The American Journal of Surgery (2012) 204, 347–354

The American Journal of Surgery®

Physician Leadership

Surgeons' leadership in the operating room: an observational study

Sarah Henrickson Parker, M.A.[a,*], Steven Yule, Ph.D.[a], Rhona Flin, Ph.D.[a], Aileen McKinley, F.R.C.S.Ed.[b]

[a]School of Psychology, University of Aberdeen, Kings College, College of Life Sciences & Medicine, William Guild Building, Aberdeen, Scotland AB24 3FX, UK; [b]Department of Surgery, Aberdeen Royal Infirmary, Aberdeen, UK

KEYWORDS:
Leadership;
Nontechnical skills;
Safety;
Surgeon;
Operating room

Abstract

BACKGROUND: There is widespread recognition in high-risk organizations that leadership is essential for efficient and safe team performance. However, there is limited empiric evidence identifying specific leadership skills and associated behaviors enacted by surgeons during surgery.

METHODS: Observational data on surgeons' intraoperative leadership behaviors were gathered during surgeries (n = 29) in 3 hospitals. Observations were coded using 7 leadership elements identified from the literature on surgeons' leadership. Surgeries were categorized by complexity using British United Provident Association ratings.

RESULTS: A total of 258 leadership behaviors were observed during more than 63 hours of observation. Surgeons most frequently showed guiding and supporting (33%), communicating and coordinating (20%), and task management behaviors (15%). In many instances the surgeons' leadership was directed to the room rather than to a specific team member. Surgeons engaged in leadership behaviors significantly more frequently during cases of high complexity compared with cases of lower complexity.

CONCLUSIONS: This study is the first step in developing an empirically derived taxonomy to identify and classify surgeons' intraoperative leadership behaviors.

Leadership is a critical nontechnical skill for surgeons[1,2] and is especially important during complex surgeries.[3] It is defined as ". . . the process of facilitating individual and collective efforts to accomplish shared objectives,"[4] and consistently has been identified as a key component for the successful functioning of work teams.[5,6] Failure to establish leadership is related to suboptimal teamwork, potentially contributing to increased risk for patients.[7] This study identified what leadership behaviors surgeons use in the operating room (OR), a critical first step before the impact of leadership on surgical patients' outcomes can be assessed.

Task analyses conducted to develop a nontechnical skills taxonomy for surgeons revealed that expert surgeons believe leadership to be important for safety and efficiency in the OR.[8,9] Although a nontechnical skills taxonomy for surgeons and other intraoperative nontechnical skills rating tools[10,11] have examined surgeons' leadership as part of a larger skill set, these tools are inconsistent in their definitions and component elements of leadership, and none is sufficiently detailed for an in-depth analysis of surgical leadership. To our knowledge, a specific and sufficiently

The authors have no conflicts of interest to declare.

* Corresponding author. Tel.: +44 (0)1224-273210; fax: +44 (0)1224-273211.

E-mail address: sarah.henrickson.parker@gmail.com

Manuscript received February 1, 2011; revised manuscript March 28, 2011

0002-9610/$ - see front matter © 2012 Elsevier Inc. All rights reserved.
doi:10.1016/j.amjsurg.2011.03.009

fine-grained tool for recording and classifying surgeons' intraoperative leadership behaviors does not exist.

A wide range of leadership styles might be expected within the OR.[12] From the industrial research, leadership behaviors relating to accomplishing the task and supporting team members would be expected. In industrial literature, there are 2 perspectives on how leadership relates to safety; either that a leader engages in safety-specific leadership behaviors,[13,14] or that there are general leadership behaviors that influence safety.[15,16] Theoretic approaches such as transformational/transactional, leader–member exchange, or dynamic leadership have been shown to be measurable and related to safety outcomes. Although many tools exist for measuring and evaluating leadership in different industrial settings,[17] it is important to develop measures within the industry under scrutiny and no model of industrial leadership from the literature has been shown to be directly applicable for investigating surgeons' intraoperative leadership within the OR.[18] The first objective of this study was to identify surgeons' observable leadership behaviors during the intraoperative phase of surgery. The second objective was to classify these behaviors using a structured list of leadership elements derived from the surgical literature. The final objective was to test whether there were any differences in the frequency of these leadership behaviors during surgeries of higher versus lower levels of complexity. We hypothesized that significantly more leadership behaviors would be observed during more complex surgeries because industrial and military team leaders have been shown to adapt their behavior during more demanding tasks.

Materials and Methods

This study was approved by the North of Scotland Research Ethics Committee.

Data collection

Participants were consultant surgeons, surgical trainees, circulating nurses, scrub nurses, and anesthetists from 3 teaching hospitals in Scotland. A convenience sample of 3 specialties (general, orthopedic, and vascular surgery) were chosen to allow for leadership to be observed across several clinical contexts between surgical specialties and hospitals to make more general observations about leadership, rather than about leadership during only 1 type of surgery. Cases included both laparoscopic (eg, laparoscopic revision fundoplication) and open surgery (eg, radical retropubic prostatectomy). Surgeries were selected from the nonemergency list by the contact consultant surgeon at each site. Written consent to be observed was obtained from all team members (consultant surgeon, trainee surgeon, anesthetist, scrub practitioner, and circulating nurse) and the surgical patient for each surgery. A total of 30 surgeries were observed, in line with previous observational studies in surgery.[19] One surgery was excluded because of the patient's inability to complete an informed consent document, leaving 29 surgeries for analysis. In total, 22 different OR teams were observed, comprising 20 different surgeons (2 surgeons were observed 3 times, all others were observed once or twice). Observations began when the first incision was made and ended at skin closure. Although leadership may influence performance during the entire perioperative period, we chose to observe during the intraoperative phase only because it is well defined and observable within the OR. The mean surgical time per case was 136 minutes (standard deviation, 92 min) and the surgeries ranged in length from 20 to 305 minutes. The total time spent observing was 3,827 minutes (63 hours and 47 minutes).

As other researchers have acknowledged,[20] 1 OR team normally comprises 3 or more different subteams (anesthesia, nursing, and surgical). For the purpose of our research, the OR team is defined as the entire team within the OR during the surgery (anesthetist, anesthetic assistant, circulating nurse(s), scrub nurse, surgeon, and trainee surgeon); the anesthesia subteam consists of the anesthetist and anesthetic assistant; and the nursing subteam consists of the circulating team, and at times the scrub nurse. Finally, the surgical subteam consisted of the consultant surgeon, surgical trainees, and usually the scrub nurse. In the present study, the focus of observation was on the operating surgeon and his/her leadership of the OR team.

One observer (S.H.P.) collected all the data over a 6-month period (August 2009 to February 2010). This observer was a psychologist with extensive experience observing nontechnical skills specifically within the OR (>200 hours) and has published previous observational studies in peer-reviewed surgical journals. During the surgery, field notes on surgeons' leadership behaviors were recorded using paper and pencil. Field notes are detailed written observations of behaviors taken with no predefined structure for observations, and for this study, were guided by Yukl's[4] definition of leadership as "behaviours in which one team member was influencing others to accomplish goals set by either that individual or the organization." The field notes took the form of a short statement describing the particular leadership behavior observed and to whom it was directed. No outcome measures were collected for this analysis because the aim of this study was to identify and classify leadership behaviors observed intraoperatively.

The field notes were transcribed for analysis within 3 days of the surgery. All data were anonymized, with participants identified by their role in the OR, rather than by name. Analysis commenced only after all observations had been completed and transcribed.

After the observations were complete, each case was classified according to complexity by a consultant surgeon (A.M.) using the British United Provident Association schedule of procedures. This schedule is adapted from the Clinical Coding and Schedule Development Group coding system[21] and has been used by surgeons as an approxima-