IRF vs. Subacute Rehab after Stroke

Joel Stein, MD

Department of Rehabilitation Medicine
Columbia University College of Physicians and Surgeons
Weill Cornell Medical College
NewYork-Presbyterian Hospital
Disclosures

- None specifically related to this presentation
- Research support from Nexstim, Tibion, Myomo, Tyromotion
- Member of Scientific Advisory Board - Myomo, Inc. (uncompensated)
Levels of Rehabilitation

- Inpatient Rehabilitation Facility (IRF, Acute Rehab)
- Skilled Nursing Facility (SNF, Subacute Rehab)
- Long Term Acute Care Hospital (LTACH)
- Home Care Services
- Outpatient
ARS Q#1: Case #1

* 68 year old man, working full-time as an attorney, lives with wife in a ranch style single-family home

* Left internal capsule stroke with right hemiparesis arm>leg. Needs moderate assistance with ADL’s and moderate assistance to walk a few steps.

* Cognition, language, swallowing intact.

* PMH: HTN, Type II Diabetes, Coronary Artery Disease, s/p cardiac stents x 2.
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ARS Q#2: Case #2

* Same medical history as Case #1, but able to walk 25 feet with minimal assistance from therapist, and needs minimal to moderate assistance with dressing and bathing.
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IRF vs. SNF: Why it matters

- IRF care is more expensive
- IRF care may result in better outcomes
- Considerable variation in utilization of these services exists
- CMS, private payors, and now ACO’s will continue to seek to minimize the costs of post-acute stroke care
- Stroke patients represent the single largest group of patients in IRF’s – 20% of total
- No clear standards exist to help clinicians determine who would benefit from which type of care
- Where would you want your family member to receive stroke rehabilitation?
Medicare FFS spending on post-acute care

http://www.medpac.gov/document_TOC.cfm?id=617
### State Variation in Stroke Discharge Destination (2002-2004)

#### Top 10 IRF users (FFS Medicare)

<table>
<thead>
<tr>
<th>State</th>
<th>Discharge to IRF</th>
<th>Rank</th>
<th>Discharge to SNF</th>
<th>Rank</th>
<th>Any Inpatient</th>
<th>IRF as a % of Inpatient</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nevada</td>
<td>30%</td>
<td>(1)</td>
<td>15%</td>
<td>(50)</td>
<td>50%</td>
<td>59%</td>
<td>(1)</td>
</tr>
<tr>
<td>Arkansas</td>
<td>28%</td>
<td>(2)</td>
<td>20%</td>
<td>(47)</td>
<td>49%</td>
<td>57%</td>
<td>(2)</td>
</tr>
<tr>
<td>Louisiana</td>
<td>27%</td>
<td>(3)</td>
<td>14%</td>
<td>(51)</td>
<td>52%</td>
<td>53%</td>
<td>(5)</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>26%</td>
<td>(4)</td>
<td>19%</td>
<td>(48)</td>
<td>49%</td>
<td>53%</td>
<td>(3)</td>
</tr>
<tr>
<td>Arizona</td>
<td>24%</td>
<td>(5)</td>
<td>21%</td>
<td>(44)</td>
<td>46%</td>
<td>53%</td>
<td>(4)</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>23%</td>
<td>(6)</td>
<td>30%</td>
<td>(21)</td>
<td>54%</td>
<td>43%</td>
<td>(14)</td>
</tr>
<tr>
<td>North Dakota</td>
<td>23%</td>
<td>(7)</td>
<td>27%</td>
<td>(34)</td>
<td>50%</td>
<td>45%</td>
<td>(10)</td>
</tr>
<tr>
<td>Kansas</td>
<td>23%</td>
<td>(8)</td>
<td>21%</td>
<td>(43)</td>
<td>45%</td>
<td>50%</td>
<td>(6)</td>
</tr>
<tr>
<td>Texas</td>
<td>22%</td>
<td>(9)</td>
<td>21%</td>
<td>(46)</td>
<td>49%</td>
<td>46%</td>
<td>(8)</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>22%</td>
<td>(10)</td>
<td>27%</td>
<td>(33)</td>
<td>50%</td>
<td>45%</td>
<td>(11)</td>
</tr>
</tbody>
</table>


Bottom 10 IRF users (FFS Medicare)

<table>
<thead>
<tr>
<th>State</th>
<th>Discharge to IRF</th>
<th>Rank</th>
<th>Discharge to SNF</th>
<th>Rank</th>
<th>Any Inpatient</th>
<th>IRF as a % of Inpatient</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virginia</td>
<td>15%</td>
<td>(42)</td>
<td>30%</td>
<td>(20)</td>
<td>45%</td>
<td>33%</td>
<td>(38)</td>
</tr>
<tr>
<td>Minnesota</td>
<td>14%</td>
<td>(43)</td>
<td>35%</td>
<td>(4)</td>
<td>50%</td>
<td>28%</td>
<td>(47)</td>
</tr>
<tr>
<td>Florida</td>
<td>14%</td>
<td>(44)</td>
<td>33%</td>
<td>(10)</td>
<td>48%</td>
<td>30%</td>
<td>(46)</td>
</tr>
<tr>
<td>Alabama</td>
<td>14%</td>
<td>(45)</td>
<td>28%</td>
<td>(30)</td>
<td>43%</td>
<td>32%</td>
<td>(41)</td>
</tr>
<tr>
<td>Nebraska</td>
<td>13%</td>
<td>(46)</td>
<td>29%</td>
<td>(23)</td>
<td>47%</td>
<td>28%</td>
<td>(48)</td>
</tr>
<tr>
<td>Vermont</td>
<td>13%</td>
<td>(47)</td>
<td>30%</td>
<td>(19)</td>
<td>43%</td>
<td>30%</td>
<td>(45)</td>
</tr>
<tr>
<td>Iowa</td>
<td>13%</td>
<td>(48)</td>
<td>29%</td>
<td>(22)</td>
<td>42%</td>
<td>30%</td>
<td>(44)</td>
</tr>
<tr>
<td>Connecticut</td>
<td>12%</td>
<td>(49)</td>
<td>40%</td>
<td>(1)</td>
<td>56%</td>
<td>22%</td>
<td>(50)</td>
</tr>
<tr>
<td>Oregon</td>
<td>11%</td>
<td>(50)</td>
<td>33%</td>
<td>(8)</td>
<td>45%</td>
<td>25%</td>
<td>(49)</td>
</tr>
<tr>
<td>Maryland</td>
<td>4%</td>
<td>(51)</td>
<td>35%</td>
<td>(3)</td>
<td>39%</td>
<td>10%</td>
<td>(51)</td>
</tr>
</tbody>
</table>

86 year old woman, widowed, lives alone in an apartment in an elevator building. Was active prior to stroke as volunteer in hospital. No children and with limited financial resources.

Left MCA stroke with right hemiplegia, severe expressive aphasia but with relative sparing of comprehension, dysphagia with g-tube in place. Dependent for ADL's, max assist for transfers.

Newly diagnosed atrial fibrillation, rate well controlled, on Coumadin for secondary stroke prevention.
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How much is Postacute Care Use Affected by its Availability?

* Nationwide retrospective study of all Medicare patients with stroke, hip fracture or LE Joint replacements in 1999

* Limited to administrative data set

* Clinical factors were important in whether IRF/SNF were utilized, but the selection of IRF vs. SNF was most strongly influenced by geographical proximity – both distance to nearest facility, and number of facilities in the area

IRF vs. SNF care by Age (1999 Medicare FFS Data)

Rehab by Age Group

Screening for possible admission to a rehabilitation program should be performed as soon as the patient’s neurological and medical condition permits.

The individual(s) performing the screening examination should be experienced in stroke rehabilitation and preferably should have no direct financial interest in the referral decision.

Level of Evidence: Expert Opinion – Strong Concensus

SNF vs. IRF: Kramer Study

- Examined both Stroke (n=485) and hip fracture (n=518) outcomes for Medicare patients, SNF vs. IRF from 1991-4

- Outcomes adjusted for premorbid residence and residence, caregiver availability, comorbidities, admission ADL ability, mobility, depression and cognition.

- Stroke patients (but not Hip fx) were more likely to return to the community after IRF care (Unadjusted 75% vs. 51%*; Adjusted OR 1.3). Better ADL outcomes as well.

* Percentages omit patients admitted to “Traditional SNF”, and include only “Subacute SNF”

Medicare HMO vs. FFS for stroke survivors

- 429 stroke patients receiving rehab 1993-1995
- Compared outcomes for Medicare HMO vs. FFS
- HMO patients less likely to be admitted to IRF (13% vs. 85%) and had fewer therapy and MD specialist visits, but more Home Health visits
- At 1 year, no difference in ADL ability, but FFS more likely to reside in the community (OR 1.8), and HMO patients more likely to reside in nursing homes (OR 2.4)
- No difference in mortality

UDS Study - Deutsch 2006

- Linked Medicare claims and UDS data for 58,724 stroke patients who received care in 1996-7

- Most patients showed greater functional improvement and likelihood of returning home with IRF compared with SNF

- Exceptions were pts. with minimal motor disabilities, and patients with a combination of mild motor disabilities and significant cognitive disabilities.

- Costs were higher in IRF, but did not include the entire episode of care.

Deutsch - limitations

- Few SNF’s participate in UDS – only 3800 SNF patients vs. 54,900 IRF patients
- Were these SNF’s representative, or perhaps more committed to Rehab than most?
- Does not examine all factors that might have influenced decision re: patient’s rehab destination
- Pre-Medicare PPS implementation
Kaiser Study

- Retrospective study from Kaiser system in Northern California
- Approx. 16,500 ischemic stroke patients who received post-acute care between 1996-2004
- 11% had IRF care, 40% SNF, 19%HH, 30% OPD
- Better survival among IRF patients than SNF (Adjusted OR 0.33-0.42)
- Limitations: No measure of stroke severity, limited clinical data from administrative data set

Survival Curves by highest level of PAC

Response to Kaiser Study:

“Finis Origine Pendet*”

(The end depends on the beginning.)

Black-Schaffer RM. Finis origine pendet: commentary on "Postacute care and ischemic stroke mortality: findings from an integrated health care system in northern California". PM & R. 3:695-6, 2011

*Attributed to the Roman Poet, Manlius. Appears on the Seal of Phillips Exeter Academy
European Stroke Unit Studies

- European “Stroke Units” found to reduce morbidity and mortality
  

- Care organized differently in Europe – combining acute stroke hospital care with rehabilitative care in a single unit

- Stroke Units improve mortality through prevention of complications (esp. those due to immobility).
  

- Some US data show Primary Stroke Centers have lower mortality
  
Post Acute Care Payment Reform Demonstration (PAC-PRD)

- Established by provision in the Deficit Reduction Act of 2005
- Demonstration program to develop and test a common standardized patient assessment instrument for use across all post-acute settings
- Would replace the IRF-PAI, MDS, and OASIS systems used in IRFs, SNF’s, and Home Care
- Long-term goal would be to have a common measurement and reimbursement system for all post-acute settings
- Research Triangle Institute contracted to develop the CARE tool
All diagnoses combined – not specific to stroke. Findings for “Neuro diagnoses” were similar to group overall

IRF patients improve more in Self Care/ADL’s (15.5 points on 100 point scale) than SNF patients (12.4 points)

Multivariate model controlled only for baseline characteristics at admission only controlled 21% of the variance in self-care change.

Adding rehab setting indicators only improved model by 2% (although statistically significant)

No difference seen for mobility between IRF and SNF

No difference seen for readmission rates (after controlling for baseline acuity)

Dobson DaVanzo study

- Commissioned by AMRPA, report issued 2014
- Published only as report, not yet peer-reviewed
- Medicare FFS sample 2005-9
- Includes broad range of diagnoses, not only stroke
- 100,000 pairs of IRF and SNF patients, matched by age, gender, comorbidities, prior health utilization, MS-DRG and ICD-9
- Two year follow-up

http://bit.ly/1oJS7dZ
**Dobson DaVanzo Findings**

- Stroke patients initial LOS is 16.5 days shorter with IRF care vs. SNF
- IRF stroke patients spend an additional 92 days at home over the two year follow-up period
- Mortality 14% less for IRF than SNF; increase in life expectancy 3 months
- IRF patients with 4% reduction in ED visits and 10% reduction in all-cause readmission c/w SNF
Chan AM-PAC Study

- Kaiser system – 222 stroke patients 2008-10
- Baseline and 6-month follow-up Activity Measure for Post Acute Care (AM-PAC)
- 30% IRF and 13% SNF Discharges
- After controlling for relevant variables, IRF showed improved outcomes (8 pts on AM-PAC)

Chan L. Arch PM&R  94(4):622-9, 2013
ARS Q#4: Case #4

- 45 year old woman, accountant, married with 3 school age children at home

- Brainstem hemorrhage from AVM with severe dysphagia, requiring g-tube, tracheostomy tube (now capped), severe dysarthria, hemiplegic on the left, and hemiparetic on the right side. Dependent for ADL’s and transfers. Alert and cognitively intact.
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Use of a Standardized Assessment to Predict Rehabilitation Care after Acute Stroke


- 630 acute stroke patients in NECC region
- Collected Barthel Index and other variables to supplement GWTG-Stroke data
- What should “Assessing Rehabilitation Needs” consist of?
- How predictive are clinical factors in determining discharge disposition?
Discharge Destination by Barthel Index
ARS Q#5: Case #5

- 83 year old man with prior stroke, lives alone, homebound prior to admission, with 24 x 7 home health aide, poor short-term memory prior to stroke

- Large Left MCA infarct with global aphasia, dysphagia requiring g-tube, and right hemiplegia. Dependent for ADL’s and transfers.
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NECC Stroke Discharge Planner Survey

- 71 Respondents
- Northeast region
Rehab Affiliations

Does your hospital have any affiliated rehabilitation units (check all that apply)

- IRF unit within acute care hospital: 40.0%
- Free-standing affiliated Rehabilitation hospital: 20.0%
- SNF/Subacute unit within acute care hospital: 10.0%
- Free-standing affiliated SNF/Subacute facility: 50.0%
Please rank typical level of influence on D/C planning in your hospital from 1-10.  1=lowest 10=highest

<table>
<thead>
<tr>
<th>Role</th>
<th>Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Manager/Social Worker/Discharge Planner</td>
<td>8.82</td>
</tr>
<tr>
<td>Patient/family</td>
<td>8.63</td>
</tr>
<tr>
<td>Physical Therapist</td>
<td>8.36</td>
</tr>
<tr>
<td>Occupational Therapist</td>
<td>7.93</td>
</tr>
<tr>
<td>Speech/Language Therapist</td>
<td>7.74</td>
</tr>
<tr>
<td>Hospitalist/Internist</td>
<td>6.93</td>
</tr>
<tr>
<td>Neurologist</td>
<td>6.68</td>
</tr>
<tr>
<td>Nurse</td>
<td>6.03</td>
</tr>
<tr>
<td>Physiatrist (Rehab Physician)</td>
<td>6.01</td>
</tr>
<tr>
<td>Other Physician</td>
<td>5.52</td>
</tr>
<tr>
<td>Neurosurgeon</td>
<td>5.42</td>
</tr>
</tbody>
</table>

Patient/Family, Discharge Planner, and PT were rated as more influential than MD’s (all combined): p<0.001
Multiple factors influence the selection of a specific post acute care facility. One a scale from 1 to 10, please rank the importance of each factor 1=lowest 10=highest

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of post-acute facility</td>
<td>8.96</td>
</tr>
<tr>
<td>Insurance</td>
<td>8.89</td>
</tr>
<tr>
<td>Prognosis for functional improvement</td>
<td>8.72</td>
</tr>
<tr>
<td>Stroke severity</td>
<td>8.60</td>
</tr>
<tr>
<td>Likelihood of ultimate return to the community</td>
<td>8.33</td>
</tr>
<tr>
<td>Location of post-acute facility</td>
<td>8.25</td>
</tr>
<tr>
<td>Patient motivation</td>
<td>8.22</td>
</tr>
<tr>
<td>Cognitive/Communication impairments</td>
<td>8.19</td>
</tr>
<tr>
<td>Pre-stroke functional status</td>
<td>8.19</td>
</tr>
<tr>
<td>Medical comorbidities/complexity</td>
<td>8.14</td>
</tr>
<tr>
<td>Mobility (e.g. ability to walk, transfer)</td>
<td>8.13</td>
</tr>
<tr>
<td>Ability to perform ADL’s</td>
<td>8.03</td>
</tr>
<tr>
<td>Patient age</td>
<td>7.97</td>
</tr>
<tr>
<td>Affiliation of post-acute facility with my hospital/health system</td>
<td>6.38</td>
</tr>
<tr>
<td>Immigration Status (i.e. illegal immigrant)</td>
<td>5.42</td>
</tr>
<tr>
<td></td>
<td>5.15</td>
</tr>
</tbody>
</table>
What is most important barrier you face in the referral process for stroke patients what you believe is the most APPROPRIATE LEVEL of post acute care?

- Insurance or lack thereof (n=41)
- Bed availability (n=5)
What is the most important barrier you face in the referral process to what you believe is the most APPROPRIATE SPECIFIC FACILITY for post acute care?

- Insurance or lack thereof (n=23)
- Bed availability (n=15)
- Location (n=7)
There is frequently pressure to discharge stroke patients to the next level of care. How frequently does the speed with which you are able to discharge a stroke patient impact his or her final destination?
For patients and their families, what is the number one driver in discharging patients to a post acute care provider?

- Available bed
- Location (proximity to patient and or family)
- Physician recommendation
- Case Manager recommendation
- Patient/family preference
- Reputation
- Other-Please specify what other represents
NECC Study of Factors Influencing Discharge Destination

- Examine patient-specific decision making for level of care
- Where was this patient discharged? Why?
- What non-clinical factors influenced this decision?
The definitive answer: A Randomized Trial of IRF vs. SNF

- Most definitive answer to this question
- Randomize stroke patients (perhaps within a certain range of disability) to either SNF or IRF
- Ethical concerns
- Expensive
- Unclear who would fund
- Difficult to convince patients/families/clinicians
Conclusions

• The available observational data suggests that stroke patients have better outcomes when cared for in IRF’s than SNF’s

• Medicare and the private insurers aren’t convinced, however

• Observational studies are inherently limited in their ability to determine which is best, and who should go where

• Non-clinical factors seem to play an important role in determining where patients get their rehab