

**NITRIC OXIDE DELIVERY WITH HIGH FLOW NASAL CANNULA: A CASE STUDY.** Natasha A. FencI BS, RRT-NPS, CPFT, Angela D. Hedgman AS, RRT-NPS, Rodolfo I. Godinez, MD, PhD. The Children's Hospital of Philadelphia, Philadelphia, PA.

A 15-year-old female diagnosed with pulmonary hypertension required supplemental oxygen (O<sub>2</sub>) with inhaled Nitric Oxide (iNO) 5 parts per million (ppm). iNO therapy was administered via nasal cannula with 100% O<sub>2</sub> at 2 liters per minute (L/m). An escalating O<sub>2</sub> requirement made it necessary to transition this patient to a humidified oxygen mask with 20 L/m of flow and 45- 50% O<sub>2</sub>.

The patient was transitioned to the Vapotherm<sup>®</sup> high flow delivery system to enhance comfort and compliance while meeting O<sub>2</sub> and flow demands. The Vapotherm<sup>®</sup> membrane transfer technology provides heated and humidified medical gas at approximately 95% relative humidity at near body temperature.<sup>1</sup>

The INOvent<sup>®</sup> flow injector module was placed in the back of the Vapotherm<sup>®</sup> between the blender and gas inlet port. The sampling line was placed between the nasal cannula tubing and the heated delivery tubing to prevent dry sampling gas alarm.

The patient was placed on the Vapotherm<sup>®</sup> nasal cannula with flow rate of 6 L/m, 100% O<sub>2</sub>, and iNO at 5 ppm. Anticipating discharge on supplemental O<sub>2</sub>, the plan of care was to gradually wean flow instead of oxygen concentration. Within 4 to 6 hours the flow was weaned to 4 L/m. The patient stated she was comfortable and oxygen saturation measured via Nellcor N-395<sup>®</sup> pulse oximeter remained 95-97% throughout the process. At 09:30 on day two, the NO (Nitric Oxide) was weaned to 4 ppm, at 13:00 to 3 ppm, and at 17:30 to 1 ppm. At 06:15 on day three the NO was discontinued. The patient remained on the Vapotherm<sup>®</sup> with 100% O<sub>2</sub> and 4 L/m of flow. Oxygen saturation remained between 94 and 98%. Over the course of the day the flow continued to be weaned and the patient was transitioned to a traditional nasal cannula at 1 L/m with oxygen saturation greater than 95%. The patient was able to ambulate comfortably and was ultimately transferred to the cardiac step-down unit with plans to discharge within the next 5 days.

Vapotherm <sup>®</sup> Nasal Cannula				
	Time	Flow (L/m)	FiO <sub>2</sub>	NO (ppm)
Day 1	11:45	6L/m	100%	5ppm
Day 1	14:40	5L/m	100%	5ppm
Day 1	17:20	4L/m	100%	5ppm
Day 2	9:30	4L/m	100%	4ppm
Day 2	13:00	4L/m	100%	3ppm
Day 2	17:30	4L/m	100%	1ppm
Day 3	6:15	4L/m	100%	OFF

1. Vapotherm<sup>®</sup>, Inc., (n.d.). The vapotherm 2000i<sup>®</sup>. retrieved March 24, 2004, from Vapotherm<sup>®</sup>: Breathtaking Results Web site: <http://www.vtherm.com/why.asp>.

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