

A High Reliability Organization's Use of the Evidence-Based Practice Process to Eliminate an Identified Potential for Wrong-Site Surgery

Salvacion Sonia Cruz, MSN, RN, CCRN; JoAnn Mick, PhD, RN, NEA-BC, NPD-BC, EBP-C

Key words: *wrong-site surgery, hand surgery, never events, high reliability organization, finger nomenclature.*

During the past two decades, the scientific body of evidence has provided information to assist hospital organizations with improving quality and safety and reducing medical errors. The Joint Commission has consistently challenged the health care delivery system to align with the concepts of high reliability used by many high-risk industries. High reliability organizations have been defined as complex, high-risk environments that deliver exceptional safety and practice consistency every day.¹ Wrong-site/-procedure/-patient surgeries were identified in 2011 as the second most frequently reported sentinel event reported to The Joint Commission,² and a 2019 report reveals that wrong-site surgery errors continue to be one of the most frequent sentinel events reported to The Joint Commission.³ Prevention of wrong-site and wrong-procedure surgeries remains an issue of concern and patient safety for perioperative nurses across the country.² Both The Joint Commission and the National Quality Forum consider wrong-site, wrong-procedure, and wrong-patient surgeries to be never events.⁴ In the United States, never events are non-reimbursable by Medicare and Medicaid.⁵

Wrong-site surgery is defined as a procedure performed at the incorrect anatomical site.⁶ A review of the history of wrong-site surgery revealed that The Joint Commission issued a sentinel event alert in August 1998 to examine the problem of wrong-site surgery.⁶ In 2002, The Joint

Commission established the National Patient Safety Goals to help leaders at health care facilities address potential patient safety issues by identifying safety risks inherent in their patient population.⁷ By 2003, The Joint Commission identified the requirement for a formal verification process to help health care workers preoperatively confirm that they are prepared to perform the correct procedure on the correct patient at the correct body site.⁶

As part of ongoing risk assessment, a nurse employee in a large health care system in the southwestern United States identified variation in the terminology being used when describing fingers on patients undergoing hand surgery. The nurse found that two different nomenclatures were being used:

1. numbering with variation in counting the thumb as "1" and fingers as "2-5" or counting the thumb plus fingers as "1-4"; or
2. naming the fingers as thumb, index, middle, ring, and little finger.

Understanding that variation can create the potential for wrong-site surgery, the nurse identified the need to standardize the terminology used to identify body parts when describing the surgical site.

The organization's culture of clinical inquiry supported independent conduct of an evidence-based practice project to address the identified concern. The project aimed to

<http://doi.org/10.1002/aorn.13219>
© AORN, Inc, 2020

standardize practice for the naming of fingers to promote patient safety and prevent any potential for surgical error during hand procedures conducted in the hospital setting. The PICO (population, intervention, control, outcomes) question that guided this project was: Among health care providers documenting on or performing procedures involving fingers, what are the best practice recommendations for finger nomenclature to standardize identification and documentation of fingers, promote patient safety, and prevent incidence of wrong-site procedures?

THE CHANGE

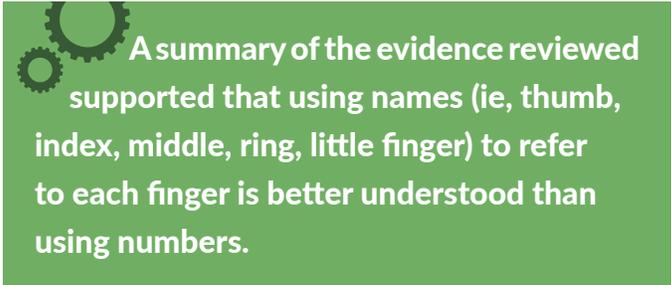
The nurse retrieved 16 evidence sources from searches in PubMed and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) databases. A review of this evidence revealed that researchers identified fingers and hands as two of the three most common locations of wrong-site surgery.⁸ Wrong-site errors have been identified in approximately one in 100,000 surgeries, often related to poor communication among medical staff members.⁹ Most of the cases of wrong-digit or wrong-side surgeries identified were orthopedic cases.⁸ In 2018, researchers estimated the incidence of wrong-site procedures on the hand as one in every 27,686 procedures, with most errors occurring on a finger.⁵ The authors also identified that patients have taken legal action in one-third of all incidences of wrong-site hand surgery.⁵

Researchers identified clear description of anatomical location as an essential factor for communication between health care providers.¹⁰ The authors identified that since 1970, the Committee on Standardization of Nomenclature has provided the preferred vocabulary for use when defining anatomy and conditions of the hand. They reviewed 157 articles in the *Journal of Hand Surgery* and found 33 discrepancies in nomenclature. Most discrepancies were associated with the use of numbers instead of finger names because numbering of fingers could start from the little finger, the index finger, or the thumb. The authors identified that numerical description does not clearly and universally indicate which finger is being referred to and therefore recommended that clinicians should use names of fingers to prevent errors.¹⁰

In 2006, researchers conducted a study comparing the two methods of identifying fingers (ie, use of numbers or use of names) to determine which method was

better understood.¹¹ The result of their comparative study revealed that participants demonstrated better understanding when finger names were used than when numbers were used.¹¹ In 2019, researchers identified that if clinicians use correct, clear terminology for hand surgery, then documentation and reporting of hand conditions and treatments can improve.¹² To avoid errors in clinical practice, the authors recommended that clinicians use the names *thumb*, *index finger*, *middle (long) finger*, *ring finger*, and *little (small) finger* instead of numbers when referring to each individual finger.¹²

A summary of the evidence reviewed supported that using names (ie, thumb, index, middle, ring, little finger) to refer to each finger is better understood than using numbers and is therefore the preferred system for finger identification.¹⁰⁻¹⁴ After synthesizing the evidence, we conducted a quality improvement project to change current practice at our facility to meet the identified practice recommendation for standardized finger nomenclature.



A summary of the evidence reviewed supported that using names (ie, thumb, index, middle, ring, little finger) to refer to each finger is better understood than using numbers.

A large number of committees and subcommittees reviewed and discussed the identified potential for wrong-site surgical errors because the project would likely involve a system-wide change in electronic documentation. We invited the surgical department leaders; clinical support and senior information analysts; the chief medical officer; and representatives from the Operating Room Council, Nursing Operational Department, Medical Executive Committee, Risk Management Department, Radiology Department, System Quality/Patient Safety/Infection Control Committee, Medical and Surgical Council, System Critical Care Council, System Women's and Children Council, and other appropriate organizational councils and committees to participate in reviewing and approving the proposed plan. After completing the review and approval process, we submitted the proposal to the Information System Department for electronic medical record documentation changes

to provide finger names as the only possible options for selection when documenting fingers.

EVALUATION OF THE CHANGE

We standardized the finger terminology system-wide for use when describing the fingers to be involved in the surgical procedure to prevent the possibility of wrong-site surgery. Representatives across the system developed and implemented system-wide education plans to inform employees at all system campuses of the change in practice with documentation and communication when describing fingers involved in surgical procedures.

IMPLICATIONS FOR PRACTICE

It is important to continually question current practice, assess for potential risk to patient safety, and investigate and apply best practice recommendations to ensure optimal practice and outcomes are achieved. Organizations that provide a culture of clinical inquiry and support for autonomous project work to remove any identified risks for error align with the recommended concepts of high reliability and meet The Joint Commission's requirements to identify and communicate process flaws that may lead to error so that they can be addressed immediately. Prevention of wrong-site surgery involves ensuring that the correct surgery is performed on the correct patient and at the correct place on the patient's body. By following the evidence-based practice, the potential for wrong-site surgery related to finger naming has been addressed with standardized nomenclature and increased awareness of patient safety for procedures involving patients' hands at our organization.

REFERENCES

1. Gaw M, Rosinia F, Diller T. Quality and the health system: becoming a high reliability organization. *Anesthesiol Clin*. 2018;36(2):217–226.
2. Steelman VM, Graling PR, Perkhounkova Y. Priority patient safety issues identified by perioperative nurses. *AORN J*. 2013;97(4):402–418.
3. Summary data of sentinel events reviewed by The Joint Commission. The Joint Commission. <https://www.jointcommission.org/-/media/tjc/documents/resources/patient-safety-topics/sentinel-event/summary-2q-2019.pdf>. Published July 1, 2019. Accessed June 7, 2020.
4. Neily J, Soncrant C, Mills PD, et al. Assessment of incorrect surgical procedures within and outside the operating room: a follow-up study from US Veterans Health Administration medical centers. *JAMA Netw Open*. 2018;1(7):e185147. <https://doi.org/10.1001/jamanetworkopen.2018.5147>.
5. Brown RD, Hammert WC. Safety in hand surgery: eliminating wrong-site surgery. *Plast Reconstr Surg*. 2018;142(4):561e–565e. <https://doi.org/10.1097/PRS.0000000000004803>.
6. Carney BL. Evolution of wrong site surgery prevention strategies. *AORN J*. 2006;83(5):1115–1122.
7. National patient safety goals. The Joint Commission. <https://www.jointcommission.org/-/media/tjc/documents/fact-sheets/npsgs-fact-sheet-12-18-19.pdf>. Published December, 2019. Accessed June 2, 2020.
8. Meinberg EG, Stern PJ. Incidence of wrong-site surgery among hand surgeons. *J Bone Joint Surg Am*. 2003;85(2):193–197.
9. Hempel S, Maggard-Gibbons M, Nguyen DK, et al. Wrong-site surgery, retained surgical items, and surgical fires: a systematic review of surgical never events. *JAMA Surg*. 2015;150(8):796–805.
10. Kumar G, Kamath V, Murali SR. Nomenclature in the Journal of Hand Surgery. *J Hand Surg Eur*. 2004;29(1):85–86.
11. Wraight WM, Smith JD, Floyd D. Nomenclature for fingers and phalanges: to name or to number? *J Plast Reconstr Aesthet Surg*. 2007;60(4):368–371.
12. Tonkin M, Hooper G, Bo Tang J. Terminology for hand surgery: digits, thumb, fingers, names and numbers. *J Hand Surg Eur*. 2019;44(6):657–658.
13. Bassett R. Finger and thumb anatomy. UpToDate. https://www.uptodate.com/contents/finger-and-thumb-anatomy?search=finger-and-thumb-anatomy&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1#topicContent. Updated April 10, 2020. Accessed June 1, 2020.
14. Metzger JT, Hallock R, Suddard OV. Correct nomenclature of the fingers. *JAMA*. 1965;193(12):1030–1032.

Salvacion Sonia Cruz, MSN, RN, CCRN, is a level IV RN in the preoperative unit and postanesthesia care unit at Memorial Hermann Health System, Houston, TX. Ms Cruz has no declared affiliation that could be perceived as posing a potential conflict of interest in the publication of this article.

JoAnn Mick, PhD, RN, NEA-BC, NPD-BC, EBP-C, is a nurse scientist at Memorial Hermann Health System, Houston, TX. Dr Mick has no declared affiliation that could be perceived as posing a potential conflict of interest in the publication of this article.

AORN CONTINUING EDUCATION FOR INDIVIDUALS

www.aorn.org/education/individuals/continuing-education

AORN can help you keep up with the latest perioperative practices to maintain your license or certification requirements. Earn contact hours through *AORN Journal* continuing education (CE) articles, prerecorded webinars, tool kits, online courses, and face-to-face programs.



AORN Journal CE articles cover a variety of perioperative topics that can help you prepare for recertification, renew your license, or just stay up-to-date to improve your own practice. AORN members receive free access to more than 200 *Journal* CE contact hours.

AORN webinars present informative, educational content on important topics, such as patient and staff safety, patient care, and leadership and professional development. Individuals can access live, interactive webinars or recorded webinars.

AORN tool kits address critical patient safety issues and help perioperative professionals implement evidence-based practices. Each tool kit contains a wealth of resources, including customizable policies and procedures, education slideshows, videos, posters, guides, and references.

AORN online courses are designed to educate perioperative nurses on a variety of topics that go beyond the standards of *Periop 101*, *Periop 202*, the Periop Mastery Program, and Prep for CNOR. Further your education online with essential topics, such as infection prevention, preoperative and postoperative care, and safe administration of moderate sedation in the ambulatory setting; onboarding; the fundamentals of evidence-based practice; and an introduction to the Perioperative Nursing Data Set (PNDS).