

## Introduction

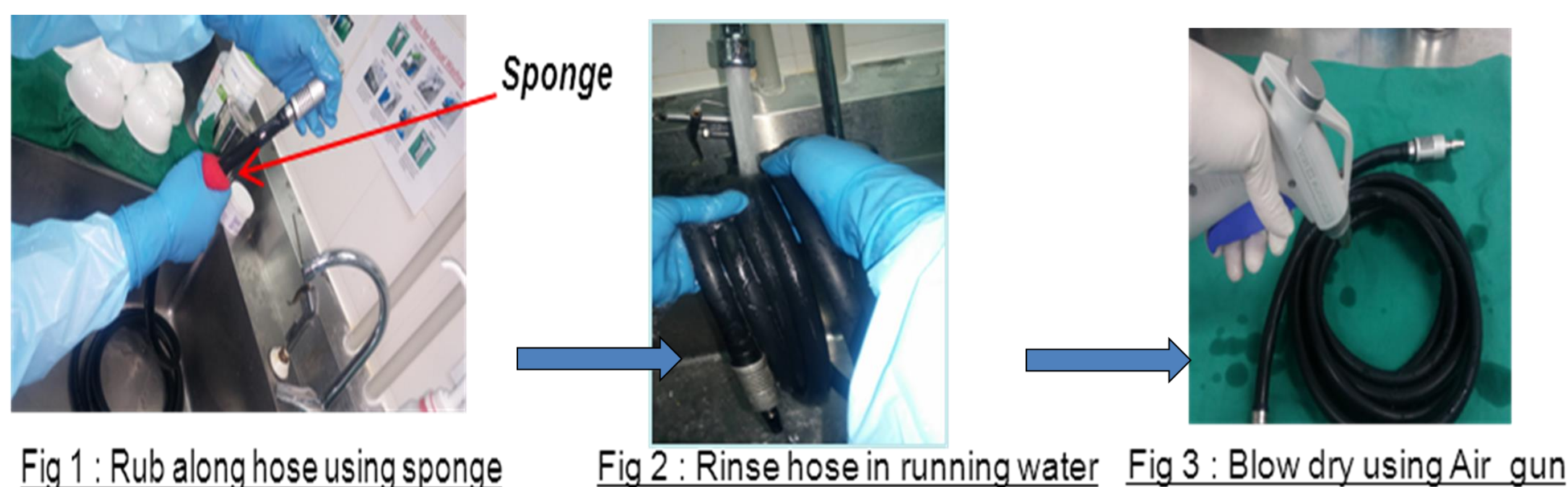
In view of the fast growing demand for more efficient ways in reprocessing surgical instruments, Theatre Sterile Supplies Unit (TSSU) is always seeking ways to improve efficiency of reprocessing surgical instruments. As such, this improvement project was carried out to look into areas where staffs can actively participate in improving the reprocessing process of power tool hoses so as to enhance work efficiency.

## Mission Statement

To reduce Power Tool Hoses washing time and improve Adenosine Triphosphate (ATP) results by 50% in TSSU decontamination area within 6 months.

## Background

In TSSU Decontamination area, staff manually washes all used Power Tool Hoses received from the Operating Theatres.



Staff uses an enzymatic detergent-soaked sponge to rub the Power Tool Hose length. Hose is then coiled and rinsed under running water followed by rinsing with Reverse Osmosis (RO) water. The hose is blow-dried using air gun. Finally, the hose connector ends are cleaned with cotton bud stick dipped in Septanol 70%. This process takes about 4 – 6 minutes per hose.



Fig 4 : Hose basket



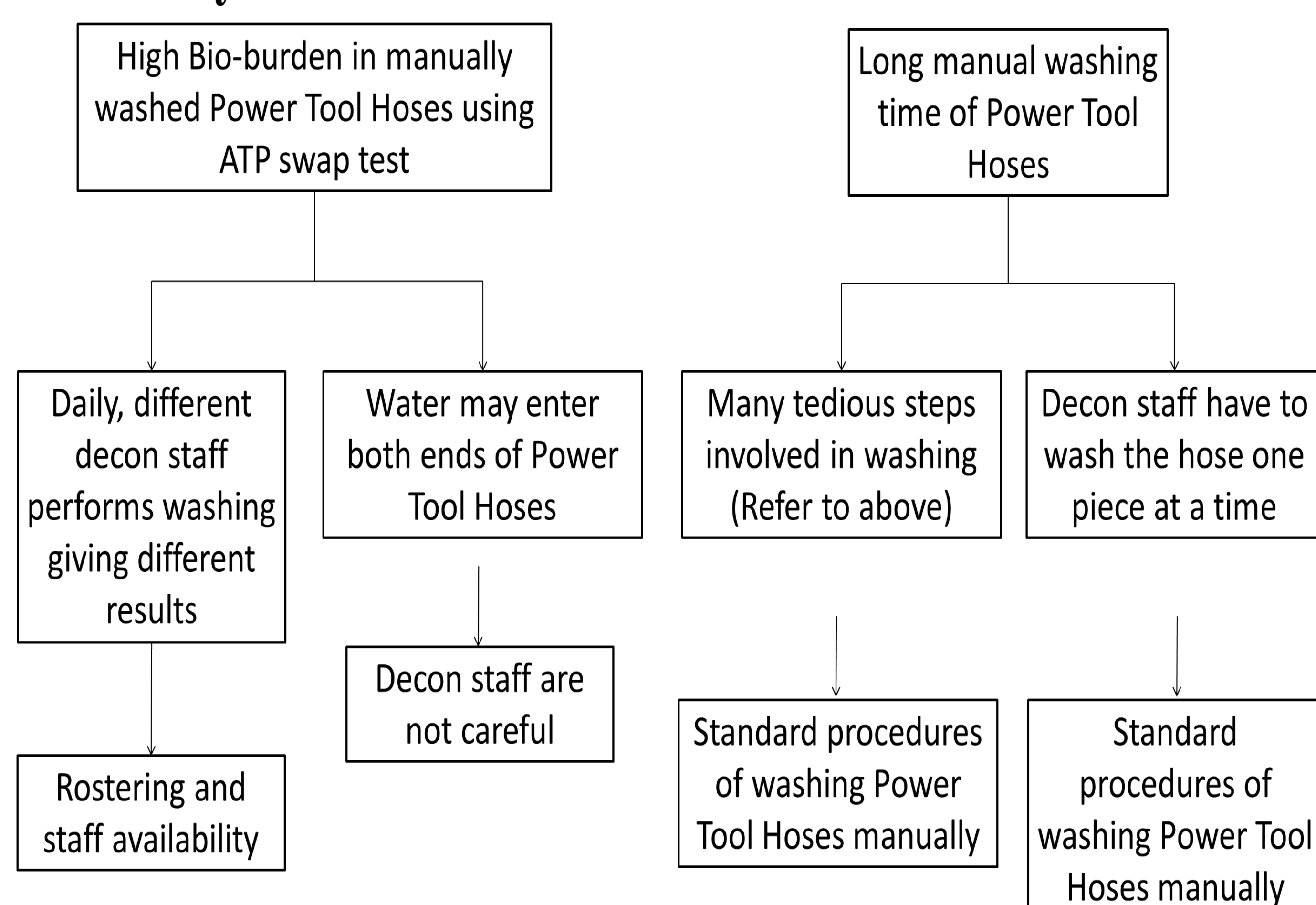
Fig 5 : Hose arrangement in basket



Fig 6 : Placing hose basket into washer cart

S/N	Implementation Plan	Responsible	Date
1.	Meeting and discussion with members and QI coach	All members and coach	1/8/18
2	Discussing with Instrument vendors on impact of the hose reliability using the Auto-mechanical washer instead of manual washing	Yew Wai Kean	12/8/18
3	Fabrication and testing of the hose basket	Lim Chai Kim	21/8/18 – 29/8/18
4	Demonstrate to TSSU staff on the use of the hose basket, arrangement of the hose in the basket ,highlighting the importance of the propeller height limit when placing the basket into the washer cart	All members	7/9/18
5	Create pictorial guidelines and monitor feedback from all staffs	All members	10/9/18
6	Conduct test to measure the amount of bio-burden on the hoses after the mechanical washing process	Yew Wai Kean	7/10/18 – 11/10/18
7	Evaluate solutions implemented	All members and coach	18/10/18

## Analysis of Root Cause



## Results

Conducted ATP swap test. ATP is the universal energy molecule found in all cells including bacteria. This test measures ATP amount left on the hose after a washing cycle using Relative Light Unit (RLU) as unit of measurement. Higher RLU means more bacteria remains on the hose.

Table 1 shows a consistently significant lower RLU when the hoses are machine-washed.

T-test result is less than 0.05, which is statistically significant indicating the RLU has decreased when the Power Tool Hoses are machine-washed.

## Cost Savings

Total time savings of 870hrs/yr.

Total manpower cost savings of **\$21,924/yr.**

**Table 1:ATP Swap Test Results**

	Manual Wash	Machine Wash
Test 1	246 RLU	12 RLU
Test 2	112 RLU	17 RLU
Test 3	98 RLU	13 RLU
Test 4	92 RLU	18 RLU
Test 5	322 RLU	46 RLU
Test 6	125 RLU	15 RLU
Test 7	278 RLU	39 RLU
Test 8	588 RLU	52 RLU

**P-value = 0.0054**

## Interventions / Initiatives

- 1.To migrate manual hose washing to auto mechanical washer as it provides a much more consistent washing and better disinfection quality.
- 2.To fabricate a hose basket to fit two or more hoses.
- 3.To create shields to prevent water from entering into the hose ends and yet be able to wash the end connectors.
- 4.To ensure the final assembly meets the washer cart propeller height limit requirement.

## Conclusion

ATP swap test and visual inspection of Power Tool Hoses for any signs of deterioration continued to be carried out. Feedback from staff was generally positive as they have more time to re-process other instruments. Now, we are in the process of creating a larger basket to accommodate 2 more hoses, which would save more time and enhance efficiency in the washing of Power Tool Hoses in TSSU.