Using Health Information to Enhance Musculoskeletal Rehabilitation for Older Persons

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Who we are:
• InfoRehab is a program of research funded by the Canadian Institutes of Health Research.
• Investigators from universities across Canada (the University of Toronto, University of British Columbia, University of Alberta, University of Waterloo, University of Ottawa, University of Calgary, and University of Western Ontario)
• Collaboration with a broad range of stakeholders (consumers, hospital, home care, long-term care, professional associations, policy-makers, experts in knowledge translation)

Our rationale…
• Older clients, often with multiple morbidities, challenge our ability to deliver high quality care
• ‘The transfer of timely and accurate information across settings is critical to the execution of effective care transitions’ (Coleman & Fox, 2004)
• The effective use and transfer of health information is particularly critical in MSK rehabilitation.
• Relevant health information systems are available, but their potential to inform care planning and decision-making has not been realized.
• Better use and management of existing health information systems could improve rehabilitation of older persons with MSK disorders

Our goal:
To enhance musculoskeletal (MSK) rehabilitation through more effective use of health information across the continuum of care.

Health Information
• Focusing on:
  – Health information collected through standardized health assessment systems
  – Frail older persons, particularly those with musculoskeletal disorders, such as hip fracture

Today
• Health assessment information for older persons
• Barriers to effective use of health information in care planning, with a focus on rehabilitation in home care
• Using statistical analysis and data mining of health assessment data, to answer clinical and policy questions
Mrs. Aasen (1)

- 87 years old
- Lives alone in own apartment
- Walking independently
- Homemaking 1X week – bathing & housework
- Fall at MD’s office → hip fracture

Mrs. Aasen (2) Comorbidities

- Hypertension many years
- Diabetes 6 yrs – control poor, frequent hypoglycemia
- Small stroke several years ago
- IHD – angina 6 months
- OA hands, knees and shoulder
- Diabetic retinopathy – blind L eye, cataract R eye
- Chronic renal impairment, creatinine 147
- Urinary urgency
- Constipation
- Poor appetite → weight 15 lb 1 year

Mrs. Aasen (3) Medications

- Acetaminophen 500 mg qid
- Beclomethasone aqueous nasal spray
- Codeine 15 mg qid
- Diltiazem CD 300 mg qd
- Ferrous Gluconate 300 mg tid
- Glyburide 5 mg daily
- Nitroglycerin Transdermal 0.4 mg/hr patch
- Pioglitazone 15 mg daily
- Docusate Sodium 100 mg bid
- Senna conc. 8.6 mg 2 daily
- Warfarin 1 mg daily
- 5 PRNs

Mrs. Aasen (4)

No delirium post-op
MMSE 27/30
Weight 52 kg
Admission FIM: 71/126

Goals:
1. Walking
2. ADL and IADL
3. Stairs
4. Tub Transfers

New Issues:
1. Son died shortly after transfer
2. At risk of depression
3. UTI and urinary retention
4. Post-op anemia
5. Osteoporosis
Frail Older Persons

- Multiple, complex problems
- Not all goals/outcomes are relevant for all patients
- Care typically involves multiple care providers and multiple care settings
- Same outcomes can be positive or negative, depending on the patient or situation
- Quality of life often more relevant than survival or length of life

Need to Re-think Clinical Information Systems (Gray, et al., 2009)

- Increasing population of older persons – often with multiple diseases/comorbidities, receiving care from multiple providers across multiple care settings
- Integration and coordination of care and services are key
- Traditional clinical information systems tend to focus on a limited set of problems
- Need a complex, multidimensional view of patients
- Need information that can move with individuals as they move across care settings

What type of assessment system would accommodate the complexity and individualized nature of health problems in frail older persons?

A couple options

- Individualized measures
- Standardized measures

An Individualized Measure: Goal Attainment Scaling

- Developed by Kiresuk and Sherman in 1968
- Key Features:
  - 5-Point Scale of Individualized Potential Outcomes
  - Summary Goal Attainment Score
- Research and Clinical Applications
Sample GAS Guide

<table>
<thead>
<tr>
<th>Attainment Levels</th>
<th>Mobility</th>
<th>Discharge Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much less than expected (-2)</td>
<td>Chairfast</td>
<td>On rehab unit &gt; 3 weeks *</td>
</tr>
<tr>
<td>Less than expected (-1)</td>
<td>Walks ~ 5 metres with walker</td>
<td>Discharged to nursing home</td>
</tr>
<tr>
<td>Expected level (0)</td>
<td>Walks ~ 10 metres with walker, 3 weeks</td>
<td>Home with daily home support, 6 weeks</td>
</tr>
<tr>
<td>Better than expected (+1)</td>
<td>Walks ~ 20 metres with walker</td>
<td>Home with home support, 2-3 times/week</td>
</tr>
<tr>
<td>Much better than expected (+2)</td>
<td>Mobile inside house with cane, walker, modest distance outside</td>
<td>Home with weekly home support</td>
</tr>
<tr>
<td>Comment</td>
<td></td>
<td>Patient does not wish nursing home placement</td>
</tr>
</tbody>
</table>

The Goal Attainment Score

\[
\text{GA Score} = 50 + \frac{10 \sum (w_i x_i)}{\sqrt{1.7 \sum w_i^2 + 3(\sum w_i)^2}}
\]

Standardized Measures

- “Three Generations” (Gray, et al., 2009)
- 1st generation: battery of assessment tools for specific uses
Pitfalls of Specific Assessment Measures

- “Measuring outcomes of multidimensional interventions” (Stolee, 2010)
- Reviewed RCTs reviewed in major systematic reviews and meta-analyses of geriatric services
- 56 RCTs

Outcome measures in 52 RCTs

- Physical function measured in 52 studies – 32 measures, 23 significant
- Cognitive function measured in 33 studies – 11 different measures, 6 significant
- Psychosocial function measured in 37 studies - 29 measures, 12 significant
- Self-rated health measured in 18 studies – 8 different approaches, 4 significant
- Health care use outcomes measured in 45 studies, 24 significant
- Other outcomes in 32 studies – 16 measures, 13 significant

2nd Generation: Standardized Health Assessments

- One instrument, multiple domains, e.g.:
  - National Rehabilitation Reporting System (inpatient rehab in Canada)
  - OASIS - Outcome an Assessment Information Set (home care in U.S.)
  - interRAI instruments (multiple settings)

3rd Generation: Extend assessment systems across multiple care settings

- A suite of compatible assessment tools
- interRAI consortium (Gray, et al., 2009)

3rd Generation: Benefits (Gray, et al., 2009)

- Reduce assessment effort as patients move across settings
- Consistent recording of information to facilitate interpretation
- Simplified training of assessors
- Administrative advantages (e.g., re software systems)
- Can compare case complexity in different settings

interRAI “Suite” (Gray, et al., 2009)

- Long-Term Care
- Home Care
- Assisted Living
- Acute Care
- Post-Acute Care
- Community Health Settings
- Palliative Care
- Mental Health (inpatient)
- Community Mental Health
- Intellectual Disability
interRAI “Suite” Components (Gray, et al., 2009)

- Clinical assessment information for care planning and decision-making
- Embedded assessment scales [e.g., cognition, depression, activities of daily living (ADL)]
- Clinical assessment protocols (CAPs)
- Quality indicators
- Casemix tools

On the RADAR for EMR?

Barriers to Using EHIS in Home Care

- Literature review
- Consultation with home care case managers and service providers through workshops and surveys

Literature Review

- Literature Review
  - The Use of Electronic Health Information Systems in Home Care
  - Top 3 Barriers and Facilitators:

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Facilitators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost (technology, training, maintenance)</td>
<td>PCs (portable technology that allow data to be input at point of care)</td>
</tr>
<tr>
<td>Training cost, time commitment, initial loss of productivity</td>
<td>Strategies provided by IT to decrease data entry errors</td>
</tr>
<tr>
<td>Staff resistance / lack of user acceptance</td>
<td>Managerial support &amp; user incentives during adoption &amp; early implementation</td>
</tr>
</tbody>
</table>
Consensus Survey

• Survey was administered to 40 different health care providers
• 22 people responded (55% response rate)
  • 86% = Female; 14% = Male
• Occupation
  • 5 Physiotherapists
  • 4 Occupational Therapists
  • 2 Registered Nurses
  • 5 Case Managers/Coordinators
  • 6 Administrative Positions (Directors, Managers, Vice Presidents)

Consensus

• A 70% consensus rate was used for the analysis of the survey responses.
• For responses to be listed as important or prohibitive, 70% of participants needed to indicate a score between 7 – 10 on the Likert scale (option of ranking between 1 – 10).

1. Rate how effective you feel the following modes of communication are in sharing information in home care.
   a) Telephone Y 1
   b) Fax Machine N
   c) Email N
   d) Voicemail N

2. Rate how important the following processes are for improving information sharing strategies in home care.
   a) Consistency in the patient information collected Y 1
   b) Consistency in language/terms used Y 2
   c) Consistency in what tools are used to collect patient information Y 2
   d) Consistency in procedures used to share patient information Y 4

3. Rate how important you feel the following are when sharing patient information with colleagues in home care.
   a) In-home conferences Y 1
   b) Team meetings Y 2
   c) Peer consults Y 3

4. Rate how important you feel the following factors are in creating a supportive work environment for information sharing.
   a) Opportunities to engage in continuing education Y 1
   b) Management support in learning new tools and strategies for providing improved patient care Y 2
   c) Culture of individual workplace Y 3

6. Rate how important the following factors are when using EHIS to communicate with other home care service providers.
   a) Easily accessible Y 1
   b) Interface is easy to navigate Y 1
   c) Clearly formatted Y 1
   d) User friendly Y 2
   e) Interactive Y 2

7. Rate how important you feel the following supports need to be available to users when adopting EHIS in home care.
   a) Technical support Y 1
   b) Training using system Y 2
   c) Training using technology Y 2
   d) Booster/update sessions Y 2
   e) Practice guidelines Y 2
   f) Online help Y 2
   g) Training manuals Y 2

8. Rate how important you feel the following factors are when using an EHIS to share information in home care.
   a) System is collecting correct information Y 1
   b) System is user friendly/interpretive Y 2
   c) System is compatible with other information systems used in the organization Y 2
   d) System can communicate and/or is compatible with IT systems outside organization or with other health care settings Y 3
   e) Strategies are provided to reduce data entry errors Y 3
   f) System is flexible and able to adapt to changes Y 4
9. Rate how important the following factors are to adopting EHIS in home care.
   a) User participation at the time of development Y 1
   b) Managerial support Y 2
   c) Cost/benefit analysis Y 3
   d) User incentive during early adoption /implementation Y 4

10. Rate how important the following issues are when using EHIS to collect patient information in home care.
   a) Security/patient confidentiality is maintained Y 1
   b) Maintaining a client centered focus during client interactions Y 2
   c) Individualized data input allows user to adapt to patient needs Y 3
   d) Data is integrated across encounters with a single patient Y 4
   e) Individualized data is focused over aggregate data Y 5

Implications and Suggestions
- Need supportive work environment
- Create patient documentation (summary abstract?) that is made available to all service providers across settings (But will CCAC share?)
- Supports in place for design, implementation, training, and trouble-shooting
- EHIS and RAI: Need to create awareness of capacity and functions of the inter-RAI information and training sessions

Answering Questions
Using RAI-HC Data

A Few Questions
- Does home care rehabilitation (PT or OT) make a difference?
- Who is a good candidate for rehabilitation in home care?
- Who uses rehabilitation in home care?

Impact of PT/OT on Functional Decline & Improvement in Home Care Clients with MSK disorders:
Statistical Analysis Using Multi-State Markov Models

Data: RAI-HC data for home care clients in Ontario with:
1. MSK disorder (arthritis, osteoporosis, hip fracture or other fractures)
2. At least one "admission" to home care
3. Baseline assessment and at least 2 consecutive assessments
4. A date of death or discharge for each admission

Impact of PT/OT on Functional Decline & Improvement in Home Care Clients with MSK disorders

Data: [Graph showing impact of PT/OT]
Impact of PT/OT on Functional Decline & Improvement in Home Care Clients with MSK disorders

Age Distribution
(N=99,764)

- < 65: 11.6%
- 65-74: 16.0%
- 75-84: 41.8%
- 85+: 30.6%

Controlled for: Age, Sex, Falls, ADLs, CHESS, CPS, DRS, Multiple Morbidities, Stamina

Note: “Good” Discharge = Service plan complete, Other community services
“Not Good” Discharge = Admitted to LTC, Hospitalized

Method:
Multi-State Markov Model
A multi-state model which considers the client’s baseline status or ‘state’ at the start of a course of OT/PT treatment at home and their ‘state’ at its completion

Results:
Effects of OT/PT on “independent” clients

- +1.57 OR, p=.0001

Results:
Effects of OT/PT on clients with some IADL impairment

- +1.34 OR, p=.00009
- +1.65 OR, p=.0001
Results:
Effects of OT/PT on clients with some IADL & ADL impairment

State 5: DEATH

State 4: "GOOD" DISCHARGE

State 3: ADL & IADL Impairment

State 2: Some IADL Impairment

State 1: Independent

+1.17 OR p=.0001

+1.34 OR p=.0001

What is the impact of OT/PT on home care clients with MSK disorders?

- Patients who are functionally "independent" (State 1) and who receive rehab are 1.57 times more likely to have a "good discharge"
- Patients with some IADL impairment who receive rehab (State 2) are 1.79 times more likely to have a "good discharge" and 1.36 times more likely to become more functionally independent
- Patients with both IADL and ADL impairment (State 3) are 1.17 times more likely to improve their functional status, and 1.32 times more likely to have a "good discharge"

Why is this important?
- Rehabilitation (PT/OT) provided through home care programs, can achieve functional benefits for clients with MSK disorders, and system benefits in terms of successful discharges from home care and reduced LTC admissions
- Many older home care clients (and many older persons generally) who could benefit from rehabilitation do not receive it (77% of clients in this study)
- Resources for home care rehabilitation are being reduced in Ontario
- RAI data can provide evidence of impact otherwise lacking at a system level

Who is a Good Candidate for Rehabilitation in Home Care: Predicting Rehabilitation Potential

Data: The RAI-HC

Machine Learning and Data Mining
Looking for patterns and relationships in large datasets, that provide new knowledge or that may be used to make predictions
Predicting Rehabilitation Potential: Candidate Approaches

- ADLCAP
  - current Clinical Assessment Protocol used to assess rehabilitation potential
- K-Nearest Neighbours Algorithm (KNN)

Home Care Clients

- Eight (8) Community Care Access Centres (CCACs) in Ontario
- 24,724 long-stay home care clients:
  - Mean Age: 76.3 (SD 13.9)
  - 68.9% Female
  - 15.7% Alzheimer disease or other dementia

Definition of Rehabilitation Potential for Validation Purposes

- improvement in ADL functioning over a follow-up period of about 12 months;
  
  OR

- discharge disposition to home.

ADLCAP

- Predicts rehabilitation potential based on combination of variables:
  - Activities of daily living, ability to understand others, health stability, and ratings of functional potential
- Same variables used in KNN algorithm

ADLCAP: SAS CODE

```
if h2a in (2,3,4,5,6,8) then adl1=1; else adl1=0;
if h2b in (2,3,4,5,6,8) then adl2=1; else adl2=0;
if h2c in (2,3,4,5,6,8) then adl3=1; else adl3=0;
...
adlnum=sum(of adl1-adl10);
if (adlnum ge 2) AND (c3 in (0,1,2)) AND
  (p6=2 OR h3=1 OR k8b=1 OR k8c=1 OR k8d=1 OR h7a=1
  OR h7b=1 OR h7c=1)
then adlcap=1; else adlcap=0;
```

K-Nearest Neighbours Algorithm
The KNN Algorithm


Performance Comparison

- Diagnostic Likelihood Ratios
  - Factor by which the screening results (protocol or algorithm) will change the prior–odds of having rehab potential
  - Want:
    - $DLR^+ > 1$; $DLR^- < 1$
    - Bigger $DLR^+$ the better
    - Smaller $DLR^-$ the better
### KNN Comparative Results: DLR

<table>
<thead>
<tr>
<th>Region</th>
<th>DLR+ CAP</th>
<th>DLR+ KNN</th>
<th>DLR− CAP</th>
<th>DLR− KNN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.1841</td>
<td>1.8826</td>
<td>0.9227</td>
<td>0.5484</td>
</tr>
<tr>
<td>2</td>
<td>1.2442</td>
<td>2.0088</td>
<td>0.8911</td>
<td>0.5537</td>
</tr>
<tr>
<td>3</td>
<td>1.1431</td>
<td>1.8415</td>
<td>0.9232</td>
<td>0.6835</td>
</tr>
<tr>
<td>4</td>
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<td>2.1511</td>
<td>1.0031</td>
<td>0.5040</td>
</tr>
<tr>
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<td>6</td>
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<td>0.5470</td>
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<td>7</td>
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<td>2.2882</td>
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<td>0.5080</td>
</tr>
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<td>8</td>
<td>1.0311</td>
<td>2.0775</td>
<td>0.9815</td>
<td>0.5844</td>
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<tr>
<td>Mean</td>
<td>1.10</td>
<td>2.15</td>
<td>0.96</td>
<td>0.57</td>
</tr>
</tbody>
</table>

### KNN

- More informative than ADLCAP
- Main limitations:
  - Need to store entire database in memory
  - Lack of interpretability.

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**OBJECTIVE**

As part of the project, this study examines:

How home care clients that utilize rehabilitation services cluster together based upon a range of clinical factors

**Overall Objective:** To develop rehabilitation client profiles.

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**CLUSTERING TECHNIQUE**

To accomplish our objective, we employed a machine learning technique known as K-means clustering

- **K Means Clustering**
  - Exploratory data mining technique
  - Works well in large datasets
  - Unsupervised learning
  - Used to group cases together on the basis of patterns of similarity

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The home health care system in Ontario provides a variety of services to a large number of individuals throughout the province.

Researchers and policy makers have long recognized that home care populations are heterogeneous yet little research has focused on this phenomenon.
**DATA**

- Utilized RAI-HC Assessment data
- Examined clients who received rehabilitation services (OT or PT) within the first 3 months of the assessment
- 150, 253 clients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Female</td>
<td>66.7%</td>
</tr>
<tr>
<td>Average Age:</td>
<td>76.8</td>
</tr>
<tr>
<td>Arthritis:</td>
<td>55.4%</td>
</tr>
<tr>
<td>Osteoporosis:</td>
<td>23.6%</td>
</tr>
<tr>
<td>Experience Daily Pain:</td>
<td>60.8%</td>
</tr>
<tr>
<td>Hip Fracture:</td>
<td>5.6%</td>
</tr>
<tr>
<td>CHESS &gt;= 2:</td>
<td>12.2%</td>
</tr>
<tr>
<td>Live Alone:</td>
<td>35.1%</td>
</tr>
</tbody>
</table>

**VARIABLES**

Once we created the rehabilitation client dataset, the next step was to choose the variables to be included in the cluster analysis.

- The selection process was assisted by consultation with InfoRehab's quantitative statistical research team and SAS variable selection techniques (Proc Varclus).
- Variables need to be relevant to rehabilitation clients.
- 37 variables were chosen for the analyses.

**K-MEANS CLUSTERING**

K-means clustering is a popular partitive clustering algorithm that was chosen due to its ability to reach convergence on a solution in large data sets in a short amount of time.

The following is an simplified, two dimensional illustration of how the algorithm works...
K MEANS ALGORITHM EXPLANATION

Example illustrations from: Standford’s CS 229: Machine Learning Class notes

One drawback of the k-means clustering algorithm is that the k (number of clusters) has to be determined.

After looking at the range of possible solutions through the lens of the 3 statistical criteria (Pseudo F, Cubic Clustering Criterion, and the Squared Multiple Correlation), we chose a:

7 cluster solution

K-MEANS CLUSTER SOLUTION

- The k-means algorithm labels each individual client with their cluster membership.
- We can then look at the RAI-HC data, calculate means of each of the clusters, and graph the variables in order to assist in determining profiles
- In the next series of graphs, 7 clusters are graphed in yellow and the 8th blue column is the overall average of the entire sample.
NEXT STEP: CREATE PROFILES

The next step in the process is to generate unique cluster descriptions using the graphs and cluster averages of the numerous RAI-HC variables.

In other words, we create seven client profiles using the clusters formulated by the k-means algorithm.

RESULTS

Cluster 1:
Older Females who live alone and needs assistance with housework and bathing
- 10% of Rehab Clients
- 86% Female
- Average age 76.4
- 70% have arthritis
- 29% have osteoporosis
- Majority need help with:
  - housework (75%)
  - bathing (61%)
- Few with cognitive problems

Cluster 2:
Older Females, Needs Assistance with IADLs and some ADLs
- 14% of Rehab Clients
- 77% female
- Average Age of 76.5
- Needs assistance with:
  - meal preparation (82%),
  - shopping (99%),
  - transportation (87%),
  - dressing lower body (70%),
  - bathing (87%)

RESULTS

Cluster 3:
Frail Elderly, Cognitive Problems, Extremely Dependent and Immobile
- 9% of Rehab Clients
- Highly dependent across all ADL and IADL domains
- Average age of 76.3 years
- 20 % had a 2 or higher on the CHESS scale
- 15% with dementia
- 27% with a stroke

Cluster 4:
Cognitively Impaired, Dependent but Mobile Elderly
- Largest cluster (23%)
- Average age 78.9 years
- 48% with dementia
- 86% had problems with daily decision making
- Similar to cluster 3 in many ways with the exception of mobility
- Highly Dependent

Cluster 5:
Elderly Needing Assistance with IADLs and Bathing
- Average age 78.2
- Relatively independent in their ADLs with the exception of bathing
- Majority require assistance with all IADL domains
- 26% with dementia
- 61% was assessed with problems with their daily decision making

Cluster 6 (10%):
Younger Impaired Males, Need Assistance with Meals, Housework, and Shopping
- Youngest of all clusters (70.6 years on average)
- Primarily male (69%)
- High proportion of smokers (13%)
- Need assistance with meal preparation, housework and shopping

Cluster 7 (15%):
Functioning Elderly Females, Need Assistance with IADLs
- Primarily female (89%)
- Majority of the cluster need assistance with their ADLs
- Highest rate of osteoporosis (37%) and arthritis (86%)

DISCUSSION

- The 7 clusters differed in numerous meaningful ways:
  - Differing ability to carry out activities of daily living and instrumental activities of daily living
  - Differing patterns of disease, gender, home living status, cognitive ability
- This cluster solution requires further validation, however, preliminary work looking into outcomes (1 year after assessment) demonstrates significant differences in outcomes

Discussion

- With the drastically increasing amount of available health data, cluster analysis can play a role by elucidating the naturally forming clusters or groups within the population
- Limited health service resources means that we need to increase our understanding of the population and how we can efficiently improve their care
**DISCUSSION**

- These results satisfied our objective of creating profiles, however, this clustering technique can be used in more of an applied fashion.
- Heterogeneity can be further uncovered by focusing on specific domains (i.e., patterns in service use; types of PT clients).
- This type of information can be used to better plan services and programming for the expanding population of older adults.

**Take Home Points**

- Vast heterogeneity exists in rehab client population, and this shouldn't be neglected when planning/assessing/researching.
- Due to limited resources means, we need to improve our understanding of the population and how we can help them.
- The results point to the utility of cluster analysis as a mechanism to organize and identify patterns within the rich array of information provided by RAI assessment tools.

**MORE TAKE HOME POINTS**

- Potential role for data mining and other alternative algorithms in prediction and clinical decision-making.
- Interpretability of results a challenge - Would clinicians accept a “Black Box” approach?
- Data mining algorithms may “set the bar” for conventional approaches.

**RAI-HC data:**

- Census-level data on long-stay home care clients, including:
  - Service use (PT/OT)
  - Comprehensive client data to permit adjustment for important client characteristics/covariates
  - Multiple long-term follow-ups
  - Functional outcome data
  - Discharge disposition (through linkage to administrative data)
ANOTHER TAKE HOME POINT

- Standardized health assessment systems provide a wealth of valuable data for care planning, resource allocation, quality improvement, and research
- But you’ve got to actually use the data.

A Cautionary Tale: The Story of P2J

At first, P2J (medication by injection) was found to be the most important predictor, highly predictive of receiving rehab.

Deeply puzzled, we investigated.

Turned out there was an error in the original data sets; P2J appeared to be an identical copy of P2P (receipt of PT within last 7 days).

ADLCAP

- The client has rehabilitation potential if he or she:
  - Needs supervision or greater assistance in at least 2 activities of daily living, AND
  - Has the ability to understand others, AND
  - Any of the following are present:
    - Care needs have increased in past 90 days, OR
    - ADL status has declined in past 90 day, OR
    - Health condition unstable, OR
    - Flare-up of recurrent or chronic problem, OR
    - Treatment change in last 30 days because of a new acute episode or condition, OR
    - Client OR Caregiver believes client is capable of increased functional independence, OR
    - Good prospects of recovery.