Analyzing Cancer Care as a Complex Adaptive System using the 6-layer model – A macro-ergonomic case study report –

3rd RHCN meeting, Hindsgavl Castle, August 12-14, 2014
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Harkness/B.Braun-Stiftung Fellow 2013-14

Acknowledgement

Supported by The Commonwealth Fund, a private independent foundation based in New York City. The views presented here are those of the author and not necessarily those of The Commonwealth Fund, its directors, officers, or staff.

Part of the presented data are based on an invitation to perform the observations as an adjunct to on-going qualitative and quantitative assessments of relational team dynamics and development of interventions in the project:
“Improving Patient Experience and Quality of Care by Enhancing Interprofessional Team Functioning on Inpatient Hematology/Oncology Rounds”
(Principal Investigator: Karen Brenner, IU Melvin and Bren Simon Cancer Center)
Co-Principal Investigators: Jose Azar, Debra Litzelman, Ann Cottingham, Kelli Thoele, Erika Marx and Jessica Neeb
Challenge: Coping with Complexity
Law of Requisite Variety (Ashby, 1956)

Research question

How to design work systems
that support collaboration?
(-using the example of cancer care)
Methodology (2/2)
Data Collection & Analysis

Model of Expert Collaboration
In the Human Factors & Ergonomics Literature

[Steinheider & Legrady, 2001]
## Findings

### Collaboration Supporting Infrastructure

#### Design Solutions

<table>
<thead>
<tr>
<th>Collaboration support system element</th>
<th>knowledge integration</th>
<th>coordination</th>
<th>communication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ORGANIZATION &amp; Standard Operating Procedures (SOPs)</strong></td>
<td>Multidisciplinary Team Rounds, “Multit Team Clinic” (semi-/structured meetings &amp; rounds)</td>
<td>“Algorithms” (Clinical protocol, decision support)</td>
<td>SOPs</td>
</tr>
<tr>
<td>TECHNOLOGY &amp; TOOLS</td>
<td>myMD Anderson platform (e.g. Electronic Health Record, scheduling)</td>
<td>Powerchart Oncology (Electronic Chemotherapy Ordering)</td>
<td></td>
</tr>
<tr>
<td>PERSONAL SKILLS &amp; TRAINING</td>
<td>Patient Education (e.g. The Learning Center)</td>
<td>Provider Education (e.g. Webinars)</td>
<td></td>
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</tbody>
</table>
Work system analysis: 6-layer model
A Framework

More information...
http://youtu.be/AmcEoVlMBOQ
Summary
First draft of a conceptual model

Challenge

Complexity (of the task)

Diversity ("creating" complexity)

Support (resilience?)

Strategy

Dynamic!

Adaptability?

Dynamic!

Adaptability?

Task complexity <-> Team diversity <-> Support systems

Structure

Variation <-> Standardization

Conclusions & Outlook
Lessons learned

• BAD NEWS
  Acceptance of Complexity = opacity, dynamic, variety

• GOOD NEWS
  Complexity is not static = continuum of low and high Complexity

• KEY
  Diversity (and collaboration) is key to cope with Complexity

• CHALLENGE
  No one-fits-all design solution: user/human-centered design = system which is adaptable/flexible, but consistent

• FUTURE DIRECTIONS
  Understanding the (potential) trade-offs and options to balance ability to monitor, to anticipate, to respond, to learn
With many thanks to...

- Sara J. Singer (primary mentor)
- Jody Hoffer Gittel (co-mentor)
- Indiana University Melvin and Bren Simon Cancer Center
  - Jose M. Azar
  - Karen S. Brenner
  - Jessica L. Neeb
  - Kelli M. Thoele
- University of Texas MD Anderson Cancer Center
  - Henry M. Kuerer
  - Isabelle Bedrosian
  - Susan E. Ferguson
  - Fran Zandstra
  - Katherine R. Gilmore
- Alex B. Haynes
- Matthew Press
- Uta Meurer, B.Braun-Stiftung
- Robin Osborn, The Commonwealth Fund

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