From Safety-I To Safety-II: Using Systems Engineering: Hospital Care to Home Care Redesign Transition Process

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Opportunity

Background
• 70% of adverse events occur during a transition in care
• Approx. 90% of readmissions are preventable, equating to 17 billion annually.
• Readmissions attributed to communication errors and undefined working relationships

Objective
Improve patient satisfaction and quality of life post hospitalization and reduce hospital readmission by:
(1) Identifying high risk patients
(2) Developing a shared care plan among all stakeholders
(3) Engaging and empowering the patient
(4) Making a culture of and protocols for interdisciplinary communication

Methods
An interdisciplinary team met weekly to apply systems engineering methods. This team included primary care physicians, the Director of Case Management, and the Director of Quality and Performance Improvement, public health experts, and systems engineers.

Process Analysis
In order to understand the current process and causes of failures, the team completed process maps, Failure Modes Effects Analysis (FMEA), and contrast analysis.

Process Design
To designing better processes, the team applied risk stratification, Functional Resonance Analysis Method (FRAM), and rapid prototyping.

Stakeholder Engagement
To incorporate the opinions of stakeholders, the team conducted think aloud testing and surveying.

Results

Stakeholder Assessment

- Latents
  - Home Care President
  - Home Care Chief Clinical Officer
  - Hospital CIO
  - Hospital Data Management
- Promotions
  - PCP
  - Home Care Director of Quality and Performance Improvement
  - Hospital Director of Case Management

- Apathetics
- Defenders
- Home Care Social Workers
- Home Care Nurses
- Home Care PT
- Caregivers

Contrast Analysis

- Success
  - Patient: Male, 80 years old
  - Diagnosis: Heart disease, renal failure, cerebral hemorrhage
  - Result: Discharged to home after hospitalization, no in-network
- Failure
  - Family member acts as care coordinator, non-medical, well-intentioned, but not in-network

- Patient: Female, 78 years old
  - Diagnosis: Progressive decline from Alzheimer’s disease
  - Result: Patient needs care at home, not in-network

Takeaways:
1. Health care primary care center, and home care infrequently interacted, communicated, or influenced one another
2. Realized that representatives from additional departments needed to be included in the project

FMEA

FRAM

Views extreme cases as the result of cumulative variability of all tasks, helpful for assessing success in complex processes

Rapid Prototyping

Takeaways:
1. Frequent, brief, direct communication between the PCP and home care distinguished successful hospital-to-home transitions from the unsuccessful
2. Scope and availability of natural supports to the patient differentiated successful transitions from the unsuccessful

Patient Engagement

Takeaways:
1. Allowed team to visualize connections between functions and identify where redesign was needed
2. Prompted project team to consider each function in more detail than cross-functional process map

Cost Analysis

Sustain and Spread

- Takeaways:
  - Avoided the use of risk-stratified workflow
  - Cost analysis of suggested improvements assisted in gaining high-level stakeholder buy-in
  - Allows teams to assess the feasibility of proposed changes

- Sustain:
  - Attained buy-in from Director of Post-Acute Care and Chief Operating Officer
  - Convened high-level hospital work group

- Spread:
  - Validated FMEA failures with another local hospital
  - Interviewed QI personnel at two local hospitals to validate high-risk workflow
  - Potential application of high-risk workflow to hospital to SHF transitions

Conclusions

- ISE can help improvement efforts by providing unique approaches to the problem.
- Project success depended on sustained and meaningful stakeholder engagement
- Patient engagement ensured that the redesigned process engaged and empowered the patient.
- Challenges:
  - Forming inter-disciplinary team across health care and engineering cultures
  - Need to familiarize the team with new methods
- Methods typically take longer to conduct