**Project Title**

Design an Algorithm to Discontinue Unnecessary Intake/Output Charting

**Project Lead and Members**

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**Organisation(s) Involved**

Yishun Community Hospital

**Healthcare Family Group(s) Involved in this Project**

Medical, Nursing, Healthcare Administration

**Applicable Specialty or Discipline**

Nutrition & Dietetics

**Project Period**

Start date: Mar 2021

Completed date: Jun 2022

**Aims**

To design an algorithm to discontinue the Intake/Output (I/O) Chart in YCH inpatient

care setting

**Background**

See poster attached

**Methods**

See poster attached

**Results**

See poster attached

**Lessons Learnt**

See poster attached (Reflections)

**Conclusion**

See poster attached

**Additional Information**

Accorded the Clinical Quality Improvement Award – Team Award (Gold) at AIC's Community Care Excellence Award (CCEA) 2023

**Project Category**

Care & Process Redesign

Quality Improvement, Workflow Redesign, Clinical Practice Improvement

**Keywords**

Consumption, Excretion, Risk Factors, Monitoring

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# Design An Algorithm To Discontinue Unnecessary Intake/Output Charting

## Yishun Community Hospital

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## Introduction/Background

Majority of the patients admitted to Yishun Community Hospital (YCH) are elderly, average age of 74 years, with a variety of co- morbidities. Their physiological status is dependent on the daily assessment by a multidisciplinary team (MDT). This is primarily achieved by using the Intake/Output (I/O) chart to monitor their consumption and excretion over a 24-hour period. Based on a 2- week study conducted in March 2021, only 13% of patients with I/O monitoring were discontinued before discharge.

## Goal/Objective

The objective was to design an algorithm to discontinue the Intake / Output (I/O) Chart in YCH inpatient care setting.

## Problem Analysis

The Multidisciplinary team was formed (consisting of nurses, dietitians, doctors and Admin staff) to collaborate and study the ward I/O charting ordering and review processes. The team conducted root causes analysis to identify reasons for excessive I/O charts (Diagram 1).
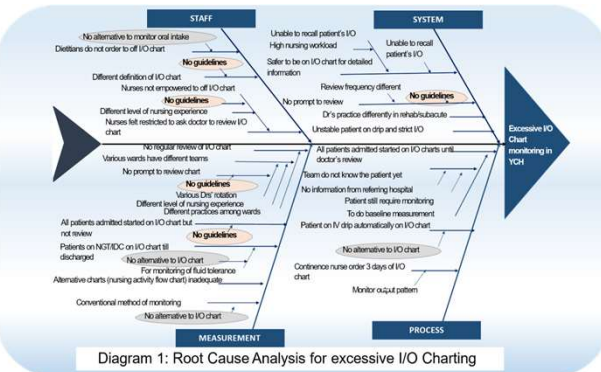


Diagram 1: Root Cause Analysis for excessive I/O Charting

The **key problems** identified were:
1. No available standard guidelines to discontinue I/O monitoring.
2. No reminders to prompt the doctors to review I/O charts.
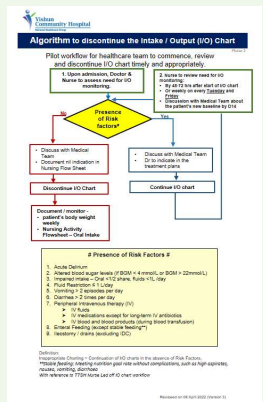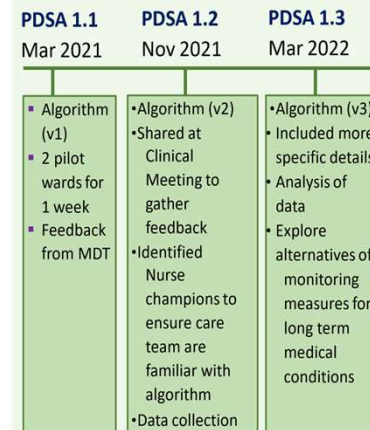3. No alternatives to I/O charts for doctor /dietitian once I/O charts were stopped.

A Time Motion study conducted amongst YCH wards showed **42 minutes per patient per day** were used for I/O charting. Average ward bed occupancy of 80% (n=27) x 42 minutes = **18.9 hours (1134mins) per day** was used to chart I/O (Table 1).

| Time spent for Nurse to perform I/O monitoring for 1 patient - electronic input in SCM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Activities** | **AM Shift** | | | **PM Shift** | | | | **NIGHT Shift** | **Total** |
| **Intake** | Check & record Breakfast | Check & record Lunch | Record fluid for the shift | Check & record 4pm tea | Check & record Dinner | Check Record 8pm drink | Record fluid for the shift | Record fluid before 12MN | Record fluid after 12MN | Intake x 24hrs |
| **Time (mins)** | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 216 |
| **Output** | Measure & Record urine | Measure & Record urine | Measure & Record urine | Measure & Record urine | Measure & Record urine | Measure & Record urine | | Measure & Record urine | Measure & Record urine | Output x 24hrs |
| **Time (mins)** | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 | 526 |

Table 1: Time Motion Study to perform I/O chart monitoring

A pilot project on Doctor's reminders to review I/O had positive outcome but was paused due to COVID-19 pandemic ward conversions. The project resumed in year 2020 and an Algorithm was formulated based on data collection. The PDSA methodology was adopted to test the algorithm.

## Implementation Plan

**PDSA 1.1** Mar 2021
- Algorithm (v1)
- 2 pilot wards for 1 week
- Feedback from MDT

**PDSA 1.2** Nov 2021
- Algorithm (v2)
- Shared at Clinical Meeting to gather feedback
- Identified Nurse champions to ensure care team are familiar with algorithm
- Data collection

**PDSA 1.3** Mar 2022
- Algorithm (v3)
- Included more specific details
- Analysis of data
- Explore alternatives of monitoring measures for long term medical conditions



*Algorithm to discontinue the I/O chart (v3, dated 8/4/2022)*

A set target of **8 days to discontinue I/O monitoring** was formulated

## Benefits/Results

Chart 1 showed an increase of I/O monitoring being discontinued within 8 days from average of **13.3% (Before)** to **42.7% (After).**



Chart 1: Percentage of I/O monitoring stopped within 8 days
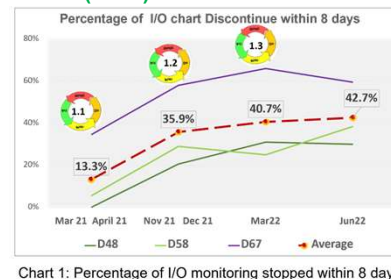
| Ward | Before | After |
|---|---|---|
| D48 | 0% | 30.0% |
| D58 | 5.5% | 38.5% |
| D67 | 34.5% | 59.5% |

Table 2: Percentage of I/O monitoring stopped within 8 days by wards

✓ Better and Faster with **43%** of patients Off I/O monitoring within 8 days of patient's stay.
✓ Time Savings of **5.6 hours** per day charting I/O (reduction from 18.9hours per day to 13.3 hours per day).
✓ Staff Satisfaction amongst nurses feeling **empowered in** initiating changes in clinical needs for patients.
✓ Increased collaborative efforts amongst Multidisciplinary team benefiting Operational Resilience in YCH.

## Sustainability & Reflections

▪ To sustain the team had an on-going training of nurse champion in all the wards during the spread of the algorithm. A laminated copy of the algorithm was put up in each nursing counter and medical officer room as reference and reminder. The team will engage stakeholders for the next step to focus on the top 3 reasons for prolonged I/O chart monitoring to understand the utility and explore alternative methods of monitoring.

▪ Reflections: The team learned the importance of team spirit to preserve their goals despite multiple challenges from development of the algorithm to members changes/movement and various interruptions during COVID-19 surged.