

## HELP: Hands on Equipment Learning Program

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**Abstract:** Nursing is a very device-heavy discipline. Learning everything about every biomedical equipment's just isn't feasible, as nurses have the entrenched cultural desire to focus on the patient care. Nursing Curriculum does not specify biomedical equipment's training. There is challenges of effective training and assessing competencies. Breakdown and repairs are also a major concern as they effect the patient care, revenue and cost optimization of the hospital. In order to bridge this gap of increasing demand of technology and limited competency of nurses, a program "HELP"- Hands on Equipment Learning Program was incited . Early adaptation and acclimatization to available technology in hospitals will help nurses in delivering better care to their patients. The development of structures, procedures, protocols and training tasks can reduce errors and enhance the quality of medical interventions[3] Keeping this view in mind, An Apollo Nursing Employee Induction Program was initiated that incorporates theory and functional training. Sessions on medical equipment and point of care testing devices is a mandatory component of the program. The staff is educated on knowledge of concerned laboratory Quality Checks and timelines as per the device and requirement. As a result of the program the incidents related to medical equipment has been reduced.The medical cost,equipment purchasing cost and servicing cost also reduced significantly.

**Key words:**Biomedical equipment's,Nursing staff,Preceptor training, Induction Program,

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### I. Introduction

Nursing is a very device-heavy discipline. Learning everything about every device just isn't feasible, according to the nursing representatives, who point to increasing demands on their time, which makes it very hard to even attend training sessions. Additionally, there is an entrenched cultural desire in nursing to focus on the patient, not technology. Nurses are also not taught specifically about devices in their Nursing Curriculum. As mentioned in one of the WHO Reports<sup>[1]</sup>- In an investigation on incidents involving defibrillators in the US, it was observed that the majority of the incidents were due to incorrect operation and maintenance. A study of 2000 adverse incidents in operating theatres in Australia showed that 9% were due to pure equipment failure. In two reports on the use of critical care equipment by nursing staff, 19% and 12.3% of nurses, respectively, indicated that they had used equipment improperly, which had consequently harmed a patient. Researchers have also showed that training in the use of equipment is a very minor activity, with less than 1% of departmental time spent on providing or receiving training<sup>[2]</sup> (staff with higher levels of expertise require less assistance from technical personnel). They concluded that critical-care equipment can be utilized more fully, cost-effectively and safely if a formal, regular and effective training programme is implemented. Beyond the challenge of effective training is the question of assessing competencies. Breakdown and repairs are also a major concern as they effect the revenue and cost optimization of the hospital.

### II. Material And Methods

The development of structures, procedures, protocols and training tasks can reduce errors and enhance the quality of medical interventions<sup>[3]</sup> Keeping this view in mind, An Apollo Nursing Employee Induction Program was initiated that incorporates theory and functional training. Sessions on medical equipment and point of care testing devices is a mandatory component of the program. The staff is educated on knowledge of concerned laboratory Quality Checks and timelines as per the device and requirement. Teaching only will not solve the purpose, hand holding the staff creates a sense of confidence and helps them in clarifying their doubts. The new joined staff are taken into preceptor training, functional training and hands on equipment training. The new recruits are hand held and are placed under the direct supervision of the Biomedical Engineer of the Nursing Department. Their competencies are checked on 5<sup>th</sup>, 15<sup>th</sup> & 25<sup>th</sup> day of their joining and reassessment is done after completion of five months from the date of deployment in their respective units.

The Biomedical Training module for the Induction Program focuses on the following areas:

- Knowledge of the intended use of the device  
Some staff are very new in the system and they do not even understand the utility of a particular equipment. For eg: they connect the patient monitor just to monitor pulse and heart rate, which can be done by a pulse oxymeter also.
- Manufacturer's instructions for use, labelling, warnings, contraindications, and known complications  
Whenever a new equipment is installed, a user training is done explaining everyone about the new technique and the accessories to be used with it. Certain equipment are compatible with certain parts and accessories. By explaining the difficulties, the errors could be minimized.
- Nursing departmental guidelines for quality check and calibration.  
Staff are mostly confused about what to do check, how to calibrate and where to send for checking. Therefore, guidelines have been made and given in all units for uniformity.
- Insight into differences in device use and design between similar devices  
One equipment is available in hospital in different models, each model has different working methods, so the staff needs to be trained on the working of each type of equipment and the differences between the similar devices.
- Eliminating errors and adverse events  
Any adverse events that take place due to mishandling by the staff or because of no functionality of the machine are reported and root-cause analysis is done.
- Detecting errors early, before injury occurs  
Daily checking of equipment will detect early errors and prevent injuries. A record is prepared for checking equipment daily and deviations are informed to the concerned department.

#### Steps which will ensure sustainability of the Hands On Equipment Learning Program

- Demonstrate what to do.
- Allow the staff to actually do the work and practice under supervision.
- Maintain a friendly environment, rather than a highly competitive environment, in which to learn.
- Be patient with the users, but expect effort and excellence.
- Invite engineers from manufacturers to visit facility to conduct training on their equipment.
- Run in-house (on-the-job) training sessions.
- Approach Apollo School of Nursing to develop, run, and accredit new modules specifically designed for equipment needs.
- Provide various training materials for staff to refer to.

#### Structure for Training Program under HELP

	Training Program Module under HELP	Frequency
1	Hand's on training on new equipment's.	At the time of installation
2	Mandatory training for Biomedical Equipment /point of care testing devices is carried out and completion certificate is awarded to all staffs.	Yearly
3	Laser safety training for the staff posted in laser exposure zone.	Twice in a year
4	Hands on equipment sessions are organized for staff with experts for clearing doubts.	Twice in a year
5	Unit training for each staff on one medical equipment.	Monthly
6	Taking feedback from units on top challenges related to medical equipment's.	Monthly
7	Reinforcement training on medical equipment's in SMS (Scrubs Meet Suits).	Weekly
8	External training by purveyor and manufacturers of medical equipment's.	As and when the need arises
9	Post error training and SSLC (slow and special learning classes) for all the staff if any incident related to equipment mishandling occurs.	Ongoing
10	Quiz and awareness campaigns are conducted, winners are awarded with special gifts and prizes. .	Ongoing

### III. Results

	Measurable	Outcomes
1	Number of incidences related to medical equipment per month .[Fig1]	0.25( 1 per month) wrong settings of ventilator
2	Number of staff trained on medical equipment handling and electrical safety	1400(100%) all nurses
3	Decrease in the material and medical cost after every incidence .[Fig 2]	from Rs.61270 to 0 (till May 2017)
4	Lessening the cost of purchasing new medical equipment due to breakdown ranging	from 40000 (syringe pump)/50000 (infusion pump) /12 lakhs (ventilator) per incident to NIL
5	Curtailing the cost of power cord due to burn and mishandling	from 1500/- to NIL
6	Reduction in servicing cost of medical equipment	from 8520 /-(syringe pump), 55,000/- (ventilator) to NIL
7	Calls received by consultants regarding lack of skill of nursing staff in medical equipment	01 in six months
8	Complications related to the inefficient handling of medical devices	Not reported

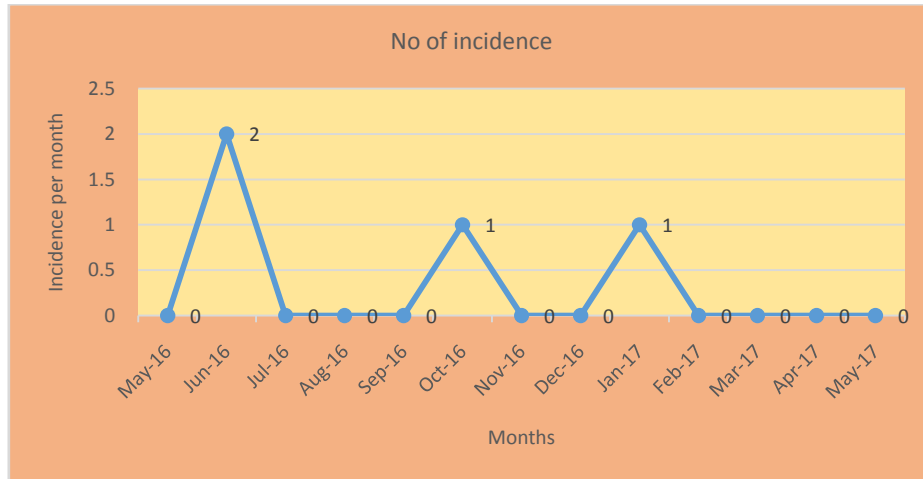


Fig:1 depicts the number of related to medical equipment per month in the year 2016-2017

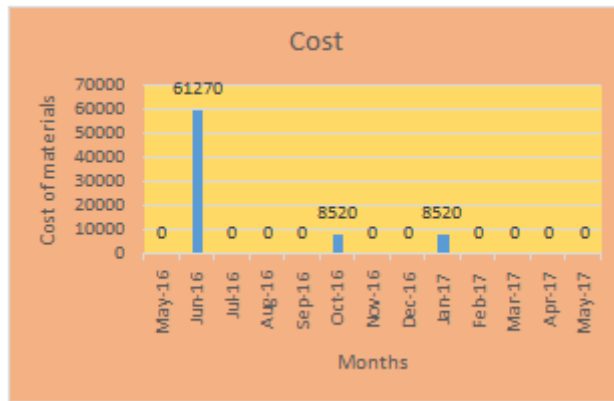


Fig:2 shows the material and medical cost after every incidence MAY 2016 to May 2017)

4FT1	4FT2	4FT3	3FT1	3FT2	3FT3	2FT1	2FT2	2F-EXT	SUR-OC
95%	95%	85%	94%	89%	91%	92%	100%	90%	90%
95%	95%	75%	94%	89%	92%	89%	92%	90%	100%
95%	95%	80%	94%	89%	92%	87%	100%	90%	100%
95%	95%	90%	94%	94%	92%	77%	100%	85%	100%
95%	95%	90%	94%	94%	92%	81%	100%	80%	100%
95%	95%	85%	95%	94%	91%	81%	92%	80%	100%
95%	95%	85%	95%	94%	91%	80%	84%	80%	100%
95%	95%	80%	94%	72%	94%	86%	100%	80%	100%
95%	95%	80%	94%	89%	94%	84%	100%	83%	100%
95%	95%	80%	94%	72%	94%	87%	100%	80%	100%
95%	95%	80%	94%	89%	95%	90%	100%	83%	100%
95%	95%	80%	94%	89%	95%	88%	92%	83%	100%
95%	95%	80%	94%	89%	95%	88%	100%	80%	100%
95%	95%	80%	94%	89%	95%	88%	100%	80%	100%
95%	95%	80%	94%	89%	95%	87%	100%	83%	100%
95%	95%	80%	94%	89%	95%	83%	100%	80%	100%
95%	95%	80%	94%	89%	95%	87%	100%	83%	100%
95%	95%	95%	98%	100%	99%	93%	100%	85%	100%
95%	95%	95%	98%	100%	99%	95%	100%	80%	100%
95%	95%	95%	98%	100%	99%	92%	100%	83%	100%
95%	95%	95%	98%	100%	99%	93%	100%	83%	100%

Fig:3 shows the increase in the percentage of patient feedback –voice of the customer

#### IV. Discussion

Many hospitals also have teams of biomedical engineers’ hence nursing and biomedical can collaborate with each other can for adapting an excellent service with this we will be able to provide consistently excellent facility to our patients’ expectations. Training and education are important components of standardization, to ensure safety. Implementing such measures as part of an overall program will help to reduce errors and improve care of patient.

In long run, with growing skills and knowledge, there will be a steep development in the competency of the staff. As an output to this we can have

- Specialized service in the organization

- Standardization of medical device checks
- Economy of time and price due to reduction in the number of incidents
- Decline in incidents related to medical devices
- Increased patient satisfaction
- Provides a safe learning environment
- Decreased in breakdown cost
- Improved skill of staff for handling medical devices
- Increases engagement levels
- Delivers exceptional return on investment by reduce breakdown

### **V. Conclusion**

Medical device technology will continue to evolve and challenge nurses at the point of care. Advances in medical equipment's and technology will always be a challenge to nurses as innovation is a part of basic instinct of mankind and new nurses are born every day. The program HELP [Hands on Equipment Learning Program] standardizes medical practices and the use of medical devices. Every input to the program was with a goal to provide maximum exposure to the nursing staff on medical equipment's.

### **References**

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