

XXVII^e Congrès National de la Société
Française d'Hygiène Hospitalière

1, 2 et 3 juin 2016



Systems Engineering to Evaluate Surgical Readmission

Sasha (Alexandra) Acher, MD

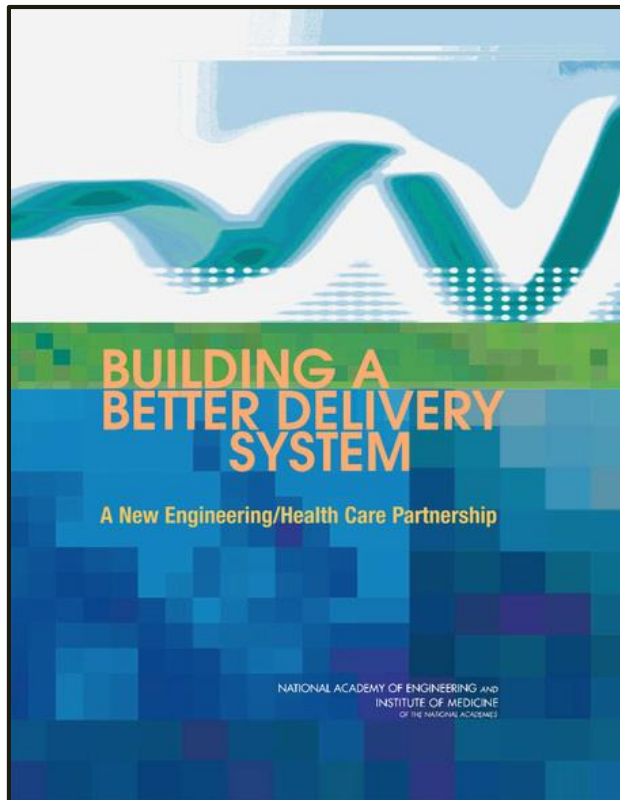
University of Wisconsin School of Medicine and Public Health
Madison, WI, USA

LINKS OF INTEREST DISCLOSURE

Name of the speaker: Sasha Acher

I have no link of interest.

Engineering and Health Care

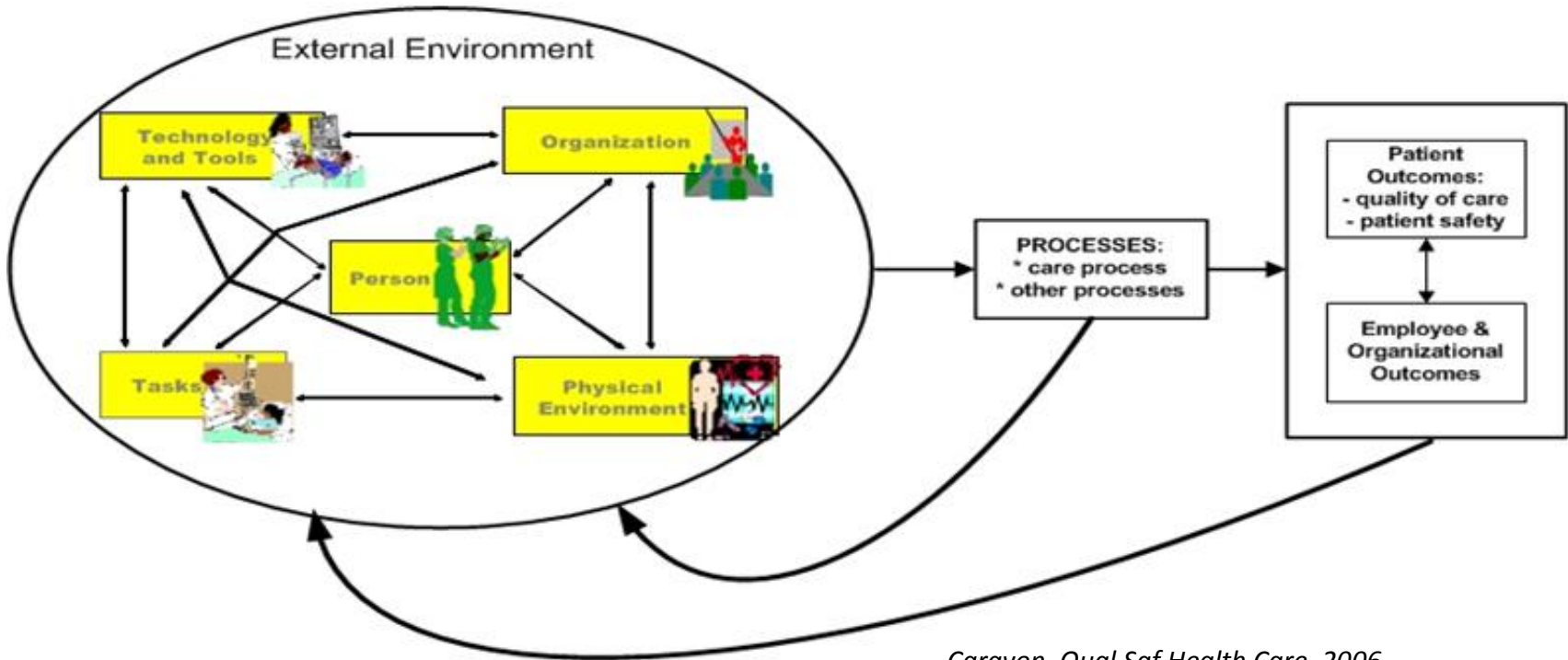
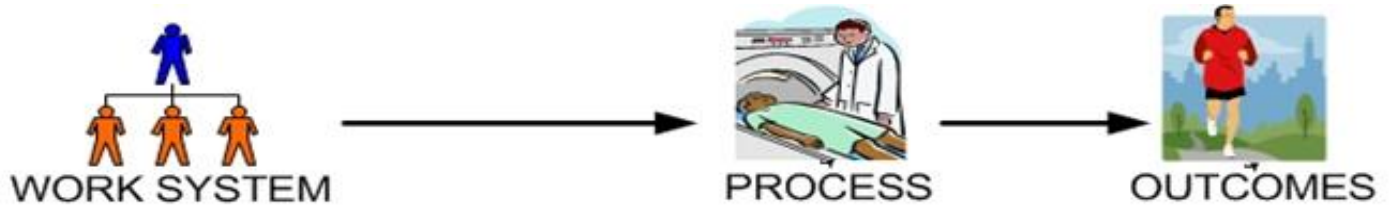


- National Academy of Engineering and Institute of Medicine: Building a Better Delivery System: A New Engineering/Health Care Partnership (2005)
 - Identify engineering tools and technologies for delivering safe, effective, timely, patient-centered, efficient and equitable care (2001 IOM Report *Crossing the Quality Chasm*)

Human Factors and Systems Engineering

- Integrate qualitative and quantitative data
- Potential for quality improvement for complex medical issues

Systems Engineering Initiative for Patient Safety (SEIPS) Model



Application of SEIPS model: Readmission in Surgical Patients

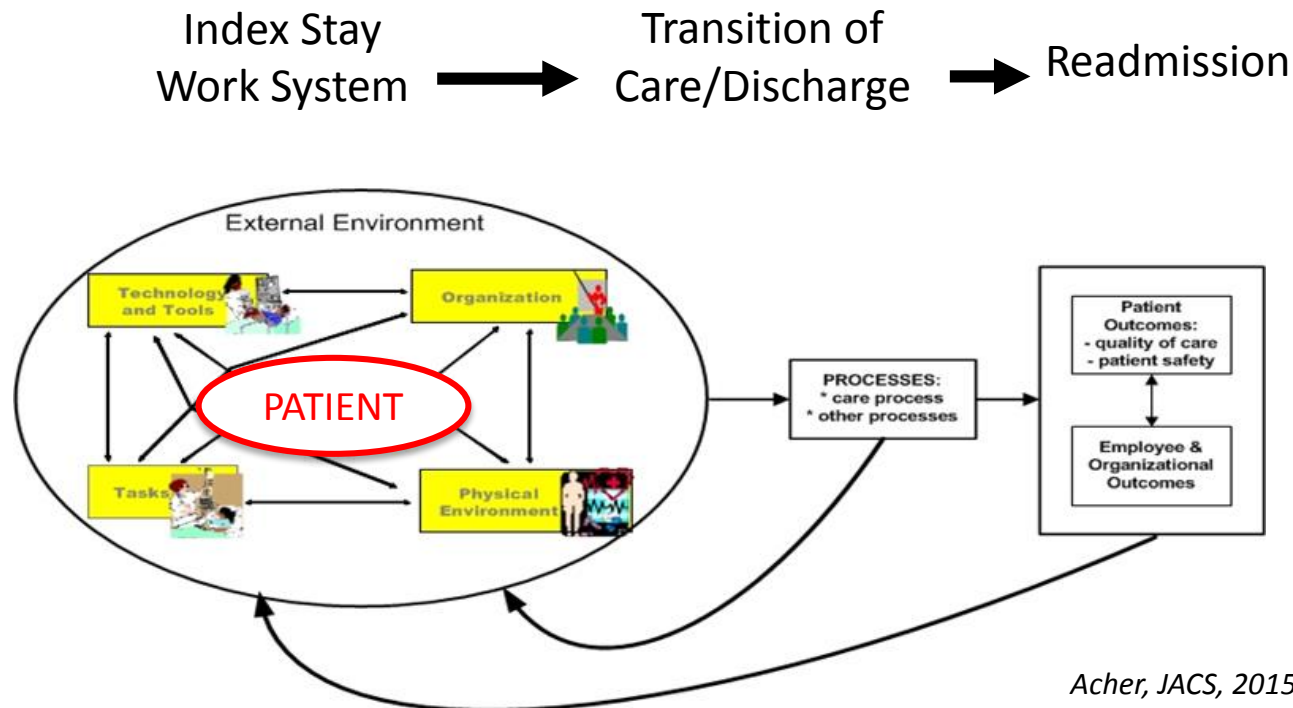
Readmission

- Complex process with multifactorial etiology
 - Qualitative data not captured
- Predictive models are inadequate
 - Low PPV
- Poorly understood in surgical patients
 - Post-discharge complication vs. Patient specific socio-demographic factors

Using Human Factors and Systems Engineering to Evaluate Readmission after Complex Surgery

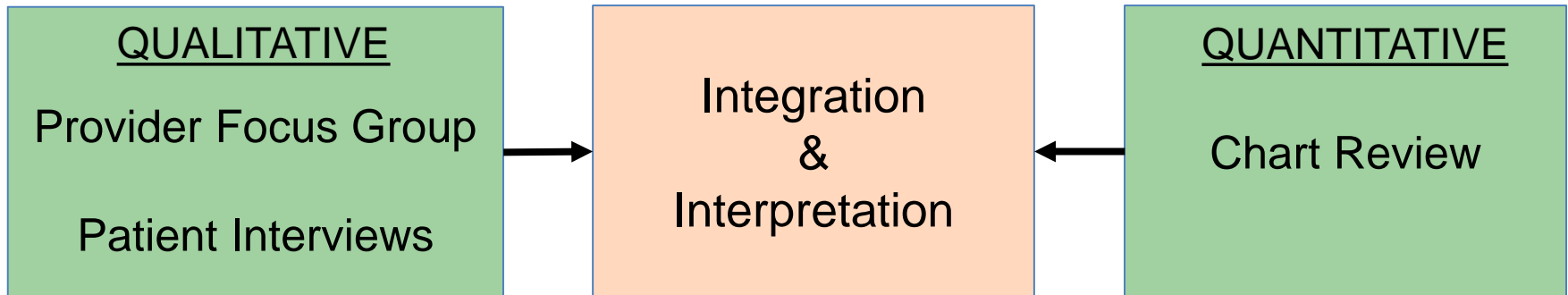
Study Objective:

- Use SEIPS model to understand surgical readmission from a patient perspective



Methods

Mixed-methods approach



Patient Interviews:

- Patients readmitted within 30 days of colorectal, pancreas, liver or esophageal surgeries
- Face-to-face interviews within 48 hrs of readmission, guided by SEIPS mode
- Focus group of clinician providers

Methods

Patient interviews and focus group analyzed for emergent themes

- Theme analysis guided by the SEIPS model
- Repeated review and comparison by 2 reviewers Initial
- Coding framework developed from content

Study Participants

Patients: 21 approached, 18 enrolled

- 86% accrual

Focus Group Participants

- Physicians (2 surgical residents)
- Inpatient nurses (2)
- Case manager
- Pharmacist

6/6 agreed to participate

Patients

Surgical procedures	n (%)	n (%) cancer
Colorectal	8 (44%)	3 (38%)
Pancreatectomy	7 (39%)	6 (86%)
Hepatectomy	2 (11%)	0
Esophagectomy	1 (6%)	1 (100%)
Total	18	10 (56%)

Patient Demographics

Characteristic	Median or n (%)	range
Age, yrs	62	24-82
Female	10 (56%)	
Non-Hispanic White	17 (94%)	
Index length of stay, days	7	5-38
Time to readmission, days	8	1-25
Interview length, minutes	34	20-110

Patient Encounters Prior to Readmission

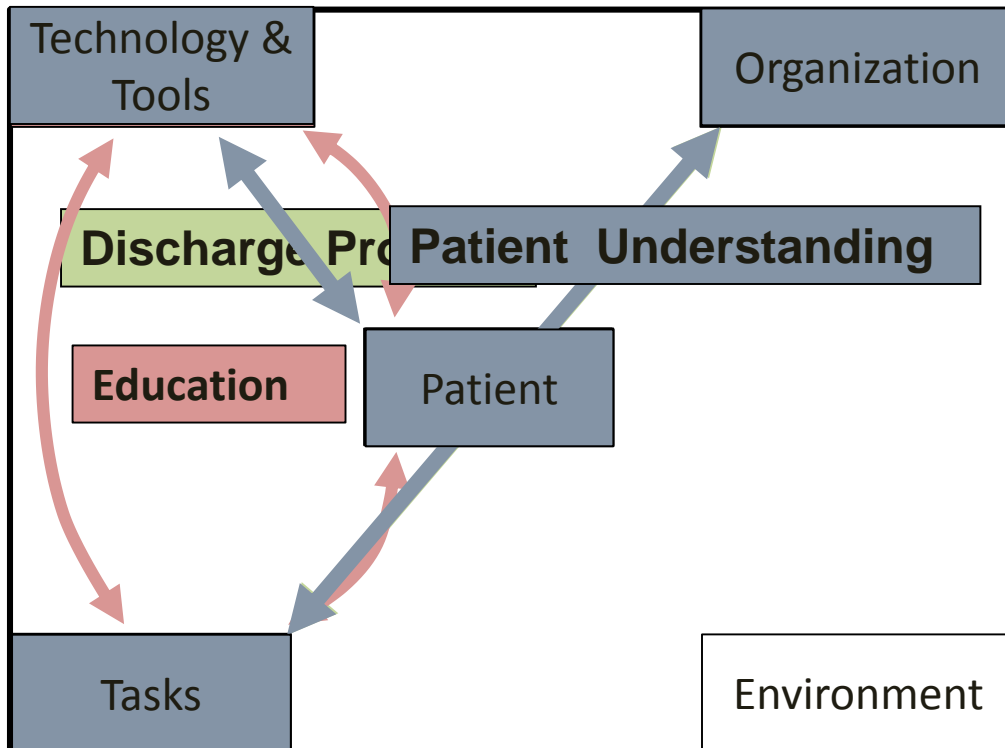
- 72% of patients were readmitted before their scheduled surgical follow-up appointment
 - Readmitted 1-13 days (median 7d) before scheduled appointment

Principle Diagnosis

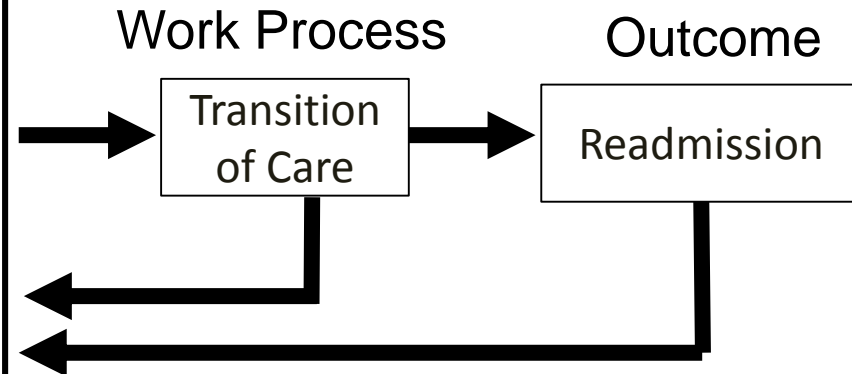
Principle diagnosis for readmission	N
Infection	9
Abscess/intra-abdominal fluid collection*	6
Surgical site infection	1
Pneumonia	1
Urinary tract infection (UTI)*	2
Small bowel obstruction	2
Delayed gastric emptying	2
Dehydration*	3
Palliative care/failure to thrive	1
Pleural effusion	1
Possible hemorrhage	1

*Recorded > 1 diagnosis: UTI and intra-abdominal fluid (1), dehydration and UTI (1), dehydration and diarrhea (1), dehydration and steroid withdrawal (1)

Summary: Themes



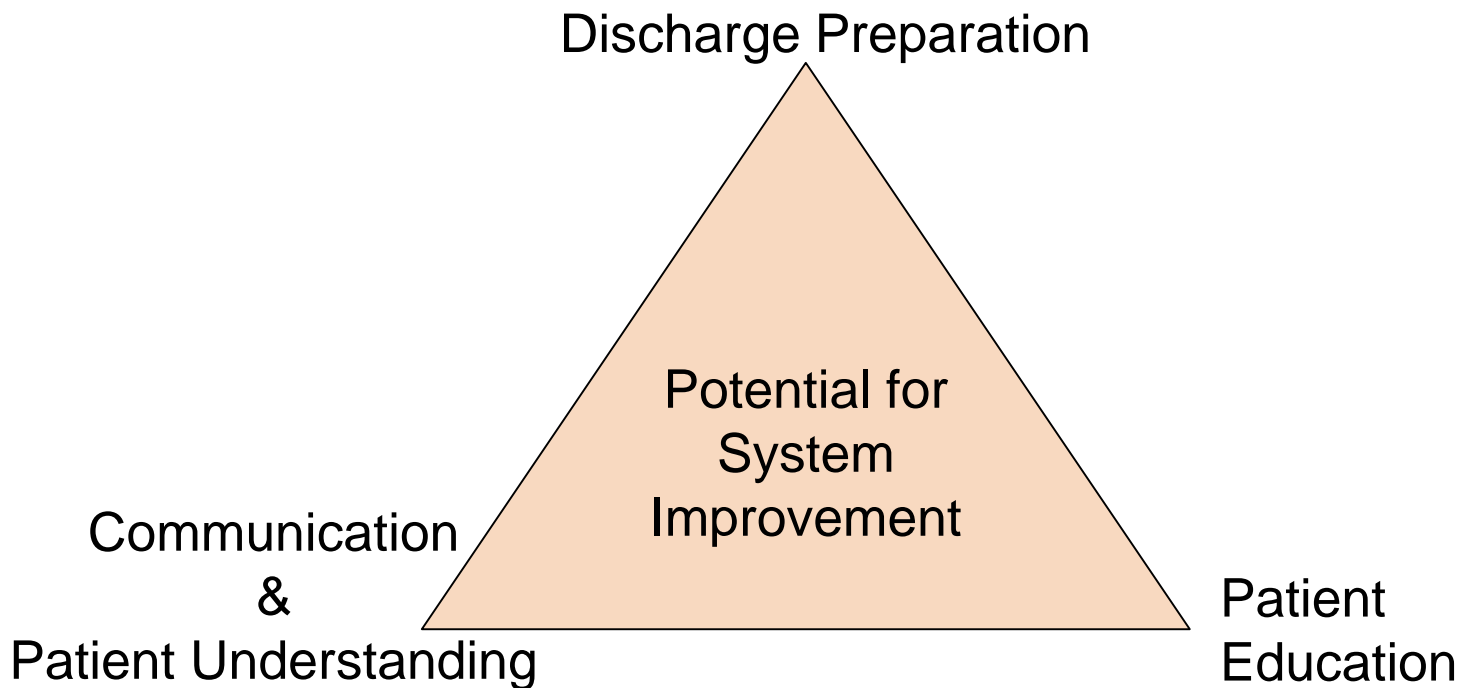
- **Poor understanding/ unrealistic expectations for recovery**
- **Altered cognition contributed**
 - **Anxiety**
 - **Illness severity**
 - **Pain medication**



Acher, JACS, 2015 Oct;221(4):810-20

Study Conclusions

Multiple areas of focus for systems improvement



Transition of Care Intervention

Goal:

- *Evidence based intervention* to address patient concerns identified in SEIPS model study
 - Discharge process and planning
 - Patient education and understanding
 - Post-discharge communication and follow up care

Coordinated Transitional Care Protocol (C-TraC)

Phone-based program utilizing:

- Specially-trained RN nurse case manager
- Transitional care protocols

Modified Coleman Care Transitions Intervention™ model

1. Educate and empower the patient/caregiver in **medication management**
2. Ensure the patient/caregiver has **follow-up appointments**
3. Educate the patient/caregiver regarding **red flags**
4. Ensure the patient/caregiver knows **whom to contact** if questions arise

C-TraC Components

1. In-hospital visit with C-TraC nurse
2. Telephone follow-up 48-72hrs post-discharge
 - Medication management
 - Medical follow up
 - Red flag identification
 - Contact information for C-TraC RN
 - Medication discrepancies or red flag prompts contact with MD office.
3. Continued follow up phone calls every few days to weekly
4. Process ends when:
 - Patient sees PCP
 - Mutual agreement that no further calls are needed
 - 4 weeks have passed

Kind, Health Aff, Dec 2012;31:2659-68

C-TraC Results

William S. Middleton VA, Madison, WI

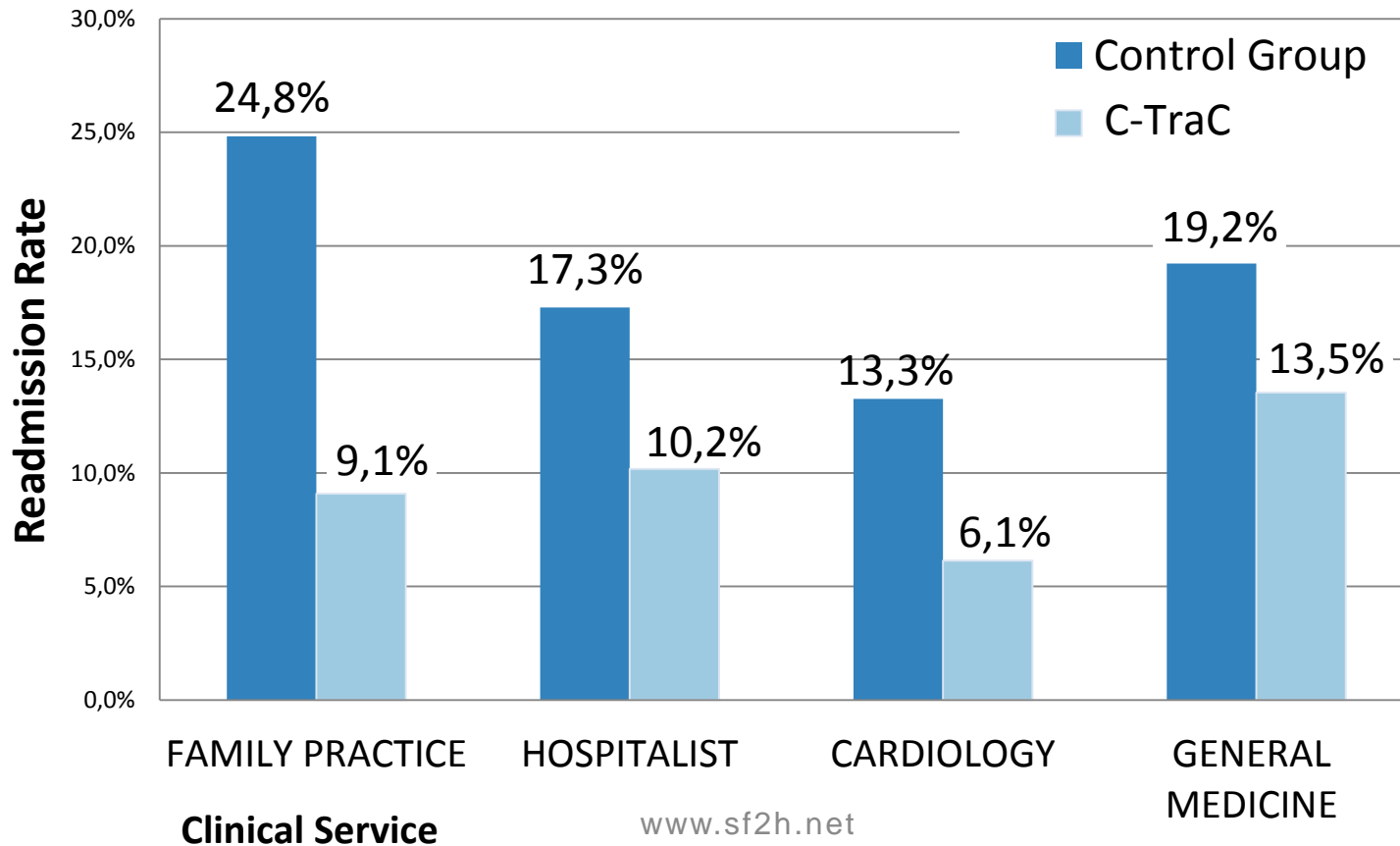
- 731 pts, 2010-2012
- 90% of enrollees reached (engagement)
- 47% medication discrepancies
- Readmission
 - 34% (baseline group) vs. 23%, $p=0.013$
 - Cost avoidance \$1225/patient

Kind, Health Aff, Dec 2012;31:2659-68

C-TraC Results: UW Hospital 11/13-2/15

Readmission Rates: CHF, Pneumonia, COPD

CTraC (n=1,128) vs. Control (n=1,059)
Overall readmission 10.3% vs 18%, p <0.05



Adaptation: Surgical C-TraC

- Can a readmission reduction program that has been proven to reduce medical readmissions be successful in surgical patients?
- Modification to address surgery-specific issues

Surgical C-TraC (sC-TraC)

Discharge process and planning

Patient education and understanding

Post-discharge communication and follow up care

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Contact Surgical Team

Red flags or medication discrepancies?

RN meets patient

Enrollment Criteria:

- Pancreatectomy
- New ostomy
- Home with drain
- Major in-house complication
- Provider discretion

4 Focus Areas:

- Medication management
- Red flags
- Post-hospital care plan
- NCM contact information

Within 24-72 hrs of discharge:

- RN contacts patient
- Discussion of 4 focus areas

Within 3-4 days of previous follow-up call:

- RN calls patient to monitor 4 focus areas

RN contacts patient/caregiver every 3-4 days to monitor 4 focus areas

Successful graduation:

- Patient and RN agree that no further phone follow-up is needed
- 4-6weeks have passes

Enrollment discontinued:

- Patient is readmitted
- Unable to contact patient after 3 successive attempts
- Patient refuses follow-up



sC-TraC Implementation Results

10/12/2015 – 1/10/2016

- Enrollment: 100%
 - 100 patients
- Engagement: 95%
- Readmission: 11/95 pts (11.6%)
 - Historical data FY2014:
 - Colorectal 12%
 - Surg Onc 20%
 - Combined readmission rate 14.5%

Procedure	N
Pancreatectomy	12
New ostomy	44
Bowel resection	16
Ostomy takedown	8
Other	20

- Medication Discrepancy – **30%** at first phone call

Adaption: *Surgical C-TraC*

- Complete protocol adaptation
 - Focus group stakeholders/clinician providers
 - Barriers/facilitators to implementation
 - Process mapping
- Pilot test final protocol
 - Acceptability evaluated
 - Focus group clinician providers and patients/caregivers
 - Assess patient activation
 - Interrupted time series analysis: Unplanned health care utilization (readmissions/ER visits)
- Multisite RCT

Glasgow, Am J Pub Health 2003;93(8):1261-67
Fieldstein, J Comm J Qual Pt Saf 2008;34(4):228-243

Conclusion

- Human Factors and Systems Engineering can be used to study complex medical systems
- Allows integration of qualitative and quantitative data
 - Specifically the patient and provider perspective
- Essential to include patient concerns into design of transitional care programs for surgical patients

Acknowledgements

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Merci!

