**SIMULATION SCENARIO**

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| **CASE TITLE:** | Viral bronchiolitis in infants requiring intubation |

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| **TARGET LEARNING GROUP:** | PGY 1-3 Pediatric Medicine Residents |

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| **LEARNING OBJECTIVES:** |  |  |
| ***Knowledge:***  1. Signs of respiratory distress and failure in the infant  2. Differential diagnosis of respiratory distress in a six-week-old  3. Airway anatomy of the infant | |  |
| ***Skills:***  1. Bag mask ventilation  2. Insertion of nasogastric tube  3. Intubation (oral) | |  |
| ***Attitudes/Behaviours:***  1. Clear communication between team members  2. Supportive behavior incorporating parents into situation  3. Ability to respond to constructive criticism between team members | |  |
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**SCENARIO ENVIRONMENT:**

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| ***Location*** | * “Emerg Dept resuscitation room” |
| ***Monitors*** | * Cardiorespiratory, oxygen saturation, oscillometric blood pressure |
| ***Props/Equipment*** | * Crash cart with defibrillator; infant and child and Ambu bag sizes. |
| ***Make-Up/Moulage*** | * Infant brought in by EMT. Parents arrive 10 min. into resuscitation, calm. Parents stand at the doorway holding a car seat, two coats and a suitcase. |
| ***Multi-Media*** | * AP x-ray of chest. 12 lead ECG. Blood gases. Complete blood count. Blood sugar |
| ***Personnel*** | * EMT, nurse, pediatric resident x 2, RT. Total of five to fulfill roles of team leader , airway skills, drugs, vitals/defibrillator and recorder |
| ***Potential Distractors*** | * All equipment works on this iteration. No extrinsic distractors |

**INITIAL SIMULATOR SETUP:**

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| ***Mannikin Position*** | On stretcher, completely wrapped up in blankets with head coverings so that only face is seen. Oxygen via nasal cannula. Full bottle of formula at top of bed. |
| ***Pupils***  *Size:*  *Reactivity:*  *Blinking:* | **3 mm**  **normal**  **yes** |
| ***Breathing***  *Resp Rate:*  *Resp Pattern:*  *Chest Rise:*  *Breath Sounds:*  *Airway Sounds:*  *% Cyanosis:*  *Oxygen Saturation:* | **65**  **Regular rate, shallow with indrawing**  **reduced excursion because of hyperinflation**  **reduced intensity**  **grunting from time to time if possible**  **no**  **88%** |
| ***Cardiovascular***  *Heart Rate:*  *Cardiac Rhythm:*  *Blood Pressure:* | **185**  **regular sinus**  **70/35** |
| ***Other Setup*** | IV or I/O line should be placed during the scenario. |
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**SCENARIO PROGRESSION:**

***Case Introduction:*** *(initial information provided to participants)*

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| * a six-week-old is brought by ambulance to the emergency department in the month of December. You are called by the emergency doctor who is overwhelmed by a simultaneous multi-victim car accident. He tells you "you are on your own but the kid is pretty pink in only a little bit of 02 so I don't expect there to be any problems". * The EMT tells you that they were called to a nearby her home after this six-week-old male infant suffered a choking spell whilst feeding. Mother had been worried that she had caused the problem by feeding too vigorously when her child did not have much of an appetite. He volunteered "mother looks like hell with a really bad cold". "She should be here any minute, they just had to drop off their toddler with a neighbor". |

***Available Collateral Information:*** *(information given if requested)*

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| * when mother arrives holding a large box of Kleenex and frequently sneezing and coughing, she volunteers the following: * he hasn't really been feeding for a whole day. He didn't really look too sick although I think he caught my cold. There's the bottle I was feeding him from this morning and you can see it's still completely full. You don't think it could be his heart do you. In the newborn nursery they heard a heart murmur and I'm really worried about that. He has an echocardiogram booked for next January. * He was born at this hospital on his due date. They had to suction him a lot in the delivery room. The nurses said he needed to be watched in the NICU because he was such a big baby. He weighed 9 pounds, 15 ounces. Still we got to go home the next day. |

***The Script:*** *(Scenario flow & management outcomes)*

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| **Scenario Transitions**  **& Evolution** | **Effective Management** | **Ineffective Management** | **Notes** |
| 1. Recognition and initial management of respiratory distress | Exposing the infant for examination.  Providing oxygen with low flow device.  Recognizing whether infant decompensates with handling  checking oxygen saturation  auscultation of chest  establishment of IV access  check glucometer | inadequate respiratory and airway examination  fail to provide oxygen  failure to recognize if infant decompensates with handling  failure to check oxygen saturation  failure to establish intravenous access  failure to check glucose |  |
| 2. Recognizing that infant has inadequate oxygenation | Proceed to high flow oxygen device  trial of inhaled bronchodilator  volume expansion if infant dehydrated  insertion of nasogastric tube to empty stomach of contents and gaseous overdistention.  preparations for intubation  initiation of bag mask ventilation with appropriate airway maintenance maneuver | Failure to change oxygen delivery device  failure to consider dehydration  inadequate preparation for bag mask ventilation and intubation  inadequate technique of bag mask ventilation.  Failure to insert a nasogastric tube. |  |
| 3. Infant responds to bag mask ventilation | Clinical reevaluation of adequacy of ventilation including vital signs and auscultation.  Reappraisal of other possible diagnoses including aspiration, congestive heart failure, child abuse and sepsis.  obtains chest x-ray  EKG and interpretation | Failure to consider other diagnoses  Failure to determine whether infant has reestablished adequate respiration.  Failure to obtain further investigations.  Failure to initiate antibiotic therapy. |  |
| 4. Infant has apneic episode | Team responds with positive pressure ventilation that is effective. Team leader ensures airways member is able to perform task  Insertion of oral airway.  Medication choices for intubation predicated on an unconscious infant. | Ineffective positive pressure ventilation.  Lack of airway management.  Lack of reappraisal of heart, CNS and infectious disease  inappropriate medications used for intubation |  |
| 5. Establishment of ventilation | Appropriate sized tube in correct location and depth. Team member assigned to determine position.  correct Ambu bag ventilation technique  reassessment of pulmonary and cardiac examination  feedback given to parents | Wrong size tube in wrong location  wrong person determines tube position.  Incorrect ventilation technique.  Failure to reassess pulmonary and cardiac status.  Parents insufficiently informed. |  |

**SUGGESTIONS FOR DEBRIEFING:** *(Link to Objectives)*

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| ***Knowledge:***  1. Features of respiratory distress and failure in the infant  2. Physical exam differentiation between aspiration, bronchiolitis and congestive heart failure  3. Normal vital signs for a six-week-old infant |
| ***Skills:***  1. Bag mask ventilation  2. Insertion of an oral airway and nasogastric tube  3. Intubation of the infant |
| ***Attitudes/Behaviours:***  1. Clear delineation of team member roles  2. Ensuring that all members continuously communicate  3. Ability to identify the team member who is under skilled |
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