Closer to the Mean: An Argument for Decreased Variance in Surgery

Wayne D. Hsueh, MD1, and Marc J. Gibber, MD1

Abstract

Variation, long accepted to be the norm in otolaryngologic surgical practice, has recently come under scrutinization. Efforts can be seen daily in the operating room to standardize procedures with time-outs, checklists, and protocols. The thought is that by enforcing repetition and eliminating variation, it is possible to decrease human error and reduce cost. However, there is understandable resistance from surgeons in removing the “art” from surgery. We propose that standardization, if appropriately put into practice, can improve surgical outcomes and efficiency and even enhance resident education.

Keywords

otolaryngology, standardization, surgery

Received August 6, 2015; revised September 23, 2015; accepted October 6, 2015.

Many would argue that variety is the spice of life; however, is it true in surgery? An obvious and somewhat unquestioned maxim in surgical care is that every surgeon has his or her own unique way of performing an operation. Patients are provided one operation at a single institution.2 Backer et al described an 18-year review of 4 techniques in pediatric tracheal surgery.3 There are also numerous “How I do it” articles published by surgeons seeking to share their innovative techniques with the surgical community.

These variations, however, are exactly what many industries, including medicine, are trying to replace with standard operating procedures. The often cited—and criticized—example of this is the comparison between aviation and medicine. After a 1999 report by the Institute of Medicine titled To Err Is Human, which estimated that 98,000 patients die annually from preventable medical errors, health care has sought to emulate the airline industry with communication protocols, debriefings, and checklists.4 Dr Atul Gawande further popularized this notion with his book The Checklist Manifesto: How to Get Things Right, a New York Times best seller.

Standardization has begun to take root in surgery. This has already been seen with pre- and postsurgical checklists and protocols that have reportedly decreased patient morbidity and mortality.5 The LOTUS trial demonstrated that surgeons are able to standardize their work.6 In this study, 40 surgeons were asked to divide into 6 groups and to each propose a common complete procedure. This resulted in 6 presentations with almost exactly the same recommendations and excluded variations, with >95% of surgeons following >90% of the recommended steps. Armstrong et al proposed a taxonomy in microvascular anastomoses using hierarchical task analysis that described the relation between surgical technique and outcomes to determine best methods and established teaching points for surgical training.7 Stark et al also proposed standardization of surgical technique in vaginal hysterectomies and caesarean sections,7 and the American College of Obstetricians and Gynecologists recently released a committee opinion that “standardization of practice to improve quality outcomes is an important tool in achieving the inspired shared vision of patients and health care providers.”8

Many surgeons are reluctant to embrace standardization. One obvious concern is that this approach fails to acknowledge or account for individual differences among patients. Furthermore, unforeseen complications, which are often out of a surgeon’s control, can force the course of surgery to change. Establishing a standard that is widely accepted and

1Department of Otorhinolaryngology–Head and Neck Surgery, Albert Einstein College of Medicine, Bronx, New York, USA

Corresponding Author:
Wayne D. Hsueh, MD, Department of Otorhinolaryngology–Head and Neck Surgery, Albert Einstein College of Medicine, Montefiore Medical Center, 3400 Bainbridge Ave, Medical Arts Pavilion, Third Floor, Bronx, NY 10467, USA.
Email: whsueh@montefiore.org
evidence based is another difficulty. Research in surgery has been plagued with a lack of strong evidence and prospective trials, with most recommendations consisting of expert opinion. Finally, one of the most interesting arguments against standardization is its potential impedance of innovation. Although deliberate research can still be performed, without variability surgeons may not be able to stumble on an unexpected new approach that works better. However, this must be balanced with the potential harm of novel ideas. Rosenfeld recently described a number of “gizmos” with unproven utility, such as lasers for myringotomy and frenectomy and balloons for opening up clogged ears, blocked sinuses, and narrowed airways. There is definitely an important argument to be made for balancing innovation with appropriate scientific study and government regulation.

Standardization also allows for improved surgical training. Currently the “see one, do one” model for teaching complex procedures may no longer be appropriate. Graduated independence as the hallmark of procedural training is being challenged as patient safety is brought into question and work hour restrictions are enforced. By analyzing operations for standardization, key steps are identified and recorded systematically. This allows for consistency in reproducing a procedure and teaching residents. Furthermore, it is equally important not only to show what a surgeon is doing but also how they do it, the tools and conditions that affect how they do it, and the associated procedural and task outcomes.

A variety of surgical techniques for the “same” surgery are currently the accepted norm. The challenge is to develop operation standardization that ensures excellent patient outcomes and efficient surgical training while allowing flexibility to individualize patient care and promote innovation. By studying and implementing operation standardization in the surgical realm, we may allow for the dissemination of best practices to the benefit of both patients and physicians.

Author Contributions
Wayne D. Hsueh, literature review, drafting manuscript; Marc J. Gibber, literature review, editing manuscript.

Disclosures
Competing interests: None.
Sponsorships: None.
Funding source: None.

References