

# Minimizing Waste in Neonatal Intensive Care Units by Effective bedside Supply Management: Application of Lean Six Sigma in Neonatal Intensive Care Unit

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## Abstract

**Objectives:** The primary objective of the study was to minimize the waste because of stocked supplies at the bedside cabinet in NICU. The aim was to find alternative options to stock, and to educate care providers about the increase in cost of the patient care arising because of the waste associated with inadequate inventory management.

**Material and Methods:** A pilot study was conducted by formulating new protocols of supply indentation and removing all excess supplies from bedside cabinet to a moving trolley which was kept outside infected area. The study lasted 12 weeks and cost savings on consumables were compared with historic data of past 12 weeks for the same beds. The response time for procuring endotracheal tube from moving trolley was compared with other bed where the new protocols were not applied. The data was compared in appropriate statistical test.

**Results:** Data was collected for 12 week time period. There was significant cost saving at the end (Average saving Rs 4383 vs. 1771, value of p was highly significant) without significant change in patient care, the time taken for procurement of an endotracheal tube was found to be 71.3 s vs. 68 s with a p value more than 0.9.

**Conclusion:** Storing consumables and supplies in moving trolley rather than on bedside cabinet resulted into waste reduction because storing at bedside cabinets rendered supplies potentially infected leading to their discarding and resulting in more waste and cost incurred on patient bills. While storing excess supplies on a moving trolley which can quickly be moved to patients bedsides in case of an emergency situation, resulted in less potential of supplies being infected and thus saving on patients costs on consumables because leftovers can be returned to stores.

**Keywords:** Lean six sigma; Waste reduction; Indent protocols; Supply management; Inventory management; Neonatal; Intensive care unit

collect the article, come back to patient care area after crossing the three barricades and doffing her usual clothes and donning the NICU sterilized suits, cap and mask. The whole process



**Figure 2** Flow chart showing process after implementation of lean.

Upon discharge of the patient, all left over supply indented in the

Average	4832.25	1771.58
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**Table 1:** Refund on unused supply before and after implementation of lean.

Value of p using Mann-Whitney U test  $\ll 0.05$

Since value of p is less than 0.05 it means there is statistically significant refunds when a patient is being discharged as compared to implementation of lean principles (Table 1).

Week	Avg time taken in procuring endotracheal tube in critical event from moving trolley in seconds	Avg time taken in procuring endotracheal tube from bedside cabinets in seconds
1	67	64
2	54	59
3	112	69
4	58	89
5	77	60
6	64	68
7	87	54
8	73	83
9	58	65
10	63	71
11	81	60
12	62	74
Average	71.3	68

## Conclusion

Staff members were effectively adjusting to the practice changes resulting from this initiative.