

1 Should my High Flow patient have a **Nasogastric tube**?

Younger infant/child

All infants < 12 months of age on High Flow should have a nasogastric tube insitu. The nasogastric tube should be vented initially to decompress the stomach which may cause respiratory compromise and at 4 hourly intervals.

Unwell neonates and infants with an increased work of breathing and tachycardia can have difficulty synchronising suck feeding and breathing.

Older child

It is at the discretion of the treating medical officer if they choose to insert a nasogastric tube on older children. Older children are able to sit up and belch to remove excess air and can safely protect their airway better than an infant.

2 Choosing the best fit and size nasal cannula for my High Flow therapy patient

When choosing a nasal cannula always note the size of the child's nares and what flows the child will be receiving via the Airvo. The appropriate cannula should be selected dependant on patient comfort and face size.

Nasal cannula should *not obstruct* the nares and a leak must always be present, showing a visible gap of up to 50% around the nares.

Optiflow Junior Cannula flow capability:

Infant	Purple	2 - 20 L/min
Paediatric	Green	2 – 25 L/min
Dolphin	Grey	10 – 50 L/min

In general the purple and green cannula suit less than 12 months of age and the older children require the grey Dolphin cannula. As a guide use the following with flexibility.

Patients less than 13kgs **Optiflow Junior Purple or Green cannula**

Patients greater than 12.5-13kg **Junior Grey (Dolphin) cannula** to achieve the higher flow rates required.

3 Which weight specific flow should be used for a 12.5 kg High Flow therapy child?

As this baby's weight is '**borderline**' for the flow rates (as per weight specific flow rate table) we suggest that they are commenced on 30L/min to match this child's inspiratory flow. The patient will need to be using the grey (dolphin) cannula as they will fit the child's nares and work when applying these higher flows.



FAQS

4 Transporting High Flow patients from ED to wards/radiology

The AIRVO 3 device has a built-in battery that can last up to 40mins when fully charged. Remember to charge the device in between transfers to ensure battery at fullest capacity. When ready to transfer the patient ensure the correct Oxygen source is on for the patient when transferring between departments. Change dual High-Pressure Oxygen (HPO) setup to have Oxygen flowing via cylinder rather than wall outlet when transferring. Remember to change HPO Oxygen flow back to the wall outlet post transfer and switch off the cylinder.

Key points about the AIRVO 3 battery

- AIRVO 3 has a built-in battery which has 300 cycles of running from 0-100%. As the device is generally always plugged into a power outlet, then the life of the battery is lengthened and can be up to 800 cycles per device. It is at this time it requires a service.
- Battery (without power source) will last approx. 40 mins
- Device will show orange at <50% battery
- Battery warning alarm occurs at <35% and <20% remaining
- When battery very low the device automatically switches off humidification, however flows will be maintained.

For study sites with the AIRVO 2 also available please remember this device has no battery backup available for transporting the patient. Instead, the patient can be transferred on low-flow Oxygen still using the Optiflow nasal cannula as the tubing interlocks securely with the cannula. The Airvo2 will only work connected to either a wall power outlet or external battery source if available in your hospital.

5 Can I give my patient oral feeds whilst on High Flow therapy?

Young infant/child (< 12 months)

It is preferential to **reduce the High Flow to low flow humidified oxygen** for a short period of feeding.

If a High Flow therapy patient wants to orally feed including eating, drinking bottle/breast feeding, the flow of the High Flow therapy should be reduced to low flow humidified oxygen using the AIRVO device for the duration of the oral intake to the following settings.

After a maximum of 20 minutes, oral feeding should be stopped, and High Flow therapy recommenced at the previous settings.

AIRVO 2 Two modes	AIRVO 3 One mode	Reduce flows for oral eating/drinking for 20mins and then return to previous flow/FiO2 settings
Junior	< 12 kg	reduce to 2L/min and 95-100% FiO2 for 20 mins
Adult (default)	≥ 12 kg	reduce to 10L/min and 95-100% FiO2 for 20 mins

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Older child

Older children have demonstrated that they can synchronise their swallow with eating and drinking whilst High Flow is in place (evidence shown from PARIS studies in more than 4000 children). It is safe for the older child who is alert to feed and drink, however if they are very tachypnoeic and working very hard or have difficulty synchronising feeding/drinking with the High Flow, then turn the High Flow to low flow humidified oxygen as outlined for the younger infant/child. Remember to recommence at the previous settings and only reduce for a short timeframe (up to 20 minutes).

6 **If the patient is weaned off FiO₂ and High Flow therapy then ceased, and the patient then desaturates only when asleep (with SpO₂ ≥90% when awake); should High Flow be recommenced?**

If the patient desaturates <90%, then the patient needs to go back on High Flow therapy immediately whether awake or asleep. The patient may only require their weight specific flow rate in room air (FiO₂ @ 21%). Aim for SpO₂ between 90-98%. Observe and follow weaning process again.

7 **When can I wean the patients FiO₂?**

Patients with NO oxygen requirement – Room Air High Flow applied since starting (21%)

Once the patients SpO₂ is stable between 90-98%, start to wean the patient's oxygen. Patients who commence and remain in room air (21%) only need to have a minimum of 2 hours of High Flow applied before ceasing and removing cannula.

Patients with an oxygen requirement and FiO₂ applied

Patients who require an FiO₂ can be weaned as soon as stable and as long as SpO₂ remain ≥90%. Therefore, any time the nurse performs observations or checks the patient which maybe 15 minutely or hourly or more frequent, reduce the FiO₂. The patient does not need to be 92/93/94/95% etc for you to wean. As long as they are ≥90% it is safe to wean the FiO₂. Wean in 5% steps down to 21%. Once at 21% and stable for an 1-2 hours, cease High Flow and remove cannula.

If the patient desaturates, place the nasal cannula in place and set the High Flow settings at the previous settings and increase the FiO₂ to maintain SpO₂ ≥90%.



FAQS

8 Administering Nebuliser/MDI to a High Flow patient

Two options exist for **administering medication via a nebuliser/MDI** when High Flow is in place.

- a) Keep high flow cannula in place and reduce the flows during administration of the nebuliser/MDI down to low flow humidified oxygen using the same method when feeding whilst high flow is in place. Administer nebuliser or MDI. The child will be receiving low flow humidified oxygen on these lower flows for the duration of the nebuliser/MDI.

After the nebuliser/MDI is finished, return patient to previous AIRVO settings with the correct flow and FiO₂ visible on the display screen.

Alternatively, remove the high flow cannula entirely for the duration of administering the nebulisers and once complete place the cannula back insitu, and return the flow to the previous high flow settings.

- b) If you are not able to achieve a good seal with high flow therapy nasal cannula in place when administering medication with a MDI, then you will have to remove the nasal cannula and administer the medication via the MDI and then return the patient to high flow therapy and previous settings used.

9 What types of patients can be placed on high flow therapy? Can both Obstructive or Non-Obstructive patients be treated with nasal high flow therapy?

Yes both obstructive and non-obstructive diseases with an ongoing oxygen requirement can be treated and managed on high flow therapy.

A child with a **WHEEZE is considered Obstructive**. This may include children with asthma (with and without a wheeze), reactive airways disease, acute lower respiratory tract infection, bronchiolitis.

A child with an **ABSENT WHEEZE is Non-Obstructive**. This may include pneumonia (viral or bacterial), aspiration, acute lower respiratory tract infection, acute respiratory distress syndrome (ARDS), bronchopneumonia, bronchiectasis, pneumonitis. Be mindful that some asthmatics can have an absent wheeze.

10 Patient has increased **work of breathing** however SpO₂ remains $\geq 90\%$ Should I place this child on High Flow therapy for their work of breathing? **NO**

No - patients should not be commenced on High Flow for work of breathing. Only patients that have an **ongoing oxygen requirement $< 90\%$** should be commenced on High Flow therapy.

It is recognised that this is difficult for the medical/ nursing staff to observe and not apply High Flow therapy, however there is no clear scientific evidence to support this theory. The PARIS studies did not ask this question and no other studies have been published with a clear answer.

Continue to observe these patients, as they will declare themselves by dropping their SpO₂ at some point if this is going to occur. It is at this time only that you should place the patient on High Flow therapy.



11 Should I wean the patients flow rate (High Flow therapy patient)?**NO**

No, FiO₂ is the only value that should be weaned (as per weaning flowchart). The patients weight specific flow rate should remain constant for the entire length of High Flow therapy. The only time the flow should be reduced is for oral feeds for a maximum for 20 minutes, before reverting back to previous High Flow therapy settings.

12 What if my patient does not 'tolerate' High Flow therapy?

It is recognised that high flow tolerance can be difficult at times, particularly in the 1-5 year old age group. The best approach to aid high flow tolerance is by choosing the appropriate size nasal cannula for age/size and try commencing the patient on a lower flow rate and gradually increase the flow over 2-5 minutes. The AIRVO devices have been set to increase in increments of 1L/min up until 35 L/min. Thereafter it increases in 5L/min increments to 60L/min. Try using distraction techniques with the child and observe how the rates are tolerated.

If you decide that your patient will not tolerate High Flow despite attempts, then treat the child with an oxygen therapy agreed on by the treating medical officer that the child will tolerate.



Weight Specific flow rates for all children on High Flow Nasal Cannula therapy

Child's weight	Flow rate	Maximum flow rate
0 - 12 kg	2 L/kg/min	Max 25 L/min
13 – 15 kg	2 L/kg/min	Max 30 L/min
16 – 30 kg	35 L/min	Max 40 L/min
31 – 50 kg	40 L/min	Max 50L/min
>50 kg	50 L/min	Max 50 L/min

For flow rates > 25 L/min increase the flow rates gradually over 2-3 minutes and observe the child's tolerance to increasing flows