

CURRICULUM VITAE

David Ennis Woodrum, M.D.

OFFICE

University of Washington
Division of Neonatology
Department of Pediatrics
Box 356320
1959 NE Pacific St, RR546B HSB
Seattle, WA 98195-6320
Phone: (206) 543-3200, Direct Line/Voicemail: (206) 685-8092
Fax: (206) 543-8926
Email: woodrum@u.washington.edu

EDUCATION

Undergraduate:	1957-61	A.B., Chemistry, MacMurray College, Jacksonville, Illinois
Graduate:	1961-65	M.D., University of Illinois, Chicago, Illinois

POSTGRADUATE TRAINING

Internship:	1965-66	Fresno County General Hospital, Fresno, California
Residency:	1966-68	University of Illinois Research and Education Hospitals, Chicago, Illinois
Fellowship:	1968-71	Neonatal and Respiratory Physiology, Division of Neonatal Biology, University of Washington, Seattle, Washington
Certificate	1994	Biomedical Ethics Certificate Course, Department of Medical History and Ethics, University of Washington, Seattle

FACULTY POSITIONS

1971-75	Assistant Professor, Department of Pediatrics, University of Washington, Seattle
1971-88	Director, Pediatric Pulmonary Training Center, University of Washington, Seattle
1975-Present	Research Affiliate, Regional Primate Research Center, University of Washington, Seattle
1975-Present	Research Affiliate, Center on Human Development and Disability, University of Washington, Seattle
1975-81	Associate Professor, Department of Pediatrics, University of Washington, Seattle
1981-Present	Professor, Department of Pediatrics, University of Washington, Seattle

1997-Present Faculty Associate, Department of Medical History and Ethics, University of Washington, Seattle

HOSPITAL POSITIONS

1971-79 Chief, Pediatric Pulmonary Disease Division,
Children's Hospital and Medical Center, Seattle
1971-Present Attending Medical Staff, University of Washington Medical Center, Seattle
1971-Present Attending Medical Staff, Children's Hospital and Medical Center, Seattle
1971-75 Medical Director, Cystic Fibrosis Clinic, Children's Hospital and Medical Center,
Seattle
1971-79 Medical Director, Chest Clinic, Children's Hospital and Medical Center, Seattle
1971-75 Medical Director, Respiratory Therapy, Children's Hospital and Medical Center,
Seattle
1976-81 Medical Director, Infant Intensive Care Unit, Children's Hospital and Medical Center,
Seattle
1987-2004 Medical Director, Neonatal Intensive Care Unit, University of Washington Medical
Center, Seattle
1989-2004 Associate Medical Director, University of Washington Medical Center, Seattle
1995-Present Medical Co-Director and Attending Physician, Volunteer, Pediatric Interim Care
Center, Kent

BOARD CERTIFICATION

7/1/70 American Board of Pediatrics, #14144
11/15/75 American Board of Pediatrics - Neonatal-Perinatal Medicine, #347

LICENSURE TO PRACTICE

1971 State of Washington

ORGANIZATIONS

- a. Local, Regional
King County Medical Society
Washington State Medical Association
Washington State Pediatric Society
Western Society for Clinical Research
Western Society for Pediatric Research
- b. National, International
American Physiological Society

Perinatal Section of the American Academy of Pediatrics
Society for Pediatric Research
American Pediatric Society
Perinatal Research Society
American Academy of Pediatrics
Ethics Section, American Academy of Pediatrics

SPECIAL LOCAL RESPONSIBILITIES

1971-76 Research Committee, Children's Hospital and Medical Center
1971-76 Human Rights Committee, Children's Hospital and Medical Center
1972-75 Member, University of Washington Medical School Admissions Committee
1973-79 Member, University of Washington School of Medicine/Children's Hospital and Medical Center Pediatric Residency Committee.
1974-81 Chairman, Intensive Care Committee, Children's Hospital and Medical Center
1975-76 Director, Washington State Regional Perinatal Care Program
1977-88 Co-Director, Washington State Regional Perinatal Care Program
1977-2006 Member, University of Washington School of Medicine/Children's Hospital and Medical Center Pediatric Intern Selection Committee
1978-81 Member, University of Washington School of Medicine Medical Student Clinical Pathway Advisor
1980 Member, Department of Social and Health Services, State of Washington Committee on Planning and Development for State Perinatal Services
1981-83 Member, University of Washington Faculty Senate
1987-89 Member, University of Washington Faculty Senate
1981-84 Member, Research Affairs Committee, Department of Pediatrics, University of Washington
1981-92 Medical Student Vertical Advising Group Faculty Leader, University of Washington School of Medicine
1983-85 Member, Utilization Management Committee, University of Washington Medical Center
1984-Present Member, Infant Care Review Committee (Ethics Committee), Children's Hospital and Medical Center
1985-89 Member, Committee on SIDS and Infantile Apnea, Washington State Pediatric Society
1985-91 Member, Department of Pediatrics Appointment and Promotion Committee, University of Washington School of Medicine
1985-98 Member, Washington State Baby Doe Advisory Committee
1986-96 Ad Hoc Member, Washington State Perinatal Steering Committee
1989-90 Chairman, Joint University of Washington Medical Center - Children's Hospital and Medical Center ECMO Steering Committee
1990-95 Member, Student Progress Committee, University of Washington School of Medicine
1991-98 Seattle, King County Department of Public Health Infant Mortality Project Review Committee

- 1991-98 Seattle, King County Department of Public Health Infant Mortality Technical Advisory Committee
- 1992-94 Member, Board of Directors, Children's/University Medical Group
- 1992-95 Member, Department of Pediatrics Fellowship Review Committee, University of Washington School of Medicine, Children's Hospital & Regional Medical Center
- 1995-Present Chairman, Department of Pediatrics Fellowship Review Committee, University of Washington School of Medicine, Children's Hospital & Regional Medical Center
- 1995-96 Member, Obstetrics and Gynecology Chairman Search Committee, University of Washington School of Medicine
- 1995-Present Chairman, Ethics Committee, Children's Hospital Medical Center
- 1995-2004 Chairman, Assisted Reproductive Technology Committee, University of Washington Medical Center
- 1995-96 Chairman, Ethics Consultation Group, University of Washington Medical Center
- 1996-97 Member, Neonatal Division Head Search Committee, University of Washington School of Medicine
- 1997-Present Member, Ethics Advisory Committee, University of Washington School of Medicine (1997-2002 Chairman)
- 1999-Present Member, Perinatal CQI Committee, University of Washington Medical Center
- 2001-Present Member, Institutional Review Board, Children's Hospital & Regional Medical Center
- 2002-03 Member, Ethics Committee, Fred Hutchinson Cancer Research Center
- 2002-03 Member, Research Ethics Committee, Fred Hutchinson Cancer Research Center
- 2002-Present Member, Corporate Ethics Committee, Children's Hospital & Regional Medical Center
- 2002-03 Member, Consortium Research Ethics Committee, Fred Hutchinson Cancer Research Center
- 2002-Present Member, Faith/Ethics and Science Dialogue Committee, University of Washington Medical Center
- 2002-2004 Member, Pediatric Scientific Advisory Committee, Children's Hospital & Regional Medical Center
- 2002-2004 Member, UW School of Medicine Deans Committee and Planning for Medical care of Un- and under-insured
- 2004-2005 Member, Prenatal Diagnosis Center Advisory/Organizing Committee
- 2004-2005 Member, UW/CHRMC BioEthics Center Organizing Committee
- 2005-2006 Member, UW/CHRMC BioEthics Center's Pediatrics Department, BioEthics Division Head Search Committee
- 2005-Present Member, UWMC Claims committee
- 2005-Present Member, Bioethics Center/Bioethics Division Faculty Search Committee
- 2006-Present Chairman CHRMC IRB Advisory Committee

CLINICAL FOCUS

Neonatal Intensive Care

RESEARCH EMPHASIS

Development of the Respiratory System

OTHER MAJOR INTEREST

Biomedical Ethics

GRANTS

- 1987-1993 Muscles of Respiration in Neonatal Respiratory Failure, National Heart, Lung, and Blood Institute
- 1981-1986 Aberrations of Respiratory Control in the Neonate, National Heart, Lung, and Blood Institute
- 1981-1986 Effects of Altered Lung Mechanics on Respiratory Control, National Heart, Lung, and Blood Institute
- 1976-1981 Development of Respiratory Control, National Heart, Lung, and Blood Institute
- 1974-1991 Pediatric Pulmonary Training, Health Resources and Services Administration

BIBLIOGRAPHY

PUBLISHED PAPERS

1. Parks CR, **Woodrum DE**, Graham CB, Cheney FW, and Hodson WA: Effect of water nebulization on normal canine mucociliary clearance. *Am. Rev. Respir. Dis.* 104:99-106, 1971.
2. **Woodrum DE**, Oliver Jr. TK, and Hodson WA: The effect of prematurity and hyaline membrane disease on oxygen exchange in the lung. *Pediatrics* 50:380-386, 1972.
3. Hodson WA, Marshall RE, Oliver TK, Parks CR, Wennberg RP, and **Woodrum DE**: Neonatal Life. IN: *Introduction to Clinical Pediatrics*, Smith and Marshall (eds.), W.B. Saunders Company, Philadelphia, Pennsylvania, pp. 21-32, 1972.
4. **Woodrum DE**, Parer JT, Wennberg RP, and Hodson WA: Chemoreceptor response in the initiation of breathing in the fetal lamb. *J. Appl. Physiol.* 33:120-125, 1972.
5. Alden ER, Mandelkorn T, **Woodrum DE**, Wennberg RP, Parks CR, and Hodson WA: Morbidity and mortality of infants weighing less than 1000 grams in an intensive care nursery. *Pediatrics* 50:40-49, 1972.
6. **Woodrum DE**: Host resistance to pulmonary infection. IN: *Brenneman's Practice of Pediatrics*, VC Kelley (ed.), Harper and Row Publishers, Inc., Hagerstown, Maryland, Vol. IV, Chapter 73, 1972.
7. Wennberg RP, **Woodrum DE**, and Hodson WA: The Perinate. IN: *The Biologic Age of Man from Conception Through Old Age*, David Smith and Edwin Bierman (eds.), W.B. Saunders Company, Philadelphia, Pennsylvania, pp. 70-84, 1973.
8. Parks CR, Alden ER, Standaert TA, **Woodrum DE**, Graham CB, and Hodson WA: Effect of water nebulization on cough transport of pulmonary mucus in the mouth breathing dog. *Am. Rev. Respir. Dis.* 108:513-519, 1973.
9. Parks CR, **Woodrum DE**, Alden ER, Standaert TA, and Hodson WA: Gas exchange in the immature lung: I. Anatomical shunt in the premature human. *J. Appl. Physiol.* 36:103-107, 1974.
10. Parks CR, Alden ER, **Woodrum DE**, Standaert TA, and Hodson WA: Gas exchange in the immature lung: II. Method of estimation and maturity. *J. Appl. Physiol.* 36:108-112, 1974.
11. Standaert TA, Alden ER, Parks CR, **Woodrum DE**, Hessel EA, II, Murphy J, Orr RJ, and Hodson WA: Extracorporeal support of the fetal lamb, simulating in utero gas exchange. *Gynecol. Invest.* 5:93-105, 1974.

12. Hodson WA and **Woodrum DE**: Respiratory problems in the newborn. IN: Brennenman's Practice of Pediatrics, VC Kelley (ed.), Harper and Row Publishers, Inc., Hagerstown, Maryland, Vol. I, Part II, Chapter 85A, 1975. (1987 edition: Vol. 2, Chapter 6).
13. Godal A, Belenky DA, Standaert TA, **Woodrum DE**, Grimsrud L, and Hodson WA: Application of the hot-wire anemometer to respiratory measurements in small animals. J. Appl. Physiol. 40:275-277, 1976.
14. Belenky DA, Orr RJ, **Woodrum DE**, and Hodson WA: Is continuous transpulmonary pressure better than conventional respiratory management of hyaline membrane disease? A controlled study. Pediatrics 58:800-808, 1976.
15. **Woodrum DE**, Standaert TA, Parks CR, Belenky D, Murphy J, and Hodson WA: Ventilatory response in the fetal lamb following peripheral chemodenervation. J. Appl. Physiol. 42:630-635, 1977.
16. Bamman JL, Ward BH, and **Woodrum DE**: Aberrant left pulmonary artery: Clinical and embryologic factors. Chest 72:67-71, 1977.
17. Hodson WA, **Woodrum DE**, and Alden ER: Gas exchange in the developing lung. IN: The Development of the Lung, WA Hodson (ed.), Marcel Dekker, Inc., New York, New York, pp. 469-496, 1977.
18. **Woodrum DE**, Guthrie RD, and Hodson WA: Development of respiratory control mechanisms in the fetus and newborn. IN: The Development of the Lung, WA Hodson (ed.), Marcel Dekker, Inc., New York, New York, pp. 561-585, 1977.
19. Hodson WA, Palmer S, Blakely GA, Murphy JH, **Woodrum DE**, and Morgan TE: Lung development in the fetal primate Macaca nemestrina: I. Growth and compositional changes. Pediatr. Res. 11:1051-1056,, 1977.
20. Guthrie RD, Hodson WA, Murphy J, Prueitt JL, and **Woodrum DE**: The Newborn. IN: Introduction to Clinical Pediatrics, DW Smith (ed.), W.B. Saunders Company, Philadelphia, Pennsylvania, pp. 52-65, 1977.
21. Truog WE, Prueitt JL, and **Woodrum DE**: Unchanged incidence of bronchopulmonary dysplasia in survivors of hyaline membrane disease. J. Pediatr. 92(2):261-264, 1978.
22. Belenky DA, Standaert TA, and **Woodrum DE**: Maturation of the hypoxic ventilatory response of the newborn lamb. J. Appl. Physiol. 45(5):927-930, 1979.
23. Hodson WA, Truog WE, Mayock DE, Lyrene R, and **Woodrum DE**: Bronchopulmonary dysplasia: The need for epidemiologic studies. J. Pediatr. 95(5), part II:848-851, 1979.
24. Kessler Jr. DL, Smith AL, and **Woodrum DE**: Chloramphenicol toxicity in a neonate treated with exchange transfusion. J. Pediatr. 96(2):140-141, 1980.

25. Guthrie RD, Standaert TA, Hodson WA, and **Woodrum DE**: Sleep and maturation of eucapnic ventilation and CO₂ sensitivity in the premature primate. *J. Appl. Physiol.: Respirat. Environ. Exercise Physiol.* 48(2):347-354, 1980.
26. **Woodrum DE**, Standaert TA, Mayock DE, Guthrie RD: Hypoxic ventilatory response in the newborn monkey. *Pediatr. Res.* 15:367-370, 1981.
27. Guthrie RD, Standaert TA, Hodson WA, and **Woodrum DE**: Development of CO₂ sensitivity: Effects of gestational age, postnatal age, and sleep state. *J. Appl. Physiol.: Respirat. Environ. Exercise Physiol.* 50(5):956-961, 1981.
28. Wright K, Lyrene RK, Truog WE, Standaert TA, Murphy J, and **Woodrum DE**: Ventilation by high frequency oscillation in rabbits with oleic acid lung disease. *J. Appl. Physiol.: Respirat. Environ. Exercise Physiol.* 50:1056-1060, 1981.
29. Truog WE, Kessler DL, Murphy J, **Woodrum DE**, and Hodson WA: Differential effect of sex in experimental hyaline membrane disease. *Am. Rev. Respir. Dis.* 124:435, 1981.
30. LaFramboise W, Standaert T, **Woodrum DE**, and Guthrie RD: Occlusion pressures during the ventilatory response to hypoxemia in the newborn monkey. *J. Appl. Physiol.: Respirat. Environ. Exercise Physiol.* 51(5):1168, 1981.
31. Guthrie RD, Knauss TA, Haberkern CM, Sumi SM, and **Woodrum DE**: Power spectral analysis of the neonatal primate electroencephalogram during acute hypoxemia. *Pediatr. Res.* 16:30-34, 1982.
32. Truog WE, Lyrene RK, Standaert TA, Murphy J, and **Woodrum DE**: Effects of PEEP and tolazine infusion on respiratory and inert gas exchange in experimental meconium aspiration. *J. Pediatr.* 100(2):284-290, 1982.
33. Kessler Jr. DL, Truog WE, Murphy JH, Palmer S, Standaert TA, **Woodrum DE**, and Hodson WA: Experimental hyaline membrane disease in the premature monkey: Effects of antenatal dexamethasone. *Am. Rev. Respir. Dis.* 126(1):62-69, 1982.
34. LaFramboise WA, Tuck RE, Standaert TA, and **Woodrum DE**: An elastic loading system for ventilatory studies in small animals. *J. Appl. Physiol.: Respirat. Environ. Exercise Physiol.* 54(1):314-317, 1983.
35. Mayock DE, Standaert TA, Guthrie RD, and **Woodrum DE**: Dopamine and carotid body function in the newborn lamb. *J. Appl. Physiol.: Respirat. Environ. Exercise Physiol.* 54(3):814-820, 1983.
36. Truog WE, Standaert TA, Murphy J, Palmer S, **Woodrum DE**, and Hodson WA: Effect of high frequency oscillation on gas exchange and pulmonary phospholipids in experimental hyaline membrane disease. *Am. Rev. Respir. Dis.* 127:585-589, 1983.

37. Truog WE, Kessler DL, Murphy J, Standaert TA, **Woodrum DE**, and Hodson WA: Antenatal glucocorticoid administration: Effects on oxygen-hemoglobin affinity and hemoglobin levels in experimental hyaline membrane disease. *Gynecol. Obstet. Invest.* 15:251-257, 1983.
38. LaFramboise WA, Guthrie RD, Standaert TA, and **Woodrum DE**: Pulmonary mechanics during the ventilatory response to hypoxemia in the newborn monkey. *J. Appl. Physiol.: Respirat. Environ. Exercise Physiol.* 55(3):1008-1014, 1983.
39. Truog WE, Standaert TA, Murphy JH, **Woodrum DE**, and Hodson WA: Effects of prolonged high frequency oscillatory ventilation in premature primates with experimental hyaline membrane disease. *Am. Rev. Respir. Dis.* 130(1):76-80, 1984.
40. Standaert TA, Truog WE, Guthrie RD, Murphy JH, LaFramboise WA, **Woodrum DE**, and Hodson WA: Growth and development of the term and premature monkey Macaca nemestrina: Cardiovascular and respiratory changes during the first 3 weeks of life. *Am. J. Primatology* 7:107-119, 1984.
41. LaFramboise WA, Tuck RE, **Woodrum DE**, and Guthrie RD: Maturation of eupneic respiration in the neonatal monkey. *Pediatr. Res.* 18(10):943-948, 1984.
42. Watchko J, and **Woodrum DE**: Neonatal respiratory failure: The role of the ventilatory pump. IN: *Seminars in Respiratory Medicine*, WA Hodson (Guest ed.), Thieme-Stratton, Inc., 6(2):135-140, 1984.
43. Truog WE, Jackson JC, Badura RJ, Sorensen GK, Murphy JH, and **Woodrum DE**: Bronchopulmonary dysplasia and pulmonary insufficiency of prematurity: Lack of correlation of outcome with gas exchange abnormalities at one month. *AJDC*, 139(6):351-354, 1985.
44. Guthrie RD, LaFramboise WA, Standaert TA, VanBelle G, and **Woodrum DE**: Ventilatory interaction between oxygen and carbon dioxide in the neonatal primate. *Pediatr. Res.* 19:528-533, 1985.
45. Standaert TA, LaFramboise WA, Tuck RE, and **Woodrum DE**: Serial determination of lung volume in small animals by nitrogen washout. *J. Appl. Physiol.* 59(1):205-210, 1985.
46. LaFramboise WA, **Woodrum DE**, and Guthrie RD: Influence of vagal activity on the neonatal ventilatory response to hypoxemia. *Pediatr. Res.* 19:903-907, 1985.
47. LaFramboise WA, and **Woodrum DE**: Elevated diaphragm electromyogram during neonatal hypoxic ventilatory depression. *J. Appl. Physiol.: Respir. Environ. Exercise Physiol.* 59(4):1040-1045, 1985.

48. Jackson JC, Standaert TA, Truog WE, Murphy JH, Palmer S, Chi EY, **Woodrum DE**, Watchko JF, and Hodson WA: Changes in lung volume and deflation stability in hyaline membrane disease. *J. Appl. Physiol.* 59:1783-1789, 1985.
49. Watchko JF, Standaert TA, Badura RJ, and **Woodrum DE**: Assessment of diaphragmatic function in the developing piglet. IN: Handbook of Swine Physiology: Swine in Biomedical Research (Volume 2), M.E. Tumbleson (Ed.), Plenum Publishing Corp., New York, 1986, pp. 1245-1252.
50. Watchko JF, Mayock DE, Standaert TA, and **Woodrum DE**: Diaphragmatic pressures in piglets: transvenous versus direct phrenic nerve stimulation. *Pediatr. Pulm.* 2:198-210, 1986.
51. Watchko JF, LaFramboise WA, Standaert TA, and **Woodrum DE**: Diaphragmatic function during hypoxemia: neonatal and developmental aspects. *J. Appl. Physiol.* 60(5):1599-1604, 1986.
52. Watchko JF, Mayock DE, Standaert TA, and **Woodrum DE**: Postnatal changes in transdiaphragmatic pressure in piglets. *Pediatr. Res.* 20(7):658-661, 1986.
53. Mayock DE, LaFramboise WA, Guthrie RD, Standaert TA, and **Woodrum DE**: The role of endogenous opiates in hypoxic ventilatory response in the newborn primate. *J. Appl. Physiol.* 60(6):2015-2019, 1986.
54. Watchko JF, **Woodrum DE**, and Hodson WA: A new agenda needed concerning "tragic choices." *Am. J. Perinatol.* 3:325-326, 1986.
55. Watchko JF, Mayock DE, Standaert TA, and **Woodrum DE**: Effect of inspiratory resistive loading on costal and crural diaphragm electromyograms in piglets. *Pediatr. Res.* 21(1):25-28, 1987.
56. Watchko JF, Standaert TA, and **Woodrum DE**: Diaphragmatic function during hypercapnia: neonatal and developmental aspects. *J. Appl. Physiol.* 62(2):768-775, 1987.
57. Watchko JF, LaFramboise WA, Mayock DE, Standaert TA, and **Woodrum DE**: Spectral analysis of diaphragmatic EMG during the neonatal biphasic hypoxic ventilatory response. *Pediatr. Res.* 21:238-241, 1987.
58. Mayock DE, Badura RJ, Watchko JF, Standaert TA, and **Woodrum DE**: Response to resistive loading in the newborn piglet. *Pediatr. Res.* 21(2):121-125, 1987.
59. Mayock DE, Hall J, Watchko JF, Standaert TA, and **Woodrum DE**: Diaphragmatic muscle fiber type development in swine. *Pediatr. Res.* 22(4):449-454, 1987.
60. LaFramboise WA, Standaert TA, Milley JR and **Woodrum DE**: Developmental changes in the steady-state response to inspiratory elastic loading: Effect on ventilatory, diaphragmatic

- EMG and work outputs. IN: Neurology and Neurobiology (Vol. 26), Respiratory Muscles and Their Neuromotor Control, Sieck, Gandevia, and Cameron (eds.), Alan R. Liss, Inc., New York, pp. 423-427, 1987.
61. LaFramboise WA, Standaert TA, Guthrie RD, and **Woodrum DE**: Developmental changes in the ventilatory response of the newborn to added airway resistance. *Am. Rev. Respir. Dis.* 136:1075-1083, 1987.
 62. Watchko JF, Mayock DE, Standaert TA, and **Woodrum DE**: Effect of hypercapnia and hypoxia on costal and crural diaphragm electromyograms in piglets. *Pediatr. Res.* 23(1):54-57, 1988.
 63. Watchko JF, Standaert TA, Mayock DE, Twiggs G, and **Woodrum DE**: Ventilatory failure during loaded breathing: the role of central neural drive. *J. Appl. Physiol.* 65(1):249-255, 1988.
 64. Watchko JF, Standaert TA, Mayock DE, and **Woodrum DE**: Diaphragmatic electromyogram (EMGdi) power analysis during ventilatory failure in infants. IN: Fetal and Neonatal Physiological Measurements III, G. Gennser, K. Marsal, N. Svenningsen, k. Lindstrom, editors, Malmoe, Sweden, 445-449, 1989.
 65. Valentine PH, Jackson JC, Kalina RE, and **Woodrum DE**: Impact of Increased Survival of Low Birthweight Infants: Impact on the Incidence of Retinopathy of Prematurity. *Pediatrics*, 84:442-445, 1989.
 66. Mayock DE, Standaert TA, and **Woodrum DE**: Effects of digoxin on diaphragmatic contractility in the piglet. *Pediatr. Res.* 25(3):271-273, 1989.
 67. Mayock DE, Twiggs G, Standaert TA, Watchko JF, and **Woodrum DE**: The effect of aminophylline on diaphragm blood flow in the piglet. *Pediatr. Res.* 26(3):196-199, 1989.
 68. The HIFI Study Group: High frequency oscillatory ventilation compared with conventional mechanical ventilation in the treatment of respiratory failure in preterm infants. *N. Engl. J. Med.* 320(2):88-93, 1989.
 69. Juul SE, Ledbetter D, Wight TN, and **Woodrum DE**: New insights into idiopathic infantile arterial calcinosis: three patient reports. *Am. J. Dis. Child.* 144:229-233, 1990.
 70. Mayock DE, Watchko JF, Standaert TA and **Woodrum DE**: Estimation of intrapleural pressure in the newborn. *Pediatr. Pulmonol.* 9:30-33, 1990.
 71. Mayock DE, Standaert TA, Watchko JF and **Woodrum DE**: Effect of aminophylline on diaphragmatic contractility in the piglet. *Pediatr. Res.* 28(3):196-198, 1990.

72. LaFramboise WA, Standaert TA, Milley JR and **Woodrum DE**: Developmental changes in the response of the newborn to sustained ventilatory elastic loads. *Am. Rev. Respir. Dis.* 141:752-757, 1990.
73. The HIFI Study Group: High frequency oscillatory ventilation compared with conventional mechanical ventilation in the treatment of respiratory failure in preterm infants: assessment of pulmonary function at nine months of corrected age. *J. Pediatr.* 116:933-941, 1990.
74. The HIFI Study Group: High frequency oscillatory ventilation compared with conventional mechanical ventilation: assessment of neurodevelopmental outcome at eighteen months of corrected age. *J. Pediatr.* 117:939-946, 1990.
75. Watchko JF, Mayock DE, Standaert TA and **Woodrum DE**: The ventilatory pump: neonatal and developmental issues. *Adv. Pediatr.* 38:109-134, 1991.
76. Mayock DE, Standaert TA, Murphy TD and **Woodrum DE**: Diaphragmatic force and substrate response to resistive loaded breathing in the piglet. *J. Appl. Physiol.* 70(1): 70-76, 1991.
77. Standaert TA, Wilham BE, Mayock DE, Watchko JF, Gibson RL and **Woodrum DE**: Respiratory mechanics of the piglet during the first month of life. *Pediatr. Pulm.* 11:294-301, 1991.
78. **Woodrum DE**: The Respiratory Muscles. IN: Fetal and Neonatal Medicine Physiology and Pathophysiology, Vol I:829-841, R. Polin and W. Fox, editors. W.B. Saunders, Philadelphia, 1992.
79. Murphy TD, Mayock DE, Standaert TA, Gibson RD and **Woodrum DE**: Group B streptococcus has no effect on piglet diaphragmatic force generation. *Am. Rev. Resp. Dis.* 145:471-475, 1992.
80. Mayock DE, Standaert TA and **Woodrum DE**: Effect of inspiratory resistive loaded breathing and hypoxia on diaphragmatic function in the piglet. *J. Appl. Physiol.* 73(5):1888-1893, 1992.
81. Mayock DE, Standaert TA and **Woodrum DE**: Effect of methylxanthines on diaphragmatic fatigue in the piglet. *Pediatr. Res.* 32(5):580-584, 1992.
82. Murphy TD, Gibson RL, Standaert TA, Mayock DE and **Woodrum DE**: Effect of group B streptococcal sepsis on diaphragmatic function in young piglets. *Pediatr. Res.* 33(1):10-14, 1993.
83. Murphy TD, Gibson RL, Standaert TA, and **Woodrum DE**: Diaphragmatic failure during group B streptococcal sepsis in piglets: the role of thromboxane A₂. *J. Appl. Physiol.* 78 (2): 491-498, 1995.

84. Hitti J, Krohn MA, Patton DL, Tarczy-Hornoch P, Hillier SL, Cassen EM, **Woodrum DE** and Eschenbach DA: Amniotic fluid tumor necrosis factor-alpha and the risk of respiratory distress syndrome among preterm infants. *Am J Obstet Gynecol.* 177(1):50-56, Jul 1997.
85. Mayock DE, Standaert TA, Watchko JF and **Woodrum DE**: Ventilatory failure during resistive loaded breathing in the newborn primate. *Pediatr. Pulmonol.* 26: 312-318, 1998.
86. Gordon P, Rutledge J, Sawin R, Thomas S and **Woodrum DE**: Early postnatal dexamethasone increases the risk of focal small bowel perforation in extremely low birth weight infants. *J Perinatol.* 19(8 Pt. 1):573-577, Dec 1999.
87. Keenan HT, Diekema DS, O'Rourke PP, Cummings P, **Woodrum DE**: Attitudes toward limitation of support in a pediatric intensive care unit. *Crit Care Med* 28(5):1590-4, May 2000.
88. **Woodrum DE** and McCormick TR: Misguided good intentions. *J Perinatology* 22: 72-74, 2002.
89. Juul SE, Zerzan JC, Strandjord TP, **Woodrum DE**: Zinc protoporphyrin/heme as an indicator of iron status in NICU patients. *J Pediatr* 142: 273-278, 2003.

ABSTRACTS

1. **Woodrum DE**, Hodson WA, and Oliver Jr. TK: Serial determinations of alveolar-arterial gradient (AaDO₂) in premature infants during the first week of life. *Pediatr. Res.* 3:379, 1969.
2. Hodson WA, **Woodrum DE**, Wennber, RP, Parer JT, Helmraht TA, Kumonde S and Oliver Jr. TK: Fetal chemoreceptor response in the initiation of breathing. Society for Pediatric Research, Atlantic City, New Jersey, 1969.
3. **Woodrum DE**, Wennberg RP and Hodson WA: Peripheral chemoreceptor response in the fetal lamb. *Clin. Res.* 19:225, 1971.
4. Alden ER, Mandelkorn TE, **Woodrum DE**, Wennberg RP and Hodson WA: Infants with birth weight of less than 1000 grams. *Clin. Res.* 19:218, 1971.
5. Parks CR, Alden ER, **Woodrum DE** and Hodson WA: Alveolar instability with inspired 100% oxygen in the newborn lung. *Pediatr. Res.* 5:492, 1971.
6. Parks CR, **Woodrum DE**, Alden ER and Hodson WA: Alveolar gas exchange in the premature human lung. *Am. Rev. Respir. Dis.* 103:909, 1971.
7. Bloom RS, Parmentier C, Parks CR, **Woodrum DE** and Hodson WA: Pulmonary ischemia and surfactant in the newborn lung. *Pediatr. Res.* 5:428, 1971.

8. Parks CR, Alden ER, Standaert TA, **Woodrum DE**, Graham CB and Hodson WA: Effect of water nebulization on cough transport of pulmonary mucus in the mouth breathing dog. *Am. Rev. Respir. Dis.* 105:991, 1972.
9. Parks CR, **Woodrum DE**, Alden ER, Markello R and Hodson WA: Alveolar stability in the normal adult canine lung. American Thoracic Society, Los Angeles, May 1971.
10. Belenky DA, Orr RJ, **Woodrum DE** and Hodson WA: Controlled trial of continuous transpulmonary pressure. *Clin. Res.* 23:157A, 1975.
11. Flanagan WJ, **Woodrum DE** and Hodson WA: Characteristics of apnea in premature infants. *Clin. Res.* 23:158B, 1975.
12. Rowe JC, Flanagan WJ, **Woodrum DE** and Hodson WA: Dissimilar cardiovascular responses to apnea in the premature. *Pediatr. Res.* 10:431A, 1976.
13. Guthrie RD, Standaert TA, Hodson WA and **Woodrum DE**: Effects of sleep state on the ventilatory response to inhaled CO₂ in the neonatal primate. Presented. Society for Pediatric Research. *Pediatr. Res.* 11:534A, 1977.
14. Rowe JC, Flanagan WJ, Hodson WA and **Woodrum DE**: The relationship between apnea and heart rate in premature infants. Presented. Society for Pediatric Research, 1977. *Pediatr. Res.* 11:541A, 1977.
15. Belenky DA, Standaert TA, Hodson WA and **Woodrum DE**: Postnatal development of the hypoxic ventilatory response in the lamb. *Pediatr. Res.* 11:531A, 1977.
16. Truog WE, Prueitt JL and **Woodrum DE**: Bronchopulmonary dysplasia: Unchanged incidence following hyaline membrane disease. *Clin. Res.* 25:194A, 1977.
17. Flanagan WJ, Rowe JC, Hodson WA and **Woodrum DE**: Apnea immediately following apnea in premature infants. *Pediatr. Res.* 11:533A, 1977.
18. Guthrie RD, Standaert TA, Hodson WA and **Woodrum DE**: Sleep state and maturation of CO₂ sensitivity in the premature primate. *Pediatr. Res.* 12:525A, 1978.
19. Rowe JC, Guthrie RD, Hinkes P, Prueitt JL, Murphy J, **Woodrum DE** and Hodson WA: Time of initiation of CPAP in HMD. Presented. Society for Pediatric Research. *Pediatr. Res.* 12:533A, 1978.
20. Kessler DL, Truog WE, Haberkern CM and **Woodrum DE**: Prognosis with long term mechanical ventilation. *Clin. Res.* 26:199A, 1978.

21. Guthrie RD, Standaert TA, Hodson WA and **Woodrum DE**: Development of CO₂ sensitivity: Effect of gestational age, postnatal age and sleep state. *Pediatr. Res.* 13(4):535A, 1979.
22. Guthrie RD, Haberkern CM, **Woodrum DE**, Hodson WA and Knauss TA: Effects of acute hypoxemia on the EEG of the neonatal primate. *Pediatr. Res.* 13(4):525A, 1979.
23. Truog WE, **Woodrum DE**, Hlastala MP and Hodson WA: Experimental meconium aspiration (MA): Effect of VA/Q distribution. *Pediatr. Res.* 13(4):543A, 1979.
24. Truog WE, Kessler DL, Palmer S, Murphy J, **Woodrum DE** and Hodson WA: Differential effect of sex in experimental hyaline membrane disease (HMD). Presented. American Physiological Society. *The Physiologist* 22(4):125, 1979.
25. Lyrene RK, Wright K, Standaert TA, Truog WE, Murphy J and **Woodrum DE**: Rapid oscillation low volume ventilation in oleic acid induced pulmonary disease. Presented. American Thoracic Society, *Am. Rev. Respir. Dis.* 121(4):294, 1980.
26. Wright K, Lyrene RK, Truog WE, Standaert TA, Murphy J and **Woodrum DE**: Rapid oscillation low volume ventilation in oleic acid induced pulmonary disease. Presented. Society for Pediatric Research, 1980. *Pediatr. Res.* 14(4):Part 2:653, 1980.
27. Murphy J, Kessler DL, Truog WE, Hodson WA and **Woodrum DE**: Lung structural alterations in experimental hyaline membrane disease. Presented. American Thoracic Society, 1980. *Am. Rev. Respir. Dis.* 121:297, 1980 (Suppl.).
28. Mayock DE, Guthrie RD, LaFramboise W, Standaert TA and **Woodrum DE**: Biphasic ventilatory response in the subhuman primate. *Pediatr. Res.* 14(4):1334A, 1980.
29. Truog WE, Lyrene RK, Standaert TA, **Woodrum DE** and Hodson WA: Intrapulmonary shunt in the newborn lamb. Presented. Federation of American Societies for Experimental Biology. *Fed. Proc.* 39(3):504, 1980.
30. Mayock DE, Guthrie RD and **Woodrum DE**: Dopamine and carotid body function in the newborn lamb. Presented. American Physiological Society, Toronto, Canada, October 1980. *The Physiologist* 23(4):139, 1980.
31. LaFramboise W, Guthrie RD and **Woodrum DE**: Effects of acute hypoxemia on central respiratory drive in the newborn monkey. *Pediatr. Res.* 14:1320A, 1980.
32. LaFramboise W, Guthrie RD and **Woodrum DE**: Effects of acute hypoxemia on central respiratory drive in the neonatal primate. Presented. American Physiological Society, Toronto, Canada, October 1980. *The Physiologist* 23(4):140, 1980.
33. Mayock DE, Guthrie RD and **Woodrum DE**: Role of endogenous opiates on CO₂ sensitivity in the newborn primate. *Pediatr. Res.* 15(4):726A, 1981.

34. LaFramboise W, Standaert T, Guthrie RD and **Woodrum DE**: Pulmonary mechanics during the biphasic ventilatory response to hypoxemia in the newborn monkey. *The Physiologist* 24(4):100, 1981.
35. Truog WE, Lyrene RK, Standaert TA and **Woodrum DE**: Respiratory and inert gas exchange in the treatment of experimental meconium aspiration. Presented. American Thoracic Society, 1981. *Am. Rev. Respir. Dis.* 123:155, 1981.
36. LaFramboise WA, Guthrie RD, Standaert TA and **Woodrum DE**: The neonatal biphasic ventilatory response to hypoxemia and changes in lung mechanics. Presented. American Physiological Society, 1981. *Fed. Proc.* 41(4):998, 1982.
37. Truog WE, Wright K, Murphy J, Kessler DL, Standaert TA, **Woodrum DE** and Hodson WA: Efficacy of high frequency oscillation in the treatment of experimental hyaline membrane disease. Presented. American Thoracic Society, 1982. *Am. Rev. Respir. Dis.* 125(4), Part 2:194, 1982.
38. Truog WE, Standaert TA, Murphy J, Palmer S, **Woodrum DE** and Hodson WA: Effects of high frequency oscillation on gas exchange and pulmonary phospholipids in experimental hyaline membrane disease. Presented. NIH Workshop on High Frequency Oscillation, Arden House, New York, March, 1982.
39. Truog WE, Wright K, Murphy J, Kessler DL, Standaert TA, **Woodrum DE** and Hodson WA: Efficacy of high frequency oscillation in the treatment of experimental hyaline membrane disease. *Clin. Res.* 30(1):153A, 1982.
40. LaFramboise WA, Standaert TA, **Woodrum DE** and Guthrie RD: Efferent vagal control of pulmonary mechanics during neonatal hypoxemia. *Fed. Proc.* 42(3):329, 1983.
41. LaFramboise WA, Standaert TA, Guthrie RD and **Woodrum DE**: The response of the newborn vs. the mature infant monkey to an external flow resistance. Presented. American Physiological Society, 1983. *The Physiologist* 26(4):A95, 1983.
42. LaFramboise WA, Standaert TA and **Woodrum DE**: Ventilatory depression without neural depression during neonatal hypoxemia. Presented. Federation of American Societies for Experimental Biology. *Fed. Proc.* 43(4):1009, 1984.
43. Badura RJ, Watchko JF, LaFramboise WA and **Woodrum DE**: Diaphragmatic fatigue in the neonatal piglet. Presented. Society for Pediatric Research, 1984. *Pediatr. Res.* 18:385A, 1984.
44. Jackson JC, Palmer S, Standaert TA, Murphy J, Truog WE, **Woodrum DE**, Badura RJ, Sorensen GK, Watchko JF and Hodson WA: Surface active material (SAM) and compliance changes during recovery from experimental hyaline membrane disease (HMD). Presented. Society for Pediatric Research, 1984. *Pediatr. Res.* 18:394A, 1984.

45. Jackson JC, Palmer S, Standaert TA, Murphy J, Truog WE, **Woodrum DE** and Hodson WA: Development changes of surface active material in newborn non-human primates. Presented. American Thoracic Society, 1984. Am. Rev. Respir. Dis. 129(4):A204, 1984.
46. Watchko JF, Standaert TA and **Woodrum DE**: Neonatal diaphragmatic function during hypercapnia. Am. Rev. Respir. Dis. 131(4), Part 2:A253, 1985.
47. LaFramboise WA, Standaert TA and **Woodrum DE**: Developmental response to elastic loading in newborn monkey Macaca nemestrina. Fed. Proc. 44(3):290, 1985.
48. Watchko JF, Standaert TA, LaFramboise WA and **Woodrum DE**: Neonatal diaphragmatic function during hypoxemia. Presented. Western Society for Pediatric Research, 1985. Clin. Res. 33:150A, 1985.
49. Watchko JF, Standaert TA and **Woodrum DE**: Distribution of diaphragmatic blood flow during inspiratory resistive loaded breathing in piglets. Pediatr. Res. 19:420A, 1985.
50. Watchko JF, Standaert TA and **Woodrum DE**: Diaphragmatic function during hypercapnia: Neonatal and developmental aspects. Presented. Aspen Conference on Perinatal Research, 1985.
51. Watchko JF, Mayock DE, Standaert TA and **Woodrum DE**: Effect of inspiratory resistive loading on costal and crural diaphragm electromyograms in piglets. Clin. Res. 34:155A, 1986.
52. Watchko JF, Mayock DE, Standaert TA and **Woodrum DE**: Postnatal changes in transdiaphragmatic pressure in piglets. Presented. American Thoracic Society, 1986. Am. Rev. Respir. Dis. 133:A104, 1986.
53. Watchko JF, LaFramboise WA, Mayock DE, Standaert TA and **Woodrum DE**: Spectral analysis of diaphragmatic EMG during the neonatal biphasic hypoxic ventilator response. Presented. American Thoracic Society, 1986. Am. Rev. Respir. Dis. 133:A104, 1986.
54. Watchko JF, Standaert TA, Mayock DE, Twiggs G and **Woodrum DE**: Central neural failure during inspiratory resistive loaded breathing (IRL). Presented. Western Society for Pediatric Research, 1987. Clin. Res. 35(1):245A, 1987.
55. Watchko JF, Mayock DE, Standaert TA and **Woodrum DE**: Effect of hypercapnia and hypoxia on costal and crural diaphragm electromyograms in piglets. Western Society for Pediatric Research, 1987. Clin. Res. 35(1):245A, 1987.
56. Mayock DE, Hall J, Watchko JF, Standaert TA and **Woodrum DE**: Diaphragmatic muscle fiber type development in swine. Presented. American Thoracic Society, 1987. Am. Rev. Respir. Dis. 135(4), Part 2:A173, 1987.

57. Watchko JF, Standaert TA, Mayock DE, Twiggs G and **Woodrum DE**: Ventilatory failure during severe inspiratory resistive loaded breathing (IRL) in the unanesthetized infant monkey: The role of central neural drive. Presented, 1987. American Thoracic Society. Am. Rev. Respir. Dis. 135(4), Part 2:A173, 1987.
58. Mayock DE, Twiggs GA, Standaert TA, Watchko JF and **Woodrum DE**: Effect of aminophylline on piglet diaphragmatic blood flow. Presented. Society for Pediatric Research, 1988. Clin. Res. 36:242A, 1988.
59. Mayock DE, Watchko JF, Standaert TA and **Woodrum DE**: Effect of Aminophylline and Digoxin on piglet diaphragmatic force generation. Presented. American Thoracic Society, 1988. Am. Rev. Respir. Dis. 137(4), Part 2:21, 1988.
60. Standaert TA, Willham BE, Mayock DE, Gibson RL and **Woodrum DE**: Lung volume and pulmonary compliance of the piglet during the first month of life. Presented. American Thoracic Society, 1988. Am. Rev. Respir. Dis. 137(4), Part 2:382, 1988.
61. Mayock DE, Twiggs GA, Standaert TA, Watchko JF and **Woodrum DE**: Effect of aminophylline on piglet diaphragmatic blood flow. Am. Rev. Respir. Dis. 137:540A, 1988.
62. Watchko JF, Standaert TA, Mayock DE and **Woodrum DE**: Diaphragmatic electromyogram (EMG_{di}) power spectral analysis during ventilatory failure in infants. Presented, The Third International Conference on Fetal and Neonatal Physiological Measurements, Romndby, Sweden, June, 1988.
63. The HIFI Study Group: A collaborative randomized trial of high frequency oscillatory ventilation in the treatment of respiratory failure in preterm infants. Bethesda, Maryland. Presented. Society for Pediatric Research, 1988. Pediatr. Res. 23(4), Part 2:1353, 1988.
64. Mayock DE, Standaert TA and **Woodrum DE**: Airway occlusion versus intrapleural pressure during phrenic nerve stimulation in the piglet. Presented. Western Society for Pediatric Research, 1989. Clin. Res. 37(1):213A, 1989.
65. Mayock DE, Standaert TA, Murphy TD and **Woodrum DE**: Diaphragmatic high energy metabolite response to long term inspiratory resistive loaded breathing in the piglet. American Thoracic Society, 1989. Am. Rev. Respir. Dis. 139(4), Part 2:A164, 1989.
66. Murphy TD, Standaert TA, Gibson RL, Mayock DE and **Woodrum DE**: Group B streptococcal (GBS) sepsis impairs diaphragmatic function in the piglet. Presented. 1990 World Conference on Lung Health -- American Thoracic Society. Am. Rev. Respir. Dis. 141(4), Part 2:A549, 1990.
67. Mayock DE, Standaert TA and **Woodrum DE**: Combined effect of inspiratory resistive loaded breathing (IRL) and hypoxemia on diaphragmatic force generation and substrate availability in the piglet. Presented. 1990 World Conference on Health -- American Thoracic Society. Amer. Rev. Respir. Dis. 141(4), Part 2:A368, 1990.

68. The HIFI Study Group: High frequency oscillatory ventilation (HFV) compared with conventional mechanical ventilation (CMV): neurodevelopmental status at 18m in survivors. Bethesda, Maryland. Presented. Society for Pediatric Research, 1990. *Pediatr. Res.* 27(4), Part 2:208A, 1990.
69. Truog WE, Mannino FL, Jordan M and the HIFI Study Group, University of Washington, Seattle, University of California, San Diego, Research Triangle Institute, North Carolina, and NHLBI, Bethesda, Maryland: Trial of oscillatory ventilation of premature infants: analysis of infants failing initial ventilator assignment. *Pediatr. Res.* 27, Part2:320A, 1990.
70. Murphy TD, Standaert TA, Gibson RL, Mayock DE and **Woodrum DE**: Group B streptococcal (GBS) shock impairs diaphragmatic contractility in the piglet. Presented. American Thoracic Society, 1991. *Am. Rev. Respir. Dis.* 143(4), Part 2:A560, 1991.
71. Murphy TD, Gibson RL, Standaert TA, Mayock DE and **Woodrum DE**: The thromboxane A2 mimetic, U46619, decreases piglet diaphragmatic contractility. Presented. American Thoracic Society, 1992. *Am. Rev. Respir. Dis.* 145(4), Part 2:A671, 1992.
72. Mayock DE, Standaert TA and **Woodrum DE**: Diaphragmatic sarcoplasmic reticulum calcium uptake during inspiratory loaded breathing. Presented, American Thoracic Society, 1993. *Amer. Rev. Respir. Dis.* 147(4):A238, 1993.
73. Mayock DE, Standaert TA and **Woodrum DE**: Developmental changes in diaphragmatic sarcoplasmic reticulum calcium uptake. Presented, American Thoracic Society, 1993. *Amer. Rev. Respir. Dis.* 147(4):A692, 1993.
74. Mayock DE, Dood MJ, **Woodrum DE** and Watchko JF: Diaphragmatic myosin heavy chain expression in the subhuman primate, *Macaca nemestrina*. Submitted to the Society for Pediatric Research, 1994.
75. Mayock DE, Dood MJ, **Woodrum DE** and Watchko JF: Diaphragmatic myosin heavy chain expression in the subhuman primate, *Macaca nemestrina*. Submitted to the American Thoracic Society, accepted for poster presentation, 1994.
76. Murphy TD, Standaert TA and **Woodrum DE**: The thromboxane analog U46619 decreases diaphragmatic force generation in vitro. Submitted to the American Thoracic Society, 1995.
77. Murphy TD, Standaert TA and **Woodrum DE**: The thromboxane analog U46619 decreases diaphragmatic force generation in vitro. *Am. J. Respir. Crit. Care Med.*, 151(4), II:A811, 1995.