



NEWS RELEASE

For immediate release

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Madonna patients are successfully rehabilitating with diaphragm pacer

Lincoln, Neb. – As air is quietly pulled into her lungs, nine year-old Kristin Piper breathes free of her mechanical ventilator for up to one hour at a time, four to five times a day. On July 15, Kristin became the second child in the United States, the fourth in the world, to receive the NeuRx DPS™ diaphragm pacemaker, a newly FDA-approved device that helps people who are ventilator-dependent to achieve more time off of the vent. In clinical trials, 50 percent of people who received the device and participated in rehabilitation achieved total ventilator independence. One hundred percent were able to breathe independently for at least four hours a day.



The device, implanted through minimally invasive laparoscopic surgery, provides electrical stimulation to muscle and nerves in the diaphragm. When the muscle is stimulated by the NeuRx DPS, the diaphragm contracts and creates a vacuum-like effect in the chest cavity that allows air to fill the upper and lower parts of the lungs. When this contraction eases, the air is expelled from the lungs – essentially the same as regular breathing.

The vent had been Kristin's lifeline since a skiing accident in El Dora, Colo., on March 20, 2009, left the young girl from Scribner, Neb., paralyzed from the neck down due to a C1 incomplete spinal cord injury (SCI). Her other injuries included two broken femurs, collapsed lungs and a ruptured diaphragm. Kristin was treated at The Children's Hospital in Aurora, Colo., before coming to Madonna Rehabilitation Hospital on April 14.



Another Madonna patient, 58-year old Larry Schroetlin, was the first person to receive the diaphragm pacer in Nebraska on that July 15 morning. Larry is now breathing independently up to 30 minutes at a time. Since Larry has been on a ventilator for three years, his weaning time is well within the normal range. He was injured in a bicycle

accident on June 3, 2006, resulting in complete tetraplegia from a C1 SCI. After emergency care at Good Samaritan Hospital in Kearney, Neb., Larry transferred to Madonna in late June 2006. He completed Madonna's SCI acute rehabilitation program and has since resided in the special needs unit.

Both Larry and Kristin are excited to pioneer this new procedure for others in the Midwest and are determined to achieve the best possible level of independence.

Christopher Reeve, the actor of "Superman" fame, was among the first to have the NeuRx DPS pacemaker implanted during its experimental phase in the early 2000s and became an advocate, helping pave the way for FDA-approval in June 2008.

Madonna physiatrist Dr. Paul Krabbenhoft and Diane Ulmer, OT, spinal cord injury (SCI) program manager, learned about the device and procedure during a presentation by Dr. Raymond Onders at a national SCI conference in Boston, Mass., in 2007. Dr. Onders helped develop the NeuRx DPS and has performed and/or proctored the 78 worldwide procedures.

Karen Divito, Madonna's director of rehabilitation programs, formed a multi-disciplinary team, including Rebecca Wills, RT, pulmonary program manager, that researched the device and worked with insurance providers, Saint Elizabeth Regional Medical Center and Dr. Timothy Cole to perform the procedure in Lincoln. After months of persistent work, Larry and Kristin were approved to receive the first diaphragm pacer implantations in Nebraska.

"[It's] amazing, awesome, a miracle," said Patty Schroetlin, Larry's wife. "I can feel Larry's diaphragm rise and fall. It's very strong." One of the biggest benefits for the Schroetlin's is the possibility of returning home. "That possibility is opened up to us now. It's very exciting," she added.

"Larry was an avid cyclist," said Dr. Onders following the procedure. "This gives him a new goal to work toward ... It's a lot of work to get off the ventilator. ... He has to now get built-up to gain strength and finish the race, getting off the ventilator completely."

By having more time off of a ventilator, individuals have lowered risk of infection and acquiring pneumonia, have greater freedom to travel and move about, the senses of smell and taste return, and as Kristin's mother, Carolyn, shared, "It just looks better to be without a vent. That's important for a kid going back to school."

"This is a great day for a lot of ventilator dependent people in this region," said Dr. Krabbenhoft, "Now there is an amazing technology that will allow them a more normal and healthy quality of life."

In July 2005, the National Spinal Cord Injury Database estimated 225,000 to 288,000 individuals in the United States live with SCI and about 11,000 new cases of SCI occur each year. It is estimated that approximately 500 new cases of tetraplegia and mechanical ventilator dependency occur each year that would be eligible for diaphragm pacing. The lifetime costs associated with SCI-related ventilator dependency for someone from the age of 25 is estimated to be \$3 million.

The Madonna Rehabilitation Hospital team is already identifying additional candidates for the NeuRx DPS device. The hospital hopes this will become an accessible option for those who are appropriate for the procedure, improving quality of life and ultimately resulting in greatly reduced health care costs.

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As one of the nation's foremost rehabilitation care and research facilities for children and adults, Madonna Rehabilitation Hospital offers highly specialized programs and services for those who have suffered a disabling injury or illness. Madonna's approach to rehabilitation is much more than just therapy, it's rebuilding lives and families; and putting hopes and dreams back together. Through internationally accredited rehabilitation programs, Madonna provides individualized treatment to help every patient heal in mind, body and spirit – and ultimately live life to the fullest. Madonna Rehabilitation Hospital is located at 5401 South Street in Lincoln, Nebraska, 68506; 402-489-7102; www.Madonna.org.