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Remote and interdisciplinary research in surgical knowledge production



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ABSTRACT

Background: Surgical knowledge production has changed dramatically in the last 30 y, moving away from investigations by individual surgeon researchers and toward remote and interdisciplinary research. We investigated how surgeons make decisions about engaging in research and identify motivators, facilitators, and barriers to conducting research in an increasingly challenging environment.

Materials and methods: We performed a qualitative analysis of semistructured interviews with surgeons from academic medical centers across the United States. We asked participants to describe their experiences and opinions regarding remote and interdisciplinary collaborations.

Results: Of 64 surgeon researchers invited, 21 (33%) agreed and participated in semi-structured interviews. Each interview lasted an average (standard deviation) of 29 min (12). Surgeons were motivated by both internal and external factors, including some that might be identified as barriers. The internal desire to improve care and the need for collaboration to address increasingly complex questions requiring larger samples sizes emerged as most significant to interview participants. Social networks were identified as the dominant facilitator of multisite research, with technology playing a supporting role. Barriers to remote and interdisciplinary research ranged from individual, “micro” level barriers, through structural barriers that include institutional level challenges and competing priorities, to macrolevel system and policy-level barriers.

Conclusions: Surgeons clearly recognize the importance of high-quality research aligned with current paradigms of clinical care and are using remote and interdisciplinary collaboration to improve the quality of the science they produce and align their work with the demand for increasingly high levels of evidence.

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1. Introduction

Research is an essential part of improving surgical care and surgical care practices. Harden explained that, through

surgical research, “excellent surgical strategies are standardized” [1]. Furthermore, surgical research allows “surgeons to optimize the care of our own patients, abandon misdirected therapies early, recognize fundamental pathophysiological

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principles, and apply these observations to our own patients in a scientifically relevant and socially sensitive fashion.” [1]. Surgical research has evolved to a highly experimental science since its advent in the late 18th century [2], but previous work by two of the present authors demonstrated that surgical knowledge production has changed dramatically in just the last 30 y, with a move away from investigations by individual surgeon researchers and toward remote and interdisciplinary collaborations [3].

It is possible to speculate why these changes occurred. As funding for surgical research has eroded, even relative to other medical research [4,5], interdisciplinary and remote collaborations may provide opportunities to maximize and diversify funding. Interdisciplinary and remote collaborations also may provide opportunities to conduct research in the face of increasing pressure for surgeons to spend more time in clinical practice. Simultaneously, as clinically based questions become increasingly complex and require higher levels of evidence, a team-based approach to surgical research may allow investigators to address research topics most relevant to clinical decision-making. However, interdisciplinary and remote collaborations also face challenges. Although information and communication technologies have been celebrated as facilitators of collaboration, evidence remains that collaboration at a distance is substantially more difficult than collaboration among colocated investigators [6].

Existing research reveals that little is known about the primary motivators, facilitators, and barriers for increasing engagement in remote and interdisciplinary collaborations. Through a series of structured interviews with surgeon researchers, this study aimed to elucidate how surgeons evaluate decisions about whether and how to engage in surgical research. Goals of the study were to identify primary motivators, facilitators, and barriers to participating in surgical knowledge production in an increasingly challenging environment.

2. Materials and methods

The purposive sample for this qualitative study was selected to represent the views of academically productive research surgeons. A selection of surgeon attendees presenting work at the 2014 Annual Meeting of the American Surgical Association were invited to participate. Surgeon researchers known to the investigators also were recruited to the study.

2.1. Data collection

Demographic data were collected including gender, experience, and academic standing. With informed consent, one author [J.C.G.] conducted all semistructured interviews. Surgeon researchers were asked about their experiences and opinions regarding remote collaborations and interdisciplinary collaboration [3]. Before beginning the interviews, the interviewer defined these terms for participants; “remote collaboration” was defined as research collaboration between investigators in different metropolitan areas, and “interdisciplinary collaboration” was defined as research collaboration between surgeon investigators and nonsurgeon investigators.

Interviews were guided by a set of questions, asked in an open-ended manner, to probe surgeon researchers’ motivations to engage in research, perceptions about both remote and interdisciplinary surgical research, and barriers to remote and interdisciplinary collaborations.

Interviews were recorded and then transcribed. This study was approved by the Christiana Care Health System Institutional Review Board.

2.2. Data analysis

NVivo qualitative analysis software (version 10.0, 2012, QSR International (America) Inc, Burlington, MA) was used for qualitative analysis. To minimize potential bias, all analyses were led primarily by a member of the author team extensively trained in qualitative data analysis that had not conducted the interviews and whose profession is outside the surgical and clinical realms.

A multistep coding process was used to analyze the data [7], and although coding was led by one particular author, all the authors engaged in the initial stage of analysis. During this initial analysis, transcripts were independently read repeatedly by all members of the author team to identify factors that surgeons believed were facilitators and/or barriers to engaging in research in general, and remote and interdisciplinary research more specifically. To ensure a satisfactory level of intercoder reliability, all the authors met at the end of this initial stage to discuss findings, memos, and notations. Differences at this juncture were openly discussed, and decisions were based on consensus.

Once consensus had been reached, the factors identified in the initial stage were used as codes themselves, and the transcripts were analyzed again to explore reoccurring categories and themes within the data. This secondary analysis showed that: (1) perceived barriers could be categorized into microdomain, mesodomain, and macrodomains; and (2) motivators and facilitators, were separate although related themes. Analysis was repeated until saturation of the thematic categories was reached. Once identified, prominent thematic categories were discussed among the entire author team to fully conceptualize and unpack them. Given that later-stage coding was led primarily by one author, the author leading the analyses then repeated each of the coding stages/processes (with “clean” transcripts) to assess and ensure “intra”coder reliability (discrepancies were unsubstantial).

For example, regarding the unearthing of the thematic category “External Motivators,” during the review of the transcripts, we found that the notion of “I can not do this alone” (and similar statements) was frequently reported by participants in reference to their inability to conduct research without the assistance of others. This broad concept was then used as a preliminary code to explore how and in what ways participants were discussing their desire to collaborate. Through further analysis, using the broad code of “Cannot Do This Alone/Why Collaborate, the sub-codes Varying Skill Sets and Increasing ‘n’” were identified and then used to reanalyze the transcripts. Through this deeper level of analysis, it was discovered that these and other subcodes could be nested within a broader thematic category—“External Motivators”.

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