

Pediatric Interfacility High Flow Nasal Oxygen (HFNO) (AIRVO2)

HEATED HIGH FLOW NASAL CANNULA (HHFNC) FOR BRONCHIOLITIS AND OTHER RESPIRATORY ILLNESSES: Bronchiolitis is a very common condition in young children, most common in children under the age of 2. Many viruses cause bronchiolitis with a common virus being RSV. Symptoms can include fever, nasal congestion, cough, and wheezing. Many cases are very mild. Children with tracheal retractions, intercostal retractions, belly breathing, or other signs of respiratory distress not improved with suctioning may be placed on HFNC in the hospital. HHFNC therapy can help maintain functional residual capacity with positive airway pressure, facilitate breathing by overcoming nasopharyngeal resistance due to edema and secretions, and wash out physiologic dead space. HFNC is not just a traditional nasal cannula with the flow turned up. It requires special equipment and consists of a flow rate and a percentage of oxygen. Often pediatric patients start at 1.5 L/kg. The information below outlines equipment that may be used in the case of a facility transfer, along with guidance for the calculations and amounts of oxygen supply needed.

Indications

- Order from sending facility/physician as part of an interfacility transfer with HHFNC by a Paramedic (for patients 13 years or older) or CCT Paramedic (for patients less than 13 years old).
- Hypoxic respiratory distress or respiratory distress
- Availability of AIRVO high flow nasal cannula device and necessary supplies required to facilitate transport of the patient

Contraindications

- Inability to provide continuous, humidification using an approved delivery device
- Inability to provide therapy through appropriately sized nasal prongs
- Insufficient supply of oxygen to complete the transport

Procedure

- Ensure that an adequate supply of oxygen is available for the transport
 - Calculate the amount of oxygen needed prior to departure.
 - Ensure that you have at least two times the amount of oxygen anticipated.
- Perform appropriate patient assessment, including obtaining vital signs, pulse oximeter reading, cardiac rhythm, and current device settings
- Utilize facility settings to set flow rate in liters per minute (L/min) to decrease work of Breathing and maintain SPO2 at or above 92%
 - Flow calculation: 2 L/kg/min up to the first 12 kg, plus 0.5 L/kg/min for each kg thereafter, up to a maximum flow rate of 60 L/min.
- Reassess vitals, work of breathing, mental status, and breath sounds. Reassessment should be continuous, but documentation of vitals must occur at least every five minutes throughout patient contact.

- Consider the need for escalation of respiratory support if patient remains in respiratory failure on more than 2 L/kg/min of flow or maximum settings for the delivery device.
- If patient deterioration occurs, terminate HFNO and begin positive pressure respiratory support via BVM, CPAP, or BIPAP if necessary.

Notes

For suspected or confirmed COVID-19 patients, personnel must don respirators, eye protection, gowns, and gloves for transport.

If ground transport is not available, consider aeromedical transportation.

Informational videos for the Airvo II device are able to be accessed for review at:

<https://www.fphcare.com/us/hospital/adult-respiratory/optiflow/airvo-2-system/#airvo2videos>

Oxygen Tank Duration

Duration = Conversion Factor * $\frac{\text{Remaining Tank Pressure (psi)}}{\text{Continuous Flow Rate (L/min)}}$

D Tank = 0.16 E Tank = 0.28
 G Tank = 2.41 M Tank = 1.56
 H/K Tank = 3.14

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1,080 x 675

EXAMPLE: "M" TANK

$$286 \text{ (in minutes)} = 1.56 * \frac{1100 \text{ (psi remaining)}}{6 \text{ (L/min)}}$$

$$= 4.77 \text{ hrs}$$

Size	Uses Time (in hours)				
	1 liter/min	2 liters/min	3 liters/min	4 liters/min	5 liters/min
D	5.33	2.667	1.77	1.33	1.066
E	9.33	4.66	3.11	2.33	1.866
M	52	26	17.33	13	10.4
G	80.33	40.166	26.77	20.08	16.06
H and K	104.66	52.33	34.88	26.16	20.93