

## Mission Statement

To increase right siting<sup>1</sup> of eligible<sup>2</sup> patients with poor prognosis intracranial hemorrhage (ICH)<sup>3</sup> presenting to TTSH ED from 0% to 100% within 6 months

- Away from ICU, in a private setting free of extraordinary life sustaining support treatment.
- Eligible patients defined by
  - Patients who are mechanically ventilated
  - Patients without unpreventable circumstances to undergo compassionate extubation in ED (e.g. family not contactable, awaiting for family to arrive from overseas, patient is being considered for organ donation, religious reasons)
- Poor prognosis as determined by NES team in charge based on combination of
  - ICH score (objective) – grades ICH severity based on GCS, age, ICH volume, intraventricular haemorrhage, infratentorial origin of hemorrhage)
  - Patient's comorbidities/preferences (subjective)

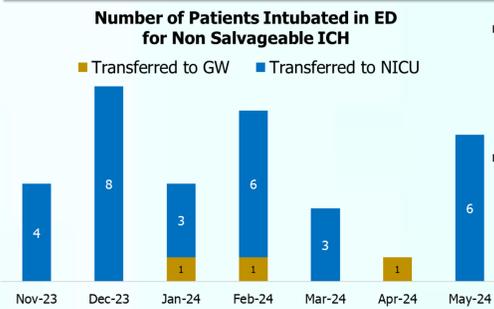
## Team Members

	Name	Designation	Department
<b>Team Leader</b>	Dr Weng Yani	Consultant	Emergency Medicine
<b>Team Members</b>	Dr Donovan Ou Yong Chee Kit	Senior Resident (SR)	
	Ms Nadirah Binte Ishak	Nurse Clinician	NNI Neurosurgery
	Dr David Mak Siu Kei	Associate Consultant	
	Dr Lee Rui Zhi	Resident Physician	
	Dr Lee Chung Seng	Senior Consultant	Palliative Medicine
	Ms Lin Jingyi	Principal Medical Social Worker	Care & Counselling

**Sponsor:** Adj Asst Prof Michael Chia Yih Chong (Head & Senior Consultant, Emergency Medicine)

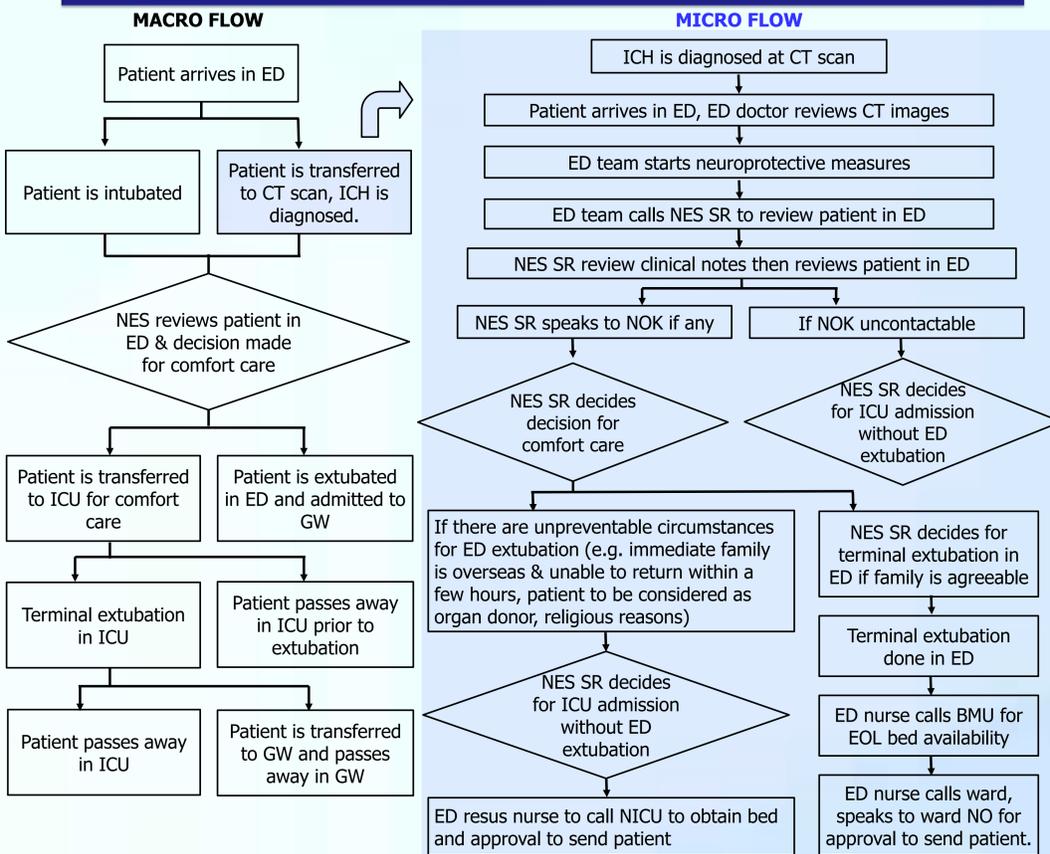
**Mentor:** Dr Sullivan Troy Daniel (Senior Consultant, Medical Oncology)

## Evidence for a Problem Worth Solving

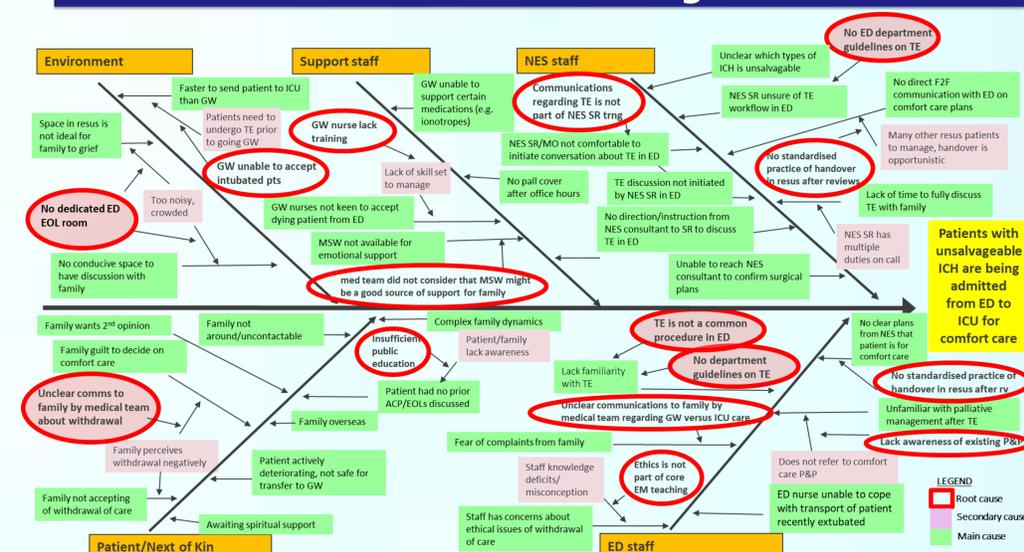


- Every month ED intubate this number of patients, only to discover along the way that they have unsalvageable ICH and decision made for comfort care.
- ED intubates approximately 5 patients per month. Only 3 out of 33 patients right sited to General Ward (GW) for comfort care. Other 30 patients were admitted to ICU for comfort care.

## Flow Chart of Process

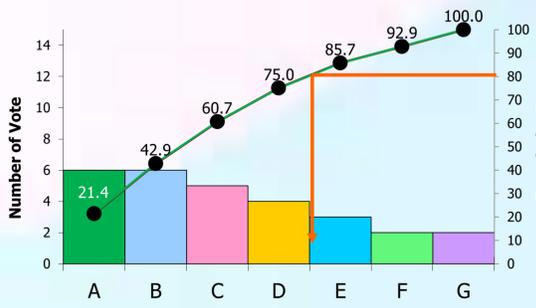


## Cause and Effect Diagram



## Pareto Chart

Causes that led to Patients with Unsalvageable ICH being admitted from ED to ICU for Comfort Care



A	No ED guidelines on TE
B	Unclear communication to family about withdrawal of care
C	No dedicated ED EOL room
D	TE is not a common procedure in ED
E	No standard practice of handover in resus after NES reviews
F	Unclear communication to family regarding GW versus ICU care
G	Insufficient public education of ACP/EOL

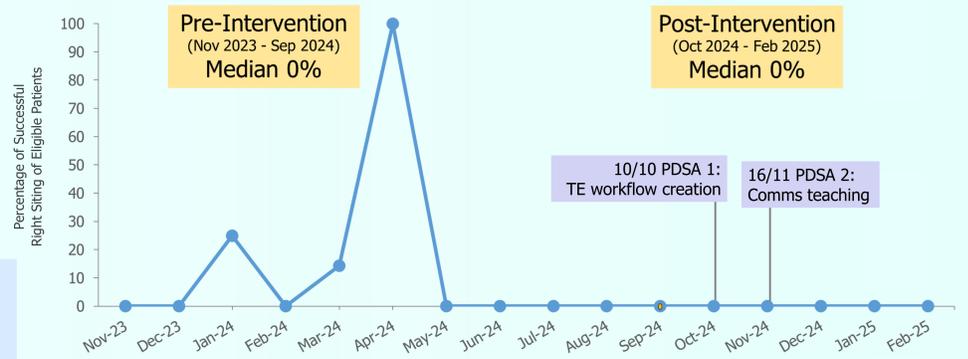
## Implementation

Root Cause	Intervention	Implementation Date
<b>Cause A:</b> No ED guidelines on terminal extubation (TE)	<ul style="list-style-type: none"> <li>Creation of ED terminal extubation workflow</li> </ul>	10 October 2024
<b>Cause C:</b> No dedicated ED EOL room	<ul style="list-style-type: none"> <li>Use of ED consult room 5H as an ED EOL room when need for it arises</li> </ul>	
<b>Cause B:</b> Unclear communications to family about withdrawal of care	<ul style="list-style-type: none"> <li>Communications teaching session by Palliative Medicine/Medical Social Worker</li> </ul>	16 November 2024

## Results

### Percentage of Successful Right Siting of Eligible Patients

(excluded patients with unpreventable circumstances to extubation)  
Period: November 2023 to February 2025



Although mission statement goals were not achieved, further analysis of cases showed a **reduction in time to compassionate extubation from 39.1 hours to 30 hours** post CPIP interventions. This allows for earlier comfort for dying patients and facilitates a shorter length of stay in ICU.

## Cost Savings

	Pre-Implementation	Post-Implementation
% of Eligible patients right sited away from ICU	0%	50% (if achieved)
Successful average number of patients right sited (Per Month)	0.4 patients	1.75 patients
Assume: Average LOS in ICU per patient is 4.75 days (based on baseline data)		
Total No. of ICU Bed Days Saved (Per Month)		$(1.75-0.4) \times 4.75 = 6.41$
Total No. of ICU Bed Days Saved (Annualized)		$6.41 \times 12 = 76.92$
Difference in ICU stay versus GW stay (Per Day)		$\$4,477 - \$1,046 = \$3,431$
Difference in Bed Days in Monetary Terms (Annualized)		$76.92 \times \$3,431 = \$263,912.52$

**Note:** Unit Cost for Inpatient Stay Per Day Per Patient = \$1,046 & Unit Cost for ICU Stay Per Day Per Patient = \$4,477

## Problems Encountered

- Finding common ground amongst different medical subspecialties and family groups within the subspecialty
- Analysis of results requires manual looking through of clinical notes. There is difficulty in automating this as documentation of communications varies.
- Public perceptions and understanding of a dignified death is still lacking.
- TTSH ED face limits in having proper infrastructure to ensure a comfortable space for patient, family and staff to proceed with TE of eligible patients.

## Strategies to Sustain

- ED Terminal extubation pathway is baked into NES MO orientation guide
- Continual sharings between ED/NES/ MSW on case outcomes
- Making communications teaching session accessible via eLEARN
- Identifying champions within ED/NES departments

## Lessons Learnt

- Communications surrounding death remain a sensitive issue for all
- Even if intervention is introduced, sufficient resources are key to ensure that intervention can proceed and show positive changes.
- Essential stakeholders must believe it is a problem worth solving to allow for project success
- Project mission statements have to be constantly reviewed through different phases of CPIP