Implementing Decision Support Tools to Enhance Care for Older Adults

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Objectives and content outline

- State the barriers to effective discharge referral decision making
  - Background and significance of the problem
  - Development and use of the tool

- Discuss the implementation of decision support tools into discharge planning workflow
  - Study design

- Examine the impact of discharge referral decision support on 30 and 60 day readmissions among medical patients
  - Results
  - Implications and Future Research
Significance

- Within 30 days of discharge:
  - 19% of Medicare beneficiaries are re-hospitalized (Jencks, Williams, Coleman, 2009)
  - Up to 76% of these readmissions may be preventable (MedPAC Report, 2007)

- Of the Medicare beneficiaries readmitted within 30 days:
  - 64% received no post acute care between discharge and readmission (MedPAC Report, 2007)

- Eliminating just 5.2% of preventable Medicare readmissions could save an estimated $5 billion annually (Lubell, 2007)

- Suggested interventions to prevent these re-admissions:
  - Identify and refer high risk patients before discharge
  - Improve care coordination and communication across settings
  - Provide transitional care
Significance (Cont’d)

- Improving transitions in care is a national priority
- Affects over 14 million older adults per year
- Discharge planners are overwhelmed
- Models vary as to which patients are assessed or screened by a discharge planner (DP)
- Huge variation in risk tolerance among clinicians
- There are no evidence-based decision support tools for discharge planning
Barriers to Effective Discharge Planning

- Lack of protocol exacerbated by:
  - Shortened lengths of stay
  - Inconsistent assessments
  - Varying levels of expertise & risk tolerance

- Discovered lack of post acute referrals
  - Confirmed with 2 pilot studies
    - Quantitative
    - Qualitative

- Potential outcomes:
  - Increased costs and poor discharge outcomes
NIH study

- Factors to Support Effective Discharge Decision Making
  - Funded by the National Institute of Nursing Research
    RO1-007674
  - Dr. Kathy Bowles, PI
    - Co-Investigators
      - Mary Naylor
      - Matthew Liberatore
      - John Holmes
      - Sarah Ratcliffe
Discharge Decision Support System: D²S²

- Decision support tools bring standardization to discharge planning

- Supports a critical decision point:
  - D²S² assists in identifying patients who should be **referred for post acute care** to avoid missing people who need care or wasting resources on over-referral

- The tool reforms how discharge planning assessment priorities and referral decision making are conducted
Discharge Decision Support System: D²S²

- Developed and tested in National Institute of Nursing Research funded study (RO1-NR07674) using care summaries of hospitalized older adults to elicit interdisciplinary experts’ post acute referral decisions

- Experts reviewed the cases
  - Yes/No referral decision
  - Reasons for referral

- Regression analysis of the important reasons for referral resulted in a predictive model of six factors associated with the expert PAC referral decision (AUC .86)

- The D²S² takes five minutes to complete
Discharge Decision Support System: D²S²

- Two clinically relevant versions:
  - Cognitively intact patients
  - Cognitively impaired patients completed with a caregiver/proxy

- The items on the two versions vary slightly

- Has a threshold cut off score that suggests a post acute referral to the clinician

- Administered any time prior to discharge, but, preferably within 24 to 48 hours of admission to get the process started early

- Since the D²S² score increases when the length of stay reaches day eight, the D²S² is repeated every eight days
Discharge Decision Support System (D²S²)

- Screening tool completed on day 1-3 and every 8 days:

<table>
<thead>
<tr>
<th>COGNITIVELY INTACT VERSION</th>
<th>COGNITIVELY IMPAIRED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking ability</td>
<td>Walking ability</td>
</tr>
<tr>
<td>Self rated health</td>
<td>Self rated health</td>
</tr>
<tr>
<td>Length of stay</td>
<td>Length of stay</td>
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<tr>
<td>Age in years</td>
<td>Caregiver availability</td>
</tr>
<tr>
<td>Number of co-morbid conditions</td>
<td>Number of co-morbid conditions</td>
</tr>
<tr>
<td>Depression</td>
<td>Annual income</td>
</tr>
</tbody>
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- Cut off score determines those who the discharge planner should consider for post acute referral

(Bowles, et al., 2009)
Study Design: Two phase quasi-experimental

- Four medical units
- Usual care control phase 8 months
- Experimental phase one year

Phase 1
Usual care without decision support

Phase 2
With decision support
Sample and data collection

- Eligibility criteria
  - Patients admitted to four medical units
  - Age 55 and older
  - Living in the community
  - English speaking
  - Not on dialysis or hospice

- Baseline in-person
  - Socio-demographic and clinical data
  - D²S²

- After discharge from hospital database
  - Readmissions up to 60 days after index discharge
  - APR-DRG
  - Primary diagnosis
  - LOS
  - Discharge disposition
Control phase without the decision support

- Usual care included assessment for discharge planning needs by unit based nurse or social work discharge planners.
- Daily discharge planning rounds with hospitalists, physicians and staff nurses.
- Assessments were guided by a self-developed assessment forms.
- Referral decision making was not structured and was made by individuals.
- The $D^2S^2$ was collected by the research team to know how the patients scored on the $D^2S^2$, but the results were not shared with clinicians.
Implementation considerations

Guided by Osheroff and colleagues’ implementation steps:

- Identify the stakeholders
- Stakeholder meeting
  - Determine the goals and objectives of the decision support
  - Understand how tools were developed and validated, purpose, how they perform
  - Develop trust
- Identifying local champions
  - Gain and maintain momentum
  - Monitor quality
  - Promote communication about and support for the practice change
  - Serve as strong advisors to the implementation team

(Osheroff, et al., 2005)
Experimental phase with decision support

- Discharge planners and staff nurses were educated about the D²S²
  - how it was developed
  - what the scores meant
  - to bring the information to discharge planning rounds for discussion

- Workflow was analyzed to determine best way to share the decision support with the clinicians

- Support staff inserted the information into the EHR

- Every instance of information transfer was checked for quality and appropriateness prior to inclusion in the data analysis
Data Analysis

- Subjects in each phase were stratified into two score groups
  - do not refer (low risk)
  - refer (high risk)

- Within and between group comparisons were made using
  - two-sample t-tests and Fisher’s Exact tests
  - adjusted survival curves and Cox proportional hazards model parameter estimates for time to readmission by D²S² referral
  - to test for differences in patterns of hospital readmission by study phase, a comprehensive Cox regression model was generated with a group x D²S² referral interaction term, with adjustment for APR-DRG, significant control variables, and clustering at the medical unit level
Usual care phase results

- D²S² recommended referral for 61% and no referral for 39%

- Compared to do not refer patients, refer patients were:
  - older (mean 70 vs. 67)  p=.037
  - on more meds (mean 10.5 vs. 8.4)  p=.001
  - with more co-morbid conditions (mean 6.8 vs. 5.7)  p=.003
  - with more major or extreme APR-DRG scores (48% vs. 29%)  p<.001
  - seeing their physicians 2 or more times in the past six months (92% vs. 64%)  p=.038
  - having 2 or more hospital admissions in the past six months (36% vs. 20%)  p<.001
Usual care phase results: time to readmission

![Graph showing probability of readmission over days for two groups.]

- Group 0 (No Referred) with a probability of 0.18% at 30 days.
- Group 1 (D2S2 Referred) with a probability of 0.23% at 30 days.

N = 281  
P = 0.021
Experimental phase results

- $D^2S^2$ recommended referral for 69% and no referral for 31%

- Compared to do not refer patients, refer patients were:
  - older (mean 71 vs. 66) $p<.0001$
  - with more conditions (mean 7.6 vs. 6.5) $p=.039$
  - insured by Medicare (55% vs. 35%) $p=.001$
  - with more major or extreme APR-DRG scores (55% vs. 34%) $p<.001$
  - having 2 or more hospital admissions in the past six months (28% vs. 14%) $p<.001$
Exp phase results: time to readmission

![Graph showing time to readmission with N=252, P=.495, and probabilities of 16%, 17%, and 24% at specific days.](image)
Between phase differences in time to readmission

Usual Care Phase  
With Decision Support

![Graphs showing probability of readmission over days for Usual Care and With Decision Support phases.](image)
Conclusions and implications

- Supplying decision support for PAC referral decision making is associated with better DC plans as evidenced by an increase in time to readmission.

- Between the two phases there was a 6% decline in readmissions by 30 days and 9% by 60 days.
  - 26% relative reduction at both time points.

- The tool differentiated patients on common risk factors such as previous admissions, age and severity.

- Unique contribution:
  - Boost, Project Red, and Coleman do not emphasize attention to post acute referral beyond PCP follow-up.
Limitations and threats to validity

- Limitations:
  - One hospital
  - Age 55 and older
  - Medical patients
  - One discharge planning model

- Threats: Two phase design but had:
  - Careful control for group and phase differences
  - Accounting for clustering by units
  - Transitional care interventions were stable
Automating the process

- Automating the process electronically is one of the largest challenges to CDS implementation.
- Disparate EHRs makes scaling difficult.

- The CDS implementation team must:
  - catalogue the information systems
  - decide where it best fits
  - determine the workflow for automatic delivery of the CDS
  - ensure that use does not require extra steps logging on to a separate application
  - our approach is to install as an EHR add-on
Lessons learned

- Timely sharing of the tools is critical to deliver the decision support at the right time to the right person.

- Close scrutiny required to:
  - maintain quality relative to how the tools are collected and scored
  - assure that results are accurately shared with the discharge planners

- Clinicians reported the tools were helpful to:
  - either guide or confirm their discharge planning decision making
  - identify high risk patients early in the hospital stay
Future Directions

- Rich data on:
  - How the tools perform
  - How they fit into the workflow
  - Ways to improve both the tools and patient outcomes

- Continue to test and develop decision support applications for discharge planning

- $D^2S^2$
  - RightCare Solutions is licensing and installing the $D^2S^2$
  - Smart capabilities
  - Dashboard reporting
  - Next generation “where to refer” current NIH grant
Conclusions

- Implementing decision support is a complex process requiring:
  - careful adherence to established steps such as assessing/assuring stakeholder involvement
  - an information system inventory and workflow analysis
  - formative and summative evaluations

- Providing decision support with the D²S² demonstrated:
  - feasibility of delivery electronically and accurately
  - usability by clinicians to support decision making
  - helpfulness in identifying patients likely to have readmissions
  - An impact on time to readmission

- Use of decision support tools such as this can bring expert advice to important decisions in an otherwise complex and variable process
Installation and further development is ongoing at:

- Johns Hopkins University Hospital
- New York University Hospital
- Thomas Jefferson University Hospital
- University of Pennsylvania Health System

NIH SBIR grant pending

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References


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