

# Improving Pleural Fluid Culture Yield with Liquid Based Microbiology



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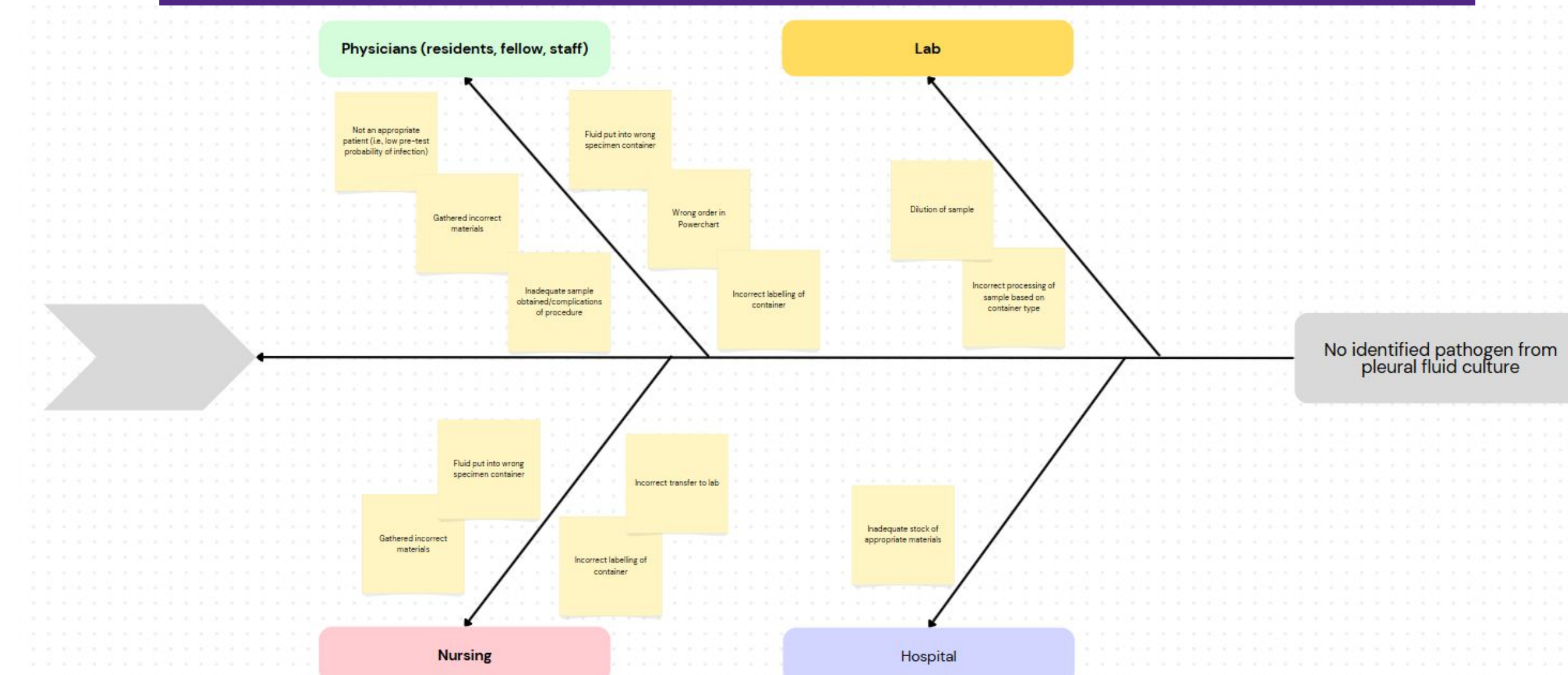
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**AIM Statement:** To increase the proportion of pleural fluid culture results with an identified bacterial pathogen by 20% within 8 months, for patients admitted to the Respiriology inpatient ward.

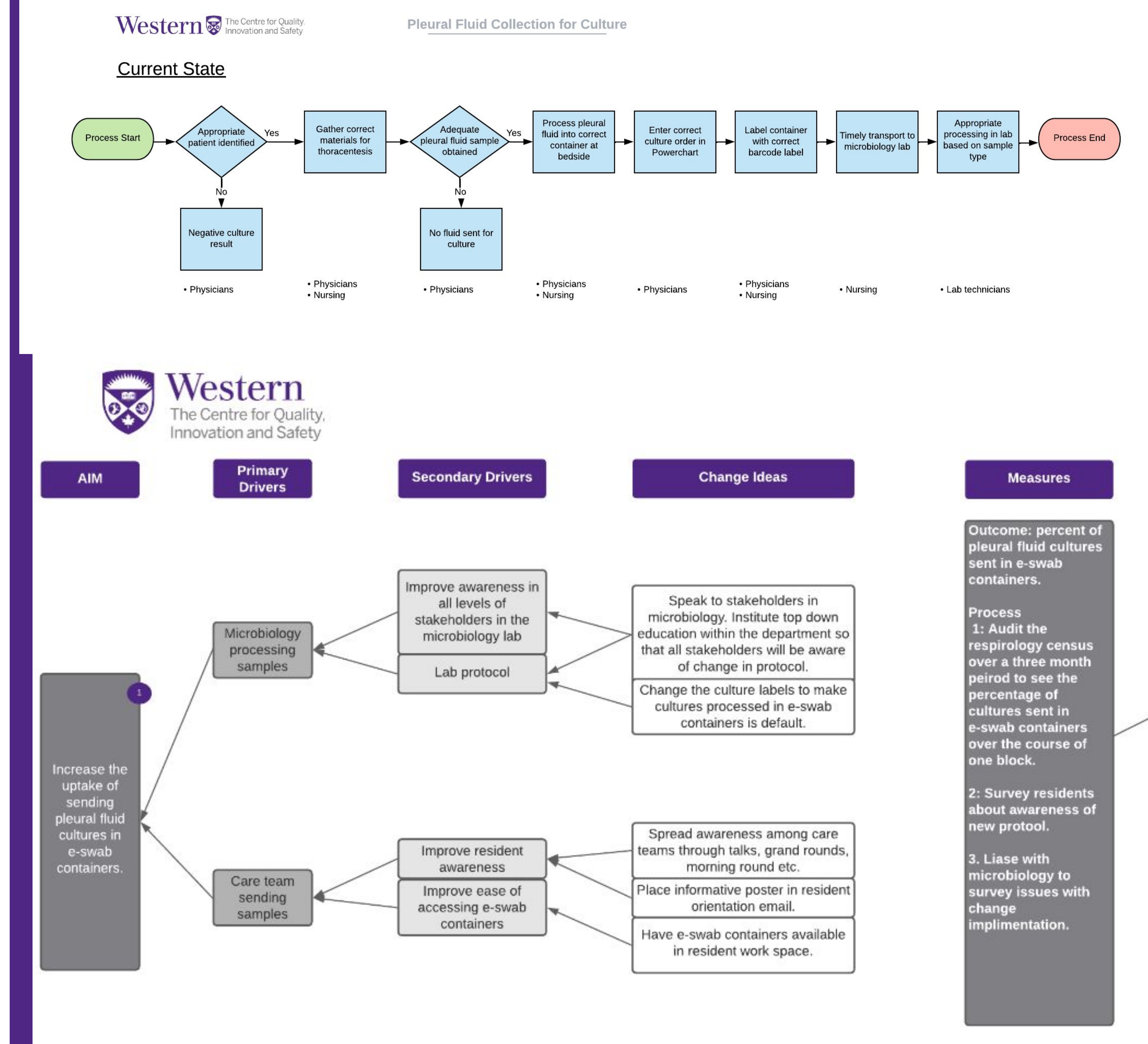
## PROBLEM DEFINITION

- Parapneumonic effusions can develop in 20-40% of hospitalized patients with pneumonia & contribute to length of stay<sup>1</sup>
- Microbiological culture yield from pleural effusions is low. Collecting pleural samples in blood culture bottles improves pathogen identification<sup>2,3</sup>
- Liquid based microbiology (LBM) in the form of an E-swab may work similarly
- Our study aims to improve pathogen identification from pleural fluid cultures using the new E-swab LBM technology

## ROOT CAUSE ANALYSIS



- **Residents/fellows** endorse lack of knowledge about appropriate container for culture, and no knowledge of LBM/E-swab availability
- **Nursing** endorse lack of knowledge about ability to use E-swab for pleural culture and availability in floor stock
- **Lab technicians** not aware that some processes (e.g. dilution of sample) affect yield



## LESSONS LEARNED

- **Unanticipated technical challenges** - midway through collection period, lab informed that redundant culture request needed to be ordered.
- **Limitations of passive education** -informal survey showed poor penetrance of awareness of change idea among housestaff despite orientation document.

	Difficult to Implement	Easy to Implement
High Impact	<ul style="list-style-type: none"><li>Fellow-led step-by-step collection for junior residents for every thoracentesis</li><li>Pre-assemble collection kits that include E-swab</li></ul>	<ul style="list-style-type: none"><li>Place posters identifying appropriate collection containers in Respiriology team room</li><li>Have education session on LBM by Microbiology lab</li></ul>
Low Impact	<ul style="list-style-type: none"><li>Include information about E-swab in emailed block orientation materials</li></ul>	<ul style="list-style-type: none"><li>Provide overview of E-swab collection in Zoom block orientation</li><li>Meet with Micro Lab to clarify collection container plans</li><li>Meet with nurse educators +/- charge to educate re: utility of E-swab and availability on floor</li></ul>

## IMPLEMENTATION

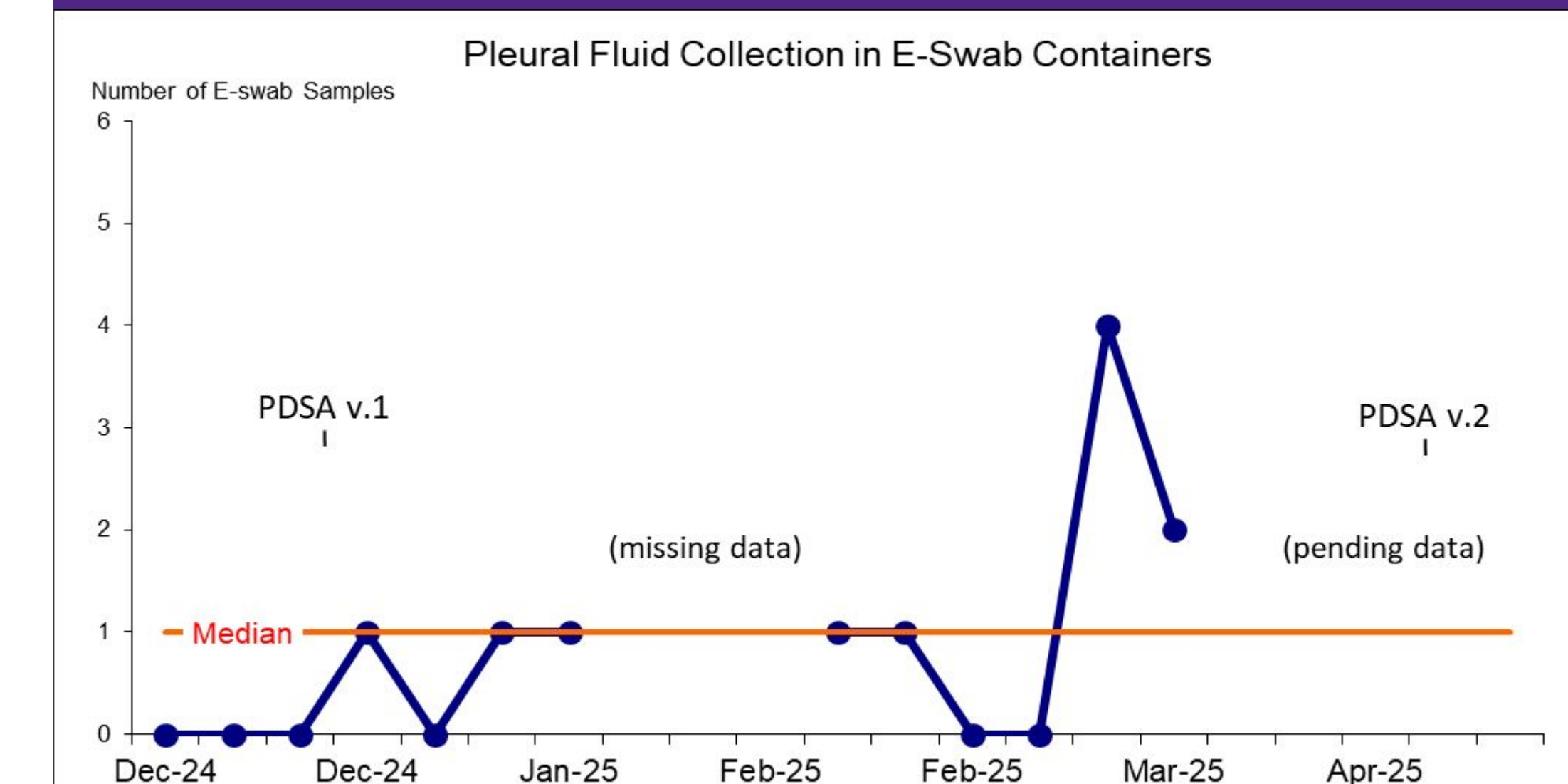
**PDSA 1** (Dec 17th, 2024 - Mar 31st, 2025)

- Initiated collection of pleural fluid samples in E-swab containers by fellows on inpatient respirology service
- Obtained data on number of collected samples and culture results compared to previous process

**PDSA 2** (April 8th, 2025 - current)

- Improving uptake of collection in E-swab containers by promoting current practice in orientation & collaboration with micro lab

## MEASUREMENT & RESULTS



- **Process:** Informal survey of resident awareness re: E-swabs; # of E-swabs sent
- **Balancing:** Added cost (material/labour) from dual sample containers & processing

## SUSTAINABILITY

Respirology fellows will continue to advocate for use of E-swabs. New standard is provided in the Respirology block orientation & posters could be added. Plan to liaise with Micro monthly for data collection.