Designing Safer Opioid Prescribing Processes in Primary Care through use of Systems Engineering Methods

Anne Shutti1, Alev Atalay, MD2, Karen Sherritt, MD2, Sara Singer, PhD1, James Benneyan, PhD1
1Healthcare Systems Engineering Institute, Boston MA, 2Brigham and Women’s Hospital, Boston MA - Harvard School of Public Health, Boston MA

Opportunity

Background

Widespread opioid and heroin epidemics are gripping our nation, affecting people of all socio-economic populations. National costs associated with opiate use are $78.5 billion annually1, and cause approximately 91 deaths daily2. Although illicit use of the drug gets the most media attention, 37% of deaths resulting from drug overdose are caused by prescription drugs3.

Objective

to design a reliable system that improves the safety and efficacy of the opioid prescription process for patients with chronic pain in primary care

Methods

In order to fully understand the system, an interdisciplinary team met bi-weekly and worked together to apply systems engineering methods to the system. This team included primary care physicians, pharmacists, pharmacy technicians, licensed practicing nurses, medical assistants, public health experts, systems engineers and patients.

Understanding and Measuring the Process

Process Mapping- breaks a process down into tasks, making it easier to identify sources of inconsistency in how the process is completed

Run Charts- track key performance indicators over time, making changes visually identifiable

Failure Analysis

Failure Modes Effects Analysis (FMEA)- assesses the detectability, severity and frequency of errors, aiding in prioritizing where improvement efforts should start

System Engineering Initiative for Patient Safety (SEIPS)- examines interactions within the system that lead to compromised patient safety and quality of care, leading to ideas that improve the system from the patient’s perspective

System Theoretic Process Analysis (STPA)- illustrates controls that exist in the process that should prevent adverse events, helps identify where new controls should exist if current controls are not adequate

Success Analysis

Functional Resonance Analysis Method (FRAM)- views extreme cases of success and failure as the result of variability of individual tasks combining, helpful when the success of a process is not determined by any individual task

Stakeholder Engagement

Think Aloud Testing- has the final user narrate their thoughts and expectations of a tool, increases utility and usability of the tool

Surveying- gives input of the population surveyed, helpful when assessing the perceived outcome of an intervention on specific stakeholders

Notable Improvements to Date

• Decreased patient wait times in the prescription pickup process by reducing touch points and adjusting workflows
• Increased the percentage of patients with urine toxicity screenings on record from 6% to 75% since May 2016
• Made more resources available to providers and patients
• Created an Opioid Resource Team that helps providers manage patient opioid regimens and interpret urine toxicity screening results

Conclusions

• Interdisciplinary teams approach problems from multiple vantage points, creating practical solutions that are likely to be widely accepted
• Breaking away from ‘linear thinking’ can be difficult, but viewing problems as a systems issue can often lead to more reliable improvement ideas
• System engineering tools can be used effectively to improve processes in healthcare, including those related to the opioid epidemic

References