



# Does scripting operative plans in advance lead to better preparedness of trainees? A pilot study



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## ABSTRACT

**Background:** We pondered if preoperative scripting might better prepare residents for the operating room (OR).

**Methods:** Interns rotating on a general surgeon's service were instructed to script randomized cases prior to entering the OR. Scripts contained up to 20 points highlighting patient information perceived important for surgical management. The attending was blinded to the scripting process and completed a feedback sheet (Likert scale) following each procedure. Feedback questions were categorized into "preparedness" (aware of patient specific details, etc.) and "performance" (provided better assistance, etc.).

**Results:** Eight surgical interns completed 55 scripted and 61 non-scripted cases. Total scores were higher in scripted cases ( $p = 0.02$ ). Performance scores were higher for scripted cases (3.31 versus 3.13,  $p = 0.007$ ), while preparedness did not differ (3.65 and 3.62,  $p = 0.51$ ).

**Conclusions:** This pilot study suggests scripting cases may be a useful preoperative planning tool to increase interns' operative and patient care performance but may not affect perceived preparedness.

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## 1. Introduction

ACGME work hour restrictions have made it difficult for surgical residents to invest time in learning operative techniques and judgment.<sup>1</sup> Surgical experts consider preoperative planning an important aspect of surgical success in the operating room (OR), but surgical judgment has remained a relatively less focused area and is both difficult to teach and assess.<sup>2</sup> According to a national survey published in 2012, only one-third of surgical residents were being taught preoperative planning.<sup>3</sup> Additionally, the residents felt one of the ways to improve OR teaching would be to guide trainees through the preoperative preparation for a particular case.<sup>3</sup>

We aimed to explore this aspect of surgical training by having surgical interns script out a surgical management plan; a key focus was to relate the plan to patient-specific details. The mere fact of getting interns to sit down, review patient details, and write/type out a plan may enhance preparedness in the OR. Hundreds of legendary educators (personal communication with J. Roland Folse—SIU, Jon van Heerden—Mayo Clinic, Stephen

Evans—Georgetown, John Tarpley—Vanderbilt, etc.) had or have a routine they go through to educate trainees the night before surgery; but literature is scant on such specifics nor of its usefulness or outcomes.<sup>3</sup>

## 2. Material and methods

After deemed exempt by our Institutional Review Board, post-graduate year 1 residents (PGY-1s) rotating on the senior author's service were asked to script randomized cases a day prior to entering the OR. Scripts were expected to be focused on less than 20 points but high-lighting specific patient information that they perceived important for pre-, intra-, and post-operative surgical management. We emphasized that these points were not simply to document procedural steps. Each participant was offered an example script to clarify this concept.

The attending was blinded to the scripting process (i.e. he was unaware which cases were scripted). A feedback questionnaire with 10 statements was then completed by the staff surgeon immediately following the procedure. The feedback statements were categorized into "preparedness" and "performance" and were scored with a five-point Likert scale (1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree). Additionally, the

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attending completed a validated OSATS score sheet.<sup>4</sup> The completed OR scripts were given to the attending following the completion of the operating day; he commented on the management plan and returned the scripts to participants as feedback. The scores for the scripted and non-scripted cases were then compared using means, ranges, and *t*-tests.

### 3. Results

Eight surgical interns operated on 116 patients, completing 55 scripted cases (range per intern: 4–9, median: 7) and 61 non-scripted cases (range: 5–11, median: 7). Overall median scores for the scripted (4) cases were higher than non-scripted (3) cases ( $p = 0.02$ ). Preparedness group scores were similar: mean score = 3.65 for scripted cases and 3.62 for non-scripted ( $p = 0.51$ ) (Table 1). Performance group scores were higher in the scripted cases (3.31 and 3.13, respectively;  $p = 0.007$ ). Subset analysis revealed one individual performance feedback statement (“The intern was a good assistant to you”) was found to have higher mean scores for the scripted cases (3.47 versus 3.24,  $p = 0.04$ ). Other feedback statements were found to have similar scores between the scripted and non-scripted cases (Table 2). OSATS scores did not differ between scripted and non-scripted cases (mean score = 2.88 and 2.84, respectively).

### 4. Discussion

This small, prospective pilot study suggests that a simple, yet novel, method to prepare surgical trainees through scripting of a patient centered operative plan has a positive effect on their performance in the OR. The blinded attending surgeon perceived an overall better experience with his trainees when they scripted a procedure versus cases that were not scripted. Preparedness scores were similar between scripted and non-scripted cases, while performance metrics were higher in scripted cases. OSATS scores did not differ. The minimal time and effort that is needed on the attending's behalf suggests this is an efficient method of preoperative planning for young trainees. Sitting down to think, order thoughts, and offer feedback may be well worth the time and effort for surgical learners and their staff.

#### 4.1. Logistics

Asking trainees to prepare for their participation in the full management of surgical patients has been done for centuries. Reading textbooks, reviewing journal articles, studying anatomy texts and surgical manuals has been the norm for students of Kocher, Billroth, Lahey, Crile, and other legendary surgeons. Getting trainees to sit down and write out key factors about caring for surgical patients and then finding a difference in performance has not previously been reported. Our group of eight surgical interns was asked to spend 10–30 min writing down their thoughts of

important factors in patient care. A simple concept of getting human beings to stop, pause, and think has been shown previously to assist in performance, safety outcomes, and decision making in chess, aviation, and nuclear reactors.<sup>5–7</sup> Indeed, hundreds of studies show human performance suffers when constricted by time.<sup>7,8</sup> It may not be all that surprising to find that subjective assessment improved when we forced our interns to stop and organize their thoughts.

#### 4.2. Scripted versus non-scripted

Scripting factors important for patients revolved around several consistent issues: medication (changes of anticoagulation, insulin, steroids, etc.), previous operations (concerns for adhesions, difficulty in dissections, etc.), patient concerns (age, gender, BMI, etc.), and postoperative care (frailty, wound healing, wound care, etc.). Actually writing down a plan affords an opportunity to rehearse potential actions and decisions. Scripting is the norm in entertainment (movies, Broadway shows, music, etc.), and more recently in vogue with NFL football coaches (Coach Bill Walsh of the San Francisco 49ers won four Superbowl titles using scripted offensive play calls and practicing them in that exact order prior to games). In medicine, both pharmacy and nursing have shown that enhanced effort of scripting patient instructions and follow-up orders offer improved compliance and success.<sup>9,10</sup> Surgeons rarely script, but perhaps it is time that we should. Cutting and pasting orders, plans or concerns in the electronic medical record that no one reads does not count as scripting. This scripting process temporarily created a culture in which residents had to make time to think, retain, be autonomous with no help from the staff, and commit to their plan.

#### 4.3. Performance versus preparedness

Our study found an increase in performance with scripting. While subjective assessment is fraught with bias, it is interesting that the senior author with experience of teaching and training 400+ interns found a difference. Was performance truly better and was it better because of scripting? Our limited data would suggest the blinded attending perceived a better assistant and is working with someone with greater insight, operating with less anxiety/stress, able to ask and answer questions, and who better understood directions. While we can envision 30 min of reflection being useful to factors we labeled as performance, we are disappointed to find no such difference with preparedness factors. Perhaps surgical interns of this surgical service consistently reviewed patient factors on all patients thoroughly, and jotting down such concerns made no difference.

#### 4.4. Effort

In a continuously busy and overwhelming environment like surgery, adding more time-hungry work for trainees and staff may

**Table 1**  
Preparedness feedback statement scores.

Feedback Questionnaire Statement	Scripted Mean Score	Non-Scripted Mean Score	P value
1. I felt that the intern reviewed the case before starting the procedure.	3.98	4.00	0.79
2. The intern knew and understood the relevant anatomy.	3.76	3.63	0.27
3. The intern knew the procedure steps.	3.05	3.21	0.20
4. The intern was well aware of the patient specific details that could have affected/changed the procedural steps/decisions.	3.89	3.75	0.20
5. Overall, the intern was well prepared for the procedure.	3.58	3.49	0.41
Total	Mean: 3.65 Median: 4	Mean: 3.62 Median: 4	0.51

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