RN/RT breakout session
Objective

- Caring for the Noninvasive supported infant and strategies
- Group Cases
Caring for Babies on Non Invasive Ventilation
RN CHECKLIST  (every 4-6 hours)

1. Skin Integrity
   - Intact
   - Redness
   - Excoriated

2. Massage
   - Done
   - Not done

3. Cannulaide
   - Yes
   - No

4. Suction
   - Nasopharyngeal
   - Oral
   - Nasal Tip

   Secretion Amount
   - Small
   - Moderate
   - Large

   Secretion Colour
   - Clear
   - White
   - Yellow
   - Blood Tinged

5. CPAP/Biphasic Level ______/______cm H₂O

6. Humidifier Temperature_______°C
The Patient Interface

- Head Gear/Bonnet
- Cannulaide
- Prongs/Mask
- Straps
- Exhalation Limb
- Generator
Concerns and Issues: Why is this happening?

Redness  
Excoriation  
Nasal/Septal Breakdown
Nasal Prongs: The Issues

Old

New
Disadvantages of New Prongs

“V” shape prongs pinch the nasal septum

Enlarged base of prongs (bellows) are pushed against the inside of the nares → pressure sores on the nose
What else contributes to nasal skin breakdown?

- Weight of circuit and pulling upwards
- Baby shifting downwards in the bed
The Redness Stage: Intervention Required!

1. Massage nares

2. Change to a mask with modified cannulaide

Alternate every 3-6 hours...

...between mask and prongs
Cannulaide: A barrier is always required!

Prongs are not pushed in too tight

Always use a barrier!
What can you do?

Ensure proper BONNET or HEADGEAR fit

Is it too **BIG** or too small?  
Ensure proper PRONG or MASK fit
Cluster Care

- Check skin integrity of nares by removing the cannulaide and prongs/mask

- Massage nares while cannulaide is removed

Is it red....

Or excoriated?
Suctioning

Deeper suctioning (to the pharynx) at least once a shift!

Nasopharyngeal (NP)  Oropharyngeal
Venting the Stomach

Ensure an orogastric tube (OG) is in place to vent the stomach to avoid “CPAP belly”
The importance of the fit

Check the ears to ensure the straps or headgear are not too tight
The Nasal Mask

Mask is compressed against nose causing obstruction of airflow
KEEP THE PEEP, EH!!!
Family involvement

- Holding/Kangaroo Care
- Keeping the pacifier in
- Bundle and gentle patting
- Changing diaper /bathing while nurse hold the interface
Biphasic
Biphasic SiPAP is not NIPPV

- Biphasic mode is a small, slow, intermittent increase (3-4 cmH₂O) increase in CPAP pressure which acts as a “sigh”

- Patient is actually breathing on 2 levels of NCPAP

- Time high is NOT physiological inspiratory time (i-time)
  - Must set long enough to overcome compliance of the circuit and to bypass the upper airway.
    - MINIMUM is 1.0 sec to see effect
    - May require up to 3 sec (more recruitment of alveoli)

- Cycle is not Respiratory Rate
  - It’s the time that the biphasic cycles from low CPAP to high CPAP
  - It can stimulate a drive to breath during the “puff” up to high CPAP
Biphasic

*Increasing $T_{High}$ will keep lungs inflated at $P_{high}$ for longer

$= \text{Spontaneous breathing}$

$P_{low}$ (CPAP) $\rightarrow$ 6 cmH20

$P_{high}$ $\rightarrow$ 9 cmH20

3-4 cmH20

$P_{high}$ released at end of $T_i$
Spontaneous breathing on higher CPAP level (P High) AND lower level
### Ventilator Associated Pneumonia (VAP) Bundle

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<th>Vent Tubing Draining Away</th>
<th>Minimize Disruption of the Circuit</th>
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- HOB Elevated
- Vent Tubing Draining Away
- Minimize Disruption of the Circuit
- Mouthcare q2-4h
- Team Discuss Readiness to Extubate
- Reason(s) why VAP bundle not used
Case 1

Ex 26 week GA  
CGA 34 week  
2.5kg

**Background history:**
- Premature, RDS, surfactant x 1.
- Respiratory History: Intubated at birth for surfactant; extubated to NCPAP and reintubated at onset of NEC. HFO for 4 weeks. PCACVG for 1 days. EE to NCPAP at 30 weeks GA. Trialed off NCPAP at 33 weeks.
- Large PDA. Received 1 course of indomethin - resolved
- Stage 2 NEC: medically managed. Full feeds at time of discharge (bottle and occasionally breast feeds)
- Grade 2 Bilateral IVH.

Transferred from Sick Kids to Hospital X’s NICU two days ago to work on feeds. Not on any respiratory support.

CBG at transfer: 7.34/52/37/29/0.
Case 1

During the day, was reported to have 4-5 self resolving bradycardia. RN paged at 2200h because mom noticed that patient was less active while bottle feeding. Was assessed by RN. Active when handled. Settled fast. SpO2 95-96%. Was told to monitor and that it’s night time, so the patient may just be tired.

□3 hours later, RN paged RT to assess due to increase frequency of apnea, bradycardia and desaturations (ABD spells) that are now requiring stimulation.

What other assessment do you need?

What is your next step?

Base on the information that you have been given, what differential diagnosis can you suspect?
Case 1

- The baby was placed on HFNC 2L/kg, but continued to have ABD spells which has now increased in severity. Patient is pale. No sign of increased work of breathing noted.
- Stat CBG result: 7.25/68/32/20/-10
- CBC:
  - WBC 19.53
  - HGB 86
  - CRP 204.2

Why was HFNC not the best modality for the patient at that time?

What is your next step?
Case 1

Patient was intubated with RSI. ETT #3.5 Taped at ____ cm oral. (fill in the blank)

- Initial settings: PC, 25/5, Ti 0.30, RR 40. Total RR is 40. FiO2 0.50.
- Antibiotics was started. PRBC was ordered.
- CXR was done
- Post intubation CBG 30 minutes later: 7.24/52/45/21/-10. Transcutaneous CO2 57. FiO2 still 0.50

Are you happy with those ventilator settings?
What changes will you make?
Case 1

2 days later:
- FiO2 weaned to 0.25, TcPCO2 37
- PC 22/7, Ti 0.35, RR set 40, total 40. Patient is not on any sedation.
- Handles well and settles between cares. No spells since being intubated.
- The RT noticed that every time she comes in, the baby doesn’t seem to be triggering above the set ventilator rate.

Why is this patient still apneic?
Is this patient ready to wean or is he still septic?
What is the next step?
Case 2

1 week old term baby (3.75kg) came into emergency department (ED) due to history of 3 days of poor feeding.

On examination, found to be pale and lethargic. Suctioned for copious amount of thick nasal secretions. SpO2 85% in room air. HR 110. Was placed on low flow nasal prongs 300 mL. SpO2 91%.

Blood work was done. Low glucose. Gas: 7.35/49/24/23/-

There has been exposure to a sick sibling at home.

Apneic period increased in frequency and the patient was orally intubated 3 hours after arriving in the ED.

Nasal swab was sent for RSV bronchiolitis.

What size ETT and where should it be placed?

Chose your initial ventilation parameters.
Case 2

- Over the course of the next 3 days, the patient’s condition improved. Triggering all breath above the set rate of 30 breath/min.
- The RT was paged because the baby is very agitated and low MV alarm has been ringing off.
- On examination, the patient was tachypneic, back was arching, “purple” tone, SpO2 70% but poor waveform.
- An audible “cry” can be heard.

What might be happening? Describe how you would troubleshoot this situation.
What is your next step?
Case 2

- After extubation, the patient was still tachypneic, mild work of breathing, and SpO2 92 on FiO2 1.0 blow by O2.
- He was placed on NCPAP 6cmH20, FiO2 0.35, but was very agitated with the mask. He was crying and arching and was difficult to settle.

List a few techniques that can be used to help this baby settle?

If the baby doesn’t settle using the above listed techniques, what other modality might the baby be more comfortable on and why?