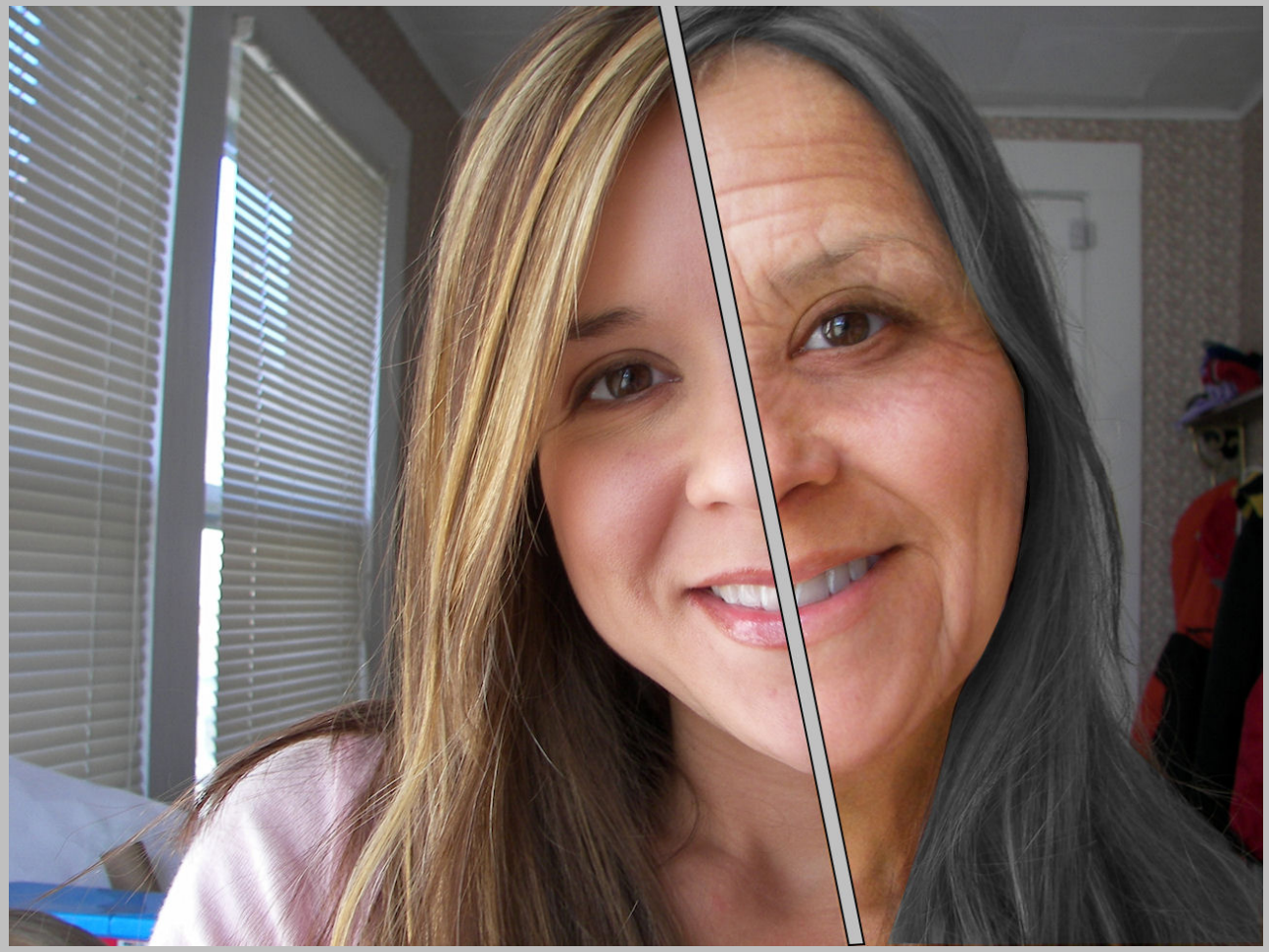
Syncope as we age: Frequency of causes and cost of care

Dr Steve W Parry
Clinical Senior Lecturer and Honorary Consultant Physician
Clinical Director, Medicine
Falls and Syncope Service, Royal Victoria Infirmary and
Institute of Cellular Medicine, Newcastle University

Syncope: an old age problem

- 15% children <18 years
- 25% military 17-26 years
- 23% >70y, 30% recurrence
- Prevalence rises with age
  - 3.6/1000 person years 20-29 years
  - 18.2/1000 person years in >75s (Soteriades 2002)
  - 9/1000 person years 20-29 year olds
  - 81.2/1000 person years >80s (Ruwald 2012)
  - 1.8/1000 person years in 15-24 year olds
  - 7.4/1000 person years in >75s
    (Vanbrabant 2011)

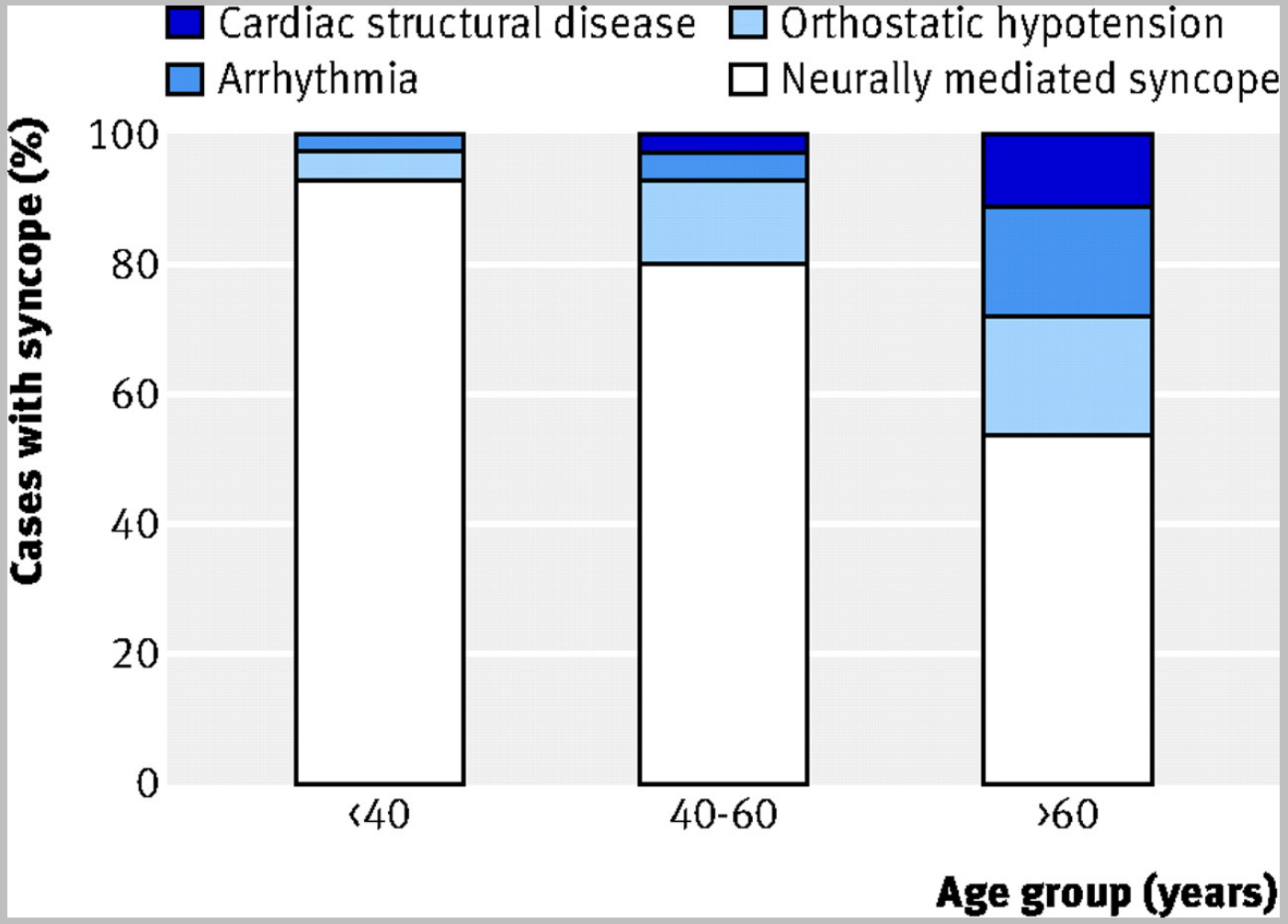
Are older people different?



From the syncope perspective.....

- Physiology of ageing
  - Changing salt and water homeostasis
  - Baroreflex changes
- Structural heart disease
- Conducting tissue disease
- Neurally mediated disorders
  - Vasovagal second peak
  - Carotid sinus syndrome
- Orthostatic hypotension
- Culprit medications

Causes of syncope by age



Parry SW, Tan MP BMJ 2010;340:c880

Syncope: The tip of the elder presentation iceberg?

Implications for causes…….

Syncope masquerading as falls

- **Cognitively normal patients**
  - **1/3 forget having fallen at 3 months**
    (Cummings et al JAGS 1988)
- **Cognitive impairment**
- **Acute medicine**
  - **Falls and syncope in 9% of acute medical admissions**
  - **42% presented with Hx of both**
    (Parry et al, Clin Med 2008)

Syncope masquerading as falls: Drop attacks

- First described by Sheldon (1948)
- Present as a sudden collapse, with no obvious environmental or medical reason
- Loss of consciousness (LOC) denied
- Sometimes difficulty rising
- Characteristically well post-drop
- Female predominance
- 12-25% of all falls in older patients

Drop attacks

- **Parry et al 2006 JAGS**
  - 90 patients with drop attacks
  - 60% underlying cardiovascular cause
    - Largely CSH
  - 10% unexplained
  - “Attributable” diagnoses only
  - Not an RCT with intervention
  - ? Correlation vs causation

"Syncopal falls?": Unexplained, recurrent falls and carotid sinus syndrome

- **Clinical studies in unexplained and recurrent fallers with CSH as sole attributable cause**
- **SAFE PACE I** (Kenny et al JACC 2002)
  - Pacing v no pacing, single centre, no placebo
  - 2/3 reduction in number of falls
- **SAFE PACE II** (Ryan et al Heart 2010)
  - Pacing v REVEAL ILR, multi-centre, "placebo"
  - No benefit from pacing, no asystole recorded
- **PERF** (Parry et al 2009)
  - Sole double-blind, placebo-controlled RCT, small numbers
  - No benefit from pacing

Bradyarrhythmias and falls

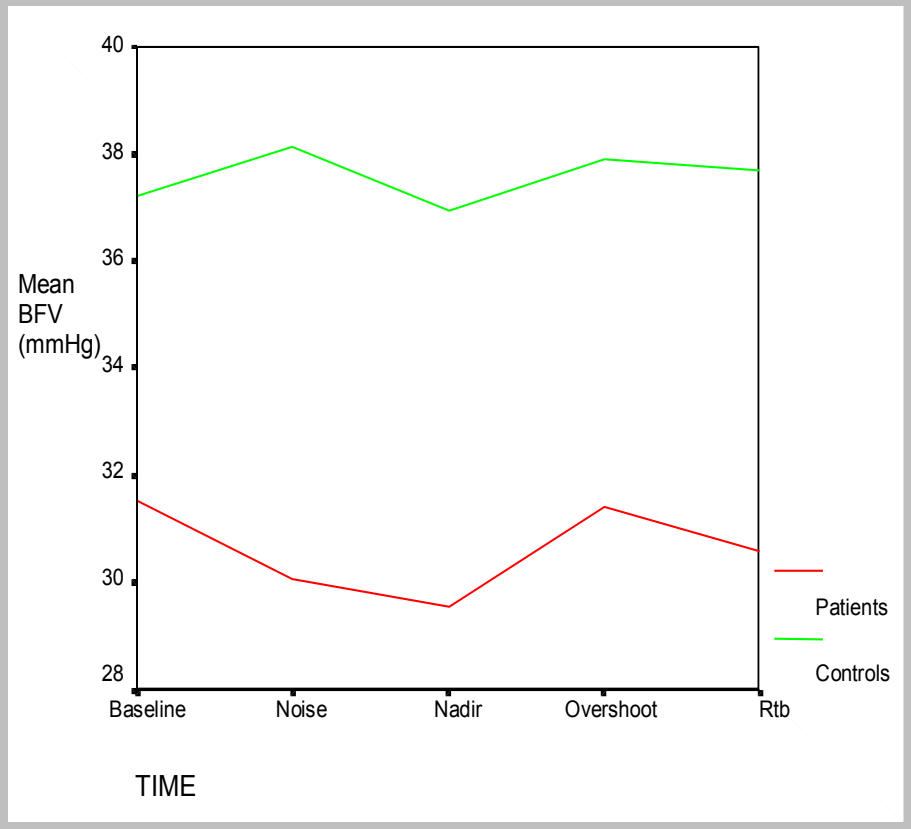
- Seifer and Kenny Am J Geriatr Cardiol 2003
- 81 patients
- 31 referred for pacing for AVB and SSS
- 50 controls admitted to CCU
- 134 falls in paced group, 12 in CCU group

Why falls rather than syncope? Amnesia for loss of consciousness

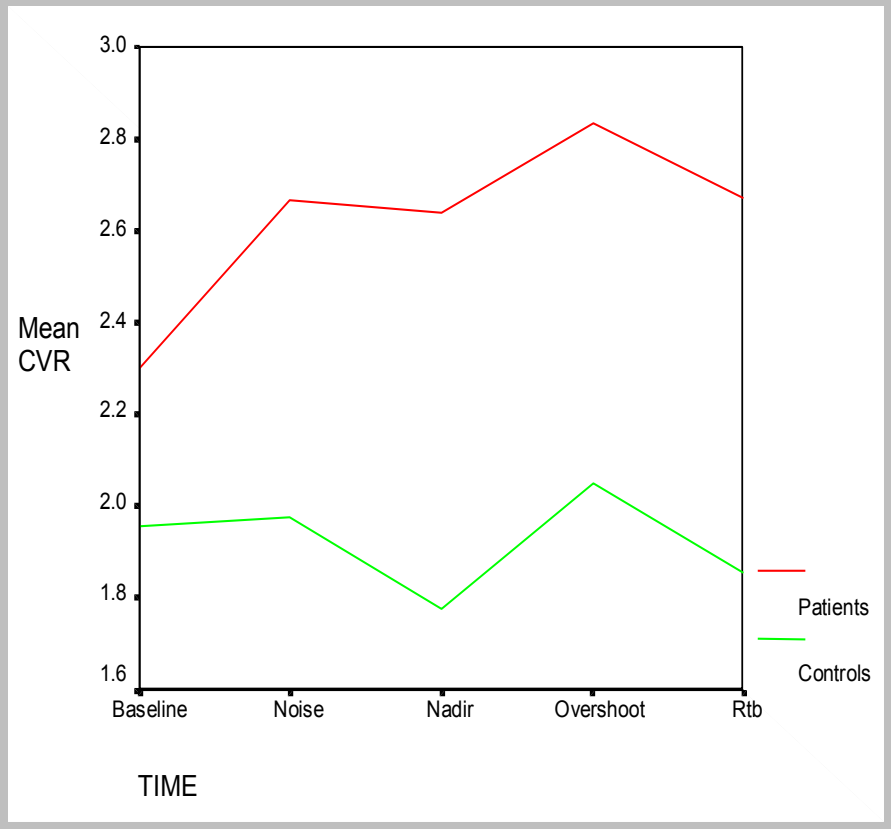
- Transient hypotension leading to “micro-syncope” v catastrophic loss of perfusion to balance centres
- Memory only of incident fall
- Evidence:
  - Observational
    - Laboratory studies during CSM-induced asystole (McIntosh et al Am J Med 1993, Parry et al J Am Coll Cardiol 2005)
  - Experimental
    - Altered cerebral autoregulation in CSH fallers v normals (Parry et al Heart 2006, Tan et al 2013)

Cerebral autoregulation in CSS patients v controls
MBFV & CVR in response to LBNP

Mean BFV in response to LBNP



CVR in response to LBNP



Cerebral autoregulation and CSH: the ongoing story…..

- **Similar design using LBNP, Tan, Parry J Am Heart Assn 2015**
- **CSH status known**
  - **Higher mean BFV in asymptomatic CSH during LBNP-induced hypotension**
  - **Lower cerebrovascular resistance index at SBP nadir for asymptomatic CSH**
  - **Wavelet phase synchronisation analysis of mean blood pressure and cerebral blood flow velocity**

	n=	Impaired cerebral autoregulation n=	Mean synchronisation parameter
NO CSH	10	0	0.14
Asymptomatic CSH	15	1	0.26
Symptomatic CSS	20	17	0.75*

*p=0.000012

“Syncopal falls”: Who to investigate

- **History**
  - **Drop attacks, unexplained recurrent falls**
  - **History suggestive of loss of consciousness**
    - **“Just went down”, “can’t remember the fall”, “all of a sudden I was on the ground, don’t know how”**
    - **Sudden fall with head turning, exercise**
    - **Association with medication use, change in posture, prolonged standing**
    - **Palpitations, chest pain**
    - **PMH structural heart disease, heart failure**
  - **Witness account of pallor, unresponsiveness**
  - **Beware cognitive impairment**
  - **Facial/head injuries**

When a fall is not a fall…..
Case 1

- 86 year old male
- 3 unwitnessed falls at his nursing home
- Intermittent short lived dizziness
- Scalp laceration requiring sutures
- Cognitively impaired, MMSE 18/30
- Poor account from staff

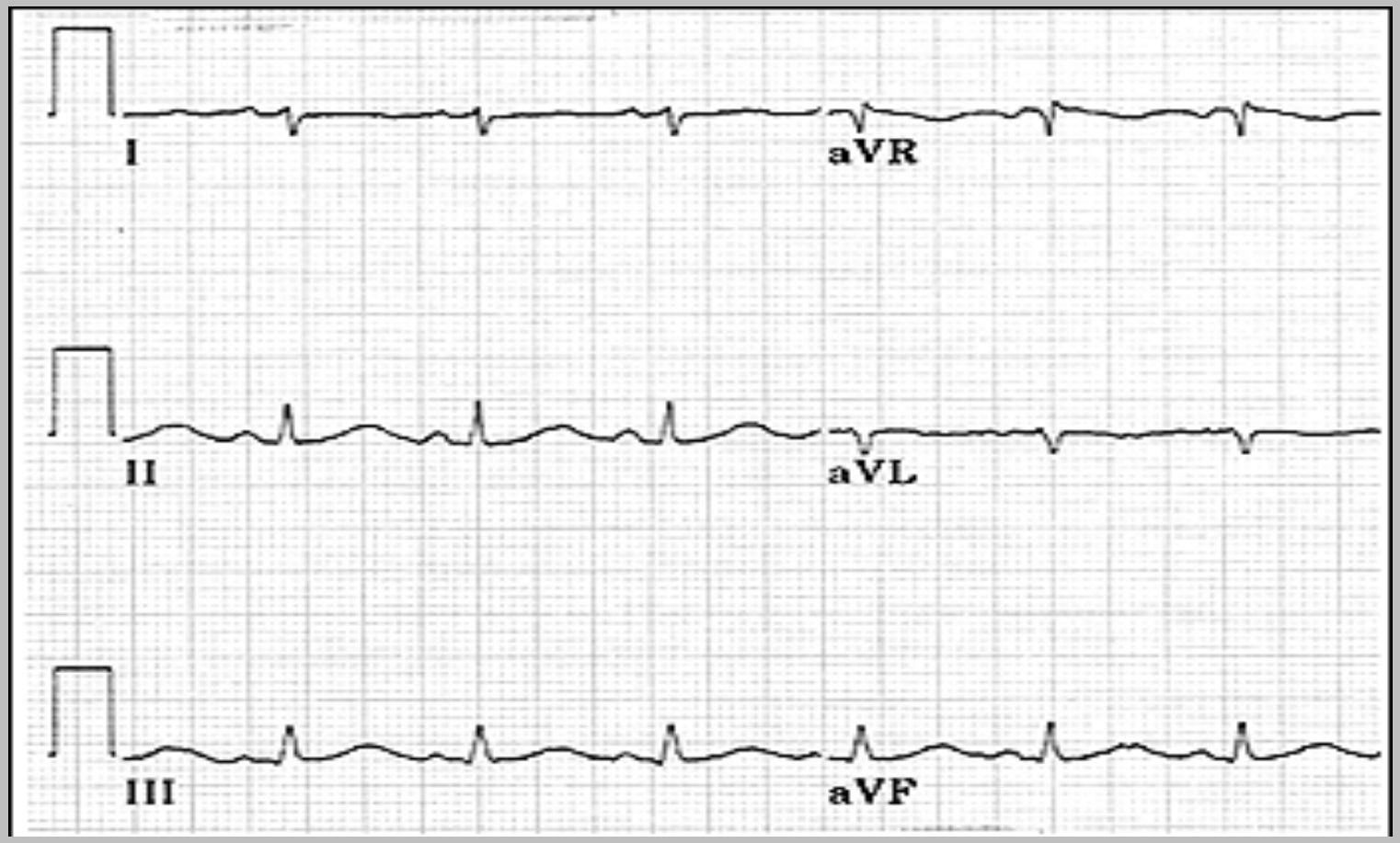
What else do you want to know?

Case 1

- Hypertension, chronic schizophrenia, COPD
- Medications: Salmeterol inhaler, haloperidol, bendroflumethiazide, quetiapine
- Examination
  - Severe Parkinsonism
  - Poor gait and balance
  - Baseline BP 110/58
  - 48mmHg fall in SBP with active standing

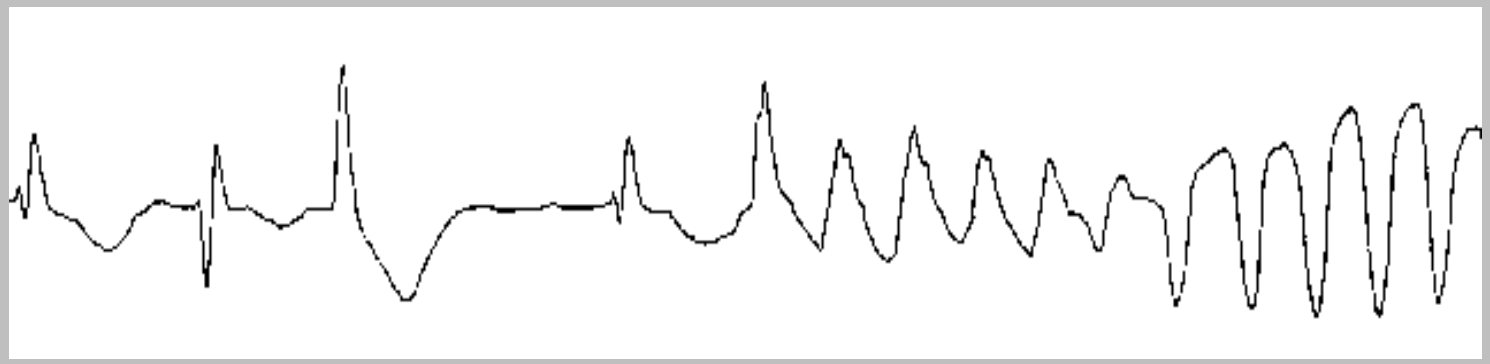
Anything else you want to know?

Case 1



QTc = 680ms

Torsade de Pointes VT



Case 1

- Check electrolytes
- Change salmeterol to salbutamol
- D/w psych team re changing haloperidol and quetiapine
- Stop BFZ, consider 24 hour BP
- Consider geriatrics referral re Parkinsonism and need for day hospital attendance for MDT input
- Prolonged external loop recorder monitoring, possible implantable loop recorder
- Compression hosiery, consider fludrocortisone

When a fall is not a fall……
Case 2

- 82 year old female
- Lives alone
- 4 episodes of falls, brought to ED by carers as persistent drowsiness
- Advanced myeloma, “6 months to live”
- Now alert, brings DNA CPR to juniors’ attention

Case 2

- During multiple admissions with falls, multiple investigations
- Polypharmacy
- ECG, previous 24 hour ECGs, 24 hour BP, echo, L/S BP all unremarkable
- Falls attributed to frailty with accompanying gait and balance abnormalities plus opiate use

What next?

Case 2

- Monitored bed, cardiac arrest
- DNA CPR respected, but oxygen put in place
- Pulseless, no complexes on monitor, pupils fixed and dilated, no respiratory effort
- After almost 3 minutes, auscultating chest to pronounce death when…..

Lub dub…..lub dub…..

Case 2

- Return of spontaneous circulation
- BP 142/73, P 78 bpm, sats 100% on oxygen
- Drowsy and confused for 35 minutes afterwards
- Urgent permanent pacemaker
- No further episodes at 8 months
- Monitor interrogation: 2 min 46 sec asystole…..

Costs of care

- Costs of syncope in older age unknown
- Cost of syncope in USA >USD 2.4 billion pa (Sun 2013)
- Cost of falls in UK >£1 billion pa (Ostopor Int 2012)
- More work needed
  - Better estimates of syncope incidence/prevalence
  - Immediate consequences (medical care, injuries etc)
  - Investigations, inappropriate investigations
  - Longer term consequences (morbidity, mortality, fear of falling, social care costs, carer costs)


SCHWARZENEGGER
THE TERMINATOR
Hemdale Presents A Pacific Western Production of a James Cameron Film
Arnold Schwarzenegger "The Terminator" Michael Biehn, Linda Hamilton and Paul Winfield
Make-up Effects By Stan Winston - Director of Photography Adam Greenberg
Executive Producers John Daly and Derek Gibson - Written by James Cameron with Gale Anne Hurd
ORION Produced by Gale Anne Hurd - Directed by James Cameron