e-tag

An Electronic Tagging System to Increase Workflow Efficiency in the Neurosurgical Ward

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# **Singapore Healthcare** Management 2019

### INTRODUCTION

Invasive lines and tubes are essential in patient care. In the Neuroscience ward in Singapore General Hospital, there are 32 patients with up to 8 invasive lines/tubes per patient at any given time. All intravascular devices are known to pose a risk to blood stream infections, and this is related to the dwelling time <sup>1</sup>. Timely removal and change is hence crucial in preventing potential adverse consequences including thrombophlebitis, line sepsis and rarely, death.

### OBJECTIVES

Currently, removal is triggered when handwritten labels are heeded. However, this labelling method is inconsistent, with low compliance and incomplete information.

This project aims to integrate our innovative electronic tagging (e-Tag) system

into the current workflow, to better manage invasive lines and tubes, hence improving patient safety.

## METHODOLOGY

Drains



We created our e-Tag system in Singapore General Hospital (SGH) and trialled our project in the SGH Neurosurgery Intensive Care Unit, High Dependency and General Ward over one month.

The project's feasibility was evaluated against standardised predefined outcome measures. Baseline data on the number of lines/tubes, label accuracy and completeness, and time taken for labelling were collected prior to intervention.

### Limitations of old method

- 1. Compulsory labelling only of certain tubes
- 2. Handwritten issue of legibility
- 3. Multiple steps in process
- 4. Identification of overdue lines

#### based on vigilance of staff

#### Labelling lines/tubes Identify overdue lines/tubes Identify lines/tubes to label Removal of lines/tubes



### Advantages of e-tag

- 1. Can be used to label all lines
- Printed labels are neater, with 2. standardized complete and information
- Simplified process 3
- 4. System monitors and flags up overdue lines automatically
- 5. Labels can be reprinted and identified easily

RESULTS

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New Method



Compliance with Visibility(%) Labelling based on Completeness of Accuracy (%) information (%) line/tube hospital Time (seconds/label) compliance (%) removal/change ■ Before ■ After Before After (%)

There was statistically significant improvement in the domains of i. compliance of line labelling - from 60% to 78% (p=0.0091) ii. completeness of information - 67% to 100% (p less than 0.0001), iii. visibility of the label - 81 to 92% (p=0.0370). Improvement was noted in the accuracy of labels with an improvement from 95% to 100% (non significant, p=0.4448). Compliance with line removal or change improved from 93% to 99.3%, which was close to statistical significance (p= 0.0649). Labelling efficiency improved by 43.8% (from 105 seconds per label to 59 seconds).

### CONCLUSION

Improvement was seen across all outcome measures, particularly in compliance and labelling efficiency. Future improvement to the system in terms of stability of the network, addition of more information regarding the lines (e.g. site) and incorporation into the existing systems would further enhance compliance.

The e-Tag monitoring system can be integrated into the current workflow and is demonstrably successful in improving management of lines and tubes, potentially leading to enhanced patient safety and clinical outcome.