Case Study 2

How Many Times is Enough?

When can we ethically pull out?
Setting the Scene

- 82 yr old medical admission
- Fever
- Tachycardia
- SOB
- Cough for 3/52
5/18/12 0400

**Medical Admission:** Reit for Stride

**Temperature:** 82°

- **Sputum:** [COX]
- **SoS:** [COX]
- **Cough:** [COX]
- **Respiratory:** [COX]
- **LRTI:** [COX]

**HPC:** Unwell, I cough for 3/52

- **Runny @ Home**: 1/14, 1/01 A 38°
- **Pick:** Similar sx.

- **Started:** I sore throat cough
- **Seen:** GP 7/21/10, epidural
- **Generally:** Weak, confused today
- **Feel:** Backwards in toilet, hit head 3 small lac

**Urine:**

- **NA:** Ongoing [COX]
- **Conf.** [COX] (Cough/weakness)
- **Main reason:** For prednisone
- **Cough:** Collapses @ home

**Denies:** CP [COX] (N/V)

**Meds:**

- **COD:** [COX]
- **Rescue:** [COX]
- **Aspirin:** [COX]
- **Vit D:** [COX]
- **PN Panadale extra:** [COX]

**BMI:**

<table>
<thead>
<tr>
<th>BMI</th>
<th>21.7</th>
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**Med:**

- **ureter:** [COX]
- **Rescue:** [COX]
- **Aspirin:** [COX]
- **Vit D:** [COX]
- **PN Panadale extra:** [COX]

**NKOA:**

- **BP:** 135/84
- **HR:** 74/14
- **Sp O2:** 98%
5/8/12

Social: "[illegible]"

Cont:
- ETOH

ECG-Cigs (quit ~ 30 yrs ago)

T x To I lead 0.12 = NSTEMI
- WCC/CREA = LRT 1
- ECG: ST LAD ST dep II, III, avF QRS 474

O/E:
- T 38°-39°
- HR 82 SR
- BP 129/72
- HSOMM, DUNNE, paroxysmal atrial fibrillation
- Jt dilat urethra K7L
- SpO2 97% on 4L
- 
- BS present
- Calfus soft, bilateral tenderness

Imp: NSTEMI, likely bacterial LRT1 2° Viral infection

Plan: ACS pathway, CCU lead
- ASA, PLAVIX, CLOXANE
- GENTLE IVF (CHAS Beware Cr)
- IV BENEFIX AZITHRIO
- Augment NFA
- BC of T 738°
- Optic deep SpO2 93%
Ward Round Dr Stride

- NSTEMI
  - Infiltrates on CXR - fluid and signs of infection; bilateral crackles R>L
  - CRP 112 (C-Reactive Protein is predictive with subsequent cardiac events)
  - WBC 26.9 (Indicates infection)
  - Troponin 0.1 (specific and sensitive to cardiac muscle damage - not normally detected)
  - +ve D-Dimer (presence indicates deep vein thrombosis, myocardial infarction)
- Confusion/ Delirium - new onset ? chronic
- Seek multidisciplinary team input and assessment
Acute Coronary Syndrome - looking at changes on ECG (Electrocardiograph)

- ST elevation myocardial infarction (injury) - STEMI

- Non-ST elevation myocardial infarction (injury) - NSTEMI

→ Injury to the heart cells that affect how the heart sends messages to contract/move all the chambers
ST segment Elevation

INFERIOR SIDE

ANTERIOR SIDE
Plan-Medical

- CTPA- rule out PE
- IVT commenced
- IDC inserted
- Nasal prong oxygen and regular nebulisers
- Acute Coronary Syndrome pathway
Adult Deterioration Detection System

- Observations implemented in all areas of the hospital to identify small changes in patient observation

- Episodes of deterioration fall in the shaded areas and gives the nurses boundaries and strategies to act on for each score

- Each set of observations must be scored

- This is adding of scores can be non-compliant

- Time consuming/ confusing/ not seen as necessary
### Adult Deterioration Detection System (ADDS)

If any observation is in a shaded area, add up the Total ADDS Score and take action.

- Score 0
- Score 1
- Score 2
- Score 3
- MET call

#### Actions Required

**Total ADDS Score 1–3**
- Record observations at least once every 4 hours
- Carry out appropriate interventions as prescribed
- Manage fever, pain or distress
- Review O₂ delivery
- Consider informing Team Leader

**Total ADDS Score 4–5**
- Ward doctor to review patient within 30 minutes
- Request review, and note on the back of this form
- Notify Team Leader
- Record observations at least once every 30 minutes
- If patient must leave ward area, Nurse must accompany patient

**Total ADDS Score 6–7**
- Registrar to review patient within 30 minutes
- Request review, and note on the back of this form
- Registrar to ensure Consultant is notified
- Ward doctor to attend
- If patient must leave ward area, Intern and Nurse must accompany patient

**Total ADDS Score ≥ 8**
- Consider MET call
- Registrar to review patient within 10 minutes
- Request review, and note on the back of this form
- Registrar to ensure Consultant is notified
- If patient must leave ward area, Registrar and Nurse must accompany patient

#### Medical Emergency Team (MET) call if:

- Any observation is in a purple area
- Airway threat
- Respiratory or cardiac arrest
- New drop in O₂ saturation < 90%
- Sudden fall in level of consciousness
- Seizure
- You are seriously worried about the patient but they do not fit the above criteria
Early Warning Systems

- Initiatives to ensure safety and quality of care
- Emphasis early detection and preventative management of sudden deterioration
  - Medical Emergency Team
  - ICU Outreach team to bridge the gap between ICU and ward areas
Clinical Signs of Deterioration

* Signs of deterioration occur up to 24hrs before the event
  - Low oxygen saturations
  - Hypotension
  - Bradycardia
  - Tachycardia
  - Fall of consciousness - glasgow coma score
MET call
no ARP

Decision
to

Resuscitate & Intubate

MET call - VSats, uncooperative, agitated

Sat 82% I/S

6/12. MET call @ 12:01.
12:51. Strike patient, 82 y/o, 8:
PM. Admitted with ? influenza,
red eye.
Rapid determination this worse.
No dentistry is available yet.
Plan on strike round.
Requested dental superintendant + 1 staff
W. flucloxacinil + azithromycin + treat.
CZ, 80mg fomepizole IV. GTN with Erg.
ABC pH 7.20, PCO2 57, PO2 79 mm
Hg, O2 0.80.
Held planning once drowsy.
ECU RN, + decision made to
intubate.
Will be RN in ECM. Dr Tim
accessible in attendance.

12:36
intubated. Daughter informed what had
happened, will be coming to visit. Transfer
in to ICU.
GCS 8

Unable to maintain airway

Intubation to maintain airway
ICU Admission

- Type 1 Respiratory Failure
- Influenza A and Pneumonia
- Complicated by
  - NSTEMI
  - acute kidney injury (AKI)
Ventilation- ICU
Changing Times

Iron Lung!
Negative Pressure Ventilation

NOW
Positive Pressure Ventilation
And LOTS MORE!!
INSPIRATION ACTIVE

• Diaphragm contracts and intercostals raise

• Lungs pulled outward by the thoracic wall

• Volume of thoracic cage is increased

• Negative pressure created

• Allows air at atmospheric pressure to flow into the lungs until intrapulmonic pressure is equal to atmospheric pressure.
Negative Pressure Ventilation

* EXPIRATION
* Passive
* Thoracic cage and lungs recoil to their original size

Diaphragm relaxes (Moves up)
Positive Pressure Ventilation

- Forces air into the lungs so that the pressure in the lungs > atmospheric pressure
- Expiration still occurs passively
  - Altered distribution of gases
  - Venous return may be impeded
  - Haemodynamic compromise
  - Patient may require intravenous volume support
Modes of Ventilation

- A/C
- CMV
- SIMV
- CPAP
- PSV
- PCV
- BiLevel
Difficult Airways

- Alternative ways to ventilate
  - Prone positioning
  - Nitric oxide
  - Prostacyclin
  - Bilevel (high PEEP)
PEEP—Positive End Expiratory Pressure

* Indications
  * Prevention and/or reversal of atelectasis
  * Improving of oxygenation, therefore allowing lower $\text{FiO}_2$ to be utilised

* Potential adverse effects
  * Decreased cardiac output due to increase in intrathoracic pressure
  * Barotrauma
  * Increased ICP
### Ventilation Observations

**Where do you start?**

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82 yr old- Influenza

Plan A

- Extubate Day 2
- Continue only light sedation
- Extubated- failed
- Hypertensive crisis and
- flash APO
- REINTUBATED
Plan B

- Failed extubation again!
- Difficulty transferring from invasive ventilation to non-invasive
- Hypertensive
- Poor secretion control
Non-invasive Ventilation

defined as the provision of ventilatory support without the use of an endotracheal tube

Face or nasal mask, attached by circuit to a mechanical ventilator or BiPAP machine

more common in ICU’s and ED’s with improving technology
The key advantages is that it:

• Avoids intubation

• Eliminating associated complications

• Improving patient comfort

• Allowing the patient to eat and speak
BiPAP

2 levels of Pressure:

→ IPAP (Inspiratory Positive Airway Pressure)
  Supporting inspiratory breaths to a set pressure

→ EPAP (Expiratory Positive Airway Pressure)
  Essentially the same as PEEP
Common ICU Weaning Complications

- Tumour/foreign body
- Epiglottitis/obstruction/laryngospasm
- Bronchoconstriction
- Retained secretions
- Anaphylaxis/oedematous airways
- Coughing/gagging/vomiting/attempting to talk
- Fighting the ventilator
Complications to Plan

Delirium

Aggression

Hypertension

- Influenza + CAP, started > 24 hrs
- Delirium + aggression
- Physical restraint/chemical restraint/settle

- Diabetic dysfunction, episodes APO
  - better controlled on Carvedilol/Captopril/Prozac
  - SNP infusion, PRN Metoprolol, PRN NA

Seems reasonably settled currently, sitting higher in bed
(used to be borderline obstructing, required restraint +
not as aggressive a care, sometimes cooperative
ables to stand all day)
Constipation

? Cause of delirium
ICU Delirium

• Often referred to as ICU Syndrome

• Delirium defined as:
  “Range of behavioural & neuropsychiatric disorders during critical illness”

• Sudden reduction in cognitive ability

• Risk factors:
  → Sleep deprivation
  → Older patient
  → Co-morbidities
  → Prolonged sedation & pharmacologic agents
Delirium - Assessment

Confusion Assessment Method
CAM ICU + ve

GCS Score
4T6
446

Extubated from PSV to BiPAP
Plan C

- Family Meeting
- What are the options?
  - Surgical tracheostomy
  - Percutaneous tracheostomy unable to be performed due to anatomy
Surgical Tracheostomy

ICA Consultant Note Family Meeting 2

Indications:

- General update

Surgical Tracheostomy consent

Present - Wife (Consent), Dr (S/W:
- Helen, Sarah, Paul, Helen, Liga (Daughter)
- Angela (Wife), Emanuel (Grandson)

Consent - Eegnoses - no work on ward round
- Difficulty with tracheostomy from massive edema
- Competing and synchronous problems
- For further level of evaluation
  - If failure and no further radicle cause
    than for surgical tracheostomy
  - Would attempt further evaluation if radicle cause identified

Difficult anatomy for tracheostomy with very short extra-nose distance

Surgical Tracheostomy discussed in detail with Angela, Helen
not until consent signed

Note that Helen is less inclined to tracheostomy
than the rest of the family, but did perceive
in the consent discussion

We will not proceed to tracheostomy until
further discussion with Helen, Angela, David
How many times is enough?

Currently intubated for 4th time.

① Initial intubation in OR on 8/8/12

② Failed extubation 7/18/12 try to HTN then APO. Reintubated

③ Failed extubation 13/18/12 no cough, secretion clearness. Reintubated after 4hr

④ Extubated 18/12 for 3 days. Reintubated last night (12.20) - secretion retention.
Plan D

- Surgical Tracheostomy denied
- Anatomy of larynx retrosternal deemed not appropriate for RDH as no ENT specialist available
- Keep trying to extubate trial of T-Piece
- Control ICU Delirium
Extubated 7/8 - reintubated (hypertensive & APO)
Extubated 13/8 - reintubated after 4 hrs (large secretions)
Extubated 17/8 - reintubated 3 days later (type 2 respiratory failure)
Extubated 24/8 .......... will he need further respiratory support?

How long can a patient be intubated for?
“ARP has not been completed. It is felt that this gentleman would not benefit from further ICU admission unless there is an improved cognitive state. There needs to be discussion with the family. Attempts to organise a formal meeting will continue. The ICU Consultant is agreeable to have discussions with the family once the patient is transferred to the ward”
Acute Resuscitation Plan

2. Capacity assessment

- [ ] I believe that the patient has capacity* to consent to and/or refuse medical treatment.
- [x] I believe that the patient does not have capacity to consent to and/or refuse medical treatment.

If there is a change in capacity, this form must be reviewed.

Details of assessment:

3.9.12

* A patient with capacity can understand information about their medical treatment and treatment options, weigh up the benefits, risks and burdens of each choice and freely and voluntarily make and communicate a decision. Please refer to the Capacity Assessment Clinical Guidelines for further information.

3. Resuscitation management plan

If an acute deterioration or critical event occurs, it is clinically indicated to:

Provide e.g. ventilation, IV fluids, supportive therapies

- MET calls
- Defibrillation, intubation
- Discuss with ICU
- IV fluids, IV antibiotics

Not provide e.g. defibrillation, intubation, antibiotics

There is further documentation in the progress notes on the following dates: 3.9.12

If a cardiac or respiratory arrest occurs, it is clinically appropriate to:

- [ ] Provide  
- [ ] Do not provide

A decision not to provide CPR does not limit other treatment or care
Summary

Ongoing chest physio

Re-orientation to ward/ environment/ ADLs

Nutrition

Mobility