National Hip Fracture Data Base
National Hip Fracture Data Base Spring Meeting
Chester
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Hip Fracture Best Practice: Multidisciplinary Approach (Evidence Based Medicine)

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• Epidemiology
• The Profile of Patients with Hip Fracture
• Preoperative & Postoperative Issues
• The surgeon & Anaesthetist
• Orthogeriatric Ward
• Hip Fracture Nurse
• Multidisciplinary Rehabilitation
• NHFDB
Projected numbers of people aged 60 years and over

Khaw K T. BMJ 1999;319:1350-1352
Estimated numbers of hip fractures in people aged over 60 in UK

Khw K T. BMJ 1999;319:1350-1352
Epidemiology

• By extreme old age
  – 1/3 of all women
  – 1/6 of all men
  will sustain a hip fracture
The Profile of Patients with Hip Fracture

- The mean age is 82 y
  Roche JJ, Wenn RT et al. BMJ 2005; 331(7529) : 1374
- 80% are women
- 90% result from a fall
- 60% have ≥ one major co-morbidity
Hip Fractures

• The median LOS
  – 12 days on a trauma ward
  – + 6 days on a rehabilitation ward

  Roche JJ, Wenn RT et al. BMJ 2005; 331(7529) : 1374

• >20% of all orthopaedic bed occupancy in the UK

= Bad News
Hip fracture results in a 10% - 15% decrease in life expectancy
Following Hip Fracture

• 20% die within a year

• 30% require long-term nursing home care

• 50% lose the ability to live independently

NICE Scope Osteoporosis 2004
80% of older women prefer death to a bad hip fracture that would result in nursing home admission

Salkeld G et al. BMJ 2000
What do patients die from?

• Trauma
• Major surgery
• Concurrent medical problems
• Postoperative complications:
  – Pneumonia (Aspiration & HAP)
  – Thromboembolic disease
  – Coronary events

Bandolier .Outcome after Hip Fracture. 1998; 48(2)
How to improve hip fracture care?

• **Coordinated multi-disciplinary** teams delivering **High quality**:  
  – Preoperative care  
  – Operative care  
  – Postoperative care  
  – Rehabilitation

• **Secondary prevention of fragility fractures**  
  – Osteoporosis risk assessment & treatment  
  – Falls risk assessment

• **Audit & feedback**
The Dudley Group of Hospitals
NHS Foundation Trust
The Dudley Group of Hospitals
NHS Foundation Trust

British Orthopaedic Association

THE CARE OF PATIENTS WITH FRAGILITY FRACTURE

Published by the British Orthopaedic Association September 2007
6 Standards for hip fracture care

- Admission to the ward within 4 hours
- Surgery within 48 hours of admission
- Minimising the risk of pressure ulcers
- Access to acute orthogeriatric medical support
- Assessment for antiresorptive therapy
- Multidisciplinary assessment and intervention to prevent future falls
Preoperative Issues
The mean age of patients sustaining a hip fracture is 82

- Roche JJ, Wenn RT et al. BMJ 2005; 331(7529) : 1374
Ageing = Lack of Physiologic Reserve

• Left ventricular filling declines 50%

• The lung function is about 50%

• Renal function declines by 50%

• Liver weight declines by 1/3

• The brain shrinks by 5 - 10%
Consequences of Lack of the Physiologic Reserve

• At risk of LVF
  – Stress of trauma & surgery
  – Volume overload
• Acute Kidney Injury
  – Dehydration (on admission)
  – NSAIDs
• Metabolism of the medications may be impaired
• Delirium
Co morbid conditions & Polypharmacy

• Most patients have co morbid conditions
  – CCF (10% prevalence after age 80 years)
  – AF (18 % prevalence in people older than 85)
  – COPD
  – CKD
  – CVD
  – PVD
  – Dementia (prevalence among persons aged 85 years and older may approach 50%)
  – PD

• Polypharmacy: > 40 % of people aged ≥ 77 years are exposed to polypharmacy, defined as the use of ≥ 5 drugs (Swedish study)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Disease</th>
<th>Prevalence Rate</th>
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<tbody>
<tr>
<td>1</td>
<td>CAD and Hyperlipidemia</td>
<td>89.9%</td>
</tr>
<tr>
<td>2</td>
<td>Hypertension</td>
<td>63.3%</td>
</tr>
<tr>
<td>3</td>
<td>Cataract</td>
<td>31.1%</td>
</tr>
<tr>
<td>4</td>
<td>Enlarged Prostate</td>
<td>27.8%</td>
</tr>
<tr>
<td>5</td>
<td>Osteoarthritis</td>
<td>26.8%</td>
</tr>
<tr>
<td>6</td>
<td>Diabetes Mellitus, Type 2</td>
<td>26.3%</td>
</tr>
<tr>
<td>7</td>
<td>Arrhythmias</td>
<td>22.2%</td>
</tr>
<tr>
<td>8</td>
<td>Prostate Cancer</td>
<td>20.8%</td>
</tr>
<tr>
<td>9</td>
<td>Skin Cancer</td>
<td>17.1%</td>
</tr>
<tr>
<td>10</td>
<td>COPD</td>
<td>16.1%</td>
</tr>
</tbody>
</table>

CAD = coronary artery disease; COPD = chronic obstructive pulmonary disease
“long lie” Syndrome

- Hypothermia
- Acute (on chronic) renal impairment
- Rhabdomyolysis
- Hypo / hyperglycaemia
- Delirium
Mortality at 30 days & Preoperative Co morbidity

Preoperative Respiratory Disease
Preoperative Renal Disease
Patients with 3 Co morbidities
Venous Thromboembolism (VTE)

- PE is the most common preventable cause of hospital death
Thromboembolic Disease by Age

Annual Incidence per 1000

Age

Arch Intern Med 151[5]:933-938, 1991
High Risk Venous Thromboembolism

• Without prophylaxis the incidence of hospital-acquired DVT is 40 to 60%

Venous Thromboembolism

• 1/4 to 1/3 involve the **proximal deep veins**
  – much more likely to be symptomatic and to result in PE


• **The majority** of symptomatic VTE occur **after** hospital discharge

Duration of Thromboprophylaxis

• Should be extended **beyond 10 days and up to 35 days after surgery**

• Options include:
  – LMWH
  – Or Warfarin

ACCP Evidence-Based Clinical Practice Guidelines (8th Edition)
The Timing of Surgery

To operate or to wait?
The Dudley Group of Hospitals

NHS Foundation Trust

Mild-Moderate Pain  Severe-Very Severe Pain

% of Patients

Day of Hospital Admission

Early Surgery (≤24 h) (n=149)

Late Surgery (>24 h) (n=338)
Odds ratios of death within hospital by operative delay

The Timing of Surgery

• As soon as possible
• Early surgery is associated with reduced pain and decreased length of stay
  

• Surgery within 24 - 48 hours reduces mortality
  
  Bottle A, Aylin P. BMJ 2006; 332:947
Why do juniors delay surgery?

• Medical assessment
• Cardiac murmurs
• Echocardiography
• Chest infection
• Anaemia
• Hyponatraemia & Hypokalaemia
Flow Murmurs

• 25% of older individuals have flow murmurs
  – Minimal functional significance
Major Abnormalities Likely to require correction prior to surgery

- McLaughlin et al. Journal of General Internal Medicine 2006;21(3);219-225
Major Abnormalities Likely to require correction prior to surgery

- Blood Pressure
  - Systolic < 90 mm HG
- Heart Rate and Rhythm
  - AF or SVT > 121
  - VT
  - 3rd degree block
  - HR < 45
- Infection/Pneumonia
  - Temperature < 35 C or > 38.5 C, with clinical diagnosis of pneumonia or infiltrate on CXR
Major Abnormalities Likely to require correction prior to surgery

- Chest Pain
  - New MI on ECG
  - Chest pain with abnormal ECG
- CCF
  - Pulmonary oedema on CXR,
  - CCF on CXR with dyspnea +/- abnormal exam
- Respiratory Failure
  - Pulse oximetry <90%, pO2 < 8 KPa, or pCO2 > 7.3 kPa
Major Abnormalities Likely to require correction prior to surgery

- INR
  - $\geq 1.6$

- Electrolytes
  - Na $< 125$ or $> 155$ mmol/L
  - K $< 2.5$ or $> 6.1$ mmol/L
  - HCO3 $< 18$ or $> 36$ mmol/L

Journal of General Internal Medicine. 2006;21(3);219-225
Major Abnormalities Likely to require correction prior to surgery

- Renal Function
  - Urea > 18 mmol/litre
  - Creatinine > 230 µmol/litre
    without history of ESRD

- Glucose
  - > 33 mmol/litre

- Anaemia
  - Hb < 7.5 gm/dl
Postoperative Issues

• Nutrition
  – Hip fracture patients achieve only 1/2 their recommended daily energy and nutritional requirements

• Pressure sores
  – 1/3 of hip fracture patients will develop pressure sores
    Versluysen M. JBJS (Br) 1985;67:1:10-13
Pressure Ulcers

• Occur in 10 to 40 % of patients


• Use of alternating pressure mattresses reduce the incidence of pressure ulcers

Postoperative Medical Complications

• The most common complications are
  – Chest infection 9 %
  – Acute heart failure 5 %

• Mortality rate of 15 – 20%

Delirium

• Occurs in 15 to 74% of postoperative patients

• The associated hospital mortality rates for delirium are 25 to 33%
  – (= acute MI or sepsis)
Hip Fracture Outcomes:

- Does the Surgeon Really Matter?
Experience of the surgeon & Long term outcome

• Significant difference in long term outcome of cemented hemi replacement based on the surgeon’s experience

Hip Fracture Outcomes: Does Surgeon Really Matter?

• Low-volume surgeons have
  – Higher in-hospital mortality rate (p = 0.005)
  – Higher incidence of transfusion, pneumonia, and decubitus ulcer (p = <0.05)
  – Longer lengths of stay (p = <0.05)

Weekends & Weekdays
Weekends & Weekdays

• Patients are more likely to die in the hospital if they are admitted on a weekend than if they are admitted on a weekday.

Weekends & Weekdays

• Patients admitted on weekends experienced slightly higher risk-adjusted mortality than did patients admitted on weekdays.

Weekends and Holidays

• Patients with a hip fracture had an independently increased risk of early postoperative mortality when admitted during longer holiday periods

Foss NB, Kehlet H. BJA 2006; 96:450-4
Orthogeriatric Ward
Orthogeriatric Ward

• The NSF for Older People states that:

“..at least one general ward in an acute hospital should be developed as a centre of excellence for orthogeriatric practice.”
Six standards for hip fracture care

Standard 4

“All patients presenting with a fragility fracture should be managed on an orthopaedic ward with routine access to acute orthogeriatric medical support from the time of admission”

The Blue Book
Hip Fracture Nurse

Hip Fracture Practioner

• To coordinate and supervise
  – Initial assessment
  – Pre-operative work-up
  – Post-operative care
  – Rehabilitation
  – Discharge planning
  – Secondary prevention
  – Follow-up
Multidisciplinary Rehabilitation
Early Mobilisation

- Early mobilisation of patients after hip fracture repair is **safe**, although the benefits of this approach have not been conclusively demonstrated

Handoll, HH, Parker, MJ, Sherrington, C. Cochrane Database Syst Rev 2003
Physiotherapy

• More frequent physical therapy (at least 2 sessions/d) was associated with better outcomes

Rehabilitation

• Intensive geriatric rehabilitation may reduce length of stay

Multidisciplinary Rehabilitation
Vs Usual Orthopaedic Care

• Multidisciplinary rehabilitation was associated with a modest but important reduction in poor outcome

Dietetic Assistants

• Showed a trend for a reduction in mortality

Avenell A, Handoll HHG. Cochrane Database of Systematic Reviews 2006
Never Forget

Osteoporosis treatment & Falls assessment
Osteoporotic Fractures

• Sustaining a fragility fracture
  – is the strongest predictor of a future osteoporotic fracture
  – at least doubles the risk of future fractures

• The risk of further fracture can be halved by anti-resorptive therapy

• Start treatment; it is never too late
Falls

• 90% of hip fractures in the elderly result from a fall

• Prognosis of Falls
  – 20% die within one year
  – 30% are admitted to 24 h care
• Secondary prevention (bone protection and falls assessment) is of proven value
NHFD: Why?

- Focus attention
- Benchmark care
- A drive for sustained improvements
- Cost effectiveness
In conclusion

• Enthusiastic team
  – Regular orthogeriatrician input
  – Experienced surgeon
  – Senior anaesthetist
  – Hip fracture nurse
  – Multidisciplinary input (PT, OT, Dietation, Discharge coordinator, social service)

• Orthogeriatric Ward (Unit)

• NHFDB
Thank you