



Making All the Difference: High-Quality CT Scans Directly in the ICU

Intensive care patients with head injuries depend on fast, reliable imaging results. The conventional way involves transporting patients from the ICU to the radiology department. Imaging with mobile head CT scanners directly at the patient's bedside reverses the process and simplifies the workflow, reduces risky transportations, and can help lower costs – while maintaining high-quality images.

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**A mobile CT head scanner*
can be brought directly
to critical patients,
eliminating the need for
risky transportation.**

A patient lies in the intensive care unit (ICU) and is prepared for a CT scan of the head. The man was involved in a bicycle accident, in which he sustained multiple injuries and a severe traumatic brain injury (TBI). Now the physicians want to know whether bleeding has occurred in the space between the cranial bone and the dura mater, as is often the case with TBI.

Computed tomography (CT) is most commonly used to assess patients with brain injuries in the ICU. Around 40 percent of all CT examinations involve the head area. CT imaging provides fast and reliable information on the exact location and extent of bleeding, edema, and other brain injuries.

Patient transport: a burden on staff, budget and patients

At present, the critically ill and only partially cooperative patients need to be prepared for transport to the radiology department. This is always a logistical and personnel challenge since the supply of and monitoring with cardiovascular monitoring technology, ventilation, syringe pumps, and infusion pumps must be guaranteed during transport. Hygienic requirements are also higher.

While two employees prepare the transport, up to five accompany it with all the medical equipment. Colleagues in the radiology department prepare the examination room.[1] The patient is then carefully transferred to the CT table and CT technologists take care of the scan. The personnel-intensive process from transport to completion of the CT examination takes an average of 50 minutes.[1]

At the same time, the procedure involves considerable risks for the patient. One third of all transports can result in mishaps.[2] For example, the connection to the monitoring equipment or to the medication supply could be interrupted, and even the ventilation access could be inadvertently removed. Transport to the CT scanner is particularly susceptible to risk: 71 percent of all transport incidents occur in such cases.[2]

Head imaging at the point of care

How would the situation change if the processes were reversed? If it weren't the patient who was brought to the CT scanner, but rather the scanner to the patient? A mobile head CT scanner has the potential to provide the diagnostic performance and speed of this imaging technique directly at

the point of care. Patient and staff no longer need to leave the ICU for transportation to the radiology department. The patient remains constantly connected to monitoring and medication supply at his or her bedside during the CT scan. In the event of complications, the entire spectrum of intensive care therapies is immediately available. In addition, a mobile head CT scanner can be used even if the patient's condition excludes transport. Fellow patients also benefit from imaging directly at the point of care, because clinical staff who might have been involved in the transport can now stay close to the patients and solve acute problems immediately.

High-quality CT imaging should be possible for all patients, whether or not they are able to cooperate and be transported. A mobile head CT scanner must be suitable for the busy and tight ICU environment. In order for such a system to significantly relieve the burden on patients

and staff, it must be easy to maneuver and operate, while at the same time offering intelligent solutions for patient positioning and radiation protection. Siemens Healthineers has combined these features in an innovative mobile head CT scanner, which is currently under development.

Reducing pressure

The use of mobile head CT technology measurably reduces the workload of ICU staff: instead of 50 minutes, imaging may take just 18 minutes with a mobile device.[1] Work such as reconnecting the patient to the monitoring and supply equipment and disinfecting the ICU room after returning from the imaging department is no longer necessary. Because the entire staff is available at least during the day for the tasks arising in the ICU, the workload is distributed. Currently, when ICU patients have emergencies during the night shift that require a head CT examination, the situation becomes very challenging for non-senior staff, especially if they do not have access to expert knowledge. This situation could be mitigated by performing CT imaging directly on the wards.

Head imaging directly in the ICU has a similarly positive effect for the imaging department. It can help avoid schedule interruptions in the radiology department that can occur when critical patients need to be scanned. As a result, scanner capacities can be planned more efficiently. While the examination of an intensive care patient with a conventional CT scanner involves up to two CT technologists, only one specialist is required for the mobile modality. By reversing the head CT imaging process, risky transportation of critically ill patients can be avoided, while more capacity is created for the hospital and its staff. ●

"The transportation of critical or unstable patients is really risky and stressful for both the patient and the nursing staff. When we have a mobile CT scanner in the neuro intensive care, we hope to improve the care of our patients by skipping the risky transportation and scanning them directly on our ward."

Nils Ståhl, Neurosurgery,
Skåne University Hospital Lund



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*SOMATOM On.site is currently under development. It is not available for sale in the United States. Its future availability cannot be guaranteed.

The statements by Siemens Healthineers customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.



"A mobile CT head scanner for the ICU would ease the scheduling of our scanner in the radiology department, because we would no longer have to interrupt our regular schedule for critically ill patients."

Roger Siemund, Neuroradiology, Skåne University Hospital Lund



The mobile CT head scanner* is easy to maneuver and operate in an ICU setting, eliminating the need for patient transport.

References

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- [2] Smith I et al. Mishaps during transport from the intensive care unit. Crit Care Med 1990; 18: 278–281