Singapore Healthcare Management 2018

USE ME, PAIN FREE

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Introduction

Patients with unknown or suspected spinal injuries are usually placed on full spinal immobilization to protect the spinal cord from worsening injury. It has been reported that more than 5% of patients experience deterioration of neurological function after arrival at a hospital, and this has been attributed partly to inadequate spinal immobilisation[1].
When caring for patients on full spinal immobilization, nurses need to roll patients for tasks such as sponging and diaper-changing using the log-rolling technique. This technique is performed to maintain the patient's spine in a neutral position throughout the procedures[2,3].

However, to date, no equipment is available to ensure that patients' spinal alignment is definitely maintained in a neutral position. The log-rolling technique also requires a minimum of four nurses to properly execute[2].

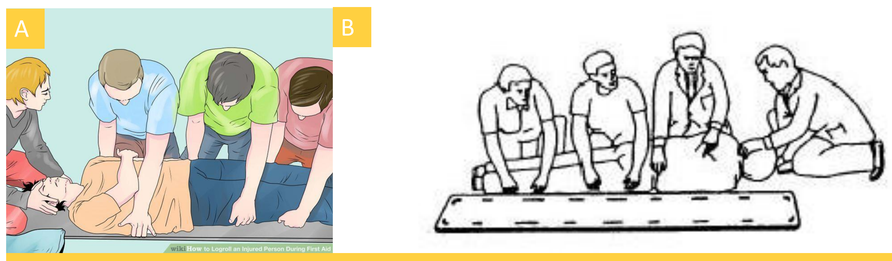


Figure 1. Log-rolling technique. (A) Preparing for a log-roll. (B) Maintaining a sidelying position with the log-roll technique for tasks such as sponging and diaper-changing.

Mission Statement

To improve ease of log-rolling, while maintaining safety for patients, within the next 12 months through the development of a device that could facilitate log-rolling.

Measures

1. Reduce number of staff required for log-rolling process by at least 1
2. Reduce time taken for nursing procedures such as sponging and diaper-changing by at least 10%

Analysis of problem

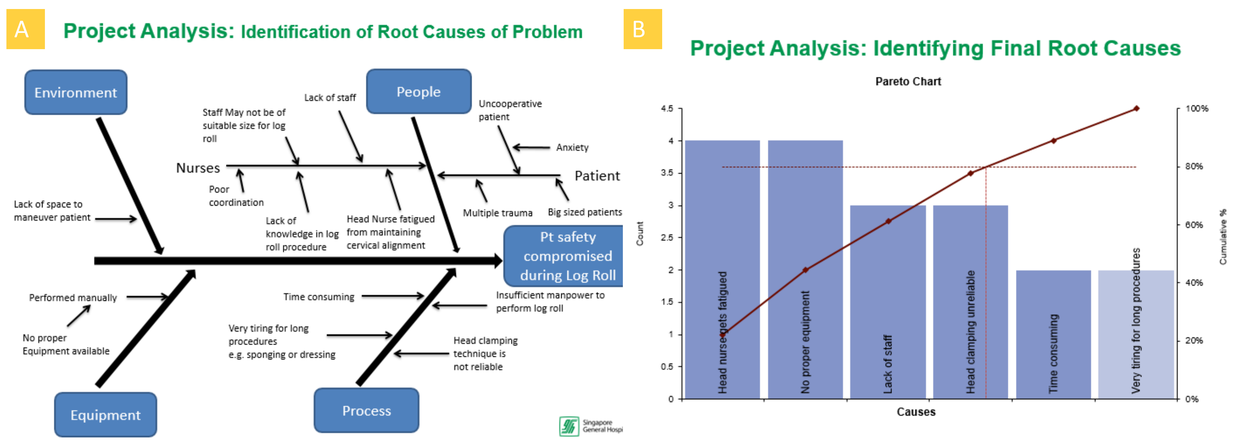


Figure 2. Identification of the root causes of the problem. (A) Fish-bone diagram for the identification of the root causes. (B) Pareto chart for the identification of the final root causes.

Interventions / Initiatives

Collaborate with engineering professionals to design a suitable equipment.

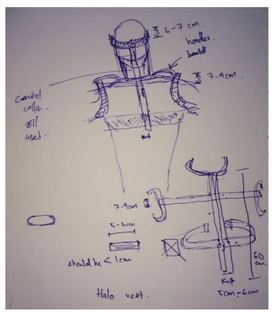
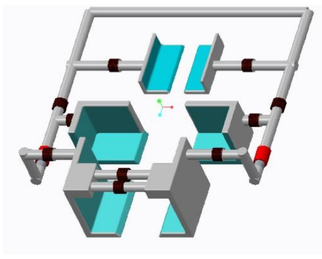


Fig 2.a



ISOMETRIC

Fig 2.b

Fig 2.c

Figure 2.a - Multiple sketches for possible designs such as this were done and put up for discussion to see which is the most practical and safe.
Fig 2.b - Once the most suitable sketch was picked, the design was then put into Isometric design by the engineering professionals to show how the final product would look like.
Fig 2.c – The final product. Paddings were added to promote comfort and safety for patient. Prototype was tested on team members.

Results

Project Achievement

	Traditional log-rolling	New log-roll device
Required manpower	≥ 4	2-3
Time taken	Set-up time: 10-12min Tear-down time: NA For sponging: 25min For diaper-changing: 20min	Set-up time: 4-5min Tear-down time: 1-2min For sponging: 20min – **reduced from 25min to 20min, a reduction of 20%** For diaper-changing: 15min – **reduced from 20min to 15min, a reduction of 25%**
Borg Rating of Perceived Exertion Scale	Of person assisting head: 14-15 Of persons assisting torso: 13-14	Of person assisting head: - Of persons assisting torso: 11-12
Total manpower per task per patient per day (assume min. number)	For sponging: (25/60 x 4) / 8 = 0.21FTE For diaper-changing: (20/60 x 4) / 8 = 0.17FTE	For sponging: (20/60 x 2) / 8 = 0.08FTE – **a reduction of 62%** For diaper-changing: (15/60 x 2) / 8 = 0.06FTE – **a reduction of 65%**
Number of times task performed per patient per day	For sponging: 1 For diaper-changing: 3	For sponging: 1 For diaper-changing: 3
Total manpower per patient per day	0.21 + (3x 0.17) = 0.72FTE	0.08 + (3x 0.06) = 0.26FTE – **a reduction of 64%**

Sustainability Plans

- Submitted plan to Nursing Administration - Quality Improvement
- Awaiting approval from appropriate boards

References

1. Surgeons, A.C.o., *Advanced Trauma Life Support: Program for Doctors.* 9E ed, ed. A.C.O.S.T. Committee 2012, Chicago: American College of Surgeons. 366.
2. Magil, J. and K. Kennedy, *Spinal Trauma,* in Emergency and Trauma Care for Nurses and Paramedics, K. Curtis, C. Ramsden, and B. Lord, Editors. 2011, Elsevier: Sydney p. 1289-1319.
3. Read, S. *Evidence Summary: Log Roll*. 2013. 1-4.