Agenda

• Discuss EHR impacts on physician burnout
• Examine trends in EHR use during the pandemic
• Discuss the evolution of the Home 4 Dinner Program
• Understand EHR-use metrics for ambulatory physicians and discuss efforts to understand inpatient efficiency
• Discuss future directions
Burnout in the U.S.: Physicians & Population

How the EHR Contributes to Burnout

Usability, User Interface, Interoperability

Shift in Workload, Lack of Mastery

Built-in Regulatory & Documentation Requirements

Effect on Interpersonal Interactions

A Shift to Virtual Care...

- Significant changes to the face of ambulatory medicine
- Changes in patient expectations and awareness of EHR communication tools
- Creation of hybrid clinical environments

A Shift to Virtual Care...

FIGURE 1: Percentage of In-person vs. TM visits at Stanford Children’s Health in 2020.

EHR Use Trends in the Pandemic

- Epic Signal data
- 12 months, 366 Epic organizations

Figure 1. Total electronic health record time per day and after-hours time per day. Note: Blue-dotted line represents national COVID-19 case count and green line represents average daily clinical volumes in our sample.

EHR Use Trends in the Pandemic

Figure 2. Caption: total electronic health record time and after-hours time, controlling for volume and organization. Notes: Graphs are event study plots controlling for organization fixed effects and daily volume. All point estimates are relative to the week, 2-weeks prior to the first state-wide shelter in place (SIP) order in California, our proxy for the onset of the pandemic. Gray regions represent 95% confidence intervals with standard errors clustered at the organization level.

EHR Use Trends in the Pandemic

EHR Use Trends in the Pandemic

Patient Message Trends
InBasket and Burnout

MEDPAGE TODAY*
Special Reports > Exclusives

Are Doctors Drowning in Inbox Overload?
— The slow simmer of non-stop messaging boils over during the pandemic

by Sophie Putka, Enterprise & Investigative Writer, MedPage Today September 22, 2021

Electronic health records and burnout: Time spent on the electronic health record after hours and message volume associated with exhaustion but not with cynicism among primary care clinicians

Julia Adler-Milstein¹, Wendi Zhao¹, Rachel Willard-Grace², Margae Knox², and Kevin Grumbach²

Physicians’ Well-Being Linked To In-Basket Messages Generated By Algorithms In Electronic Health Records

The Joint Commission Journal on Quality and Patient Safety 2021; 47:76–85

Physician Task Load and the Risk of Burnout Among US Physicians in a National Survey

Elizabeth Harry, MD; Christine Simisky, MD; Lotte N. Dyrbye, MD, MHPH; Maryam S. Makowski, PhD; Mickey Trochel, MD, PhD; Michael Teney, PhD; Lindsey E. Carlassare, MBA; Colin F. West, MD, PhD; Tait D. Shanafelt, MD

Stanford Children’s Health | Lucile Packard Children’s Hospital Stanford
InBasket and Burnout

• Usability and attitude
  • Measured usability
  • Perceived usability *
  • Attitude toward the EHR *

• Time
  • Time spent in EHR
  • Work-outside-of-work (WOW)
  • Documentation time ★

• Task Volume
  • Total in basket messages ★
  • System messages

• Task characteristics
  • Task load/Cognitive complexity
  • Task type - Clerical work ★

★ = strongest association with burnout
*Not EHR-derived

Yan, Qi, et al. JAMIA (2021)
### Message Types

#### Patient
- Medical advice request
- Telephone request
- Clinical update message

#### Team
- Staff Message
- CC’ed charts
- Chart Cosign

#### System
- Unsigned Orders
- Incomplete Note
- Open Encounters

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Addressing InBasket Burden

• Address generation of messages AND
• Help clinicians deal with the backlog of old messages
  – Through targeted training and communication
  – System clean-up/auto-purging
Individualized Training (including H4D)

Optimization, personalization, and education can improve overall provider EHR experience

<table>
<thead>
<tr>
<th>Percent of personalization adopted by providers</th>
<th>Average net EHR experience score for organizations</th>
<th>Number of organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–20</td>
<td>−21.5</td>
<td>3</td>
</tr>
<tr>
<td>20–30</td>
<td>−29-</td>
<td>6</td>
</tr>
<tr>
<td>30–40</td>
<td>−21.1</td>
<td>15</td>
</tr>
<tr>
<td>40–50</td>
<td>15.7</td>
<td>44</td>
</tr>
<tr>
<td>50–60</td>
<td>27.3</td>
<td>54</td>
</tr>
<tr>
<td>60–70</td>
<td>25.1</td>
<td>10</td>
</tr>
</tbody>
</table>

Home 4 Dinner Pre-Pandemic

Learning Plan Development Process

Online Survey (15 minutes)
- Triggers observation scheduling

Observation Session (1-2 hours)
- Standardized checklist
- Stored in online Sharepoint database

Data Analysis (30 minutes)*
- Trainer analyzes:
  - Survey responses
  - EHR Profile
  - Observation data

Individualized Learning Plan (10-15 minutes)*
- Baseline goals for learning session
- Utilize established learning tracts when available

1-hour Learning Session
- Repeat as needed

*trainer only

Stevens, et al. ACI. (2017)
Home 4 Dinner Current State

Learning Plan Development Process

Short (5 question) intake form

Review Session Recorder when necessary

Observation Session
- Trainer analyzes:
  - Survey responses
  - EHR Profile
  - Observation data

Data Analysis
(30 minutes)*

Individualized Learning Plan
(10-15 minutes)*
- Baseline goals for learning session
- Utilize established learning tracts when available

1-hour Learning Session

Repeat as needed

*trainer only
Home 4 Dinner in Pandemic Era

- Intake process much more succinct
  - Shorter form
  - No in-person observation
  - Push and pull participation
Home 4 Dinner in Pandemic Era

• Intake process much more succinct
  – Shorter form
  – No in-person observation
  – Push and pull participation

• Program now almost exclusively virtual
  – Leverage zoom and screen/mouse sharing capabilities
  – More flexible scheduling since trainers don’t need to move sites
Additional Training Supports

• Provider onboarding now includes:
  – 1 week check-in to ensure job preparedness
  – 30 day check-in for on-the-job questions and advanced tips
  – 60/90 day check-ins as needed

• Dedicated telehealth training

• Group refresher sessions
  – InBasker Management & Optimization
  – Dragon Voice Dictation
Cute Animal Break

Measuring Impact

• Often difficult to assess nuance in clinician EHR behaviors
• System-use metrics correlate with burnout
  – Proposed surrogates for surveying end-users
  – Currently work best for ambulatory clinicians
Table 1. Proposed core EHR use measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Abbreviation</th>
<th>Definition and example</th>
</tr>
</thead>
</table>
| Total EHR time               | EHR-Time\(_8\) | Total time on EHR (during and outside of clinic sessions) per 8 h of patient scheduled time.  
  *Example:* A physician with 32 patient-scheduled hours per week, 20 h of EHR time during scheduled hours, 10 h of WOW each week would have EHR-Time\(_8\) of \(30/32 \times 8 = 7.5\). |
| Work outside of work         | WOW\(_8\)    | Time on EHR outside of scheduled patient hours per 8 h of patient scheduled time.  
  *Example:* A physician with 32 scheduled patient hours per week and a total of 10 h of EHR time outside of these scheduled hours, would have WOW\(_8\) = \(10/32 \times 8 = 2.5\). |
| Time on encounter            | Note-Time\(_8\) | Hours on documentation (note writing) per 8 h of scheduled patient time.  
  *Example:* A physician with 32 scheduled patient hours per week and a total of 20 h of documentation time (both in the room with the patient and outside of the room) per week would have DocTime\(_8\) of \(20/32 \times 8 = 5.0\). |
| note documentation           |              |                                                                                                                                                        |
| Time on prescriptions        | Script-Time\(_8\) | Total time on prescriptions per 8 h of patient scheduled time.  
  *Example:* A physician spends 3 h per week on prescription work and has 24 h of patient scheduled time per week. Script\(_8\) = \(3/24 \times 8 = 1\). |
| Time on inbox                | IB-Time\(_8\) | Total time on inbox per 8 h of patient scheduled time.  
  *Example:* A physician spends 10 h per week on Inbox work and has 20 h per week of patient scheduled time. IB\(_8\) = \(10/20 \times 8 = 4\). |
| Teamwork for orders          | TW\(_{ORD}\)  | The percentage of orders with team contribution.  
  *Example:* A physician working with a team that is empowered to pend, send orders by protocol, or operationalize verbal orders, may compose 25% of the orders from start to finish on their own, while the rest are pended or completed by team members for the physician’s co-signature. In this case, TW\(_{ORD}\) = 75%. |
| Undivided attention          | ATTN         | The amount of undivided attention patients receive from their physician. It is approximated by [(total time per session) minus (EHR time per session)]/total time per session.  
  *Example:* A physician who is actively on the EHR 3 h of a 4-h clinic session would have a lower ATTN score \((4-3)/4 = 0.25\) than would a physician who was actively on the EHR 1 h of a 4-h clinic session. \((4-1)/4 = 0.75\). |

EHR: electronic health record.  
*For consistency, and to avoid distortion owing to different session lengths, we define work outside of work precisely as that time outside of scheduled patient hours and do not include any “shoulder time” before or after clinic.*
Understanding Inpatient Efficiency

• Current EHR use metrics difficult to apply in inpatient setting

• **First step** – validate EHR audit logs for system use in inpatient setting

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Measuring Electronic Health Record Use in the Pediatric ICU Using Audit-Logs and Screen Recordings

Amita Sinha¹, Lindsay A. Stevens², Felice Su¹, Natalie M. Pagele³, Daniel S. Tawfik¹

¹Division of Pediatric Critical Care Medicine, Department of Pediatrics, Stanford University School of Medicine, Stanford, California, United States
²Division of General Pediatrics, Department of Pediatrics, Stanford University School of Medicine, Stanford, California, United States
³Division of Biomedical Informatics Research, Department of Medicine, Stanford University School of Medicine, Stanford, California, United States


EHR time can be extrapolated from audit logs for IP providers

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Sinha et al, ACI (2021)
Trying to find an inpatient metric...

- Studied 246 inpatient pediatric providers and correlated with 2020 Stanford Wellness Survey
- EHR experience scores negatively correlated with burnout scores ($r = -0.18$, $p = 0.03$)
- No significant independent association between EHR experience scores and burnout
- Being a PICU provider is independently associated with burnout

Objective EHR use measures may be predictors of negative EHR experience, but not burnout

Preliminary findings
Next Steps

• In order to measure “work outside work” in inpatient setting, need to understand clinician schedules
  — easier with unified scheduling platform

• Larger studies are needed to evaluate these relationships further
Looking forward

Usability & User Interface

Team-Based Care

Regulatory & Documentation Requirements

Effect on Interpersonal Interactions
Future Directions

• Studying the impact of virtual care expansion on physician burnout
• Assessing impact of InBasker mitigation efforts
• Expanding research on inpatient efficiency metrics
Key Points

• A shift to virtual care during the pandemic has led to a significant increase in patient message volume
  – inbox work has strong association with burnout
• Targeted training and optimization has a role in improving the clinician EHR experience and can be done virtually
• There is still work to be done in understanding the impact of the EHR on inpatient clinician experience
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- Natalie Pageler, MD
Questions?
lindsay.stevens@stanford.edu