

Purpose

Building on a previous systemic literature review, we observed the influence of disruptions on performance, such as prolonged operating room (OR) times and patient safety²¹. However, the underlying reasons for disruptions during surgery have not been fully identified, and the possible economic consequences have yet to be examined. This literature review aims to enhance the prior systematic literature review by providing an updated overview of studies published since the last review. Our aim is to assess the key causes associated with intraoperative disruption and their impact on device performance, patient safety, and practice-related outcomes.

Methods

A targeted search was performed and screened using the following strategy and criteria:

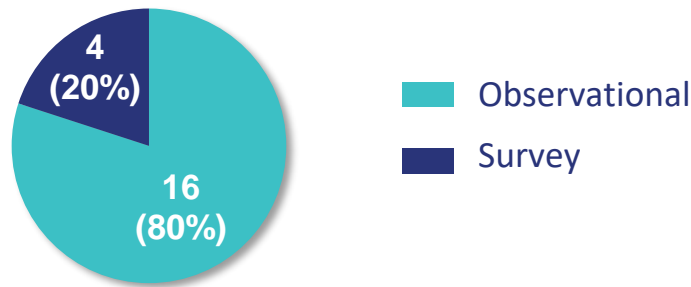
Database	PubMed
Date range	January 1, 2020 - November 8, 2023
Search terms	“disruption”, “distraction” or interruption” and “surgical”, “operation” or “Intraoperation”
Inclusion criteria	<ul style="list-style-type: none">No restrictions on study designEnglish language
Outcomes of interest	<ul style="list-style-type: none">Cause of intraoperative disruptionsImpact of intraoperative disruptionsEconomic consequences

Results

A total of 20 studies were reviewed, encompassing a mix of survey and observational studies (Figure 1). The studies assessed a wide variety of surgical fields, including laparoscopic, orthopedic, urology, emergency, and digestive surgery

Results

Figure 1. Overview of Study Designs



Study Objectives:

- 9/20 aimed to understand the causes behind intraoperative disruptions
- 9/20 aimed to explore the impact of intraoperative disruptions
- 2/20 aimed to evaluate preventive measures
- 0/20 assessed the financial implications

Causes of Intraoperative Disruptions

Figure 2.Type of Intraoperative Causes Identified in the Studies

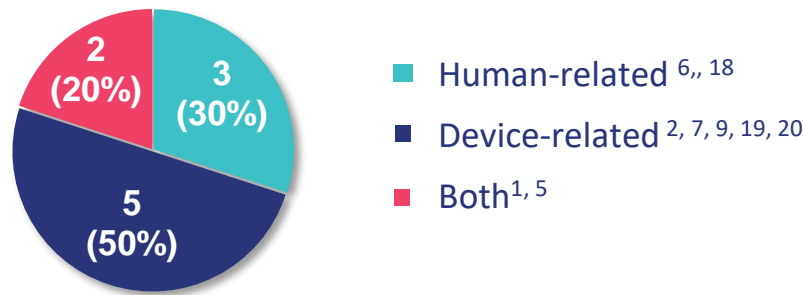


Table 1. Key Causes Associated with Intraoperative Disruptions

Human-related	Device-related ^{19,20}
<ul style="list-style-type: none">Irrelevant conversations^{1, 5, 6}Case-relevant communications^{6,18}Smartphone usage^{6,18}Door movement⁶Teaching¹⁸Coordination issues⁵Music¹⁸Consultation¹⁸	<ul style="list-style-type: none">Device failure, such as video device malfunction or disconnection^{7,9}Machine alarms²Improper assembly⁷User unfamiliarity with the device⁹Physical breakage of the device⁹

Potential Interventions

Out of the 20 studies reviewed, 2 specifically aimed at the reduction of intraoperative disruptions by:

- Implementing preventive measures like team briefings and warning signs to help prevent unnecessary door openings¹⁶
- Highlighting the significance of reporting disruptive behaviors and the need for management to respond promptly and decisively to such issues¹²

Results

Consequences of Intraoperative disruptions



Patient Safety

- While the study did not assess the correlation between distractions and Intraoperative adverse events (IAEs), out of the 80 cases studied, 138 clinically significant IAEs were observed, with distractions occurring in all observed cases.¹⁷



Heightened staff mental workload

- Equipment- and patient-related disruptions were associated with increased staff workload¹⁴
- Surgical flow disruption appears to impact on surgeons' mental, emotional and physiological resources¹⁰



Increased stress among care providers

- Higher stress level among surgeons was associated with distractions related to equipment failures and people entering or exiting the OR (r = 0.206, P < 0.01 and r = 0.137, P < 0.01, respectively)⁸



Longer procedure duration

- Distractions in the operating room could result in longer procedure durations²¹, which, in turn, could increase the likelihood of surgeons feeling distracted¹⁵

Conclusions

Findings from this study expand on existing knowledge by highlighting newly published literature assessing the key causes associated with intraoperative disruptions and their impact on patient outcomes and practice dynamics. Further studies are needed to quantify the financial implications of operating room disruption.

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