A Socio-Technical Assessment of Hospital Systems to Improve Provider Well-Being Using Contextual Inquiry

Trusha Taneja, PharmD
MPS Candidate 2020
Carolina Health Informatics Program
Agenda

• Introduction
• Study Description
• Key Findings
• Lessons Learned
• Conclusion
• Acknowledgements
• References
INTRODUCTION
Provider Burnout is a growing epidemic in the United States

*Burnout, in a professional setting, is a reaction to prolonged stress manifesting in the form of loss of enthusiasm for work, feelings of cynicism, and a low sense of personal accomplishment.*

- 50% exhibited symptoms of burnout
- 8% decline in satisfaction with work-life balance

Increased provider burden is associated with reduced outcomes

- Healthcare expenditure
- Staff turnover
- Risk of medical errors
- Patient satisfaction and experience
- Judicious use of resources
- Medication adherence
High prevalence indicates systemic rather than individual causes
EHRs have been instrumental in improving care delivery

- Reduce transcription costs
- Improve access to patient data
- Increase patient participation
- Enhance care coordination

Research on providers’ experience show unintended consequences of EHR use

- 87% cited administrative and paperwork burden as the leading cause of work-related stress
- 2013 survey found EHR technology had an adverse effect on professional satisfaction
- More than 75% complained of interference with patient care
- PCPs spent 50 minutes to respond to alerts, out of which 80% were non-emergent

Poor usability
Time-consuming data entry
Lack of interoperability

The Well-Being Program was launched to address systemic causes of provider burnout

• System-wide initiative to improve Epic@UNC and provider practice

• Goal: to meet the fourth arm of the Quadruple Aim (preventing burnout and improving work life)

• Formal adoption of wellness as a performance measure
We aimed to identify system breakdowns that contribute to provider burnout

Objectives
• Explore systemic causes of workplace stress
• Identify technological breakdowns that caused frustration
• Develop solutions to overcome technological barriers

Setting
• 2 hospitals within UNC HCS
• In-patient and out-patient environments
• 2 specialties – cardiology and oncology

Duration: 6 months
Contextual Inquiry was chosen as the method of systems analysis

- Customer-centric integrated method of analysis
- Requires active participation from users at multiple steps throughout the process
- Builds upon in-depth field research

A modified version of Contextual Inquiry was applied

**Immersion:**
The research team shadowed providers in real-world hospital/clinic settings

**Interpretation:**
The findings were discussed with the team to promote shared understanding and concept mapping

**Modeling:**
Insights from the field and from interpretation sessions were organized into models to identify common thematic elements
A modified version of Contextual Inquiry was applied

**Immersion:**
The research team shadowed providers in real-world hospital/clinic settings

**Interpretation:**
The findings were discussed with the team to promote shared understanding and concept mapping

**Modeling:**
Insights from the field and from interpretation sessions were organized into models to identify common thematic elements
We collected data by direct observation using the CI framework

- 11 shadowing experiences over 3 months
- Goal: to gain an understanding of healthcare providers’ daily workflows and team dynamics
- Attending physicians and APPs were shadowed
- Confidentiality of data maintained
- All observations coded to remove identifiable information
A modified version of Contextual Inquiry was applied

**Immersion:**
The research team shadowed providers in real-world hospital/clinic settings

**Interpretation:**
The findings were discussed with the team to promote shared understanding and concept mapping

**Modeling:**
Insights from the field and from interpretation sessions were organized into models to identify common thematic elements
We held weekly interpretive sessions to discuss findings

- One-on-one interview with provider
- Weekly team meetings to discuss observations and potential issues
  - Moderator
  - Model developer
  - Documentation of breakdowns
A modified version of Contextual Inquiry was applied

**Immersion:**
The research team shadowed providers in real-world hospital/clinic settings

**Interpretation:**
The findings were discussed with the team to promote shared understanding and concept mapping

**Modeling:**
Insights from the field and from interpretation sessions were organized into models to identify common thematic elements
We honed and developed additional models to organize the data

Roles and Relationships Model
- Represented multidisciplinary teams
- Indicated positive relationships
- Identified relationship breakdowns

Affinity Model
- Identified common themes
- Defined significant breakdowns
- Helped visualize the scope, nature, and interconnectedness of the problem
KEY FINDINGS
Three significant EHR constraints were identified

**Inbox Management**
- Inadequate feedback mechanism for messages sent through Epic

**Medication Order Entry**
- Time-consuming and error-prone process of entering medication orders

**Inconsistent IP vs. OP displays**
- Functional differences in the EHR display depending upon the setting in which it is being used

EHR = Electronic Health Record  IP = Inpatient  OP = Outpatient
Three significant EHR constraints were identified

**Inbox Management**
- Inadequate feedback mechanism for messages sent through Epic

**Medication Order Entry**
- Time-consuming and error-prone process of entering medication orders

**Inconsistent IP vs. OP displays**
- Functional differences in the EHR display depending upon the setting in which it is being used
Status reports and messages serve as elementary starting points in inbox re-structuring

**Finding**
- No feedback regarding the status of the transmitted message
- User activity unknown

**Implication**
- Require other modes of communication
- Time-consuming, leading to frustration and stress

**Recommendation**
Incorporate a status report when a message has been sent using the built-in inbox in the form of a simple sentence or icons
Status reports and messages serve as elementary starting points in inbox re-structuring.

This message has been delivered to the intended recipient’s inbox.
Three significant EHR constraints were identified

**Inbox Management**
- Inadequate feedback mechanism for messages sent through Epic

**Medication Order Entry**
- Time-consuming and error-prone process of entering medication orders

**Inconsistent IP vs. OP displays**
- Functional differences in the EHR display depending upon the setting in which it is being used
A color-coded formulary decision support system can greatly ease medication order entry concerns

**Finding**
- Extensive list of medication information cannot be synthesized in one screen
- Requires the provider to make multiple clicks
- Inadequate access to drug formulary

**Implication**
- Drug selection process is cumbersome, time-consuming, conducive to making errors in selection or dosing

**Recommendation**
Built-in formulary decision support within e-prescribing systems
A color-coded formulary decision support system can greatly ease medication order entry concerns.

Sample prescribing screen for the PocketScript (Zix Corporation, Dallas, Texas) e-prescribing system with formulary decision support.
A color-coded formulary decision support system can greatly ease medication order entry concerns.
Three significant EHR constraints were identified:

- **Inbox Management**
  - Inadequate feedback mechanism for messages sent through Epic

- **Medication Order Entry**
  - Time-consuming and error-prone process of entering medication orders

- **Inconsistent IP vs. OP displays**
  - Functional differences in the EHR display depending upon the setting in which it is being used

**Abbreviations**
- EHR = Electronic Health Record
- IP = Inpatient
- OP = Outpatient
A transitional EHR guide can help minimize confusion when providers change practice settings

<table>
<thead>
<tr>
<th>Finding</th>
<th>Implication</th>
</tr>
</thead>
</table>
| • Functional differences in the display between inpatient and out-patient settings | • Inability to carry out same task  
| | • Confusion and frustration |

**Recommendation**

An easy-to-understand, always accessible transitional manual serves as a simple preliminary solution
A transitional EHR guide can help minimize confusion when providers change practice settings.
LESSONS LEARNED
Theoretical and practical applications afforded opportunities to hone technical and soft skills

- Professional Development
- PSM Internship
- CHIP Coursework
Limitations

- Small number of shadowing experiences
- Short duration of shadowing experience (1 or 2 days)
- Recommendations were out of scope of the Well-Being program and hence, could not be evaluated
- Subjective analysis
- Potential bias due to modification of user’s natural environment
CONCLUSION
Summary and Future Steps

• Modified CI-based approach revealed bottlenecks hindering the efficient use of electronic health records

• Pilot exploratory evaluation integrating one or more of the proposed recommendations may ascertain its effect on the well-being of physicians and advanced practice providers

• Improving physician well-being is essential in the current health care climate
I am extremely grateful to:

**Dr. Sara Baker Stokes** for her valuable guidance, mentorship, and encouragement throughout the course of my internship

**Dr. Karthik Adapa** for considering me for such an enriching opportunity

**My teammates at DHE** for their effort and cooperation

and

**Dr. Saif Khairat** for his sound advice and support

Thank you for making this a fun learning experience.
References


References


• Bodenheimer T, Sinsky C. (2014). From Triple to Quadruple Aim: Care of the Patient Requires Care of the Provider. Ann Fam Med, 12:573-576


