Perioperative Geriatrics

Rob Morris
Pathway Lead Clinician for Older people
Nottingham University Hospitals NHS Trust
Agenda

- The Problem
- POPS
- Making the case for change
- Frailty screening
- SCOPES
  - Lower Limb Joint Replacements
  - Cardiac Surgery
- SCOPES For Sale
The Problem - Population Ageing

More Customers

Figure 1: Estimated and projected age structure of the United Kingdom population, mid-2012 and mid-2037

Source: ONS
The Problem - Population Ageing

More Customers

- UK population is **aging rapidly** - by 2033, almost a quarter of the population will be over 65

- People over 65 are the **core users of acute hospital care** - 60% of admissions, 65% of bed days, 70% of emergency readmissions, over 90% of delayed transfers of care

- People with long-term conditions account for 55% GP appointments, 70% of outpatient and emergency attendances, 77% inpatient days, 90% drug spend in over 75s

- **People over 65 account for 2/3 of acute and elective surgical admissions** and a significant proportion of these are over 80 - often with complex medical needs or frailty and are at higher risk of postoperative complications
Safer Surgery and Anaesthesia
More Customers

Surgical Mortality

- Emergency Surgery
- Over 80 yrs
- Over 70 yrs
- Over 60 yrs

Thomas DR and Ritchie CS. Preoperative Assessment of Older Adults. JAGS 1995; 43:811-821
Elective Hip Replacement Surgery – Projected increases in numbers of procedures

Birrell F et al. Projecting the need for hip replacement over the next three decades: influence of changing demography and threshold for surgery Ann Rheum Dis 1999;58(9):569-72
Older People have poorer outcomes

Major postoperative complications and in-hospital mortality in patients undergoing non-cardiac surgery.

Older People have poorer outcomes

Diminished cardiac/respiratory functional reserve

Fig 2 Kaplan–Meier curve for 90 day survival for AT $\geq 11$ ml kg$^{-1}$ min$^{-1}$ compared with AT $< 11$ ml kg$^{-1}$ min$^{-1}$. Survival at 90 days was significantly greater in patients with an AT of 11 ml kg$^{-1}$ min$^{-1}$ or greater ($P=0.034$).

Older People have poorer outcomes

Co-Morbidities:
- Cardiac
- Respiratory
- Neurological
- Anaemia
- Diabetes
- Poor nutrition

Survival analysis based on number of preoperative comorbidities

**NCEPOD Key recommendations**

- In elderly patients needing urgent surgery careful attention should be given to **improving fluid status**, reducing unnecessary drug treatment and anticipating nutritional support.

- Elderly patients undergoing surgery need access to **routine daily clinical review from specialists in elderly care.**

- **Delays in surgery**, which lead to poor outcome, should be subject to rigorous audit and rectified.

- **Pain and its management** should have a high priority to avoid patient suffering.
Blue Book Six Standards – monitored by NHFD

1. All patients with hip fracture should be admitted to an acute orthopaedic ward within 4 hours of presentation.
2. All patients with hip fracture who are medically fit should have surgery within 48 hours of admission, during normal working hours.
3. All patients with hip fracture should be assessed and cared for with a view to minimising their risk of developing a pressure ulcer.
4. All patients presenting with a fragility fracture should be managed on an orthopaedic ward with routine access to orthogeriatric medical support from the time of admission.
5. All patients presenting with fragility fracture should be assessed to determine their need for antiresorptive therapy to prevent future osteoporotic fractures.
6. All patients presenting with a fragility fracture following a fall should be offered multidisciplinary assessment and intervention to prevent future falls.
### NHFD – Impact on Outcomes

<table>
<thead>
<tr>
<th>NHFD Standard</th>
<th>2010</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orthopaedic ward within four hours</td>
<td>57%</td>
<td>50%</td>
</tr>
<tr>
<td>Surgery within 48 hours</td>
<td>80%</td>
<td>86%</td>
</tr>
<tr>
<td>Pressure ulcers</td>
<td>6%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Orthogeriatrician</td>
<td>31%</td>
<td>47%</td>
</tr>
<tr>
<td>Bone protection</td>
<td>57%</td>
<td>69%</td>
</tr>
<tr>
<td>Falls assessment</td>
<td>60%</td>
<td>94%</td>
</tr>
</tbody>
</table>
There must be a better way!
Comprehensive Geriatric Assessment

Multi professional Interdisciplinary Diagnostic Process

- Environment
- Mental Health
- Functional Capacity
- Medical
- Social Circumstances
Proactive care of older people undergoing surgery (‘POPS’): Designing, embedding, evaluating and funding a comprehensive geriatric assessment service for older elective surgical patients

DANIELLE HARARI, ADRIAN HOPPER, JUGDEEP DHESI, GORDANA BABIC-ILLMAN, LINDA LOCKWOOD, FINBARR MARTIN

Abstract

Background: Older people undergoing elective surgery have significant posts-operative problems prolonging hospitalisation.

Objectives: to design, embed, and evaluate an evidence-based comprehensive geriatric assessment (CGA) service for at-risk older patients undergoing elective surgery.

Setting: urban teaching hospital.

Subjects: 80 elective surgical patients aged 65+.

Intervention: Multidisciplinary prospective CGA service with post-operative follow-up (proactive care of older people undergoing surgery [POPS]).

Methods: Observational cohort study and multilevel surveys (development and modelling phase). Prospective before and after comparator (exploratory evaluation).

Results: Findings from the development phase showed high levels of preoperative co-morbidity, no multidisciplinary preoperative input, and multiple potentially preventable post-operative problems delaying discharge of older elective surgery patients. Comparison of 2 cohorts of elective orthopaedic patients (pre-POPS vs POPS, N = 54) showed the POPS group had fewer post-operative medical complications including pneumonia (20% vs 8% [p = 0.009]), and delirium (13% vs 6% [p = 0.039]), and significant improvements in areas requiring multidisciplinary input including pressure sores (19% vs 4% [p = 0.038]), poor pain control (38% vs 2% [p < 0.001]), delayed mobilisation (28% vs 9% [p = 0.012]), and inappropriate rehydration use (29% vs 7% [p = 0.046]). Length of stay was induced by 6.3 days. There were fewer delayed discharges relating to medical complications (47% vs 13%) or waits for OT assessment or equipment (20% vs 4%).

Conclusion: A proactive evidence-based CGA service for at-risk older elective surgical patients was developed according to MRC framework for complex interventions. Pre/post comparison in elective orthopaedic patients showed improved (within methodological limitations) post-operative outcomes indicative of better clinical effectiveness and efficiency, and contributed to the service obtaining mainstream funding. Informal by the present study, a randomised controlled trial is ongoing.

Keywords: Older, elective surgery, prospective, comprehensive geriatric assessment, elderly

Nottingham University Hospitals

NHS Trust
Proactive care of older people undergoing surgery (‘POPS’)

Developmental Phase
Postal Questionnaire
“At risk” Invited
Marketing
Referral Criteria

Modelling Phase
The POPS Intervention
CGA

Evaluation
“Before” & “After”

Lower limb joint replacement

Average Age 75

2/3 Female
## Proactive care of older people undergoing surgery (‘POPS’)

<table>
<thead>
<tr>
<th>Complication</th>
<th>Pre – POPS no. /54 (%)</th>
<th>After POPS no. /54 (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delirium</td>
<td>10 (18.5)</td>
<td>3 (5.6)</td>
<td>0.036</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>20.4 (11)</td>
<td>2 (3.7)</td>
<td>0.008</td>
</tr>
<tr>
<td>Angina/heart attack</td>
<td>4 (7.4)</td>
<td>2 (3.7)</td>
<td></td>
</tr>
<tr>
<td>Heart rhythm problem</td>
<td>7 (13.0)</td>
<td>4 (7.4)</td>
<td>0.263</td>
</tr>
<tr>
<td>Heart failure</td>
<td>2 (3.7)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Deep vein thrombosis</td>
<td>4 (7.4)</td>
<td>1 (1.9)</td>
<td></td>
</tr>
<tr>
<td>Pulmonary embolism</td>
<td>2 (3.7)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Dehydration</td>
<td>6 (11.1)</td>
<td>4 (7.4)</td>
<td>0.371</td>
</tr>
<tr>
<td>Over hydration</td>
<td>3 (5.6)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>9 (16.7)</td>
<td>4 (7.4)</td>
<td>0.118</td>
</tr>
<tr>
<td>Wound infection</td>
<td>12 (22.2)</td>
<td>2 (3.7)</td>
<td>0.004</td>
</tr>
<tr>
<td>Uncontrolled pain</td>
<td>16 (29.6)</td>
<td>1 (1.9)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Pressure sores</td>
<td>10 (18.5)</td>
<td>2 (3.7)</td>
<td>0.028</td>
</tr>
<tr>
<td>Delayed discharge</td>
<td>38 (70.4)</td>
<td>13 (24.1)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Length of stay (days)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>15.8 ± 13.2</td>
<td>11.5 ± 5.2</td>
<td>0.028</td>
</tr>
</tbody>
</table>
Comprehensive Geriatric Assessment

The Orthopaedic Toolbox

The Geriatrician’s Toolbox

CGA:
Multiprofessional
Multidimensional
Assessment and Tailored Interventions
Follow-up
Making the Case for Change

Length of Stay Distribution 2009/10 Electives: Orthopaedics

Orthopaedics 70 and over
Orthopaedics Under 70
## Making the Case for Change

**City Campus Combined Data (Hips and Knees)**
Feb 2009 – Jan 2010

<table>
<thead>
<tr>
<th>Length of Stay (Days)</th>
<th>Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Over 70</td>
</tr>
<tr>
<td>N</td>
<td>309</td>
</tr>
<tr>
<td>Mean</td>
<td>8.3</td>
</tr>
<tr>
<td>Median</td>
<td>6.0</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>8.5</td>
</tr>
<tr>
<td>Variance</td>
<td>72.82</td>
</tr>
<tr>
<td>Range</td>
<td>105</td>
</tr>
</tbody>
</table>
Screening for Frailty

• Comprehensive Geriatric Assessment (CGA) is effective for selected older people at risk of functional decline

• Effective (Efficient) CGA and preventative geriatrics start with proper case finding

• The “frail” and the “pre-frail” represent an ideal target group for CGA
Pitfalls in targeting frailty

• Targeting is usually by referral

• Frail older people at risk may not be identified in the community

• The existing CGA model is too cumbersome for case finding
  – time consuming and requires special training
The Edmonton “Frail Scale”

THE FRAIL SCALE
EXAMINED BY: __________________________
DATE: __________________________
SCORE: Column B x 1 pt = ________
Column C x 2 pt = ________
Total Score: ________/17

INSTRUCTIONS: For each item please check only one option either in column A, B or C. Give zero points if item is checked in Column A. Give one point if the item is checked in Column B. Give two points if the item is checked in Column C. If there is any doubt about the cognition of the patient, have them complete the Clock Drawing Test initially. Anything less than a pass in this section, would result in inviting the caregiver to come and give input on the rest of the FRAIL SCALE questions.

A. General Health Status
In the past year, how many times have you been admitted to a hospital?
0 1-2 >2
In general, how would you describe your health? (check one)
Excellent, Good, Very Good
Fair
Poor

B. Functional Independence
With how many of the following activities do you require help?
0-1 2-4 5-8
- Meal Preparation
- Shopping
- Transportation
- Telephone
- Housekeeping
- Laundry
- Managing Money
- Taking Medications

C. Social Support
When you need help, can you count on someone who is willing and able to meet your needs?
Always Sometimes Never

D. Medication Use
a) Do you use five or more different prescription medications on a regular basis?
No Yes
b) At times do you forget to take your prescription medications?
No Yes

E. Nutrition
Have you recently lost weight such that your clothing has become looser?
No Yes

F. Mood
Do you often feel sad or depressed?
No Yes

G. Continence
Do you have a problem with losing control of urine when you don’t want to?
No Yes

H. Functional Performance
PLEASE NOTE: SCORE this test item as >20 sec if:
1. The individual is reluctant or unable to complete the test
2. Safe performance of the test requires a safety belt, walking aid or another person

TIMED GET UP AND GO TEST: “I would like you to sit in this chair with your back and arms resting. Then, when I say ‘GO’, please stand up and walk at a safe and comfortable pace to the mark on the floor (approximately 3 meters away), return to the chair and sit down” Record total time. (If omitting this item, check off column C)
TOTAL TIME: ________ seconds
0-10 sec 11-20 sec >20 sec

The interpretation of the clock drawing may require some explanation, but it is really not too difficult. Minor errors (score of 1) are minor number spacing errors. Major errors (score of 2) are any other error such as incorrect hand placement, missing or duplicate numbers, and the placement of number significantly off course - crossing outside of the core circle of the clock, leaving an entire quadrant of the clock without numbers, etc.

Frailty is associated with postoperative complications in older adults with medical problems

Monidipa Dasgupta a, Darryl B. Rolfson b, Paul Stolee c,d, Michael J. Borrie e, Mark Speechley d,f

Archives of Gerontology and Geriatrics 48 (2009) 78–83
# The Edmonton “Frail Scale”

<table>
<thead>
<tr>
<th>DOMAIN</th>
<th>SCREENING ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognition</td>
<td>Clock Test (normal, minor, major)</td>
</tr>
<tr>
<td>Health Status</td>
<td>General Health Question (Good, Fair, Poor)</td>
</tr>
<tr>
<td>Burden of Illness</td>
<td>No. of annual hospitalizations (0,1-2,&gt;2)</td>
</tr>
<tr>
<td>Function Independence</td>
<td>IADL (dependent for &lt;2, &lt;5, 5-8)</td>
</tr>
<tr>
<td>Social Support</td>
<td>“..count on someone to meet your needs?”</td>
</tr>
<tr>
<td>Medications</td>
<td>“..5 or more?”, “at times do you forget?”</td>
</tr>
<tr>
<td>Nutrition</td>
<td>“lost weight...clothing has become loose?”</td>
</tr>
<tr>
<td>Depression</td>
<td>“do you often feel sad or depressed?”</td>
</tr>
<tr>
<td>Continence</td>
<td>“..losing control..when you don’t want to?”</td>
</tr>
<tr>
<td>Functional Performance</td>
<td>Timed Get Up and Go (&lt;10s, 11-20s, &gt;20s)</td>
</tr>
</tbody>
</table>
Testing The EFS - Methods

• EFS collected by nursing and therapy staff
  – prospectively
  – pre-operatively
  – all elective primary hip and knee replacements over 70 years

• Length of stay (LoS) collected from our elective orthopaedic database.

• LoS>5 days used as a proxy measure of post-operative complications
Testing the EFS - Results

• 110 patients were seen.

• Mean EFS score was 4.95 (SD 3.13)

• Mean LoS was 8.38 (SD 6.97).

• Correlation between length of stay and the EFS score was positive (r=0.425; p<0.01)
EFS = 5

EFS ≤ 5
Sensitivity = 0.70
Specificity = 0.79

Diagonal segments are produced by ties.
• Recognised problem to solve
• Real benefits to realise
• Target population identified
• Effective Intervention
• Willing and able CGA Team

No Money
2 CHOICES
It’s going to be fantastic – Magpies hero Craig Short is Notts’ new boss

Secret donor gives £400k to hospitals
Mystery benefactor helps out NHS patients

By Rob Bayliss
What can a jobbing geriatrician buy with £415,000
The SCOPES T & O Team

Geriatrician  |  Nurse  |  Project Manager  |  Occupational Therapist  |  Physiotherapist
SCOPES

Systematic Care for Older People in Elective Surgery
The SCOPES Model

• Single OP Clinic visit – 6-8 weeks pre-op
• OT/Physio/Doctor/Nurse/SW
• Comprehensive Geriatric Assessment
  – Co-morbidities
  – Medications
  – Cognition
  – Functional status
  – Mobility
  – Social supports
• Individualised management plan
# SCOPES – Trauma & Orthopaedics Project

<table>
<thead>
<tr>
<th></th>
<th>2009-2010</th>
<th>Pre-SCOPES 2010-2011 N= 77</th>
<th>SCOPES 2010-2011 N= 47</th>
<th>SCOPES Reduction in LoS (Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Ages</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hip</strong></td>
<td>8.37</td>
<td>9.4</td>
<td>7.3</td>
<td>2.1</td>
</tr>
<tr>
<td><strong>Knee</strong></td>
<td>8.3</td>
<td>9.1</td>
<td>6.8</td>
<td>2.3</td>
</tr>
</tbody>
</table>

*Prior to ERAS & scheduling projects*
SCOPES – Cardiac Surgery Project

Different population

Different Surgeons

Different Culture
## SCOPES – Cardiac Surgery Project

<table>
<thead>
<tr>
<th>Operation</th>
<th>Cohort</th>
<th>n</th>
<th>Length of Stay (Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>CABG</td>
<td>SCOPED</td>
<td>26</td>
<td>5</td>
</tr>
<tr>
<td>CABG</td>
<td>UnSCOPED</td>
<td>37</td>
<td>10</td>
</tr>
<tr>
<td>VALVE</td>
<td>SCOPED</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>VALVE</td>
<td>UnSCOPED</td>
<td>37</td>
<td>13</td>
</tr>
</tbody>
</table>
6 Domains – Defining the Best Teaching Hospitals

Clinical Outcomes

Patient Experience

Staff Experience

Value for Money

Education and Training

Research
Summary

• Growing numbers of elders undergoing surgery
• Vulnerable populations at risk of poor outcomes
• Good geriatric medicine and CGA can improve clinical outcomes and patient experience
• The interventions tested appear to be cost-neutral
• Uncharted territories (as yet):
  
  Acute Surgical Geriatrics
  Cancer Care
Wisdom comes from experience. Experience is often a result of lack of wisdom.