

National Hip Fracture Data Base

National Hip Fracture Data Base Spring Meeting
Chester

3 February 2010



Hip Fracture Best Practice: Multidisciplinary Approach (Evidence Based Medicine)

Atef Michael

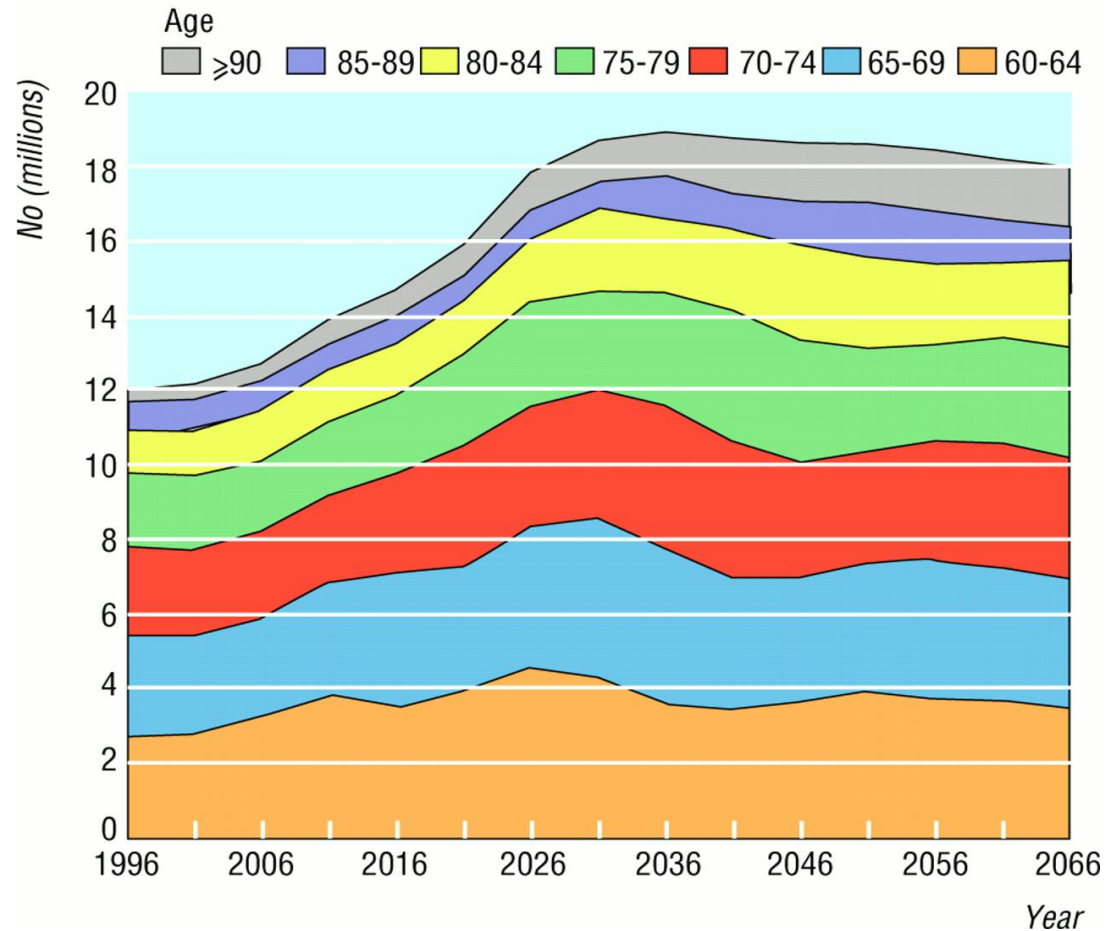
Consultant Orthogeriatrician

Russells Hall Hospital

Honorary Senior Lecturer of Medicine

- Epidemiology
- The Profile of Patients with Hip Fracture
- Preoperative & Postoperative Issues
- The surgeon & Anaesthetist
- Orthogeriatric Ward
- Hip Fracture Nurse
- Multidisciplinary Rehabilitation
- NHFDB

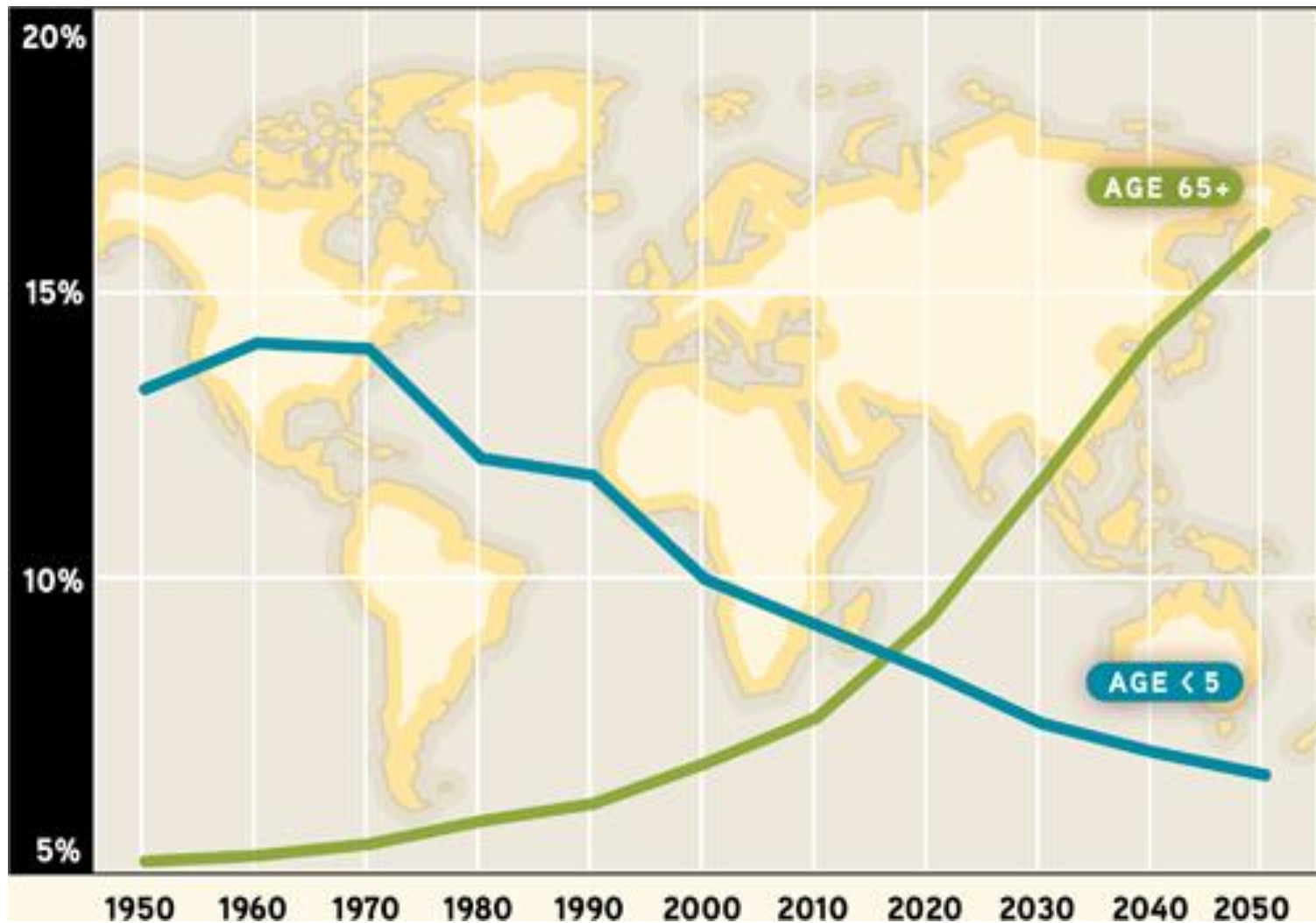
Projected numbers of people aged 60 years and over



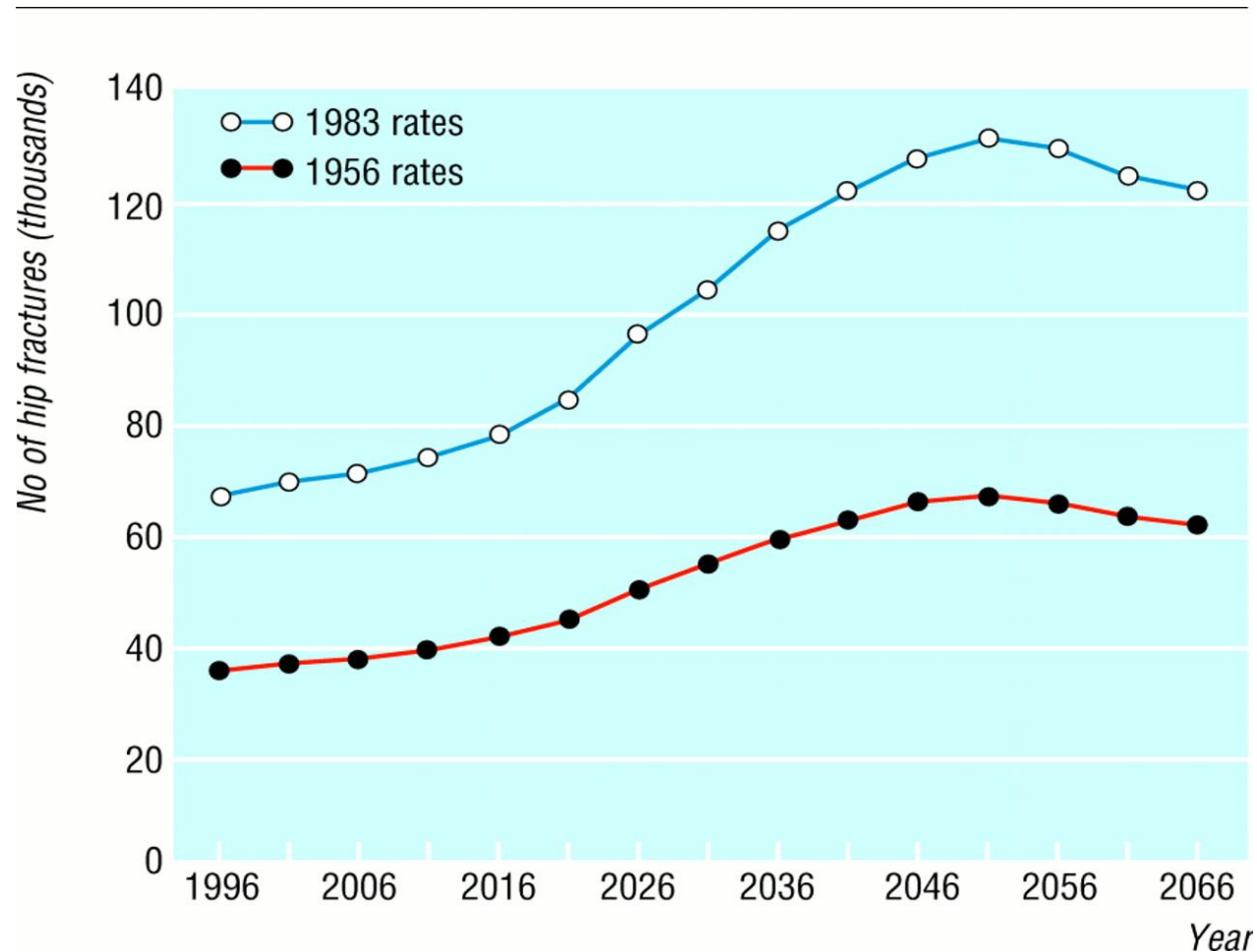
Khaw K T. BMJ 1999;319:1350-1352

The Dudley Group of Hospitals **NHS**

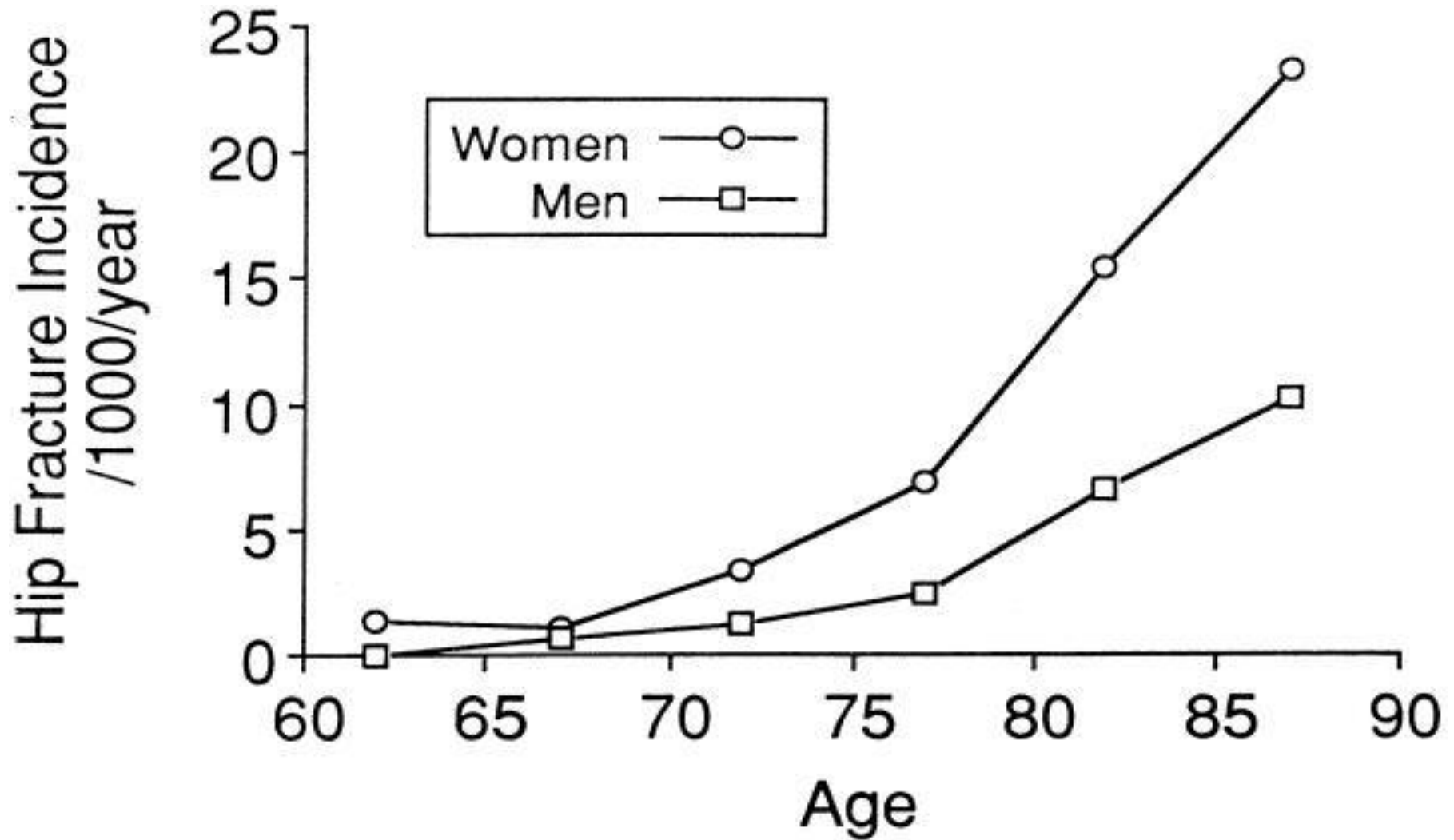
NHS Foundation Trust



Estimated numbers of hip fractures in people aged over 60 in UK



Khaw 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

Baker SP, Harvey AH. Clin Geriat Med 1985;1:501-12

- 60 % have \geq 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

Kanis JA, et al. Osteoporos Int 1997;7:390–406



= 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?

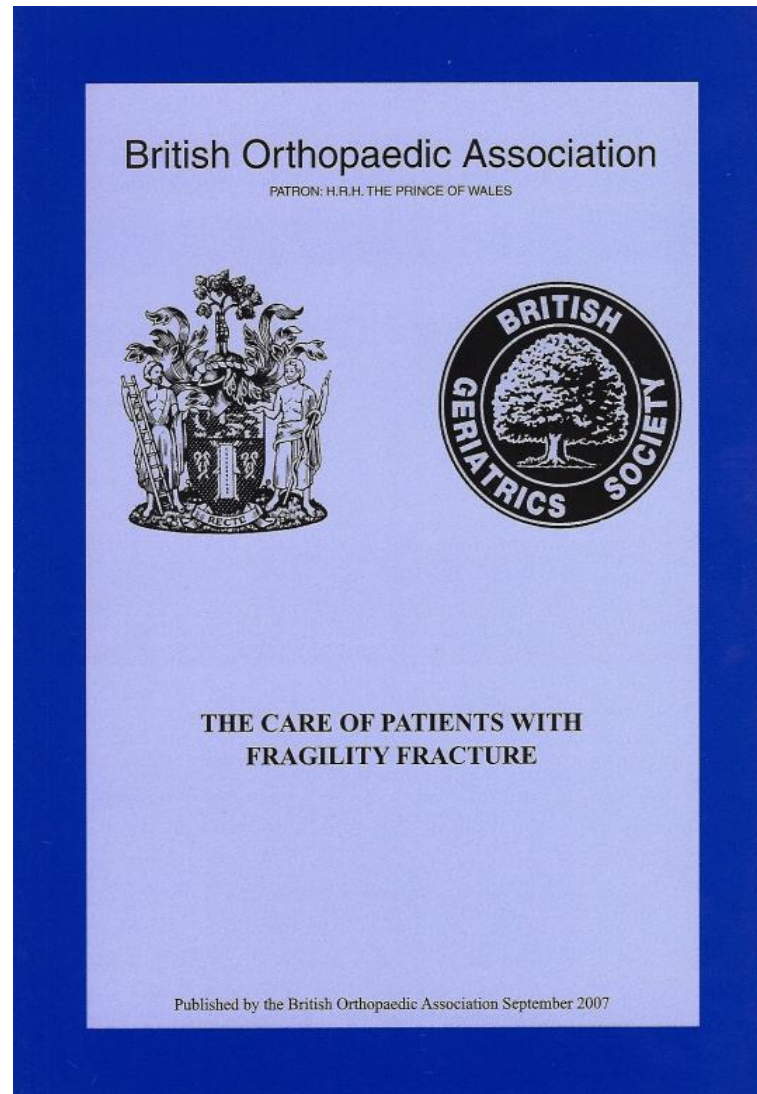
- Trauma
- Major surgery
- Concurrent medical problems
- Postoperative complications:
 - Pneumonia (Aspiration & HAP)
 - Thromboembolic disease
 - Coronary events

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





6 Standards for hip fracture care

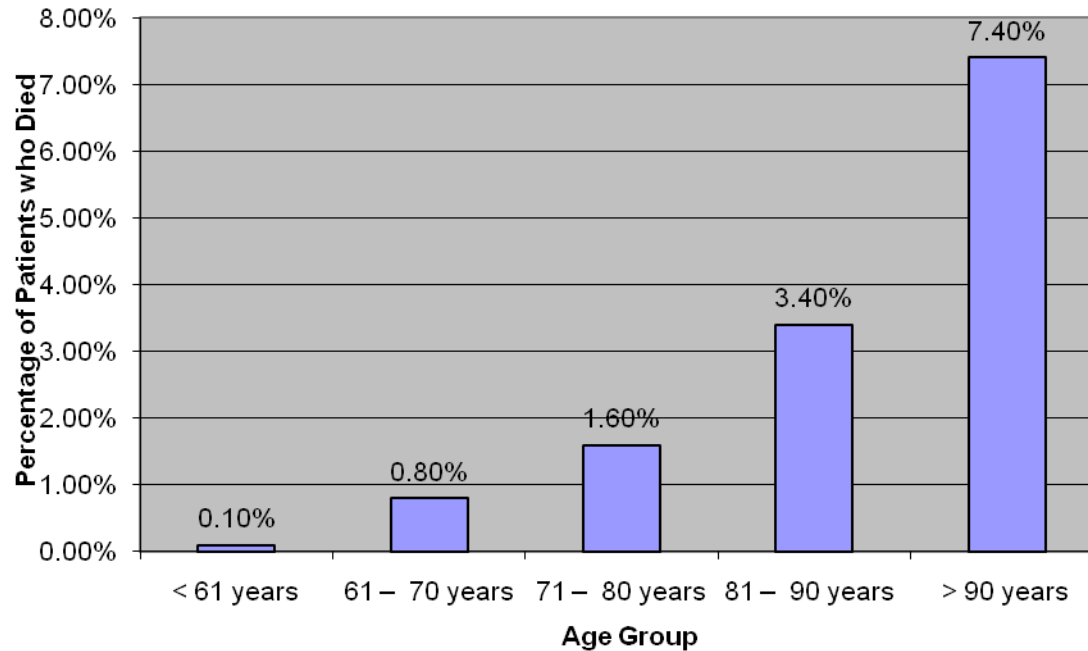
- Admission to the ward within 4 hours
- Surgery within 48 hours of admission
- Minimising the risk of pressure ulcers
- Access to acute orthogeriatric medical support
- Assessment for antiresorptive therapy
- Multidisciplinary assessment and intervention to prevent future falls

Preoperative Issues

The mean age of patients sustaining a hip fracture is 82

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

Age related Inpatient Mortality following operative treatment for fracture neck of femur (n = 5979)



Michael A, Doos L. Osteoporos Int. 2009; 20 (supplement 4): S289.

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)

Haider S.I et al. Clinical Therapeutics, 2008 Feb;30(2):419-27

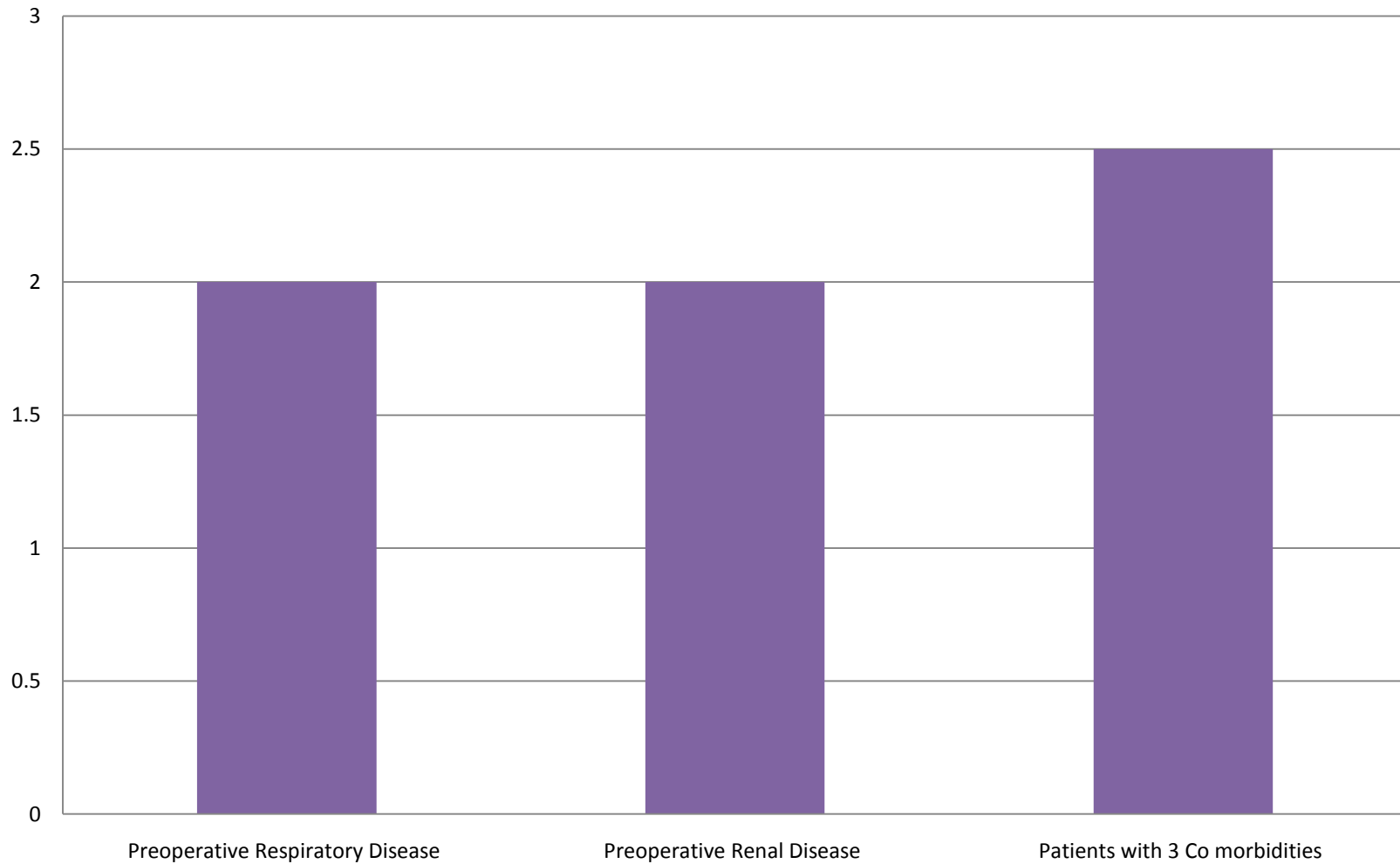
Rank	Disease	Prevalence Rate
1	CAD and Hyperlipidemia	89.9%
2	Hypertension	63.3%
3	Cataract	31.1%
4	Enlarged Prostate	27.8%
5	Osteoarthritis	26.8%
6	Diabetes Mellitus, Type 2	26.3%
7	Arrhythmias	22.2%
8	Prostate Cancer	20.8%
9	Skin Cancer	17.1%
10	COPD	16.1%

CAD = coronary artery disease; COPD = chronic obstructive pulmonary disease

“long lie” Syndrome

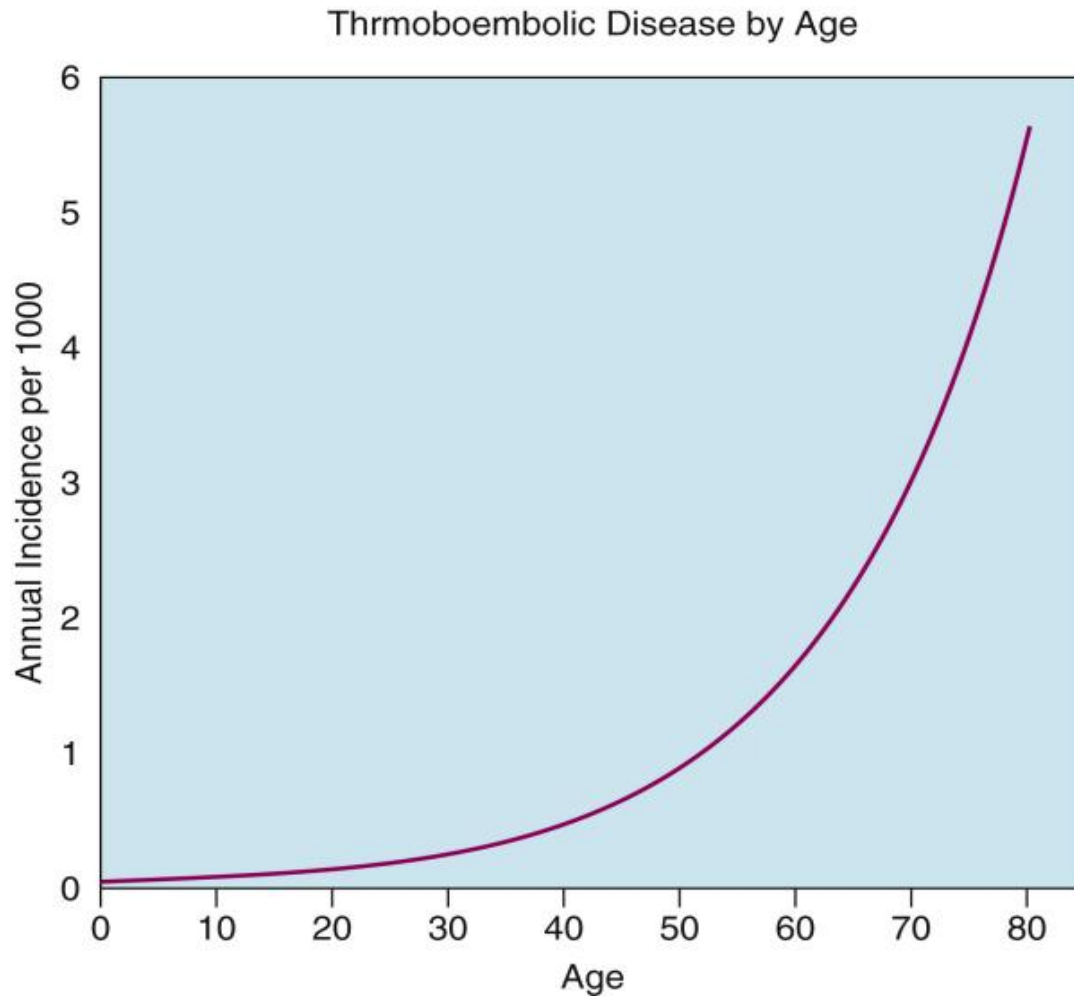
- Hypothermia
- Acute (on chronic) renal impairment
- Rhabdomyolysis
- Hypo / hyperglycaemia
- Delirium

Mortality at 30 days & Preoperative Co morbidity



Venous Thromboembolism (VTE)

- PE is the most common preventable cause of hospital death



Arch Intern Med 151[5]:933-938, 1991

High Risk Venous Thromboembolism

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

Geerts WH, Pineo GF, Heit JA, et al. Chest 2004; 126:338S

Venous Thromboembolism

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

Geerts WH, Pineo GF, Heit JA, et al. Chest 2004; 126:338S

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

Geerts WH, Pineo GF, Heit JA, et al. Chest 2004; 126:338S

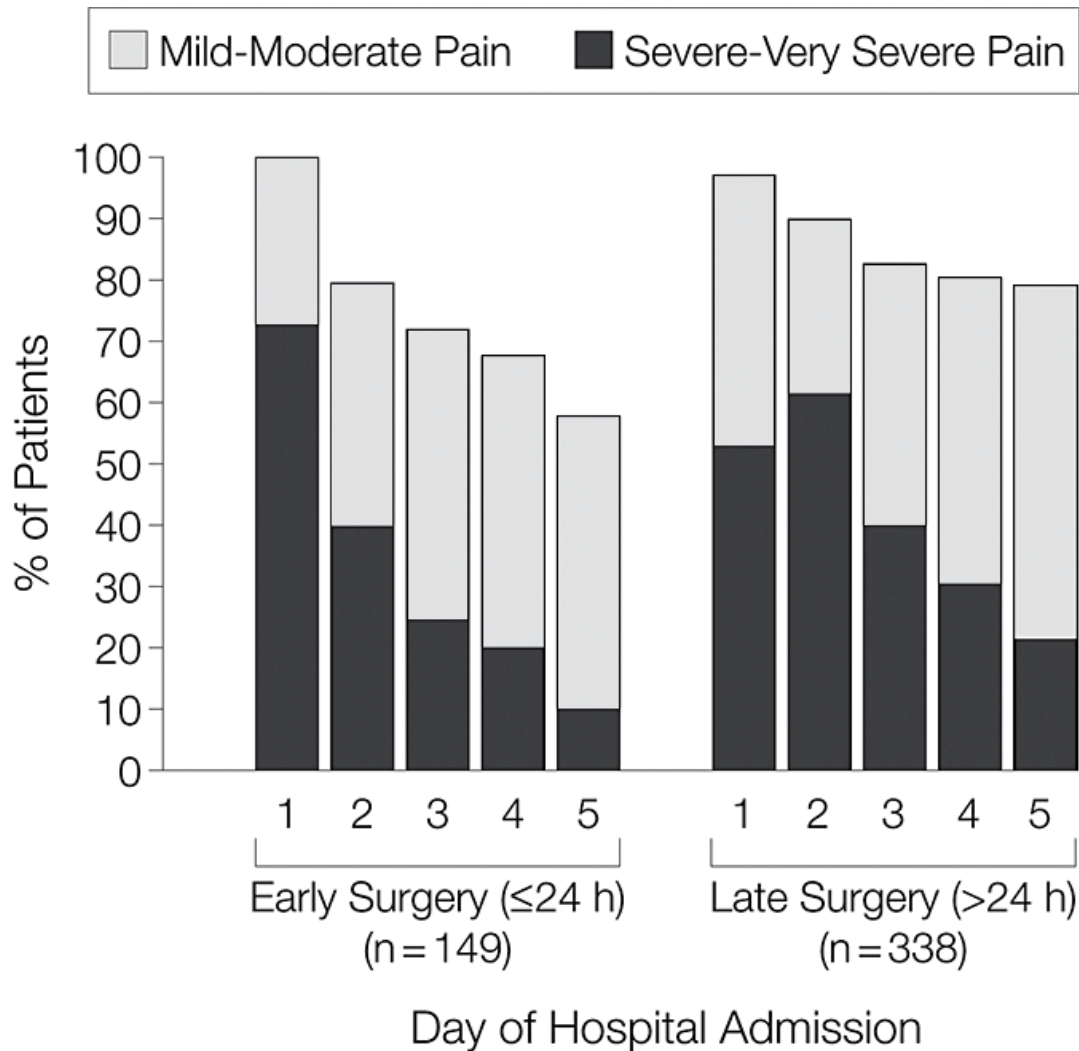
Duration of Thromboprophylaxis

- Should be extended **beyond 10 days and up to 35 days after surgery**
- Options include:
 - LMWH
 - Or Warfarin

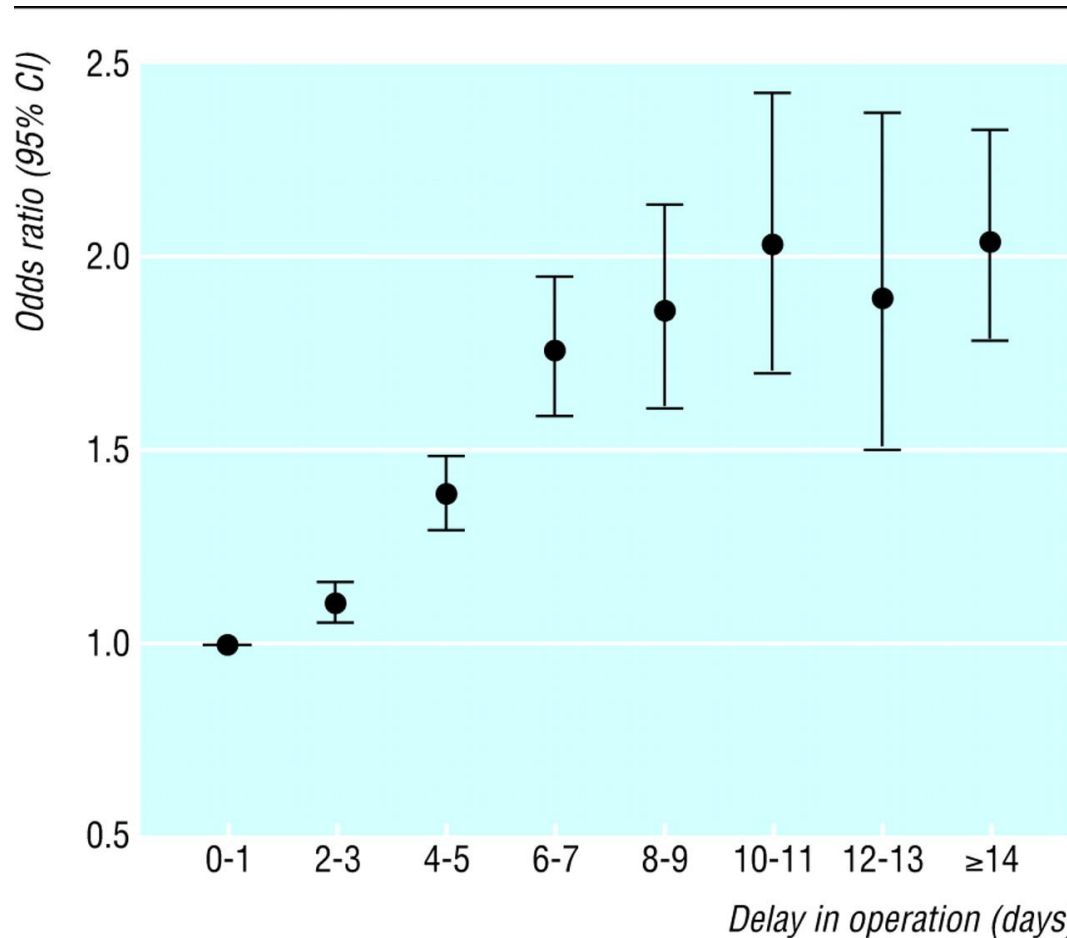
ACCP Evidence-Based Clinical Practice Guidelines (8th Edition)

The Timing of Surgery

To operate or to wait ?



Odds ratios of death within hospital by operative delay



Bottle, A. et al. BMJ 2006;332:947-951

The Timing of Surgery

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

Orosz, GM, Magaziner, J, Hannan, EL, et al. JAMA 2004; 291:1738

- 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 +/- or abnormal exam
- Respiratory Failure
 - Pulse oximetry $<90\%$, $pO_2 < 8$ kPa, or $pCO_2 > 7.3$ kPa

Major Abnormalities Likely to require correction prior to surgery

- INR
 - ≥ 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 μ mol/litrewithout 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

Duncan D et al. Age & Ageing 2001;30:Suppl2:22

- Pressure sores

- 1/3 of hip fracture patients will develop pressure sores



Pressure Ulcers

- Occur in 10 to 40 % of patients

Beaupre, LA, Jones, CA, Saunders, LD, et al. J Gen Intern Med 2005; 20:1019

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

Beaupre, LA, Jones, CA, Saunders, LD, et al. J Gen Intern Med 2005; 20:1019

Postoperative Medical Complications

- The most common complications are
 - Chest infection 9 %
 - Acute heart failure 5 %
- Mortality rate of 15 – 20%

Roche J, Moran C. Ger Med, 2006 Oct (36):67- 74

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 out come of cemented hemi replacement based on the surgeon's experience

Malal J G, Pillai A, Nimon GA. J B J S British Volume 2009, 91 B, Supp I, 134.

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 ($p = <0.05$)

Browne J A, Pietrobon R, Olson S A. The Journal of Trauma: Injury, Infection, and Critical Care: March 2009 (66) 3- pp 809- 14

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.

Bell CM and Redelmeier DA. N Engl J Med 2001; 345:663–8

Weekends & Weekdays

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

Cram P, Hillis SL et al. Am J Med 2004; 117:151–7

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 Practitioner

- 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**

Penrod, JD, Boockvar, KS, Litke, A, et al. J Am Geriatr Soc 2004; 52:1114

Rehabilitation

- Intensive geriatric rehabilitation may **reduce length of stay**

Huusko, TM, Karppi, P, Avikainen, V, et al. Acta Orthop Scand 2002; 73:425

Multidisciplinary Rehabilitation Vs Usual Orthopaedic Care

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

Halbert J, Crotty M et al. Journal of Rehabilitation Medicine 2007;39(7):507–12.

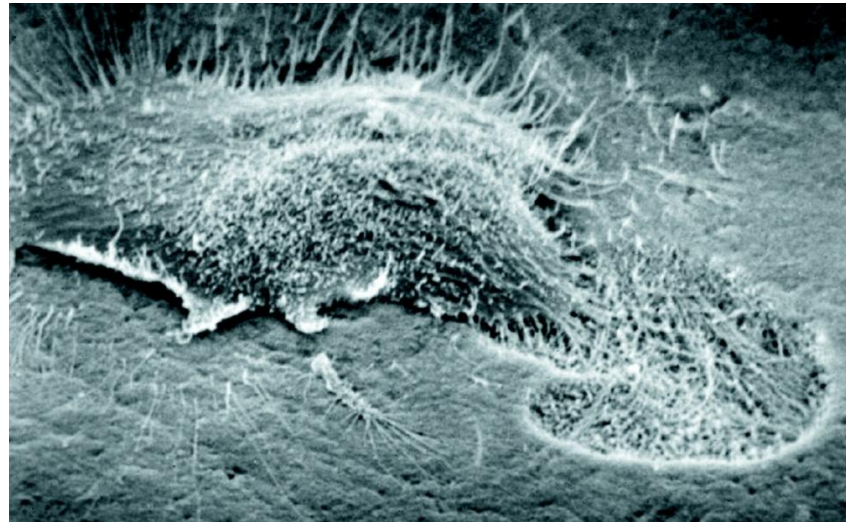
Dietetic Assistants

- 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

The Dudley Group of Hospitals

NHS Foundation Trust



In conclusion

- Enthusiastic team
 - Regular orthogeriatrician input
 - Experienced surgeon
 - Senior anaesthetist
 - Hip fracture nurse
 - Multidisciplinary input (PT, OT, Dietitian, Discharge coordinator, social service)
- Orthogeriatric Ward (Unit)
- NHFDB

Thank you