The Perioperative Medicine Special Interest Group in conjunction with the Acute Pain Special Interest Group presents:

“When worlds collide: Perioperative medicine – The new specialty on the block?”
What, who, how? – The big questions facing perioperative medicine

Associate Professor David Story
Who, What and How?
The big questions facing perioperative medicine

Dave Story

- Head of Research, Department of Anaesthesia, Austin Health;
- A/Prof, Department of Surgery, The University of Melbourne
- ANZCA Perioperative Medicine SIG
- ANZCA Trials Group
The patient and medical team

Patient
- 75 year old woman
- Revision hip replacement
- ASA 4
  - diabetes
  - Stable IHD
  - CCF
  - eGFR 35
- Long term opioids

Outpatient Team

Hospital Medical Team
- Anaesthesia
- Intensive care
- Acute pain service
- Physician(s)
- Rehabilitation
- Orthopaedic surgery
- Complex (Chronic) pain
Current Team Models

- Australian Private model: surgeon + physician


**REVIEW**

**Evidence-based guide to perioperative medicine**

I. A. Scott, R. S. Lodge and D. M. Russell

Perioperative Medicine Working Group of the Internal Medicine Society of Australia and New Zealand RACP, Sydney,

Evidence of benefit?
Consultation vs Co-management

• Consultation - give opinion
• Co-management – ongoing review
  - ensures patient care
  - continues to engage surgeons
  - rules of engagement

• Low risk ? Benefit
• Targeted group – high risk

Siegal, *Journal of Hospital Medicine*, 2008
Skills for postoperative medicine?

- **5 skill sets:**
  - Surgical site management
  - Acute pain medicine
  - General medicine adapted to perioperative period
  - Rehabilitation
  - Resuscitation
The Status Quo...
### Some gross generalizations on skill sets...

<table>
<thead>
<tr>
<th>Intensivists</th>
<th>Physicians</th>
<th>Surgeons</th>
<th>Anaesthetists</th>
</tr>
</thead>
<tbody>
<tr>
<td>+/--OP site</td>
<td>? OP site</td>
<td>+ OP site</td>
<td>? OP site</td>
</tr>
<tr>
<td>+ Resus</td>
<td>+/- Resus</td>
<td>? Resus</td>
<td>+ Resus</td>
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</tbody>
</table>
Postoperative Care

1. Surveillance

2. Intervention

Complications after surgery

85,000 patients, 150 hospitals, median age 62
Mortality by hospital: 3.5 to 6.2%, quintiles
Failure to rescue after complications

Ghaferi et al, NEJM, 2009
Identify and manage deteriorating patients
**Deterioration: Sequential and Individualized**

<table>
<thead>
<tr>
<th>Before admission</th>
<th>At admission</th>
<th>At deterioration</th>
<th>After deterioration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Inter-hospital transfer</td>
<td>Number vital signs deranged</td>
<td>Response to therapy</td>
</tr>
<tr>
<td>Gender</td>
<td>Unplanned admission</td>
<td>Severity vital sign derangement</td>
<td>Quality and intensity of ongoing follow-up</td>
</tr>
<tr>
<td>Place of residence</td>
<td>Diagnostic category</td>
<td>Duration instability</td>
<td></td>
</tr>
<tr>
<td>Functional status</td>
<td>Severity of illness</td>
<td>Presence ↑ respiratory rate</td>
<td></td>
</tr>
<tr>
<td>Level of support</td>
<td></td>
<td>End-organ dysfunction</td>
<td></td>
</tr>
<tr>
<td>Nutritional status</td>
<td></td>
<td>Monitored area</td>
<td></td>
</tr>
<tr>
<td>Frailty</td>
<td></td>
<td>Staff availability</td>
<td></td>
</tr>
<tr>
<td>Extent and severity of co-morbidity</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Plan care with patients
avoid futility and allow death with dignity

In search of a good death
Diagnosing dying is an important clinical skill

Murphy, Medical Journal of Australia, 2008
Frailty and Disability

An Age Old Problem
A review of the care received by elderly patients undergoing surgery

A report by the National Confidential Enquiry into Patient Outcome and Death (2010)

Define, Measure, Intervene?

Frailty exists when the patient displays any 3 of the following:
- Unintentional weight loss (at least 4kg in last year)
- Self-reported exhaustion
- Weak grip strength
- Slow walking speed
- Low physical activity

Figure 3.1. The Canadian Veterans Heart Study
Definition of frailty
Herald Sun

REVEALED: Secret police files expose schools shame

KIDS, 11 DEAL DRUGS

Angel Annabel’s birthday joy

Last hope for Ben
How
Definitions

International agreement for consistency and comparison

- Comorbidity
- Surgical procedures
- Complications
- Interventions

Warnen, *Anesthesiology* 2007

- Compare outcomes among institutions
- Frequency and severity for clinical trials and personal anesthesia practice
- Prevent disparate definitions influencing public perception of care
Possibilities…

Future studies
• POST for entire hospital stay?
• Consultant rounds?
• Complications?
• Mortality after complications?
• Long term outcomes
Melbourne Study
Postoperative complications and mortality in older patients having non-cardiac surgery at three Melbourne teaching hospitals

McNicol et al, Medical Journal of Australia, 2007

- 1,100 patients
- 30 Day mortality 61 patients (5.5%)
- Complications within the first five days
  - 208 patients (19%)
Perioperative Mortality (POM) risk score

Cumulative Risk Score
Three preop “As”:
- Age
- ASA
- Albumin

Three postop “Is”:
- Unplanned ICU
- Systemic Inflammation
- Acute kidney Injury

<table>
<thead>
<tr>
<th>Variable</th>
<th>Status</th>
<th>Score</th>
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</thead>
<tbody>
<tr>
<td><strong>Preoperative</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, y</td>
<td>70-79</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>80-89</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>≥90</td>
<td>6</td>
</tr>
<tr>
<td>ASA status</td>
<td>1+2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Albumin (g/l)</td>
<td>&lt;30</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Postoperative</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unplanned ICU admission</td>
<td>Yes</td>
<td>4</td>
</tr>
<tr>
<td>Systemic inflammation</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>Acute renal impairment</td>
<td>Yes</td>
<td>2.5</td>
</tr>
</tbody>
</table>

REASON Total: 4,158 patients, 23 Hospitals

20% one or more complications within 5 days
10% critical care within 5 days
5% died within 30 days
### 4As and 3Is: The REASON score

30-day Mortality 70 yr old, ASA 2, elective surgery = 1% (at least)

<table>
<thead>
<tr>
<th>Preop Variables</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (per 10 yrs)</td>
<td>+2</td>
</tr>
<tr>
<td>Albumin &lt; 30 g/L</td>
<td>+2</td>
</tr>
<tr>
<td>A+E surgery</td>
<td>+2</td>
</tr>
<tr>
<td>ASA</td>
<td></td>
</tr>
<tr>
<td>ASA 3</td>
<td>+3</td>
</tr>
<tr>
<td>ASA 4</td>
<td>+4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postop Variables</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute renal Impairment</td>
<td>+3</td>
</tr>
<tr>
<td>Inflammation + Sepsis</td>
<td>+3</td>
</tr>
<tr>
<td>Unplanned ICU</td>
<td>+3</td>
</tr>
</tbody>
</table>

**Risk scores: sequential? Value?**

“At least” 30-day mortality estimate: add ORs to 1%

- 80 yr old, ASA 4, Albumin 28 g/L, emergency lap chole, post op sepsis + unplanned ICU
  - Pre op = 1 + 2 + 2 + (3 + 4) + 2 = 14% 30-day mortality
  - Post op = 1 + 2 + 2 + (3 + 4) + 2 + 3 + 3 = 20% 30-day mortality
CPX?
No large RCTS – risk and management?

West et al, *Best Practice and Research, Clinical Anaesthesiology*, 2011
Exercise and Nutrition?

Pre-habilitation?

Limited evidence

Preoperative nutrition?
Pain

• Individulized plans
• Measurement
• Research outcome measures
• Long term

Reeves, *Australasian Anaesthesia*, 2011
Economic analyses

Cost evaluation of cardiovascular magnetic resonance versus coronary angiography for the diagnostic work-up of coronary artery disease
   Moschetti K, et al
   *Journal of Cardiovascular Magnetic Resonance* 2012

Cost analysis of re-exploration for bleeding after coronary artery bypass graft surgery
   Alstrom U, et al
   *BJA* 2011
• Professor and Chair of Anaesthesia

• Head, Centre for Anaesthesia, Perioperative and Pain Medicine
Network
Future Research

- Modulate inflammation / immune
  Gen surg sepsis 4% vs PE 0.3% Moore et al, Ann Surg, 2010
- Quantify frailty NCEPOD 2010

RCTs:
- Nutrition, Fluids, Goal directed therapy
- Operation invasiveness + time
- Anaesthetic technique and pain management
  - Banz et al, Anesth Analg, 2010
- Exercise
- Postop ward rounds

Intervention vs usual care

Large RCTs or Bundle studies?

Ongoing Research Collaboration…
Physicians and Intensivists
Surgeons
Administration
...and Anaesthetists

Thank you!