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## War stories: a qualitative analysis of narrative teaching strategies in the operating room

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### Abstract

**BACKGROUND**—“War stories” are commonplace in surgical education, yet little is known about their purpose, construct, or use in the education of trainees.

**METHODS**—Ten complex operations were videotaped and audiotaped. Narrative stories were analyzed using grounded theory to identify emergent themes in both the types of stories being told and the teaching objectives they illustrated.

**RESULTS**—Twenty-four stories were identified in 9 of the 10 cases (mean, 2.4/case). They were brief (mean, 58 seconds), illustrative of multiple teaching points (mean, 1.5/story), and appeared throughout the operations. Anchored in personal experience, these stories taught both clinical (eg, operative technique, decision making, error identification) and programmatic (eg, resource management, professionalism) topics.

**CONCLUSIONS**—Narrative stories are used frequently and intuitively by physicians to emphasize a variety of intraoperative teaching points. They socialize trainees in the culture of surgery and may represent an underrecognized approach to teaching the core competencies. More understanding is needed to maximize their potential.

### Keywords

Narrative teaching; Surgical education; Core competencies; Professionalism; Surgical culture

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The educational value of the operating room (OR) is understudied and therefore potentially underrealized. It holds great potential as a teaching site for the spectrum of issues in patient care, from operative technique and decision making to preoperative and postoperative

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management. The OR experience also provides trainees with hours of unimpeded access to faculty members, during which the non-clinical aspects of surgery may be addressed; however, this is infrequently described.<sup>1,2</sup> Despite this richness of the OR as an educational environment, little is understood about the breadth of teaching strategies used intraoperatively. Several lists of teaching behaviors have been developed, but none have been validated in the OR in real time.<sup>2-4</sup>

Narrative has long been recognized as “a significant mode of human communication, a bearer of culture, and a potentially profound and far-reaching educational methodology” in other academic fields.<sup>5</sup> Among educators, storytelling is a familiar mechanism for highlighting learning objectives, providing depth to a subject matter, and connecting generations, concepts, and ideas. Based on the idea that knowledge can be simultaneously stored, retrieved, and relayed by stories, the narrative method of teaching is known for its power.<sup>6</sup>

Narrative is also an emerging discipline within medicine. Surgical (and medical) educators are just beginning to understand the power of stories to convey information. However, the bulk of narrative medicine focuses on its ability to humanize clinicians—to “deepen their ability to adopt or identify others’ perspectives”<sup>7-9</sup>—or, alternatively, its utility as a methodology for gathering qualitative data and/or triggering reflection from them.<sup>8-11</sup> Its role as a teaching strategy, namely, narrative teaching, has yet to be described.

Charon<sup>12</sup> defined narratives as “stories with a teller, a listener, a time course, a plot, and a point.” During an observational study using video to understand performance in the OR, we noted a recurring use of narrative by surgeons as a teaching tool. Because of the oft-drawn parallels between surgery and the military—both require rigorous training and have a traditionally hierarchical social structure, for example—we chose the term *war stories* to describe narratives told by surgeons “in the trenches” of the OR. Once this phenomenon was identified, we sought to capture and characterize narrative teaching in the OR: to measure the frequency with which this technique is used and to understand the learning objectives that it is used to illustrate.

## Methods

Ten complex surgical procedures, representing 38.8 hours of intraoperative time, were audiotaped and videotaped. This paper summarizes the results of a single qualitative project within a larger parent study using mixed methods to study intraoperative performance. The procedures for data collection are described in detail elsewhere.<sup>13</sup> The videos were analyzed using RATE, open-access software developed by Guerlain et al<sup>14</sup> at the University of Virginia for playing multiple video and audio streams in synchrony. Two surgical research fellows (Y.-Y.H. and A.F.A.) independently generated transcripts of the videos, and these transcripts were reviewed by a multidisciplinary panel, including the surgeon–principal investigator, a cognitive psychologist, and an educational psychologist.

Two independent coders (Y.-Y.H. and S.E.P.) identified narrative stories told by surgeons and characterized them by duration, teller/teacher and listener/learner, and the phase of the

case in which they appeared. Summary statistics were calculated around the number of stories per case, the length of each story, and the number of teaching points per story. A second pass was performed by the two coders; using grounded theory analysis, we identified emergent themes in both the types of stories being told and the teaching points they illustrated. The stories and their themes were then reviewed and verified by the entire research team.

## Results

In nine of our ten cases, we identified a total of 28 narrative stories. Table 1 displays summary statistics of these stories; they appeared frequently, tended to be brief, and were often used to demonstrate several teaching points at once. Most commonly, the attending surgeon was the storyteller and initiated the story spontaneously. In a single instance, he or she was prompted by a resident's question. Four stories were told by residents, one of which was prompted by a question from the scrub technician. The intended audience was generally the surgical resident and/or the medical student, but anesthesiologists were also targeted (three times), as was the nursing staff (once). One story was told to the operative attending surgeon by a second attending surgeon who was visiting the room.

### Types of stories

Three main story types emerged: practice changes from lessons learned, personal training stories, and near misses and adverse events. These were not mutually exclusive; stories could belong to more than one type. The incidence of each story type is shown in Table 2.

Stories of practice changes from lessons learned were the most commonly observed during data collection. Unlike near misses and adverse events, the focal point of a practice change story was not a particular case gone wrong; these stories usually described parallel patients from which knowledge was gained and contributed to adjustments in the management of patients or personnel. In the following example, the surgeon describes the evolution of his approach to pelvic sarcomas over time, a process that has been directed by trial and error and advice from other surgeons, rather than a discrete case that he fears replicating:

**Surgeon:** So this is our [anterior superior iliac spine]. I used to...do more of a curvilinear [incision], but I am starting to do more of a linear.

**Resident:** Two fingers' [breadth away]?

**Surgeon:** Actually, you want to go more lateral...Theoretically you can stay out of [the vessels]...you can keep your external oblique intact and you avoid cutting the muscle. You just come down through that fascia, and you have very good fascia on the bone. I learned that from the ortho folks because the last thing they want to do is get in the belly, and they come as laterally as [there]...and they do not have any problem sewing the bone. You know, we always hate going close to the bone.

On occasion, practice change stories and their teaching points were unrelated to the patients on the table. For example, in the following excerpt, a senior attending surgeon visiting the operative surgeon mentions that his case has been canceled. The teaching point of his story

is not pertinent to the ongoing case but is informative for the future practice of both surgeons:

**Visiting Surgeon:** [I] had a guy on the schedule...today, and it's the first time I ever saw it: during his neoadjuvant [therapy], he lit up a new retroperitoneal area [on positron emission tomography]. [The oncologist] said, "They don't go to retroperitoneal nodes," and I have never seen it either....It was right at the edge of the radiation field, but it was way back, behind the left kidney, down low.

**Operative Surgeon:** It doesn't go there.

**Visiting Surgeon:** "It doesn't go there"—that's what everyone said [They] said, "Don't bother needling it." [I] said, "Well, I got to be sure." Positive.

**Operative Surgeon:** Good move.

Personal training stories were rooted in the surgeons' own experiences while either in residency or fellowship and encompassed ideas about surgical culture and professionalism, as well as patient care. Cautionary tales encompassing prior experiences with negative outcomes (whether merely potential or actually realized) were categorized as near misses and adverse events.

### Teaching objectives

Intraoperative narrative stories most frequently illustrated clinical teaching objectives. Thirty-five teaching points were documented about patient care compared with 14 programmatic teaching objectives. Table 3 displays the occurrences of various teaching objectives throughout our study.

Operative management was unsurprisingly the most common clinical teaching topic and fell into two subgroups, of which technique was the more frequently observed. Fifteen stories served to support the rationale for a surgeon's technical approach. In the following example, the surgeon teaches his trainees about his choice of sutures near the pancreas, giving it weight by incorporating a story, one that identifies a well-respected mentor from whom he adopted this practice:

**Surgeon:** [Mentor] showed me how to do this—instead of Vicryl, using PDS. [He] told me Vicryl [disintegrates] under pancreatic enzymes—they get activated so easily.

Decision making included preoperative preparations, intraoperative fluid management, and the treatment of hemo-dynamic instability, as well as considerations about the procedural components of the operation itself. Surgeons appeared to tell these stories to illustrate their thought processes at key decision points.

Seven stories taught about error identification. These narratives focused on the etiology of faulty techniques, cognitive processes, or assumptions. In using them, surgeons' intentions ranged from merely boosting awareness among listeners to direct instruction about effective prevention strategies. Both are exemplified by this adverse event story, which makes a

concurrent teaching point about operative management (both technique and decision making):

**Surgeon:** I think everyone's who's radiated should get diverted, no matter what level... [Previous patient], she had radiation in the pelvis, and I did a sigmoid resection. You know that bowel's radiated, right? She has a leak.

These stories may be based on shared patients, making it personal for the listener as well.

Therapeutic options were the subject of four intraoperative stories and consisted of teaching points about the non-operative management of surgical patients. Surgeons told stories from their own experiences to either illustrate the success of multimodality treatment or explain how they set realistic postoperative expectations for their patients.

Three nonclinical teaching topics were identified. Resource management was the most common programmatic teaching topic in our study. Surgeons told these stories to demonstrate their practice patterns relating to time allocation, supply preparation, and supervision and/or interaction with others, both inside and outside the discipline of surgery. In one example, the surgeon argued against a common approach to maximizing block operative time by overbooking or understating the estimated operative time. He provided the OR and its staff with an accurate operative time to increase efficiency, and he validated this practice with a personal training experience story: operating in a hospital in which the number of OR hours per day was fixed, he learned (1) to figure out the length of time he required to perform various operations and (2) the value of notifying other staff members as to these temporal needs.

Four stories addressed professionalism and/or surgical culture. These narratives made teaching points both explicit and implicit. In one example, the surgeon used his experience in a prescriptive manner. Referencing his past experience, he instructed the resident that advanced notification is appreciated by departmental leadership after operating on a potentially high-profile case. In contrast, in many stories, the advice was more oblique. In the next story, the surgeon sets himself up as an example, but the idea that others should imitate it is no more than implied:

**Surgeon:** I demanded a lot of the interns, junior residents, but I never left [before] everybody else, ever. Ever. One of the junior residents... said, "I never worked so hard as a junior resident, but I never learned so much. I learned more in 3 days than I learn in an entire month with the other chiefs." And she said to me, "And you never leave before we do."

The final programmatic teaching topic, residency structure, appeared 3 times. These stories consisted of a personal training experience that influenced the storyteller's opinion about the programmatic coordination of various rotations in general surgery residency. In our only resident-to-resident story, a junior resident contrasted his own experiences as a daytime postgraduate year 2 resident and an overnight postgraduate year 3 resident on the acute care surgery team to demonstrate his preference for having (1) 2 equivalent residents on the same team to share the workload and (2) a senior resident to serve as an intermediary for communication with the attending surgeon.

## Comments

Attending surgeons spontaneously use narrative stories to emphasize a variety of intraoperative teaching topics. The use of stories is particularly intuitive when considering the social construct of the educational environment of the OR. Indeed, storytelling is an instinctive method for organizing, transmitting, and receiving information that is factual as well as social-contextual.<sup>8,15</sup> However, in medicine, the power of the narrative as a teaching strategy is poorly described. Few studies have examined the potential educational value of stories outside of their utility in building empathy or aiding self-reflection.

Quaintance et al<sup>16</sup> reported lessons on professionalism gathered from faculty narratives prompted by student interviews. Our study corroborates the use of narratives by physicians for teaching in a setting without inducement: the OR. We have collected naturally occurring stories pertaining to a range of clinical and programmatic topics, of which professionalism is only one. The appearance of professionalism and other nonclinical topics in our data set is especially notable, as these domains were previously thought to be not amenable to intraoperative teaching.<sup>1</sup>

Rather, intraoperative storytelling may represent an underrecognized method for teaching those core competencies that have inspired the greatest debates about practicality: those that may be more efficiently absorbed if imprinted upon the learner via illustration rather than delivered didactically. Systems-based practice, defined by the Accreditation Council for Graduate Medical Education as an “awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care,”<sup>17</sup> may be exemplified in resource management stories that address the allocation of time and supplies or equipment. Similarly, resource management stories specific to the dealings of surgeons with other hospital personnel may demonstrate principles of both interpersonal and communication skills (“effective exchange of information and collaboration with...health professionals,” including communication “with physicians, other health professionals, and health related agencies” and work “as a member or leader of a health care team”) and professionalism (“a commitment to carrying out professional responsibilities and an adherence to ethical principles,” eg, “responsiveness to patient needs that supersedes self-interest”). Finally, stories about practice changes surgeons have made because of lessons learned align with the Accreditation Council for Graduate Medical Education’s description of practice-based learning and improvement: the “ability to...continuously improve patient care based on constant self-evaluation and life-long learning.” Charon<sup>7</sup> wrote of the 3 movements of narrative medicine—attention, representation, and affiliation—as a conceptual framework with which to understand the power of stories. Although for her, *narrative competency* refers to “the capacity to recognize, absorb, metabolize, interpret, and be moved by stories of illness” and thus “see with new clarity deep aspects of the illness, the sick person, the situation of care, and the person who cares for the sick,” rather than the relatively traditional teaching points we have highlighted here, her theories still apply. In telling stories, surgeons not only teach but also establish a connection with the learner; teller and listener “join...in a sustained habit of clinical reflection.” Attention is the respect paid by the learner. In telling a story, one of the teacher’s primary motivations is to be heard. As we see in the tone and content of our

surgeon's story, describing how he needle-biopsied a mass against the advice of other physicians, the attention a storyteller seeks is a form of validation by another. Through attention, affiliation is achieved; the relationship between teller and listener is cemented. Interestingly, this affiliation is one of indoctrination, of socialization, into the culture of surgery, as well as one of education. Stories are a form of role modeling; informally, they showcase core values in surgery—hard work, sacrifice, and self-accountability in our surgeon's story about his leadership skills—and in doing so, they teach the “hidden curriculum.”<sup>11</sup> Finally, surgeons may derive therapeutic benefit from the representation of stories: the “taking [of] a chaotic or formless experience and conferring form on it.” Our surgeon's story about an anastomotic leak developing in his irradiated patient shows us that meaning may be found and acted upon in difficult, often emotionally taxing, situations.

### Limitations

As in any observational study, the Hawthorne effect may be a concern. This project emerged as a secondary analysis after the collection of video data for a larger parent study, the intended purpose of which was to characterize the human factors and systems attributes that contribute to intraoperative performance. This larger study was exploratory in nature, and analysis was planned using grounded theory, a qualitative research technique in which recurring themes are identified iteratively. As such, narrative arose as a consistently used technique for teaching. Because this analytic technique precludes predetermined thematic identification, participating surgeons could not have known to intentionally alter their teaching behaviors to incorporate narrative for the sake of posturing. Furthermore, we noted the conversations between participants to be of a fairly confidential nature; it became apparent upon review of our audio data that surgeons forgot that they were being recorded as these long cases progressed. Thus, we are confident that our capture of narrative in the OR is naturalistic.

We did not attempt to verify the veracity of the stories told by our surgeons and recognize that surgical war stories may be the product of selective memory, embellishment, and/or urban legend. However, the value of stories as a vehicle for teaching lies not in the historical truths embedded within them but in their ability to promote retention and thus corrective action. As Swap et al<sup>18</sup> wrote, “because stories are more vivid, engaging, entertaining, and easily related to personal experience than rules or directives, the research would predict they would be more memorable, be given more weight, and be more likely to guide behavior.” Cognitive scientists describe this phenomenon with three overlapping concepts: the availability heuristic (information that is memorable is more likely to be processed and judged valid), elaboration (the verbal and visual imagery provided by stories aids recall), and episodic memory (connections to personal experience facilitate information retrieval).

### Conclusions

It is important to note that although the power of narrative originates from a singular personal experience, it is not a rejection of the multiplicity of evidence. Because a particular story (indeed, any teaching point, whether delivered via narrative or another technique) may be inconsistent with the existing body of scientific evidence, the importance of critical listening skills in the learner cannot be understated. Furthermore, as the teaching points



embedded within narrative are often implicit, there is potential for the learner to misconstrue their applicability as broader than intended. Surgeons should strive to make their teaching points concretely, connecting their stories to the specific situations in which they may be relevant, rather than assuming that their trainees have drawn identical conclusions.

Although narrative medicine and evidence-based medicine may at first glance appear to espouse different and perhaps contradictory values, a model of clinical practice integrating the two has been delineated. In it, the translation of knowledge into care is accomplished by establishing a thorough understanding of the patient (via the attention, representation, and affiliation stages of narrative) and filtering the available evidence through this patient-centered lens.<sup>19</sup> Similarly, in this paper, we describe narrative as a tool for delivering data in an individually targeted fashion, intended to increase the likelihood of its uptake.

Narrative has long been a part of the way we as a society transmit information: cautionary tales, great victories, and tragic defeats. This study shows that stories are readily told and are interwoven into OR teaching. We believe narrative to be a powerful educational tool in the OR. Further research should be directed toward better understanding the effectiveness of narrative as a teaching strategy in the OR. With such data, faculty members may be guided in the more purposeful incorporation of stories into their intraoperative teaching efforts. As other areas of medicine are beginning to harness the potential of narrative stories, surgeons should also consider deliberate attention to this dynamic teaching strategy.

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**Table 1**

## Story characteristics

Characteristic	Mean	Median	Range
Stories per case	2.8	2	0 to 7
Story duration	64 s	48 s	11 s to 233 s
Teaching points per story	1.9	2	1 to 4

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**Table 2**

## Types of stories

Story type	Number of stories
Practice changes from lessons learned	19
Personal training experience	9
Adverse event/near miss	4

These story types are not mutually exclusive; for example, a single story may be categorized as both a training experience and an adverse event/near miss.

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**Table 3**

## Teaching points

Domain	Teaching point	Number of stories
Clinical	Operative technique	15
	Operative decision making	9
	Error identification	7
	Therapeutic options	4
Programmatic	Resource management	7
	Professionalism/surgical culture	4
	Residency structure	3

These teaching points are not mutually exclusive; for example, a single story may illustrate both a resource management and a professionalism lesson.