Electronic Health Record Burnout in Surgery

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Abstract

Background: Physician burnout is a prominent component of the medical field defined as a chronic stress response with components of depersonalization, exhaustion, and a diminished sense of accomplishment. This study summarizes findings from a PubMed literature search that shows the significant contributors to electronic health record (HER)-related burnout in the surgical field may be documentation and clerical burdens, complex usability, electronic messaging and inbox, cognitive load, and time demands.

Objective: This study aimed to characterize the significant contributors to EHR-related burnout in the surgical field to better provide a framework to create evidence-based strategies to promote the well-being of providers and high-quality patient care.

Methods: A literature search of PubMed was completed in April of 2024 to include articles 20 years prior. Articles were filtered to English only and were filtered out based on the following exclusion criteria (1) not applicable to surgery, (2) not involving EHRs in the US, (3) not related to physician burnout. The topic of documentation, usability, time demands, and electronic messaging was recorded for each article.

Results: Initially 207 articles were obtained. After filtering through articles title 48 remained after. Further filtering through abstracts produced 25 articles. Surgical specialties included general surgery, vascular, orthopedics, ENT, surgical oncology, and the surgical intensive care unit. Documentation was mentioned in 15 out of 25 articles, usability in 4 out of 25, time demands 16 out of 25, and electronic messaging in 8 out of 25 articles.

Conclusions: The findings of this study highlight the significant impact of (EHR) on physician burnout within surgical specialties. The two main factors of the EHR contributing to burnout were documentation and time demands, as evidence by the literature.

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Keywords: electronic health record; surgeon; burnout

Introduction

Electronic Health Record (EHRs) integration into modern healthcare aimed to improve patient care by enhancing the efficiency, accessibility, and reliability of patient health information (1). First introduced in the 1970's, EHR usage has continued to increase over the years, with nearly all non-federal acute care hospitals (96%) and a significant percentage (78%) of office-based physicians having adopted a certified EHR as of 2021 (2). EHRs have been empirically linked to increased adherence to evidence-based clinical guidelines as well as effective care; for example, usage has been associated with a reduction in medication errors, fewer unnecessary diagnostic tests, improved anticoagulation prophylaxis adherence, increased vaccination rates, and lower mortality rates (3-8). However, the integration of EHRs into the clinical workflow has had unintended consequences, including a heightened risk of burnout among surgical professionals. EHR usage has been identified as the single most common stressor in patient care in some studies and has been strongly associated with burnout and intent to leave a practice (9-11).

Physician burnout is defined as a chronic stress response in the medical field with components of depersonalization, exhaustion, and a diminished sense of accomplishment (12). Burnout awareness and universality have continued to increase, with one longitudinal cohort and cross-sectional study showing that prevalence increased from 35% to 56% from 2013 to 2020; despite multiple attempts to mitigate burnout, medical students, residents, and all practicing physicians are at a significant risk of burnout (13-15). Surgeons retain an elevated risk of burnout relative to other fields, with consequences of burnout including a heightened risk of substance abuse, disruptive behavior, attrition, strained interpersonal relationships, suicidal ideation, depression, and poor patient outcomes (16-19). The complex and time-consuming nature of EHR usage in the surgical field has a meaningful impact on the well-being of surgeons. While literature shows an association between EMR use and provider burnout, little evidence is in use for burnout-reducing interventions (20). This study aimed to characterize the significant contributors to EHR-

related burnout in the surgical field to better provide a framework to create evidence-based strategies to promote the well-being of providers and high-quality patient care.

Methods

A summary of the literature search of PubMed was performed in May 2024 to include articles from 2004 through 2024. The strategy utilized included titles having keywords including the following: ([“EHR" or "EHRs" or "electronic health record" or "electronic medical record" or "electronic health record" or "electronic health records" or "health information technology")] and [“stress” or “burnout” or “frustration” or “workload”) AND [“surgery”]). Articles were filtered to the English language only. Sequential title, abstract, and full-text reviews were completed with the following exclusion criteria: (1) not applicable to surgery or surgery subspecialties, (2) not involving EHRs in the U.S., (3) not related to physician burnout, and (4) editorials or commentaries. Relevant literature that further explored burnout was also included. The 25 articles eligible for inclusion in this review are summarized and discussed.

Results

Initially, 207 articles were obtained. After filtering through article titles, 48 articles remained to be assessed. Evaluating the abstracts of the 48 articles ultimately produced 25 relevant articles (Figure 1). The articles primarily included the following surgical specialties: general surgery, vascular surgery, orthopedic surgery, ENT, surgical oncology, and the surgical intensive care unit. Documentation was a significant contributor in 15 out of 25 articles, time demands 16 out of 25, electronic messaging in 8 out of 25, and usability in 4 out of 25 articles (Table 1).

Source	Potential Source of Burnout			
	Documentation	Usability	Time demand	Electronic Messaging
Malay, 2020	x		x	
Cox, 2021		x	X	
Ebbers, 2022	x	x	X	
Dymek, 2021	x			X
Yan, 2021	x		x	X
Lilly, 2019			X	
Kesler, 2022			x	x
Somerson, 2020	x		X	

Victores, 2014			x		
Coleman, 2021	x		x		
McPeek-Hinz, 2021	x		X		
Lin, 2021		X			
Bahr, 2023		X			
Ho, 2023	x		x		
Drudi, 2022	X				
Carayon, 2015	x		X		
Aziz, 2019	x		x		x
Wormer, 2015	x		x		
Ham, 2016	x		x		
Shenson, 2016					X
Sun, 2018					x
Cronin, 2015					x
Congelosi, 2023			x		x
Crowson, 2016	x		x		
Feibur, 2011	x				

Discussion

Documentation

Electronic medical records have streamlined documentation while increasing transparency (21). However, the standardized EMR templates were designed to optimize billing and revenue generation and often struggle to capture the complexity of patient care (22). Accurately incorporating the nuances of the complete clinical picture adds time. Clinical documentation in the US takes nearly four times longer than in other countries; excessive entry requirements, long cut-and-pasted notes, and excessive data entry requirements can add to a document's length without significantly contributing to patient care (23, 24). Deceptively minimal time spent on one patient becomes significant; Malay discussed that an added 3-5 minutes of documentation per patient encounter could easily lead to an additional 45-100 minutes of unreimbursed time (25).

The added burden of documentation negatively impacts the patient-provider relationship. Because documentation is so emphasized, physicians often feel they need to spend time on their computers in patient rooms to complete their work. Sinsky et al. performed a quantitative direct observational time and motion study and found that 49.2% of time total office was spent on EHR and desk work; of the 27% of time interacting with patients, 52.9% of patient interaction time was

spent via direct face time with 37.0% of the time spent on EHRs and desk work (26). Time spent on clerical tasks not directly related to patient care is associated with burnout (27). Increased documentation time also adds to the cognitive load on physicians and increases the potential for errors. One study showed that 80% of physicians experienced fatigue within 22 minutes of EHR usage-which was then associated with less capable EHR usage in subsequent cases (28). Usage of an EHR greater than 20 hours a week was also associated with higher burnout (29).

The average daily workload in EHRs is significant; 58% of a surgeon's workload was spent on EHR-related tasks, with another study showing administrative workload as high as 67% (30, 31). Even "average" EHR-related workload places physicians at risk for burnout, likely related to navigating multiple screens, templates, and pop-up screens, disrupting the natural workflow (32, 33). Drop-downs or text entries in inappropriate areas are associated with negative patient consequences (34, 35). Frequently switching tasks leads to increased mental strain and loss of focus in an already busy career.

Time Demands

Surgeons have the highest mean annual hours worked of all specialties (+303 hours over average); additional time spent navigating EHRs detracts from other patient care, self-care, or other important life events (36). One study found that surgeons, when forget to balance administrative and clinical demands with their personal lives, gave their personal lives a lower priority (37). Fewer than one-quarter of providers believe there is enough time for documentation during the work day, as evidenced by 17.08% of all EMR encounters occurring outside of working hours (38, 39) (40). EMR usage at home significantly increased the odds of burnout (33). Cox et al. discussed that 35% of EMR time occurred remotely, with a greater proportion of this time occurring during nighttime hours and on Sundays (41).

Electronic messaging

Every surgical specialty has experienced growth in outpatient interactions, commonly through electronic messaging (42, 43). While there are positive benefits to electronic messaging,

such as the ability to mitigate patient frustrations, concerns, and questions while decreasing costs, over-utilization can also impact burnout. High patient call message volumes are associated with higher rates of provider burnout (44). Electronic messaging between healthcare providers has also increased as well; while messaging allows for effective relaying of information, inappropriate messaging unnecessarily burdens providers. One study showed that 27.7% of nighttime communication was non-urgent, highlighting the importance of timing and content (45).

Usability

Transitioning to use EHRs or transitioning from a different EHR system can cause struggles for providers (2). While certain basic principles exist between them, there can also be variability within the same EHR based on the hospital. Despite this, little literature exists to guide EHR transitions, instead relying on the internal training teams when applicable (46). Additionally, for providers who are required to learn how to operate EHRs for the first time, their efficiency drastically drops. While it does eventually improve, it often does not return to the pre-EHR baseline (47). One limitation of EHRs also relates to downtime, the period when the system is partially or fully unavailable. These times periods can pose significant risks to patients and hospital operations. While protocols often exist to mitigate this risk, one study showed that the protocols were only executed 27.6% of the time (48). Providers who are dissatisfied with their EHR are at a higher risk of burnout; however, satisfaction with one's EHR was found to be protective of burnout, demonstrating the difference that a functional, usable EHR makes (49). These results extend beyond burnout, as poor EHR usability was associated with higher intention to leave, significantly higher odds of inpatient mortality, and 30-day readmission (50).

Burnout Strategies

Surgeons' workloads are already high between balancing scheduled surgery, clinic patients, consultations, administrative tasks, hospitalized patient visits, and emergent surgeries. Given the already high risk of burnout in the field, combating the issue from every avenue is important (16). While global changes to EHRs would likely have the most significant contribution to EHR-related

burnout rates in surgeons, the changes will take time and likely require years of refinement to ultimately achieve the desired outcome. The design of EMRs would ideally be optimized on a user-centered design with direct input from physicians; by creating a system that enhances usability and patient care, physicians would be more likely to adopt and optimize an EHR (51). While EHR's do have limitations, they also provide an economic advantage, increased quality of care, and can be a protective factor against burnout when utilized well (49, 52, 53).

The quality of EHR training can impact usability, which can then be extrapolated to improved burnout rates (54). Most surgeons likely remember their onboarding training at a new hospital comprised of hospital tours, meeting staff, company policies, going through multiple handbooks, and, at some point, going through the EHR. Surgeons frequently receive suboptimal introductions to their new practice settings; robust onboarding can help mitigate the transition (55). This extends beyond index training, as one study evaluated 1010 providers participating in a personalized re-training program designed to improve efficiency and knowledge using EHRs. The results showed a reduction in burnout rates from 32% to 23% (56). Studies have also shown that daily EHR usage decreases over a period of years, highlighting that physicians also improve their efficiency over time (57).

Speech recognition software allows physicians to create text from voice commands, decreasing documentation time (58). This technology has continued to become more complex and useful in documentation (59, 60). Artificial intelligence (AI) has the potential to drastically impact documentation by leveraging natural language processing (NLP) technology to automate documentation of patient visits in EHRs (61). The benefits of artificial intelligence, particularly regarding machine learning, are not limited to documentation only. Machine learning can potentially modify chart review; one test using NLP retrieved information in patient records in a reasonably accurate, low-effort, and scalable manner (62). While still in its infancy, rapid processing and analysis of past medical experiences can be an excellent therapeutic aid. Although it is unlikely to fully replace a surgeon’s own onus to perform a chart review, it may develop into an adjunct that

decreases HER-related time.

Medical scribes have been proposed to alleviate stress through decreased provider-EHR time, increased patient and provider satisfaction, improved workflow efficiency, and billing and reimbursement coding optimization (23, 63, 64). Systemic reviews and meta-analyses support scribe usage with an improved impact on RVU per patient hour as well as satisfaction (65). While the impact on burnout has some varied data, some studies show reduced burnout and significantly less time charting (66). One retrospective study examined 148,410 scribed encounters at 55 different clinics and found that surgery had the lowest median completion time, further showing the potential for scribes to improve documentation-related burnout (23). These findings had a financial impact, as one pediatric plastic surgery clinic at a tertiary care facility found that scribes reduced their cost per office visit (67). With an improvement in documentation burden, coding, and inter-office communication, scribes may be a useful addition to help mitigate burnout (68).

While some strategies above can help mitigate burnout related to EHRs in the surgical field, the largest and most lasting change would have to be at a policy level. While vendors can mitigate difficulties with current issues, until it is required that EMRs are produced in a user-friendly design, with input from healthcare professionals, have interoperability standards to easily facilitate the exchange of information between systems, and there is a reform to payment policy to include care coordination and accuracy of information provided, there is little incentive for EHRs to adapt to the needs of patients (22). The requirement of significant changes to the usability of EHR, including reform of certification standards, interoperability, increase physician engagement in the design, implementation, and customization, would be an important first step in addressing EHR-related issues

Conclusion

While EHRs have made a substantial positive contribution to healthcare, they have also been a significant contributor toward physician burnout in surgical specialties. This review of the literature identified documentation and time demands as the two main factors contributing to

burnout. Surgeons are inherently placed under an immense amount of stress at baseline in their careers, and the inherent risk of burnout being increased by providing patient care need to be better addressed. Ultimately, for there to be a substantive impact on burnout rates, changes to EMRs needs to happen at a policy level. However, steps can be taken in the interim to attempt to better mitigate burnout.

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Supplementary Files

Figures

Breakdown of articles selected after review.