# 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: bacteriological 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 on doctor’s orders for continuous telemetry.

## 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.

### Equipment

- Dinamap: (portable, automated devices)
- TRAM: (in patient monitoring system)

### Frequency of Vital Sign collection:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each vital sign collection required</td>
<td>8 minutes on average per patient with 5 minutes dedicated to disinfecting the portable device.</td>
</tr>
</tbody>
</table>

### 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 presence of “fake germs”.

**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

### 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.

## Study Analysis

### Compare the Standard Practice versus the Observed Practice

<table>
<thead>
<tr>
<th>Component</th>
<th>Dinamap Standard Practice</th>
<th>Dinamap Observed Practice</th>
<th>Tram Standard Practice</th>
<th>Tram Observed Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of VS Collection</td>
<td>Locate dinamap $\rightarrow$ Clean dinamap $\rightarrow$ 2 minutes of drying $\rightarrow$ obtain vital signs 4 minutes $\rightarrow$ Document $\rightarrow$ Clean dinamap $\rightarrow$ 2 minutes for drying $\rightarrow$ next patient=total time of 8 minutes</td>
<td>Locate dinamap $\rightarrow$ Clean dinamap $\rightarrow$ 0-30 seconds of drying $\rightarrow$ obtain vital signs 4 minutes $\rightarrow$ Document $\rightarrow$ Clean dinamap $\rightarrow$ 2 minutes for drying $\rightarrow$ next patient=total time of 6 minutes 30 seconds</td>
<td>Connect power cords to TRAM $\rightarrow$ obtain vital signs 4 minutes $\rightarrow$ next patient=total time of 5 minutes</td>
<td>Same as Standard</td>
</tr>
</tbody>
</table>

### Infection Control

| Disinfecting non-critical devices per the SANI D (germicidal disposable wipes) recommendations | Dinamap found with previous patient’s BP cuff, no cleaning 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

| Cost | Unit equipment is purchased from a departmental Operations budget based on bed size and budget allowances. | 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 |

## Results

### Time Collection

<table>
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<th>Tram</th>
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<td>Time Collection</td>
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<td>5 min</td>
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</table>

### Infection Control Risk

| * (see below) | + Risk | - Risk |

### Cost

| Cost | 1 Dinamap cost $2700 | 11 Trams for a cost of $145,000 |

## 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 $2,700.

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 $284.4 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.

## References


