INTENSIVE CARE AND THE ELDERLY SURGICAL PATIENT

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LIFE EXPECTANCY

• Average number of years of life remaining at a certain age
• 2014 – Queensland Life expectancy at birth
  • Males 79.9 (National 80.3)
  • Female 84.2 (National 84.4)

• Australia ranked 6th in OECD countries
• USA - 2014
  • Males 76.4
  • Females 81.2

• ABS 2014
• Maximum Life span of humans probably fixed
• Very little improvement in survival beyond 100 years old
• Oldest documented human 122 years old at death
LOWER RATES OF DEATH

- Increase in average life expectancy due to reduction in younger mortality but upper limit of age not increasing – natural limit of human lifespan
- Nutrition and quality of life improving
- Significant advancement in treatment of diseases but no advancement on normal ageing process
AGEING POPULATION

• Increased proportion of elderly
• Australia - population aged > 65
  • 2014 – 14%
  • 2051 – 26%
INCREASED ICU ADMISSIONS OF ELDERLY

- Estimated 5.6% increase in patients > 80 years admitted to ICU in Australia per year

*Critical Care* 2009, 13:R45
NORMAL PHYSIOLOGICAL CHANGES OF AGEING

• Ageing complex biological process – highly variable
  • Genetic and Environmental contribution

• Progressive decrease in organ reserve that increases the vulnerability of an individual to organ dysfunction and failure
  • All organs – Respiratory / Cardiovascular / Neurological / Renal / MSK etc

• Affects physical performance by
  • Disruption of physiological rhythm – endocrine function alterations
  • Loss of physiological complexity – functional decline and loss of adaptive responses
  • Disordered homeostasis - progressive loss of physiological reserves and inability to compensate for physiological stressors

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DEFINITION OF ELDERLY

- No universal definition
- > 65 years old
- > 75 years old
- > 80 years old
ANAESTHESIA OUTCOMES OF ELDERLY

- REASON Study
  - Prospective study non-cardiac surgical patients > 70 years old in 23 hospital Australia and New Zealand
  - 4158 consecutive patients
  - 30 day mortality 5%
  - 9.4% admitted to ICU (5% planned, 4.4% unplanned)
    - Unplanned ICU admission associated with 20% mortality
  - 20% at least one complication in first 5 post op days
    - Patients who developed complications – 14% mortality
  - Patient factors more correlation with mortality than type of surgery
    - Increasing age, increasing ASA, non-scheduled surgery

Anaesthesia, 2010, 65:1022–1030
ICU OUTCOMES - MORTALITY

- Duke MJA 2014
  - Retrospective review all Victorian adult ICUs 1999-2011
  - Patients aged > 65 years – 108,171 - 16.4% ICU mortality
  - Patients aged > 80 – 24.1% ICU mortality
  - Patients < 65 – 8.4% ICU Mortality

- Bagshaw Crit Care 2009
  - Retrospective review ANZICS data base 2000-2005
  - Patients > 80 years – 12% ICU mortality and 24% hospital mortality
• Hoffman CCR 2016
  • Retrospective review Canberra Tertiary ICU – 2011-2014
  • Patients > 80 years - hospital mortality 30%
  • 12 month mortality 46%
LONG TERM MORTALITY

- Heyland ICM 2014
  - Prospective study 22 ICUs in Canada – patients > 80 admitted to ICU > 24 hours
  - ICU mortality 14%
  - Hospital Mortality 26%
  - 12 month mortality 44%
  - Of survivors only 26% reached baseline physical function
- Roch Crit Care 2011
  - All patients at a single tertiary hospital > 80
  - Hospital mortality 55%
  - 2 year mortality 79%
- Fuchs ICM 2012 – Boston database
  - 7265 patients > 65 year old
  - 13% ICU mortality
  - 22% hospital mortality
  - 44% 1 year mortality
- Bouendi PLOS one 2012
  - 2646 patients > 80 at 15 hospitals in Paris
  - 27% hospital mortality
  - 50% 6 month mortality
- Andersen Annals Int Care 2015
  - All patients at a single tertiary hospital > 80
  - Norway
  - 24% ICU mortality
  - 40% hospital mortality
  - 58% 1 year mortality
PREDICTORS OF ICU MORTALITY

• Independent predictors of increased mortality
  • Increasing age
  • Frailty – marker of decreased physiological reserve
  • Disease severity – APACHE / SOFA
  • Co-morbid disease
FINANCIAL COST

• 2009 USA
  • National Health Expenditure $2.5 trillion dollars – 17.6% GDP
  • 60% of this budget spent in the last 3 months of patients life
  • $80 billion per year on critical illness
  • 29% of patients who died spent time in ICU in the preceding month before death

Crit Care Clin 28 (2012) 1–10
JAMA. 2013;309(5):470-477
DEMAND ELASTICITY

- USA
  - 25 ICU beds per 100,000 population
- UK
  - 5 ICU beds per 100,000 population
- Australia
  - 8.74 ICU beds per 100,000 population
- New Zealand
  - 5.37 8.74 ICU beds per 100,000 population

*JAMA. 2014;311(6):567-568*
ICU BEDS IN AUSTRALIA

- ANZICS CORE Data 2015
- Bed availability – 391 beds in Queensland and Australia 2326 beds
- All ICU admission outcomes 7.8% mortality
- Elective Surgical ICU admissions – 30-40% ICU admissions
- Top 5 admission diagnoses – 4 surgical
• Cost of futile admissions is consumption of limited resources
• Direct impact on availability of ICU beds and elective surgical admissions
• ANZICS CORE data from 58 units in Australia with elective surgical cancellation rate a percentage of admissions of around 3%
• Balance between life extension at any cost versus symptom treatment
• Quality of life and ‘acceptable’ outcome value based
• Not all feasible care is desirable care and, at the end of life, aggressive interventions may not only be futile but also inappropriate.
• Beneficence and non-maleficence principles should be applied considering the specific outcomes of elderly patients and the expected duration of life of which they may benefit
• The benefit and burden of care should be cautiously balanced to achieve the best decision
• Not advocate for treatments that are unreasonable or unable to achieve the expected results
• Elderly patients admitted to ICU have
  • 10-15% ICU mortality, 20-25% hospital mortality and 50% 12 month mortality
• Ageing leads to functional impairment with reduced homeostatic response to environmental stressors and loss of physiologic reserve

• Realistic expectations of patient and family members before initiation of treatment with discussion around the goals of care
• Perioperative support reasonable whilst achievable outcome still possible but once complications develop then ceiling of care needs to be established
• Discussions prior to deterioration always easier – pre-operatively ideal