

CARESCAPE ONE Usability Study

INTRODUCTION

An observational study was performed with the GE Healthcare's CARESCAPE™ ONE intra-hospital transport patient monitor to evaluate the ease of use and the impact of operational features on patient transport in a clinical setting. Trained transport nurses performed 18 patient transports using the CARESCAPE ONE with the CARESCAPE Monitor Bx50 or as a standalone monitor at a leading research hospital in Wisconsin. User feedback from the transport nurses and the nurses in the unit receiving the patients was collected through a structured questionnaire.

PATIENT TRANSPORT MONITORING

Patient transport is a complex and highly sensitive process that requires adherence to high quality and safety standards. It is also a time-consuming task for nurses working in critical care areas, often resulting in nurses performing various tasks with higher physical and psychological requirements. Therefore, healthcare facilities are continuously seeking a more efficient and advanced featured transport monitor that could help ensure greater ease of use while enabling faster and safer patient transport.

ABOUT THE CARESCAPE ONE MONITOR

The CARESCAPE ONE intra-hospital transport monitor is an intuitive monitoring solution designed to help improve workflow for intra-hospital patient transport. It allows nurses to visually monitor critical patients' conditions with precision during active transport between care areas. It is a portable monitoring device with docking capability on the transport bed or at the bedside. The device's user interface is

designed to enable customization for individual care environments, thus helping simplify tasks, which may help the clinician reduce errors during patient transport. The CARESCAPE ONE features a new design approach, whereby the CARESCAPE ONE is standardized, and measurements are externalized with CARESCAPE PARAMETER¹ micro-modules, allowing greater hospital-wide standardization and improved care area flexibility. This helps to streamline workflow and may have a positive impact on user productivity.

USABILITY STUDY'S OBJECTIVE

The primary objective of the study was to gather user feedback on the ease of use of the CARESCAPE ONE with CARESCAPE PARAMETER micro-modules and the impact of its operational features when the monitor was used under clinical conditions during the patient transport between or within care areas within the hospital. The approach to collect observations from the transport nurses on the CARESCAPE ONE transport monitor with the CARESCAPE Bx50 bedside monitor, included:

- Structured feedback from the transport nurses through a questionnaire at the end of each transport on the operational features and usability of the CARESCAPE ONE monitor
- User observations (unstructured feedback and open comments) on the overall transport experience with CARESCAPE ONE monitor.

STUDY METHODOLOGY

The study was conducted at a leading research hospital in Wisconsin during the period of July 23 to September 26, 2018. The evaluation consisted of observing 18 evaluable patient transport cases, selected according to the set standard procedures and protocols of the site. Each patient transport was completed by an experienced patient transport (registered) nurse and with the CARESCAPE ONE transport monitor alongside the primary monitor CARESCAPE Bx50. None of the transport nurses had previous experience of using CARESCAPE ONE prior to the study.

The following inclusion criteria were used for considering a patient transport case from the respective in-patient and out-patient care areas (Emergency Department, Operating Room, Post Anesthesia Care Unit and Intensive Care Unit) for evaluation:

1. Adults 18 years old and over;
2. Being cared for in the care area and expected to remain in the unit for the duration of evaluation or intra-hospital transportation; AND
3. Able to provide written informed consent or have a legally authorized representative (LAR)

Selection of the transport cases was based on voluntary participation of the subjects upon consent for the evaluation purpose. Transport nurse recruitment was based on clinical qualifications for performing patient transport - relevant qualifications and experience to perform their tasks was documented as per standard guidelines². Following recruitment, staff were trained on the requirements set as per the study protocol to collect and record their overall observations on CARESCAPE ONE for their respective patient transport and capture their responses in a predefined questionnaire.

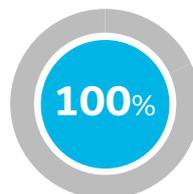
The following tools were used to capture user feedback from the transport nurses and the nurses in the unit receiving the patient:

- **Structured Questionnaire³:** User agreement on specific product attributes were captured employing five-point and 10-point Likert rating scales. Nurses were requested to answer product-specific statements associated with the transport monitor's ergonomics and its impact on workflow.
- **Qualitative User Feedback:** Qualitative feedback from nurses was also gathered on their overall observations on the different aspects of the operational features of CARESCAPE ONE and their interactions with the device during the patient transport.

RESULTS AND KEY FINDINGS FROM THE OBSERVATION STUDY

As part of the questionnaire, the OR transport nurses and PACU nurses receiving the patient were asked a set of questions regarding their overall experience using the CARESCAPE ONE monitor. The results are as follows:

Figure 1: Summary of transport nurse system recommendation

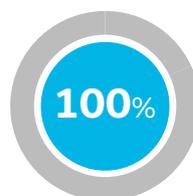


100% of the participating transport nurses who used CARESCAPE ONE for patient transfer indicated that they would approve CARESCAPE ONE for their care area

(Would you recommend this system for your unit/Care area? n = 33, respondents who conducted the transport and received the patient in the PACU response to closed question; no response from 3 nurses)

“Unit staff would not have to locate transport monitor; easy to disconnect and place on bed rail for transport. CARESCAPE ONE is light; easy to move from bed to imaging table.”

Figure 2: Summary of transport nurse and receiving unit response on overall system experience



100%* of the respondents indicated CARESCAPE ONE was excellent to use as a transport monitor

(How do you rate overall use of the system? (Scale: 0 to 10) n = 35, no response from one nurse)

**Excellent rating based on responses scored 8 and above*

Both transport nurses and nurses at the receiving units indicated that they would approve the CARESCAPE ONE as a transport monitor.

The key reasons given by the nurses were

- ICU staff: CARESCAPE ONE was very easy to use and they liked the size of the transport monitor.
- Transport nurses commented positively on the size, weight and the ability of positioning CARESCAPE ONE's sturdy holder at the end of bed.

Reliability and data continuity

Nurses stated that the CARESCAPE PARAMETER micro-modules felt secure throughout transport and also while moving patient from bed to imaging table, and there were no accidental disconnections during an active patient transport [Figure 3]. This, along with quick and easy transfer of data from primary monitor to CARESCAPE ONE monitor, allowed the transport nurse to feel confident [Figure 4] of having all the relevant patient data required for patient transport [Figure 4].

Figures 3 and 4: Summary of transport and receiving nurse responses on CARESCAPE PARAMETER micro-module connection reliability and data transfer continuity



89% of the nurses in the study indicated that the data transfer happened as expected during transport

(Was your data transferred as expected? n = 36, responses from nurses who conducted the transport from OR and received the patient in the PACU)



100% of the nurses in the study rated CARESCAPE ONE micro-module connections as reliable during the patient transport

(The micro-module connection feels reliable. (1-Disagree, 5-Agree) n = 36, responses from nurses who conducted the transport from OR and received the patient in the PACU;)

Figure 5: Summary of transport nurse response on overall performance of CARESCAPE ONE during transport



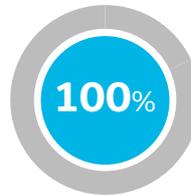
94% of the nurses in the study indicated that they strongly agreed that the CARESCAPE ONE performed well during the patient transport

(CARESCAPE ONE Profile performed well during transport. (1-Disagree, 5-Agree) n = 18, nurses who conducted the transport from OR, 17 nurses out of 18 rated four and above on a five-point rating scale)

Ergonomics

All nurses liked CARESCAPE ONE as a transport monitor as it was “easier to use the CARESCAPE PARAMETER micro-modules”. Nurses indicated that overall it was easy to connect and disconnect the micro-module during / after the procedures. Further, nurses also indicated that the ability to connect micro-modules to any standardized CARESCAPE ONE port further made it easier to work with CARESCAPE ONE due to these standardized connectors.

Figure 6: Summary of transport and receiving nurse responses on CARESCAPE PARAMETER micro-module connection for the entire patient transport



100% of the nurses in the study indicated that with CARESCAPE ONE it was easy to connect the CARESCAPE PARAMETER micro-module

(It was easy to connect the micro-modules. (1-Disagree, 10-Agree) n = 36, respondents who conducted the transport from OR, and received the patient in PACU)

“Staff felt it would improve workflow. The size and ease of use made the process smooth.”

“Able to prepare subject for transport easier/quicker. During transfer of subject to imaging table, it is easy to move monitor.”

Improved workflow

In general, the participant nurses could easily use the CARESCAPE ONE monitor as they were “able to prepare subject for transport easier and quicker”. Nurses also indicated that the CARESCAPE ONE would positively contribute towards improving the overall workflow due to its size and being lighter in weight; which made it easier to use as a portable transport monitor than typical transport monitors they have used previously.



100% of the nurses indicated that CARESCAPE ONE improved their overall transport workflow

(Does this solution improve your transport workflow? n = 14, Nurses who answered this survey question “all agreed”; no response from five nurses)

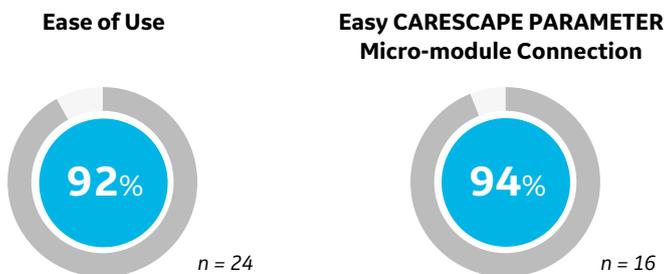
“Easier to prepare subject for transfer/transport; monitor size/weight easier to place in holder and then at end of CT table.”



COMBINED QUALITATIVE USER FEEDBACK RECEIVED AFTER THE PATIENT TRANSPORT

Of the total feedback captured after the patient transport, analysis of the qualitative feedback was performed, and the responses were categorized into “Ease of Use” and “Easy Micro-Module Connection”. Below are those results.

Figures 7 and 8: Summary of total number of comments ($n = 132$) from the nurses over 18 subject transport cases who used CARESCAPE ONE as transport monitor



“n” indicates total number of nurses that commented on respective feature of the CARESCAPE ONE monitor. The number in the circle indicates the percentage of positive comments contributing towards CARESCAPE ONE user benefit

CONCLUSION

The observational study in 18 patient transport cases on CARESCAPE ONE evaluating operational features and the ease of use under clinical conditions found that using CARESCAPE ONE provided workflow-associated operational benefits. The transport nurses gave positive feedback on the CARESCAPE ONE system for its intuitive interface, and ease of use during active intra-hospital patient transport and CARESCAPE PARAMETER micro-module connection.

REFERENCES

1. Externalized measurements parameters are digital CARESCAPE PARAMETER micro-modules that can be tailored to various patient needs. These micro-modules have standardized connectors allowing users to plug any CARESCAPE PARAMETER micro modules into any port.
2. Clinical investigation of medical devices for human subjects - Good Clinical Practice: International Organization for Standardization; 2011. ISO 14155:2011(E)
3. Likert Scale Analysis: Developed in 1932 by Rensis Likert to measure attitudes, the typical Likert scale is a 5- or 7-point ordinal scale used by nurses to rate the degree to which they agree or disagree with a statement.

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