

## Mission Statement

To reduce the no. of inappropriate feeding interruption episodes\* per 100 patient enteral feeding days from 18 to 0 in MICU patients in 6 months

\*as defined by withholding of feeds when aspirates <250ml; extended period of fasting prior extubation (>2hr); stopping of feeds for standard procedures as stated in protocol; unstated reasons for feed interruption

## Team Members

| Name            | Designation                   | Department                                                |
|-----------------|-------------------------------|-----------------------------------------------------------|
| Ng Puay Shi     | Principal Dietitian           | Nutrition and Dietetics                                   |
| Dr Jonathan Tan | Snr Consultant, SICU Director | Dept of Anaesthesiology, Intensive Care and Pain Medicine |
| Dr Sennen Lew   | Consultant                    | Dept of Respiratory Medicine                              |
| Lorraine Tan    | MICU Nurse Clinician          | Nursing                                                   |
| Durghasri       | MICU Staff Nurse              | Nursing                                                   |
| Glen Brian      | MICU Enrolled Nurse           | Nursing                                                   |

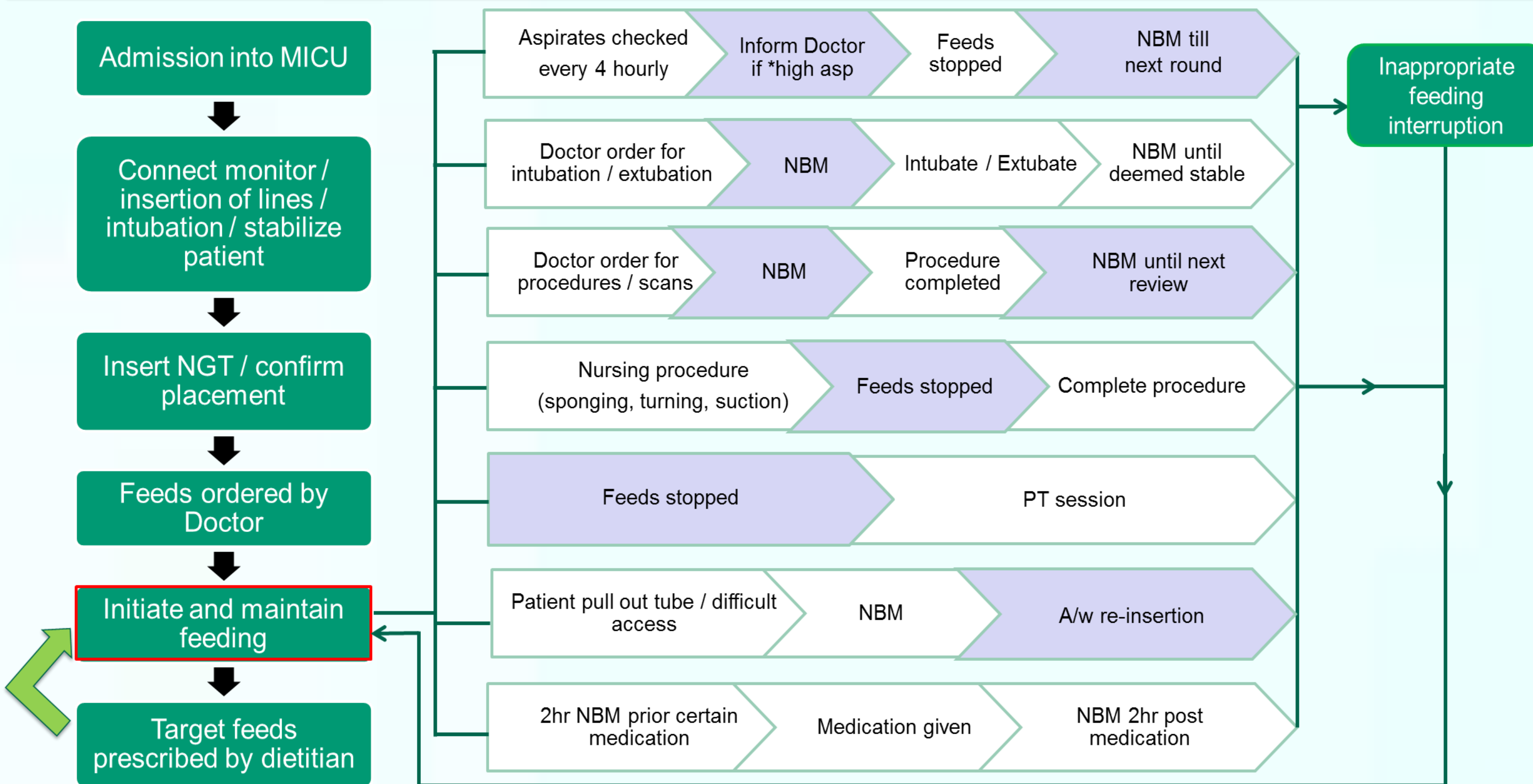
Sponsor: Dr Lim Yen Pen, HOD Nutrition and Dietetics

Facilitators: Adj A/Prof Tan Hui Ling, Dept of Anaesthesiology, Intensive Care and Pain Medicine  
Mr Balachandran Jayachandran, Physiotherapy

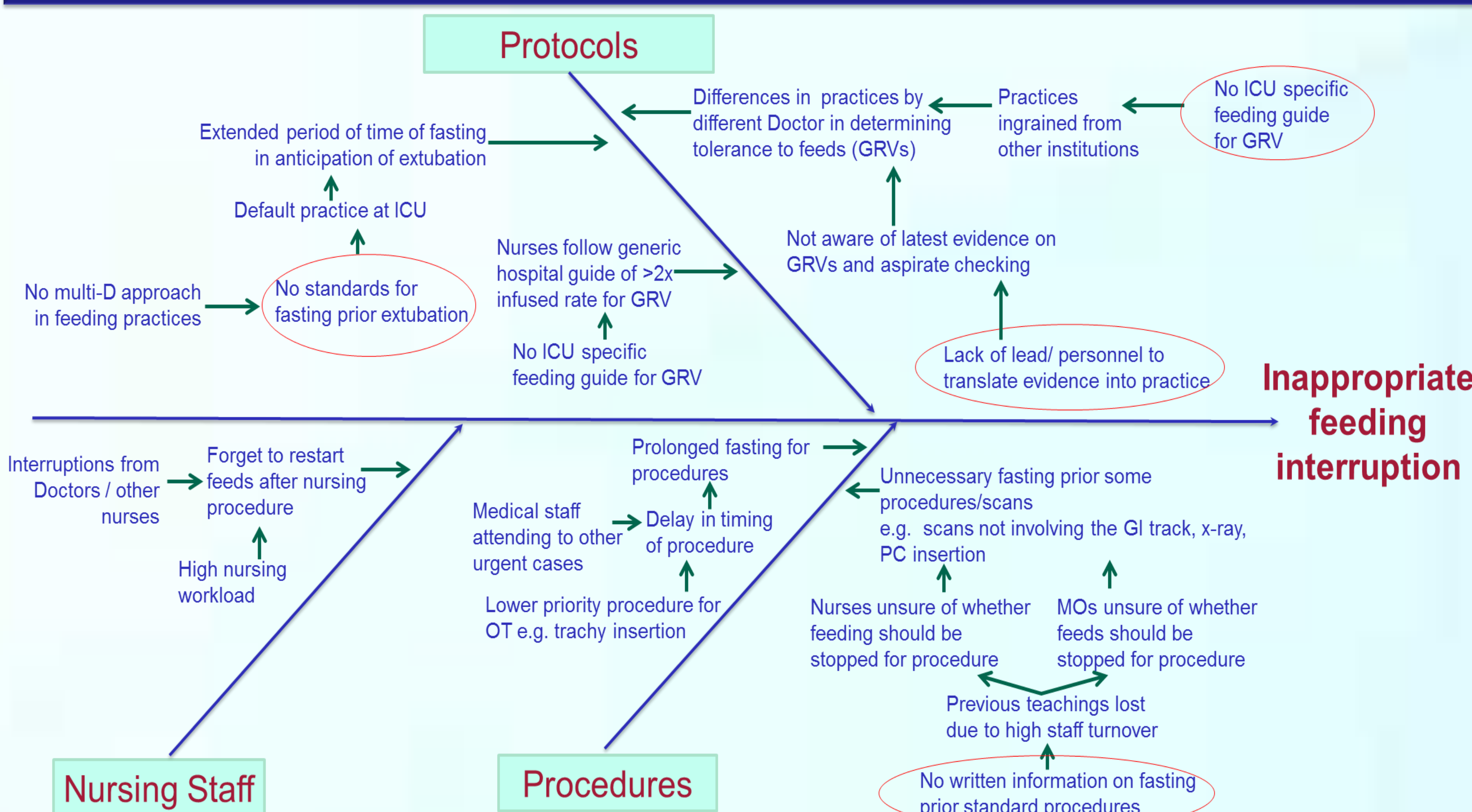
## Evidence for a Problem Worth Solving

- Timely & adequate nutrition support in critically ill patients is crucial as it preserves lean body mass, modulates immune response and attenuates metabolic response to stress, reducing severity of the disease, associated complications and length of stay.
- Frequent feeding interruption leads to decreased nutrition delivery and underfeeding.
- International nutrition guidelines from ASPEN and ESPEN have recommended to provide >80% of estimated nutritional requirement within 48-72 hours to achieve the clinical benefit of EN over the first week of hospitalisation.
- However, in a quality audit done in 2013 on feeding adequacy, ICU patients could only meet ~50% of their target nutritional requirements throughout the whole ICU stay. The main reason was the frequent feeding interruption, with each feeding interruption lasting a long duration.

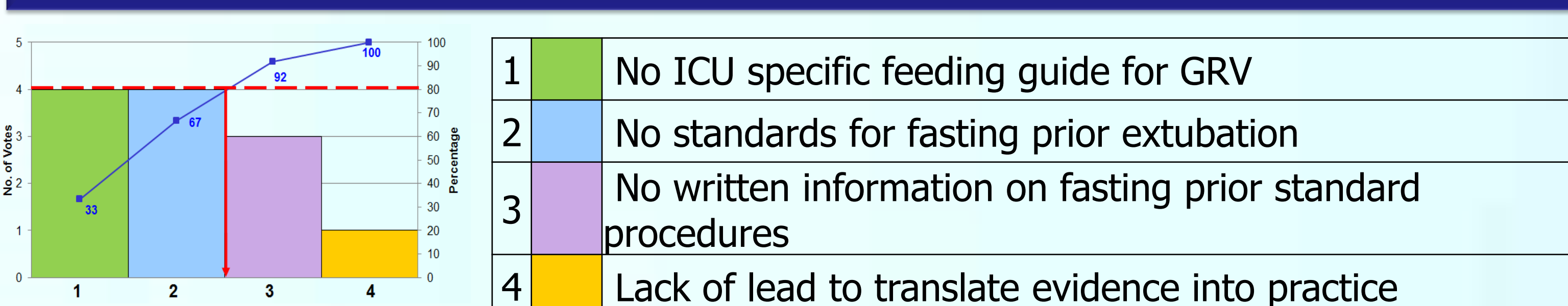
## Flow Chart of Process



## Cause and Effect Diagram

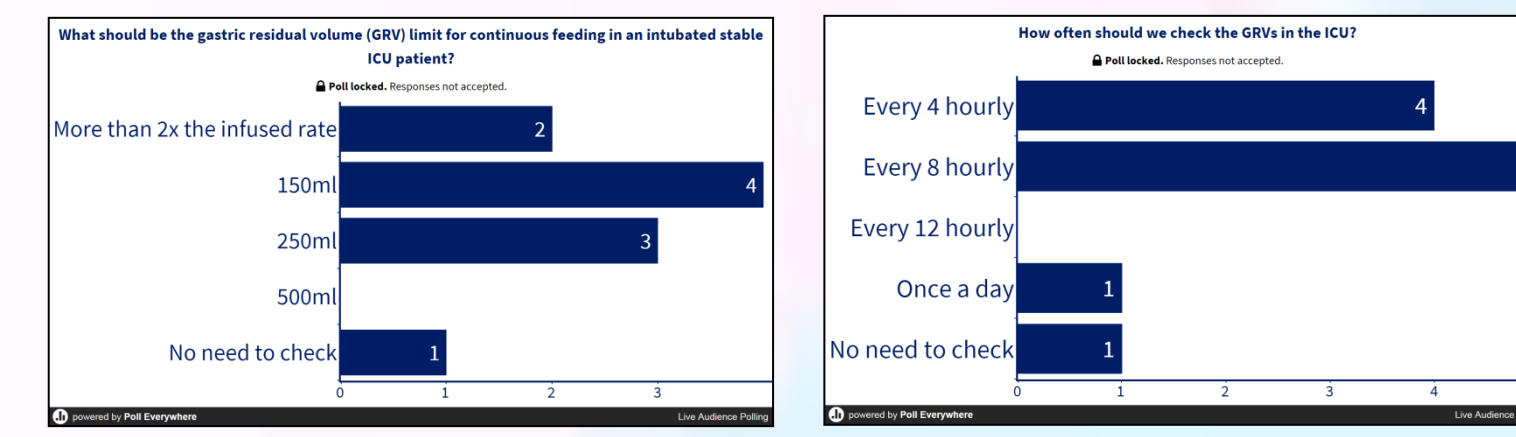


## Pareto Chart

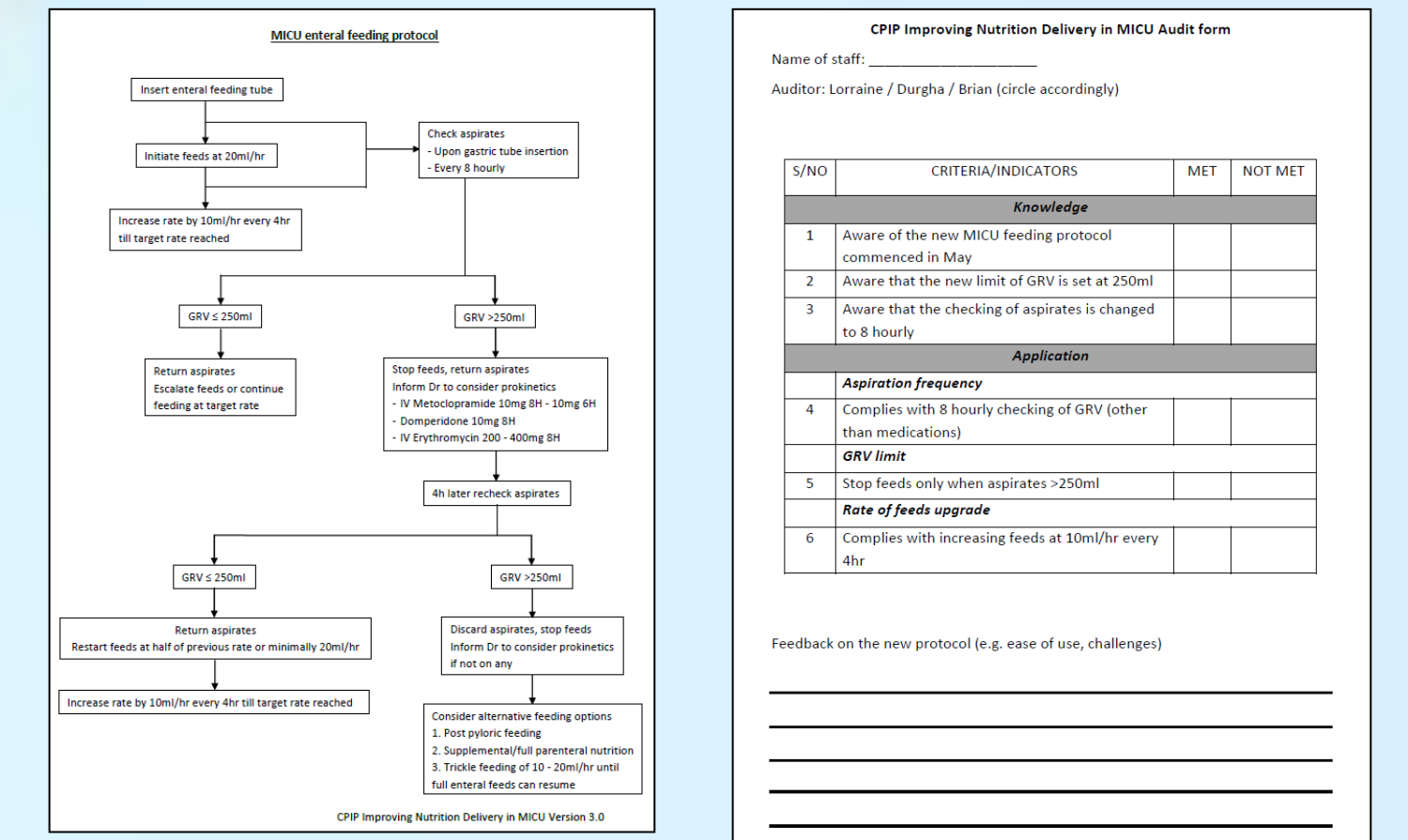


## Implementation

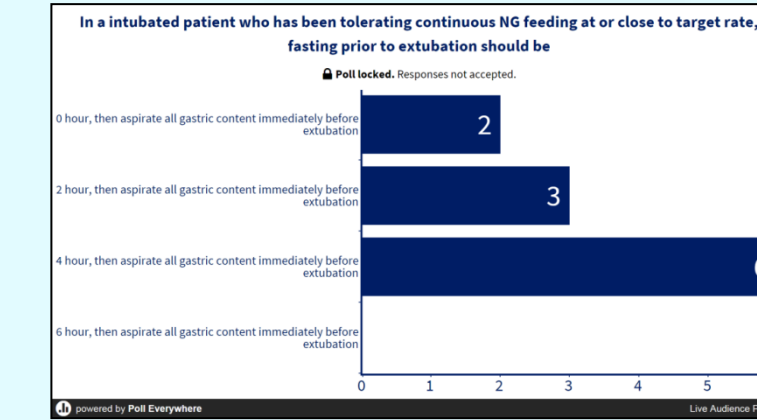
**Root Cause 1: No ICU specific guide for GRV**



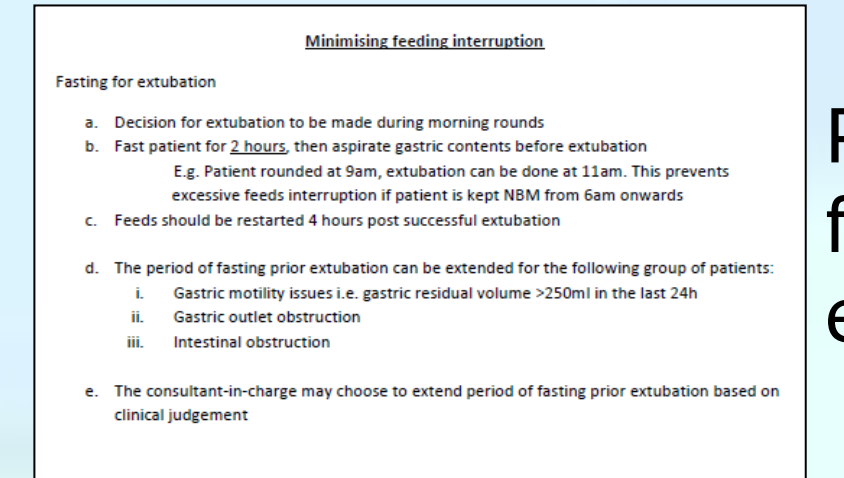
Roadshow to consultants from Department of Respiratory Medicine (Poll on preferred practice regarding feeding standards)



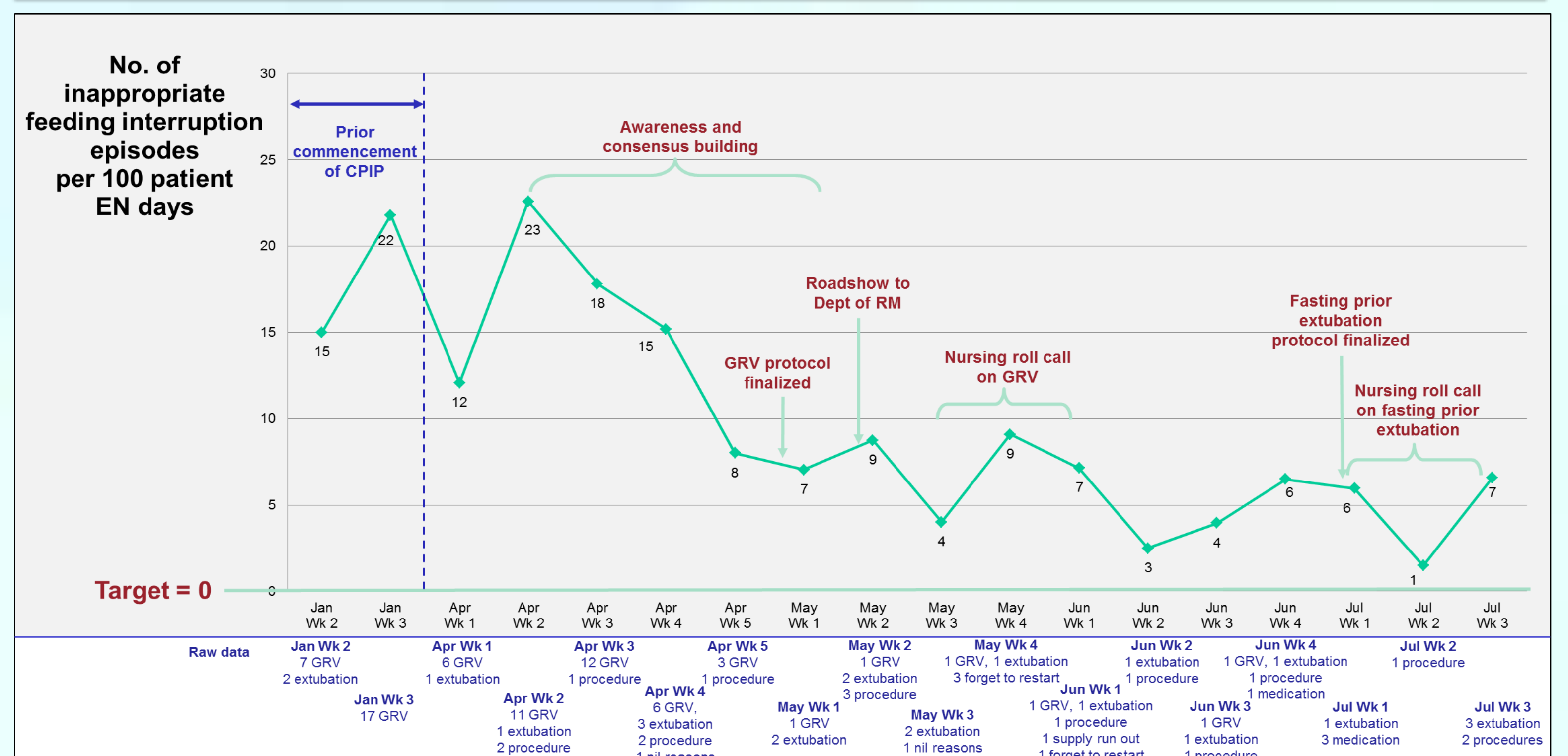
**Root Cause 2: Lack of standardisation in NBM duration pre/post extubation**



Roadshow to consultants from Department of Respiratory Medicine (Poll on preferred practice regarding fasting prior extubation)

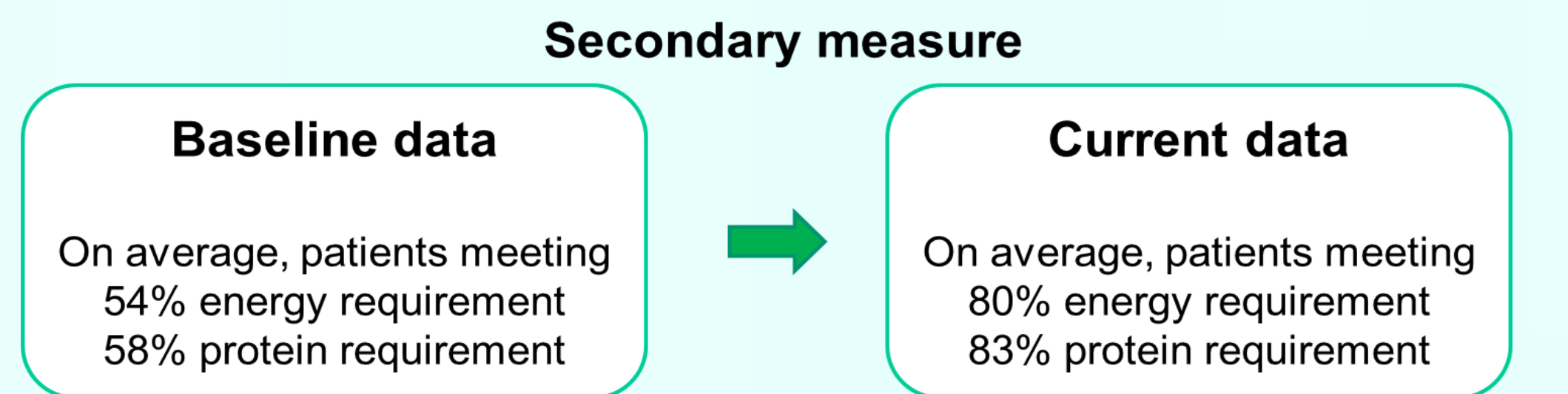


## Results



## Cost Savings

Improvement in nutrition delivery translates to:



- Projected reduction in ventilator free days by 3.5 days = Savings of ~\$791 per patient (Average cost of ventilation per patient per day = ~\$226)
- Projected lower odds of mortality by 24% (OR=0.76)

## Problems Encountered

- New rotation of MOs, need some time impart medical knowledge before introducing new protocol.
- New MOs not aware of the protocol for fasting for extubation.
- Different ICUs have slightly different reasons for inappropriate feed interruption, thus rolling out to other ICUs requires some adjustments in the feeding protocol.

## Strategies to Sustain

- ICU committee and all ICU directors have given the go ahead to spread project to all ICU.
- Nursing champion in each ICU has been identified.
- CME session on CPiP project conducted for CVM and Anaesthesia.
- Interventions from CPiP project have been integrated into ICU guideline CG-ICU-GEN-035 Guidelines for Enteral Nutrition in the Critically Ill Patient in May 2017.
- Moving forward
  - Regular audits to ensure compliance to feeding protocol
  - Raise up issues pertaining to feeding interruption at appropriate platforms e.g. ward level or ICU committee

## Lessons Learnt

- Preparatory work (Engage MICU consultants and ward nurses early for mindset change).
- Key stakeholders (Get the buy-in from ICU committee, ICU directors and ward nursing officers).
- Platform to air views (Roadshow to consultants & nursing roll calls).
- Nurses taking up gatekeeping role (Empower nurses to make decision on the ground).
- Working with people outside immediate improvement area (Engage nurse educators for input on feeding protocol and roll out).