

Simulation Day Scenario: High Flow

Scenario supplies:

- Two high flow circuits (Optiflow—for sim, and Airvo—for group review post sim)
- Manekin (baby), ECG leads, O2 sat probe (+posey)
- Documentation: fake chart, Integrated Careplan, VSFS, PRAM tool/bedside resource, RT flowsheet, ePOPs documents
- Little sucker, yankeur, emergency bag
- MDI (Ventolin) + spacer

Objectives:

1. Ability to perform a site-to-source check of high flow circuit
2. Demonstrates foundational knowledge of troubleshooting for patient on high flow
3. Performs appropriate monitoring for patient on high flow
4. Responds appropriately to patient who is desaturating
5. Recognize signs of respiratory distress
6. Identifies resources for caring for a patient on high flow therapy (RT, CRN, CNE, CNC, MD)
7. Communicates and delegates effectively (SBAR)

Presenting History:

Oliver is an 18 month old boy who presented to the BCCH Emergency room with fever, poor intake over 12 hours, rhinorrhea, and a persistent, coarse cough. His parents reported that Oliver had been coughing and had a runny nose for 3 days. On assessment in the ER, Oliver's oxygen sats were 88% on RA, and he had moderate subcostal indrawing and observed tracheal tug. On auscultation, his lung sounds were coarse with decreased air entry bilaterally and mild expiratory wheezes to the LLL, RML and RLL. A FLOQ swab obtained in the ER came back positive for RSV and Oliver was admitted to T7 with RSV bronchiolitis. Oliver arrived to T7 yesterday late afternoon on high flow oxygen.

Optional Discussion Points:

- *High Flow Oxygen therapy is a type of non-invasive ventilation. What other types of NIV might you see in BCCH inpatients?*
-BiPAP and CPAP
- *What is high-flow oxygen therapy?*
-Heated and humidified (almost 100% humidity at body temp) mix of oxygen at a flow higher than patient's peak inspiratory flow. Improves wob and patient comfort.
- *Why use high flow oxygen in bronchiolitis?*
High flow oxygen therapy decreases work of breathing by washing out dead space in the airways with fresh gas flow and positive airway pressure. The warmth and humidity provides patient comfort and helps with mucociliary clearance.

You are starting your day shift on T7 and are in the midst of morning report on the lower west side, when the Phillips monitor starts alarming. It's Oliver in T7-107 and his saturations are reading 88-91% with a stable pleth.

Further information (if asked):

- No past medical history; normal pregnancy, born term
- Wt=11.2kg
- Orders: Tylenol 115mg po q4h prn, Ventolin 4 puffs via MDI q4h prn

-Admitted under the CTU Violet team, MRP-Dr. Pulmo, Jr Resident-Jimmy Lung
-Dad is at the bedside but just stepped out during your assessment to get a coffee; Mom will be coming in with Oliver's older sibling around mid-day

Initial Vital signs: HR 138 bpm, BP 105/57, T 37.7 temporal, RR 48/min, sats 89% on high flow (20L flow, 40% fiO2)

Initial Impression: Oliver is awake + alert, active in the crib. Desaturating on high flow oxygen with mild wob (same as in handover).

Primary Assessment:

A: Open, no audible congestion, normal secretions

B: Mild intercostal and subcostal retractions, slight tracheal tug; Coarse lung sounds with slight decreased air entry to bases bilaterally and a mild, expiratory wheeze auscultated to LLL, and RLL

C: Pale/pink and mottled to extremities with mild circum-oral cyanosis; warm throughout; HR stable and regular on auscultation

D: FLACC=0. Stable neuro, pupils equal and reactive, GCS=15; interactive with Dad, active and babbling

E: Benign

Expected Intervention:

- Checks orders for high flow settings and parameters
- High Flow 'site to source' check of circuit ***Highlight differences in Airvo circuit and site-to-source check after optiflow check complete***
 - Nares/prongs: Nares patent (secretions)? Prongs patent (vs kinked, stretched, torn, etc)? Prongs sitting correctly in nares? Proper prong size (50% of nare diameter)?
 - Are the prongs connected tightly to the circuit?
 - Circuit connected to the machine?
 - Settings correct (as per orders)
 - Back of machine: Air intake & air filter free of obstruction?
 - Machine plugged into power outlet?
 - Oxygen: connected to green tee on side of machine? tubing connected to flowmeter? Correct flow set (per orders)?
- Environment
 - Bedside safety check
 - Opportunity for family/caregiver teaching

Issue to identify: disconnect of corrugated tubing to prong tubing (should identify issue, correct and complete site-to-source of circuit)

***Advance to the following 'progression' activities below, time permitting...**

Progression—After completing your check of the high flow circuit, you notice that Oliver's oxygen saturations are now 100%. However, Oliver begins coughing coarsely, is audibly congested and has visible, copious secretions in his nares and mouth. Saturations post coughing are 94% and Oliver is upset/fussy.

Expected Knowledge/Intervention(s):

- Recognition of need for airway support/suction
- Competence in suctioning nares and mouth for patient on high flow oxygen
 - Knows how to use wall suction (turns on, ensures system intact/working, low-med pressure)
 - Knows appropriate supplies (size of yankeur, little sucker, suction catheters, etc)
 - Ensures prongs are patent, clears appropriately or replaces
 - Patient position: hob elevated for suction, reposition min q2h, encourage mobilization/holding etc. chest PT prn
- Assesses patient post suction

Progression—*Oliver is settled post suction, his respirations are clear/quiet, and his saturations are 99%. He has mild work of breathing and his RR is 36/min. He is still fussy and his Dad thinks that Oliver may be hungry and wanting some milk. He asks if he can feed Oliver.*

Expected Knowledge/Intervention(s):

- Refers to orders for feeding restrictions, goals, etc.
- Assesses/considers safety for feeding a patient on high-flow
 - Readiness: RR/wob/sats acceptable?
 - Assist parent to hold or elevate hob
 - Observe during feed: increased RR/wob or decreasing sats? need for pacing (parent teaching, use of different nipples, etc)
 - Post-feed assessment: increased RR/wob, decreased sats or increased congestion? gastric distension? need for alternative feed plan/NG insertion, etc?

Progression--*Oliver settled for a nap post feed and woke 1.5 hours later with increased cough, but this time his cough is more wheezy than congested. His oxygen saturations are 97% and his wob is now mild-moderate. You auscultate his chest and hear increased expiratory wheezing from earlier, to the RML, RLL and LLL.*

Expected Knowledge/Intervention(s):

- Recognizes need for prn ventolin
- Checks MAR/order for dose
- Competent in using MDI + spacer for patient on high flow
- Completes pre/post assessment, uses PEWS and PRAM scoring and knows where/how to document on flowsheet

Progression--*Post ventolin, Oliver is unchanged, still coughing with moderate wob and his saturations are 94%. He is irritable and not consolable by you or his Dad.*

Expected Knowledge/Intervention(s):

- Knows who to notify and how
 - RT-via Vocera 'Inpatient RT'
 - MSI/Resident
 - CRN or floor nurse (for help, delegation, second opinion)
 - CNC/charge (to inform re patient changes, progress, etc)
 - SBAR communication

