5) How do we educate our residents and practitioners?

Recognizing a need, and seizing an opportunity, the University of Pennsylvania has developed one of the first, if not the first, core resident rotations dedicated to teaching the principles of NORA cases. This 2 week NORA core rotation of first year residents consists of 1 week of learning in the GI/Endoscopy suite, and 1 week in the Electrophysiology lab. Residents are also exposed to neuroradiology cases in their in neuro-anesthesia rotation. This program developed a set of goals for our NORA rotation, and employs a consistent, dedicated lecture series covering the broad spectrum of NORA topics to reinforce these important aspects of NORA training. This program emphasizes excellence of patient care delivered in an efficient manner, emphasizes hands-on case involvement, as well as didactic teaching. The NORA course is delivered within the context of our core values. We emphasize the development of research in the NORA field, relating both to best-teaching and best-care practices.

This NORA teaching rotation has been very successful. Indeed, so successful that it was brought to the attention of Residency Program Directors from around the country. As a result of their discussions and deliberations, it has now been mandated by the RRC (the Residency Review Committee) that ALL

anesthesia residents in the United States be trained in NORA cases beginning in 2016. The goal eventually will be to standardize the training of our residents so that every graduate of an American residency program will provide the highest level of care not only to his or her patients inside the operating room, but outside of it as well. This brings us to the sixth challenge for our specialty.

6) How will these changes affect us economically? How can we collaborate in the future for our mutual success?

How will factors such as the Affordable Care Act affect our ability to earn a living? How will bundled payments affect the specialties? And more locally, who pays for the extra staffing, equipment and resources that these new cases will consume? How do we teach and inform both our practitioners about these economic issues as they develop or change? This is where our societies, like the AACD and SONORIA, can provide the leadership needed to establish the protocols necessary for safe, efficient, effective practice.

The challenge, and indeed, the opportunity for all of us is the accumulation, assessment and assimilation of a vast amount of information about a new and growing sub-specialty of medicine, NORA. With advances in technology, an aging population, and improved procedural techniques, access and information to, of, and about NORA cases will continue to grow. In the future, perhaps in partnership with technology or business concerns, universities, government health care agencies, or insurance companies, this information could be made accessible to today's practitioners through hand-held or mobile devices, or even be used to influence the provision of resources used in public health-care. All of us at the AACD, like SONORIA, recognize the obligation and the opportunity to move our field forward. We recognize that tomorrow, all of these NORA cases, and groups like the AACD and SONORIA, have the potential to change how we practice medicine, how we teach our residents and practitioners, how we earn our income, how we collaborate with other specialties, and perhaps how we provide the resources for health care in the future.

Respectfully submitted,

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