12-2021

A Wicked Problem: The Implementation of Clinical Guidelines Application to Optimize Patient Care (UHN OpenLab)

Ardavan Bonyadi Behrouz
Western University

Nelson Chang
Western University

Jasmine Luo
Western University

Daniel Olteanu
Western University

Naomi Smith
Western University

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Ardavan Bonyadi Behrouz, Nelson Chang, Jasmine Luo, Daniel Olteanu, Naomi Smith
Department, Schulich School of Medicine & Dentistry, Western University, London, ON, Canada

Introduction

Clinical practice guidelines (CPGs)

- Systemically developed recommendations for physicians on how to diagnose and treat medical conditions with the aim of optimizing patient care.

Process of guideline development

- Review existing literature → assess scientific evidence → edit draft → publish → disseminate → alter standard treatments → train with standardized treatment → monitor guideline and intervention outcomes[13].
- At least 30-40% of patients do not receive evidence-based care[3].

Innovative Guidelines Application (IGA)

- Digital tool aimed to support real-world clinical workflow by making access to CPGs more user-centered, mobile and able to address co-morbidity for the practitioner.
- The incorporation of sporadically-released CPGs into the IGA is hindered by barriers:
  - Stakeholders and specialization groups
  - General guidelines issues
  - Considerations of healthcare professionals and public perception
- Clinical decision support systems such as IGA only account for 19% of mobile health penetration[15].

Systems Map (SM) | White Paper (WP) | Recommendation Brief (RM)

Project Aims

Our goal is not to offer solutions, but to assist in streamlining guidelines implementation by analyzing systems contributing to the wicked problem*.

Objectives

- Analyze the stakeholders involved (SM)
- Explore US/Canada differences in the process of guidelines implementation (SM)
- Explore how the practicability of the application can be improved (SM, RM)
- Reiterate systems map to identify interdependence between problems (SM)
- Synthesize multiple sources of literature to close gaps in current understanding about mobile health applications (WP)

Methods

Figure 1. A 3-step approach to complete the deliverables. Through collaboration with UHN OpenLab, key objectives were established. A list of key terms was used.

Detailed Overview

1) Project overview was discussed with community partner
2) Potential problems were brainstormed and timeline for the project was proposed
3) With guidance from "Systematic & Scoping Reviews: Before You Start", scholarly literature review was conducted by searching key terms on PubMed[4]
4) Novel findings were presented in weekly “Show & Tells” by individual group members
5) Identified problems were categorized using the Cynefin Framework[12]
   - Complex, complicated and simple
6) Kumu was used to develop a systems map, incorporating identified problems
7) With feedback from community partner, the systems map was reiterated
8) Steps 3 to 7 were repeated to expand the systems map
9) Leverage points within the systems map were identified and categorized[8]
10) White paper, systems map, & recommendation brief were completed with a final revision with the community partner

Deliverables

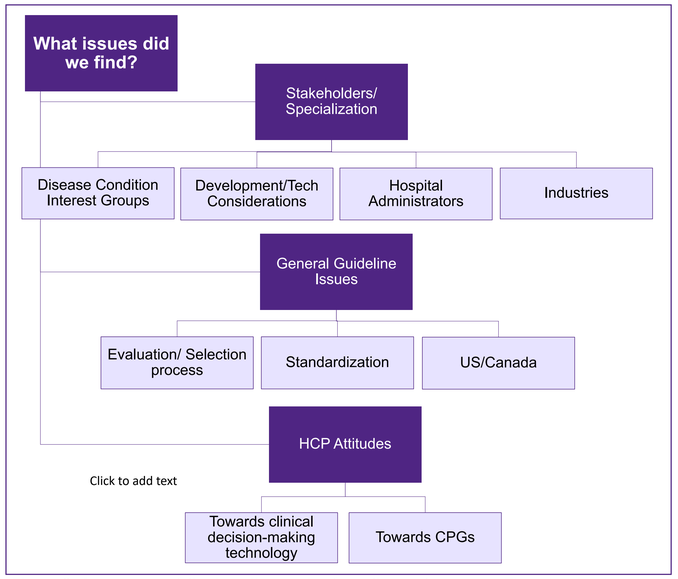

Figure 2. A summary of the key discoveries from the systems map. Three key barriers were identified: stakeholders/specializations, general guideline issues, and HCP attitudes.

Impact and Future Directions

Impact of Systems Map: Provide **UHN OpenLab** with insights about unidentified problems influencing the success of IGA.

- Applications involving recommendations for diagnosis and treatment are high risk → IGA will require licensing by Health Canada or FDA[6]

Impact of White Paper and Recommendation Brief: Provide evidenced-based and action-focused recommendations.

- Serve as literature to share with **UHN OpenLab**, **general public** and **relevant stakeholders** interested in changing the system → close gaps in current understanding about mobile health applications & offer future directions

Next steps & future directions:

- Promote an interdisciplinary team at UHN OpenLab → recruit physicians, patients and civil servants → provide unique stakeholder perspectives about CPGs
- Implement Conference on Guidelines Standardization (COGS) checklist for screening CPGs[11]
  - Wide dissemination of COGS checklist can help future guideline developers to produce high quality guidelines[11]
- Conduct semi-structured interviews to assess typical workflow, work environment and patient-doctor interactions
- Conduct usability tests for target users and collect feedback

Limitations:

- Short time frame and limited literature available on complex and complicated problems prevented us from exploring certain topics in depth → topics can be over or underrepresented

***Wicked problem**: social or cultural problem that is difficult or impossible to solve due to incomplete/contradictory knowledge, number of people and opinions involved, economic burden and interconnected nature of these problems.

Key Findings of the White Paper

Development/Tech Considerations

- Automated programs have difficulties identifying sections between unstandardized CPGs[5].
- Incorporation of CPGs into IGA may not translate to a noticeable clinical improvement.

Hospital Administrators

- Lack of funding and resources to implement strategies for effective dissemination of constantly-updating CPGs[3].

Industries

- Conflict of interest created by the patron of guidelines:
  - Not mandatory to disclose financial conflicts in Canada → CPGs are vulnerable to industry influence[7].

Standardization

- Pre-existing guidelines need to be reformatted → tedious & costly
  - Guidelines are proprietarily formatted for differentiation between producers[5].
- No incentives for government or guideline producers to mandate CPGs standardization.
- Limitation of Standardization:
  - Not applicable to all patients and rare cases[9]
  - Potential overreliance on the guidelines → negative sentiment of major stakeholders[9] → slows IGA implementation

US/Canada

- American CPGs are produced by public health, public and private research, advocacy institutions, and specialist medical societies → lack of centralized power structure governing standardized procedures[14]
- Different philosophies in developing guidelines[1]
  - **Canada: evidenced-based** approach→ CPGs are only applicable to patients similar to the clinical trial population
  - **US: evidence-informed** approach→ extrapolation of CPGs

HCP Attitudes towards clinical decision-making technology:

- **Concerns:** physician autonomy, remaining familiar with constantly-changing CPGs, and access[3]
- Use of CPG technology in the medical workplace may be associated an image of incompetency or distracted[2,10]

References & Acknowledgements

[1] Daskalopoulou, S. S., Rabi, D. M., Schiffrin, E. L., Feldman, R. D., Padwal, R. S., Tremblay, G., & Khan, N. A. (2018). Hypertension Guidelines in the United States and Canada: Are We Getting Closer? *Hypertension*, *71*(6), 976–978. https://doi.org/10.1161/HYPERTENSIONAHA.117.10772
[2] Edlin, J. C. E., & Deshpande, R. P. (2013). Caveats of smartphone applications for the cardiothoracic trainee. *The Journal of Thoracic and Cardiovascular Surgery*, *146*(6), 1321–1326. https://doi.org/10.1016/j.jtcvs.2013.08.033
[3] Fischer, F., Lange, K., Klose, K., Greiner, W., & Kraemer, A. (2016). Barriers and Strategies in Guideline Implementation—A Scoping Review. *Healthcare*, *4*(3), 36. https://doi.org/10.3390/healthcare4030036
[4] Goodman, M. (2021, November 16). *Research Guides: Systematic & Scoping Reviews: Before You Start*. https://guides.lib.uwo.ca/c.php?g=256182&p=5183622
[5] Kredo, T., Bernhardsson, S., Machingaidze, S., Young, T., Louw, Q., Ochodo, E., & Grimmer, K. (2016). Guide to clinical practice guidelines: The current state of play. *International Journal for Quality in Health Care*, *28*(1), 122–128. https://doi.org/10.1093/intqhc/mcv115
[6] Kwong, W. (2015). *What is government's role in medical apps? | CMAJ*. Retrieved December 4, 2021, from https://www.cmaj.ca/content/187/11/E339
[7] Lexchin, J. R. (2021). Industry involvement in clinical practice guidelines. *Canadian Family Physician*, *67*(10), 721–724. https://doi.org/10.46747/cfp.6710721_3
[8] Meadows, D. (1999). Leverage Points: Places to Intervene in a System. *The Academy for Systems Change*. https://donellameadows.org/archives/leverage-points-places-to-intervene-in-a-system/
[9] Mussalli, G. M. (2011). Does Standardization of Care Through Clinical Guidelines Improve Outcomes and Reduce Medical Liability? *Obstetrics & Gynecology*, *117*(3), 732–733. https://doi.org/10.1097/AOG.0b013e31820cd2c3
[10] Payne, K. F., Weeks, L., & Dunning, P. (2014). A mixed methods pilot study to investigate the impact of a hospital-specific iPhone application (iTreat) within a British junior doctor cohort. *Health Informatics Journal*, *20*(1), 59–73. https://doi.org/10.1177/1460458213478812
[11] Shiffman, R. N., Shekelle, P., Overhage, J. M., Slutsky, J., Grimshaw, J., & Deshpande, A. M. (2003). Standardized Reporting of Clinical Practice Guidelines: A Proposal from the Conference on Guideline Standardization. *Annals of Internal Medicine*, *139*(6), 493–498. https://doi.org/10.7326/0003-4819-139-6-200309160-00013
[12] Snowden, D. J., & Boone, M. E. (2007, November 1). A Leader's Framework for Decision Making. *Harvard Business Review*. https://hbr.org/2007/11/a-leaders-framework-for-decision-making
[13] UNAIDS. (1999). *13. Budgeting for guideline development*. http://www.nzdl.org/cgi-bin/library.cgi?a=d-00000-00---off-0unaids--00-0----0-10-0---0---0direct-10---4-------0-1l--11-en-50---20-about---00-0-1-00-0-0-11-1-0utf8-8-00&cl=CL1.1&dHASH016131ee7b35128c4788b0a1.5.2.13&gl=1
[14] Weisz, G., Cambrosio, A., Keating, P., Knaapen, L., Schlich, T., & Tournay, V. J. (2007). The Emergence of Clinical Practice Guidelines. The Milbank Quarterly, 85(4), 691–727. https://doi.org/10.1111/j.x 1468-0009.2007.00505
[15] WHO Global Observatory for eHealth. (2011). *mHealth: New horizons for health through mobile technologies: second global survey on eHealth*. https://apps.who.int/iris/handle/10665/44607

Considerable thanks to Dr. Sarah McLean, John David Sardido, and Kevin McIntyre for their guidance, as well as Morgan Rosenberg for his collaboration and feedback.