Factors Supporting Discharge Referral Decision Making

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Background

A *post discharge referral* is a recommendation that the evaluating staff nurse, physical therapist, social worker, or physician refer the patient for post hospital services such as skilled home care, outpatient rehabilitation, or admission to a nursing home or rehabilitation center/skilled nursing facility

Background

◆ Each year more than 12 million hospital discharge referral decisions are made for Medicare recipients

◆ There are no national, empirically-derived guidelines for these decisions

◆ Purposes of this study are to

– elicit expert knowledge about important referral factors

– use this information to predict which patients need a post discharge referral

Methods

- Exploratory data analysis
- Mixed methods
  - Focus groups
  - Case studies
  - Delphi for knowledge elicitation
- Qualitative analysis and data mining used to identify variables for the logistic regression predictive model (refer/don't refer)

Sample

- 355 older adults hospitalized for a variety of medical and surgical conditions and admitted to one of six different sites
  - Cases included cardio (205), respiratory (43), digestive (45), and a mix of others
- Needed a larger sample than projected to assure enough non-referrals
- Case studies developed based on patient medical records
  - Instruments for self-rated health status, mental status, functional status, depression (not for all patients)

Example case study

Age/Gender/Race: The patient is a 78 year-old, white, male.

Health State: The patient was admitted for shortness of breath, coughing, and chest tightness. A chest x-ray was performed and his diagnosis was pneumonia and exacerbation of COPD. He was admitted and treated with IV antibiotics and nebulizer treatments. Past medical history is significant for coronary artery disease, atrial fibrillation, COPD, hypercholesterolemia, and diabetes mellitus secondary to steroid use. Medications prior to this admission include Aspirin, Cartia, Combivent, Coumadin, Digoxin, Flovent, Nitrostat, and Augmentin (for the last 2 days). Discharge medications included Levaquin and Glucotrol. Length of stay was 3 days.

Developmental State: The patient attended school until the 10th grade. He is retired. He scored 9/10 on the mental status exam and 9 on the depression scale (16-60 = depression). He is independent in all activities of daily living. He has no health aids and does not feel that he needs any. He has no dietary restrictions. He reports fatigue and shortness of breath while dressing, walking, and bathing. He rated his health as fair at the present time. He has not used any formal health services and does not feel he needs any.

Health Care System Factors: The patient has had no hospitalizations in the past six months. He saw his doctor twice in the past six months.

Family System Factors: The patient is married and lives with his spouse. He considers his wife and son to be his primary caregivers. They are available whenever needed.

Environmental Factors: The patient lives in a single-family home. There is a bathroom on the level of the bedroom and kitchen. The kitchen and bedroom are on the same level.

Socioeconomic Factors: The patient reports his income as $5,000-10,000/year and is insured by Medicare Parts A and B and private health insurance.

Expert Knowledge Elicitation

◆ Four nationally recognized scholars and four local clinicians evaluated the cases

◆ All experts evaluated all cases online, indicating whether or not a referral was needed, and the factors influenced their decision

◆ Three Delphi rounds were used to reach consensus

◆ Focus groups held with local and national experts to review results, discuss the referral factors, and validate the ontology

Results

- Sample: 54% female, 745 white, ave. age 74 (65-90), 50% married, 36% widowed; 33% High school; 30% < H. S.; 43% income <$20k; 53% 1+ hospitalization in last 6 months

- Experts recommended 80% (n=284) of the sample for a post discharge referral
  - 88% to home care, 8% outpatient rehab, 11% inpatient rehab

Results

- Experts more likely to refer patients who had ($p < 0.05$):
  - Major walking restrictions
  - Less than excellent self-rated health
  - In hospital > 1 week
  - > 80 years old
  - Higher depression scores
  - Higher number of co-morbidities
- Sensitivity and specificity are 86.1% and 68.5%, respectively

Results

- ◆ Second model without depression scores
- ◆ Walking function, self-rated health, length of stay, and number of co-morbidities still significant
- ◆ Help available and mental health score also important
  - – Sensitivity and specificity of both models not significantly different
  - – Can use these two factors if depression scores not available

Final logistic regression model for experts' referral decision

Variable (n=255)	Estimate	S.E.	p-value	Odds of	95.0% C.I. for Odds	
					Lower	Upper
Walking Function			.044			
No restriction	(ref)				(ref)	
Minor restriction	.517	.433	.232	1.677	.719	3.915
Major restriction	1.954	.808	.016	7.060	1.450	34.374
Subjective health rating			.009			
Excellent	(ref)				(ref)	
Good	1.144	.544	.036	3.140	1.080	9.125
Fair / Poor	1.763	.574	.002	5.832	1.892	17.976
Stay >7 days	2.747	.833	.001	15.602	3.049	79.832
Depression Score	.079	.027	.003	1.083	1.027	1.141
Age > 80 years	1.442	.607	.018	4.229	1.287	13.893
No. Co-morbidit.	.216	.092	.019	1.241	1.036	1.486

Final Logistic Regression Model for Expert Referral Decision (excludes depression)

Variable (n=353)	Estimate	S.E.	p-value	Odds of Referral	95.0% C.I. for Odds Lower	Upper
Walking Function			<.001			
No restriction	(ref)			(ref)		
Minor restriction	.452	.358	.206	1.572	.780	3.168
Major restriction	2.290	.577	<.001	9.876	3.189	30.584
Subjective health rating			.003			
Excellent	(ref)			(ref)		
Good	1.1291	.453	.004	3.635	1.495	8.842
Fair / Poor	1.593	.474	.001	4.920	1.942	12.464
Stay >7 days	1.359	.434	.002	3.894	1.663	9.118
No. Co-morbidit.	.179	.078	.021	1.196	1.027	1.392
None or intermittent help available	1.149	.457	.012	3.155	1.289	7.723
SPMSQ Score <10 on admission	.787	.396	.047	2.197	1.010	4.779

Observations

◆ Depression, mental status, and self-rated health are not routinely collected but this study points to their importance

◆ Model does well in predicting who should be referred, but not as well in predicting those who should not – possibility of over-referral should be addressed from quality and cost considerations

◆ Study limited to subjects from acute care hospitals in SE PA who are in at risk patient groups, cognitively intact, and expected to be discharged home.

Conclusions

◆ This study defines the information needed to predict hospitalized older adults in need of post discharge services

◆ By assuring the systematic, valid, and reliable collection of these six items, the multidisciplinary team is alerted to patients in need of services