**EMR-Related Burnout:
What does the Evidence Suggest?**

Kim Thompson & Sarah Pickup

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Objectives

At the conclusion of this activity, you will be able to:

1. Understand the defining qualities and symptoms of Burnout Syndrome (BOS)

2. Describe the impacts that BOS has on an individual and the healthcare system

3. Understand the evidence in the literature about Electronic Medical Records (EMR) related burnout.

4. Outline ways to moderate Burnout Syndrome in the planning and design of Clinical Information Systems and Electronic Medical Records that will reduce the risk of Burnout in clinicians.

Nova Scotia's One Person One Record Burnout Working Group

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Definitions

EMR- Electronic Medical Record (single practice's version of a patient's chart)

EHR- Electronic Health Record (designed to be shared with other providers)

CIS- Clinical Information System (Integrated information management system with a that is designed to integrate, collect, store and manage data from numerous sources to support healthcare)

BOS- Burnout Syndrome

HIT- Health Information Technology

HIM- Health Information Management

CPOE- Computerized Provider Order Entry

SUS- System Usability Score

TIS- Time in System

PGHD- Patient-Generated Health Data

NOTE: there is a **difference between EMR and EHR.** We used EMR for this presentation to not exclude EMRs from the review. In general, we are referring to both EMRs and EHRs for the purposes of Burnout. We did not exclude primary care environments but focused more on hospital-based systems.

Factors we will not address today but recognize are exceptionally impactful in Burnout
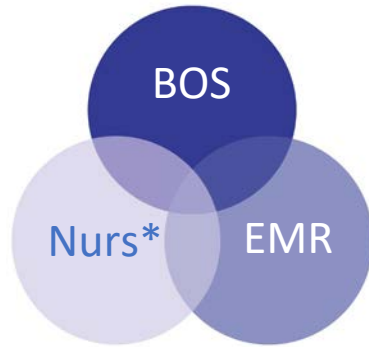

Health System issues

Workload Control

HHR & Vacancy challenges

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What do we know about BOS and EMR use?

Review of the Evidence:

- 44 articles were reviewed by the Burnout Working Group

- EMBASE, Pubmed, CINAHL, Google Scholar

- Search Terms: EHR, EMR, Burnout, Burnout Syndrome, Mitigation, nurs*, HIT, HIM, Allied Health, [Electronic Medical Record], [Electronic Health Record], CIS

- Clinical Information System (CIS) does not garner many results for this topic

- Did not exclude literature published since Covid, or those that address Covid, but focus of the study needed to be BOS based on EMR use.

- Limited to Peer-reviewed; avoided grey literature

What is Burnout Syndrome?

What is Burnout Syndrome (BOS)?

Emotional exhaustion is the feeling of being depleted, indifferent and over-extended.

Depersonalization involves a reduced attachment towards a one's work or a patient to whom one is providing care.

Lack of **professional or personal accomplishment** is described as a lack of feeling of achievement in one's work.

Burnout Syndrome Risk Factors

Workload

Lack of control (in defined role and direction)

Lack of reward

Sense of community in the workplace

Fairness

Values and job-person incongruity

Less experienced practitioners have been found to be more at risk for BOS than older, more experienced staff

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Maslash Burnout Inventory (MBI)

A 22-question validated survey measuring for factors associated with BOS that are then divided into three domains, emotional exhaustion being the most recognized and overriding of the three.
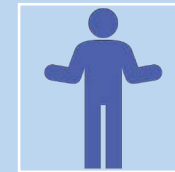
Measured on a Likert scale:

Never (0)
A few times a year or less (1)
Once a month or less (2)
 A few times a month (3)
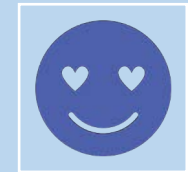Once a week (4)
A few times a week (5)
Every day (6)

I feel emotionally drained from my work.

I worry that this job is hardening me emotionally.

I feel frustrated by my job.

I can easily understand how my recipients feel about things.

I feel burned out from my work.

I feel I'm positively influencing other people's lives through my work.

Symptoms and personal impacts associated with BOS

Psychological
- Hopelessness
- Lack of empathy
- Feeling overwhelmed
- Anxiety
- Anger
- Suicidal ideation
- PTSD

Physical
- Exhaustion/Fatigue
- Insomnia
- Muscle tension
- Headaches
- GI problems
- Chronic illness
- Alcoholism

Impacts to the Health System

- Quality and safety of patient care
- Financial implications of lost productivity
- Turnover
- Sick time
- Higher mortality rates
- Increased medication errors
- Higher rates of infection
- Increased adverse events
- Decreased patient satisfaction in care

Understanding Burnout in Nova Scotia Health context

REPORTS OF ORIGINAL INVESTIGATIONS

Understanding burnout and moral distress to build resilience: a qualitative study of an interprofessional intensive care unit team

Comprendre l'épuisement professionnel et la détresse morale afin de développer la résilience : une étude qualitative d'une équipe interprofessionnelle à l'unité de soins intensifs

Jennifer Hancock, MD, FRCPC, CCM · Tobias Witter, MD · Scott Comber, PhD · Patricia Daley, BN, RN · Kim Thompson, BSc, RRT · Stewart Candow, BN, RN · Gisele Follett, BSc, RRT · Walter Somers, RN, MN · Corry Collins, CLU, CHFC, CHS · Janet White, RN · Olga Kits, BA(H), MA

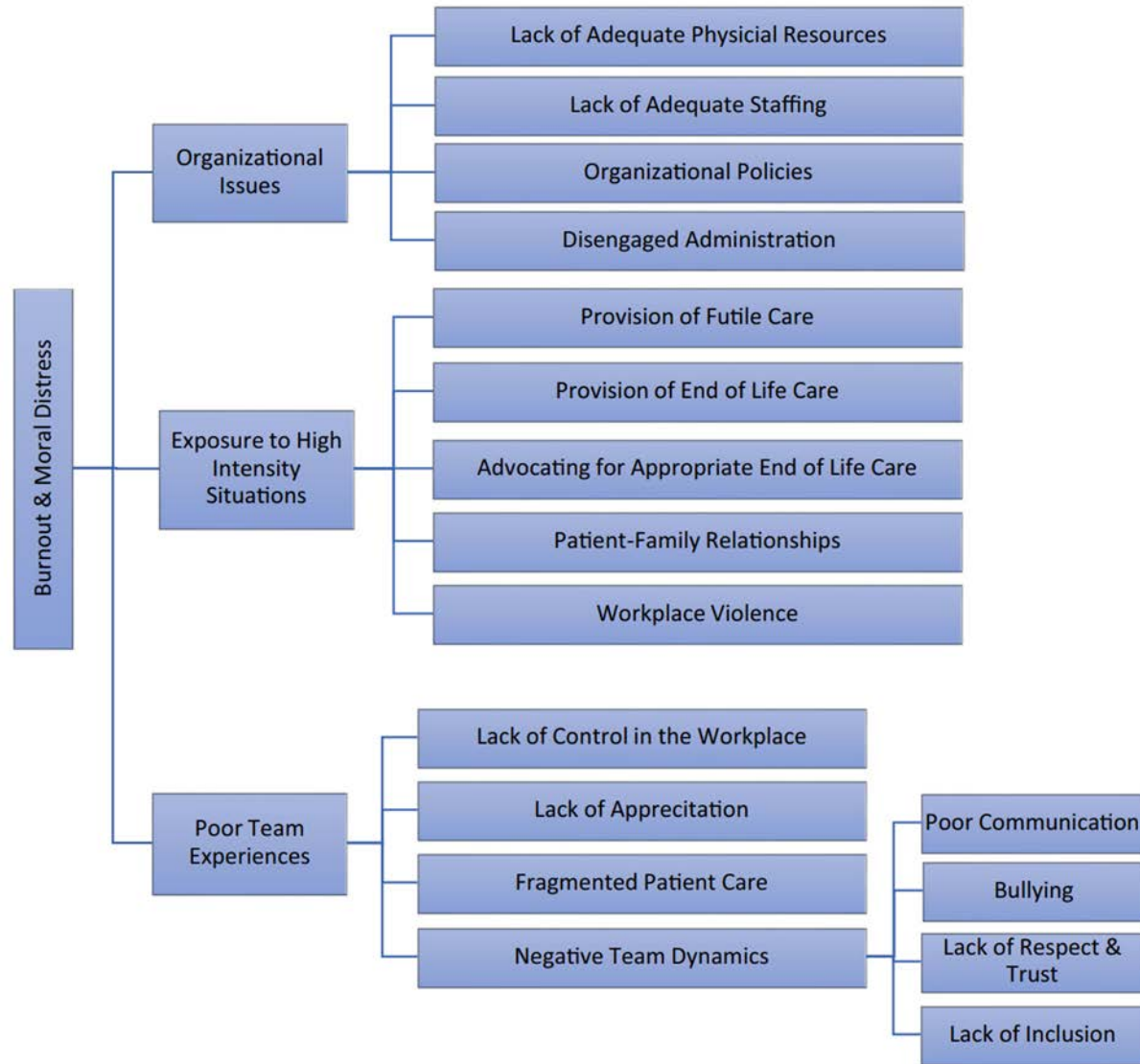# Burnout & Moral Distress- Results

Figure Themes causing burnout and moral distress

Hancock et al, 2020

# Other professionals in the health system

Burnout Among Hospital Non-Healthcare Staff

Influence of Job Demand-Control-Support, and Effort-Reward Imbalance

Maëlys Clinchamps, MSc, Candy Auclair, MD, Denis Prunet, MSc, Daniela Pfabigan, PhD, Francois-Xavier Lesage, MD, PhD, Julien S. Baker, PhD, Lenise Parreira, MD, Martial Mermillod, PhD, Laurent Gerbaud, MD, PhD, and Frédéric Dutheil, MD, PhD
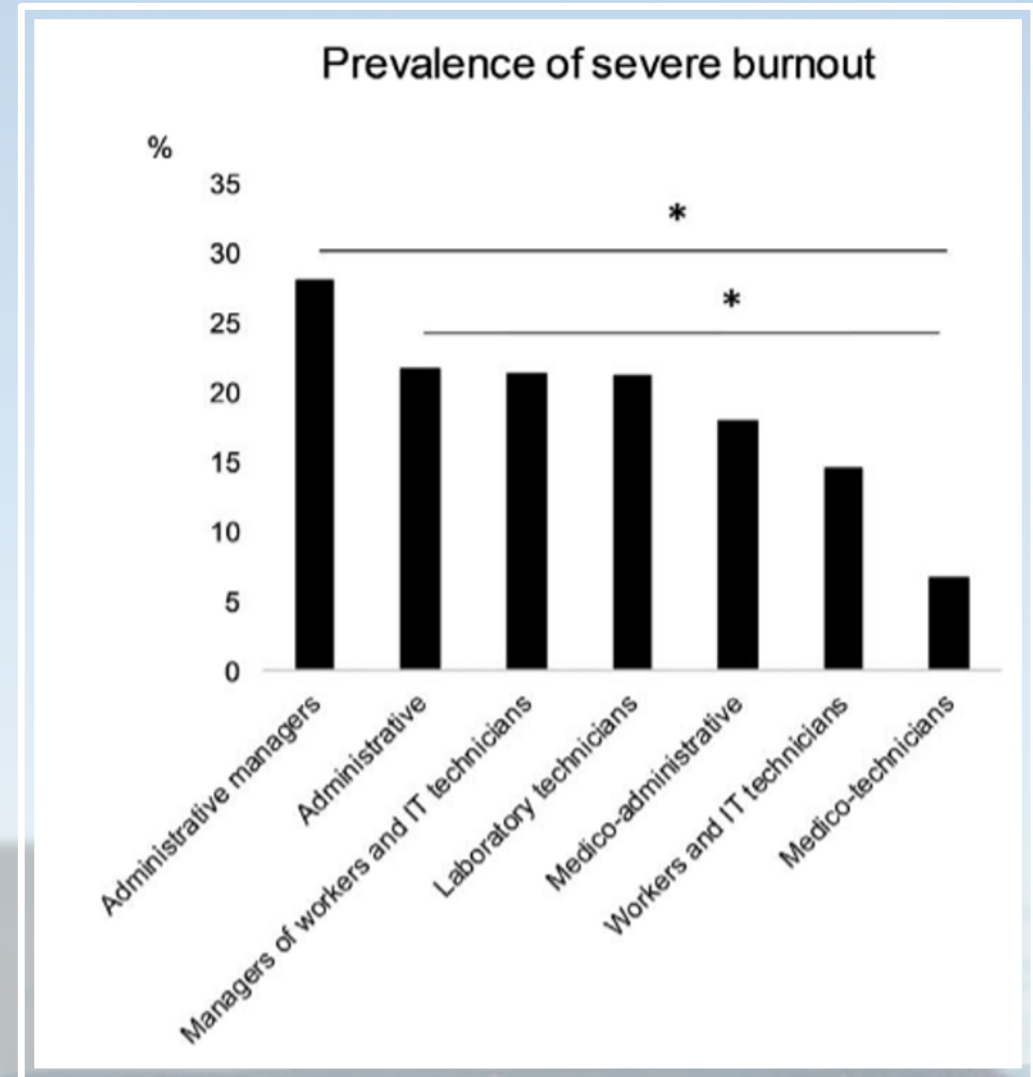
Team Burnout

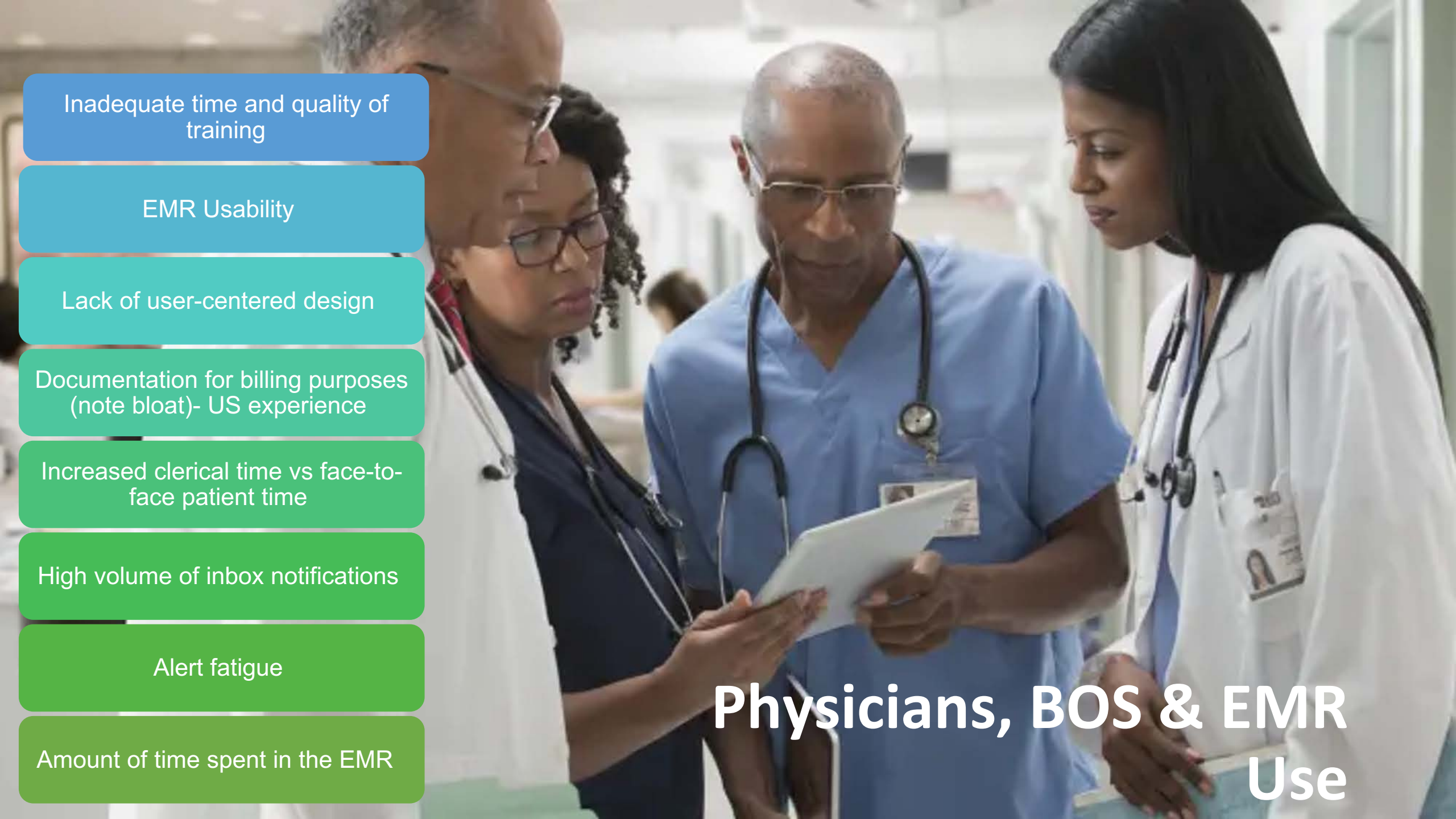**TABLE 2.** Cross Tabulation of Position Held in Emergency Department by Burnout Category Scores

	Physician	Medical Technician	Nurse	Information Technician	Total	Pearson Chi-Square*
Emotional exhaustion score						
Low	1 (2.63)	5 (5.95)	12 (13.48)	2 (5.12)	20 (8.00)	0.035
Moderate	10 (26.31)	8 (9.52)	18 (20.22)	5 (12.82)	41 (16.40)	
High	27 (71.05)	71 (84.52)	59 (66.29)	32 (82.05)	189 (75.60)	
Depersonalization score						
Low	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0.170
Moderate	8 (21.05)	10 (11.90)	18 (20.22)	3 (7.69)	39 (15.6)	
High	30 (78.94)	74 (88.09)	71 (79.77)	36 (92.30)	211 (84.40)	
Personal accomplishment score						
Low	11 (28.94)	56 (66.66)	58 (65.16)	17 (43.58)	142 (56.80)	0.000
Moderate	27 (71.05)	22 (26.19)	29 (32.58)	20 (51.28)	98 (39.2)	
High	0 (0.00)	6 (7.14)	2 (2.24)	2 (5.12)	10 (4.00)	
Total (%) for each group and category	38 (100)	84 (100)	89 (100)	39 (100)	250 (100)	

*$P < 0.05$.

**Technician= Lab, DI, paramedic*

EMR-Related Burnout

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Inadequate time and quality of training

EMR Usability

Lack of user-centered design

Documentation for billing purposes (note bloat)- US experience

Increased clerical time vs face-to-face patient time

High volume of inbox notifications

Alert fatigue

Amount of time spent in the EMR

Physicians, BOS & EMR Use

Nursing, BOS & EMR use

- Nursing is the largest healthcare professional group and user of a hospital-based EMR

- Nursing to physician ratio is 4:1, studies on burnout are 1:4

- Amount of time spent in an EMR impacts physician's well-being, this is less the case for nurses.

- Nurses prioritize the quality of their interaction with an EMR over the quantity.

- Difficult-to-use technology can discourage nurses from utilizing it as intended, leading to workarounds that contribute to increased burnout and decreased work satisfaction due to inaccurate documentation and limited information sharing.

- Nurses' positive attitude and readiness to embrace and enjoy new technology in their nursing work can lead to increased work satisfaction and well-being, as they perceive it as a supportive resource that enhances their tasks.

Physicians & Nurses, BOS & EMR use

- System usability and BOS in both professions
- Insufficient documentation = higher burnout
- EMR use after hours & at home = high association with BOS
- Adequate training = low reported levels of BOS
- Alert and message load (volume)
- *Perception matters -* 88% were burned out vs 56% , higher BOS with those who disagreed that EMRs keep patients safe, improve efficiency, EMR communications were effective or were dissatisfied with non-clinical clerical tasks.

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EMR Design and Use Factors

Figure. Conceptual Framework of Association of Work Conditions and Electronic Health Record (EHR) Design and Use Factors With Clinician Outcomes

Background Variables

- Clinician sex
- Clinician age
- Years in practice
- Patient complexity

- Part time/full time
- Work control
- Chaos
- Organizational culture

EHR Design and Use Factors

- Excessive data entry
- Note bloat (too much cut-and-paste template use)
- Notes focused on billing, not patient care
- Fear of missing something
- Inability to navigate system quickly
- Slow system response times
- Information overload
- Interference with patient-clinician relationship

Clinician Outcomes

- Satisfaction
- Posture problems
- Burnout
- Pain
- Stress
- Intent to leave

JAMA Network Open. 2019;2(8):e199609. doi:10.1001/jamanetworkopen.2019.9609

August 16, 2019   2/14

These 2 factors account for 52% of the variability in use and design related to clinician stress and burnout

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Keep in mind…..

Journal of the American Medical Informatics Association, 28(5), 2021, 985–997
doi: 10.1093/jamia/ocaa301
Advance Access Publication Date: 19 January 2021
Review

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Review

The burden of the digital environment: a systematic review on organization-directed workplace interventions to mitigate physician burnout

Kelly J. Thomas Craig [1], Van C. Willis[1], David Gruen[1], Kyu Rhee[1] and Gretchen P. Jackson[1,2]

U.S. vs Canadian Context

"EHR optimization will not be sufficient as the documentation burden for regulatory purposes (eg, billing and reimbursement) is the primary driver of US dissatisfaction with EHRs………US regulatory changes could potentially lessen the documentation burden by nearly 4-fold"

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The Digital Divide

Conscious Competence Learning Model   Bell, J. Resultswise.com
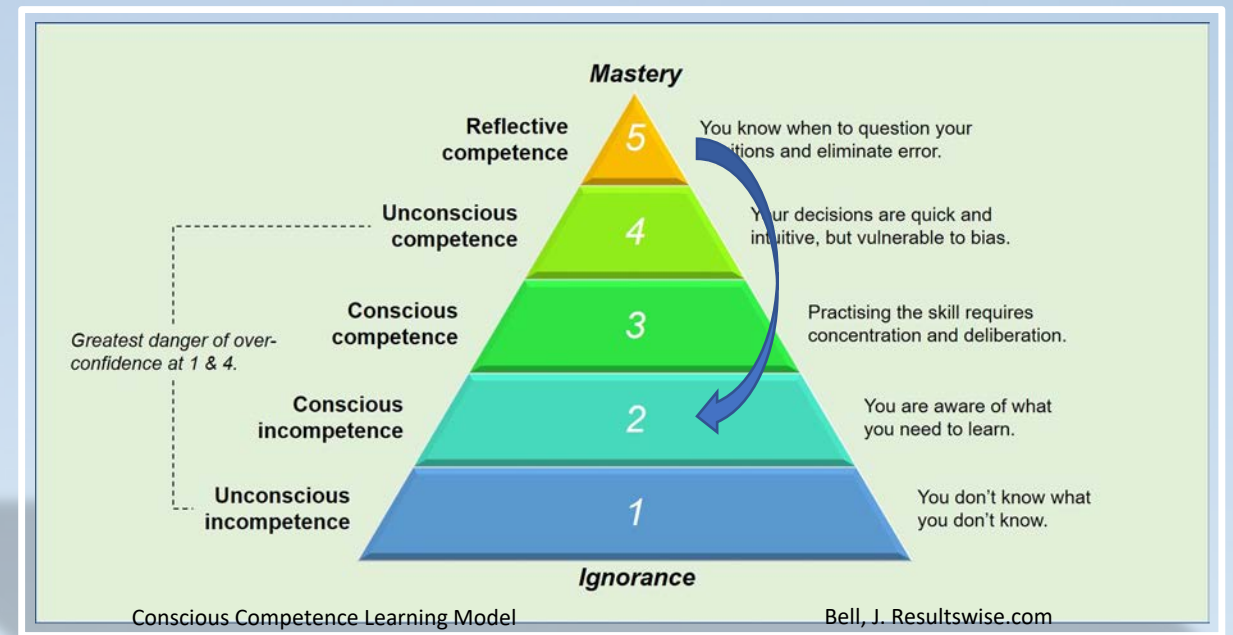
▪ Gen Z and Baby Boomers have different communication preferences, cognitive styles and information sources.

▪ Younger generations are 'digital natives' and have a leg up on more experienced practitioners in this domain

▪ Experienced clinicians tend to mentor newer members of their team about clinical care and medicine.

▪ This juxtaposition can cause stress to experienced clinicians

▪ Baby boomers were more likely to have developed policy surrounding use of technology without having had the opportunity to use it, (i.e., HIPPA, PHIA, PIIDPA, FOIPOP)

Generational Differences

Table 1 Generational characteristics

Characteristics	Traditionalists	Baby Boomers	Generation X	Millennials	Generation Z
Birth years	1928–1945	1946–1964	1965–1980	1981–1996	1997–present
% of U.S. population[a]	7%	21%	20%	22%	30%
% of U.S. workforce[a,b]	<1%	25%	33%	35%	6%
Defining experience	Great Depression World War II GI Bill	Cold War Vietnam War Apollo Moon Landing	First PC introduced Fall of Berlin Wall World Wide Web	Dot-Com Bubble Social Media 9/11	Climate Change Covid-19
Defining product	Jukebox	Color TV	Sony Walkman	Apple iPod Google Search Facebook	Snapchat TikTok
Experience with technology	No digital	Early IT adopters	Digital immigrants	Digital natives	Digital natives/technologists

•
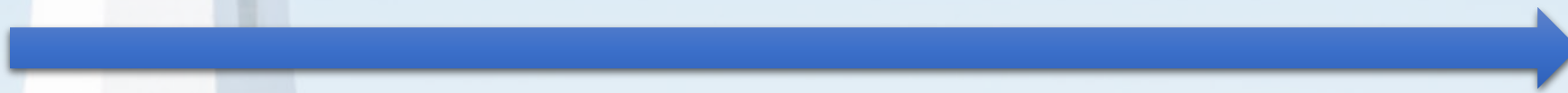
Recommendations to prepare for the Generational shift

Incorporate technologies that make clinical workflows and patient experiences more efficient and convenient

Adapt clinical workflows to the cognitive processes of younger generations

Less hierarchical culture in medicine

Technology-based training throughout the year

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Telemedicine, Virtual care and Patient-generated health data (PGHD)

- Telemedicine has increased by **8336%** in April of 2020 compared to the year prior
- Telemedicine and virtual care can allow for asynchronous patient visits
- Collaborative care models are enabled without need for proximity (tele-ICU)
- Impacts (positive or negative) of virtual care and telemedicine on BOS requires more time and research
- Patient-generated health data can include Smart watches, Smart phone apps, wearable devices, mobile health
- PGHD can lead to:

  Technostress, Workflow issues, Time pressure
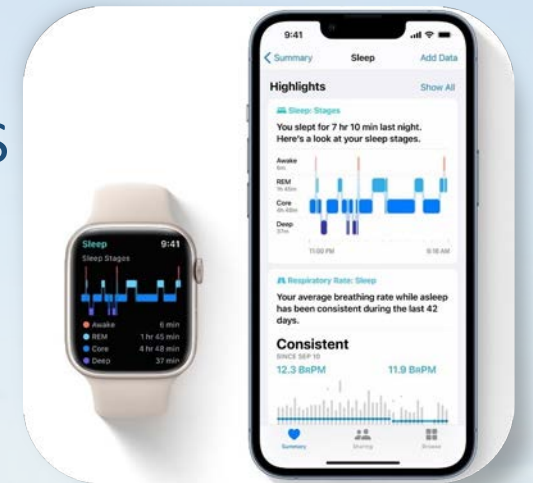
Design and Implementation Matters

Klaus® Research, 2020
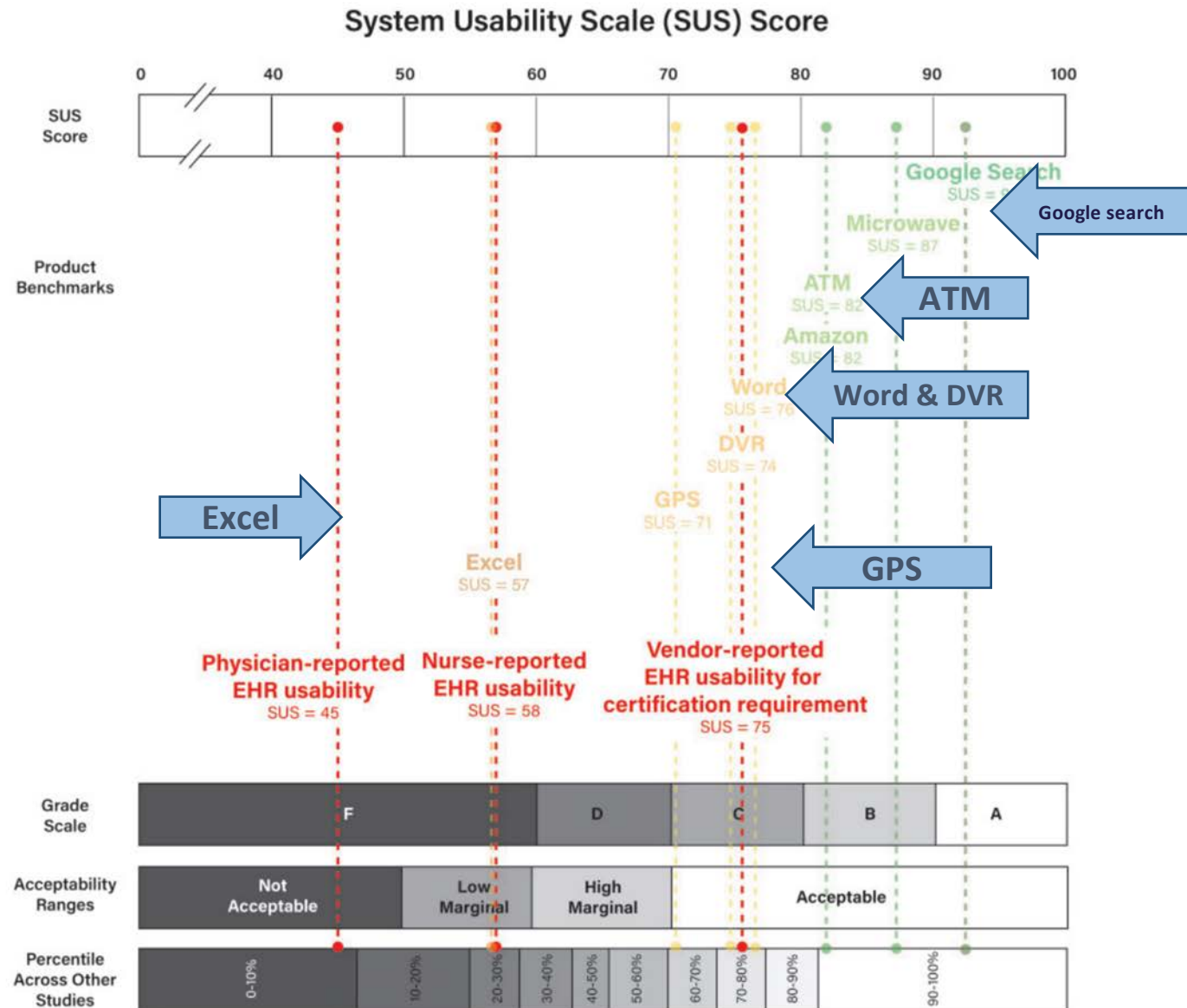
Figure 1. System usability scale (SUS) scores for the electronic health record (EHR) as reported by nurses in this analysis and compared across studies in healthcare and everyday products from other industries mapped onto a grading scale, acceptability ranges, and percentile of scores across previous studies. Figure adapted from: Kortum PT, Bangor A,[55] with permission from Taylor & Francis; License Number 5015970550082.

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Strategies to Avoid or Mitigate
EMR-related Burnout

Strategies that have been successful in avoidance or mitigation of EMR-related Burnout

After-hours clinical support	SWAT Teams/Optimization Sprints/Efficiency Improvement programs	Quality training	Robust clinician involvement in design
Scribes (high turnover and costly)	Improve standardization and appearance of alerts, i.e, color	Decrease steps needed for messaging and inbox functions	Ongoing EHR training for physicians-effective and efficient
	Application interoperability	Use HIT to mitigate rather than hinder workflow.	

The Electronic Elephant in the Room: Physicians and the Electronic Health Record -Kroth P., Morioka-Douglas N. et al. 2018

Table 3. Focus group themes

Things that work (successes)	Things that don't work (stress predictors)	Personal Consequences (outcomes)	How to make it better (organizational fixes)	How to cope with HICT (personal/resilience)
• Patient trends, medical images, and pictures • Messaging (colleagues, patient status, and patient connections) • References, research • Access to all info from anywhere • Allergy alerts; drug interactions • Filters • Legibility • Training/mentoring • Quality of care (ambivalent)	• Click boxes, too many clicks • Short visits, no time to reflect • Doctor–patient interactions • EMR built for billing rather than patient care (thought process lost) • Note bloat (cut and paste) • EMR at home, home not restful, hard to disconnect • IT staff not knowledgeable of clinical issues • Lose lunch, staying late • Too many screening questions • Interoperability (between hospitals) • Hard to find things in chart, fear of missing something • No clear spot for required activities (eg foot exams) • Computer slowdowns • Scanned info lost • No printers in rooms • Stress—"when can I do my notes"? • Population management compromises care of individual patient • Productivity down due to EHR • Need for workarounds/speed • Problem list maintenance • Lack of standardized data curation • Redundancy	• Pain: wrist, neck, back, eye, shoulders, and headaches • Posture • Sleep troubles • Anxiety (regulations, missing things, when to write notes) • Providers dropping out of primary care • Primary care less attractive to students	• Go talk with someone, less pinging • Highlighting key findings • Artificial intelligence • Auto-billing • Badge or fingerprint login (tap and go) • Touchscreen functionality • Care team work to top of license, staff support with In-basket, MAs write orders (watch out for consequences for support staff) • Recurring IT training, including "elbow to elbow" • "Desktop" time slots to catch up on EMR • Decrease # of clicks • Chat room with specialists • Scribes/documentation support (help with data input) • Customizable EMRs • Increase contact time with patients (eg printers in rooms)	• Swimming, spinning, exercise—self care • Set limits, be intentional about work, protect home time, sharpen work/life boundaries • Have routines, walk at lunch • More concise notes/empowerment around note writing • When I'm there I'm there, when I'm not, I'm out • Don't respond quickly • Think positively • Remember what you cannot control • Take the training and retraining • Customizing your EHR • Talk with residents and colleagues to learn the "tricks" of technology • Reduce clinical hours or work part-time

SWAT teams

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Case Report

EHR "SWAT" teams: a physician engagement initiative to improve Electronic Health Record (EHR) experiences and mitigate possible causes of EHR-related burnout

Lydia Sequeira,[1,2] Khaled Almilaji,[1] Gillian Strudwick,[1,2] Damian Jankowicz,[1] and Tania Tajirian[1,2]

[1]Centre for Addiction and Mental Health, Toronto, ON, Canada and [2]University of Toronto, Toronto, ON, Canada

Corresponding Author: Tania Tajirian, MD, Centre for Addiction and Mental Health, 6168F—100 Stokes Street, Toronto, ON M6J 1H4, Canada; tania.tajirian@camh.ca.
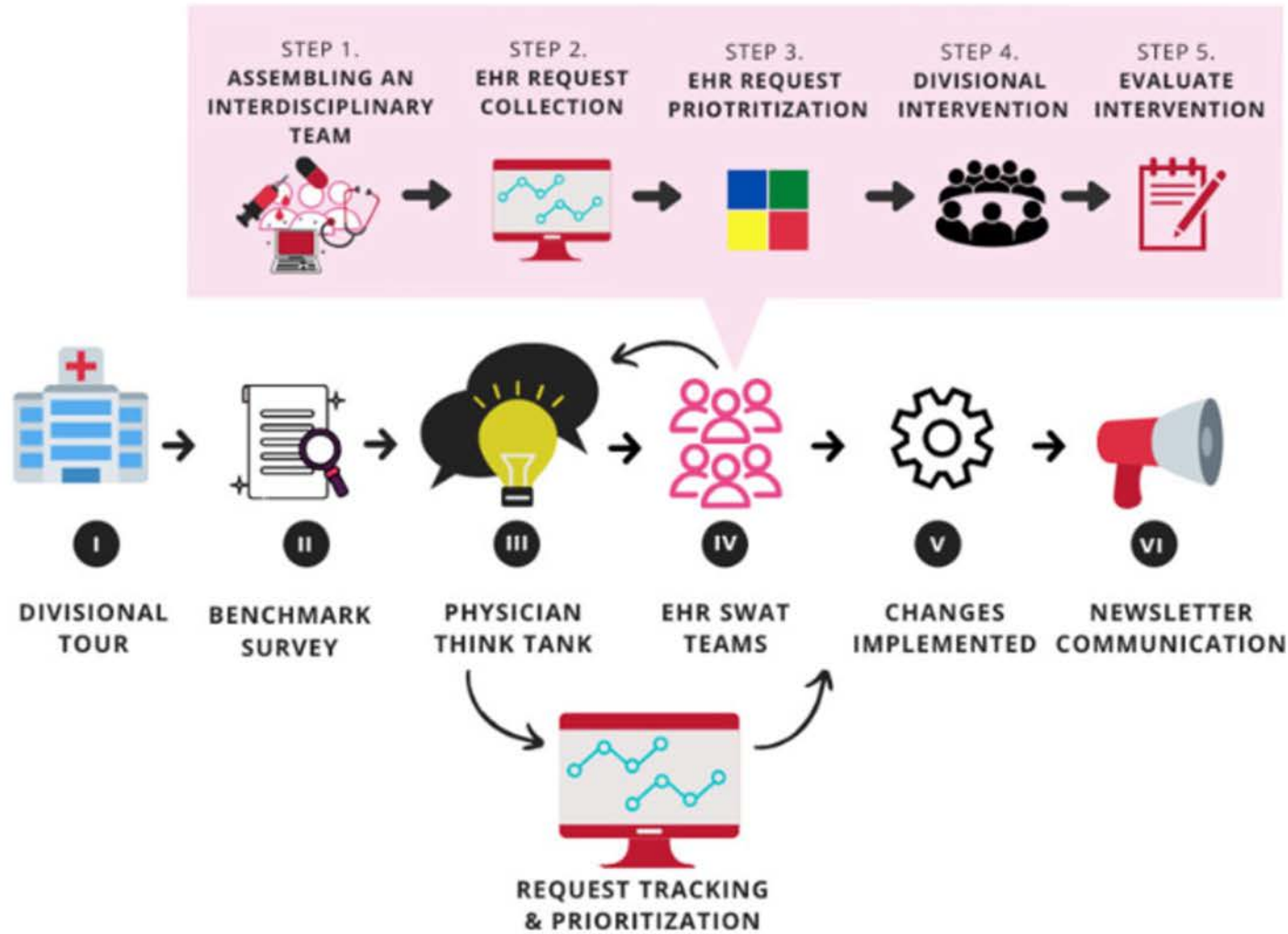
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SWAT teams

Figure 1. Overarching physician engagement strategy and how the SWAT team initiative is incorporated.

SWAT teams

Table 2. Lessons learned

	Theme	Key benefit
1	Leadership buy-in	Allowed us key in-kind resources that were needed to accomplish prioritization, approval, and implementation of change requests
2	Physician engagement	Allowed us to leverage monthly divisional meetings, providing physicians with protected time for this initiative
3	Project management	Allowed the team to efficiently carry out project management activities related to this initiative, including planning (e.g., scheduling divisional meetings), execution (e.g., collecting and tracking EHR change requests), and monitoring the initiative (e.g., carrying out evaluation), and tracking
4	Agile methodology	Allowed us to produce incremental updates and changes to the EHR, while striving for maximum physician end-user satisfaction with the EHR
5	Defined accountability	Allowed us to leverage a monthly newsletter to inform physician end-users about updates to the EHR and educational messages

Optimization Sprints

MAYO CLINIC

ORIGINAL ARTICLE

Optimization Sprints: Improving Clinician Satisfaction and Teamwork by Rapidly Reducing Electronic Health Record Burden

Check for updates

Amber Sieja, MD; Katie Markley, MD; Jonathan Pell, MD; Christine Gonzalez, CSM; Brian Redig, MBA; Patrick Kneeland, MD; and Chen-Tan Lin, MD

Abstract

Objective: To evaluate a novel clinic-focused Sprint process (an intensive team-based intervention) to optimize electronic health record (EHR) efficiency.

Methods: An 11-member team including 1 project manager, 1 physician informaticist, 1 nurse informaticist, 4 EHR analysts, and 4 trainers worked in conjunction with clinic leaders to conduct on-site EHR and workflow optimization for 2 weeks. The Sprint intervention included clinician and staff EHR training, building specialty-specific EHR tools, and redesigning teamwork. We used Agile project management principles to prioritize and track optimization requests. We surveyed clinicians about

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Optimization Sprints consisted of 3 components:

1. Training clinicians to use existing EHR features more efficiently,

1. Redesigning the multidisciplinary workflow within the clinic

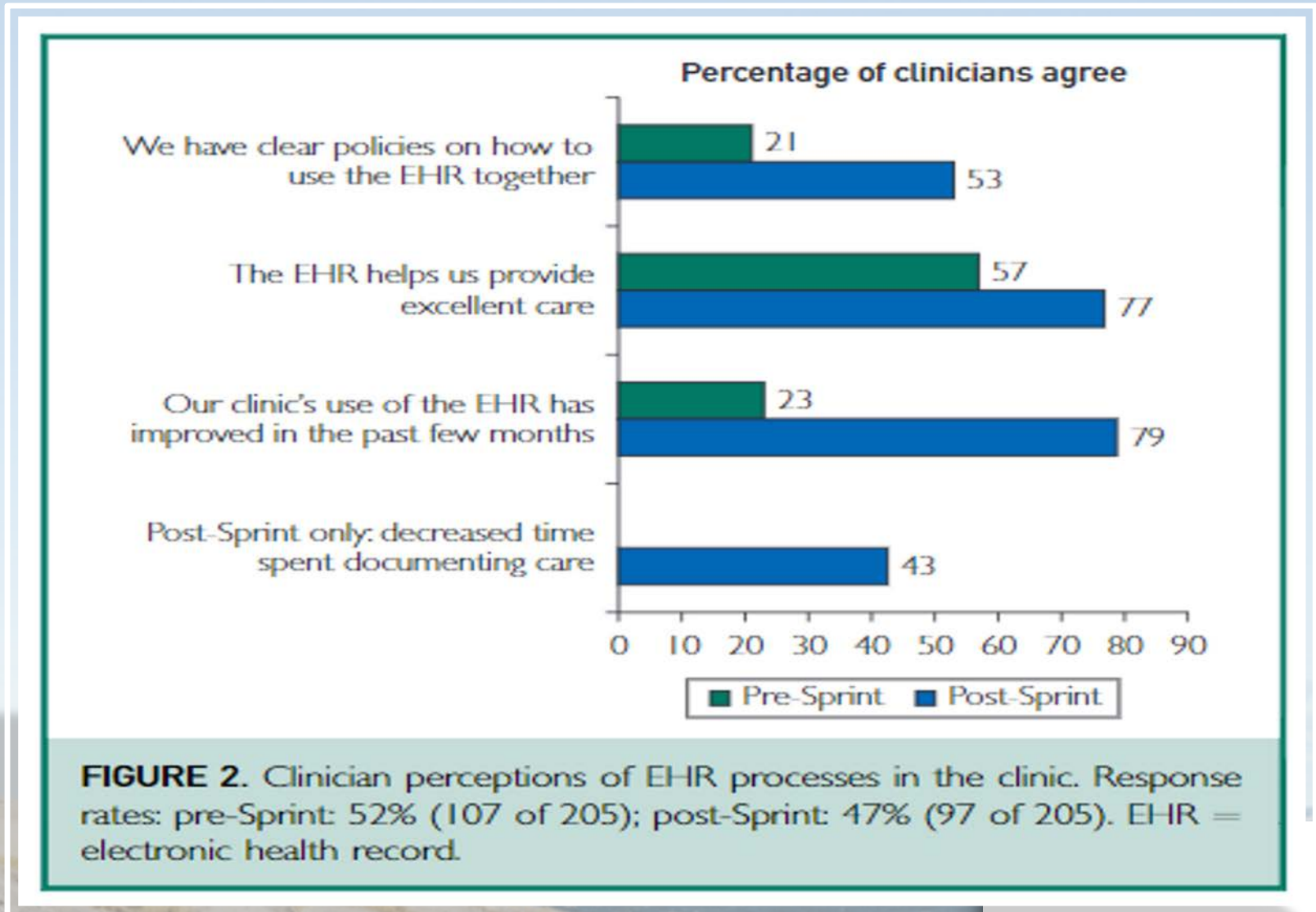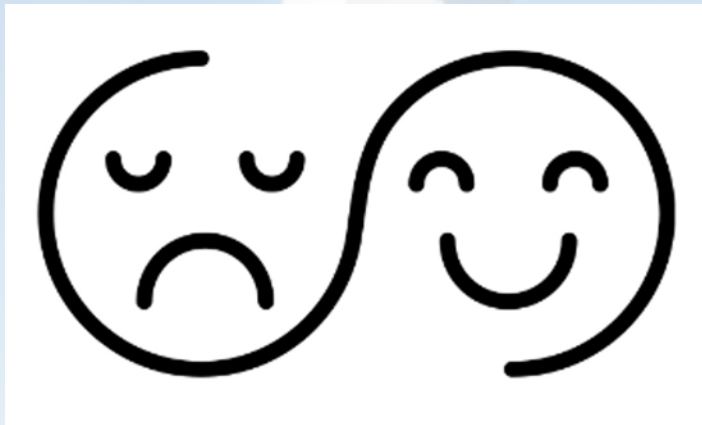1. Building new specialty specific EHR tools.

TABLE 2. Clinician Assessment of Helpfulness of Sprint Activities[a]

Activity	Description/content	Percentage of respondents who responded positively (No. of respondents)[b]
1-to-1 training	Clinician met individually with a trainer or PI to learn specific skills or address personal frustrations with the her	93% (68)
Speech recognition tool	Clinician learned how to use speech recognition with the EHR to improve word accuracy and create navigation shortcuts	87% (54)
New or redesigned tools	Specialty-specific EHR tools built during Sprint in response to clinic requests	80% (66)
Notes: smart phrases	Creation of personalized note templates to autotype frequently used phrases and allow efficient selection from drop-down lists	80% (64)
Observation/shadow	Trainer or PI observed a clinician use the EHR in an examination room or work area and offered feedback	79% (58)
Chart review efficiency	Tools for finding patient information in the EHR, including "chart search" and "custom filters"	77% (62)
Notes: problem list	Problem-based charting, problem list sorting and maintenance, and autocorrect dictionary	73% (67)
In-basket: clinic messaging	Managing patient calls, prescription renewals, and communication with referring physicians and receiving faxes and other paper forms	66% (59)
Ordering efficiency	Maximizing efficiency in placing single orders, multiple orders, future orders, and favorite orders	65% (58)
Out-of-office workflows	Best practices for notifying patients and for EHR in-basket (messaging) coverage when the clinician is not available	62% (48)
In-basket: test results	Managing test results from internal and external sources and notifying patients	60% (60)
Medication management	Efficiency tips for prescribing, setting preferences, managing refills, adjusting doses of existing medications, and reconciling medications	56% (59)
Check-in, check-out workflows	Coordinating care with clinic staff at patient check-in (verifying referring physician and preferred pharmacy) and check-out (follow-up, referrals, and testing)	48% (48)

[a]EHR = electronic health record; PI = physician informaticist.
[b]The percentage of clinicians who responded "agree" or "strongly agree" to the statement that the listed activity was helpful. A total of 186 clinicians were surveyed, and 84 responded to the survey. Not all clinicians participated in each activity. Total respondents to each question are shown within parentheses.

Clinician Perception of EHR pre and post Sprint

Percentage of clinicians agree

We have clear policies on how to use the EHR together
- Pre-Sprint: 21
- Post-Sprint: 53

The EHR helps us provide excellent care
- Pre-Sprint: 57
- Post-Sprint: 77

Our clinic's use of the EHR has improved in the past few months
- Pre-Sprint: 23
- Post-Sprint: 79

Post-Sprint only: decreased time spent documenting care
- Post-Sprint: 43

■ Pre-Sprint ■ Post-Sprint

FIGURE 2. Clinician perceptions of EHR processes in the clinic. Response rates: pre-Sprint: 52% (107 of 205); post-Sprint: 47% (97 of 205). EHR = electronic health record.

Implementation to Optimization: A Tailored, Data-Driven Approach to Improve Provider Efficiency and Confidence in Use of the Electronic Medical Record

Sarah S. Kadish, Erica L. Mayer, David M. Jackman, Mark Pomerantz, Lauren Brady, Audra Dimitriadis, Jessica L.F. Cleveland, and Andrew J. Wagner

- **205 Medical Oncologists**
- Provider Shadowing
- Provider Survey
- EMR Utilization profile
- Training sessions (targeted)
- Assessing training Impact

Post intervention Survey:
(89%) were positive
(11%) were neutral; the neutral comments generally discussed the EMR itself rather than the effectiveness of training.
No negative comments about the training or trainers were received.
Nearly all cited efficiency gains

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No overall TIS changes but after-hours time in system reduced

Table 2. System Usage Time Before and After Training

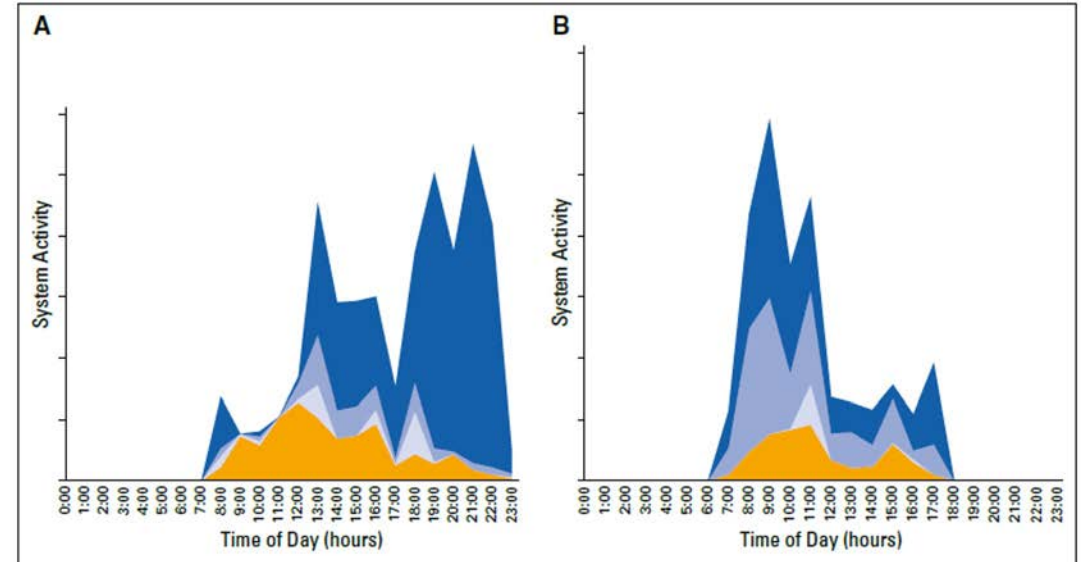| Activity	Time in System per Appointment (mins)		P
	Baseline	After Training	
Overall	26.69	25.88	.104
Clinical review	6.37	6.37	.627
Documentation	8.02	7.55	.019
Placing orders (excludes chemotherapy)	4.44	4.28	.042
Inbox management	2.01	2.11	.425
Other (includes chemotherapy)	5.85	5.56	.036

Fig. Example profiles that illustrate the average minutes per day per hour by activity for (A) a provider who spends a significant amount of time on documentation after hours and (B) a provider who spends a significant amount of time placing and reviewing orders relative to other activities. Dark blue, notes/letters; medium blue, order entry and review; light blue, inbox management; orange, clinical review.

What can clinicians do to the reduce risk of EMR-related Burnout?

- Participate in design decisions when asked. Fixing poor workflow is more difficult than planning with clinician needs from the outset

- Adhere to recommended training schedule

- Reach out for support before workarounds and poor practices become engrained.

- Understand that an initial period of discomfort and reduced productivity is normal.

- Understand that in your previous practice, there was no record or reminders of all the activities you do in the run of a day. Seeing it electronically can be overwhelming

- Your experience with another EMR or CIS may not translate (good or bad!)

- Digital tools can augment your practice to alleviate stress and pressure

- **Patient Care Comes First**. Documentation is a secondary activity. Your expertise and prioritization as a clinician will not change.

- Recognize your own needs around self-care and reduction of Burnout. The last number of years, and upcoming years in healthcare have been, and will be been unprecedented internationally.

Nurses-Reducing the impact of burnout

A meta-analysis identified <u>three primary themes</u> regarding nurses' well-being when using an EMR:

1. Enhancement of digital literacy is necessary during nurse training.

1. Enhanced integration of patient information displays, such as a patient dashboard, can facilitate decision-making.

3. Organizational policies:
   - number of workstations,
   - amount of downtime,
   - protected time for documentation (particularly NPs)
   - Use of adult learning principles used in training nurses.

More targeted research about nurses and non-physician healthcare personnel and burnout and use of an EMR is required

Conclusions

More research is needed on non-physician healthcare professionals in Burnout space and Burnout related to the use of an EMR.

Clinician training on an EMR is vital to reduce burnout

Post implementation optimization has been found to be key to user experience with an EMR

An EMR can lead to Burnout but can also be used as a solution to address workflow and mitigate burnout

Visibility of clinician usage, time studies and assistance of clinical decision support can help address workflow, and time/documentation burden
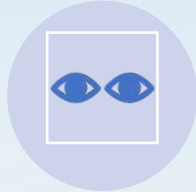
Usability is in the eye of the end-user.

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Thank you!

Questions?

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