



Barwon  
Health

# PROGNOSTICATION IN CRITICALLY ILL PATIENTS

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# Cases

## Prognostic tools

## Geelong experience



# case 1

- 38yo M with septic shock
  - Necrotising fasciitis to RUL.
  - Intubated for surgical debridement.
  - Appropriate antibiotics started on admission.
  - High dose vasopressor requirements.
  - No organ failure.

## What is his prognosis?



## case 2

- 65yo M with Childs Pugh C cirrhosis
  - 5<sup>th</sup> admission for the year with hematemesis and melena.
  - Required massive transfusion.
  - Initial management:
    - Gastroscopy/banding
    - Sengstaken NG tube
  - Day 3 of admission – more bleeding.
    - Has TIPS procedure, continues to bleed and now in multi-organ failure.

## What is his prognosis?



## case 3

- 60 year F otherwise fit and well
  - Influenza A complicated by ARDS.
  - Complicated by:
    - Bilateral pneumothoraces managed with ICCs.
    - AKI requiring CRRT.
  - Tracheostomy on day 14.
  - Day 25 – Septic shock. Candidemia.
    - High dose vasopressors (Norad, Adrenalin, Vasopressin)

## What is her prognosis?



## case 4

- Same 60 year old ... survived her candidemia but developed digital ischemia.
  - Bilateral forefoot amputations.
- Now day 40 in ICU.
- Remains dialysis dependent.
- Hasn't been able to wean off ventilator due to severe ICU acquired weakness.

What is her prognosis?



# Why Prognosticate?

Pts and families want to know.

Resource allocation.

Compare hospital performance and case mix.

Compare predicted and observed outcomes.

Research purposes.



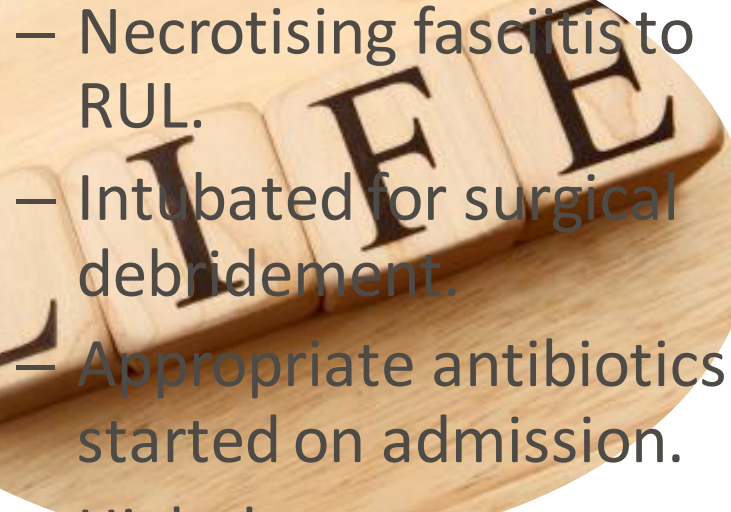



# Prognostication is Easy

- 38yo M with septic shock

**versus**

- 65yo M with Childs Pugh C cirrhosis

- 
- Necrotising fasciitis to RUL.
  - Intubated for surgical debridement.
  - Appropriate antibiotics started on admission.
  - High dose vasopressor requirements.
  - No organ failure.

- 
- 5<sup>th</sup> admission for the year with hematemesis and melena.
  - Required massive transfusion<sub>1</sub>
  - Initial management:
    - Gastroscopy/banding
    - Sengstaken NG tube
  - Day 3 of admission – more bleeding.
  - Has TIPS procedure, continues to bleed and now in multi-organ failure.





# Prognostication is hard

60 year old otherwise fit and well  
Medical advances.

Influenza A complicated by ARDS.  
Have the right diagnosis.

Complicated by  
Medical disorders can behave unpredictably.

managed with ICCs  
What are we prognosticating? Life vs death,

AKI requiring CRRT.  
independently mobile vs wheelchair, home vs nursing home?

Day 25 – Septic shock.  
Candidemia.

- High dose vasopressors (Norad, Adrenalin, Vasopressin)

- Same 60 year old ... survived her candidemia but developed digital ischemia.

Bilateral foot amputations.

- Remains dialysis dependent.
- Hasn't been able to wean off ventilator due to severe ICU acquired weakness.





**Prognostic  
Scores**

**Clinical  
Judgement**





**Barwon  
Health**

# **Prognostic Scoring Systems**

# Scoring systems

## ICU SCORING SYSTEMS

**APACHE  
II, III, IV**

**SAPS**

**SOFA**

**TISS**

## DISEASE SPECIFIC SCORING SYSTEMS

**RANSON'S**

**PESI**

**NELA**

**PSI**



# ICU Scoring systems

**APACHE  
II, III, IV**

**SAPS  
I, II**

**SOFA**

**MPM**

**AND  
MANY  
MORE ...**





# Clinical Judgement



# Life or Death ...

- Detsky 2017
  - Predicting in-hospital mortality
    - Physicians +LR 7.32 -LR 0.61
    - Best when physicians confident and have objective clinical variables.
- Coleman 2008
  - ICU doctors predicting death within 60mins of withdrawal of mechanical ventilation.
    - Specificity 77%
    - Sensitivity 89%





# Is that the right question?

- Improving ICU survival
  - NEJM 2014 – Australian survival from severe sepsis and septic shock.
    - From 35% to 18%.
  - Lancet 2017 – Multinational study across SE Asia of patients with severe sepsis.
    - 13% 28day mortality

Most patients with will survive ...



# Survive With or Without Disability

- Rabiee 2016
  - 30% of ICU survivors with clinically important depressive symptoms.
- Hodgson 2017
  - Patient reported outcomes: 6months
  - Mild disability 50%
  - Moderate/severe disability 25%
    - Risk factors:
      - Previous hx of depression or anxiety
      - Separation or divorce.
      - Longer duration of mechanical ventilation.
      - Discharge to another hospital or rehab vs home.



# Dying with Dignity



## Distribution of value preferences by gender for all participants

Male

Female

P-value

Number	132		349		
Age	58.6 ( $\pm$ 17.4)		54.9 ( $\pm$ 15.9)		0.03
Dignity	5 [4,5]	4.54 ( $\pm$ 0.67)	5 [5,5]	4.76 ( $\pm$ 0.54)	<0.0001
Pain and suffering	5 [4,5]	4.59 ( $\pm$ 0.64)	5 [4,5]	4.69 ( $\pm$ 0.58)	0.06
Longevity	3 [2,4]	3.01 ( $\pm$ 1.19)	3 [2,4]	3.01( $\pm$ 1.13)	0.97
Independence	5 [4,5]	4.37 ( $\pm$ 0.76)	5 [4,5]	4.52 ( $\pm$ 0.68)	0.05



1. Data are shown as median [IQR], number (%), or mean ( $\pm$ SD)

Milnes, S., et al. "Patient values informing medical treatment: a pilot community and advance care planning survey." *BMJ supportive & palliative care* (2017): bmjspcare-2016.



OUR VALUES / RESPECT / COMPASSION / COMMITMENT / ACCOUNTABILITY / INNOVATION

Use prognostication to help identify patients that may not benefit from full intensive care management.

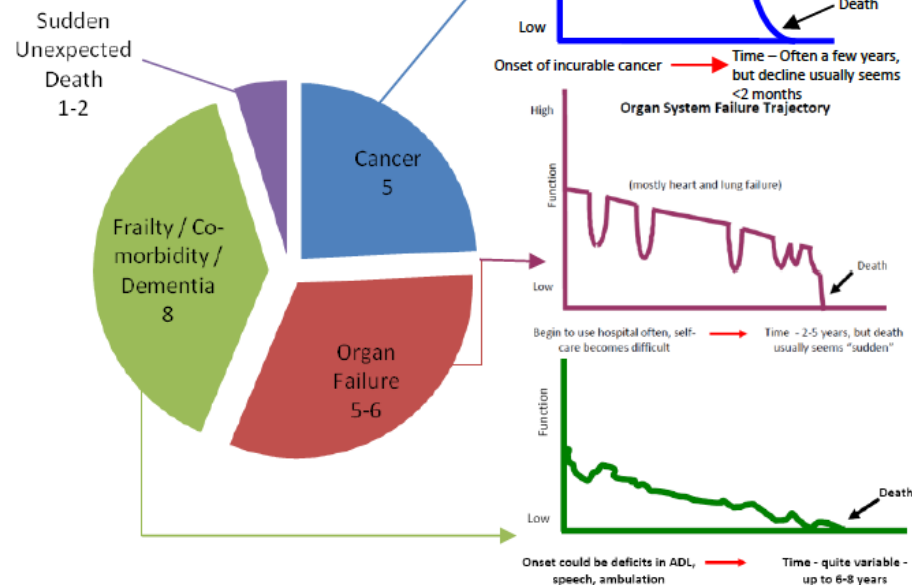
Enables shared decision making.

Use non-ICU specific tools.



# Gold Standards Framework

Average GP's workload – average 20 deaths/GP/year approx. proportions



## Clinical Frailty Scale



**1 Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.



**2 Well** – People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally, e.g. seasonally.



**3 Managing Well** – People whose medical problems are well controlled, but are not regularly active beyond routine walking.



**4 Vulnerable** – While not dependent on others for daily help, often symptoms limit activities. A common complaint is being "slowed up", and/or being tired during the day.



**5 Mildly Frail** – These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.



**6 Moderately Frail** – People need help with all outside activities and with keeping house. Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.



**7 Severely Frail** – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).



**8 Very Severely Frail** – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.



**9 Terminally Ill** – Approaching the end of life. This category applies to people with a life expectancy <6 months, who are not otherwise evidently frail.

## Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.



# GSF Validated in Acute Hospital

O'Callaghan 2014

At 12 months: Sn = 62% Sp = 92%

**Table 2.** Relative risk and odds ratio of death between 'identified' ( $n = 99$ ) and 'non-identified' ( $n = 402$ ) groups at 6 and 12 months.

Time	Group	Deaths	Relative risk	95% CI	Odds ratio	95% CI
6 months	'Identified' group	56	10.82**	6.89–16.99	23.63**	12.57–44.75
	'Non-identified' group	21				
12 months	'Identified' group	67	6.80**	4.91–9.40	18.94**	10.76–33.53
	'Non-identified' group	40				

CI: confidence interval.

\*\* $p < 0.001$ .





# Life Limiting Illness and ICU

Orford 2016

ICU referrals over 1 year.

30% of all referrals were patients with an LLI.

Those with LLIs and admitted to ICU had:

- Prolonged hospital length of stay

- Loss of independence

- High 1 year mortality



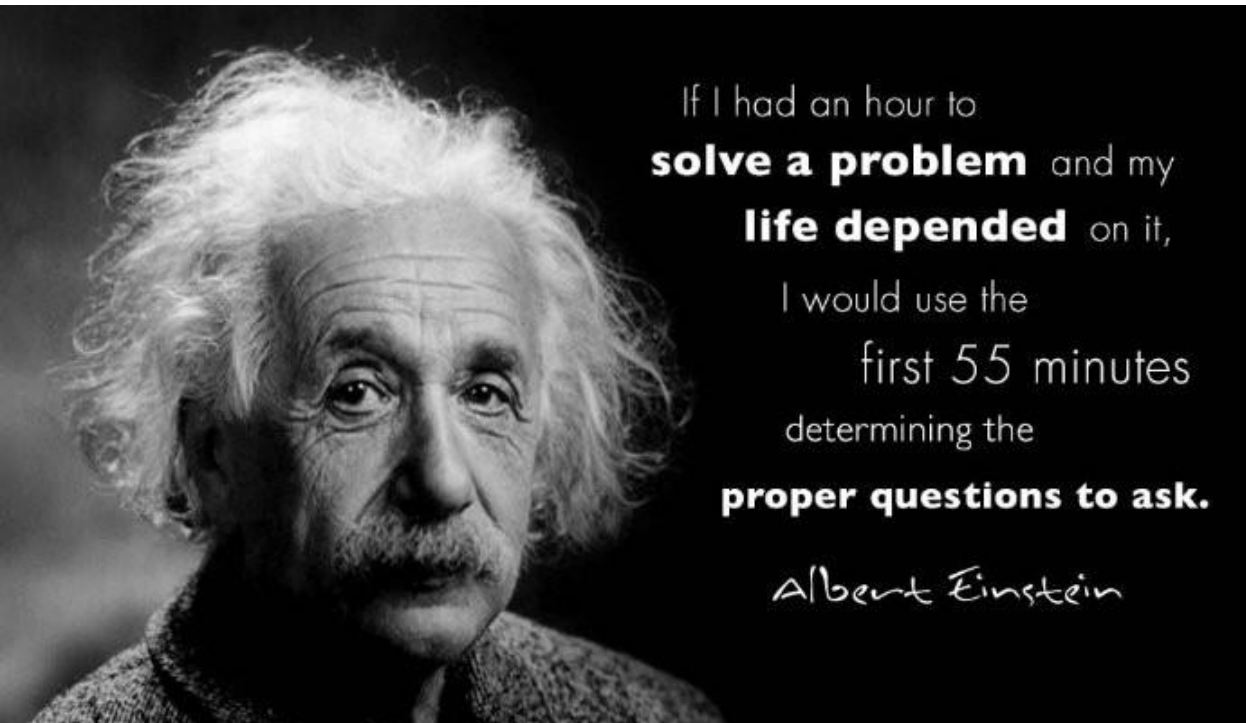


## i-Validate Functional and Clinical Indicators

Life    Limiting    Illness    Disease    Trajectory

1. **Cancer** – metastatic or not amenable to treatment
  
2. **Functional Decline**
  - **Dementia** – no consistent meaningful conversation or needs assistance with ADL
  - **Frailty** – Clinical Frailty Score 6 – 9
  - **Resides in high level care facility**
  
3. **Organ Failure**
  - **Congestive cardiac failure** – NYHA stage III/IV or reduced exercise tolerance
  - **COPD** – disease assessed as severe e.g. long term oxygen therapy/home oxygen or SOB at 100m on level ground or FEV1 <30% predicted
  - **Renal Failure** – stage 5 chronic renal failure or long term dialysis or not for dialysis or eGFR < 15 ml/min
  - **Neurological Disease**
    - **Stroke** – minimal conscious state or dense hemiparesis
    - **Parkinson's Disease** – assistance with ADL or falls or difficulty swallowing
    - **Multiple Sclerosis** – dysphagia
    - **Motor Neurone Disease** – rapid decline or episode of aspiration pneumonia

# Summary



ถ้าฉันมีเวลาหนึ่งชั่วโมงใน  
การแก้ปัญหา  
และชีวิตฉันขึ้นอยู่กับมัน  
ฉันจะใช้เวลา 55 นาทีแรก  
เพื่อหาคำถามที่ถูกต้อง

