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| **Maryland Next Gen NCLEX Test Bank Project****September 1, 2022** |
| **Case Study Topic**: (& stand-alone -bowtie) | Neonatal Respiratory Distress Syndrome | **Author:** | Deborah Miller MSN, RNC, C-EFM, CNECommunity College of Baltimore County |

**Case Summary**

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| A late preterm newborn, born at home attended by a certified nurse midwife, is brought to the emergency room at 12 hours of life in respiratory distress. The learner must recognize symptoms of respiratory distress; decide what interventions to include in the plan of care, the care priority, and determine what client findings would indicate interventions have been effective. |

**Objectives**

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| 1. Recognize the signs/symptoms of respiratory distress syndrome.2. Utilize the nursing process to develop an evidence-based, patient centered plan of care for newborns experiencing a complication related to gas exchange. 3. Identify nursing interventions that are consistent with current patient care standards in the care of the newborn experiencing a complication related to gas exchange.4. Demonstratecaring behaviors and professional communication in the nursing care of the reproductive family experiencing a complication related to gas exchange. |

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| **Case Study Link** | **Case Study QR Code** |
| <https://umaryland.az1.qualtrics.com/jfe/form/SV_bjROnSBym2IXpj0> |  |
| **Bow-tie QR Code** | **Bow-tie Link** |
|  | <https://umaryland.az1.qualtrics.com/jfe/form/SV_af3vDHcvZ7SSxtc> |

**Case References**

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| Ricci,S.S, Kyle, T. & Carmen,S. (2021) *Maternity & Pediatric Nursing* (4th ed) Philadelphia, Wolters Kluwer |

**Case Study Question 1 of 6**

The nurse cares for a 12- hour- old late-preterm male with respiratory distress following a home birth.

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| **Nurses’ Notes** |
| 1300: Parents of a 12-hour-old male newborn, born vaginally at home, brought the newborn into the emergency department in respiratory distress. Neonate was born at 37-weeks gestation in a birth attended by certified nurse midwife. Parents provided records that showed APGARs were 8/8 and the birth weight was 3235 grams. The newborn has fast and shallow breathing, grunting, nasal flaring, chest retracting, a heart murmur, and skin color gray. Parents report the baby breastfed right after birth, but has has not voided since birth. Provider at bedside.  |
| **Vital Signs**  |
| Time | 1300 |
| Temp | 36.1 C/ 97F |
| HR | 166 |
| RR | 76 |
| B/P | N/A |
| Pulse oximeter | 91% on RA |
| Pain | 0 |

Which 3 findings require **immediate** follow-up?

* Urine output
* Temperature\*
* Birth weight
* Respiratory status\*
* Pain
* Heart rate
* Oxygen saturation\*

**Scoring Rule: 0/1**

**Rationale:** The newborn has respiratory distress as evidenced by the low oxygen saturation, elevated respiratory rate >60 and increased work of breathing (grunting, retracting, nasal flaring). The newborn also has a low temperature which could be causing cold stress. The resting heart rate is slightly elevated (normal resting rate 110-160). The infant is large for gestational age and a blood glucose should be obtained. There is no mention of pain. Urine output is irrelevant at this time, since the newborn is only 12 hours old. Excepted urinary output for the first day of life is once in 24 hours.

**Case Study Question 2 of 6**

The nurse cares for a 12- hour- old late-preterm male with respiratory distress following a home birth.

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| **Nurses’ Notes** |
| 1300: Parents of a 12-hour-old male newborn, born vaginally at home, brought the newborn into the emergency department in respiratory distress. Neonate was born at 37-weeks gestation in a birth attended by certified nurse midwife. Parents provided records that showed APGARs were 8/8 and the birth weight was 3235 grams. The newborn has fast and shallow breathing, grunting, nasal flaring, chest retracting, a heart murmur, and skin color gray. Parents report the baby breastfed right after birth, but has has not voided since birth. Provider at bedside. 1310. Blood glucose 34 mg/dl. Newborn is lethargic with poor muscle tone. CBC with differential and metabolic panel, arterial blood gases, blood cultures obtained. Meconium stool passage, toxicology sent. Chest x-ray ordered. Oxygen hood applied. |
| **Vital Signs**  |
| Time | 1300 | 1315 |
| Temp | 36.1 C/ 97F |  |
| HR | 166 | 166 |
| RR | 76 | 76 |
| B/P | N/A | N/A |
| Pulse oximeter | 91% on RA | 91% on RA |
| Pain | 0 | 0 |

The nurse obtains labs and a blood glucose.

For each client finding click to specify if the finding is consistent with the findings of neonatal abstinence syndrome, neonatal sepsis, congenital heart diseases, or respiratory distress syndrome. Each finding may support more than one condition.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Factor/findings | Neonatal abstinence syndrome | Neonatal Sepsis | Congenital heart disease | Respiratory distress syndrome |
| Expiratory Grunting |  | * \*
 |  | * \*
 |
| Hypothermia |  | * \*
 |  | * \*
 |
| Hypotonic muscle tone |  | * \*
 |  | * \*
 |
|  Central cyanosis |  |  | * \*
 | * \*
 |
| Hypoglycemia | * \*
 |  |  | * \*
 |
| Lethargy |  | * \*
 | * \*
 | * \*
 |
| Tachypnea | * \*
 | * \*
 | * \*
 | * \*
 |

Note: each column must have at least 1 finding

**Scoring Rule: +/-**

**Rationale:** Grunting, hypotonic muscle tone, tachypnea, and hypoglycemia are evidence of respiratory distress syndrome. Hypothermia, tachypnea, & lethargy are evidence of infection. Symptoms of neonatal abstinence syndrome involve the GI tract and central nervous system, the newborn would be irritable not lethargic with NAS. Central cyanosis, lethargy and tachypnea are all signs of congenital heart disease.

**Case Study Question 3 of 6**

The nurse cares for a 12- hour old late-preterm male with respiratory distress following a home birth.

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| **Nurses’ Notes** |
| 1300: Parents of a 12-hour-old male newborn, born vaginally at home, brought the newborn into the emergency department in respiratory distress. Neonate was born at 37-weeks gestation in a birth attended by certified nurse midwife. Parents provided records that showed APGARS were 8/8 and the birth weight was 3235 grams. The newborn has fast and shallow breathing, grunting, nasal flaring, chest retracting, a heart murmur, and skin color gray. Parents report the baby breastfed right after birth, but has has not voided since birth. Provider at bedside. 1310. Blood glucose 34 mg/dl. Newborn is lethargic with poor muscle tone. CBC with differential and metabolic panel, arterial blood gases, blood cultures obtained. Meconium stool passage, toxicology sent. Chest x-ray ordered. Oxygen hood applied. |
| **Vital Signs**  |
| Time | 1300 | 1310 |
| Temp | 36.1 C/ 97F |  |
| HR | 166 | 166 |
| RR | 76 | 76 |
| B/P | N/A | N/A |
| Pulse oximeter | 91% on RA | 91% on RA |
| Pain | 0 | 0 |
| **Laboratory Report** |
| Lab | Results | Reference range  |
| ABG pH | 7.25 | 7.35-7.45 |
| ABG P02 | 58 | 60 -70 mm Hg |
| ABG PC02 | 52 | 35-45 mmHg |
| ABG SaP02 | 88 | 95-100% |
| ABG HC03 | 17 | 22-26 mEq/L |
| Glucose  | 34 | 40-60 mg/dl |
| Hematocrit | 53 | Newborn 46-68% |
| Hemoglobin | 18 g/dl | Newborn 15.2-23.6 g/dl |
| WBC | 10 | 9.1 – 30.1 x 103 cells/mm3 |
| Blood type | O+ |  |
| **Diagnostic Reports** |  |
| Echocardiogram no congenital heart defect notedChest x-ray hypo aeration- ground glass pattern  |

Initial labs and diagnostic reports return.

* Drag words from the choices below to complete the following sentence

The condition the client is most likely experiencing is

which untreated can lead to

|  |  |
| --- | --- |
| Conditions | Conditions |
|  Neonatal abstinence syndrome | Circulatory collapse |
| Neonatal Sepsis | Increased atelectasis\* |
| Congenital heart disease | Seizures |
| Respiratory distress syndrome\* | Septic shock |
| Neonatal septic shock | Neonatal septic shock |

**Scoring Rule: Rationale**

**Rationale:** Chest x-ray demonstrated ground glass appearance that gives the strongest evidence that the hypo aeration is due to a lack of surfactant. ABG results demonstrate metabolic acidosis but do not reveal the cause. Left untreated the newborn will eventually develop atelectasis. The lab work is not reflective of infection WBC normal. The newborn is not demonstrating withdraw symptoms…irritability, yawning, high-pitched cry.

**Case Study Question 4 of 6**

The nurse cares for a 12- hour old late-preterm male with respiratory distress following a home birth.

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| **Nurses’ Notes** |
| 1300: Parents of a 12-hour-old male newborn, born vaginally at home, brought the newborn into the emergency department in respiratory distress. Neonate was born at 37-weeks gestation in a birth attended by certified nurse midwife. Parents provided records that showed APGARs were 8/8 and the birth weight was 3235 grams. The newborn has fast and shallow breathing, grunting, nasal flaring, chest retracting, a heart murmur, and skin color gray. Parents report the baby breastfed right after birth, but has has not voided since birth. Provider at bedside. 1310. Blood glucose 34 mg/dl. Newborn is lethargic with poor muscle tone. CBC with differential and metabolic panel, arterial blood gases, blood cultures obtained. Meconium stool passage, toxicology sent. Chest x-ray ordered. Oxygen hood applied1340: Newborn transferred to neonatal intensive care nursery with diagnosis of respiratory distress syndrome. |
| **Vital Signs**  |
| Time | 1300 | 1310 | 1320 | 1340 |
| Temp | 36.1 C/ 97F |  | 36.4 C/ 97.5F |  |
| HR | 166 | 166 | 170 | 170 |
| RR | 76 | 76 | 80 | 78 |
| B/P | N/A | N/A | N/A | N/A |
| Pulse oximeter | 91% on RA | 91% on RA | 93% on 100% | 93% on 100% |
| Pain | 0 | 0 | 0 | grimace |
| **Laboratory Report** |
| Lab | Results | Reference range  |
| ABG pH | 7.25 | 7.35-7.45 |
| ABG P02 | 58 | 60 -70 mm Hg |
| ABG PC02 | 52 | 35-45 mmHg |
| ABG SaP02 | 88 | 95-100% |
| ABG HC03 | 17 | 22-26 mEq/L |
| Glucose  | 34 | 40-60 mg/dl |
| Hematocrit | 53 | Newborn 46-68% |
| Hemoglobin | 18 g/dl | Newborn 15.2-23.6 g/dl |
| WBC | 10 | 9.1 – 30.1 x 103 cells/mm3 |
| Blood type | O+ |  |
| **Diagnostic Reports** |  |
| Echocardiogram no congenital heart defect notedChest x-ray hypo aeration- ground glass pattern  |

The neonate is diagnosed with respiratory distress syndrome.

* For each potential intervention clinic to indicate if it indicated or contraindicated.

|  |  |  |
| --- | --- | --- |
| Potential Intervention | Indicated  | Contraindicated |
| Encourage bottle feeding |  | * \*
 |
| Suction airway hourly |  | * \*
 |
| Surfactant administration | * \*
 |  |
| Cluster care | * \*
 |  |
| IV placement | * \*
 |  |
| Blood glucose every 2 hours | * \*
 |  |
| Intubation  | * \*
 |  |
| Provide chest physiotherapy |  | * \*
 |
| Neutral thermal environment | * \*
 |  |

**Scoring Rule: 0/1**

**Rationale:** The newborn has a diagnosis of respiratory distress syndrome. Surfactant administration is the main treatment with respiratory support. Newborn is intubated for administration of the surfactant and airway support. Cluster care to reduce oxygen demands. Oral feedings are contraindicated in newborn with tachypnea. Suctioning airway hourly can actually increase respiratory distress. IV placement is necessary for access. This causative issue is not lung edema (secretions), so chest physiotherapy would not be indicated. It would be Important to maintain a neutral thermal environment to reduce metabolic needs.

**Case Study Question 5 of 6**

The nurse cares for a 12- hour old late-preterm male with respiratory distress following a home birth.

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| **Nurses’ Notes** |
| 1300: Parents of a 12-hour-old male newborn, born vaginally at home, brought the newborn into the emergency department in respiratory distress. Neonate was born at 37-weeks gestation in a birth attended by certified nurse midwife. Parents provided records that showed APGARs were 8/8 and the birth weight was 3235 grams. The newborn has fast and shallow breathing, grunting, nasal flaring, chest retracting, a heart murmur, and skin color gray. Parents report the baby breastfed right after birth, but has has not voided since birth. Provider at bedside. 1310. Blood glucose 34 mg/dl. Newborn is lethargic with poor muscle tone. CBC with differential and metabolic panel, arterial blood gases, blood cultures obtained. Meconium stool passage, toxicology sent. Chest x-ray ordered. Oxygen hood applied.1340: Transferred to neonatal intensive care nursery with diagnosis of respiratory distress syndrome. |
| **Vital Signs**  |
| Time | 1300 | 1310 | 1320 | 1340 |
| Temp | 36.1 C/ 97F |  | 36.4 C/ 97.5F |  |
| HR | 166 | 166 | 170 | 170 |
| RR | 76 | 76 | 80 | 78 |
| B/P | N/A | N/A | N/A | N/A |
| Pulse oximeter | 91% on RA | 91% on RA | 93% on 100% | 93% on 100% |
| Pain | 0 | 0 | 0 | grimace |
| **Laboratory Report** |
| Lab | Results | Reference range  |
| ABG pH | 7.25 | 7.35-7.45 |
| ABG P02 | 58 | 60 -70 mm Hg |
| ABG PC02 | 52 | 35-45 mmHg |
| ABG SaP02 | 88 | 95-100% |
| ABG HC03 | 17 | 22-26 mEq/L |
| Glucose  | 44 | 40-60 mg/dl |
| Hematocrit | 53 | Newborn 46-68% |
| Hemoglobin | 18 g/dl | Newborn 15.2-23.6 g/dl |
| WBC | 10 | 9.1 – 30.1 x 103 cells/mm3 |
| Blood type | O+ |  |
| **Diagnostic Reports** |  |
| Echocardiogram no congenital heart defect notedChest x-ray hypo aeration- ground glass pattern  |

* Which one of the following interventions should the nurse implement first?
* Obtain a repeat blood glucose.
* Assist with intubation.\*
* Suction the newborns airway.
* Administer surfactant.

**Scoring Rule: 0/1**

 **Rationale:** Maintaining a patent airway is the priorities. Surfactant cannot be administered until the newborn is intubated. Suctioning the newborns airway, is not indicated. The blood glucose level can be addressed after surfactant is given. The priority is intubation, to allow access for the administration of surfactant. A lack of surfactant is the causative issue in this case.

**Case Study Question 6 of 6**

The nurse cares for a 12- hour old late-preterm male with respiratory distress following a home birth.

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| **Nurses’ Notes** |
| 1300: Parents of a 12-hour-old male newborn, born vaginally at home, brought the newborn into the emergency department in respiratory distress. Neonate was born at 37-weeks gestation in a birth attended by certified nurse midwife. Parents provided records that showed APGARS were 8/8 and the birth weight was 3235 grams. The newborn has fast and shallow breathing, grunting, nasal flaring, chest retracting, a heart murmur, and skin color gray. Parents report the baby breastfed right after birth, but has has not voided since birth. Provider at bedside. 1310. Blood glucose 34 mg/dl. Newborn is lethargic with poor muscle tone. CBC with differential and metabolic panel, arterial blood gases, blood cultures obtained. Meconium stool passage, toxicology sent. Chest x-ray ordered. Oxygen hood applied.1340: Transferred to neonatal intensive care nursery with diagnosis of respiratory distress syndrome.1400: Intubated with 3.0 ET tube and placed on mechanical ventilation. Surfactant administered via endotracheal tube. Peripheral IV placed. Repeat blood glucose 42mg/dL. |
| **Vital Signs**  |
| Time | 1300 | 1310 | 1320 | 1340 | 1415 |
| Temp | 36.1 C/ 97F |  | 36.4 C/ 97.5F |  | 36.6C/98F |
| HR | 166 | 166 | 170 | 170 | 158 |
| RR | 76 | 76 | 80 | 78 | 58 |
| B/P | N/A | N/A | N/A | N/A | 80/46 |
| Pulse oximeter | 91% on RA | 91% on RA | 93% on 100% | 93% on 100% | 98% on 60% |
| Pain | 0 | 0 | 0 | grimace | 0 |
| **Laboratory Report** |
| Lab | Results | Reference range  |
| ABG pH | 7.25 | 7.35-7.45 |
| ABG P02 | 58 | 60 -70 mm Hg |
| ABG PC02 | 52 | 35-45 mmHg |
| ABG SaP02 | 88 | 95-100% |
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| Hemoglobin | 18 g/dl | Newborn 15.2-23.6 g/dl |
| WBC | 10 | 9.1 – 30.1 x 103 cells/mm3 |
| Blood type | O+ |  |
| **Diagnostic Reports** |  |
| Echocardiogram no congenital heart defect notedChest x-ray hypo aeration- ground glass pattern  |

The nurse reassesses the client afterbeing intubated and receiving surfactant.

* Complete the following sentence by choosing from the list of options.

|  |  |
| --- | --- |
| The nurse determines the client’s status is  | Select |
| improving. \* |
| deteriorating.  |
| unchanged |
| The nurse nurse should now  | Select |
| administer a second dose pf surfactant.  |
| begin weaning the oxygen. \* |
| request a ventilator rate increase. |

**Scoring Rule: 0/1**

**Rationale**: Client is responding to treatment. The infant is warming, the blood glucose is increasing, the vital signs are within normal limits and the oxygen saturation improving. The nurse can begin to wean the oxygen settings on the ventilator to prevent compliactions of oxygen toxicity.

**Bowtie**

The nurse cares for a 12- hour old late-preterm male with respiratory distress following a home birth.

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| **Nurses’ Notes** |
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| **Vital Signs**  |
| Time | 1300 | 1310 |
| Temp | 36.1 C/ 97F |  |
| HR | 166 | 166 |
| RR | 76 | 76 |
| B/P | N/A | N/A |
| Pulse oximeter | 91% on RA | 91% on RA |
| Pain | 0 | 0 |
| **Laboratory Report** |
| Lab | Results | Reference range  |
| ABG pH | 7.25 | 7.35-7.45 |
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| Glucose  | 34 | 40-60 mg/dl |
| Hematocrit | 53 | Newborn 46-68% |
| Hemoglobin | 18 g/dl | Newborn 15.2-23.6 g/dl |
| WBC | 10 | 9.1 – 30.1 x 103 cells/mm3 |
| Blood type | O+ |  |
| **Diagnostic Reports** |  |
| Echocardiogram no congenital heart defect notedChest x-ray hypo aeration- ground glass pattern  |

* Complete the diagram by dragging from the choices below to specify what condition the client is most likely experiencing, 2 actions the nurse should take to address that condition, and 2 parameters the nurse should monitor to assess the client’s progress.

|  |  |  |
| --- | --- | --- |
| Action to take |  | Parameter to monitor |
|  | Condition most likely experiencing |  |
| Action to take |  | Parameter to monitor |
|  |  |  |
| **Actions to take** | **Potential conditions** | **Parameters to monitor** |
| Adminster antibiotics | Neonatal sepsis | Temperature |
| Arrange cardiac consult |  Respiratory distress syndrome\* | Arterial blood gases\* |
| Assist with intubation\* | Neonatal abstinence syndrome | Blood pressures in all 4 extremities |
| Administer narcotics | Congenital Heart disease | Oxygenation saturation\* |
| Administer surfactant\* |  | Neonatal abstinence scores |

**Scoring Rule: 0/1**

**Rationale:** The newborn has respiratory distress syndrome. The priority action is to assist with intubation and administer surfactant. The assessments to monitoring for evidence of effectiveness of care are oxygenation saturation and ABGs.