Although an artificial heart kept Justin Ryder alive long enough to receive a donor heart, it was nurses at the University of Arizona Medical Center in Tucson who kept his spirit alive during recovery.

“The nurses basically became my family,” said Ryder, 35, a former semi-pro arena football player who received a SynCardia Total Artificial Heart in December 2012 at UAMC. “They took such great care of me. They saw me go through everything.”

Diagnosed with hypertrophic cardiomyopathy at 18, Ryder, of Las Vegas, first underwent a procedure to reduce his enlarged heart. The surgery allowed him to play fullback and tight end for the Las Vegas Sidewinders before he had to have his mitral and aortic valves replaced when he was 22. He was placed on a heart transplant list in 2005 and lived with an artificial heart for 83 days before receiving his donor heart. Initially, Ryder’s artificial heart was powered by a machine dubbed the Companion 2 until he was stable enough to switch to a Freedom driver, a wearable backpack device that allows patients to leave the hospital.

“Without this option many people wouldn’t have the opportunity to get a transplant because they wouldn’t live long enough,” said Sara Eberline, RN, BSN, staff nurse in the cardiac ICU at UAMC. “These devices make you healthier for a transplant.”

Artificial heart patients first recover from surgery with their hearts powered by either the Companion 2 or an older, larger power source called “Big Blue,” Eberline said. UAMC played a significant role in the history of the artificial heart, with the first successful bridge to transplant procedure performed there in 1985 by Jack Copeland, MD, and biomedical engineer Richard Smith, technical director of UAMC’s artificial heart program. The medical center has performed 124 artificial heart implants since then, Smith said. Marcela Padilla, the first artificial heart patient to leave UAMC with a Freedom driver was discharged in 2011, he said.

The artificial heart replaces most of the native heart structure, Eberline said. Unlike a human heart, which has four chambers, the artificial heart has two chambers. Patients have two drivelines about the size of small garden hoses placed in their chests to attach to a power source. Although patients must take special care when showering and receive assistance for frequent bandage changes, most are able to resume normal activities, Eberline said.

“You see someone go from heart failure and poor quality of life to getting this device and going home,” Eberline said. “It’s giving them a second chance.”

A typical hospital stay for an artificial heart implant can be at least a month or more, depending on the patient’s condition and his or her place on the transplant list, said Lindsay Johnson, RN, BSN, staff nurse in UAMC’s cardiac ICU. Healing is similar to a donor heart transplant, with nurses working alongside physical therapists to encourage patients to move as soon as possible, she said. Nurses start out teaching patients the proper body mechanics for getting in and out of chairs. They also assist patients in using special “chariot chairs” which allow them to safely practice walking around the unit while accompanied by their artificial heart power sources, Johnson said. With the help of the interdisciplinary team, RNs familiarize patients with their artificial hearts, ensuring they and their families become well versed in proper dressing changes, showering, taking medications and checking vitals.

“It’s exciting because it’s very quick,” Johnson said of the time between post-surgery and physical therapy. “We get them moving very quickly.”

In addition to helping patients recover physically, nurses sometimes need to offer emotional support as well, Johnson said. Suddenly having an artificial heart can be a major psychological adjustment for some patients, she said. “We encourage them to keep going,” Johnson said.

Lindsay Johnson, RN

Sara Eberline, RN, staff nurse in the cardiac ICU at UAMC, poses with Big Blue, the older, larger artificial heart power source on her right and, on her left, the newer, backpack-sized Freedom driver.