**Diagnose bronchiolitis using the following definition:**

An infant less than one year of age with: Cough ,Tachypnoea and/or recessionWheeze and/or crackles

Initial Assessment

**Are there risk factors for severe disease?**

* Congenital heart disease
* Cystic Fibrosis/Chronic lung disease
* Immunodeficiency
* Neuromuscular disorder
* Preterm (born < 32 weeks gestation)

**ADMIT**

**Consider admission if:**

* Early stage of illness (D1 -2)
* Difficult social circumstances
* Skills and confidence of carer reduced

**Yes**

**No**

**No**

**Safe for discharge**

* Reassure parents
* Explain expected time course
* Information leaflet
* 24 hour open access

**Oxygen saturations**

Aim for saturations of:

>90% in air

≥92% if requires oxygen

**Do not administer:**BronchodilatorsAnticholinergicsInhaled steroidsOral steroidsAdrenalineHypertonic salinePhysiotherapy

**Do not routinely carry out:**Nasopharyngeal aspirate

Intravenous access

Blood tests

Blood gas

Chest X-ray

**Yes**

Individualised pathway

Low threshold for admission

**Minimal handling**

Consider **gentle nasal suction**If feeds <50% normal consider orogastric or nasogastric **tube feeding**

**Review after 2 - 4 hours**

* At least 1 feed >75% normal
* One sleep
* Oxygen sats >90%

**Administer Oxygen** via nasal cannulae or headbox to maintain Oxygen saturations ≥92%

Feeds >75% normal

Wet nappies

Oxygen sats >90%

Feeds 50-75% normal

Oxygen sats >90%

Decreased wet nappies

Feeds<50% normal

Oxygen sats ≤90%

Apnoeas

OR

< 4 weeks of age

WALES BRONCHIOLITIS PATHWAY

Ward admission

**Do not administer:**BronchodilatorsAnticholinergicsInhaled steroidsOral steroidsAdrenalineHypertonic salinePhysiotherapy

**Minimal handling**

Consider **gentle nasal suction**If feeds <50% normal consider orogastric or nasogastric **tube feeding**

**Administer Oxygen** via nasal cannulae or headbox to maintain Oxygen sats ≥92%

**Yes**

**Review at least every 8 hours**

High Flow discontinued

Oral feeds > 75%

Oxygen sats in air >90%

**Deteriorating**

**Safe for discharge**

* Stamp in notes
* Reassure parents
* Explain expected time course
* Information leaflet
* 24 hour open access

Wean and then discontinue High Flow as per local guidance

**High Flow Nasal Cannulae**

Pass oro/naso gastric tube

Administer High Flow therapy as per local policy

**Stable/Improving**

Oxygen requirement ≥50%

**Senior review**

Consider trial of CPAP

Consider Anaesthetic opinion and referral to PICU

**Yes**

Requiring >50% head box or

>2L/min nasal cannulae to maintain Oxygen sats ≥92%

**Consider HFNC or CPAP**

**Reassess after 2 hours**

**CPAP**

*Exit pathway*

**No**

**Yes**

**Indications for chest x-ray:**(Discuss with consultant)

Haemodynamically unstablePersistent fever >39°CProtracted clinical course (> 5days)

Consider if on CPAP

**Indications for antibiotics:**

(Discuss with consultant)

Haemodynamically unstablePersistent fever >39°CProtracted clinical course (> 5days)

Consider if on CPAP

**Review at least every 8 hours**

Oral feeds > 75%

Oxygen sats in air >90%

Not tolerating tube feeds

Significant respiratory distress

**Consider intravenous fluids**

(Senior review)

**Any clinical deterioration?**

**Clinical guidelines**

**Humidified High Flow Nasal Cannula Oxygen Therapy ( AIRVO 2)**

**Introduction**

Humidified High flow nasal cannula therapy(HHFNC) is used to deliver humidified air/oxygen at higher flow rates than the patient can generate spontaneously.

**HHFNC works by** –

* wash out of pharyngeal dead space
* decreased nasopharyngeal resistance
* variable distending pressure (PEEP) may also be generated (increasing alveolar recruitment)
* reduction in metabolic load related to gas conditioning.

The above factor leads to improved pulmonary compliance which in turn leads to decreased respiratory effort**.** HHFNC may reduce need of CPAP and /or intubation. Humidification with heated water is necessary to avoid drying of secretions due to high flow rate

**Indication**

* In our setting main indications are respiratory distress from bronchiolitis, pneumonia and congestive heart failure
* Weaning therapy from mask CPAP or BIPAP
* In PICU setting used as respiratory support post extubation and mechanical ventilation

**Contraindications**

* Choanal atresia, blocked nasal passages, trauma or sugery to nasopharynx
* Basal skull fracture
* Pneumothorax , Pneumomediastinum
* Recurrent Apnoeas/low GCS
* Respiratory acidosis with pH<7.25
* Multi organ compromise
* Use with caution in high risk infants(ex prem<32 weeks gestation, congenital heart disease, neuromuscular disease)

**How should therapy be initiated?**

1. A senior doctor (ST4 Registrar or a Consultant) should review the patient prior to initiating the therapy and rule out any contraindication as mentioned above. A clear plan should be documented in the notes.

2. The child needs to be admitted to HDU and needs continuous ECG and oxygen saturation recording.

3. Obtain blood gas and consider the need for chest radiograph.

4. Select appropriate sized nasal prongs. These should not occlude more than half of the diameter of the nares.

5. Secure nasal cannula on patient using supplied “wiggle pads” ensuring the prongs sit well into the nares

6. Choose the right high flow rate as per the table. Flow rate is usually 2L/kg for first 10kg and 0.5L/kg/min for each kg above that.

7. Use oxygen flow meter at the wall (0-15L/min) .If needing >25L/min flow, change flow meter to 30L/min or 70L/min.

8. Insert NG tube and aspirate regularly to decompress stomach.

9. Monitor patient for response, RR,HR ,degree of chest indrawing , SpO2. Within 2 hours it should be possible to reduce FiO2 and clinical stabilisation should be seen.

**\*Consult manufactures guide for setting of equipment**

**Patient nursing care**

* All infants on high flow should have a nasogastric tube . Keep nil by mouth for first few hours after starting High flow.
* Once stable on high flow, the infant should be assessed as to whether they can feed. Some infants can continue to breast feed, but most require feeding via a nasogastric tube
* Regularly aspirate the NG 2-4 hourly for air
* Oral and nasal care must be performed 2-4 hourly
* Note nasal prongs are in correct position and no pressure areas to nares
* Gentle suction as required to keep nares clear
* Check humidifier water level hourly

These guidelines are designed for Airvo 2 optiflow machine and for children >3kg weight.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mode &Tubing | **JUNIOR** | | | **ADULT** |
| Nasal Cannula | Infant | Infant | Paediatric | Adult |
| **Age** | **<1month** | **1-12 month** | **1-5 years** | **>5years** |
| Weight | >3kg | Upto 12kg | 12-22kg | >22kg |
| **Initial setting** | 6 L/min and FiO2 40% | 8L and Fi02 40% | 10 L/min and Fi02 40 % | 15L/min and FiO2 40% |
| **Escalation** | Increase flow max to 8L/min  Increase Fi02 to maintain saturation >92% | Increase flow max to 20L/min  Increase Fi02 to maintain saturation >92% | Increase flow max to 25L/min  Increase Fi02 to maintain saturation >92% | Increase flow max to 50L/min  Increase Fi02 to maintain saturation >92% |
| **Further Escalation** | If needing >50% Fi02 or no clinical improvement consider alternative respiratory support like CPAP in neonates ,infants and Liase with Anaesthetic and WATCH team | | | |
| **Consider weaning when clinically stable, and maintaining saturation >92% in Fi02 <40% with decreased work of breathing for at least 8-10 hours.** | | | | |
| **Weaning** | Upto 1L/min every 4hours until rate is 4L/min then switch to either low flow nasal cannula oxygen or air | Upto 1L/min every 2hours until rate is 5L/min then switch to either low flow nasal cannula oxygen or air | Upto 1L/min every 2hours until rate is 10L/min then switch to either low flow nasal cannula oxygen or air | Upto 1L/min every 2hours until rate is 15L/min then switch to either low flow nasal cannula oxygen or air |

References

1. High flow nasal cannula in children literature review. July 2016. *Ingvild Bruun Mikalsen, Peter Davis etal* *Scandanivian journal of trauma ,resuscitation and emergency medicine*

2. Clinical guidelines Optiflow-High flow nasal cannula oxygen therapy(Airvo2/neonatal optiflow**) Bristol Royal hospital for children**

3. High flow Nasal prongs HFNP oxygen guidelines **The Royal children hospital of Melbourne**

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