Acute Respiratory Care of the Neonate, 3rd Edition—Course 4

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 $25.00 (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 7.8 contact hours* for the course (including 2.3 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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   Provider, Academy of Neonatal Nursing, approved by the California Board of Registered Nursing, Provider #CEP 6261; and Florida Board of Nursing, Provider #FBN 3218, content code 2505.
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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 complications of positive pressure ventilation in the premature neonate.
2. Evaluate the impact of surfactant and inhaled nitric oxide therapies.
3. Compare and contrast high-frequency jet ventilation and high-frequency oscillatory ventilation.
4. List the criteria used to select infants as extracorporeal membrane oxidation candidates.

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1. What percentage of newborns develops an air leak?
a. 1–2
b. 3–4
c. 5–6

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2. Infection with which of the following organisms has been identified as a risk factor for air leaks?
a. *Escherichia coli*
b. Klebsiella
c. Pseudomonas

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3. The "sail sign" is a radiographic finding in:
a. pneumomediastinum
b. pneumopericardium
c. pulmonary interstitial emphysema

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4. The premature infant with a pneumothorax is at increased risk of developing:
a. intraventricular hemorrhage
b. necrotizing enterocolitis (NEC)
c. sepsis

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5. Which of the following is a symptom of a pneumopericardium?
a. muffled heart sounds
b. peaked T waves on EKG
c. shift in the point of maximal intensity

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6. Which of the following is true of Type II lesions in necrotizing tracheobronchitis? They are:
a. hemorrhagic
b. patchy in nature
c. premalignant

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7. In neonates with pulmonary hemorrhage, airway splinting and a reduction in bleeding may be achieved by increasing:
a. positive end expiratory pressure (PEEP)
b. peak inspiratory pressure (PIP)
c. ventilator rate

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8. In term neonates, the ductus arteriosus is usually functionally closed by _____ hours of age.
a. 12
b. 24
c. 48

9. Which of the following is a relative contraindication for indomethacin use?
a. platelet count of 75,000/mm^3
b. serum creatinine of 2.2 mg/dL
c. urine output of 1.5 mL/kg/hour

10. During an oxygen needs test, an infant is said to have bronchopulmonary dysplasia (BPD) if, after 30 minutes on room air, the oxygen saturation is <_____ percent.
a. 90
b. 93
c. 95

11. Which of the following cofactors is required for the production of antioxidant enzymes?
a. carnitine
b. cobalt
c. copper

12. Which of the following is a common finding in infants with surfactant-treated lungs who have BPD?
a. bronchial stenosis
b. fewer, larger alveoli
c. hyperplasia of the conductive airways

13. BPD increases the premature infant's metabolic rate by approximately _____ percent.
a. 15
b. 20
c. 25

14. Production of vascular endothelial growth factor is stimulated by:
a. hypoxia
b. insulin-like growth factor
c. optic nerve stimulation

15. The presence of blood vessel growth extending from the retina into the vitreous is characteristic of stage _____ retinopathy of prematurity (ROP).
a. 2
b. 3
c. 4

16. The use of vitamin E to prevent ROP has been shown to increase the risk of:
a. chronic lung disease
b. free oxygen radicals
c. sepsis

17. Mydriatic agents containing phenylephrine require cautious use in infants with:
a. hypertension
b. NEC
c. threshold disease

18. The recommended dose of beractant is _____ mL/kg.
a. 2.5
b. 3
c. 4

19. Following surfactant administration, suctioning should be avoided for at least _____ minutes.
a. 30
b. 60
c. 90

20. From an ethical perspective, it is important to recognize that beractant may be undesirable for a family with what religious background?
a. Hindu
b. Muslim
c. Seventh Day Adventist

21. The primary action of nitric oxide (NO) is:
a. enhancing alveolar gas diffusion
b. improving cardiac output
c. relaxation of vascular smooth muscle

22. Current recommendations from the literature suggest that inhaled nitric oxide (iNO) therapy be initiated when the oxygen index meets or exceeds:
a. 15
b. 20
c. 25

23. In addition to reducing the dose of NO, methemoglobinemia may be treated with intravenous:
a. immune globulin
b. methylene blue
c. sildenafil

24. What is the approximate cost per day of iNO therapy?
a. $1,000
b. $2,000
c. $3,000

25. In a randomized clinical trial, administration of sildenafil to newborns with persistent pulmonary hypertension of the newborn caused a/an:
a. drop in oxygenation
b. increase in systemic blood pressure
c. reduction in the effectiveness of iNO

26. Prostaglandin I_2 (prostacyclin) is being used therapeutically to cause:
a. increased cardiac contractility
b. pulmonary vasodilation
c. systemic vasoconstriction

27. The drug of choice for antenatal steroid treatment is:
a. betamethasone
b. dexamethasone

28. Short-term risks of postnatal steroid therapy include:
a. gastrointestinal bleeding
b. hypoglycemia
c. pulmonary hemorrhage

29. Infants treated with steroids postnatally are more likely to develop:
a. cerebral palsy
b. hydrocephalus
c. renal impairment

30. The onset of action of albuterol is _____ minutes.
a. 5
b. 10
c. 15

31. Atropine has the greatest dilating effects on the:
a. alveoli
b. large airways
c. small airways

32. The preferred drug for acute bronchospasms in infants with chronic lung disease is:
a. albuterol
b. ipratropium
c. terbutaline

33. During conventional mechanical ventilation, carbon dioxide removal is dependent on respiratory rate multiplied by:
a. PIP
b. PEEP
c. tidal volume (V_T)

34. In high-frequency jet ventilation (HFJV), changing the tidal volume is best accomplished by manipulating the:
a. amplitude
b. frequency
c. mean airway pressure (Paw)

35. Which type of lung volume strategy has been shown to improve gas exchange?
a. average based on birth weight
b. high lung volume
c. low lung volume

36. Side effects of sustained inflation include:
a. decreased cerebral blood flow
b. delayed surfactant release
c. pulmonary hypertension

37. In addition to PIP, the V_T in HFJV is determined by
a. gas flow
b. inspiratory time
c. rate

38. In high-frequency oscillatory ventilation (HFOV), Paw is determined by:
a. amplitude
b. flow
c. PEEP

39. Which of the following is critical to the success of HFOV?
a. infant positioning
b. specialized endotracheal tube
c. stable lung volume

40. What is the minimum Paw (in cmH_2O) needed to maintain adequate lung volume on HFOV?
a. 8–10
b. 10–12
c. 12–14

41. The increase in intraventricular hemorrhage rates seen in early HFOV studies was attributed to:
a. hypoxia
b. hypercapnia
c. impaired venous return

42. The risk of hemodynamic compromise in high-frequency ventilation (HFV) is greatest in the presence of:
a. atelectasis
b. high ventilator rates
c. overdistended lungs

43. The recommended interval for chest vibration assessment during HFV is every _____ minutes.
a. 15
b. 30
c. 60

44. Neonates are considered candidates for extracorporeal membrane oxygenation (ECMO) when their risk of death exceeds _____ percent.
a. 60
b. 70
c. 80

45. ECMO is not usually initiated when the infant has been on mechanical ventilation for more than _____ days.
a. 4–8
b. 10–14
c. 16–20

46. Advantages of venoarterial (VA) bypass over venovenous (VV) bypass include:
a. improved cerebral blood flow
b. lower pump flow rates
c. preservation of the carotid artery

47. Disadvantages of the VV route for ECMO include the possible need for:
a. higher oxygen concentrations
b. inotropic support
c. more heparin

48. The desired activated clotting time prior to cannulization is _____ seconds.
a. 150
b. 200
c. 250

49. Causes of decreased venous return and collapse of the silicone bladder during ECMO include:
a. inadequate ventilation
b. hypoxemia
c. hypovolemia

50. The typical duration of cardiac stun is _____ days.
a. 1–3
b. 4–6
c. 7–10

51. During ECMO, the flow to the infant is determined by blood volume and:
a. catheter diameter
b. membrane size
c. roller speed

52. The recommended PO_2 for VV bypass is _____ torr.
a. 50–60
b. 60–70
c. 70–80

53. **For infants on ECMO, platelet transfusions are recommended when the platelet count falls below _____/mm³.**
a. 60,000 c. 100,000
b. 80,000

54. **Infants on ECMO usually require supplements of what electrolyte?**
a. chloride c. sodium
b. potassium

55. **The recommended hematocrit range for infants on ECMO is:**
a. 35–45 c. 55–65
b. 45–55

56. **How many hours of VA bypass idling time are recommended as a test for stopping ECMO?**
a. 1–4 c. 8–12
b. 4–8

ANSWER FORM: Acute Respiratory Care of the Neonate, 3rd Edition—Course 4

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

Questions are numbered vertically.

1. a. ◯ b. ◯ c. ◯	7. a. ◯ b. ◯ c. ◯	13. a. ◯ b. ◯ c. ◯	19. a. ◯ b. ◯ c. ◯	25. a. ◯ b. ◯ c. ◯	31. a. ◯ b. ◯ c. ◯	37. a. ◯ b. ◯ c. ◯	43. a. ◯ b. ◯ c. ◯	49. a. ◯ b. ◯ c. ◯	55. a. ◯ b. ◯ c. ◯
2. a. ◯ b. ◯ c. ◯	8. a. ◯ b. ◯ c. ◯	14. a. ◯ b. ◯ c. ◯	20. a. ◯ b. ◯ c. ◯	26. a. ◯ b. ◯ c. ◯	32. a. ◯ b. ◯ c. ◯	38. a. ◯ b. ◯ c. ◯	44. a. ◯ b. ◯ c. ◯	50. a. ◯ b. ◯ c. ◯	56. a. ◯ b. ◯ c. ◯
3. a. ◯ b. ◯ c. ◯	9. a. ◯ b. ◯ c. ◯	15. a. ◯ b. ◯ c. ◯	21. a. ◯ b. ◯ c. ◯	27. a. ◯ b. ◯ c. ◯	33. a. ◯ b. ◯ c. ◯	39. a. ◯ b. ◯ c. ◯	45. a. ◯ b. ◯ c. ◯	51. a. ◯ b. ◯ c. ◯	
4. a. ◯ b. ◯ c. ◯	10. a. ◯ b. ◯ c. ◯	16. a. ◯ b. ◯ c. ◯	22. a. ◯ b. ◯ c. ◯	28. a. ◯ b. ◯ c. ◯	34. a. ◯ b. ◯ c. ◯	40. a. ◯ b. ◯ c. ◯	46. a. ◯ b. ◯ c. ◯	52. a. ◯ b. ◯ c. ◯	
5. a. ◯ b. ◯ c. ◯	11. a. ◯ b. ◯ c. ◯	17. a. ◯ b. ◯ c. ◯	23. a. ◯ b. ◯ c. ◯	29. a. ◯ b. ◯ c. ◯	35. a. ◯ b. ◯ c. ◯	41. a. ◯ b. ◯ c. ◯	47. a. ◯ b. ◯ c. ◯	53. a. ◯ b. ◯ c. ◯	
6. a. ◯ b. ◯ c. ◯	12. a. ◯ b. ◯ c. ◯	18. a. ◯ b. ◯ c. ◯	24. a. ◯ b. ◯ c. ◯	30. a. ◯ b. ◯ c. ◯	36. a. ◯ b. ◯ c. ◯	42. a. ◯ b. ◯ c. ◯	48. a. ◯ b. ◯ c. ◯	54. a. ◯ b. ◯ c. ◯	

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Name _____
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Address _____

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Nursing License # _____ State(s) of License _____

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(optional)

Test expires May 20 2018

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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 complications of positive pressure ventilation in the premature neonate. ①②③④⑤
2. Evaluate the impact of surfactant and inhaled nitric oxide therapies. ①②③④⑤
3. Compare and contrast high-frequency jet ventilation and high-frequency oscillatory ventilation. ①②③④⑤
4. 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:_____

_____