



The ICU Robot Physician Presence's Network in Cancer Care

Alisher Agzamov* and Ahmad Al Boutaiban

Department of Anaesthesiology & ICU, Kuwait Cancer Control Center, Kuwait

***Corresponding author:** Dr. Alisher Agzamov, Department of Anaesthesiology & ICU, Kuwait Cancer Control Center, Ministry of Health, Kuwait City, P.O. Box 4078, Safat, Postal Code 13041, Kuwait, Email: draalisheer2011@hotmail.com

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Introduction

As the region's leading academic oncology medical center, Kuwait Cancer Control Center (KCCC) using a remote robot physician (RP) presence robot network since 2011, as one part of its initiative across Kuwait. RP has been used for healthcare services for more than a decade; however, its use within an oncology ICU is not yet widespread. ICU RP's used to increase access to off-site supervising ICU physicians and other specialists, reducing possible wait time for difficult admissions and procedures [1].

The Robot Physician's will provide the highly specialized expertise and support resources of the hospital medical faculty to outlying hospitals via a remote controlled robot. The network is the first of its kind in the region, and provides quality oncology surgical and medical care to hospitals in a way that will bring together the capacity at regional hospitals and those of the cancer care centers. Hospital sharing partnerships with many other hospitals in the region's in this exciting new endeavor.

The remote physician presence robot network is one aspect of the modern oncology care initiative, which is designed to extend hospital capacity in a cooperative and complementary fashion improving patient access to a wider range of specialists, technologies and services. The program is designed as a partnership with regional health centers that will create better diagnoses, allow patients to remain in their regions where appropriate and create a direct access to treatments in oncology patient's care and management [2].

The RP-7™ Robot (InTouch Health, USA) through the utilization of a secured wireless, broadband, internet connection and provide ICU physician care to ICU Oncology patients in another location. Within moments of a request for a ICU oncology consultation, an ICU physician, seated at a computer (either at home, ICU or anywhere in the world that has a wireless connection) connects via the Internet to the RP-7 Robot located in the ICU to consult on the patient. Through the RP -7, a ICU doctor interact and converse with an ICU patient, patient's family, ICU physician or ICU nurse through a live, two-way audio and video. Using by PC the camera and the guidance of infrared sensors, the ICU physician maneuver the RP - 7 through the hospital to a patient's bedside and move the robot's head to view vital signs on monitors and charts. The physician drives the robot through remote access, and the robot is almost self-sufficient; the only thing it needs assistance with is plugging in to recharge the robot's battery.

Oncology patients have benefit from the RP-7 'anytime anywhere patient care.' Emergency Departments across hospitals will now be assisted by nationally renowned Oncology physicians, specializing in cancer treatment of brain, lungs, colons, prostates, breast, ovarian cancers, hematology disorders (including ALL, AML, MM) and other subspecialties of oncology. Through the use of the RP - 7 ICU physicians now be adding to the patient's spectrum of care and supporting the partner hospitals' existing services. Through the KCCC's RP - 7, the hospitals have access to physicians specializing in neurosurgery, spinal surgery, neurology, pediatric and adult cardiology, neonatology, maternal fetal health, gastroenterology, and endocrinology, in addition to oncology ICU care. With a

specialized physician shortage that is often more pronounced outside metropolitan areas, RP - 7 is poised to help provide a solution to oncology care problem with an innovative solution. RP conceived the RP – 7 initiatives after 15 years of developing robotic health care programs that could extend capacities and services across hospitals. When it was introduced to In Touch Health's robot technology, specialists pursued their vision with even greater energy and dedication making Oncology Care's remote ICU physician presence robot network a reality.

RP 7 is deployed in ICUs with various patterns of utilization that, in toto, simulate normal ICU work flow. About 10% of ICU patients with DM have experience with RP and it is well accepted, especially one based on glucometers. Using RP – 7 and patient satisfaction showed a statistically significant difference in MD confidence, medical communication, explanation understanding, explanation satisfaction, mutual communication, and mutual response. In the RP 7 group, patients satisfied with the audio and video qualities and believed that the RP 7 provided better care, and 85% of patients preferred RP – 7 ICU rounding's in the absence of the attending ICU physician. RP 7 provides efficient and cost-effective oncology surgical & medical ICU rounding by reducing inconvenience and labor cost with greater cancer patient satisfaction with postoperative cares [3].

Our intent is to complement the great RP services of our partner hospitals. There are many highly qualified oncology physicians providing oncology service in hospital. This is our attempt to provide a linkage between our academic medical center and those hospitals and physicians wishing to access services on an as-needed basis. The RP also offer additional services including: adult and pediatric oncology, oncology surgery, chemotherapy, radiotherapy, cardiology, neonatology, maternal fetal medicine, endocrinology and GI / hepatology [4].

While of course the preference is to always have an ICU physician to Oncology ICU patient, face to face interaction at the bedside, this technology helping Oncology physicians connect with oncology patients without having to physically travel hundreds of miles away. This provides faster access to the oncology surgeon or oncology physician resources available at the hospital. The expertise and resources of oncology ICU physicians have provided through a Robot Physician anywhere in the state—or eventually the world. It also solves the problem of being in two places at once. The ICU physician has provided the appropriate diagnosis to a cancer patient in another part of the state and then returns to his/her patients in hospital. These allowing oncology ICU

physicians to more efficiently partner with Hospitals physicians across the state and create the best plan of treatment for oncology patients [5].

The Robot Physician is a valuable ICU physician tool. We have found that using the RP means that patients have accessed more quickly, which expands treatment and intervention opportunities, and eventually opens up opportunities for enrollment in clinical trials that benefit all oncology patients. With Cancer, time saved is Patient saved. The earlier an oncology patient is diagnosed, the earlier the best oncology treatments can be applied. The RP used to bring intensivist expertise to ICU patients [6].

Intensivists regard RP – 7 ICU rounding as an effective alternative to conventional ICU rounding from the standpoint of ICU patients' care and teaching [7]. RP network provide the highly specialized expertise and support resources of the hospital medical faculty to outlying hospitals via a remote controlled robot. The network is the first of its kind high tech and provides quality oncology surgical and medical care to hospitals in a way that will bring together the capacity at regional hospitals.

Aging population increase in the future and need specialized care when admitted to ICUs with beset with chronic conditions, such as cardiovascular, COPD, diabetes, renal complications and depression. Specialist opinions available through RP facilities. RP is a specialized hub consisting of highly skilled staff trained in ICU critical care able to deliver timely, quality care service to patients admitted to ICUs using highly advanced information technology services. These specialists in the RP ICU hub able to analyze and gather data arriving at timely interventional management decisions and provide this vital feedback to the nursing staff and doctors manning remote ICU locations where specialized intensivist may not be available. The clinical benefits of RP include better patient outcomes, reduced medical errors, mortality and reduced ICU and hospital length of stay. The main disadvantage in implementation the upfront high cost involved, for which low-cost models have being explored. Considering the burgeoning aging population, RP in ICU become the way forward in delivering geriatric ICU critical care [8].

The implementation of RP – 7 in Oncology ICU have been more beneficial than costly, and it have provided hospitals the opportunity to increase quality of care and decrease mortality, while it have decreased costs of delivering oncology ICU services in both rural and urban areas [9,10]. Large-scale remote monitoring eICU database, have a strong potential to advance the role of critical care

PR by serving as a test bed for secondary research as well as for developing and testing tools, including predictive and prescriptive analytical solutions and decision support systems [10]. The RP 7 also coordinates of care for critically ill ICU patients, intensivist coverage, and the overall process of RP's critical care. KCCC is looking to form partnerships with many other hospitals in Kuwait and in the Middle East Regions in this exciting new endeavor.

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