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| **Case Title** | Frozen Chest |
| **Scenario Name** | Neonate Frozen Chest post Fentanyl +/- Sepsis RIH NICU Case #1 |

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| **Learning Objectives -** [**Use action words**](http://ubccpd.ca/sites/ubccpd.ca/files/Accreditation_Learning%20Objectives_%20Verbs.pdf) | |
| **Knowledge:**   1. Recognize abnormal blood gases & relate to respiratory pathophysiology 2. Recognize signs and symptoms of Frozen Chest | |
| **Skills:**   1. Management of Frozen Chest 2. Prepare and administer RSI medications for intubation 3. Demonstrate full clinical assessment of Neonate on a ventilator | |
| **Attitude/Behaviours:**   1. Demonstrate Team skills 2. Demonstrate Situational awareness 3. Demonstrate Graded Assertiveness | |
| **Scenario Environment** | |
| **Location** | NICU |
| **Monitors** | Cardiac Monitor |
| **Props/Equipment** | Intubation supplies; Meds: Fentanyl, Atropine, Succinylcholine; RSI Kit (from NICU); Ventilator; Overhead warmer; PPO & admission pack; IV & syringe pump |
| **Make-up/Moulage** |  |
| **Potential Distractors** |  |

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| **Case Introduction:** |
| Baby born at 38 weeks +4 gestation. His mother, who is now G-2, P-1, had previously attempted a home delivery and labored for over 26 hours before she reconsidered and went to the hospital. She experienced SROM approximately 20 hours prior and developed chorioamnionitis; the fever and uterine pain lead her to seek medical treatment. While in the labour suite, it was determined that she was GBS+ and then quickly received a dose of IV antibiotics, just 30 minutes before delivery. Babe appears to be having difficulty breathing right after being placed on skin-to-skin bonding; now brought to the warmer. NICU was called to second in. |

| **Patient Parameters** | **Effective Management** | **Notes** |
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| **Phase 1: Assessment**  **Condition: Critical**  **Initial Assessment**   * **Heart Rhythm: Sinus** * **HR: 76** * **RR: 4** * **Inspiration%: 25%** * **SP02: Preduct 60%, Postduct 60%** * **T: 38.5** * **CNS: tone – limp, mouth – relaxed, fontanelle – N** * **Chest: Normal sounds** * **CVS: Heart sounds Normal, volume 3** * **Integ: cyanosis 50%; cap refill 3 secs** * **Weight: 4000gm** | 1. **Take a focused history** (see Notes column) 2. **Medical Management**  * Engage resuscitation team; assign roles * Start timer at birth * Warm, dry, stimulate x30 seconds * Open airway, position head & neck for respiration * Initiate PPV * Apply cardiac & SpO2 monitoring   **Consequences of ineffective management**   * If no effective IPPV – go to phase 9 * Declining HR etc. (PPV rate must be above 50) | 1. **Focused history:**    1. Gestational age?    2. How many babies?    3. Fluid clear?    4. Other risk factors? 2. Term? Tone? Breathing/Crying? 3. MRSOPPA started    1. If getting to second “(P)ressure increase” & greater than 2 mins since start, Code should be called |
| **Phase 2: 2 mins post delivery**  **Physical Examination**   * **Heart Rhythm: Sinus** * **HR: 123** * **BP: 69/46** * **RR: 12** * **SP02: pre 62%, post 62%** * **CNS: tone – reduced both, mouth – relaxed, fontanelle – N, eyes – closed** * **Chest: normal sounds** * **CVS: Heart sound volume 3** * **Integ: Cyanosis 6%** | 1. **Patient Reassessment** (see Notes column) 2. **Medical Management**  * Recognize need to continue EFFECTIVE IPPV * Consider transfer to NICU from L&D suite   + Call for support (RT, peds if not already called, etc) * Attempt CPAP & move back to IPPV within 15 secs   **Consequences of ineffective management**   * If they stop IPPV or go to CPAP for greater than 30 secs – go to Phase 9 | Completed MR & SO, recognize current controlled situation, initiate transfer to NICU |
| **Phase 3: Transferred to NICU**  **Physicial Examination**   * **Heart Rhythm: Sinus** * **HR: 130s** * **BP: 67/45** * **RR: 16** * **Throat sounds: Soft grunting, volume 4** * **Retractions: mild** * **SPO2: preduct 71%, postduct 71%** * **T: 38.8** * **CNS: tone – reduced, mouth – relaxed, fontanelle – Normal, eyes – blink 10/min** * **Chest: Normal, volume 2** | 1. **Patient Reassessment** (see Notes column) 2. **Medical Management**  * Oxygen titration to SpO2 goal of >90%   + 0.30 or greater * Anticipate intubation & RSI   + Draw up meds * Initiate IV access   **Consequences of ineffective management**  Under 30% O2 sats low 80’s. | * **If haven’t anticipated intubation, peds to suggest** |
| **Phase 4: Ready for intubation**  **Physical Examination**   * **Heart Rhythm: Sinus** * **HR: 143** * **BP: 66/46** * **RR: 16** * **Throat sounds: soft grunting, volume 4** * **Inspiration%: 35%** * **SP02: Preduct 94%, Postduct 94%** * **T: 38.9** * **CNS: tone – reduced both, mouth – relaxed, fontanelle – N, blink state – 10 blinks/min** * **Chest: Normal – volume 2** * **CVS: Heart sounds Normal, volume 3** * **Integ: cap refill 2 secs** | 1. **Patient Reassessment** (see Notes column) 2. **Medical Management**  * Have meds prepared * Ensure team is ready and aware of plan * Start Fentanyl on pump * Prepare to give Atropine * Recognize temp & identify need for possible Abx   **Consequences of ineffective management** | **When Atropine give, move to Phase 5** |
| **Phase 5: Frozen Chest**  **Physical Examination**   * **Heart Rhythm: Sinus** * **HR: 70 (transition over 30secs)** * **BP: 69/45** * **RR: 0** * **Lung resistance/compliance: ON/1** * **Ventilatory options: inspiratory effort** * **Inspiration%: 0%** * **SP02: 50s% (transition over 30secs)** * **T: 38.9** * **CNS: tone – limp, mouth – relaxed, fontanelle – N, blink state – closed** * **Chest: Normal, volume 0** * **CVS: Heart sounds Normal, volume 3** * **Integ: normal, cap refill 2 secs** | 1. **Patient Reassessment** (see Notes column) 2. **Medical Management**  * Recognize need for Succinylcholine STAT to be given, and have at bedside   + Identify Succ ready to go to team leader * Succinylcholine given * IPPV to stabilize (Phase 6)   **Consequences of ineffective management** | **If moving to intubate prior to drugs given, confederate peds unable to tube & request Succinylcholine be given** |
| **Phase 6: Stabilization & Intubation**  **Physical Examination**   * **Heart Rhythm: Sinus** * **HR: 130s (transition over 1min with effective IPPV)** * **BP: 69/45** * **RR: 0 – 15 with intubation** * **Lung resistance/compliance: ON/1** * **Ventilatory options: inspiratory effort** * **Inspiration%: 0%** * **SP02: Preduct 90%, Postduct 90%** * **T: 38.9** * **CNS: tone – limp, mouth – relaxed, fontanelle – N, blink state – closed** * **Chest: Normal volume 2** * **CVS: Heart sounds Normal, volume 3** * **Integ: normal, cap refill 2 secs** | 1. **Patient Reassessment** (see Notes column) 2. **Medical Management**  * Intubation by peds or RT * Post tube xray * Ventilator attached   + Appropriate vent settings     - PRVC, RR 40, Vt 20, i time 0.4, fiO2 0.25   **Consequences of ineffective management** | **Maintained on ventilator, start down the sepsis treatment route?**  **If challenging intubation, sats start to decrease. Aim for IPPV after 30sec attempt** |
| **Phase 7: Stabilization & on Vent**  **Physical Examination**   * **Heart Rhythm: Sinus** * **HR: 130s** * **BP: 51/33** * **RR: 40** * **Lung resistance/compliance: ON/1** * **Ventilatory options: inspiratory effort** * **Inspiration%: 0%** * **SP02: Preduct 93%, Postduct 93%** * **T: 38.9** * **CNS: tone – limp, mouth – relaxed, fontanelle – N, blink state – closed** * **Chest: Normal volume 2** * **CVS: Heart sounds Normal, volume 3** * **Integ: normal, cap refill 4 secs** | 1. **Patient Reassessment** 2. **Medical Management**  * Call RT due to CBG result * Identify ventilator changes to reflect gas results   + Increase RR to 50s | **CBG: 7.20, pCO2 58, BE -5, HCO3 18, fiO2 0.25** |
| **Phase 8: Respiratory stabilized, Sepsis management**  **Physical Examination**   * **Heart Rhythm: Sinus** * **HR: 130s** * **BP: 51/33** * **RR: 40** * **Lung resistance/compliance: ON/1** * **Ventilatory options: inspiratory effort** * **Inspiration%: 0%** * **SP02: Preduct 93%, Postduct 93%** * **T: 38.9** * **CNS: tone – limp, mouth – relaxed, fontanelle – N, blink state – closed** * **Chest: Normal volume 2** * **CVS: Heart sounds Normal, volume 3** * **Integ: normal, cap refill 4 secs** | 1. **Patient Reassessment** (see notes column) 2. **Medical Management**  * Maintain current management * Identify need for LP * Initiate Abx if not already given | **CBG: 7.32, pCO2 47, BE 2, HCO3 23** |
| **Phase 9: INEFFECTIVE MANAGEMENT**  **Physical Examination**   * **Heart Rhythm: Sinus** * **HR: 70s** * **RR: 5** * **Inspiration%: 0%** * **SP02: Preduct 50%, Postduct 50%** * **CNS: tone – limp, mouth – relaxed, fontanelle – N, blink state – closed** * **Retractions: Severe with air hunger** * **Chest: Normal volume 1** * **CVS: Heart sounds Normal, volume 3** * **Integ: Cynaosis 100%, cap refill 5 secs** | 1. **Patient Reassessment** (see notes column) 2. **Medical Management**  * **Provide effective PPV** * **MRSOPPA** | \*Once effective PPV established move to end of last phase |

**Insert more lines if more phases required.**

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| **Expected Patient Management** | **Debriefing Points** |
| 1. **RN**    1. **Anticipate treatment/management plan**    2. **Provide IPPV**    3. **Act as team leader PRN**    4. **Medication management** 2. **RT**    1. **Intubation**    2. **Ventilator changes** | * **Debrief between Phase 6 & Start of Phase 7** * **Communication between team members (RN to RT, etc)** * **Frozen chest & Succinylcholine** |