



Streamlining the work process in preparing patient for Orthopaedic Lower Limb Surgery



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Introduction

In Major Operating Theatre (OT), more than 2,000 lower limb surgeries such as Total Knee and Total Hip Replacement are performed annually. These surgeries require a non-sterile Ancillary Staff, such as the OT Technician (OTT) and OTT Associate (OTTA), to manually lift and hold patient's leg for Surgeon to carry out disinfecting and draping procedures to create a sterile field at the surgical site and surrounding area. The average time taken is 8 minutes.

Background

Ancillary Staff feedback that they experienced shoulder and back ache after lifting patients' lower limb for a long period of time, several times a day. This is further worsened when they had to lift and hold both legs simultaneously. At times, surgeons even requested the Ancillary Staff to hold patient's leg for a longer period of time for effective drying of disinfectants prior to draping.

Aim

To improve current practice of manual lifting and holding of patient's leg/s in Orthopaedic Lower Limb Surgery with the sub-goal of reducing the duration of lifting and holding from 8 minutes to 1.5 minute within 6 months.

Methodology

Cause and Effect Diagram - Determine possible root causes to problem.

Pareto Chart - Plotted according to the possible root causes selected and multi-voting was carried out. By using the 80/20 rule, three final root causes were selected for improvement:

- Long time taken for the leg/s to be properly disinfected and draped
- Ancillary Staff lack strength
- Did not purchase equipment to lift and hold patient's leg/s

Solutions Selection

Tree Diagram and Decision Matrix

Criteria	Intervention	Meets criteria					Total
		(1) Meets criteria least	(2) Meets criteria moderately	(3) Meets criteria most	(4) Meets criteria most	(5) Meets criteria most	
To shorten the process of preparing patient's leg/s for surgery	1) To lift and hold patient's legs only when surgeon is ready to disinfect & drape	5	5	3	5	5	23
	2) To use only one cleansing solution for disinfection procedure	5	1	5	1	1	13
To improve the current practice of lifting and holding of patient's leg/s in Orthopaedic Lower Limb Surgery	1) Instruct short stature / small size staff to use low standing platform	3	5	5	3	3	19
	2) Deploy more male ancillary staff to Orthopaedic theatre	3	3	5	1	3	15
To provide equipment to lift and hold the limb	1) Improvise leg support to hold up legs	3	3	5	3	3	17
	2) Purchase a leg support	1	1	1	1	3	7

Interventions



Intervention 1: Ancillary Staff lifted and held patient's leg/s only when surgeon is ready to disinfect and drape.



Intervention 2: Ancillary Staff stood on standing platform with lowered operating table during the procedures.

Briefing and supervision conducted for interventions 1 and 2 to ensure compliance.

Intervention 3: Improvised leg support using a drip stand with cotton bandage.



Cotton Bandage used to hold patient's toes to the drip stand



Ancillary Staff held onto drip stand



Completed disinfection, cotton bandage removes, Ancillary Staff held leg for draping

Improvised leg support was unsuitable after one-week trial as cotton bandage occasionally gave way when used for a period of time. Thus, a leg support was customized (Prototype 1).

Prototype 1: Upper part of drip stand removed, replaced with shoulder support



Patient's leg placed on Prototype 1 leg support

Feedbacks: To add padding, width of leg support not wide enough, leg support restricted by table frame.

Prototype 2: Modified Leg Support



Padded leg support with adjustable extension arm

Feedbacks: Extension part too long causing instability, leg support unable to rotate

Improvement made by fixing leg support with ball bearing socket to be rotated at any angle, as well as maximum and minimum height reviewed.

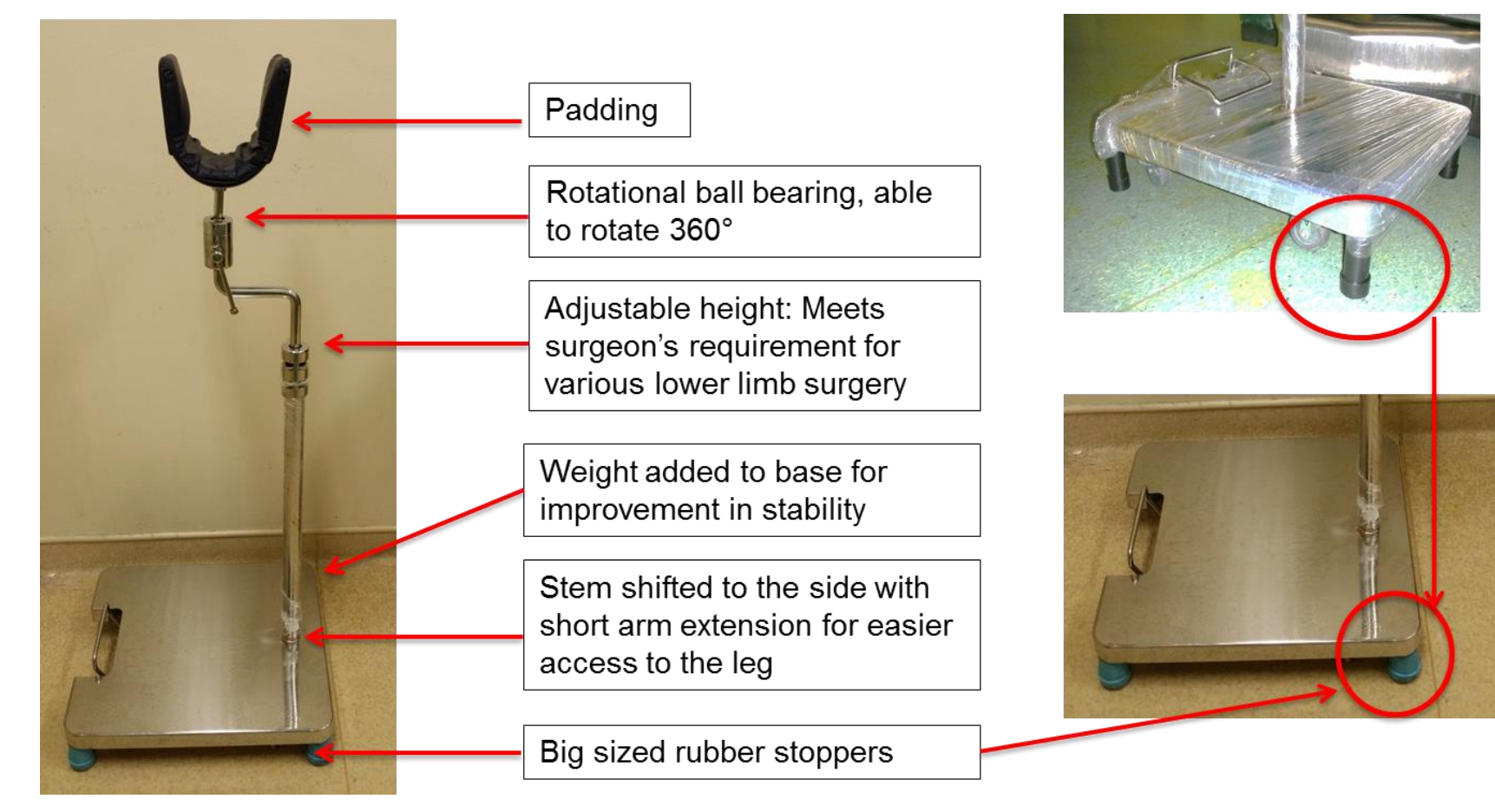
Prototype 3: Improved Modified Leg Support



Leg elevated on the leg support



Surgeon performs cleansing

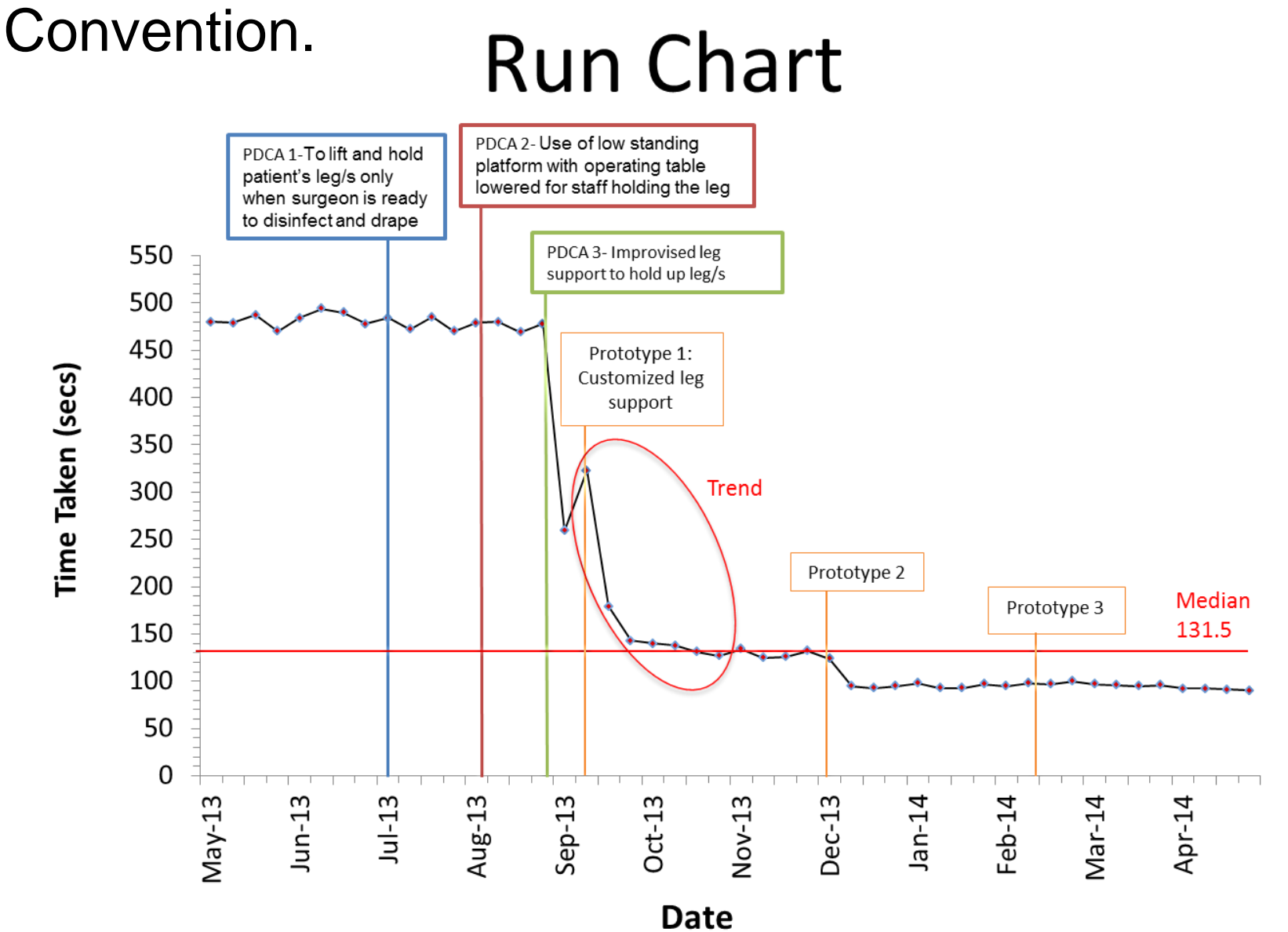


The new improved leg support ensures patient safety during disinfecting and draping processes and staffs do not have to worry about dropping patient's leg and risk of contamination at all times.

Briefing, demonstrations and in-service lectures conducted to Nurses and Ancillary Staff. On-site supervision was carried out. Project also shared at Team Excellence Innovation Quality Convention.

Results

Progress of interventions and improvement in time taken to lift and hold patient's leg are shown in this Run Chart.



There was a total manhour time-savings of **6 minutes 40 seconds** per case.

Tangible Benefits

1. Estimated Cost Savings of \$1122 in a year (per theatre)
2. Medical cost avoidance due to workplace injury

Intangible Benefits

1. Increase staff productivity
2. Promote workplace safety
3. No breach in sterility
4. No surgery delay
5. Better patient care
6. Enhanced hospital reputation

Sustainability

- We continue to Collect feedbacks from surgeon and staff
- Provide in-service
- Conduct on-site supervision and monitoring of work process
- Update staff promptly of any changes or improvement made

Conclusion

Support from all stakeholders is important in making the project a success. All these years, we have been dependent on people power to lift and hold patient's leg/s. With the implementation of the leg support, patient's safety is greatly enhanced as risk of leg dropping is eliminated. The project also promotes workplace safety as staff no longer manually lift and hold patient's leg for long period of time, several times a day. With time saved, OT staff will have more time to provide better patient care as "Patients At The Heart of All We Do".

Leg Holder Perfected!

We further enhance the design of leg holder. 1. Modify existing parts to hydraulic pump 2. Foot pedal for adjust height. 3. Lift up mechanism modify to side. The combined effort contributed to the success for the implementation of the project.