

## Surgical Flow Disruptions: Measurement and Impact of Stressful Events in the Operating Room

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We read with interest the article by Henrickson Parker et al. [1] reporting the development and trial of an observational tool to capture disruptions in surgical flow in the operating room (OR). Their study is an important application of what has been termed the “systems approach” to surgery, an approach that explicitly acknowledges and assesses the contribution of the OR team and environment to safe surgery.

However, the authors’ claims that “to date no validated methods currently exist to systematically categorize flow disruptions” in the OR (p. 354) and that their tool is “the first effort of its kind to create and validate a tool” for such use (p. 357) are not entirely accurate. Such a tool has already been developed and was validated for use in both general surgery [2] and urological surgery [3] several years ago. This tool incorporates an approach, akin to that utilized by Henrickson Parker et al., that captures via observation various disruptions to surgical work, including verbal interruptions, disruptions caused by faulty technology/equipment, and others. The severity of each observed disruption is rated on behaviorally anchored scales, which two trained observers can use reliably [2]. Moreover, based on observational findings from this work, a self-report tool was subsequently developed that captures disruption to

surgical work flow as experienced by the surgeon and other members of the OR team, the Disruptions in Surgery Index [4].

Henrickson Parker et al.’s study does indeed add to the existing descriptive evidence base of disruptions in ORs, but it does not do much to advance it. Recent developments in the nontechnical skills research literature demonstrate that although it is useful to describe latent factors that potentially threaten safety in the OR such assessments should be paired with demonstrable impact (if any) on the operating surgeon [5]. A disruption in itself does not necessarily equate with compromised safety. Safety may be threatened only when the demands exerted by these stressful events exceed a surgeon’s (or an OR team’s) resources to cope. Evidence to corroborate this comes from recent work that has shown that disruptions such as those reported by Henrickson Parker et al. actually elicit significant levels of stress in surgeons. It is precisely this rise in stress (not the disruptions per se) that is most likely to impair surgical performance [6].

Further such studies that robustly correlate disruptions with surgeons’ nontechnical skills are needed to better understand the mechanism behind key performance-debilitating and performance-enhancing factors in the OR—for expert surgeons as well as for less experienced trainees. Careful, quantitative, replicable assessments of disruptions alongside concurrent measurements of nontechnical skills and stress levels are integral to improving the OR environment, thus enhancing surgical performance and ultimately patient outcomes.

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