Acute Respiratory Care of the Neonate, 3rd Edition—Course 1

Test Directions

1. Please fill out the answer form and include all requested information. We are unable to issue a certificate without complete information.
2. All questions and answers are developed from the information provided in the book. Select the one best answer and fill in the corresponding circle on the answer form.
3. Mail the answer form to NICU Ink, 1425 N. McDowell Blvd., Ste. 105, Petaluma, CA 94954-6513 with a check for $60 (processing fee) made payable to NICU Ink. This fee is non-refundable.
4. You will be notified of your test results within 6 weeks. Please retain the test for your records.
5. An answer key is available upon request with completion of the exam.
6. A total of 20 contact hours* for the course (including 2.8 hours of pharmacology credit) may be earned as CNE credit for reading the material and for completing a posttest and evaluation. To be successful the learner must obtain a grade of at least 80% on the test.
7. No relevant financial interest or affiliation with any commercial interests was disclosed by members of the activity test panel. No commercial support/sponsorship was provided for this education activity. The Academy of Neonatal Nursing (ANN)/American Nurses Credentialing Center (ANCC) does not endorse any commercial products discussed in conjunction with this educational activity.
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* Contact hours based on a 60-minute hour.

Course Objectives

After reading the book and taking the test, the participant will be able to:

1. Discuss lung mechanics in the premature infant.
2. Describe the pathophysiology of common lung diseases.
3. Summarize the pathophysiology of the three types of apnea.
4. Outline the nursing care of the infant in acute respiratory distress.
5. Interpret pulmonary function data.
6. Correctly analyze neonatal blood gases.
7. Explain the principles of mechanical ventilation.
8. Discuss the special aspects of the nursing care of neonates on various types of noninvasive ventilation.
9. Compare two types of mechanical ventilation as to which infants respond best to which therapy.
10. Discuss complications of positive pressure ventilation in the premature neonate.
11. Evaluate the impact of surfactant and inhaled nitric oxide therapies.
12. Compare and contrast high-frequency jet ventilation and high-frequency oscillatory ventilation.
13. List the criteria used to select infants as extracorporeal membrane oxidation candidates.

1. The structures of the respiratory system arise from which of the following structures?
a. cardiac tube
b. laryngotracheal groove
c. primitive esophagus

2. The onset of the canalicular stage of lung development is signaled by:
a. branching of the terminal bronchioles
b. development of terminal saccules
c. flattening of epithelial cells

3. Which of the following critical changes occurs in the terminal saccular stage?
a. mature alveoli form
b. rudimentary blood vessels develop
c. surfactant secretion begins

4. Pulmonary cell proliferation is controlled by which gene?
a. fibroblast growth factor 8
b. sonic hedgehog
c. thyroid transcription factor

5. **In fetal pigs, ligation of one of the pulmonary arteries results in increased alveolar growth in:**
   a. the affected lung
   b. both lungs
   c. the contralateral lung

6. **In the fetal lung, vasculogenesis of the bronchial vessels is completed by week _____ of gestation.**
   a. 16
   b. 20
   c. 24

7. **The area of the alveolus where gas exchange occurs most rapidly is in the:**
   a. cytoplasmic extensions
   b. laminar bodies
   c. type II cells

8. **Ninety percent of surfactant consists of:**
   a. carrier molecules
   b. lipid
   c. protein

9. **Secretion of surfactant into the alveoli is stimulated by which of the following?**
   a. catecholamines
   b. glucocorticoids
   c. thyroid hormones

10. **Fetal breathing movements are inhibited by:**
    a. catecholamines
    b. corticosteroids
    c. prostaglandins

11. **The normal volume of the neonatal lung at term is _____ mL/kg.**
    a. 15
    b. 20
    c. 25

12. **Tidal volume (V_T) refers to the volume of air:**
    a. left in the alveoli on expiration
    b. displaced with each breath
    c. that moves in and out of the large airways

13. **Looking at a pressure-volume loop, a vertical compliance line indicates a lung with:**
    a. decreased compliance
    b. increased compliance
    c. increased work of breathing

14. **A normal tidal volume for a term infant is _____ mL/kg.**
    a. 2–4
    b. 6–8
    c. 10–12

15. **The healthy term infant's partial pressure of oxygen (PaO_2) at birth is _____ mmHg.**
    a. 25
    b. 50
    c. 75

16. **Factors which predispose an infant to respiratory distress syndrome (RDS) include:**
    a. female sex
    b. first born twin
    c. prematurity

17. **Conditions which reduce the likelihood that a newborn will have RDS include:**
    a. fetal growth restriction
    b. maternal alcohol use
    c. multiple gestation

18. **An ominous sign in infants in early stage RDS is:**
    a. apnea
    b. grunting
    c. retractions

19. **Maternal asthma is thought to increase the risk of transient tachypnea of the newborn (TTN) by altering:**
    a. airway resistance
    b. lung volumes
    c. sodium transport

20. **In infants with TTN, fluid first clears from the:**
    a. lower lung fields
    b. perihilar area
    c. upper lung fields

21. **The most common route for acquisition of organisms causing neonatal pneumonia is:**
    a. perinatal ascending
    b. postnatal contact
    c. transplacental

22. **In a newborn with pneumonia, concurrent hepatosplenomegaly suggests that the infection is caused by a:**
    a. bacterium
    b. fungus
    c. virus

23. **Which of the following drugs is recommended for the treatment of pneumonia caused by Chlamydia?**
    a. azithromycin
    b. imipenem
    c. piperacillin-tazobactam

24. **A 33 percent reduction in the incidence of meconium aspiration syndrome (MAS) has been attributed to which of the following?**
    a. enhanced fetal monitoring
    b. fewer postterm deliveries
    c. increased numbers of cesarean deliveries

25. **Which of the following radiographic findings are typical of MAS?**
    a. loss of volume
    b. patchy infiltrates
    c. uniform haziness

26. **During auscultation, typical findings of persistent pulmonary hypertension of the newborn (PPHN) include a murmur that is:**
    a. heard in the axilla
    b. long and harsh
    c. soft and musical

27. **Differences between pre- and postductal saturations that exceed 15–20 mmHg indicate:**
    a. lack of significant shunting
    b. significant left-to-right shunting
    c. significant right-to-left shunting

28. Treatment of PPHN with hyperventilation has been found to increase the risk of:
a. cardiac failure
b. poor neurologic outcomes
c. renal damage

29. Apnea with muscle activity and absent airflow is termed:
a. central
b. mixed
c. obstructive

30. Where are the most important of the peripheral chemoreceptors in the respiratory feedback loop located?
a. carotid bodies
b. descending aorta
c. superior vena cava

31. Compared to adults, peripheral chemoreceptor activity is:
a. decreased
b. increased
c. the same

32. The ventilatory response to PCO_2 begins to increase after how many weeks of gestation?
a. 28
b. 30
c. 32

33. Chest distortion occurring during rapid eye movement sleep stimulates which of the following reflexes?
a. diving
b. Hering-Breuer
c. intercostal phrenic inhibitory

34. Sighs are thought to play a role in apnea by decreasing:
a. dead space ventilation
b. lung volumes
c. PCO_2 levels

35. Which of the following maternal medications is implicated in newborn apnea?
a. indomethacin
b. labetalol
c. magnesium sulfate

36. Stimulation of what receptors triggers the diving reflex?
a. central chemoreceptors
b. laryngeal receptors
c. stretch receptors

37. Methylxanthines prevent apnea by blocking:
a. adenosine
b. dopamine
c. endorphins

38. At what postconceptional age in weeks does the risk of apnea in preterm infants become equivalent to that of term infants?
a. 39–40
b. 41–42
c. 43–44

39. The first period of reactivity after birth typically encompasses the first _____ minutes of life.
a. 30
b. 60
c. 90

40. In newborns, the most sensitive thermal receptors are located in which area of the body?
a. abdomen
b. scapula
c. face

41. Which of the following encourages heat loss through convection?
a. bathing
b. cool drafts
c. placing the infant directly on an x-ray cassette

42. Gestational age assessment is less accurate in the presence of:
a. low birth weight
b. intrauterine growth restriction
c. neurologic injury

43. In three newborns with the same PaO_2, which one is more likely to appear cyanotic? One with a hemoglobin of:
a. 13 g/dL (130 g/liter)
b. 16 g/dL (160 g/liter)
c. 19 g/dL (190 g/liter)

44. Fine crackles reflect sounds generated in the:
a. distal airways
b. mainstem bronchi
c. trachea

45. A molecule of hemoglobin is capable of combining with how many molecules of oxygen?
a. 2
b. 3
c. 4

46. Which of the following shifts the oxygen disassociation curve to the right?
a. acidosis
b. hypothermia
c. low PCO_2

47. Arteries recommended for intermittent arterial punctures include the:
a. dorsalis pedis
b. femoral
c. temporal

48. Heelstick sampling may result in false elevation of which of the following?
a. calcium
b. potassium
c. sodium

49. On chest x-ray, which of the following heart shapes is characteristic of tetralogy of Fallot?
a. boot
b. egg
c. snowman

50. Which of the following is an example of a condition associated with an opaque chest x-ray?
a. MAS
b. pulmonary hemorrhage
c. pulmonary interstitial emphysema (PIE)

51. In a term infant, how many mL/kg/day of fluid are usually lost through insensible water loss (IWL)?
a. 5–10
b. 15–20
c. 25–30

52. Warming and humidifying ventilator gases are estimated to decrease insensible IWL by _____ percent.
a. 20–30
b. 30–40
c. 40–50

53. What is the recommended minimum amount of protein intake (in g/kg/day) for an infant receiving parenteral nutrition on Day 1 of life?
a. 0.5–1
b. 1–1.5
c. 1.5–2

54. At how many weeks of gestation is the epidermis considered to be mature?
a. 32
b. 34
c. 36

55. By measuring the infant's respiratory flow over time it is possible to calculate:
a. resistance
b. tidal volume
c. total lung volume

56. The most direct method of measuring flow is with:
a. anemometry
b. pneumotachography
c. plethysmography

57. During airway pressure monitoring, which of the following parameters can be calculated?
a. dead space
b. peak inspiratory flow
c. positive end expiratory pressure (PEEP)

58. Normalization of neonatal lung volume can be achieved by dividing measured compliance by:
a. airway opening pressure
b. functional residual capacity (FRC)
c. V_T

59. Pulmonary resistance is determined by dividing transpulmonary pressure by:
a. flow
b. opening pressure
c. volume

60. One time constant is the time it takes to move what percentage of V_T?
a. 54
b. 63
c. 72

61. Techniques to assess FRC include:
a. end-distending pressure measurement
b. helium dilution
c. thoracoabdominal motion

62. In optimal continuous positive airway pressure (CPAP) levels, the goal is to maintain lung volume just above what part of the lung's pressure-volume relationship?
a. base line volume
b. lower inflection point
c. upper inflection point

63. An erratic tracing on the flow-volume graph may be a sign of:
a. air leak
b. hyperinflation
c. increased secretions

64. The optimal position for an infant undergoing pulmonary function testing is:
a. prone
b. side-lying
c. supine

65. In an infant with congenital diaphragmatic hernia, airway resistance is usually:
a. high
b. low
c. normal

66. The majority of oxygen in the blood is:
a. bound to hemoglobin
b. carried by bicarbonate ions
c. dissolved in plasma

67. Normal adult hemoglobin reaches 90 percent saturation at a PaO_2 of _____ mmHg.
a. 30
b. 60
c. 90

68. In which of the following newborns would you expect the oxygen disassociation curve to shift to the left? One with:
a. alkalosis
b. increased 2,3-diphasphoglycerate
c. more adult hemoglobin

69. The function of carbonic anhydrase is to:
a. combine CO_2 and water
b. form bicarbonate ions
c. transform carbonic acid back to CO_2

70. In order to move into the plasma, bicarbonate ions are exchanged with which ion?
a. chloride
b. potassium
c. sodium

71. To maintain a neutral pH, how many parts bicarbonate is needed to neutralize one part carbonic acid?
a. 10
b. 15
c. 20

72. Which of the following causes metabolic alkalosis?
a. diarrhea
b. renal disease
c. vomiting

73. Which of the following blood gas sources most accurately reflects placental status?
a. fetal scalp sampling
b. umbilical arterial blood
c. umbilical venous blood

74. Newborns begin to appear cyanotic at an approximate PaO_2 of _____ mmHg.
a. 40
b. 50
c. 60

75. An arterial blood gas is obtained in a 2-hour-old, 35-week newborn. The results are as follows: pH 7.31, PCO_2 48, PO_2 50, HCO_3^- 24. The best interpretation for this gas is:
a. compensated respiratory alkalosis
b. compensated metabolic acidosis
c. uncompensated respiratory acidosis

76. Pressure-cycled ventilators give a breath to a preset:
a. time
b. pressure
c. volume

77. Volume ventilation for a nonhomogenous lung condition such as pneumonia increases the risk of:
a. airway collapse
b. overdistension
c. ventilation-perfusion mismatching

78. With a pressure-limited ventilator, the primary determinant of V_T is:
a. airway pressure gradient (ΔP)
b. PEEP
c. peak inspiratory pressure (PIP)

79. Alveolar ventilation can be estimated by multiplying the ventilator rate by the:
a. ΔP
b. PIP
c. PEEP

80. The minimum flow rate for a mechanically ventilated infant is how many times the infant's minute ventilation?
a. 2
b. 3
c. 4

81. Increasing PEEP without changing the PIP is most likely to result in which of the following?
a. decreased oxygenation
b. decreased ventilation
c. increased ventilation

82. Which of the following maneuvers can be used to increase mean airway pressure (Paw)?
a. decrease the ventilator rate
b. decrease the PEEP
c. increase the inspiratory flow rate

83. Compliance refers to the lung's ability to:
a. remain open
b. recoil
c. stretch

84. The major determining factor of lung compliance is:
a. alveolar surface tension
b. chest wall rigidity
c. lung volume

85. The most important factor determining resistance through an endotracheal (ET) tube is:
a. flow rate
b. tube radius
c. tube length

86. In a 3-mm ET tube, turbulent flow occurs when the flow rate reaches _____ liters/minute.
a. 7
b. 7.5
c. 8

87. Which of the following is an example of a restrictive lung disorder?
a. congenital cystic adenomatoid malformation
b. pneumonia
c. TTN

88. Which of the following has been reported as a benefit of bubble CPAP? It:
a. delivers high humidity to the airways
b. generates variable gas flow rates
c. produces chest wall vibrations

89. According to the American Association for Respiratory Care, oxygen flow rates for nasal cannula should be limited to _____ liters/minute.
a. 1
b. 2
c. 3

90. Minute ventilation is calculated by multiplying respiratory rate by:
a. FRC
b. inspiratory pressure
c. V_T

91. The use of CPAP in neonates has been shown to stimulate the secretion of:
a. antidiuretic hormone
b. cytokines
c. glucagon

92. In the first study of the INSURE method of respiratory support the number of neonates requiring mechanical ventilation decreased by _____ percent.
a. 25
b. 50
c. 70

93. The minimum flow level for effective noninvasive ventilation (NIV) is _____ liters/minute.
a. 3
b. 5
c. 7

94. Complications reported with early generation face mask CPAP include:
a. cerebellar hemorrhage
b. nasal septal erosion
c. pneumothorax

95. Ideal characteristics of nasal prongs include which of the following features? They:
a. can be firmly secured
b. are long
c. rest against the nasal septum

96. Reported complications of NIV include:
a. decreased cardiac output
b. laryngeal edema
c. tracheomalacia

97. The most common cause of nasal trauma in NIV is:
a. inadequate humidity
b. incorrect prong position
c. prongs that are too small

98. The minimum recommended gas temperature for NIV is _____°C.
a. 34.5
b. 35.5
c. 36.5

99. Criteria for intubating a baby on NIV includes the need for >_____ percent FiO_2.
a. 40
b. 50
c. 60

100. Which of the following scenarios best represents SIMV?
a. every patient-initiated breath is supported to a preset level
b. a preset number of breaths per minute are introduced by the ventilator
c. a set number of patient-initiated breaths are supported to a preset level

101. Which of the following is a distinguishing characteristic of pressure support ventilation?
a. the breath is terminated when inspiratory flow declines
b. a preset number of breaths is supported
c. breath size is determined by inspiratory time

102. Volume guarantee is considered a self-weaning mode because:
a. each breath is supported
b. inspiratory pressure is autoregulated
c. PEEP is decreased as the lungs improve

103. The most common cause of hypoxemia in neonates with lung disease is:
a. air trapping
b. poor perfusion
c. ventilation-perfusion mismatch

104. Which of the following infants would be expected to have a short time constant? One with:
a. chronic lung disease
b. MAS
c. RDS

105. In ventilated infants, the best bedside marker of adequate lung volumes is:
a. oxygen levels
b. pressure requirements
c. spontaneous breathing effort

106. Which of the following is a consequence of setting a V_T that is too high for the infant?
a. air trapping
b. hypoxia
c. poor respiratory drive

107. The risk of air leaks is thought to be higher in premature infants because of a decrease in the:
a. elastic resistance of the alveoli
b. number and size of the pores of Kohn
c. calcification of the ribs

108. PIE is more common in infants who:
a. are premature
b. have aspirated meconium
c. have pneumonia

109. Which of the following is a risk factor for spontaneous pneumothorax?
a. female sex
b. low one-minute Apgar
c. second of twins

110. In aspirating a tension pneumothorax, the needle is usually inserted into which intercostal space?
a. second or third
b. fourth or fifth
c. sixth or seventh

111. Factors increasing the risk of tracheomalacia include:
a. frequent apnea
b. gastroesophageal reflux
c. use of an uncuffed ET tube

112. Pulmonary hemorrhage is more common in infants with:
a. Group B Streptococcus sepsis
b. patent ductus arteriosus (PDA)
c. pneumothorax

113. High levels of PIP are least likely to affect cardiac output in neonates with:
a. normal lungs
b. pneumothorax
c. RDS

114. Using M-mode echocardiography the presence of a PDA is confirmed when the ratio of aortic root to left atrium is:
a. <1:1
b. 1:1
c. >1:1

115. How many days of supplemental oxygen are required to meet the National Institutes of Health's definition of bronchopulmonary dysplasia (BPD)?
a. 28
b. 36
c. 45

116. In animals, mechanical ventilation with excessive lung volume results in an influx of:
a. free radicals
b. leukocytes
c. superoxide dismutase

117. Infants are more likely to develop BPD if there is a family history of:
a. asthma
b. eczema
c. hypertension

118. Which of the following vitamins has been shown to reduce the incidence of BPD?
a. A
b. D
c. E

119. The acute phase of retinopathy of prematurity (ROP) occurs at _____ weeks of gestational age.
a. 28–30
b. 30–32
c. 32–34

120. ROP is most dangerous when it is found in Zone _____.
a. 1
b. 2
c. 3

121. ROP changes occurring in five continuous clock hours is termed:
a. aggressive posterior ROP
b. pre-plus disease
c. threshold ROP

122. Infants at highest risk of developing ROP are those from what ethnic background?
a. African American
b. Caucasian
c. South Asian

123. For an infant born at 25 weeks of gestation, the first examination for ROP should take place at _____ weeks after birth.
a. 4
b. 6
c. 8

124. Which of the following is an indication for surgical treatment of ROP?
a. Stage 1 in Zone II
b. Stage 2 in Zone III
c. Stage 3 in Zone I

125 Infasurf is derived from:
a. artificial sources
b. calf lung
c. porcine lung

126. Which of the following is a recognized complication of surfactant administration?
a. intraventricular hemorrhage (IVH)
b. PDA
c. pulmonary hemorrhage

127. In addition to RDS, surfactant is most widely recommended for the treatment of:
a. MAS
b. PIE
c. pulmonary hemorrhage

128. Nitric oxide (NO) is derived from:
a. cyclic GMP
b. guanosine
c. L-arginine

129. In a 37-week infant with PPHN, the recommended starting dose of NO is _____ ppm.
a. 10
b. 20
c. 30

130. The efficacy of inhaled nitric oxide therapy is increased when it is used in conjunction with:
a. high-frequency ventilation (HFV)
b. permissive hypercapnia
c. surfactant administration

131. Sodium nitroprusside has been used in the treatment of PPHN because it:
a. donates NO
b. is a selective pulmonary vasodilator
c. increases systemic vascular resistance

132. Which of the following is a mechanism of action of pentoxifylline? It:
a. increases cardiac output
b. reduces pulmonary inflammation
c. stimulates respiratory muscles

133. Antenatal steroid exposure is associated with a lower risk of:
a. necrotizing enterocolitis
b. PDA
c. sepsis

134. Three or more courses of antenatal steroids have been shown to:
a. improve lung maturity
b. increase mortality
c. prolong gestation

135. Long-term *adverse effects* of postnatal steroids include an increased risk of:
a. chronic hypertension
b. IVH
c. severe ROP

136 In studies of dexamethasone to reduce stridor and extubation failure, the dose used was _____ mg/kg.
a. 0.1
b. 0.25
c. 0.3

137. Side effects of metaproterenol include:
a. hypotension
b. tachycardia
c. vomiting

138. Atrovent is a/an:
a. adrenergic agonist
b. anticholinergic
c. xanthine

139. HFV refers to a mode of ventilation that uses a rate of ≥_____ breaths per minute.
a. 100
b. 150
c. 200

140. In HFV, oxygenation is influenced by inspired oxygen concentrations and:
a. Paw
b. inspiratory pressure
c. ventilator rate

141. During HFV, the "pendelluft" effect occurs because the respiratory units have different:
a. perfusion
b. sizes
c. time constants

142. In high-frequency jet ventilation (HFJV), exhalation is:
a. active
b. dependent on amplitude
c. passive

143. Compared to high-frequency oscillatory ventilation (HFOV), HFJV allows the use of lower:
a. PEEP
b. PIP
c. V_T

144. The usual frequency for HFOV is _____ cycles.
a. 300–600
b. 600–900
c. 900–1,200

145. When switching an infant with MAS from conventional mechanical ventilation (CMV) to HFOV, it is recommended that the Paw be:
a. decreased by 1–2 cmH_2O
b. increased by 1–2 cmH_2O
c. remain the same as the CMV PIP

146. HFJV has been shown to be of benefit in treating MAS over HFOV because HFJV:
a. enhances surfactant release
b. mobilizes secretions
c. results in fewer air leaks

147. In studies comparing HFJV and CMV, the incidence of PIE in the HFJV group was what compared to CMV?
a. decreased
b. increased
c. the same

148. The incidence of necrotizing tracheobronchitis in patients receiving high-frequency ventilation is estimated to be _____ percent.
a. 2–4
b. 6–8
c. 10–12

149. During assessment of an infant on HFV, the nurse notes higher pitched breath sounds. This increased pitch is most likely related to the presence of:
a. atelectasis
b. air leak
c. secretions

150. Extracorporeal membrane oxygenation (ECMO) is contraindicated in which of the following infants? One who:
a. has a Grade II IVH
b. is 36 weeks gestational age
c. weighs 2.2 kg

151. Venoarterial (VA) bypass is recommended for ECMO primarily for _____ support.
a. cardiac
b. respiratory
c. both cardiac and respiratory

152. Which vein is used for venovenous (VV) bypass?
a. femoral
b. internal jugular
c. umbilical

153. Relative contraindications for VV bypass include:
a. anuria
b. respiratory acidosis
c. pulmonary hypertension

154. The ideal position for the arterial catheter in VA bypass is at the:
a. aortic arch
b. left atrium
c. junction of the carotic artery and aorta

155. Causes of increased postmembrane pressures include:
a. inadequate catheter size
b. kinking of the arterial catheter
c. pneumothorax

156. The mechanism for peripheral hypotension in VV double-lumen bypass is thought to be:
a. anemia
b. hypocapnia
c. reduction in blood viscosity

157. With VA bypass, the typical blood flow is _____ mL/kg/minute.
a. 80–100
b. 100–120
c. 120–140

158. **Platelet destruction in the ECMO circuit is minimized by flushing the circuit with:**
a. albumin
b. carbon dioxide
c. heparin

159. **Thrombocytopenia can develop for up to how many days after ECMO is discontinued?**
a. 2 c. 4
b. 3

160. **Which of the following parameters represents the best tool for assessing adequate flow in VA bypass?**
a. PaO_2 c. SvO_2
b. pH

161. **The most common mechanical complication during ECMO is:**
a. displacement c. vessel rupture
b. clots in the circuit

ANSWER FORM: Acute Respiratory Care of the Neonate, 3rd Edition—Course 1

Please completely fill in the circle of the **one best answer** using a dark pen.

Questions are numbered vertically.

1. a. ◯ b. ◯ c. ◯	13. a. ◯ b. ◯ c. ◯	25. a. ◯ b. ◯ c. ◯	37. a. ◯ b. ◯ c. ◯	49. a. ◯ b. ◯ c. ◯	61. a. ◯ b. ◯ c. ◯	73. a. ◯ b. ◯ c. ◯	85. a. ◯ b. ◯ c. ◯	97. a. ◯ b. ◯ c. ◯	109. a. ◯ b. ◯ c. ◯
2. a. ◯ b. ◯ c. ◯	14. a. ◯ b. ◯ c. ◯	26. a. ◯ b. ◯ c. ◯	38. a. ◯ b. ◯ c. ◯	50. a. ◯ b. ◯ c. ◯	62. a. ◯ b. ◯ c. ◯	74. a. ◯ b. ◯ c. ◯	86. a. ◯ b. ◯ c. ◯	98. a. ◯ b. ◯ c. ◯	110. a. ◯ b. ◯ c. ◯
3. a. ◯ b. ◯ c. ◯	15. a. ◯ b. ◯ c. ◯	27. a. ◯ b. ◯ c. ◯	39. a. ◯ b. ◯ c. ◯	51. a. ◯ b. ◯ c. ◯	63. a. ◯ b. ◯ c. ◯	75. a. ◯ b. ◯ c. ◯	87. a. ◯ b. ◯ c. ◯	99. a. ◯ b. ◯ c. ◯	111. a. ◯ b. ◯ c. ◯
4. a. ◯ b. ◯ c. ◯	16. a. ◯ b. ◯ c. ◯	28. a. ◯ b. ◯ c. ◯	40. a. ◯ b. ◯ c. ◯	52. a. ◯ b. ◯ c. ◯	64. a. ◯ b. ◯ c. ◯	76. a. ◯ b. ◯ c. ◯	88. a. ◯ b. ◯ c. ◯	100. a. ◯ b. ◯ c. ◯	112. a. ◯ b. ◯ c. ◯
5. a. ◯ b. ◯ c. ◯	17. a. ◯ b. ◯ c. ◯	29. a. ◯ b. ◯ c. ◯	41. a. ◯ b. ◯ c. ◯	53. a. ◯ b. ◯ c. ◯	65. a. ◯ b. ◯ c. ◯	77. a. ◯ b. ◯ c. ◯	89. a. ◯ b. ◯ c. ◯	101. a. ◯ b. ◯ c. ◯	113. a. ◯ b. ◯ c. ◯
6. a. ◯ b. ◯ c. ◯	18. a. ◯ b. ◯ c. ◯	30. a. ◯ b. ◯ c. ◯	42. a. ◯ b. ◯ c. ◯	54. a. ◯ b. ◯ c. ◯	66. a. ◯ b. ◯ c. ◯	78. a. ◯ b. ◯ c. ◯	90. a. ◯ b. ◯ c. ◯	102. a. ◯ b. ◯ c. ◯	114. a. ◯ b. ◯ c. ◯
7. a. ◯ b. ◯ c. ◯	19. a. ◯ b. ◯ c. ◯	31. a. ◯ b. ◯ c. ◯	43. a. ◯ b. ◯ c. ◯	55. a. ◯ b. ◯ c. ◯	67. a. ◯ b. ◯ c. ◯	79. a. ◯ b. ◯ c. ◯	91. a. ◯ b. ◯ c. ◯	103. a. ◯ b. ◯ c. ◯	115. a. ◯ b. ◯ c. ◯
8. a. ◯ b. ◯ c. ◯	20. a. ◯ b. ◯ c. ◯	32. a. ◯ b. ◯ c. ◯	44. a. ◯ b. ◯ c. ◯	56. a. ◯ b. ◯ c. ◯	68. a. ◯ b. ◯ c. ◯	80. a. ◯ b. ◯ c. ◯	92. a. ◯ b. ◯ c. ◯	104. a. ◯ b. ◯ c. ◯	116. a. ◯ b. ◯ c. ◯
9. a. ◯ b. ◯ c. ◯	21. a. ◯ b. ◯ c. ◯	33. a. ◯ b. ◯ c. ◯	45. a. ◯ b. ◯ c. ◯	57. a. ◯ b. ◯ c. ◯	69. a. ◯ b. ◯ c. ◯	81. a. ◯ b. ◯ c. ◯	93. a. ◯ b. ◯ c. ◯	105. a. ◯ b. ◯ c. ◯	117. a. ◯ b. ◯ c. ◯
10. a. ◯ b. ◯ c. ◯	22. a. ◯ b. ◯ c. ◯	34. a. ◯ b. ◯ c. ◯	46. a. ◯ b. ◯ c. ◯	58. a. ◯ b. ◯ c. ◯	70. a. ◯ b. ◯ c. ◯	82. a. ◯ b. ◯ c. ◯	94. a. ◯ b. ◯ c. ◯	106. a. ◯ b. ◯ c. ◯	118. a. ◯ b. ◯ c. ◯
11. a. ◯ b. ◯ c. ◯	23. a. ◯ b. ◯ c. ◯	35. a. ◯ b. ◯ c. ◯	47. a. ◯ b. ◯ c. ◯	59. a. ◯ b. ◯ c. ◯	71. a. ◯ b. ◯ c. ◯	83. a. ◯ b. ◯ c. ◯	95. a. ◯ b. ◯ c. ◯	107. a. ◯ b. ◯ c. ◯	119. a. ◯ b. ◯ c. ◯
12. a. ◯ b. ◯ c. ◯	24. a. ◯ b. ◯ c. ◯	36. a. ◯ b. ◯ c. ◯	48. a. ◯ b. ◯ c. ◯	60. a. ◯ b. ◯ c. ◯	72. a. ◯ b. ◯ c. ◯	84. a. ◯ b. ◯ c. ◯	96. a. ◯ b. ◯ c. ◯	108. a. ◯ b. ◯ c. ◯	120. a. ◯ b. ◯ c. ◯

121. a. ◯ b. ◯ c. ◯	126. a. ◯ b. ◯ c. ◯	131. a. ◯ b. ◯ c. ◯	136. a. ◯ b. ◯ c. ◯	141. a. ◯ b. ◯ c. ◯	146. a. ◯ b. ◯ c. ◯	151. a. ◯ b. ◯ c. ◯	156. a. ◯ b. ◯ c. ◯	161. a. ◯ b. ◯ c. ◯	
122. a. ◯ b. ◯ c. ◯	127. a. ◯ b. ◯ c. ◯	132. a. ◯ b. ◯ c. ◯	137. a. ◯ b. ◯ c. ◯	142. a. ◯ b. ◯ c. ◯	147. a. ◯ b. ◯ c. ◯	152. a. ◯ b. ◯ c. ◯	157. a. ◯ b. ◯ c. ◯		
123. a. ◯ b. ◯ c. ◯	128. a. ◯ b. ◯ c. ◯	133. a. ◯ b. ◯ c. ◯	138. a. ◯ b. ◯ c. ◯	143. a. ◯ b. ◯ c. ◯	148. a. ◯ b. ◯ c. ◯	153. a. ◯ b. ◯ c. ◯	158. a. ◯ b. ◯ c. ◯		
124. a. ◯ b. ◯ c. ◯	129. a. ◯ b. ◯ c. ◯	134. a. ◯ b. ◯ c. ◯	139. a. ◯ b. ◯ c. ◯	144. a. ◯ b. ◯ c. ◯	149. a. ◯ b. ◯ c. ◯	154. a. ◯ b. ◯ c. ◯	159. a. ◯ b. ◯ c. ◯		
125. a. ◯ b. ◯ c. ◯	130. a. ◯ b. ◯ c. ◯	135. a. ◯ b. ◯ c. ◯	140. a. ◯ b. ◯ c. ◯	145. a. ◯ b. ◯ c. ◯	150. a. ◯ b. ◯ c. ◯	155. a. ◯ b. ◯ c. ◯	160. a. ◯ b. ◯ c. ◯		

Acute Respiratory Care of the Neonate, 3rd Edition—Course 1

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Evaluation Directions

Thank you for taking the time to assist us in evaluating the effectiveness of this course. Using the scale below, darken the circles corresponding to your responses. If an item is not applicable, leave it blank.

①	②	③	④	⑤
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Objectives: I am able to:

1. Discuss lung mechanics in the premature infant. ①②③④⑤
2. Describe the pathophysiology of common lung diseases. ①②③④⑤
3. Summarize the pathophysiology of the three types of apnea. ①②③④⑤
4. Outline the nursing care of the infant in acute respiratory distress. ①②③④⑤
5. Interpret pulmonary function data. ①②③④⑤
6. Correctly analyze neonatal blood gases. ①②③④⑤
7. Explain the principles of mechanical ventilation. ①②③④⑤
8. Discuss the special aspects of the nursing care of neonates on various types of noninvasive ventilation. ①②③④⑤
9. Compare two types of mechanical ventilation as to which infants respond best to which therapy. ①②③④⑤
10. Discuss complications of positive pressure ventilation in the premature neonate. ①②③④⑤
11. Evaluate the impact of surfactant and inhaled nitric oxide therapies. ①②③④⑤
12. Compare and contrast high-frequency jet ventilation and high-frequency oscillatory ventilation. ①②③④⑤
13. List the criteria used to select infants as extracorporeal membrane oxidation candidates. ①②③④⑤

Presentation

1. The material presented is relevant to my practice. ①②③④⑤
2. The content of this activity is likely to engender a change in my clinical practice. ①②③④⑤
3. The questions on the test reflected the content of the book. ①②③④⑤
4. The book content was comprehensive. ①②③④⑤
5. The test directions were clear. ①②③④⑤
6. The CNE activity was free of commercial bias. ①②③④⑤
7. I would recommend this CNE activity to colleagues. ①②③④⑤
8. I perceive the education level of this course to be: ①②③
   1 = Basic; 2 = Intermediate; 3 = Advanced
9. How long did it take you to complete the course? ____ hours ____ minutes
10. In what level unit do you practice? I___ II___ III___

I am a ☐ staff nurse ☐ NNP ☐ nurse manager _____ other (please state)

What subjects would you like to see offered for CE courses?_____

_____

Additional comments:_____