Cognitive Impairment in the Hospital Setting

Professor Len Gray

April 2014
Some key questions…

- How common is cognitive impairment among hospitalised older patients?
- Which cognitive syndromes are associated with cognitive impairment?
- Is there variation among hospital settings and programs?
- What comorbidities are associated with cognitive impairment?
- What are the outcomes for patients with cognitive impairment?
- What is the current quality of care? Is there room for improvement?
Our research studies

- **Emergency Department**
  - Geriatric syndromes in the Emergency Department
    - 13 EDs in 7 nations (n=2282 (273 Australian))

- **Acute Care**
  - Geriatric syndromes among older medical inpatients
    - 3 Brisbane hospitals (n=577)
  - Cognitive syndromes and outcomes among older inpatients
    - 4 Brisbane hospitals (n=493)
  - Development of Quality Indicators for acute medical patients
    - 9 Australian hospitals in 2 states (n=643)

- **Transition Care**
  - Geriatric syndromes and outcomes among Transition Care program patients
    - 6 TCP services in 2 states (n=351)
How did we identify cognitive syndromes?

- **interRAI Assessment Systems**
  - Validated screeners for dementia and delirium
- **Conventional diagnostic screeners**
  - CAM, MMSE, NPI
- **Expert opinion**
  - Clinical experts reviewing data and files
- **Direct assessment by clinical experts**
  - For delirium validation study
interRAI Assessment System

Clinical observations

Clinical tools

Administrative tools

Diagnostic screeners

Risk

Severity

Clinical problems

Problem lists

Clinical profiles

Quality indicators

Casemix

Planning

Centre for Research in Geriatric Medicine
VALIDATION OF THE INTERRAI COGNITIVE PERFORMANCE SCALE AGAINST INDEPENDENT CLINICAL DIAGNOSIS AND THE MINI-MENTAL STATE EXAMINATION IN OLDER HOSPITALIZED PATIENTS

C. TRAVERS¹, G.J. BYRNE², N.A. PACHANA³, K. KLEIN⁴, L. GRAY¹

Reference standard:
Clinician review of all assessment results (all metrics, file review) except interRAI cognitive items

<table>
<thead>
<tr>
<th>Test</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
<th>Agreement (kappa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPS</td>
<td>0.68</td>
<td>0.92</td>
<td>0.7</td>
<td>0.92</td>
<td>0.61</td>
</tr>
<tr>
<td>MMSE</td>
<td>0.75</td>
<td>0.82</td>
<td>0.48</td>
<td>0.93</td>
<td>0.46</td>
</tr>
</tbody>
</table>
SCREENING FOR DELIRIUM WITHIN THE INTERRAI ACUTE CARE ASSESSMENT SYSTEM

S.A. SALIH¹, S. PAUL², K. KLEIN³, P. LAKHAN⁴, L. GRAY¹

Reference standard:
Geriatrician diagnosis guided by DSM IV criteria

- Sensitivity 0.90
- Specificity 0.69
- PPV 0.75
- NPV 0.86
- AUC 0.79
How common is Cognitive Impairment in hospital?
Profiles of Older Patients in the Emergency Department: Findings From the interRAI Multinational Emergency Department Study

Leonard C. Gray, MD, PhD; Nancye M. Peel, PhD; Andrew P. Costa, PhD; Ellen Burkett, MBBS; Aparajit B. Dey, MD; Palmi V. Jonsson, MD; Prabha Lakhan, RN, PhD; Gunnar Ljunggren, MD, PhD; Fredrik Sjostrand, MD, PhD; Walter Swoboda, MD; Nathalie I. H. Wellens, PhD; John Hirdes, PhD

Study objective: We examine functional profiles and presence of geriatric syndromes among older patients attending 13 emergency departments (EDs) in 7 nations.

Methods: This was a prospective observational study of a convenience sample of patients, aged 75 years and older, recruited sequentially and mainly during normal working hours. Clinical observations were drawn from the interRAI Emergency Department Screener, with assessments performed by trained nurses.

Results: A sample of 2,282 patients (range 98 to 549 patients across nations) was recruited. Before becoming unwell, 46% were dependent on others in one or more aspects of personal activities of daily living. This proportion increased to 67% at presentation to the ED. In the ED, 26% exhibited evidence of cognitive impairment, and 49% could not walk without supervision. Recent falls were common (37%). Overall, at least 48% had a geriatric syndrome before becoming unwell, increasing to 78% at presentation to the ED. This pattern was consistent across nations.

Conclusion: Functional problems and geriatric syndromes affect the majority of older patients attending the ED, which may have important implications for clinical protocols and design of EDs. [Ann Emerg Med. 2013;62:467-474.]

Please see page 468 for the Editor’s Capsule Summary of this article.
**Cognitive impairment in the ED**

- Medical file review, 273 patients aged > 75 years at 2 major Brisbane EDs
- 20% evidence of cognitive impairment
- 51% evidence of documentation of cognition
  - Predominantly brief comments alluding to cognitive function
  - 16% formal screening tool for cognition applied
  - NO application of screening tool for delirium

Schnikter L., Martin-Khan M., Burkett E., Beattie E., Gray L. (2011)
Geriatric syndromes: Premorbid & admission

Patients aged > 70 years in 3 Brisbane hospitals (n=557)

- Cognition
- Delirium
- Communication
- Pressure ulcer
- Fall in previous 90 days
- Bladder incontinence
- Bowel incontinence
- Any personal ADL
- Any instrumental ADL

New syndromes developed in hospital

Dementia prevalence: 4 Brisbane hospitals

- 493 patients, aged 70 years and older
- Geriatrician data and file review

**Dementia present:**
- General medicine – 29%
- General surgery – 16%
- Orthopaedic surgery – 15%

Severity of Cognitive Impairment

Older medical patients (n=643)

CPS interpretation
0=normal
2 or greater=probable dementia
6=severe cognitive impairment
Delirium

Research Article
Delirium in Australian Hospitals: A Prospective Study

C. Travers, G. J. Byrne, N. A. Pachana, K. Klein, and L. Gray

1 Queensland Dementia Training Study Centre, Queensland University of Technology, Kelvin Grove, QLD 4059, Australia
2 Centre for Psychiatry & Clinical Neuroscience, The University of Queensland, Royal Brisbane and Women’s Hospital, Herston, QLD 4029, Australia
3 School of Psychology, The University of Queensland, Brisbane, QLD 4072, Australia
4 Queensland Clinical Trials & Biostatistics Centre, School of Population Health, University of Queensland, The Princess Alexandra Hospital, Woolloongabba, QLD 4102, Australia
5 Centre for Research in Geriatric Medicine, The University of Queensland, The Princess Alexandra Hospital, Woolloongabba, QLD 4102, Australia

Correspondence should be addressed to C. Travers; catherine.travers@qut.edu.au

Received 8 April 2013; Accepted 30 July 2013

Academic Editor: Francesc Formiga

Delirium major predictor of mortality (OR 5.19 for admission delirium, 31.07 for subsequent delirium)
Cognitive impairment in TCP

351 cases assessed using the interRAI HomeCare

- Probable dementia: At entry 30%, Pre-morbid 14%
- Symptoms suggestive of delirium: 10%

IMPACT OF POST-ACUTE TRANSITION CARE FOR FRAIL OLDER PEOPLE: A PROSPECTIVE STUDY

N.M. PEEL¹, R.E. HUBBARD¹, L.C. GRAY¹

1. Centre for Research in Geriatric Medicine, The University of Queensland, Brisbane, Queensland 4102, Australia

Corresponding Author: Dr Nancye Peel, Research Fellow, Centre for Research in Geriatric Medicine, Level 2 Building 33, Princess Alexandra Hospital, Ipswich Road, Brisbane, Queensland 4102, Australia, Ph: +61 7 3176 7402, Fax: +61 7 3176 6640, Email: n.peel@uq.edu.au

Abstract: Objectives: To describe the characteristics and outcomes of frail older people in a post-acute transitional care program and to compare the recovery trajectories of patients with high and low care needs to determine who benefits from transition care. Design: Prospective observational cohort. Participants and Setting: 351 patients admitted to community-based transition care in two Australian states during an 11 month recruitment period. Intervention: Transition care provides a package of services including personal care, physiotherapy and occupational therapy, nursing care and case management post discharge from hospital. It is targeted at frail older people who, in the absence of an alternative, would otherwise be eligible for admission to residential aged care. Measurements: A comprehensive geriatric assessment using the interRAI Home Care instrument was conducted at transition care admission and discharge. Primary outcomes included changes in functional ability during transition care, living status at discharge and six months follow-up, and hospital readmissions over the follow-up period. For comparison of outcomes, the cohort was divided into two groups based on risk factors for admission to high or low-level residential aged care. Results: There were no significant differences between groups on outcomes, with over 85% of the cohort living in the community at follow-up. More than 80% of the cohort showed functional improvement or maintenance of independence during transition care, with no significant differences between the groups. Conclusions: Post-acute programs should not be targeted solely at fitter older people; those who are frail also have the potential to gain from community-based rehabilitation.

Key words: Post-acute care, frail aged, community-based rehabilitation.
Severity of Cognitive Impairment TCP

Older medical patients (n=643)

CPS interpretation
0=normal
2 or greater=probable dementia
6=severe cognitive impairment
## Outcomes in TCP

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Cognitively impaired</th>
<th>Cognitively intact</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial hospital stay (days)</td>
<td>30.8</td>
<td>22.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Admission ADL score (mean)</td>
<td>2.6</td>
<td>1.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Community discharge</td>
<td>84.6%</td>
<td>86.4%</td>
<td>NS</td>
</tr>
<tr>
<td>Achieved at least one goal</td>
<td>88%</td>
<td>92.7%</td>
<td>NS</td>
</tr>
<tr>
<td>LOS in TCP</td>
<td>58</td>
<td>50</td>
<td>0.004</td>
</tr>
<tr>
<td>Hospital readmission (6 months)</td>
<td>42.3%</td>
<td>39.3%</td>
<td>NS</td>
</tr>
</tbody>
</table>
Is there Room for Improvement?
Outcomes are worse...
Hospitalised older patients

Percentages of documented assessment of cognitive ability within 48 hours of hospital admission
Delirium: UQFDEL01

Percentages of patients screened for delirium

<table>
<thead>
<tr>
<th>Hospital IDs</th>
<th>Percentages (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
</tr>
<tr>
<td>B</td>
<td>80</td>
</tr>
<tr>
<td>C</td>
<td>30</td>
</tr>
<tr>
<td>D</td>
<td>60</td>
</tr>
<tr>
<td>E</td>
<td>15</td>
</tr>
<tr>
<td>F</td>
<td>60</td>
</tr>
<tr>
<td>G</td>
<td>25</td>
</tr>
<tr>
<td>H</td>
<td>5</td>
</tr>
<tr>
<td>I</td>
<td>35</td>
</tr>
</tbody>
</table>
Can care be improved?

- Delirium incidence can be reduced in some cases with mild – moderate risk in general medicine
  - Inouye et al, NEJM 669-72, 340, 1999
- Delirium incidence can be reduced in cases with fractured hip and cardiac surgery
  - Marcantonio et al, JAGS 516-22, 49, 2001
- Identification of cognitive impairment early may increase the reliability and efficiency of care delivery
- Sensitive care may improve patient and family satisfaction, and reduce stress
Contributors

- CRGM, UQ
  - Melinda Martin-Khan
  - Catherine Travers
  - Nancye Peel
  - Prabha Lakhan
  - Linda Schnikter
  - Ellen Burkett

- University of Queensland
  - Gerard Byrne
  - Nancy Pachana
  - Olivia Wright

- External
  - Rich Jones,
    - Harvard Medical School, Boston, USA
  - John Morris,
    - Hebrew Senior Life, Boston
  - Caroline Brand,
    - Melbourne Health
  - Elizabeth Beattie,
    - QUT
  - John Hirdes,
    - University of Waterloo, Canada
Funding sources

- National Health and Medical Research Council
- The JO and JR Wicking Trust
- Alzheimer's Australia / Viertel Foundation
- Queensland Emergency Medicine Foundation
The CRGM Dementia in Hospitals research program:

Citations


Conclusions

- Cognitive impairment is common among hospitalised older patients
  - 25% in the ED
  - 30% in general medical services
  - 15% in general surgical services
  - 15% in orthopaedic services
  - 30% in TCP
- Delirium occurs in 15% of general medical inpatients
- Outcomes are worse for patients with cognitive impairment
- There may be opportunities for improvement…
Websites...

CRGM  
www.som.uq.edu.au/research/crgm

interRAI Australia  
www.interrai-au.org

RAIplus  
www.raiplus.com

CeGA Online  
www.cegaonline.com