Safe from Sepsis

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Mission Statement

To achieve at least 80% of febrile patients who are developing new[1] or worsening sepsis[2] to receive antibiotic administration[3] from baseline 220 mins to <= 180 mins from fever recognition[4] at Level 8 Wards Tan Tock Seng Hospital within 6 months.

Definitions:

[1] **new sepsis –** Newly developing physiological derangements which can be eventually attributed to new infection

[2] **worsening sepsis –** Dynamic state experienced by a patient compromising hemodynamic stability, marked by physiological decompensation accompanied by subjective or objective findings (e.g. increase in any component of NEWS2 score); which can be eventually attributed to a worsening infection.

[3] **antibiotic administration –** Either starting of new antibiotics for new onset fever or escalation of antibiotics if the patient is already on antibiotics (imply to deteriorating groups) depending on clinician's assessment

[4] **fever recognition –** Identifying a febrile patient with a new fever spike (body temperature >38ºC) within the past 48 hours, requires timely assessment for possible sepsis.

Team Members

	Name	Designation	Department
Team Leaders	Caren Mok Kar Yen	Senior Nurse Manager	Nursing Service
	Asst Prof Huang Wenhui	Senior Consultant	General Medicine
Team Members	Dr Ei Ei Thazin Win	Associate Consultant	General Medicine
	Li Lihong	Advanced Practice Nurse	Nursing Service
	Emilia Fan Aimin	Nurse Clinician	Nursing Service
	K Florence A Servai	Nurse Educator	Nursing Service
	Agnes Ho Hui Yin	Assistant Nurse Clinician	Nursing Service
	Jacelyn Lee Jie Lin	Staff Nurse	Ward 7A

Special Acknowledgement: Level 8 Sepsis Champions

Sponsors:
- Adj A/Prof Tan Hui Ling (ACMB, Quality & Clinical Governance)
- Dr Hoi Shu Yin (Chief Nurse)

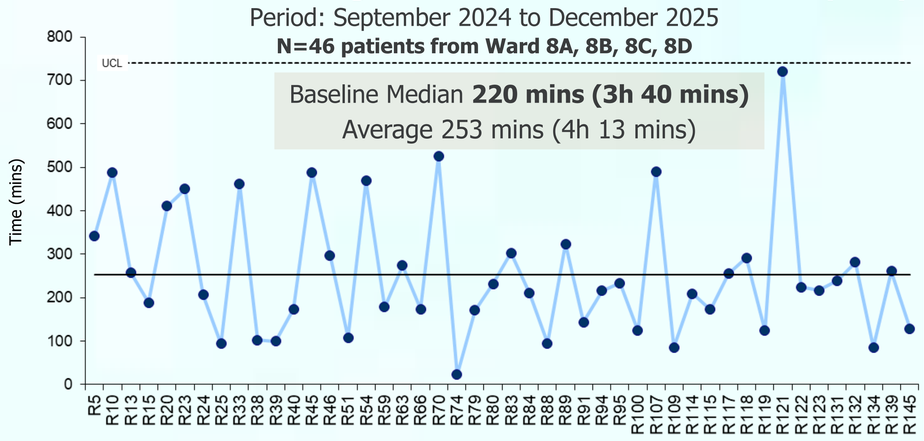
Advisors: Dr Chiu Li Qi, Ms Katherine Wong Kar Kar, Ms Tan Si Ling

Evidence for a Problem Worth Solving

Time from Fever Recognition to Antibiotics Administered (mins)

Period: September 2024 to December 2025

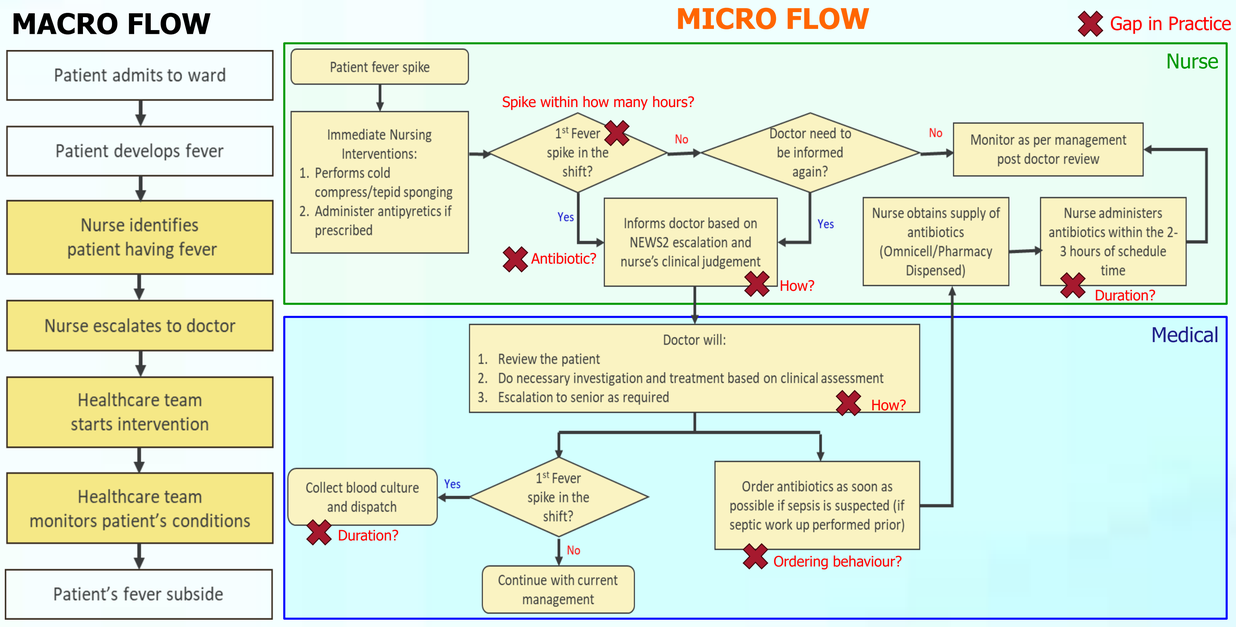
N=46 patients from Ward 8A, 8B, 8C, 8D



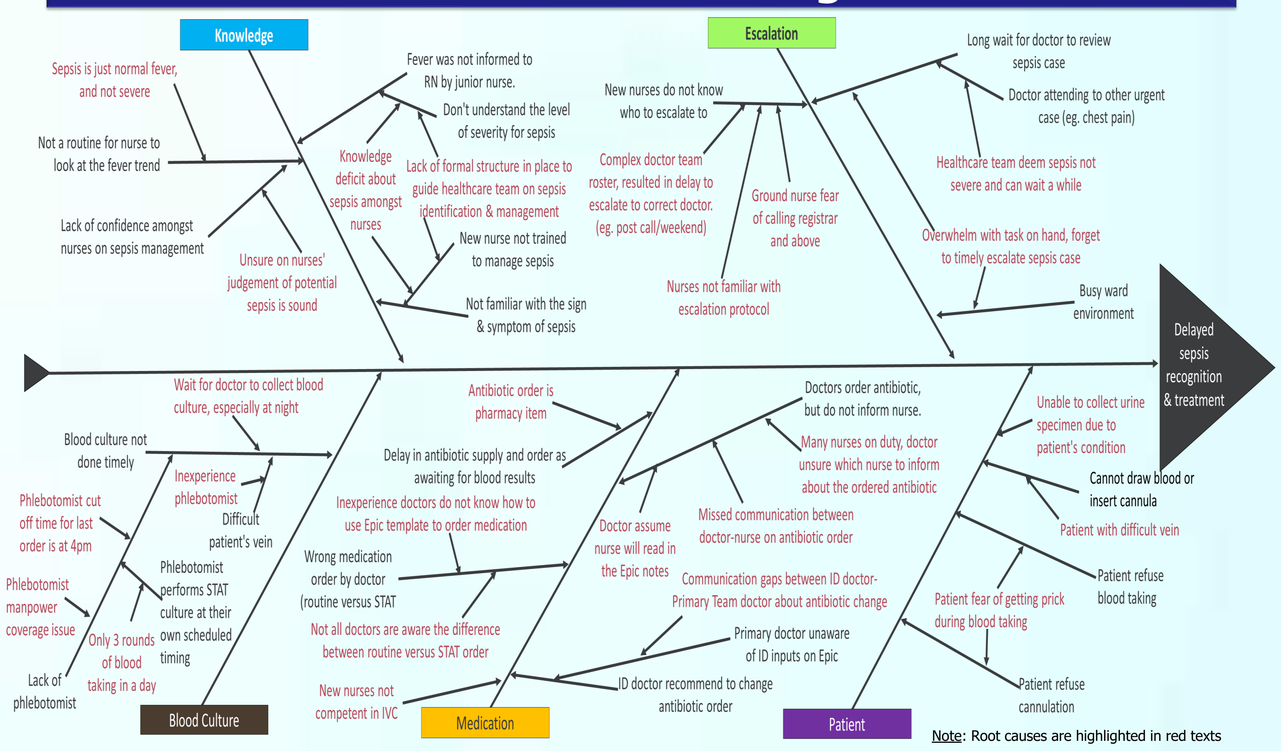
Only **37%** febrile patients met <=180mins from Sepsis Recognition to Antibiotics Administration

Impact on Mortality: A study published in Critical Care Medicine examined 35,000 patients with sepsis and found that the median time to antibiotic administration was 2.1 hours. Importantly, patients receiving antibiotics earlier had a higher severity of illness, highlighting the necessity of prompt treatment in severe cases. *The Timing of Early Antibiotics and Hospital Mortality in Sepsis | American Journal of Respiratory and Critical Care Medicine*

Flow Chart of Process

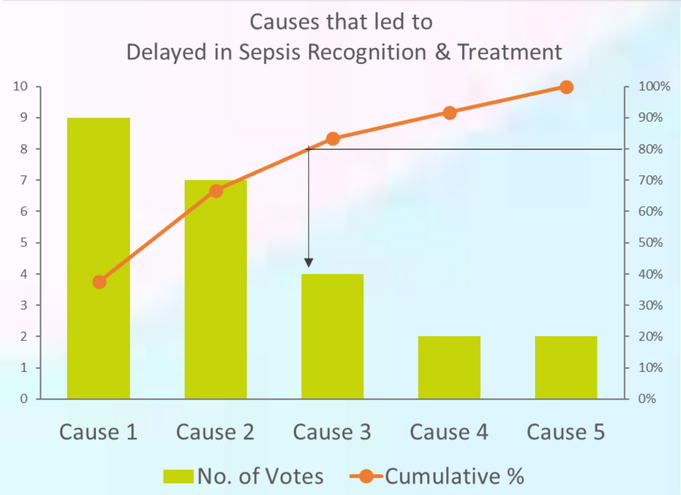


Cause and Effect Diagram



Note: Root causes are highlighted in red texts

Pareto Chart



Cause 1	Knowledge deficit about sepsis amongst nurses
Cause 2	Lack of formal structure in place to guide healthcare team on sepsis identification & management
Cause 3	Overwhelm with task on hand, forget to timely escalate sepsis case
Cause 4	Sepsis is just normal fever, and not severe
Cause 5	Communication gaps between ID doctor-Primary Team doctor about antibiotic change

Implementation

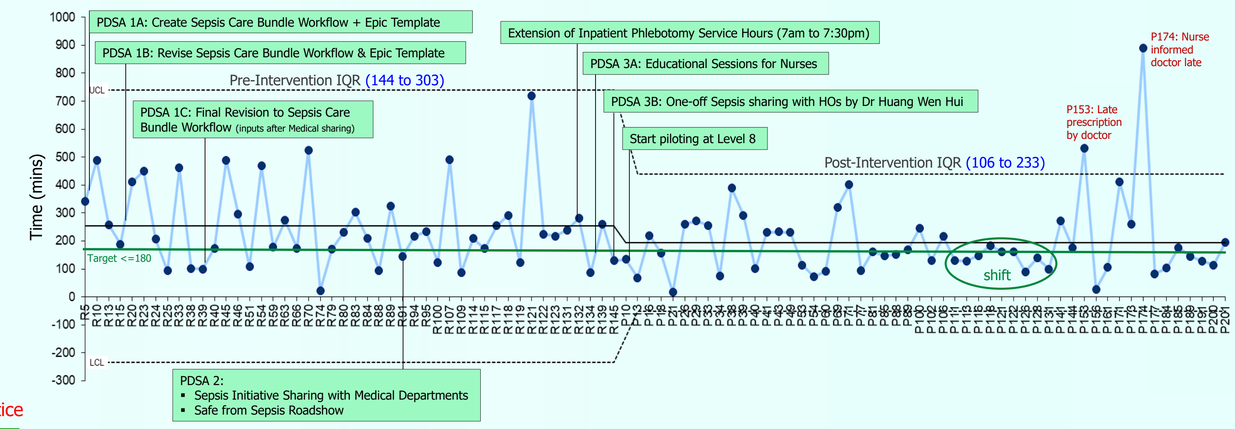
Root Cause	Intervention	Implementation Date
Cause 1: Knowledge deficit about sepsis amongst nurses	PDSA 1: Create Sepsis Care Bundle Workflow and Epic Documentation Template	September 2024
Cause 2: Lack of formal structure in place to guide healthcare team on sepsis identification & management	PDSA 2: Sepsis Initiative Sharing with Healthcare Team ▪ Doctors: Department Meeting ▪ Level 8 Staff: Change Management Roadshow	October 2024
Cause 3: Overwhelm with task on hand, forget to timely escalate sepsis case	PDSA 3: Educational Sessions for Nurses	December 2024
	PDSA 4: Data Coaching Session with Nurse Champions	December 2024 to January 2025

Results

XMR Chart: Time from Fever Recognition to Antibiotics Administered (mins)

Period: September 2024 to March 2025

N=98 patients from Ward 8A, 8B, 8C, 8D



Pre-Intervention		Post-Intervention
= **37%**	Pre-Intervention Median = **220 mins** (mean 253 mins) Post-Intervention Median = **159 mins** (mean 194 mins)	= **62%**

Cost Savings

	Pre-Intervention	Post-Intervention
Median Length of Stay (LOS) Note: Excluded Patients with LOS > 20 Days	10 Days	9 Days
No. of Bed Days Saved (Per Patient)	1 Day	
Bed Days Saved in Monetary Terms (Per Patient)	$1,046	
Assume in 1 month, we have about 40 patients at Level 8 (~60% receive antibiotics <=180mins after fever recognition)		
Total No. of Bed Days Saved (Annualized)	40*(60/100) = 24 Days	
Total Bed Days Saved in Monetary Terms (Annualized)	24 * 1046 = **$25,104**	

Note: Private Ward Costs per Patient Day = $1,046

Lessons Learnt

- Difficulty establishing reliable baseline data
- Manual data collection burden on staff
- Variable buy-in from different specialties and departments
- Resource constraints (ie. manpower) and competing priorities during peak hours
- Need for continuous education due to staff turnover

Strategies to Sustain

- Integrate into daily practice (ie. embed sepsis screening in routine assessments and EHR documentation)
- Ongoing training & engagement through refresher sessions, case discussions, and audits.
- Leadership & Accountability (ie. assign sepsis champions)
- Real-time monitoring
- Encouraging multidisciplinary collaboration
- Continuous improvement through audits and regular feedback