Engaging Multidisciplinary Teams to Develop a Model of CDS Adoption

PRESENTER:

The Data Science in Clinical Care Team

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BACKGROUND

As Clinical Decision Support (CDS) tools grow in complexity and application in the medical field, particularly the use of artificial intelligence, many tools test well in development but are not as effective when put into practice.

- There is increasing pressure from medical practitioners, administrators, and outside stakeholders to create regulations and guidelines for the implementation.
- The Duke Healthcare System has implemented an oversight committee to guide the process of clinical decision support tool creation, implementation, and regulation.
- Our work focuses on identifying the factors that lead to successful and unsuccessful implementation of Clinical Decisions Support Tools using a system dynamics approach.

Why adopting a Participatory System Dynamics (PSD) Modeling is a good idea for our project:

- Provides a collaborative tool for diverse stakeholders who can work collectively to address the implementation issues of CDS tools
- Recognizes that the challenges in CDS tool implementation often stem from interactions at systems level rather than isolated issues with individual components
- Emphasizes an understanding of the system as a whole in order to effectively address problems associated with the CDS tools
- Creates a shared framework that can be used to facilitate the development process, bring together multi-disciplinary clinical teams and stakeholders for a shared understanding
- Promotes stakeholder learning by leveraging a participatory approach and fosters a more in-depth exploration of CDS tool adoption process from diverse perspectives.

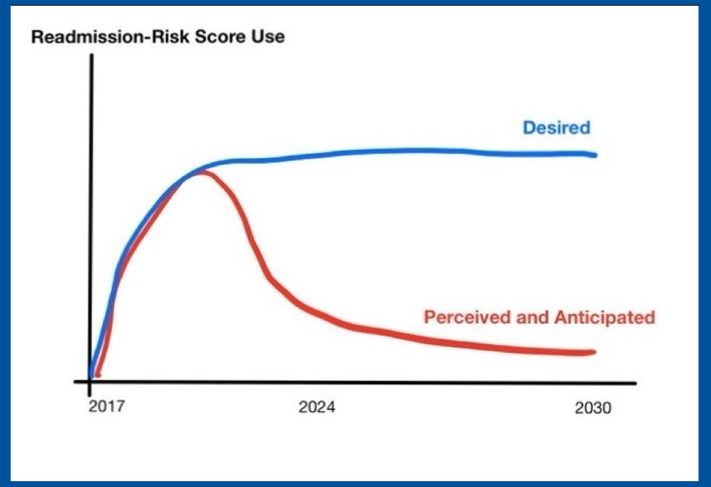
METHODS

1. Identified key issues by talking to ABCDS committee members and reviewing the literature
2. Selected a CDS use case at Duke Health
3. Conducted a workshop with staff who use the CDS to elicit facilitators and barriers to use of the CDS over time

PRELIMINARY KEY FINDINGS

- Direct effects of the tool (which shows up as colored "dots") appear to have risen then waned over time:
  - An initial pilot program boosted awareness and knowledge of tool and its features
  - Later, not all potential users were made aware of the readmission-risk tool or how to use the interface to evaluate and understand the details behind the risk score
  - Turnover and limited tool-specific training has affected awareness: new case managers have not received training about the score during their onboarding
- Indirect effects appear widespread and lasting as tool use appear to have led to:
  - increased use of multi-disciplinary meetings
  - new data gathering and evaluation at time of admission
  - deeper understanding of readmission risks

Participatory System Dynamics modeling brings individuals together to develop a **holistic understanding** of implementation challenges and enablers.



> *..without even looking at the dots we are using it [the readmission risk score],... because it's incorporated into our every day now...We have so many different ways to get the information now...*" –DUHS case manager

Take a picture to **download** more information about our project

Case Study: Epic Readmission Risk

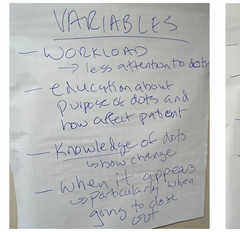
Characterization of the Epic Readmission Risk score by features of clinical decision support systems and the 5 rights framework

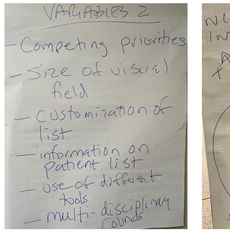
The 5 rights*	Features of CDS	The Epic Readmission Risk Score†
Information	Capability (overall tool functionality)	Prognostic: visual color code for risk level (0-100)
	Outcome (the impact on pt health)	Readmission
	Complexity (algorithm characteristics)	Data-driven: immediately available data within the EHR; exact complexity unknown because proprietary Epic algorithm
Person	User (who uses it)	Hospital team members, case managers
	Population (for which patients)	General medicine
Format	(how interruptive)	Color-coded alert column
Channel	Interface (how delivered)	Epic EHR system
Workflow	Integration (how disruptive)	Live updates every four hr. that can be added to patient list, non-disruptive to current workflow

*Osheroff JA, Teich JM, Middleton B, Steen EB, Wright A, Detmer DE. A roadmap for national action on clinical decision support. *Journal of the American medical informatics association. 2007;14(2):141-145.* †Gallagher D, Zhao C, Brucker A, et al. Implementation and Continuous Monitoring of an Electronic Health Record Embedded Readmissions Clinical Decision Support Tool. *J Pers Med. Aug 26 2020;10(3)doi:10.3390/jpm10030103.*

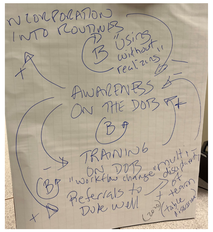
Artifacts from workshop with case managers

Variable Elicitation





Causal Loop Diagram



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