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## ICU Volume 5 - Issue 4 - Winter 2005 - Cover Story: Care with IT

### Robotic Telepresence Rounding

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#### Author

**Paul Vespa, MD**

*Associate Professor of Neurosurgery and Neurology*

*David Geffen School of Medicine at UCLA*

*University of California, Los Angeles*

Dr Vespa writes on the benefits of Robotic Telepresence based on practical experience at UCLA Neurointensive Care Unit.

#### The Problem

Providing timely and routine attending-level expertise is one of the main goals of critical care medicine (Haupt et al. 2003). But providing this expertise 24 hours-a-day is difficult given the shortage of intensive care specialists (Ewart et al. 2004).

#### The Solution

The strategic use of telemedicine has the potential to enhance the supply of attending level expertise and improve patient care and safety as well as hospital profitability (Breslow et al. 2004; Rosenfeld et al. 2000).

In the UCLA Neurointensive Care Unit, we have chosen a telemedicine approach called Robotic Telepresence (Latifi et al. 2004; Vespa 2005). Robotic Telepresence (RT) is the concept that the physician is able to look and feel real to those in the intensive care unit and interact in a human way with the environment. This is accomplished through using a remotely-controlled robot which projects the image of the physician in real time on a flat screen mounted at the head of the robot (figure 1). The robot is mobile and under the control of the remotely located physician to move around the ICU in a manner which is similar to walking around the ICU on foot. The flat screen serves as the head and is able to

move in 360 degrees and orient to directly face a person in the ICU. The RT method permits real time, two-way, face-to-face communication with the nursing staff, patients and families in the ICU. This interaction provides important visual information that cannot be easily conveyed by phone, such as the appearance of the patient, graphical data, waveforms, and body language.

#### How We Use RT

We have used the RT for the past year at UCLA to make RT rounds by the attending physician from home. The attending makes two sets of RT rounds each day: daybreak RT rounds at 0600 hours with neurosurgical residents, and night time RT rounds after 2100 hours, in addition to normal "in-person" rounds in the ICU each morning. RT rounds consist of moving from bed to bed, reviewing the ICU flow sheet, discussing ongoing treatments with the residents (trainees) and bedside nurse, and culminate in generating a treatment plan.

#### Benefits of RT

We have preliminary observations suggesting that RT leads to improvement in the delivery of ICU care. We have noted:

- Improved education of our residents (trainees);
- Improved ICU bed-turnover due to more rapid triage decisions made via RT at night or during daybreak rounds;
- Decreased response time by the attending to make treatment decisions on critical patients;
- Increased compliance with ICU standard protocols due to night time RT;
- Improved nursing and family satisfaction from speaking with the attending via RT at night.

We have combined RT with an advanced data and image integration system, called Global Care Quest® (Los Angeles, CA). This enables review of crucial imaging and laboratory data simultaneously by the RT attending and other team members (i.e. nurses, trainees, consultants), thus providing a platform to make multidisciplinary rounds and decisions. For example, using the combination of RT and Global Care Quest®, the attending can remotely discuss the latest chest radiograph and arterial blood gas with the nurse and respiratory therapist, order a change in the mechanical ventilator and see the immediate result with all parties sharing the experience. Using this approach, we have successfully avoided complications that may otherwise have occurred.

#### **Conclusion**

In our hands, RT has been useful in enhancing trust and camaraderie among the multidisciplinary team and families of our patients. This results primarily from the nurses and families feeling that the attending is always there or at least nearby. While interaction with the robot is potentially awkward, we have been pleased that our nurses, patients and families interact with the robot as if it is a person. This interaction is critically important and occurs spontaneously with only a brief orientation. It is not completely clear why this occurs, but this may reflect the mobility of the system, direct facial contact and the sense of sharing. In a world in which impersonal telephone interactions are commonplace (i.e. "beep, you have reached a pre-recorded message"), RT is distinctly human. We see a real potential for RT to help the ICU team fulfil its mission of compassionate, timely, expert care of the critically ill patient.

Published on : Fri, 21 Oct 2011