Clinical events and indicators in the Post Anaesthetic Care Unit (PACU): A New Zealand perspective

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Nga Mihi

E nga mana
E nga reo
E nga iwi o te motu

Tena Koutou, Tena Koutou,
Tena Tatou Katoa
Content

• Where?
• Who?
• Why?
• When?
• What?
Where?
Latitude: 41° 17', South.
Longitude: 174° 47', East
New Zealand

Facts:

• Population: 4.2 million
• Capital: Wellington
• Major languages: English, Maori
• Life expectancy: 76 years (men), 81 years (women)
Healthcare in New Zealand

- Essentially publicly funded
- 8.9% of GDP on health care
- District Health Boards
Wellington Regional Hospital
Post Anaesthetic Nurses Course

Course Description

• A two-day course covering care of the Post Anaesthetic Patient.

• A mixture of hands on scenario-based learning and focussed tutorials
National PACU course
What are the chances of an event?

Audits reveal it is low.

- 2.5% cardiovascular
- 1.5% respiratory
- 1.5% hypothermia
- 1.2% excessive pain
- 0.25% prolonged sedation

Peskett, 1999
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**PACU EVENT AUDIT**

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**DID ANY OF THESE EVENTS OCCUR?**

- CONSCIOUSNESS
- Agitation / Hitting / Treatment
- INJURY / WOUND
- Seizure / 20% Oxygen
- Airway Obstruction Above Larynx
- Sino / Laryngeal
- Bronchospasm
- Pulmonary Edema
- RESP Rate + Stimulate
- Naloxone Given
- Neuroablation
- IV IV Required

- ANESTHETIC
- Arrhythmia / Bradycardia / Bradycardia Treated
- LOW BP Treated
- HIGH BP Treated
- CPR Given

- ANAESTHETIC ASSISTANCE
- Pain - Extra Prescritption Required
- Antimetic - Extra Prescription Required
- Respiratory Neuramsscular Block
- Line Anesthetic Summoned
- Unavailable / Anesthetic - Another Called
- Emergency Button Pushed

**DELY REASON**

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When?

- November 2010 to April 2011
- 6 months of patient data
- 7142 patients
- Retrospective observational study
What?
**PACU DATA FROM ORSOS CUSTOM SCREEN**

CASES THROUGH RECOVERY 01/11/2010 - 30/04/2011
Prepared for Owen Ashwell 30/6/2011 by Ankh Spice, Operating Theatres

**NOTES:**
1. Excludes cases with no PACU dates and/or time points AND with no tickboxes populated.
2. Cases with time points are zero but tickboxes are populated are shown in RED FONT in the dataset.
3. Cases where time points contain data but tickboxes are not populated are shown in BOLD FONT in the dataset.
4. Dataset columns included only for calculating counts, categorising or quantifying uncoded data are shown in BLUE FONT/HIGHLIGHT in the dataset.
5. Oxygen saturation less than 95% or oxygen data is not available.
6. Where possible, some data has been corrected for obvious data entry errors post-extraction (i.e. post-midnight dates/time). All other errors, incomplete or missing data is as a result of insufficiently robust entry into ORSOS.

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Sex of patients

N = 7142

Females = 4164  Males = 2978

Female: 57.89%  Male: 41.4%
Age category

76% females in the 26-35 age group

N = 7142
ASA grade

N = 7142
Level of consciousness

- Unresponsive: 39.63%
- Respond to voice: 21.56%
- Responds to pain: 23.53%
- Awake: 3.22%

N = 7142
Airway support on arrival to PACU

N = 7142
Length of stay in PACU

N = 7142
Blood pressure on arrival to PACU

N = 7142
Heart rate on arrival to PACU

N = 7142

- Low for pt: 1.09%
- Acceptable: 82.76%
- High for pt: 3.65%
Temperature on arrival to PACU

N = 7142
Pain on admission to PACU

N = 7142
Nausea and vomiting

N = 7142

- Nil: 6102
- Nausea/no vomit: 134
- Vomit: 16

Total: 7142
LOC, Complications, ASA & Age

FIGURE 1.—Complications and ASA Grade. The frequency of patients having one or more respiratory complication in relation to ASA grade and level of consciousness on arrival in the recovery room. Level of consciousness: 1 = awake, 2 = responsive only to verbal command, 3 = responsive only to physical stimulation, 4 = unresponsive.

FIGURE 2.—Complications and Age. The frequency of patients having one or more respiratory complication in relation to age and level of consciousness on arrival in the recovery room. Level of consciousness: 1 = awake, 2 = responsive only to verbal command, 3 = responsive only to physical stimulation, 4 = unresponsive.

Parr et al, 1991
Respiratory markers

- Pulmonary oedema (30)
- Stridor/laryngospasm (8)
- Airway obstruction above larynx (5)
- Bronchospasm (2)
- IPPV required (2)
- Naloxone given (2)
- Respirate <8/min (1)

N = 7142
Respiratory markers

- Pulmonary oedema: 30
- Airway obstruction above larynx: 5
- Stridor/laryngospasm: 8
- Bronchospasm: 2
- Resp rate <8/min: 1
- Naloxone given: 5
- Reintubated: 0
- IPPV required: 2

Total: N = 7142
Respiratory problems

Range from 1.3 % to 2.95%.

Related:
- ASA grade
- Level of consciousness
- Age (> 60 yrs)
- Males
- Obesity
- CORD
- Smokers
- Renal disease

0.64%
- ASA 1(6), ASA 2(19), ASA 3(19), ASA 4(2)
- 57% unconscious (32% responded to pain or voice)
- Nearly 50% >60 years (8 cases out of 12 laryngospasm aged 1-10 yrs)
- 53% female

2011 study

Cardiovascular markers

- Arrhythmia/tachy/bradycardia treated (111)
- Low BP treated (30)
- High BP treated (30)
- CPR given (1)

N = 7142
Types of cardiovascular problems

- Hypotension 1.2 - 2.2%
- Hypertension 0.6 - 2.0%
- Bradycardia 0.4 - 2.5%
- Tachycardia 0.1 - 0.9%

Rose et al 1996, Peskett 1999

2011 study

- 5.05% (0.42% required treatment)
- 2.85% (0.42% required treatment)
- 1.09% (1.55% required treatment)
- 3.65%
Anaesthetist assistance required

- List anaesthetist summoned (314)
- PAIN – extra Rx required (205)
- Antiemetic – extra Rx required (33)
- Emergency button pushed (7)
- List anaesthetist unavailable – another called (101)
- Residual neuromuscular block (8)

N = 7142
Study results

Audits reveal it is low.

- 2.5% cardiovascular
- 1.5% respiratory
- 1.5% hypothermia
- 1.2% excessive pain
- 0.25% prolonged sedation

2011 study

- 2.4% cardiovascular
- 0.64% respiratory
- 0.49% hypothermia
- 2.14% excessive pain
Summary

- 7192 patients from November 2010 to April 2011
- 1186 more females than males
- Average age 41 years, most common age group 26-35
- ASA 2 and 3
- 40% of patients unconscious on admission
- 54% required no airway support. LMA the most common airway adjunct (18.7%)
- Majority of patients 1 to 2 hour length of stay
• 46 patients had a respiratory event
  Airway obstruction above larynx (5 cases), Stridor/laryngospasm (8 cases), Bronchospasm (2 cases) Pulmonary oedema (30 cases) Resp rate<8/min (1 case) Naloxone given (5 cases) Reintubated (0 cases) IPPV required (2 cases)

• 172 patients had a cardiovascular event
  Arrhythmia/tachy/bradycardia treated (111 cases) Low BP treated (30 cases) High BP treated (30 cases) CPR given (1 case)

• Relatively low rates of excessive pain, nausea

• 668 patients required anaesthetist input
  PAIN – extra Rx reqd (205 cases) Antiemetic – extra Rx reqd (33 cases) Residual neuromuscular block (8 cases) List anaesthetist summoned (314) List anaesthetist unavailable – another called (101 cases) Emergency button pushed (7 cases)

• And nobody died! Woohoo!!
Where to from here?

• How will the results change what I teach?
• Aid practice
• Recommendations
• Limitations
He aha te mea nui o te ao?
He tangata! He tangata! He tangata!

What is the most important thing in the world?
It is people! It is people! It is people!


Clinical events and indicators in the Post Anaesthetic Care Unit (PACU): A New Zealand perspective

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