

Safe and Efficient Vital Signs-is it Time to Change our Methods?

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Introduction

Nelson 8 is a 23 bed, Telemetry-medicine unit, which has a variety of adult-geriatric patient population. In this unit, vital signs are collected every 4 hours on 23 patients /day. Vital signs are collected to obtain important data about a patient's health: Vital Sign collection is obtained by Clinical Technicians and Nurses using the Dinamap (a portable, automated machine)

Although, the method for which vital signs are obtained seems to be cost efficient to the hospital but can be detrimental to the patient's health if the non-critical device was not properly disinfected prior to usage, in which increasing risk of a transmission- bacteria infection.

Each patient care room has the monitors that are capable of vital sign measurements, perform EKG's and ability to monitor the patient's heart rate & rhythm, along with monitoring a patient's condition within an emergency setting; However, only 12 TRAMS (Which are the central processing component for the monitors) available on the unit, and are placed into the patient's room based upon doctor's orders for continuous telemetry.

Objectives

To compare the two vital sign collection methods: The Dinamap (portable, automated device) and The TRAM (in patient monitoring system) in relation to time to complete vital sign collection, infection control, and cost.



Methods

Nelson 8 has 1-2 clinical technicians, 6 nurses, 5 Dinamaps and 12 TRAMS. To compare the two vital sign collection methods: The Dinamap (portable/automated device) and The TRAM (in patient monitoring system) in relation to: time to complete vital sign collection, infection control, and cost.

Portable Dinamap – current method	Measure	Data Collection
Frequency of Vital sign collection:	Each vital sign collection required 8 minutes on average per patient with 4 minutes dedicated to disinfecting the portable dinamap	Vital signs obtained every 4 hours for 23 patients by the Clinical Technician. Stop watch was used to record the vital sign process from start to finish, including cleaning of the dinamaps over a 7 day period.
Infection Control	A survey was conducted on the cleanliness of the portable dinamap and TRAMS after heavy usage with vital sign collection. Weekly average around 12pm demonstrated a 49% of presence of "fake germs" on the portable dinamap. "Goo Germs" was applied to the TRAM with a result of 0% due to the environmental care services daily cleaning of patient rooms.	HEIC provided "goo germs" and a black light in order to swab the dinamap machines for the presence of "fake" germs". "Goo germs" is easily wiped away if the surface has been cleaned.
Cost	\$2,700 for a Dinamap machine.	Interview with Nurse Manager

Study Analysis

Compare the Standard Practice versus the Observed Practice				
Component	Dinamap Standard Practice	Dinamap Observed Practice	Tram Standard Practice	Tram Observed Practice
Time of VS Collection	Locate dinamap → Clean dinamap → 2 minutes of drying → obtain vital signs 4 minutes → Document → Clean dinamap → 2 minutes for drying → next patient=total time of 8 minutes	Locate dinamap → Clean dinamap → 0-30 seconds of drying → obtain vital signs 4 minutes → Document → Clean dinamap → 2 minutes for drying → next patient=total time of 6 minutes 30 seconds	Connect power cords to TRAM → obtain vital signs 4 minutes → next patient = total time of 5 minutes	Same as Standard
Infection Control	Disinfecting non-critical devices per the SANI-D (germicidal disposable wipes) recommendations is 2 minutes and allow to air dry	Dinamaps found with previous patient's BP cuff, no cleansing at all or less than the complete dinamap cleansing (photos obtained)	Trams cleaned daily by environmental services. One Tram per one patient.	Same as Standard
Cost	Unit equipment is purchased from a departmental Operations budget based on bed size and budget allowances.	Nelson 8 purchased one Dinamap 6 months ago.	Unit equipment is purchased from a departmental Operations budget based on bed size and budget allowances.	Nelson 8 purchased 12 TRAMS when the unit opened in

Conclusion

It took the staff an average time of 8 minutes for the dinamap and 5 minutes for the TRAMs to collect vital signs. There is a higher rate of Goo presence in the dinamap group compared to the TRAMS. The cost of each dinamap is \$2,700. The cost of a TRAM is \$15,000. To ensure each patient room on Nelson 8 had a TRAM would cost \$145,000; However, the average cost of a hospital acquired infection ranges between \$28.4 to \$33.8 billion dollars in direct medical costs.

Nelson 8 is a medicine unit with various types of patients, students, and non-clinical members whom play a part in the cleanliness of the portable machines. Nelson 8 is a great unit for education gaining clinical/nursing experience due to the variety of patients available. However, the increased health-care personnel within the unit, raises the risk of bacterial transmission from one patient to another.

Recommendations

Based on the findings, it is recommended that the nursing unit at this time, consider making a capital investment in purchasing 11 additional TRAMS, so each patient room on Nelson 8 has a TRAM.



Results

Component	Dinamap	Tram
Time Collection	8 min	5 min
Infection Control Risk *(see below)	+ Risk	- Risk
Cost	1 Dinamap cost \$2700	11 Trams for a cost of \$145,000

*The results from swabbing the portable machines indicate that the percentage of the dinamaps being cleaned are lower during the afternoon phase. The results vary upon the number and types of staff members present during each peak period of usage of the machines.
Several staff, non-clinical and clinical staff members were observed not cleaning the portable dinamaps after usage and placed in the hallways where another person can utilize the dinamap.

References

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