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## Joint-service, civilian team makes medical history

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In an unprecedented Air Force, Army and civilian medical move, the longest recorded adult extracorporeal oxygenation transport to date was conducted from Hawaii.

ECMO (extracorporeal mobile oxygenation) is a medical treatment that provides both cardiac and respiratory support to patients whose heart and lungs are so severely diseased, or damaged that they can no longer function. ECMO is most commonly used in neonatal intensive care units for newborns in pulmonary distress.

Only a handful of the approximately 130 ECMO programs worldwide are set up to handle adult patients, said Lt. Col. (Dr.) Melissa Tyree, a staff neonatologist and neonatal/pediatric ECMO specialist at Tripler Army Medical Center.

In November 2010, a 56-year-old woman from Chicago developed a fever and cough while vacationing on Oahu, Hawaii. She was diagnosed with a viral infection and admitted to Straub Hospital in Honolulu. Although she was treated with antibiotics and then put on a ventilator, the woman's condition continued to deteriorate to the point where she was in severe respiratory failure and unresponsive to all advanced pulmonary support available. She needed ECMO to survive.

The doctors at Straub tried to find an adult ECMO transport team in the continental United States for her, but none was available.

There is no formal adult ECMO program, or even one physician specializing in adult ECMO anywhere in Hawaii.

But there was a sliver of hope for the patient. In 2007, Kapiolani Medical Center, Kaiser Permanente and Tripler Army Medical Center officials pooled resources to create the Hanuola Neonatal and Pediatric ECMO Consortium. The consortium has a network of 15 joint-service and civilian doctors.

Straub staff members contacted Tyree, who acts as the medical director of Hanuola, for assistance. Although she and her consortium associates were only experienced with administering ECMO treatment to youngsters, it became clear that their expertise was the only thing that could save the woman who was, Tyree recalled, “quickly approaching zero percent survival.”

“(We knew) the concept exists, the technology exists, and we were not going to let anything stop us, including red tape,” Tyree said.

Tyree was joined on the case by Lt. Col. (Dr.) Erik Osborn, an Army pulmonologist and adult critical care specialist at Tripler Army Medical Center. They both received permission from Brig. Gen. Keith W. Gallagher, the commanding general of the Pacific Regional Medical Command and Tripler, to provide medical care to the woman at Straub and they began to work on saving her life.

The patient was placed on ECMO the afternoon of Nov. 13. Over the course of the next several days, it became apparent that her lung disease wasn’t going to be quickly resolved. She required transportation to an established adult ECMO center for extended ECMO care and a possible lung transplant. After an adult ECMO center located in Iowa agreed to accept the patient, Straub administrators coordinated extensively with the woman’s insurance company while the transport team arranged for air travel to Iowa. “This is where the magic came in,” Tyree said.

In less than 24 hours, the medical team was organized, a civilian plane secured and multi-institutional equipment and supplies all coordinated. In addition, a special ECMO stretcher chock-full of tubes, wires and medical devices was constructed from scratch.

The core medical transport team included Tyree Osborn Kris Costales, a civilian perfusionist (a specialized health professional who operates the heart-lung machine); and Melody Kilcommons, a civilian registered nurse. Also on the Gulfstream III jet were two adult critical care transport nurses (supplied from the civilian medical jet company), a civilian safety officer, two pilots and the patient.

Col. Sean Murphy, the Pacific Air Forces Command surgeon, said the composition of the medical team was “very unique.”

“It was a joint effort combined with a civilian team,” he said. “Hawaii is truly an island, and with the challenges of resourcing medically complicated and expensive efforts such as ECMO, it makes sense to partner where we can as this patient could just as easily have been a military beneficiary as a civilian.”

The patient was transported more than 4,051 miles – a total transport time of approximately 12 hours – from her Hawaii hospital bed to her Iowa hospital bed on Nov. 19. The transport was a complete success and the patient underwent additional ECMO treatment in Iowa.

The patient eventually died of complications, but she had been given an additional month to say goodbye to her loved ones. In addition, she was able to partake in a private family ceremony that included water from the Ganges River in India. As Hindus, she and her family consider such water sacred and essential for a good death/funeral.

Tyree, who previously worked in the neonatal/pediatric ECMO program at Lackland Air Force Base, Texas, said even when a patient dies despite the best efforts of a military medical team, “what gives families the greatest sense of peace is that the government cares – it’s as if the president himself has reached out to them.”

In this case, she said, the woman’s family felt, “the whole island rose to (their) mother’s need.”

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