INOVENT SAMPLE LINE MODIFICATION FOR USE WITH THE VAPOTHERM HUMIDIFICATION SYSTEM.

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BACKGROUND: High flow nasal cannula (3-8 LPM) utilizing the Vapotherm humidication system is common practice in our NICU. For patients with acute pulmonary hypertensive crisis it is often necessary to start nitric oxide with the patient already on high flow nasal cannula. Resistance from the Vapotherm cartridge generates significant backpressure. Monitoring failure alarms occur on the INOVent (Datex-Ohmeda), when the sample inlet port of the INOVent is exposed to > 70 cm H_2O pressure. Previously described fixes for use with CPAP devices include the insertion of the calibration tee from the inovent to the sample line to vent the excess pressure in a CPAP circuit. We propose to use this sample tee to vent pressure when using the Vapotherm with nitric oxide.
METHODS: The setup for the nasal cannula with nitric oxide has been previously described in the INOvent Application Update #10 (Use of Nasal Cannula with the INOvent Delivery System, revised Nov 2000(Datex-Omeda). The flow from this system is hooked up to the back of the Vapotherm via O_2 tubing replacing the cannula. The Vapotherm circuit is standard with the addition of an infant size nasal cannula. The calibration tee normally used to calibrate the inovent is placed between the sample line leur-lock and the inovent sample inlet. This bleeds excess flow to prevent overpressurizaton of the sample line. Nasal cannula flow was stepped from 1- 8 LPM in 1 liter increments. Pressure was monitored with a calibrated manometer teed into the sample line for purposes of this abstract. Pressure was monitored in the system with and without the calibration tee in place. Circuit pressure was recorded and a notation was made when the "monitoring failure" alarm was activated.
RESULTS: Without the calibration tee pressure exceeded 70 cm H_2O at 3 LPM with subsequent monitor failure alarm activation. The following values were measured during patient use with an infant cannula in place. (*=cm H_2O pressure) (BOLD = monitor failure)
1L 35* 2L 62* **3L 108 * 4L 140 * 5L 168* 6L 172 * 7L 180* 8L 182*.**
With the calibration tee in-line pressures remained at <10 cm H_2O at all measured liter flow. Measured levels of NO remained at set concentration with no fluctuations. NO_2 levels were 0.1 or 0.0 ppm with no fluctuations.
CONCLUSIONS: Use of the Calibration tee in the sample line keeps the Vapotherm circuit pressure below the "monitoring failure" threshold. This allows continuous display of NO and NO_2 levels. The use of the Calibration tee is a safe and effective way to prevent "monitoring failure" alarms with the INOVent and the Vapotherm. OF-04-237

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