The elderly and emergency medicine

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Emergency Medicine Training Hub
Ballarat & Grampians Region
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Learning objectives

Recognise the aging milieu

The approach to the aged patient
- Physical
- Mental (often but not always)
- Social

A few specifics of elderly care

Put some of these into practice with a few cases

Refer to ED lecture series and self directed workbooks
Introduction

Why is this a separate topic?

- Proportion of elderly to ED is increasing
- They do not follow ‘the rules’
- Symptoms less clear
- Complications more likely
- Mortality much higher
What is aging?
What is aging?

‘Ageing is a progressive physiological process that is characterised by degeneration of organ systems and tissues with consequent loss of functional reserve of these systems.’

Dr Reena Hacking,
Dr Dominic O’Connor,
Anaesthesia UK, 2006
The future

Globally, the proportion of older people is growing faster than any other age group. In 2000 one in ten, or about 600 million, people were 60 years or older. By 2025, this figure is expected to reach 1.2 billion people.

Moreover, life expectancy at birth has increased globally from 48 years in 1955 to 65 in 1995, and is projected to reach 73 in 2025.

By 2050, people over 80 years old are expected to account for 4% of world’s population, up from 1% today.

14.5% of ED visits ≥ 65 yr\(^1\).

65% of people admitted to hospital are over 65 years old\(^2\)

Elderly patients tend to be sicker\(^1\):

- >40% of ED elderly patients are admitted
- 6% go to intensive care units
- 50% are prescribed new drugs

1. [http://www.merckmanuals.com/professional/geriatrics/provision_of_care_to_the_elderly/hospital_care_and_the_elderly.html#v1135701](http://www.merckmanuals.com/professional/geriatrics/provision_of_care_to_the_elderly/hospital_care_and_the_elderly.html#v1135701)

The problems after ED

- High subsequent re-admission rate (20% - ?period)

- >50% of attendees to ED >65 years old will have increased dependency
  Archives of EM, 1984;1:205-213
What we will explore

- Physiology of the elderly
  - What is ‘normal’
  - Physiological reserve
  - Assessment
- Co-morbidity
- Poly-pharmacy
- Treatment and End of Life decisions and discussions
- Social issues
Physiology
The geography problem

“The farther you get from your 21st birthday the more likely there is to be a problem . . .”
# Respiratory

Approximate values for 70 Kg 40 y/o male (Litres) | Effect of advancing age
---|---
TLC | 6.0 | Reduced
FVC | 4.5 | Reduced (4.0 aged 70)
FEV₁ | 4.0 | Reduced (3.0 aged 70)
RV | 1.5 | Increased
FRC | 2.5 | Unchanged
Respiratory

- Airway elasticity reduced
  - Closing capacity may encroach on normal tidal volumes
  - Upper airway obstruction
- Cervical Spine mobility decreased
- Loss of teeth affects airway support

- $\text{PaO}_2 = 100 - (\text{age}/4) \text{ mmHg}$
Cardiovascular

- CO falls 3 per cent/year
- Vasculature decreased elasticity
  - LV strain
- Deteriorating conduction system
  - AF, varying degrees of block
- AF – reduces CO by 30%
  - Fast AF even more severe
- Cumulative ischaemic events
Cardiovascular

- Reduced autonomic homeostasis
  - Inability to respond to low BP
- Reduced cardiac adrenergic receptors
  - Do not respond to vasopressors
- Valvular disease
  - Aortic stenosis (western)
  - Mitral rheumatic (3rd world)
Renal

- eGFR reduces 1% per geography year
- Cumulative deterioration
  - Renal artery stenosis
  - Diabetic nephropathy
  - Obstructive nephropathy (e.g. prostatic hypertrophy)
- Nephrotoxic drugs
  - NSAIDS
  - ACE-I
- Dehydration
Neurological

- 30% reduction in brain mass by age 80-yrs-old
  - Cumulative insults
  - Atrophy

- Cognitive decline
  - Risk to wellbeing (injury, medication, comprehension of instruction)

- Multifactorial causes
Musculoskeletal

- Osteo-arthritis
- Osteoporosis
  - Vertebral collapse
- Loss of muscle mass
  - 5% muscle strength per day in hospital
Consequence

- Of patients >65 years old:
  - 85% have one chronic disease
  - 30% have ≥3 chronic diseases

- Loss of physiological reserve
  - Reduced ability to recover
  - Susceptibility to complications
    - Atelectasis during operations
    - Increased hemorrhage in stroke thrombolysis

- Increased mortality and morbidity
Pneumonia

- 50x increased incidence in residential care
- May present as abdominal pain
- CURB 65

<table>
<thead>
<tr>
<th>CURB-65 Severity Score for Community-Acquired Pneumonia</th>
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<td>Calculates the CURB-65 Score to estimate pneumonia mortality to help determine inpatient vs. outpatient treatment.</td>
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</table>

| Confusion? | Yes +1 |
| BUN > 19 mg/dL (7 mmol/L)? | No -1 |
| Respiratory Rate ≥ 30? | No -1 |
| Systolic BP < 90 mmHg or Diastolic BP ≤ 60 mmHg? | Yes +1 |
| Age ≥ 65? | Yes +1 |

Patient has none of these

Score

Low risk group: 2.7% 30-day mortality. Consider outpatient.

Score

Moderate risk group: 6.8% 30-day mortality. Consider inpatient treatment or outpatient with close followup.
Other issues

- Fragile skin
  - Tears
  - Bed sores

- Drug pharmacokinetics
  - Relatively high adipose fraction
  - Lower blood protein
  - MAC (6 % reduction per decade)
  - Slower metabolism (1% decline per year after 30)
In ED

- Lower rates of intensive therapy
- Meals and medication missed
  - Parkinsonian drugs especially
- Environment confusing and uncomfortable
- Delayed discharges to ward
- Longer stays overall
Assessing the elderly

- Communication difficulties
  - Talk to patient first
  - If possible, talk to patient alone
  - Formal, respectful approach
  - Optomise your environment for consult
  - Stay near middle of field of vision
  - Do not ‘assume’

- Histories from multiple collateral sources
Assessing the elderly

- The ‘elderly RWC’
  - FBC
  - U&E
  - Urine dip
  - Low threshold for CT head especially if warfarinised
- Mobility need to be assessed

- CXR
- ECG
- Postural BPs
Presentation to ED

- Non-specific presentations
  - Falls – 69% of >80y.o. attendances
  - MI manifests as chest pain in < 50% of patients > 80 yr
  - Non-localising abdominal pain may represent serious intra-abdominal pathology
    - Beware renal colic in the elderly (AAA)
- ‘The organs of the aged do not cry’
- Probe history and examine thoroughly
Falls

- primary cause of injury for adults aged ≥65
- 35% of people >65 yrs known to fall each year
- 60% of falls attended by ambulance are taken to ED
Falls

- Often classified as ‘simple mechanical’
- Often occur in familiar environment
- Likely to represent functional decline
- If patient or witness unable to give clear account of mechanism – consider syncope
Syncope

- Often multifactorial
- Assess (in addition to full history)
  - pre-syncopal symptoms
  - medication
  - recovery
- If no ongoing instability, treated pts can often go home (if safe at home)
- ‘Rules’ for syncope admission often over inclusive (e.g. all over 70 years old)
Syncope

- Altered mental status caused by transient interruption or decrease in cerebral blood flow
- Morbidity/mortality higher than in younger people
Syncope

- Cardiogenic
  - NSTEMI (may be result of syncopal episode)
  - Stokes-Adams attack
  - Tachyarrhythmias
  - Bradyarrhythmias
  - Sick sinus syndrome
  - Beta blocking agents
Syncope

- Seizure disorders
- Vasomotor depression
  - Diabetic neuropathy
  - Antihypertensive agents
    - Vasodilators
    - Diuretics
Syncope

- Consider volume depletion
  - Depressed thirst/inadequate fluid intake
  - Occult bleeding

- TIAs very rarely causes LOC – has to affect brainstem (basi-vertebral)

- Troponin indicator of outcome
Seizures

- All first time seizures in geriatric population are danger sign
- CT head mandatory
- High probability of hemorrhage
Adverse drug reactions


‘most emergency hospitalisations for recognised adverse drug events in older adults resulted from a few commonly used medications, with the four most implicated being warfarin, insulin, oral hypoglycaemic and oral antiplatelet agents.’
Polypharmacy

- 25% of prescription drug use is by people >65

- Physiological changes/ability to compensate

- Compliance
  - Own/other medication
  - Confusion when doses or regime changed
Warfarin

- In patients with AF an INR <2.0 results in a significantly higher risk of embolic stroke—without the expected reduction of the risk of hemorrhagic stroke
- Greater fluctuations in INR than younger patients
Warfarinising the >75 with AF

Fig. 1
Treating patients with non-valvular atrial fibrillation depending on their CHADS$_2$ score

- Congestive heart failure: 1
- Hypertension: 1
- Age $\geq$75 years: 1
- Diabetes: 1
- Stroke: 2

- CHADS$_2$ = 0: no treatment or aspirin
- CHADS$_2$ = 1–2: aspirin ± clopidogrel
- CHADS$_2$ = 2 or more: warfarin
Warfarinising the >75 with AF

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Treating patients with non-valvular atrial fibrillation depending on their CHADS$_2$ score

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- CHADS$_2$ = 0: no treatment or aspirin
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Head injury

- NICE guidelines (UK)

Head injury

- NICE guidelines (UK)

Up to 30% of patients without this but on warfarin will have evidence of an intracranial bleed
Unexpected complications . . .

Clinical significance of unsuspected rise in cardiac troponin in the setting of falls in older people

Sylvestre Maréchaux, Rémy Lubret, Pascal Delser Marie-Michèle Six-Carpentier, Emilie Carpentier, Véi Claire Pinçon, Thierry Le Tourneau, François Puisie Philippe Asserman, Pierre Vladimir Ennezat

ABSTRACT
Objectives To assess the clinical significance of unsuspected rise in cardiac troponin I (cTnI) levels in elderly patients who have fallen.

Design Monocentre prospective observational pilot study

Participants Consecutive elderly patients (age >65 years) referred to the emergency department after being immobilised on the ground after a fall.

Measurements Clinical, laboratory and Doppler echocardiography data were collected on admission to assess the cardiac correlates of increased cTnI. The survival endpoint was a composite of death or cardiovascular event.

Results 60 patients were included in this study. Mean age was 81 ± 8 years. Cardiac TnI was ≥0.05 ng/ml in at least one blood sample in 40 patients (67%). New diagnosis of cardiac disease was performed in 14 patients, 13 of whom had cTnI ≥0.05 ng/ml. Transient apical ballooning was diagnosed in six patients. During a median follow-up of 92 (49–131) days death occurred in six patients, myocardial infarction in three, stroke in one and acute heart failure in five. Cardiac TnI ≥0.05 ng/ml was a predictor of these events (p = 0.034).

Conclusion An unsuspected rise in cTnI correlates with new diagnosis of cardiac disease and is a potential marker of stress induced cardiomyopathy in elderly patients who fall. Cardiac TnI might be a strong predictor of outcome in these patients.

INTRODUCTION
Falls represent a major health problem in the geriatric population. About 40% of people aged more...
Who needs a shot … a review of tetanus immunity in the West of Ireland

Adrian Moughty,1 John O Donnell,1 Mary Nugent2

ABSTRACT
Introduction Tetanus is a rare disease but, in the era of widespread vaccination, largely a preventable one. Immunization programmes in childhood are felt to offer lifelong immunity but it is known that with increased age immunity wanes. We sought to assess immunity in a group of patients presenting for conditions unrelated to injury to the emergency department covering an area in the West of Ireland.

Methods A convenience sample of 218 patients, who presented to the emergency department for complaints unrelated to injury, requiring blood tests for their management was obtained. Using the Proteus tetanus toxoid determined the number of patients who were non-immune

Results No statistical difference was found in terms of tetanus immunity (p<0.001). Those non-immune mean age of 66 years compared to mean age of 46 years for immune. Using logarithmic regression analysis an increase in age of 10 years was associated with a 50% reduction in immunity.

INTRODUCTION
In most Western nations the prevalence is less than one case per million which would account for approximately 3–5 cases in Ireland annually. Actual case numbers are much lower with only two cases diagnosed in 2008 and one in 2007.1 Most cases are those over 20 years of age and 70% of those over 70 years of age who have not received boosters may not be seroprotected.4

Tetanus vaccination programmes began in Ireland in the 1980s so any individuals born prior to this time may never have been immunised and many middle aged or elderly patients born since this date have had few, if any, booster injections and, as such, with a consequent likely decline in their immunity.

Classical teaching is that on presentation with a wound a risk assessment should be performed. This is based on the patient’s vaccination history and the nature of the wound and the likelihood that it
Ethical considerations

- Withholding treatment
- When to stop a resuscitation
- ‘DNRs’/advanced directives
- Clarity of documentation
- How do we broach the subject with patients and families?
‘the younger patients (possibly more likely to survive) were more likely to receive EGDT. However, the elderly were just as likely to receive the other bundles . . . ’

Your thoughts on this please
But what if you survive?

Bring out yer’ dead!

I don’t want to go on the cart!

Don’t be such a baby

I want to go for a walk . . .
Avoiding ED or admission

- Discharge coordination
  - Knowledge of system and alternatives to acute hospital admission
  - Liaison with other organisations
- Access to GP or other clinics
- Education of long term residential staff
Relax for 15 . . .
After the break

Cases

- Ethical dilemmas and strategy
- Clinical cases
Ethical considerations

- Withholding treatment
- When to stop a resuscitation
- ‘DNRs’/advanced directives
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Ethical considerations

- Withholding treatment
- When to stop a resuscitation
- ‘DNRs’/advanced directives
- How do we broach the subject with patients and families?
In each of the following scenarios you have three choices:

- Palliation
- Limited treatment
- Commence Full treatment
Emergency clinicians' attitudes and decisions in patient scenarios involving advance directives
Rebecca E Wong, Tracey J Weiland, George A Jelinek (St Vincent’s, Melbourne)

- Scenario 1: a 75-year-old patient with major trauma

- Scenario 2: an 85-year-old nursing-home resident with dementia, cancer and sepsis

- Scenario 3: a 65-year-old man with prostate cancer and respiratory distress
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- **Scenario 1:** a 75-year-old patient with major trauma
  - Recent MEPA (advanced directive) for no resuscitation

- **Scenario 2:** an 85-year-old nursing-home resident with dementia, cancer and sepsis

- **Scenario 3:** a 65-year-old man with prostate cancer and respiratory distress
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- **Scenario 1:** a 75-year-old patient with major trauma
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- **Scenario 2:** an 85-year-old nursing-home resident with dementia, cancer and sepsis
  - Active directive for full treatment

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  “Just let me die”
Ethical considerations

- Withholding treatment
- When to stop a resuscitation
- ‘DNRs’/advanced directives
- How do we broach the subject with patients and families?
89 y.o. male

- Off plane from NZ
- Seen to become confused/LOC during flight
- Reviewed by paramedics in airport – ‘I’m completely well’
- Stoical and insistent he leaves with family
In Ballarat

- Fall in garden of family
- Facial injury
- No LOC
- Feels well and wants to go home to see family

WHAT DO YOU DO?
What we did . . .

- HR 50bpm
- BP 142/65mmHg
- ECG -
- FBC – Hb 12.2, WCC 9.6, Plt 129
- U&E – Na 137, K 4.9, Ur 11.8, Cr 122
- Consider
  - Postural BPs
  - Urine dip
  - Full neurological examination
Drug history
Medication review

- Inhibace
  - cilazapril (ACE-Inhibitor)
  - Hydrochlorothiazide (Thiazide diuretic)
- Diltiazem CD
  - Dose range 240mg to 360mg daily
- Metopralol
  - Dose range 25mg to 100mg daily
Discharge

- No CT head

- Advised to increase water intake

- Stop Metopralol

- GP review
75 y.o. female

- 18 hours of non-specific abdominal pain
- Colicky
- Not associated with any other symptoms
- Slightly reduced appetite
Bloods

- Hb 11.2, WCC 7.8, Plt 202
- Na 136, K 3.5, Ur 10, Cr 110
- CRP 12
- Urine dip - NAD
CT abdomen

TECHNIQUE: Post-oral and intravenous contrast-enhanced CT abdominal scan has been performed from the lung bases down to the level of the lesser trochanters.

FINDINGS: The appendix is thickened, measuring up to 10.0mm in diameter. It is located retrocaecally and is associated with mesenteric fat stranding. No evidence of extraluminal gas or fluid collection to suggest an appendicular abscess.

There are at least four large faceted calcified gall stones within the gall bladder. The gall bladder is not thickened.

There are no inflammatory changes around the gall bladder.

The remaining intraabdominal organs are normal. Small and large bowel loops are normal. The bladder is moderately distended. The lung bases are normal. No suspicious bony lesions.

CONCLUSION: The appearances are in keeping with acute appendicitis, with no evidence of perforation or abscess identified.
## ELDERSS: Some Important Issues for the Hospitalized Elderly

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Issue</th>
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<tbody>
<tr>
<td>E</td>
<td>Eating (nutritional status)</td>
</tr>
<tr>
<td>L</td>
<td>Lucidity (mental status)</td>
</tr>
<tr>
<td>D</td>
<td>Directives for limiting care (eg, do not resuscitate)</td>
</tr>
<tr>
<td>E</td>
<td>Elimination (incontinence)</td>
</tr>
<tr>
<td>R</td>
<td>Rehabilitation (needed because of bed rest effects)</td>
</tr>
<tr>
<td>S</td>
<td>Skin care (to prevent and treat pressure ulcers)</td>
</tr>
<tr>
<td>S</td>
<td>Social services (discharge planning)</td>
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Resources

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- [http://lifeinthefastlane.com](http://lifeinthefastlane.com)

- EMJ archive