

Using Physician and Staff Input to Inform EHR Design: A WREN Supported Study

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1. INTRODUCTION

Background

- Electronic Health Records (EHRs) aim to improve the quality and efficiency of patient care
- Analyses of the effects of current EHRs on primary care have shown mixed results¹⁻³
 - Weak evidence for improved patient outcomes in areas such as preventive care, cancer and mental health screening, and chronic disease care
 - Disruption of workflow, increased workload, and burnout
 - Disruption of established patterns of teamwork
- A well-designed EHR should
 - Support cognitive work of clinicians and clinic staff
 - Support the teamwork needed for high-functioning primary care clinics

Objective

- To guide the design of a more functional EHR, we gathered information about the goals, decisions made and information needs of clinicians and staff in primary care clinics

2. METHODS

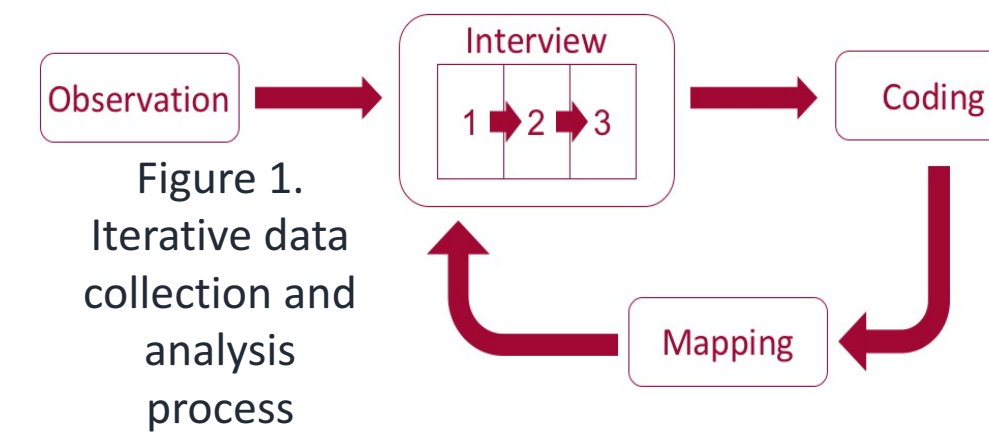
Clinic Recruitment

- Researchers at UW-Madison worked with the Wisconsin Research and Education Network (WREN) to recruit Internal Medicine and Family Medicine practices in Wisconsin and Iowa to represent a variety of clinic types (a total of 8 clinics; 16 teams)
- Clinics varied by
 - Size, location (urban or rural)
 - Organizational structure (including regional healthcare organizations, independent clinics, Federally Qualified Health Centers, and solo practices)
 - Patient mix (including capitated patients, fee for service, and Medicaid/Medicare)
 - Patient primary language (English and Spanish)
- A total of 103 interviews (194.3 hours) and 83 direct observations (221.8 hours) have been completed, most on-site at the clinic
- Interviews were conducted with the following team members from the 8 clinics
 - 14 physicians
 - 3 physician assistants
 - 2 nurse practitioners
 - 16 registered nurses
 - 2 licensed practical nurses
 - 17 medical assistants
 - 49 other staff, including: receptionists, schedulers, pharmacists, health educators, social workers, technicians, case managers, care coordinators and clinic managers

2. METHODS cont'd

Data Collection & Analysis

- We used observations and semi-structured interviews to identify the cognitive requirements of primary care clinicians and staff in order to determine their work-related
 1. Goals and Sub-goals
 2. Decisions
 3. Information requirements



- **Situation Awareness (SA)**⁴ is how a person understands what is happening around them. SA has 3 different components: SA1) Perception of elements in the environment, SA2) comprehension of their meaning, and SA3) projection of their future status
- **Goal Directed Task Analysis (GDTA)**⁵ is the method used to assess individual's and team members' cognitive needs. GDTA is a cognitive task analysis technique that identifies SA requirements necessary to complete a task, using information needed by users to perform tasks and how this information is combined to address a particular decision

3. RESULTS

Goal Directed Task Analysis (GDTA)⁵

- We created GDTA maps of the goals for each stage of a patient encounter, decisions needed to meet each goal and the information needed to make those decisions (SA requirements). We then determined areas where team members share the same cognitive requirements

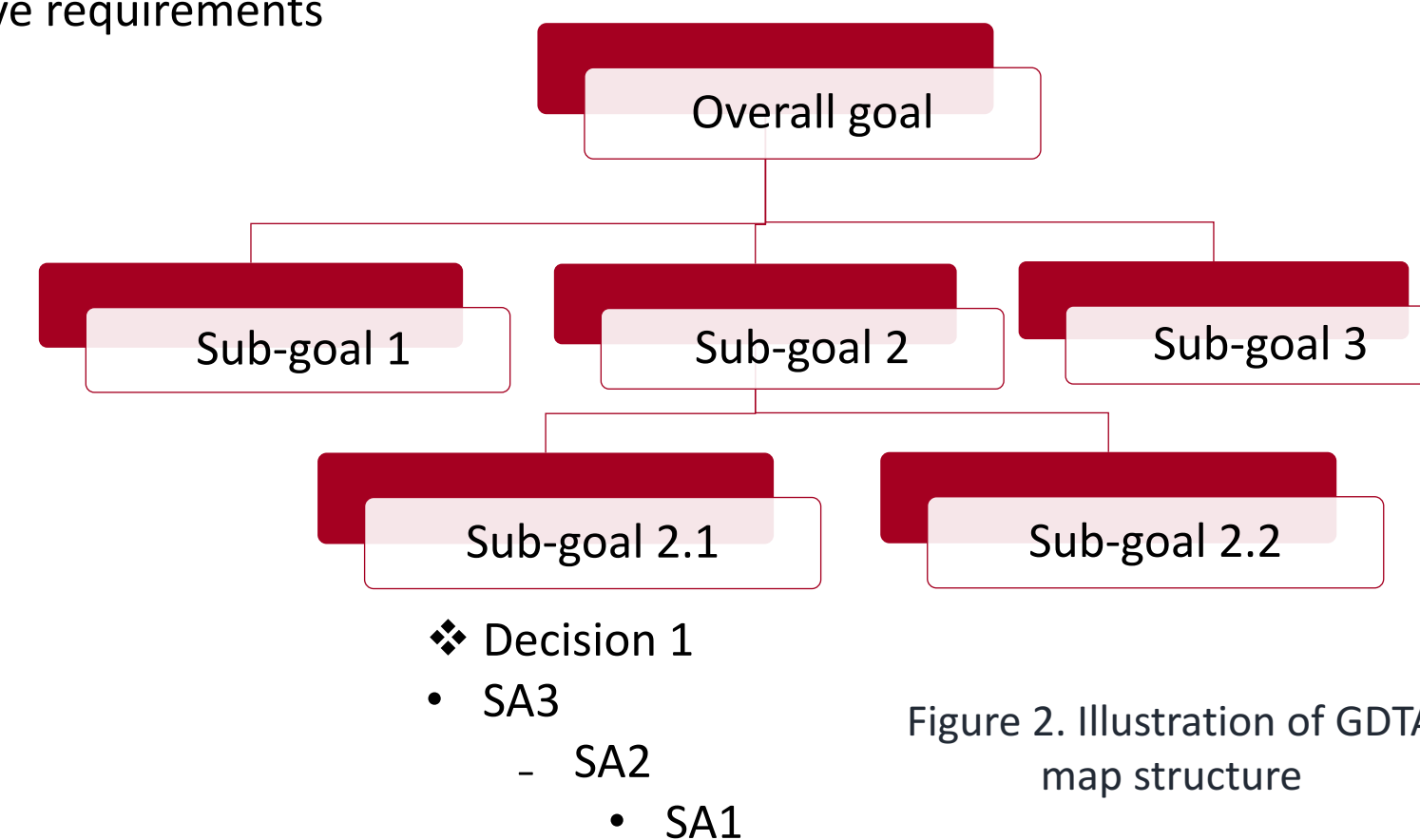
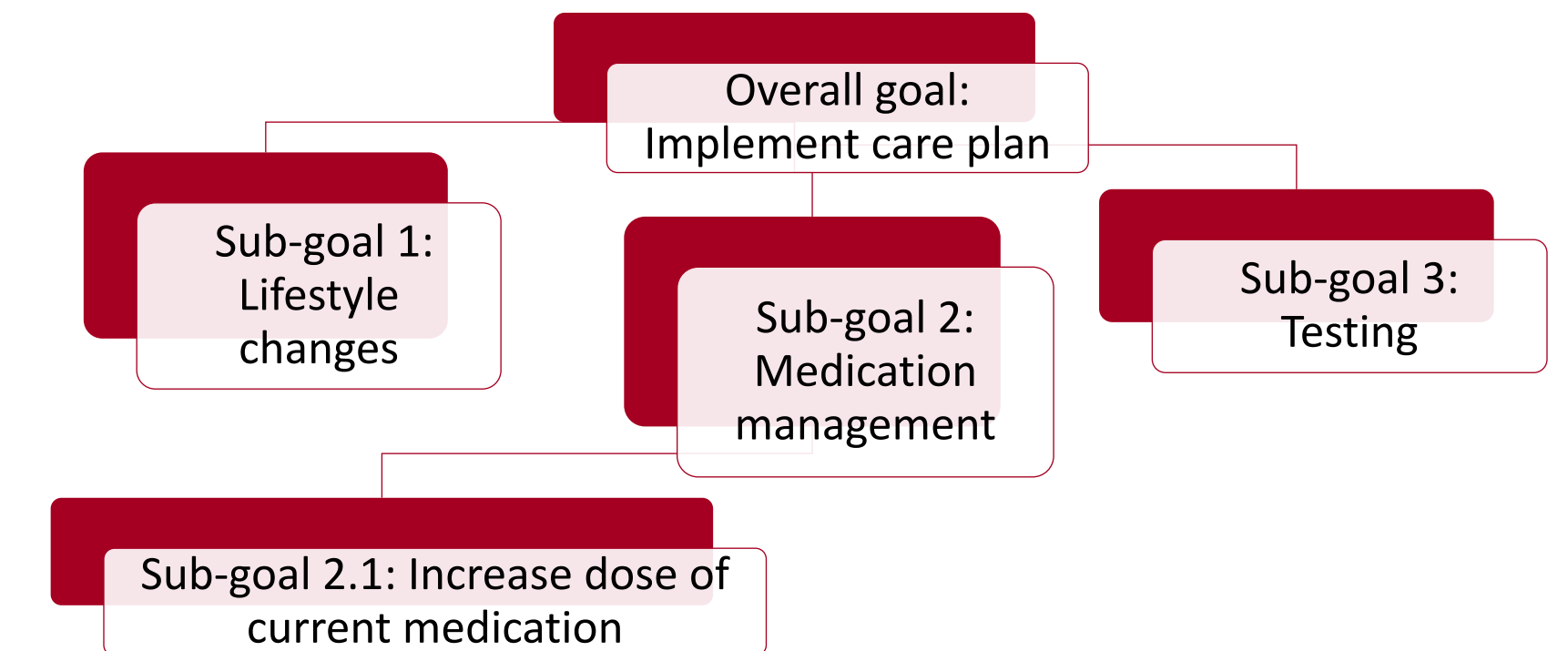


Figure 2. Illustration of GDTA map structure

- GDTA maps inform the design of EHR interfaces that provide all the information a clinician needs in a format that is easy to comprehend and that quickly meet cognitive needs and clinic workflows at the time of making a clinical decision.
 - An example Sub-goal is shown in Figure 3: Deciding whether to increase the dose of a medication. After processing this type of information, a prescriber can then decide if a dose should be changed and enter an order

3. RESULTS cont'd

Figure 3. Example of GDTA map structure for increasing a dose of medication



- **Decision 1: Should dose of medication be increased to manage patient symptoms/diagnosis?**
- SA3: Projected positive impact of increase in medication on management of patient symptoms/diagnosis
 - SA2.1: Level of evidence for prescribing medication for symptom or disease control
 - SA2.2: Current effect of medication on symptom or disease control
 - SA1.1: Current medication order
 - SA1.2: Patient taking medication as prescribed?
 - SA1.3: Treatment outcomes related to medication use
 - SA1.4: Results of related blood tests or other monitoring

4. DISCUSSION

- Clinics have been enthusiastic to participate in this process in hopes of improving the EHR and their current workflows
- Using information gathered from primary care teams, EHR interfaces can be designed to support the information needs of team members and enable them to more easily make the decisions needed to meet their goals for patient encounters
- EHRs will be more useful if designed around the information needs of the primary care team. Our work can provide useful input into future EHR development

5. REFERENCES

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6. ACKNOWLEDGMENTS

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