Utilizing a national benchmarking database for rehabilitation services to explore injury rehabilitation in Australia

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Outline

1. Australian Health Care system
2. Rehabilitation following injury
3. Rehabilitation outcomes
   - Australasian Rehabilitation Outcomes Centre
4. Rehabilitation funding
   - Sub-acute and Non-acute Patient Classification system
5. Injury Rehabilitation data
1. Australian Health Care System
The Australian Health Care System - in a nutshell

- Universal coverage (Medicare)
  - Medical provision
  - Hospital provision
  - Some allied health
  - Subsidized pharmaceuticals

- Universal coverage includes rehabilitation

- Separate State based schemes for support following catastrophic motor vehicle injury

- Mix of public and private provision (and private health insurance)
2. Rehabilitation following injury
What is rehabilitation following injury?

- Rehabilitation is about providing people with loss of function or ability due to injury with the highest level of independence possible. Dimensions include:
  - Physical
  - Psychological
  - Social
  - Economic
- It is achieved through a combined and coordinated use of medical, nursing and allied health services, and assistive devices when needed.
- It involves individual assessment, treatment, regular review, discharge planning, community reintegration and follow-up.
Principles of rehabilitation following injury

- Rehabilitation should start early.
  - Often while the person is in acute care

- Prevent secondary complications
  - Pressure areas
  - Contractures
  - Venous thromboembolic events
  - Disuse and atrophy
  - Deconditioning
  - Depression
  - Dependence

- Multidisciplinary
- Sufficient intensity
- Goal orientated
3. Rehabilitation outcomes
Australasian Rehabilitation Outcomes Centre - AROC

- Established 2002
- Objective is to collect standardized data for every rehabilitation episode of care in Australia (and New Zealand)
- Purpose is for National Benchmarking of outcomes
- Multiple stakeholders
  - Public and private providers
  - Government
  - Insurers
  - Professional bodies
- Over 90% of inpatient facilities currently submit data
- Biannual reports to member facilities
AROC Annual Reports


- The AROC Annual Report: the state of rehabilitation in Australia 2006. Frances Simmonds; Tara Stevermuer. *Australian Health Review*; To be published soon!!
AROC dataset includes:

- Demographics
- Impairment
- Functional Independence Measure (FIM)
  - Admission
  - Discharge
  - Change
  - Efficiency (change/Length of stay)
- Length of stay
- Date of acute onset
- Co-morbidities, complications, interruptions
- Discharge destination
- Impairments due to trauma (from 2007)
- Now 50,000 episodes per year
18 items (7 point ordinal scale)
- 13 motor
- 5 cognitive

- Individual’s ability to carry out an activity independently, versus the need for assistance from another person or device.

- Score reflects actual, observed, performance.

- Must be collected within 72 hours of rehabilitation admission and within 72 hours before discharge.
# Functional Independence Measure (FIM) items

<table>
<thead>
<tr>
<th>MOTOR</th>
<th>COGNITIVE</th>
<th>SCORING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating</td>
<td>Comprehension</td>
<td>FIM SCORES</td>
</tr>
<tr>
<td>Grooming</td>
<td>Expression</td>
<td>No Helper</td>
</tr>
<tr>
<td>Bathing</td>
<td>Social Interaction</td>
<td>7 = Complete Independence</td>
</tr>
<tr>
<td>Dressing Upper Body</td>
<td>Problem Solving</td>
<td>6 = Modified Independence</td>
</tr>
<tr>
<td>Dressing Lower Body</td>
<td>Memory</td>
<td>Helper</td>
</tr>
<tr>
<td>Toileting</td>
<td></td>
<td>5 = Supervision or set up</td>
</tr>
<tr>
<td>Bladder Management</td>
<td></td>
<td>4 = Minimal Assistance</td>
</tr>
<tr>
<td>Bowel Management</td>
<td></td>
<td>3 = Moderate assistance</td>
</tr>
<tr>
<td>Transfers- Bed/Chair/Wheelchair</td>
<td></td>
<td>2 = Maximal Assistance</td>
</tr>
<tr>
<td>Transfer –Toilet</td>
<td></td>
<td>1 = Total Assistance</td>
</tr>
<tr>
<td>Transfers– Bath/shower</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walk/Wheelchair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stairs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
AROC link

AROC is based at University of Wollongong

CHSD

http://chsd.uow.edu.au
Injury-specific impairments in the 2002 – 2006 AROC dataset

- Traumatic brain injury
  - Open, closed, other
- Traumatic spinal cord dysfunction
  - Paraplegia (incomplete, complete)
  - Quadriplegia C1-4 (incomplete, complete)
  - Quadriplegia C5-8 (incomplete, complete)
- Fracture
  - Hip (unilateral, bilateral)
  - Femur
  - Pelvis
- Burns
- Major multiple trauma
  - Brain + Spinal cord injury
  - Brain + Multiple Fracture/Amputation
  - Spinal cord + Multiple Fracture/Amputation
AROC dataset from July 2007

- More information on trauma / injury
  - Specific question about trauma as the cause of impairment
  - Enhanced detail in fracture impairments
Trauma to be included in the AROC dataset from July 2007
Fracture (includes dislocation, excludes neurological involvement)

- 8.111 Fracture of hip, unilateral (includes #NOF)
- 8.112 Fracture of hip, bilateral (includes #NOF)
- 8.12 Fracture of shaft of femur (excludes femur involving knee joint)
- 8.13 Fracture of pelvis
- 8.141 Fracture of knee (includes patella, femur involving knee joint, tibia or fibula involving knee joint)
- 8.142 Fracture of lower leg, ankle, foot
- 8.15 Fracture of upper limb (includes hand, fingers, wrist, forearm, arm, shoulder)
- 8.16 Fracture of spine (excludes where the major disorder is pain)
- 8.17 Fracture of multiple sites (multiple bones of same lower limb, both lower limbs, lower with upper limb, lower limb with rib or sternum. Excludes with brain injury or with spinal cord injury)
- 8.19 Other orthopaedic fracture (includes jaw, face, rib, orbit or sites not elsewhere classified)
4. Rehabilitation funding
**AN-SNAP classification system**

- **Australian Sub-acute and Non-acute Patient casemix classification system.**
  - Version 1 developed in 1996
  - Diagnosis is not the major determinant of cost in rehabilitation
  - Diagnosis Related Groups in the acute setting

- Five case types
  - Rehabilitation
  - Palliative Care
  - Psychogeriatric
  - Geriatric evaluation and management
  - Maintenance

- Rehabilitation classes are based on impairment, function and +/- age
  - Not based on aetiology of impairment such as injury
AN-SNAP funding model

- Blended payment model
  - Episode payment
  - Per diem amount
  - Rules around short stay and long stay outliers

- Also based on cost weights

- Version 1 had 32 inpatient Rehabilitation Classes

- Version 2 released in 2007
Examples of AN-SNAP classes and cost weights

<table>
<thead>
<tr>
<th>AN-SNAP CLASS</th>
<th>COST WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2-202 Brain, Neuro, Spine &amp; MMT, FIM 13</td>
<td>6.6706</td>
</tr>
<tr>
<td>* S2-227 Orthopaed Conds, Fractures, Mot 58-91</td>
<td>0.9326</td>
</tr>
<tr>
<td>* S2-228 Orthopaed Conds, Fractures, Mot 48-57</td>
<td>1.4265</td>
</tr>
<tr>
<td>* S2-229 Orthopaed Conds, Fractures, Mot 14-47, Cog 19-35</td>
<td>1.7703</td>
</tr>
<tr>
<td>* S2-230 Orthopaed Conds, Fractures, Mot 14-47, Cog 5-18</td>
<td>1.3765</td>
</tr>
<tr>
<td>* S2-238 Major Multiple Trauma, FIMtotal 101-126</td>
<td>0.91</td>
</tr>
<tr>
<td>* S2-239 Major Multiple Trauma, FIMtotal 74-100</td>
<td>1.3959</td>
</tr>
<tr>
<td>* S2-240 Major Multiple Trauma, FIMtotal 44-73</td>
<td>1.7396</td>
</tr>
<tr>
<td>* S2-241 Major Multiple Trauma, FIMtotal 19-43</td>
<td>5.761</td>
</tr>
</tbody>
</table>
How is the data collected?

- One database to collect AROC and SNAP data
- Many data elements identical
- Collected at each facility and uploaded (in NSW)
5. Injury rehabilitation data
AROC 2006 data

- Total episodes reported 48836
- **Injury represented a minimum of 6695 episodes (13.7%)**
- Limitations of the data system precluded the identification of injury as the cause of the impairment for:
  - Amputation
  - Pain syndromes
  - Orthopaedic - joint replacements
  - Orthopaedic - other
  - Debility
- New item will remedy this problem from 2007
- **Injury probably represents 15 – 20% plus of inpatient Australian rehabilitation episodes**
- Database of domiciliary rehabilitation remains in its infancy
## Traumatic paraplegia

<table>
<thead>
<tr>
<th></th>
<th>Incomplete lesion</th>
<th>Complete lesion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>30%</td>
<td>14%</td>
</tr>
<tr>
<td>Male</td>
<td>70%</td>
<td>86%</td>
</tr>
<tr>
<td>Age (mean)</td>
<td>48</td>
<td>36</td>
</tr>
<tr>
<td>Adm FIM (mean)</td>
<td>80</td>
<td>76</td>
</tr>
<tr>
<td>Length of stay</td>
<td>47</td>
<td>65</td>
</tr>
<tr>
<td>FIM improvement</td>
<td>31</td>
<td>21</td>
</tr>
<tr>
<td>FIM Efficiency</td>
<td>0.7</td>
<td>0.3</td>
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</tbody>
</table>
# Traumatic Quadriplegia C1-4

<table>
<thead>
<tr>
<th></th>
<th>Incomplete lesion</th>
<th>Complete lesion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female</strong></td>
<td>8%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>92%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Age (mean)</strong></td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td><strong>Adm FIM (mean)</strong></td>
<td>77</td>
<td>56</td>
</tr>
<tr>
<td><strong>Length of stay</strong></td>
<td>52</td>
<td>59</td>
</tr>
<tr>
<td><strong>FIM improvement</strong></td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td><strong>FIM Efficiency</strong></td>
<td>0.2</td>
<td>0.1</td>
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</table>
## Hip, femur and pelvic fractures

<table>
<thead>
<tr>
<th></th>
<th>Hip, femur, pelvic fractures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>72%</td>
</tr>
<tr>
<td>Male</td>
<td>28%</td>
</tr>
<tr>
<td>Age (mean)</td>
<td>79.5</td>
</tr>
<tr>
<td>Adm FIM (mean)</td>
<td>83</td>
</tr>
<tr>
<td>Length of stay</td>
<td>23</td>
</tr>
<tr>
<td>FIM improvement</td>
<td>18.5</td>
</tr>
<tr>
<td>FIM Efficiency</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Why?

- Uniform rehabilitation data across the country
- Detailed clinical outcomes and complications
- Units can benchmark performance
- Platform for research
- Data linkage possible
- Units own their own data
- Clinical data and costing data

- Time precludes exploring the actual data – see me if interested or consult the publications in Australian Health Review
Thank you