

Stanford



William Rhine

Professor of Pediatrics (Neonatology), Emeritus
Pediatrics - Neonatology

CLINICAL OFFICE (PRIMARY)

- Neonatal Intensive Care Unit

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Bio

CLINICAL FOCUS

- Neonatal-Perinatal Medicine

ACADEMIC APPOINTMENTS

- Emeritus (Active) Professor, Pediatrics - Neonatology
- Member, Maternal & Child Health Research Institute (MCHRI)

ADMINISTRATIVE APPOINTMENTS

- President, California Association of Neonatologists, (2005-2006)
- President, Board of Governors, Stanford University School of Med. Alumni Assoc., (2009-2011)
- National Advisory Board Member, Vermont-Oxford Network NICQ, (2007-2015)
- Medical Director, Neonatal ICU, (2000-2016)

PROFESSIONAL EDUCATION

- Internship: Stanford University School of Medicine (1985) CA
- Medical Education: Stanford University School of Medicine (1984) CA
- Fellowship: Stanford University School of Medicine (1989) CA
- Residency: Stanford University School of Medicine (1987) CA
- Board Certification: Neonatal-Perinatal Medicine, American Board of Pediatrics (1989)
- M.D., Stanford University, Medicine (1984)
- M.S., Mass. Institute of Technology, Nutritional Biochemistry (1979)
- B.S., Mass. Institute of Technology, Biology (1977)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Neonatology, extracorporeal membrane oxygenation, nitric oxide therapy, mechanisms of bilirubin toxicity and brain injury, non-invasive biotechnologies to study cellular and organ metabolism.

Publications

PUBLICATIONS

- **Reimagining Kangaroo Care for Preterm Infants: A Novel Garment for Safe and Comfortable Bonding** *CHILDREN-BASEL*
McMillin, A., Aiden, A., Sherman, J. P., Crystal, R., Rhine, W. D.
2024; 11 (11)
- **A Novel Method for Administering Epinephrine During Neonatal Resuscitation.** *American journal of perinatology*
Gu, H., Perl, J., Rhine, W., Yamada, N. K., Sherman, J., McMillin, A., Halamek, L., Wall, J. K., Fuerch, J. H.
2023
- **Clinical Study of Continuous Non-Invasive Blood Pressure Monitoring in Neonates.** *Sensors (Basel, Switzerland)*
Rao, A., Eskandar-Afshari, F., Weiner, Y., Billman, E., McMillin, A., Sella, N., Roxlo, T., Liu, J., Leong, W., Helfenbein, E., Walendowski, A., Muir, A., Joseph, et al
2023; 23 (7)
- **Limitations of Conventional Magnetic Resonance Imaging as a Predictor of Death or Disability Following Neonatal Hypoxic-Ischemic Encephalopathy in the Late Hypothermia Trial.** *The Journal of pediatrics*
Laptook, A. R., Shankaran, S., Barnes, P., Rollins, N., Do, B. T., Parikh, N. A., Hamrick, S., Hintz, S. R., Tyson, J. E., Bell, E. F., Ambalavanan, N., Goldberg, R. N., Pappas, et al
2020
- **Case 3: Late Preterm Infant with Respiratory Distress.** *NeoReviews*
Kim, M., Arain, Y., Rhine, W.
2019; 20 (9): e527–e529
- **Air pollution exposure associates with increased risk of neonatal jaundice.** *Nature communications*
Zhang, L., Liu, W., Hou, K., Lin, J., Song, C., Zhou, C., Huang, B., Tong, X., Wang, J., Rhine, W., Jiao, Y., Wang, Z., Ni, et al
2019; 10 (1): 3741
- **An Analysis of Time to Improvement in Oxygenation in Japanese Preterm and Late Preterm or Term Neonates With Hypoxic Respiratory Failure and Pulmonary Hypertension** *CLINICAL THERAPEUTICS*
Rhine, W. D., Suzuki, S., Potenziano, J. L., Escalante, S., Togari, H.
2019; 41 (5): 910–19
- **An Analysis of Time to Improvement in Oxygenation in Japanese Preterm and Late Preterm or Term Neonates With Hypoxic Respiratory Failure and Pulmonary Hypertension.** *Clinical therapeutics*
Rhine, W. D., Suzuki, S., Potenziano, J. L., Escalante, S., Togari, H.
2019
- **Welcome and Opening Remarks** *BREASTFEEDING MEDICINE*
Bode, L., Rhine, W. D.
2019; 14: S2
- **Welcome and Opening Remarks.** *Breastfeeding medicine : the official journal of the Academy of Breastfeeding Medicine*
Bode, L., Rhine, W. D.
2019; 14 (S1): S2
- **Welcome and Opening Remarks** *BREASTFEEDING MEDICINE*
Rhine, W. D., Bode, L.
2018; 13: S2

- **Technology - Considerations for the NICU of the Future** *NEWBORN AND INFANT NURSING REVIEWS*
Rhine, W. D.
2016; 16 (4): 208–12
- **Apolipoprotein E genotype and outcome in infants with hypoxic-ischemic encephalopathy.** *Pediatric research*
Cotten, C. M., Goldstein, R. F., McDonald, S. A., Goldberg, R. N., Salhab, W. A., Carlo, W. A., Tyson, J. E., Finer, N. N., Walsh, M. C., Ehrenkranz, R. A., Laptook, A. R., Guillet, R., Schibler, et al
2014; 75 (3): 424-430
- **Parental coping in the neonatal intensive care unit.** *Journal of clinical psychology in medical settings*
Shaw, R. J., Bernard, R. S., Storfer-Isser, A., Rhine, W., Horwitz, S. M.
2013; 20 (2): 135-142
- **Impact of an EMR-Based Daily Patient Update Letter on Communication and Parent Engagement in a Neonatal Intensive Care Unit.** *Journal of participatory medicine*
Palma, J. P., Keller, H., Godin, M., Wayman, K., Cohen, R. S., Rhine, W. D., Longhurst, C. A.
2012; 4
- **A Quality Improvement Project to Increase Breast Milk Use in Very Low Birth Weight Infants** *PEDIATRICS*
Lee, H. C., Kurtin, P. S., Wight, N. E., Chance, K., Cucinotta-Fobes, T., Hanson-Timpson, T. A., Nisbet, C. C., Rhine, W. D., Risingsun, K., Wood, M., Danielsen, B. H., Sharek, P. J.
2012; 130 (6): E1679-E1687
- **Combining hand techniques with electric pumping increases the caloric content of milk in mothers of preterm infants** *JOURNAL OF PERINATOLOGY*
Morton, J., Wong, R. J., Hall, J. Y., Pang, W. W., Lai, C. T., Lui, J., Hartmann, P. E., Rhine, W. D.
2012; 32 (10): 791-796
- **Prediction of Bronchopulmonary Dysplasia by Postnatal Age in Extremely Premature Infants** *AMERICAN JOURNAL OF RESPIRATORY AND CRITICAL CARE MEDICINE*
Laughon, M. M., Langer, J. C., Bose, C. L., Smith, P. B., Ambalavanan, N., Kennedy, K. A., Stoll, B. J., Buchter, S., Laptook, A. R., Ehrenkranz, R. A., Cotten, C. M., Wilson-Costello, D. E., Shankaran, et al
2011; 183 (12): 1715-1722
- **Improved outcomes with a standardized feeding protocol for very low birth weight infants** *JOURNAL OF PERINATOLOGY*
McCallie, K. R., Lee, H. C., Mayer, O., Cohen, R. S., Hintz, S. R., Rhine, W. D.
2011; 31: S61-S67
- **Brief Cognitive-Behavioral Intervention for Maternal Depression and Trauma in the Neonatal Intensive Care Unit: A Pilot Study** *JOURNAL OF TRAUMATIC STRESS*
Bernard, R. S., Williams, S. E., Storfer-Isser, A., Rhine, W., Horwitz, S. M., Koopman, C., Shaw, R. J.
2011; 24 (2): 230-234
- **Combining hand techniques with electric pumping increases milk production in mothers of preterm infants** *JOURNAL OF PERINATOLOGY*
Morton, J., Hall, J. Y., Wong, R. J., Thairu, L., Benitz, W. E., Rhine, W. D.
2009; 29 (11): 757-764
- **Synchronized Nasal Intermittent Positive-Pressure Ventilation and Neonatal Outcomes** *PEDIATRICS*
Bhandari, V., Finer, N. N., Ehrenkranz, R. A., Saha, S., Das, A., Walsh, M. C., Engle, W. A., Van Meurs, K. P.
2009; 124 (2): 517-526
- **A quality improvement project to improve admission temperatures in very low birth weight infants** *JOURNAL OF PERINATOLOGY*
Lee, H. C., Ho, Q. T., Rhine, W. D.
2008; 28 (11): 754-758
- **Inhaled nitric oxide in the treatment of preterm infants** *EARLY HUMAN DEVELOPMENT*
Miller, S. S., Rhine, W. D.
2008; 84 (11): 703-707
- **Neonatal heparin overdose-a multidisciplinary team approach to medication error prevention.** *The journal of pediatric pharmacology and therapeutics : JPPT : the official journal of PPAG*

- Arimura, J., Poole, R. L., Jeng, M., Rhine, W., Sharek, P.
2008; 13 (2): 96-98
- **A cluster-randomized trial of benchmarking and multimodal quality improvement to improve rates of survival free of bronchopulmonary dysplasia for infants with birth weights of less than 1250 grams** *PEDIATRICS*
Walsh, M., Lupton, A., Kazzi, S. N., Engle, W. A., Yao, Q., Rasmussen, M., Buchter, S., Heldt, G., Rhine, W., Higgins, R., Poole, K.
2007; 119 (5): 876-890
 - **The use of inhaled nitric oxide in the premature infant with respiratory distress syndrome.** *Minerva pediatrica*
Van Meurs, K., Hintz, S., Rhine, W., Benitz, W.
2006; 58 (5): 403-422
 - **Eliminating nosocomial infections in the NICU: everyone's duty** *JOURNAL OF PERINATOLOGY*
Rhine, W. D.
2006; 26 (3): 141-143
 - **Implementing potentially better practices to reduce lung injury in neonates** *PEDIATRICS*
Burch, K., Rhine, W., Baker, R., Litman, F., Kaempf, J. W., Schwarz, E., Sun, S. Y., Payne, N. R., Sharek, P. J.
2003; 111 (4)
 - **Venoarterial versus venovenous extracorporeal membrane oxygenation in congenital diaphragmatic hernia: The Extracorporeal Life Support Organization Registry, 1990-1999** *31st Annual Meeting of the Section-on-Surgery of the American-Academy-of-Pediatrics*
Dimmitt, R. A., Moss, R. L., Rhine, W. D., Benitz, W. E., Henry, M. C., VanMeurs, K. P.
W B SAUNDERS CO-ELSEVIER INC.2001: 1199-1204
 - **Decreased use of neonatal extracorporeal membrane oxygenation (ECMO): How new treatment modalities have affected ECMO utilization** *PEDIATRICS*
Hintz, S. R., Suttner, D. M., Sheehan, A. M., Rhine, W. D., Van Meurs, K. P.
2000; 106 (6): 1339-1343
 - **Tc-99m annexin V imaging of neonatal hypoxic brain injury** *STROKE*
D'Arceuil, H., Rhine, W., de Crespigny, A., Yenari, M., Tait, J. F., Strauss, W. H., Engelhorn, T., Kastrup, A., Moseley, M., Blankenberg, F. G.
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 - **Secondary infection presenting as recurrent pulmonary hypertension.** *Journal of perinatology*
Hintz, S. R., Benitz, W. E., Halamek, L. P., Van Meurs, K. P., Rhine, W. D.
2000; 20 (4): 262-264
 - **Inhaled nitric oxide in term and near-term infants: Neurodevelopmental follow-up of The Neonatal Inhaled Nitric Oxide Study Group (NINOS)** *JOURNAL OF PEDIATRICS*
Finer, N. N., Vohr, B. R., Robertson, C. M., Ehrenkranz, R. A., Verter, J., Wright, L. L., Hoffman, H. J., Walsh-Sukys, M. C., Dusick, A. M., Fleisher, B. E., Steichen, J., Laadt, G., Yolton, et al
2000; 136 (5): 611-617
 - **Sonography, CT, and MR imaging: A prospective comparison of neonates with suspected intracranial ischemia and hemorrhage** *AMERICAN JOURNAL OF NEURORADIOLOGY*
Blankenberg, F. G., Loh, N. N., Bracci, P., D'Arceuil, H. E., Rhine, W. D., Norbash, A. M., Lane, B., Berg, A., Person, B., Coutant, M., Enzmann, D. R.
2000; 21 (1): 213-218
 - **Serial magnetic resonance diffusion and hemodynamic imaging in a neonatal rabbit model of hypoxic-ischemic encephalopathy** *NMR IN BIOMEDICINE*
D'Arceuil, H. E., de Crespigny, A. J., Rother, J., Moseley, M., Rhine, W.
1999; 12 (8): 505-514
 - **Bilirubin toxicity and differentiation of cultured astrocytes.** *Journal of perinatology*
Rhine, W. D., SCHMITTER, S. P., Yu, A. C., Eng, L. F., Stevenson, D. K.
1999; 19 (3): 206-211
 - **Inhaled nitric oxide for respiratory failure in pediatric patients**
Andrus, J. P., Derish, M. T., Rhine, W. D., Van Meurs, K. P.
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- **Strategy for lipid suppression in lactate imaging using STIR-DQCT: A study of hypoxic-ischemic brain injury** *MAGNETIC RESONANCE IN MEDICINE*
Nakai, T., Rhine, W. D., Okada, T., Stevenson, D. K., Spielman, D. M.
1998; 40 (4): 629-632
- **Diffusion and perfusion magnetic resonance imaging of the evolution of hypoxic ischemic encephalopathy in the neonatal rabbit** *JOURNAL OF MAGNETIC RESONANCE IMAGING*
D'Arceuil, H. E., de Crespigny, A. J., Rother, J., Seri, S., Moseley, M. E., Stevenson, D. K., Rhine, W.
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- **Congenital diaphragmatic hernia associated with aortic coarctation** *29th Annual Meeting of the Canadian-Association-of-Paediatric-Surgeons*
Eghtesady, P., Skarsgard, E. D., Smith, B. M., Robbins, R. C., Wexler, L., Rhine, W. D.
W B SAUNDERS CO-ELSEVIER INC.1998: 943-45
- **Response of premature infants with severe respiratory failure to inhaled nitric oxide. Premie NO Collaborative Group.** *Pediatric pulmonology*
Van Meurs, K. P., Rhine, W. D., Asselin, J. M., Durand, D. J.
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- **Response of premature infants with severe respiratory failure to inhaled nitric oxide** *66th Annual Meeting of the Society-for-Pediatric-Research*
VanMeurs, K. P., Rhine, W. D., Asselin, J. M., Durand, D. J., Peverini, R., Dudell, G., Butler, S., Durand, D., Asselin, J., VANMEURS, K., Rhine, W.
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- **Hemopericardium from coronary artery laceration complicating extracorporeal membrane oxygenation.** *Journal of perinatology*
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- **Nitrovasodilator therapy for severe respiratory distress syndrome.** *Journal of perinatology*
Benitz, W. E., Rhine, W. D., Van Meurs, K. P., Stevenson, D. K.
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- **A model for detecting early metabolic changes in neonatal asphyxia by 1H-MRS** *JOURNAL OF MAGNETIC RESONANCE IMAGING*
Nakai, T., Rhine, W. D., Enzmann, D. R., Stevenson, D. K., Spielman, D. M.
1996; 6 (3): 445-452
- **NEONATAL JAUNDICE - WHAT NOW** *CLINICAL PEDIATRICS*
Dennery, P. A., Rhine, W. D., Stevenson, D. K.
1995; 34 (2): 103-107
- **LOBAR LUNG TRANSPLANTATION AS A TREATMENT FOR CONGENITAL DIAPHRAGMATIC-HERNIA** *JOURNAL OF PEDIATRIC SURGERY*
VanMeurs, K. P., Rhine, W. D., Benitz, W. E., Shochat, S. J., Hartman, G. E., Sheehan, A. M., Starnes, V. A.
1994; 29 (12): 1557-1560
- **INTRACRANIAL ABNORMALITIES AND NEURODEVELOPMENTAL STATUS AFTER VENOVENOUS EXTRACORPOREAL MEMBRANE-OXYGENATION** *JOURNAL OF PEDIATRICS*
VanMeurs, K. P., Nguyen, H. T., Rhine, W. D., Marks, M. P., Fleisher, B. E., Benitz, W. E.
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- **MAGNETIC-RESONANCE (MR) DIFFUSION AND PERFUSION IMAGING STUDIES OF IMMATURE RABBIT HYPOXIC-ISCHEMIC ENCEPHALOPATHY (HIE)**
RHINE, W. D., DECRESPIGNY, A., PELC, L. R., MOSELEY, M. E., STEVENSON, D. K.
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- **GD-DTPA MR DETECTION OF BLOOD-BRAIN-BARRIER OPENING IN RATS AFTER HYPEROSMOTIC SHOCK** *JOURNAL OF COMPUTER ASSISTED TOMOGRAPHY*

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- Rhine, W. D., Benaron, D. A., Enzmann, D. R., Chung, C., GONZALESMENDEZ, R., Sayre, J. R., Stevenson, D. K.
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- **BRAIN-STEM BILIRUBIN TOXICITY IN THE NEWBORN PRIMATE MAY BE PROMOTED AND REVERSED BY MODULATING PCO2** *PEDIATRIC RESEARCH*
Wennberg, R. P., Gospe, S. M., Rhine, W. D., Seyal, M., Saeed, D., Sosa, G.
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 - **ANTICOAGULATION THERAPY ADVISER - A DECISION-SUPPORT SYSTEM FOR HEPARIN-THERAPY DURING ECMO** *16th Annual Symposium on Computer Applications in Medical Care*
Peaverini, R. L., Sale, M., Rhine, W. D., Fagan, L. M., Lenert, L. A.
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 - **Anticoagulation therapy advisor: a decision-support system for heparin therapy during ECMO.** *Proceedings / the ... Annual Symposium on Computer Application [sic] in Medical Care. Symposium on Computer Applications in Medical Care*
Peaverini, R. L., Sale, M., Rhine, W. D., Fagan, L. M., Lenert, L. A.
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 - **Fatal postoperative Legionella pneumonia in a newborn.** *Journal of perinatology*
Greene, K. A., Rhine, W. D., Starnes, V. A., Ariagno, R. L.
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 - **NEONATAL ASPERGILLOSIS - A CASE-REPORT AND REVIEW OF THE LITERATURE** *CLINICAL PEDIATRICS*
Rhine, W. D., Arvin, A. M., Stevenson, D. K.
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 - **SCHISTOSOMA-MANSONI - REPRODUCTIVE POTENTIAL OF MALE AND FEMALE WORMS CULTURED INVITRO** *JOURNAL OF PARASITOLOGY*
Basch, P. F., Rhine, W. D.
1983; 69 (3): 567-569