Division of Neonatology

Academic Year 2018

Annual Report

Department of Pediatrics

University of Washington

and

Seattle Children’s Hospital
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Mission Statement: We will improve neonatal outcomes by

- Providing outstanding evidence-based neonatal clinical care
- Educating the next generation of neonatal caregivers
- Advancing neonatal scholarship

History of Division Faculty:
The Division of Neonatal Biology and Respiratory Diseases of the Department of Pediatrics at the University of Washington was officially created in 1963 with the recruitment of Dr. Tim Oliver. He then recruited Dr. W. Alan Hodson from Johns Hopkins in 1966 as a second faculty member. A third faculty member, Dr. Dick Wennberg, was added in 1969 and a fourth, Dr. David Woodrum, in 1971. Dr. Oliver left Seattle in 1971 to become Chair of Pediatrics at Pittsburgh and Dr. Hodson became head of the Division, a position he held until 1997 when he stepped down and Dr. Christine Gleason was recruited from Johns Hopkins as Division Head of Neonatology. At that time, Pulmonary Medicine officially became its own division under the direction of Dr. Greg Redding. Since 1997, the Division has substantially expanded its clinical activities, research programs, and its outstanding neonatal fellowship training program. Dr. Gleason stepped down as Division Head in 2014 when Dr. Sandra Juul was successfully recruited January 2015.

History of Division Research:
Between 1966 and 1970, research funding for the Division was obtained from the NICHD with a Neonatal Biology Training Grant, an individual research award, and a satellite clinical research center. In 1972, Division members worked together with members of the Department of Medicine to obtain a 5-year Specialized Center of Research (SCOR) Grant in respiratory disease from the NHLBI. This SCOR became an independent pediatric pulmonary SCOR when it was renewed in 1976, with a second 5-year renewal in 1982. In 1987, a Program Project grant entitled “Pathophysiology of Respiratory Disorders of the Newborn” was funded through the NHLBI for a 5-year period ending in 1992. From 1992 to the present, the Division’s scholarship has diversified; new directions in developmental neuroscience were included beginning in 1998 after Dr. Christine Gleason became Division Head. In 2000, Dr. Sandra Juul was recruited. NIH-funded bench research programs focused on neurodevelopment and neonatal neuroprotection, with translation to multicenter clinical trials of erythropoietin (Epo) neuroprotection. The addition of senior scientist Dr. Colin Studholme to the Division in 2011 brought state of the art neuroimaging techniques for fetal and neonatal brain imaging. The overarching basic science research goal of the Division is to improve the neurodevelopmental outcomes of at-risk infants. Clinical research is focused on neuroscience, medical education, ethics and global neonatal-perinatal health. In 2013, Dr. Juul was awarded a $10.1 million UO1 grant supporting a 5-year multi-center clinical trial investigating Epo as a neuroprotective agent in extremely preterm infants, and in 2016 a second U01 grant was awarded to study the neuroprotective effects of Epo for term infants with hypoxic ischemic encephalopathy. Dr. Dennis Mayock is the Associate Division Head for Clinical Research.
Division Clinical Services:

University of Washington Medical Center Neonatal Intensive Care Unit (Level IV):

Thomas P. Strandjord, MD, Medical Director; David Loren, MD, Assoc. Medical Director

The UWMC NICU admits critically-ill newborns from one of the highest risk obstetric services in the nation. The multi-professional perinatal and NICU teams have special expertise in management of the most fragile growth-restricted and premature fetuses and newborns. The high-risk perinatal program receives obstetrics referrals from throughout the WWAMI region for fetal abnormalities, severe maternal illness, and extreme prematurity and is the site of delivery for the most complex birth defects, including infants requiring EXIT procedures for airway anomalies. Additional advanced services include therapeutic hypothermia and the full range of ventilation strategies including inhaled nitric oxide, high –frequency oscillatory and jet ventilation. The NICU medical team includes neonatal faculty, neonatal fellows, neonatal nurse practitioners, neonatal hospitalists, pediatric residents, interns and medical students. The inter-professional team includes dedicated respiratory therapists, neonatal pharmacists, dieticians, physical therapists, speech language pathologists and social work support. The nursing team includes three tiers of RN expertise and leadership. A state-of-the-art 50-bed NICU opened October 2012. The new unit includes 42 single-bed rooms with space for a family member to stay with their infant plus several additional rooms for multiples as well as an integrated OR for surgical procedures. Patients are cared for by one of two multi-disciplinary teams, a resident-based team, and an NNP/hospitalist team. The UWMC NICU’s care model includes 24/7 coverage by in-house residents and, mid-level intensivists (fellow or NNP/hospitalist), under the direction of attending neonatologists. In AY 2017, the UWMC had 1,924 deliveries with 468 NICU admissions. The average daily census was 31.3 with 134 preterm infants weighing less than 1500 grams at birth and an average daily census of 3.4 on ventilators.

Seattle Children’s Hospital Neonatal Intensive Care Unit (Level IV):

Robert DiGeronimo, Medical Director; Zeenia Billimoria, MD, Assoc. Medical Director

The Neonatal Intensive Care Unit at Seattle Children’s Hospital is the highest rated Level IV NICU in the Seattle area and serves as the major tertiary referral center for medically and surgically complex neonates in the Pacific Northwest. Seattle Children’s NICU admits nearly 500 patients annually and has over 500 affiliated faculty that represent all pediatric subspecialties including: 12 pediatric surgeons, 5 pediatric neurosurgeons and 4 pediatric cardiac surgeons – more than any other hospital in the region. The Children’s NICU provides the full spectrum of neonatal medical care including therapeutic hypothermia for acute hypoxic ischemic encephalopathy, seizures, high frequency ventilation, inhaled nitric oxide and ECMO for severe respiratory failure, renal replacement therapy including dialysis and surgical expertise in the areas of congenital diaphragmatic hernia, intestinal failure, bowel atresia, craniofacial anomalies, reconstructive pelvic medicine, post-hemorrhagic hydrocephalus, neural tube defects and neurovascular malformations. In addition, we offer multidisciplinary care teams providing neuro-critical care and management of bronchopulmonary dysplasia. Daily rounds with the medical team incorporate the patient’s family, NICU nurses, dietician, pharmacist and respiratory therapist. The NICU team accepts admissions of critically ill neonates up to 44 weeks’ post menstrual age (i.e., up to 4 weeks after due date) from the 5-state WAMI region. The Seattle Children’s Hospital NICU’s care model includes an in-house fellow or Advanced Neonatal Practitioners and attending neonatologist 24/7. Seattle Children’s Prenatal Diagnosis and Treatment Program partners with the University of Washington to provide care for pregnant women and their families when pregnancy is complicated by known or suspected conditions in
the developing fetus. Our program integrates obstetric, neonatology and pediatric specialty care for families facing complicated pregnancy management or decision-making.

**Overlake Hospital Medical Center Neonatal Intensive Care Unit (Level III):**
*Shilpi Chabra, MD, Medical Director; Krystle Perez, MD, Assoc. Medical Director*
In 2012, Overlake Hospital opened a new NICU with a total capacity of 18 beds, 13 of which are single-bed rooms with space for a family member to stay near their infant. This model fits in well with the patient/family-centered care provided by the Neonatology team. This facility boasts Nutrition follow up, exclusive breastmilk feedings and same day cardiac consults. The Overlake Hospital NICU’s care model is 24/7 in-house Advanced Neonatal Practitioners under the direction of attending neonatologists. In AY 2017, Overlake had 3,797 deliveries with 346 NICU admissions. The average daily census was 8.0 with 13 preemies weighing less than 1500 grams at birth, and an average daily census of 0.05 on ventilators.

**Providence Regional Medical Center Everett Neonatal Intensive Care Unit (Level III):**
*Michael D. Neufeld, MD, MPH, Medical Director; Anna Hedstrom MD, Assoc. Medical Director*
Providence Regional Medical Center Everett’s 29-bed capacity NICU opened on Mother’s Day in 2002. The unit was developed through the efforts of an alliance between PRMCE and Seattle Children’s Hospital. Individual rooms provide privacy for patients and their families. The multidisciplinary team meets daily with parents and concentrates on family-centered care, teaching parents how to take care of their infants, especially those with special needs. In preparation for discharge, parents are provided in-depth instruction on how to manage emergencies that may arise in the home, including the need for CPR. The care model at PRMCE is 24/7 in-house Advanced Neonatal Practitioners under the direction of attending neonatologists. In AY 2016, PRMC had 4,815 deliveries with 641 NICU admissions. The average daily census was 21.9 with 48 preemies less than 1500 grams at birth with an average daily census of 1.3 on ventilators.

**UW Medicine/Valley Medical Center Neonatal Intensive Care Unit (Level III)**
*Christina Long, DO, Medical Director; Christopher Traudt, MD, Associate Director*
In July 2017, Neonatologists and Advanced Neonatal Practitioners from University of Washington/Seattle Children’s Hospital began a collaborative effort to staff the NICU at UW/Valley Medical Center. The unit has a 29-bed capacity. The single bed rooms provide space and privacy for our patients and their families. Two, unique, infant stabilization rooms allow immediate resuscitation of infants in the NICU after birth without requiring transport after stabilization. Valley has a robust high-risk perinatal clinic and the Neonatologists work closely in conjunction with the high-risk team to provide consults for families prenatally. The Valley NICU uses a multi-disciplinary approach to patient care with NICU dedicated pharmacists, dieticians, physical therapists, speech therapists, respiratory therapists, social work, and NICU nurses. This multi-disciplinary staff meets with families to provide the best family-centered care for our patients. Advanced services provided at Valley include therapeutic hypothermia with 24/7 Pediatric Neurology support and a large range of ventilation strategies including high-frequency oscillatory ventilation. Advanced Neonatal Practitioners staff the NICU with 24/7 in-house coverage under the direction of attending Neonatologists. In FY 2017, Valley had 3745 number of deliveries with 383 NICU admissions.
Franciscan Health Care System; St Joseph Medical Center (Level III); St Francis (Level II)
Stephen Welty, MD, Medical Director; Elizabeth Flanigan, MD, Associate Medical Director
Franciscan Health Care System includes a network of hospitals with approximately 9,000 deliveries annually at its 5 obstetrical facilities: St Joseph Medical Center in Tacoma, St Francis Hospital in Federal Way, St Elizabeth Hospital in Enumclaw, Harrison Medical Center in Silverdale, and Highline Medical Center in Burien. St Joseph Medical Center has a licensed capacity of 23 neonatal beds and has 24/7 in-house Advanced Neonatal Practitioners supported by faculty neonatologists. St. Francis Hospital has a licensed capacity of 10 Level II beds, with medical care from local pediatricians, with consultation and attendance at high-risk deliveries as needed from SCH Advanced Neonatal Practitioners and/or neonatologists. St. Elizabeth is a critical access hospital with 345 deliveries a year. Seattle Children’s Hospital partnered with the Franciscan Health Care System to begin providing Neonatology services and medical direction on April 1, 2013, and St. Joseph Medical Center opened its new Level III NICU in June 2013. This partnership has made it possible for the vast majority of patients to stay within their community while receiving excellent care for their fragile newborns. In AY 2017, St. Joseph’s had 4,132 deliveries with 423 NICU admissions. Our average daily census was 17.3 with 58 premature infants weighing less than 1500 and 10 weighing less than 1000 grams at birth. With the new emphasis on non-invasive ventilation, we average between 3 and 5 babies on nasal CPAP per day. We have recently expanded our care to provide inhaled nitric oxide for infants with hypoxic respiratory failure.

PERSONNEL

Sandra E. Juul, MD, PhD
W. Alan Hodson Endowed Chair in Pediatrics
Professor of Pediatrics
Head, Division of Neonatology, Department of Pediatrics

Maneesh Batra, MD, MPH
Associate Professor of Pediatrics
Associate Director, Pediatric Residency Program

Zeenia Billimoria, MD
Assistant Professor of Pediatrics
Associate Medical Director, NICU, Seattle Children’s Hospital

Shilpi Chabra, MD
Associate Professor of Pediatrics
Medical Director, NICU, Overlake Hospital Medical Center

Pattaraporn Chun, MD
Clinical Assistant Professor of Pediatrics

Robert DiGeronimo, MD
Clinical Professor of Pediatrics
Medical Director, NICU, Seattle Children’s Hospital
Medical Director, Infant Ground Transport Program, Seattle Children’s Hospital
Cyril Engmann, MD  
Clinical Professor of Pediatrics and Global Health  
Global Program Leader/Director, Maternal, Newborn, Child Health & Nutrition, PATH

Elizabeth Flanigan, MD  
Clinical Associate Professor of Pediatrics  
Associate Medical Director NICU, St. Joseph’s Medical Center

Christine A. Gleason, MD  
Emeritus Professor of Pediatrics

Megan Gray, MD  
Assistant Professor of Pediatrics  
Associate Director, Neonatal-Perinatal Medicine Fellowship Training Program

Sarah J. Handley, MD  
Clinical Assistant Professor of Pediatrics  
Physician Liaison, Neonatal Nurse Practitioner Program, Seattle Children’s Hospital

Anna Hedstrom, MD  
Assistant Professor of Pediatrics  
Associate Medical Director NICU, Providence Regional Medical Center Everett

Melinda Hendrickson, MD  
Clinical Associate Professor of Pediatrics

J. Craig Jackson, MD, MHA  
Professor of Pediatrics  
Associate Division Head, Regional Neonatal Program Development

Elizabeth N. Jacobson, MD  
Clinical Assistant Professor of Pediatrics  
Site Physician Sponsor, Children’s Hospital Neonatal Consortium, Seattle Children’s Hospital  
Director of Quality, Neonatology Regional Network

Christina Long, DO  
Clinical Associate Professor of Pediatrics  
Medical Director, NICU, Valley Medical Center

David Loren, MD  
Associate Professor of Pediatrics  
Associate Medical Director, NICU, University of Washington Medical Center  
Course Director PEDS669, Medical Student Elective in NICU, University of Washington Medical Center
Dennis E. Mayock, MD
Professor of Pediatrics
Associate Division Head, Scholarship and Clinical Research

Michael D. Neufeld, MD, MPH
Clinical Associate Professor of Pediatrics
Medical Director, NICU, Providence Regional Medical Center Everett

Pratik Parikh, MD
Assistant Professor of Pediatrics

Krystle Perez, MD, MPH
Assistant Professor of Pediatrics
Associate Medical Director, NICU, Overlake Hospital Medical Center

Taylor Sawyer, DO, MEd
Associate Professor of Pediatrics
Director of Medical Simulation, Seattle Children’s Hospital
Director, Neonatal-Perinatal Medicine Fellowship Training Program
Director of Outreach Education, Neonatal Education & Simulation Based Training (NEST) Program
Associate Division Head, Education

Kendra Smith, MD
Clinical Professor of Pediatrics

Thomas P. Strandjord, MD
Clinical Associate Professor of Pediatrics
Medical Director, NICU, University of Washington Medical Center

Colin Studholme, PhD
Professor of Pediatrics and Professor of Bioengineering
Adjunct Professor of Radiology

Christopher Traudt, MD
Assistant Professor of Pediatrics
Associate Medical Director, NICU, Valley Medical Center

Rachel Umoren, MD, MS
Assistant Professor of Pediatrics

Linda Wallen, MD
Clinical Professor of Pediatrics
Associate Division Head, Clinical Operations

Elliott Weiss, MD, MSME
Assistant Professor of Pediatrics
Assistant Professor, Division of Bioethics
Stephen Welty, MD
Professor of Pediatrics
Medical Director, NICU, St. Joseph’s Medical Center

Fellows:

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<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Pediatric Residency Program</th>
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<tr>
<td>3rd Year</td>
<td>Meenakshi Dutta, MD</td>
<td>Tulane University</td>
</tr>
<tr>
<td></td>
<td>Kendell German, MD</td>
<td>University of California San Francisco</td>
</tr>
<tr>
<td></td>
<td>Jeanne Krick, MD</td>
<td>Madigan Army Medical Center</td>
</tr>
<tr>
<td>2nd Year</td>
<td>Teresa Lam, MD</td>
<td>Loma Linda University Medical Center</td>
</tr>
<tr>
<td></td>
<td>Patrick Motz, DO, MPH</td>
<td>Wright State University</td>
</tr>
<tr>
<td>1st Year</td>
<td>Brianna Brei, MD, MPH</td>
<td>Rush University Medical Center</td>
</tr>
<tr>
<td></td>
<td>Shubha Setty, MD</td>
<td>Emory University</td>
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2018-2019

Incoming Fellows
Sarah Kolnik, MD, MBA New York University
Katherine Kenningham, MD University of Washington

Seattle Children’s Hospital Neonatal Nurse Practitioner/Physician Assistant Program: (4)
April Morris, ARNP, Manager, Advance Practice Services, Overlake Hospital Medical Center
Meg Keith, MSN, ARNP, Supervisor, Seattle Children’s Hospital
Kim Gustafson, MSN, ARNP, Supervisor, Franciscan Health System
Carol Otto MSN, ARNP, Supervisor, Valley Medical Center
This program provides NP/PA services at four regional medical centers in collaboration with Seattle Children’s Hospital and the Division of Neonatology.

University of Washington Medical Center Neonatal Nurse Practitioner Program: (6)
Shwu-Shin Hou, MN, ARNP, NNP-BC, Program Manager
Jennie Collins, MD
Amy Dunn Caldwell, ARNP
Jennifer Fesinmeyer, ARNP
Tiffany Stanley, ARNP

Research Staff:
Daniel Moralejo, PhD, DVM, Research Scientist
Kylie Corry, MS, Research Scientist
Tommy Wood, MD, PhD, Post Doc

HEAL Grant Project Team:
Sandra Juul, MD, PhD, Principal Investigator; Clinical Coordinating Center
Dennis Mayock, MD, Site Principal Investigator
John Feltner, Lead Clinical Coordinator (HEAL)
Isabella Esposito, Research Coordinator
Elizabeth Jacobson, MD
Craig Jackson, MD, MHA
Pratik Parikh, MD
Krystle Perez, MD, MPH
Thomas Strandjord, MD
Christopher Traudt, MD
Linda Wallen, MD
Elliott Weiss, MD, MSME

PENUT Grant Project Team:
Sandra Juul, MD, PhD, Principal Investigator; Clinical Coordinating Center
Dennis Mayock, MD, Site Investigator
Bailey Clopp, Lead Clinical Coordinator (PENUT)
Colin Studholme, PhD, Biomedical Imaging Computing Group
Christopher Traudt, MD, Imaging Data Analysis

Biomedical Image Computing Group:
Colin Studholme, PhD, Principal Investigator
David Hunt, PhD, Senior Fellow
Mary Kociuba, PhD, Senior Fellow
Mengyuan Liu, Graduate Student
Ipek Ozdemir, PhD, Visiting Scientist
Thilo Strauss, PhD, Senior Fellow
Viktoria Taroudaki, PhD, Senior Fellow
Gwendolyn Van Steenkiste, PhD, Senior Fellow
Hirofumi Watari, PhD, Senior Fellow

Administrative Staff:
Paula Sword, MHA, Division Administrator
Jake Hawksworth, MHA, Director of Medical Specialties Neonatology, SCH
Marissa Atienza, Fellowship Program Administrator
Lisa Wormke, BA, MPA, Grants Manager
Samantha Soler, Administrative Assistant, UW
Neil Kline, Office Assistant, UW
Kathy Peltz, Senior Administrative Assistant, SCH
Stacy Bishop, Senior Administrative Assistant, SCH
The Division provides 24/7 neonatal consultation services and medical control for neonatal ground and air transport for the 5-state WWAMI region for about 400 patients per year.

**NEONATAL TRANSPORT PROGRAM**

*Robert DiGeronimo, MD, Medical Director*

Neonatal transport services for Seattle Children’s and its affiliated hospital partners is provided by dedicated teams from Seattle Children’s and Airlift Northwest. Our transport team are leaders in safe newborn transport and have ground, rotor and fixed wing capability. Teams are comprised of specially trained transport nurses and respiratory therapists. Infants from referral centers throughout the WWAMI (Washington, Wyoming, Alaska, Montana, Idaho) region are transported to facilities best suited to their needs. Services provided include en-route cardiopulmonary monitoring, conventional ventilator support, high frequency ventilation, administration of nitric oxide, blood gas analysis and mobile extracorporeal membrane oxygenation for critically ill patients too unstable to move via other means. Team members are trained in the interpretation of x-rays, newborn resuscitation, endotracheal tube placement, insertion of umbilical catheters, treatment of pneumothoraces, cardiopulmonary resuscitation, blood pressure management, complex congenital heart disease and other newborn emergencies. Members of the Division of Neonatology serve as Medical Control Providers for all transport missions.

**INFANT DEVELOPMENT FOLLOW-UP CLINIC**

*William Walker, MD*

The University of Washington Infant Development Follow-Up Clinic (IDFC) was provides critical screening and follow up for high risk infants cared for in the UWMC and SCH NICUs. It also provides interdisciplinary training, and follow up for patients in clinical research studies such as PENUT and HEAL. Current staffing includes developmental pediatrics, neonatal neurology, neonatology, advanced practice nursing, psychology, audiology, nutrition, physical and occupational therapy, and social work. Scheduled IDFC evaluations occur at 4 and 12 months corrected age, and 24, 36, and 54 months chronological age. Very low birth weight infants (weighing less than 1500 grams at birth) are prioritized for follow-up. Other infants with specific neonatal concerns, e.g., chronic lung disease, intracranial hemorrhage, infection, hypoxic-ischemic encephalopathy and selected surgical patients are also followed.

Approximately 600 high-risk infants and children are seen annually in the clinic. About 40 percent of these visits are with infants during the first year of life. The most recent innovation is the Late and Moderate Preterm Babies (LAMBs) Follow-up Clinic which opened in June 2018. This clinic serves infants born between 32 0/7 and 36 6/7 weeks gestation, with a birthweight of 1500 grams or greater, and a NICU length of stay 5 days or greater. Scheduled evaluations for LAMBs occur at 4-6 months corrected age, 12 months corrected age, and 24 and 36 months chronological age.
NEONATAL-PERINATAL DATABASES

Michael D. Neufeld, MD, MPH and Thomas P. Strandjord, MD, Database Coordinators

The University of Washington Medical Center Neonatal Intensive Care Unit maintains a quality improvement and research NICU database that includes all infants admitted to the NICU, as well as all infants delivered at UWMC over 22 weeks gestation. The database is maintained by Division staff and faculty. In addition, since 2000, the University of Washington NICU has participated in the Vermont-Oxford Network (VON) database for 401-1500 gram infants. Data is selected for inclusion in the NICU database by consensus of the neonatology faculty and fellows. The NICU database contains a superset of the data required by the VON database and as such includes extensive admission, diagnostic, outcome and local QA/QI data. The outcome (morbidity and mortality) data is generated annually and reviewed with the faculty and fellows. In addition, ad hoc queries are performed at the request of fellows and faculty and reviewed as a group.

Elizabeth Jacobson, MD, Site Physician Sponsor, Robert DiGeronimo, MD, Co-Sponsor

Seattle Children’s Hospital belongs to the Children’s Hospitals Neonatal Consortium of more than 30 children's hospital Level IV NICUs. This allows for involvement in benchmarking and quality evaluation and improvement initiatives for the SCH NICU through the Children’s Hospitals Neonatal Database.

Robert DiGeronimo, MD, Site Physician Co-Sponsor

Seattle Children’s Hospital belongs to the Extracorporeal Life Support Organization (ELSO), an international non-profit consortium of over 350 health care institutions dedicated to the development and evaluation of novel therapies to support organ failure. Participation in ELSO affords the opportunity to participate in and query the extracorporeal membrane oxygenation database to support clinical research, quality improvement and evidence based guideline recommendations.

TEACHING ACTIVITIES

NEONATAL-PERINATAL FELLOWSHIP TRAINING PROGRAM

Taylor Sawyer, DO, MEd, Program Director
Megan Gray, MD, Associate Program Director

The Neonatal-Perinatal Medicine Fellowship Training Program at the University of Washington began in the mid-1960s. Our mission is to educate and inspire the next generation of neonatologists who will provide state-of-the-art, evidence-based clinical care, and to assist and mentor them in finding and pursuing their scholarly passion so they are poised to be the future academic leaders of our field. During their 3 years of training, fellows spend a total of 56 weeks on clinical service: 46 weeks on rotations in the two teaching hospital NICUs (Seattle Children’s Hospital & University of Washington Medical Center); 8 weeks on clinical services including perinatology, cardiac ICU, and pediatric surgery; and 2 weeks in one of the Division's community hospital NICUs. Fellows also attend NICU follow-up clinic 8 half-days each
year. Additionally, fellows achieve a high degree of scholarly/academic competence in order to excel in a career in academic neonatology. We have designed our program to provide ample protected time for scholarly activities. Our research areas of focus include neuroscience, global health, education/simulation, quality improvement, and biomedical ethics. We have strong research mentors both within and outside the Neonatology Division. As of 2017, 59 neonatologists have successfully completed their clinical and research training in our program, and more than 50% have pursued an academic career. Our graduates have a 1st time board pass rate of 100% over the past 5 years.

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**DIVISION FELLOWSHIP GRADUATES:**

*Note: The program was inactive 7/95 – 6/99.*

<table>
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<tr>
<th>Name</th>
<th>Years of Training</th>
<th>Current Position/Institution</th>
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<tbody>
<tr>
<td>Richard Wennberg</td>
<td>1966-1968</td>
<td>Clinical Professor of Pediatrics, University of Washington (Retired from the University of California, Davis), Seattle, WA</td>
</tr>
<tr>
<td>Thomas Helmrath</td>
<td>1967-1969</td>
<td>Medical Director, Riverside Hospital, Columbus, OH</td>
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<tr>
<td>Robert Hall</td>
<td>1968-1970</td>
<td>Professor of Pediatrics, University of Missouri, Mercy Children’s Hospital</td>
</tr>
<tr>
<td>David Woodrum</td>
<td>1969-1971</td>
<td>Professor Emeritus of Pediatrics, University of Washington, Seattle, WA</td>
</tr>
<tr>
<td>Colby Parks</td>
<td>1969-1971</td>
<td>Private Practice, Anchorage, AK</td>
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<tr>
<td>Ron Bloom</td>
<td>1969-1971</td>
<td>Professor of Pediatrics, University of Utah, Salt Lake City, UT</td>
</tr>
<tr>
<td>Errol Alden</td>
<td>1970-1972</td>
<td>Executive Director, American Academy of Pediatrics</td>
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<tr>
<td>Thomas Nelson</td>
<td>1971-1973</td>
<td>Professor of Pediatrics, Georgetown University, Washington, DC</td>
</tr>
<tr>
<td>Rosemary Orr</td>
<td>1971-1973</td>
<td>Professor of Anesthesiology, University of Washington, Seattle, WA</td>
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<tr>
<td>Jacquelyn Bamman</td>
<td>1972-1974</td>
<td>Director, Neonatal &amp; Pulmonary Medicine, Ventura County Hospital, Ventura, CA</td>
</tr>
<tr>
<td>Janet Murphy</td>
<td>1972-1974</td>
<td>Associate Professor Emeritus of Pediatrics, University of Washington(Retired), Seattle, WA</td>
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<tr>
<td>David Belenky</td>
<td>1973-1975</td>
<td>Private Practice, Seattle, WA</td>
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<tr>
<td>John Prueitt</td>
<td>1973-1975</td>
<td>Private Practice, Seattle, WA</td>
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<tr>
<td>Paul Hinkes</td>
<td>1973-1975</td>
<td>Private Practice, Glendale, CA</td>
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<td>John Yount</td>
<td>1973-1975</td>
<td>Private Practice, Salem, OR</td>
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<tr>
<td>Robert Guthrie</td>
<td>1974-1976</td>
<td>Professor of Pediatrics, Drexel University, Philadelphia, PA</td>
</tr>
<tr>
<td>Name</td>
<td>Years</td>
<td>Position and Location</td>
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<tr>
<td>Jonelle Rowe</td>
<td>1974-1976</td>
<td>Professor Emeritus of Pediatrics, University of Connecticut Health Center, Farmington, CT</td>
</tr>
<tr>
<td>Charles Haberkern</td>
<td>1975-1977</td>
<td>Clinical Professor of Anesthesiology, University of Washington, Seattle, WA</td>
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<tr>
<td>Robert Perelman</td>
<td>1975-1977</td>
<td>Director, Department of Education, American Academy of Pediatrics</td>
</tr>
<tr>
<td>William E. Truog</td>
<td>1976-1978</td>
<td>Professor of Pediatrics, University of Missouri, Kansas City, MO</td>
</tr>
<tr>
<td>Dale Kessler</td>
<td>1976-1978</td>
<td>Director, Neonatal Medicine, Maine Medical Center, Portland, ME</td>
</tr>
<tr>
<td>Dennis Mayock</td>
<td>1979-1981</td>
<td>Professor of Pediatrics, University of Washington, Seattle, WA</td>
</tr>
<tr>
<td>Kelly Wright</td>
<td>1979-1981</td>
<td>Private Practice, Memphis, TN</td>
</tr>
<tr>
<td>Greg Sorensen</td>
<td>1982-1984</td>
<td>Vice President, Medical Affairs, Bon Secours Health System, Richmond, VA</td>
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<tr>
<td>J. Craig Jackson</td>
<td>1982-1985</td>
<td>Professor of Pediatrics, University of Washington, Seattle, WA</td>
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<tr>
<td>Richard Badura</td>
<td>1982-1985</td>
<td>Private Practice, Seattle, WA</td>
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<tr>
<td>Jon Watchko</td>
<td>1983-1986</td>
<td>Professor of Pediatrics, University of Pittsburgh, Pittsburgh, PA</td>
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<tr>
<td>Gary Twiggs</td>
<td>1985-1987</td>
<td>Private Practice, Newport Beach, CA</td>
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<tr>
<td>A.C. Hoffmeister</td>
<td>1985-1987</td>
<td>Private Practice, Eugene, OR</td>
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<tr>
<td>Sandra Juul</td>
<td>1986-1989</td>
<td>Professor of Pediatrics, University of Washington, Seattle, WA</td>
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<tr>
<td>Charles Davis</td>
<td>1987-1989</td>
<td>United States Navy</td>
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<tr>
<td>Thomas Strandjord</td>
<td>1987-1990</td>
<td>Clinical Associate Professor of Pediatrics, University of Washington, Seattle, WA</td>
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<tr>
<td>Matt Lee</td>
<td>1989-1992</td>
<td>Research Assistant Professor, University of Southern California, Los Angeles, CA</td>
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<tr>
<td>James Berger</td>
<td>1990-1993</td>
<td>Private Practice, Ogden, UT</td>
</tr>
<tr>
<td>Valerie Newman</td>
<td>1993-1994</td>
<td>Private Practice, Portland, OR</td>
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<tr>
<td>Peter Tarczy-Hornoch</td>
<td>1992-1995</td>
<td>Professor of Pediatrics, University of Washington, Seattle, WA</td>
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<tr>
<td>Michael Neufeld</td>
<td>1999-2003</td>
<td>Clinical Associate Professor of Pediatrics, University of Washington, Seattle, WA</td>
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<tr>
<td>Eric Leung</td>
<td>1999-2003</td>
<td>Private Practice, Renton, WA</td>
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<tr>
<td>David Anderson</td>
<td>2000-2003</td>
<td>Private Practice, Walnut Creek, CA</td>
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<tr>
<td>Susan Miller</td>
<td>2002-2005</td>
<td>Private Practice, Naples, Florida</td>
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<tr>
<td>Robert Mertz</td>
<td>2002-2005</td>
<td>Private Practice, Seattle, WA</td>
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<tr>
<td>Name</td>
<td>Years</td>
<td>Position, Institution, City, State</td>
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<tr>
<td>Eric Demers</td>
<td>2002-2005</td>
<td>Private Practice, Seattle, WA</td>
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<tr>
<td>Katherine Salinas/Simon</td>
<td>2004-2006</td>
<td>Private Practice, Austin, TX</td>
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<tr>
<td>Maneesh Batra</td>
<td>2004-2007</td>
<td>Associate Professor of Pediatrics, University of Washington, Seattle, WA</td>
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<tr>
<td>Marcella Mascher-Denen</td>
<td>2005-2008</td>
<td>Private Practice, Corpus Christi, TX</td>
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<tr>
<td>Jessica Slusarski</td>
<td>2006-2009</td>
<td>Associate Professor, Brown University, Providence, RI</td>
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<tr>
<td>Annie Nguyen-Vermillion</td>
<td>2007-2010</td>
<td>Private Practice, Seattle, WA</td>
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<tr>
<td>Janna Patterson</td>
<td>2007-2010</td>
<td>Senior Vice President, Global Child Health and Life Support</td>
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<tr>
<td>Andrew Beckstrom</td>
<td>2008-2011</td>
<td>Private Practice, Seattle, WA</td>
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<tr>
<td>Elizabeth Jacobson</td>
<td>2008-2011</td>
<td>Clinical Assistant Professor of Pediatrics, University of Washington, Seattle, WA</td>
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<tr>
<td>Pattaraporn Tanya Chun</td>
<td>2010-2013</td>
<td>Assistant Professor of Pediatrics, University of Washington, Seattle, WA</td>
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<tr>
<td>Rachel Fleishman</td>
<td>2010-2013</td>
<td>Assistant Professor, Drexel University College of Medicine; St. Christopher's Hospital for Children, Philadelphia, PA</td>
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<tr>
<td>Anna Hedstrom</td>
<td>2011-2014</td>
<td>Assistant Professor of Pediatrics, University of Washington, Seattle, WA</td>
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<tr>
<td>Stacey Soileau</td>
<td>2011-2014</td>
<td>Ochsner Health System, New Orleans, LA</td>
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<tr>
<td>Shaun Odell</td>
<td>2012-2015</td>
<td>Utah Valley Regional Medical Center, Provo, UT</td>
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<tr>
<td>Vijayeta (Vij) Rangarajan</td>
<td>2012-2015</td>
<td>Private Practice, Seattle, WA</td>
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<tr>
<td>Eric Peeples</td>
<td>2013-2016</td>
<td>Assistant Professor, University of Nebraska</td>
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<tr>
<td>Jayalakshmi (Ammu) Ravindran</td>
<td>2013-2016</td>
<td>Private Practice, University of San Francisco</td>
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<tr>
<td>Gillian Pet</td>
<td>2014-2017</td>
<td>Johns Hopkins University</td>
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<tr>
<td>Anita Shah</td>
<td>2014-2017</td>
<td>Private Practice, Children’s Hospital of Orange County</td>
</tr>
<tr>
<td>Meenakshi Dutta</td>
<td>2015-2018</td>
<td>Clinical Assistant Professor of Pediatrics, University of Washington, Seattle, WA</td>
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<tr>
<td>Kendell German</td>
<td>2015-2018</td>
<td>Assistant Professor of Pediatrics, University of Washington, Seattle, WA</td>
</tr>
<tr>
<td>Jeannie Krick</td>
<td>2015-2018</td>
<td>Neonatologist, Madigan Army Medical Center, Tacoma, WA</td>
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</table>

**RESIDENT EDUCATION**
Maneesh Batra, MD, MPH, Associate Director, Pediatric Residency Program

Our faculty, fellows, and advanced neonatal practitioners are involved in several aspects of the core training program for pediatric residents. Currently the University of Washington Pediatric Residency Program accepts 43 residents per year. All residents complete one 4-week rotation in the UWMC NICU during their intern year and one or more rotations in the UWMC NICU and SCH NICU over the course of their subsequent 2 years of residency. Additionally, University of Washington family practice residents rotate through the UWMC NICU for 2-4 weeks. For all of these trainees our faculty, fellows and advance neonatal practitioners provide bedside teaching during the rotation. Additionally, our Division has been responsible for training all pediatric interns in the Newborn Resuscitation Program (NRP). Finally, several of our faculty are invited to participate each year in the WWAMI (Washington, Wyoming, Alaska, Montana, Idaho) visiting professor program.

MEDICAL STUDENT EDUCATION

David Loren, MD, Course Director

An elective rotation in the UWMC NICU is offered to 4th year medical students. Division faculty also lecture in various medical school courses (for example, Ethics) and offer research experience for students in their laboratories. In addition, selected faculty have participated in the University of Washington’s medical school “College Faculty” program.

NEONATAL EDUCATION AND SIMULATION-BASED TRAINING (NEST) PROGRAM

Rachel Umoren, MD, MS, Program Director; Taylor Sawyer, DO, MEd, Director of Outreach Education; Thomas Strandjord, MD, Director of Clinical Integration; Megan Gray, MD, Director of Kinesthetic Learning

In 2014, the Division of Neonatology joined an elite group of neonatal divisions who own and operate a dedicated neonatal simulation program. The Neonatal Education and Simulation-based Training (NEST) Program sets the UW and Seattle Children’s Division of Neonatology apart and highlights the Division’s dedication to simulation-based education. The mission of the NEST Program is to improve neonatal outcomes through advanced technology-enhanced training and simulation research. The program’s vision is to provide international leadership in neonatal education, simulation-based training and scholarship. Current projects include: ‘boot camps’ for residents and fellows, neonatal resuscitation training, neonatal procedural skills training, development of a computer-based perinatal counseling simulator, and virtual reality neonatal disaster training. The NEST program works to improve the care of neonates in the Seattle region by conducting educational outreach with pediatric providers and neonatal transport teams.
RESEARCH FUNDING

ACTIVE RESEARCH FUNDING

Maneesh Batra, MD, MPH

2016-2018  AID-OAA-F-16-00026 USAID, Saving Lives at Birth (SLAB) Grand Challenges Validation Grant
“Mobile WACH NEO: Communication Empowering Mothers and Newborns”
PI: Jennifer Unger
Collaborator/Co-Investigator, Effort 1%: M. Batra
SLAB, Total award: $250,000

2015-2017  Seattle Children’s Research Institute, Center for Clinical and Translational Research
Academic Enrichment Fund “Does an Elevated Respiratory Severity Score Correlated to Hypercapnia in Neonates?”
PI: Anna Hedstrom, Mentor, Co-Investigator: M. Batra
SCH, Total Award: $24,312

2015-Present  Ambassador J. Christopher Stevens Endowment for International Child Health Research and Education), Seattle Children’s Foundation
Role: Manager and Steward
Principal: $500,000, Annual Disbursement: $25,000

2014-2017  U01HL111478 NIH-NHLBI “Multi-center trial of limiting PGY2&3 resident work hours on patient safety (ROSTERS study)”
PI: Czeisler CA (Brigham and Women’s Hospital)
Seattle Site Co-Investigator, Effort 5%: M. Batra
NIH, Annual Direct Costs (Seattle Site): $238,000

Shilpi Chabra, MD

2017-2018  UWHA Research grant, “Point-of-Care Ultrasound for PICC line monitoring (PUP): a pilot study” Role: Mentor and Co-Investigator
Total Direct Costs: $1,200 + $2,000

Annual Direct Costs: $5,000

Robert DiGeronimo, MD

2015-2017  IRB_00083501, University of Utah/Intermountain Medical Center DiGeronimo (PI)
Discovery Labs, Prospective Observational Study of Respiratory Support Provided to
Premature Infants at Risk for Respiratory Distress Syndrome.
Role: Co-investigator (Site PI)

Cyril Engmann, MD
2017-2020  Scaling up Early Childhood Development: Expanding Nurturing Care in the early years. MNCHN Program Lead: C. Engmann
Grant from the Conrad Hilton Foundation, Total Award: $8,200,000
2016-2020  Advancing Maternal Immunization. MNCHN Program Lead: C. Engmann
Grant from the Bill & Melinda Gates Foundation, Total Award: $9,000,000
2016-2018  Milk Banking, Compendium for Capacity Building & Best Practice Assessment. Program Lead: C. Engmann
Grant from the Family Larsson Rosenquist Foundation, Total Award: $1,277,300
2016-2020  Technical Assistance for Nutrition, Chair of Consortium: C Engmann
Grant from the Department for International Development, United Kingdom
Total Award: $20,000,000
2015-2018  Scaling up Human Milk Banking in Vietnam and India, Co-investigator: C. Engmann
Cargill Foundation, Total Award: $ 2,000,000
2014-2018  Maternal Child Survival Program: Grant from the United States Agency for International Development, Program Lead: C. Engmann, Total Award: $10,000,000
2015-2018  Optimizing the Health Extension Program (OHEP) in Ethiopia: Grant from the Bill & Melinda Gates Foundation, Co-PI: C. Engmann, Total Award: $5,000,000
2014-2018  Making Every Baby Count Initiative (MEBCI): Grant from the Children's Investment Fund Foundation, PI: Cyril Engmann, Total Award: $12,421,572

Christine Gleason, MD
2016-2017  Robert Wood Johnson Foundation, Health Policy Fellowship
Total Award: $165,000

Megan Gray, MD
2017-2018  “Speaking up for Patient Safety” UW Patient Safety Innovations Program
Role: Co-Investigator, Total Award: $50,000 annually
2016-2018  “Multimodal Simulation for Emergency and Disaster Preparedness” Academic Enrichment Fund Program, Seattle Children’s Hospital
Role: Co-Principal Investigator, Total Award: $50,000 annually

Anna Hedstrom, MD
2017-2019  Use of the respiratory severity score (RSS) to predict intubation (CPAP failure) in very preterm neonates. For study of the use of the RSS to predict CPAP failure/intubation in
neonates < 32 weeks. Seattle Children’s Hospital, CCTR
Role: Principal Investigator, Total Award $60,000 (0.1 FTE)

2017 “Use of the respiratory severity score (RSS) to predict intubation (CPAP failure) in very preterm neonates” Division Support for additional statistical analysis, Division of Neonatology. Role: Principal Investigator, Total Award: $5,737

2012-Present Adara Development, “For International Travel to Uganda. I provide annual nursing and physician educational updates on neonatal topics, assist in design of unit protocols for care delivery and data collection and support the implementation of Continuous Positive Airway Pressure (CPAP) and oxygen blending” in the Kiwoko Hospital NICU Travel Funding, Award: ~$2,500 annually

Craig Jackson, MD, MHA
2016-Present Site co-investigator (0.05 FTE) on NIH-funded HEAL Study, a national, multi-center, randomized clinical trial: “High-dose erythropoietin for asphyxia and encephalopathy” (PI: Sandra Juul).

Sandra Juul, MD, PhD
2018-2020 Epigenetic biomarkers of cerebral palsy in the ELGAN CP Alliance. Sandra Juul, MD, PhD and An Massaro, MD Co-PIs.
Total Award: $179,925

2017-2019 Uridine neuroprotection in neonatal hypoxic-ischemic brain injury. Bill and Melinda Gates Foundation, Sandra Juul, MD, PhD, PI.
Total Award: $489,128

2016-2022 High-dose Erythropoietin for Asphyxia and Encephalopathy (HEAL) CCC. 1U01NS092764-01A1, NINDS. Sandra Juul, MD, PhD and Yvonne Wu MD, MS, Multi-PIs.
Total Award: $10,100,000

2013-2018 Preterm Erythropoietin Neuroprotection Trial (PENUT Trial) CCC. 1U01NS077953-01 NINDS. Sandra Juul, MD, PhD, PI.
Total Award: $10,145,741

2013-2018 Biomarkers of neonatal encephalopathy in a nonhuman primate model. 5R01HD073128-02. Sandra Juul, MD, PhD, PI.
Total Award: $3,233,245

Dennis Mayock, MD
2016-2022 High-dose Erythropoietin for Asphyxia and Encephalopathy (HEAL) CCC. 1U01NS092764-01A1, NINDS.
Role: Co-Investigator, Total Award: $10,100,000
2013-2018  Preterm Erythropoietin Neuroprotection Trial (PENUT Trial) CCC. 1U01NS077953-01 NINDS. Role: Co-Investigator, Total Award: $10,145,741

2016-2018  Developmental Impact of NICU Exposures (DINE) Study. NICHQ. Role: Site Investigator

Pratik Parikh, MD


2017-2019  Academic Enrichment Fund. Does Nanocurcumin protect the preterm brain from injury? Role: Principal Investigator, Total Funding requested: $25,000

2018-2020  Bill and Melinda Gates Foundation. Uridine neuroprotection in neonatal hypoxic-ischemic brain injury. Role: Co-Investigator. 01/01/2018 to 7/1/2019. Total Funding: $489,128.00

Taylor Sawyer, DO, MEd

2017-2019  NIH/NICHD1 R21 HD089151-01A1. Improving safety and quality of tracheal intubations in neonatal ICUs. Role: Co-PI, Total Award: $275,000

2016-2018  UW CoMotion Innovation Fund. University of Washington CoMotion, A Novel Airway Device for Neonates: The iLMA. Role: PI, Total Award: $50,000

Kendra Smith, MD

2014-Present  Pfizer Pharmaceutical Company. A Multi-center, Randomized, Placebo-controlled, Double-blind, Two-armed, Parallel Group Study to Evaluate Efficacy and Safety of IV Sildenafil in the Treatment of Neonates with Persistent Pulmonary Hypertension of the Newborn or Hypoxic Respiratory Failure and at Risk for Persistent Pulmonary Hypertension, with a Long Term Follow-up Investigation of Developmental Progress 12 and 24 Months after Completion of Study. Annual Direct Costs: $51,827

2015-2018  United Therapeutics. Intravenous Remodulin (Treprostinil) as Add-on Therapy for the Treatment of Persistent Pulmonary Hypertension of the Newborn. Annual Direct Costs: $97,718


Colin Studholme, PhD

2013-2018  NIH NIBIB. “Motion robust mapping of human brain functional connectivity changes in utero.” Year 1 Award: $499,857
2013-2018 NIH NINDS. Motion robust mapping of human brain microstructure and macrostructure in utero (Competing renewal of High resolution in-utero mapping of fetal brain development from combined MRI). Year 1 Award: $459,691

2013-2017 Oregon Health Science University. “Characterizing the FASD of the cerebral cortex in utero with DTI.” Year 1 Award: $54,378

2014-2017 Bill & Melinda Gates Foundation. “Gestational malnutrition – a preventable cause of cognitive impairment in children.” Year 1 Award: $90,000

2013-2018 NIH NINDS. Preterm Epo Neuroprotection Trial (PENUT Trial) Clinical Coordinating Center (CCC). Award: $1,789,418

Christopher Traudt, MD


Rachel Umoren, MD

2017-2019 Bill and Melinda Gates Foundation, “eHBB: Virtual reality technology to improve newborn healthcare delivery in low and middle income countries.” Role: PI (25% FTE) Total Award: $1,109,135

2017-2018 Center for Leadership & Innovation in Medical Education (CLIME) Small Grant Program (PI Burns), “TeamBITS Online - Expanding Access to Teamwork Training for Medical Students,” Role: Co-Investigator, Total Award: $4,163

2016-2018 Seattle Children’s Academic Enrichment Fund Program (PI Gray), “Multimodal Simulation for Emergency and Disaster Preparedness,” Role: Co-Investigator Total Award: $50,000

2017-2018 Safety Innovations Program (PI Kim), “Speaking Up for Promoting the Culture of Safety: Piloting the SPEAK-PREP Tool,” Role: Consultant, Total Award: $50,000

2017-2018 Indiana Minority Health Coalition State Master Research Plan (PI Place), “Evaluating Evidence-Based and Culturally Sensitive Communication Recommendations on Interconception, Prenatal, and Infant Health and Safety for the Hispanic/Latino(a) Populations in Indiana,” Role: Consultant, Total Award: $19,992

2017-2020 Indiana State Department of Health: Safety PIN (PI Litzelman), “WeCare Plus: An Innovative, Community-Based Collaboration to Decrease Infant Mortality,” Role: Consultant, Total Award: $2,100,000
Anna Hedstrom, MD

Sandra Juul, MD, PhD
Role: Principal Investigator.
Role: Principal Investigator.

Dennis Mayock, MD
2018-2023  Co-analysis of Longitudinal Fetal Brain and Placenta Functional MRI in Healthy and Growth Restricted Pregnancies. NICHD  
Role: Co-Investigator

Pratik Parikh, MD
2018-2022  NIH/NINDS. RO1Nanocurcumin for neuroprotection in neonatal HIE.  
Role: Co-Investigator.
Role: Co-Investigator.
Role: Co-Investigator.
Maneesh Batra, MD, MPH

Clinical Interests: Newborn health, survival and long-term outcomes in developed and developing country settings.

Scholarly Focus: Epidemiology and newborn outcomes in developed and developing country settings. Dr. Batra has been involved with a series of studies involving the Washington State Birth Events Records Database (BERD) including: environmental risk factors for ventricular septal defects, pregnancy outcomes among Somali women, risk factors for recurrent shoulder dystocia, and effects of mode of delivery on pregnancy and newborn outcomes. His primary interests revolve around improving newborn care in resource-poor settings. He has been involved with developing guidelines of care in a special care nursery in central Uganda since 2002.

Administration/Education Roles: Associate Director of the pediatric residency program and co-director of the residency pathways in global health and community pediatrics/advocacy. He is involved with the clinical training of students, residents, and fellows at the University of Washington and with the training of health workers of all levels in Kenya, Uganda, and Ethiopia.

Zeenia Billimoria, MD

Clinical Interests: Providing care to critically ill, high-risk newborns as part of a multi-disciplinary team. Caring for neonates requiring ECMO.

Scholarly Focus: Dr. Billimoria’s interests lie in studying outcomes of neonates in Washington State using the CHARS database. She is currently studying the outcomes of early term infants. She also has an interest in telemedicine and is working on projects with the NEST team.

Administration/Education Roles: Dr. Billimoria is the Associate Medical Director of Seattle Children’s Hospital NICU. She participates in simulation education with special interest in ECMO simulation.

Shilpi Chabra, MD

Clinical Interests: Dr. Chabra is passionate about all aspects of the care of infants with gastroschisis. She helped develop the clinical pathway guidelines used pre and postnatally at UW and SCH, and continues to update and review these guidelines.

Scholarly Focus: Effects of prematurity and small-for-gestational age on outcomes of fetal gastroschisis; Optimal ultrasound formulae to assess fetal growth restriction; Use of ultrasound checklist to determine the timing of delivery in fetal gastroschisis; histopathological evaluation of intrauterine demise of fetal gastroschisis; trends in gastroschisis and diaphragmatic hernia outcomes using national database.

Administration/Education Roles: Medical Director of the NICU at Overlake Hospital with multiple relevant quality improvement projects such as effects of empiric antibiotic treatment on exclusive breastfeeding rates; effects of 2017 AAP Hepatitis B vaccine guidelines on newborn vaccine success; effects of 39 week initiative on late preterm and early term births. She helped establish the Overlake infant nutrition clinic which serves as Washington State DOH model for preterm infants’ safe transition from hospital to home, and she is a physician advisor for Washington State DOH. She is extremely passionate about trainee
wellbeing and educating Pediatric residents/fellows who are the future generation of Neonatology providers.

Pattaraporn Chun, MD

**Clinical Interests:** Providing care to critically ill infants, with an emphasis on implementing evidence-based neuroscience and neurobehavioral knowledge to optimize neurodevelopmental outcomes of high-risk newborns.

**Scholarly Focus:** Dr. Chun’s research interest includes neurodevelopment and neuroprotection for infants at high risk of developmental delay. She has studied metabolite changes as potential biomarkers of brain injury in a non-human primate model. She is pursuing a graduate degree in Neuroscience at the University of Washington.

**Administration/Education Roles:** Through mentoring medical students, pediatric residents and neonatal fellows, Dr. Chun’s primary teaching goal is to promote self-directed learning with a focus on bedside critical thinking and incorporation of evidence based medical knowledge.

Robert DiGeronimo, MD

**Clinical Interests:** Neonatal respiratory failure management, ECLS, BPD, surgical diseases of the newborn, transport medicine.

**Scholarly Focus:** Outcomes based research in tertiary care Children’s Hospital level IV NICUs using large multicenter databases to include the Children’s Hospital Neonatal Database Collaborative (CHND) and the Extracorporeal Life Support Organization (ELSO). Dr. DiGeronimo is currently the co-site sponsor for Seattle Children’s Hospital for the CHND and is involved in numerous study focus groups in the areas of congenital diaphragmatic hernia, necrotizing enterocolitis, bronchopulmonary dysplasia, ECMO and hypoxic ischemic encephalopathy. He is also involved in numerous NICU quality improvement initiatives involving NICU care at Seattle Children’s Hospital as well as nationally.

**Administration/Education Roles:** NICU Medical Director for Seattle Children’s including oversight responsibility for neonatal ECMO and transport. He is involved with the clinical training of residents, fellows, nurse practitioners and PA students at Seattle Children’s as well as at other Seattle Children’s and University of Washington affiliated teaching sites.

Cyril Engmann, MD

**Clinical Interest:** Maternal, newborn and child health and survival, optimizing nutrition and early childhood development in low and high-income settings; assuring holistic, family-centered, high quality care to infants and their families in community and facility settings.

**Scholarly Focus:** Dr Engmann is widely regarded as a global leader in the field of maternal, newborn child health and nutrition (MNCHN). He is regularly invited to partner with a broad cross-section of stakeholders including United Nations agencies such as the World Health Organization and UNICEF, private foundations, academic centers and non-governmental organizations. He frequently leads MNCHN policy, implementation and educational dialogues with national governments including the Governments of India, South Africa, Mozambique, Ethiopia and Ghana. He chairs a consortium that advises Britain on how best to spend and invest its overseas development money on nutrition through conducting in-depth
country and international-level research and analysis, and regularly conducts educational briefings at the US Senate. Cyril remains passionate about the generation, transfer, preservation and pragmatic utilization of knowledge through interdisciplinary collaborations, establishing strategies, and executing integrated programs that improve the human condition and put bold solutions into action.

**Administration/Education Roles:** Cyril Engmann is the Global Program Leader for Maternal, Newborn, Child health and Nutrition at PATH, an international non-governmental health organization driving transformative innovation to save lives in 70 countries. The MNCHN departments work spans the value chain from research, policy and planning, technical assistance, program and implementation science at global and national level, and represents funding received from a wide variety of sources including the National Institutes of Health & Centers for Disease Control, private foundations such as Gates, CIFF, Hilton, Family Larsson Rosenquist, and governments including USAID & DFID.

Elizabeth Flanigan, MD

**Clinical Interests:** Providing evidence based care to critically ill, high-risk newborns that is family centered. Her specific areas of interest include neonatal resuscitation, minimizing invasive ventilation, effective communication with parents, and neurodevelopmental outcomes.

**Scholarly Focus:** Dr. Flanigan is primarily an academic clinician who is working to improve care of infants by bringing evidence based care to the bedside.

**Administrative/Education roles:** Dr. Flanigan is the Associate Medical Director of the NICU within the Franciscan Healthcare System within this role she is focused on quality improvement and protocol development. Providing quality education and mentoring of fellows, residents and medical students, with emphasis on clinical thinking and communication.

Christine A. Gleason, MD

**Clinical interests:** Dr. Gleason’s primary areas of interest are the prevention of prematurity, ethical issues at the “limits of viability,” neonatal pain management and neonatal abstinence syndrome.

**Scholarly focus:** Health policy, particularly maternal and newborn care issues, and the scholarship of integration. She is particularly interested in writing and editing books (Avery’s Diseases of the Newborn for example).

**Administrative/Education roles:** Dr. Gleason has been a co-editor of Avery’s Diseases of the Newborn, a major neonatal textbook, for the last three editions. She is also the Deputy Medical Editor of the Neonatal SubBoard of the American Board of Pediatrics. Her administrative duties include being Secretary/Treasurer of the American Pediatric Society, on the Executive Committee of the Pediatric Academic Societies Annual Meeting, and she is a member of the Coordinating Committee for the International Neonatal Consortium.

Megan Gray, MD

**Clinical Interests:** The application of evidence based medicine to optimize growth and healing for all infants who require intensive care. She has a focus on maximizing the breastmilk and/or breastfeeding experience for mother baby dyads and preserving early family bonding.
**Scholarly Focus:** Improving medical education and emergency preparedness for all team members in the Neonatal Intensive Care Unit (NICU). She is investigating how interdisciplinary simulation can lead to improvements in clinically relevant outcomes and measures of teamwork. She is the Director of Kinestatic Learning in the Neonatal Education and Simulation-Based Training Program (NEST) where she is investigating how to use motion based technology to deepen our understanding of how providers perform chest compressions.

**Administration/Education Roles:** Resident, fellow and interdisciplinary education through simulation and other technology based platforms. She works with Drs. Sawyer, Umoren and Strandjord as part of the NEST Program to provide education for neonatal care teams within the WWAMI region.

Sarah Handley, MD

**Clinical Interests:** ECMO in the neonate and management of the chronically ill/surgical neonate.

**Administration/Education Roles:** She is committed to fellow and resident education and assists in the Fellows’ Curriculum Conference (Comprehensive review of Neonatal Board Topics over 3 years). She is also active in quality improvement in our community neonatal intensive care nurseries, along with outreach teaching in the community, and serves as liaison between the Seattle Children’s Hospital Neonatal Nurse Practitioner program and neonatology attending teams.

Anna Hedstrom, MD

**Clinical Interests:** Interdisciplinary, family-focused neonatal intensive care and investigation of targeting respiratory support to a newborn’s specific needs

**Scholarly Focus:** Dr. Hedstrom’s research has focused on clinical research and the implementation of neonatal intensive care in resource limited areas globally. In particular she researches ways to provide safe, ethically sound and scientifically supported continuous positive airway pressure (CPAP) for newborns. She has also designed and implemented a novel data collection process in a rural Ugandan NICU with which she is able to assess clinical course and outcomes real-time. Her current research focuses on the use of a respiratory severity score as a tool to predict increased respiratory support after birth. This includes investigation of use of a respiratory score to guide support decisions including “in and out” surfactant administration.

**Administration/Education Roles:** Dr. Hedstrom is the Associate Medical Director of the neonatal unit at Providence Regional Medical Center Everett. Her teaching includes medical students, residents, neonatology fellows, nurse practitioners and physician assistants at the University of Washington and Seattle Children’s Hospital as well as instructing providers in the community and abroad in neonatal care and resuscitation.

Melinda Hendrickson, MD

**Clinical Interests:** Focus on reduced ventilator induced lung injury with application of non-invasive ventilation methods in the preterm infant and better growth and neurodevelopmental outcomes of NICU babies with improved nutritional practices.

**Scholarly Focus:** Implementation of potentially better practices to reduce chronic lung disease. Extremely low birth weight infants have high incidence of chronic lung disease following treatment of acute
Respiratory Distress Syndrome, Chronic lung disease in preterm infants is a marker for long term neurodevelopmental outcomes and contributes to hospital length of stay. With less invasive respiratory support, chronic lung disease rates may decrease and severity may decrease with other members of the neonatology division, she will monitor the impact of new practice management guidelines in the delivery room on the development of chronic lung disease

**Administration/Education Roles:** Resident and fellow education in the NICU as well as mentoring the NNP staff in university affiliated community nurseries.

**J. Craig Jackson, MD, MHA**

**Clinical Interests:** Prenatal neonatal counseling; critically ill infants with complex surgical and/or pediatric subspecialty problems.

**Scholarly Focus:** Development of workshops for teaching empathetic communication skills and how to best help parents make difficult therapeutic decisions for their children.

**Administration/Education Roles:** Lead neonatology consultant in the Seattle Children’s Prenatal Diagnosis Clinic and the University of Washington Maternal-Infant Care Clinic; member of the CONNECT program leadership team (for enhancing clinician communication skills); Associate Division Head for Regional Neonatal Program Development; member of Children’s University Medical Group Board of Directors; chair of the CUMG contracting committee; CUMG representative on the Clinical Integrated Network Finance Committee; member of the SCH/UW pediatric intern retreat steering committee; division educator on professional billing documentation and compliance.

**Elizabeth N. Jacobson, MD**

**Clinical Interests:** Quality of care of newborns, including those with congenital, surgical and/or multi-complex disorders. Dr. Jacobson pursues multi-disciplinary, evidence-based, guideline-directed, and individualized management for these patients.

**Scholarly Focus:** Evidence-based guideline development for neonates, particularly those undergoing surgical operations.

**Administration/Education Roles:** Director of Quality, Division of Neonatology; Site Physician Sponsor for SCH NICU in the Children’s Hospitals Neonatal Consortium and Database. Clinical training of medical students, residents, and fellows, as well as neonatal PAs.

**Sandra Juul, MD, PhD**

**Clinical Interests:** Optimizing care for the critically ill newborn with a particular focus on discovering and implementing neuroprotective approaches to care.

**Scholarly interests:** Dr. Juul's research mission is to improve the neurodevelopmental outcomes of at risk neonates. As such, she has focused on developing neonatal models of brain injury, neuroprotective interventions, biomarkers of neonatal disease, and discerning and maintaining iron sufficiency in the preterm infant. Animal models used or developed in her lab include the Vannucci model of hypoxia ischemia, middle carotid artery occlusion as a model of stroke, and novel models of neonatal stress in rodents, a ferret model of preterm encephalopathy, and a nonhuman primate model of perinatal asphyxia. Dr. Juul has been fortunate to translate her bench research on erythropoietin (Epo)
neuroprotection to the bedside, and is now principal investigator of the ongoing NIH funded clinical trial of Preterm Epo Neuroprotection (PENUT), and co-principal investigator of a multicenter phase III of Epo neuroprotection in term infants with hypoxic ischemic encephalopathy (HEAL).

**Administration/Education Roles:** Dr. Juul became Division Head in Jan 2015, and has been actively recruiting and hiring new research and clinical faculty. Nationally, she is currently the Chair of the neonatal sub-board of the American Board of Pediatrics (yes, writing exam questions!), is a member of the Committee of the Fetus and Newborn and liaison to the AAP Executive Committee and is Chair of the Developmental Brain Disorders NIH study section, and co-editor of Avery’s Diseases of the Newborn, 10th edition. She is a sought after speaker at National and International meetings. Locally, Dr. Juul participates in the research education of undergraduate students, residents and fellows in her lab, as well as the clinical education of pediatric residents and neonatology fellows. She is also a member of the promotions committee.

**Christina Long, DO**

**Clinical Interest:** Providing family-centered care for all NICU patients.  
**Scholarly Focus:** Administration and quality improvement to improve neonatal outcomes. Dr. Long has an interest in continuing to develop evidence-based guidelines for management of neonatal problems and assessing their effectiveness in improving neonatal care and outcomes.

**Administration/Education Roles:** Serves as the NICU Medical Director at Valley Medical Center. Dr. Long is involved in teaching medical students, residents, fellows, and nurse practitioner students during their NICU rotations.

**David Loren, MD**

**Clinical Interests:** Innovating family centered strategies for developing comprehensive multi-disciplinary care plans in the neonatal ICU. Dr. Loren is passionate about engaging families in partnerships with the clinical care team. He describes his motivation as “In this I believe...a society is defined by how it provides care for its most vulnerable members.”

**Scholarly Focus:** Dr. Loren studies inter-professional and parent-provider communication centered on issues of transparency and accountability. He is a principle investigator and co-investigator on several projects studying communication of unanticipated outcomes and disclosure of medical errors throughout the continuum of perinatal and newborn care. He is interested in how clinical care teams maintain – and lose – situational awareness and how teams debrief crisis situations. He is also collaborating with leaders in patient advocacy to produce documentaries exploring how parents and clinical team members integrate their experiences of the newborn ICU.

**Administration/Education Roles:** He mentors and supports residents and fellows at the University of Washington and Seattle Children’s Hospital NICUs. His administrative responsibilities include serving as the Associate Medical Director of the UWMC NICU and course director for medical students rotating in the NICU at the University of Washington. Dr. Loren also leads Neonatal Resuscitation Program courses for residents, clinical faculty and community providers.
Dennis E. Mayock, MD

Clinical Interests: Evaluation of therapies that may potentially improve the neurodevelopmental outcomes of preterm and term infants. Foster interest in neonatal trainees in clinical research project design, management and completion.

Scholarly Focus: Clinical research activities that have the potential to improve the quality of life for NICU patients, not only while inpatients but also the long term improvement in their health. This focus includes the multiple clinical activities:
- Participation in studies that minimize the development of bronchopulmonary dysplasia such as inhaled nitric oxide and late surfactant treatments.
- Evaluation of whether high dose erythropoietin treatment has neuroprotective effects in pre-term and term infants.

Administration/Education Roles: Associate Division Head for Scholarship and Research in the Clinical arena. Design programs to educate future clinical researchers. Education responsibilities include training future pediatricians, neonatologists, neonatal nurse practitioners, and NICU nursing staff.

Michael D. Neufeld, MD, MPH

Clinical Interests: Long-term neurodevelopmental outcomes of premature infants. He is also interested in quality improvement, patient safety, eliminating nosocomial infections, and medical education.

Scholarly Focus: His research has focused on maternal infection and the risk of cerebral palsy in term and preterm infants and markers of inflammation and the risk of severe retinopathy of prematurity. He mentors MPH students studying perinatal epidemiology as well as Neonatology fellows and Developmental and Behavioral Medicine fellows interested in neonatal outcomes.

Administration/Education Roles: Medical Director of the NICU at Providence Regional Medical Center in Everett (PRMCE), where he has developed a 3rd-year rotation for neonatal fellows. He is also Medical Director of the Neonatal Transport Team at PRMCE. Along with Tom Strandjord, he manages the Division's clinical database, participation in the Vermont Oxford Network, and developed a database of patients seen in the High-Risk Infant Follow-up clinic. He mentors neonatology fellows in data management and in research projects using the databases.

Pratik Parikh, MD

Clinical Interests: Neonatal neuroprotection, neonatal pain and neurodevelopmental outcomes.

Scholarly Focus: His area of research is neonatal neuroprotection. He research is focused towards understanding mechanism of neuronal injury in term and preterm infants. Simultaneously testing novel molecules for neuroprotection in animal model of neonatal brain injury. He is developing a pilot study, to look at curcumin as a potential neuroprotective agent in neonatal hypoxic injury model. Pratik is also interested in preterm brain injury and has developed a novel rodent model of preterm brain injury and also is working with Dr. Juul in developing a Ferret model of preterm brain injury.

Administration/Education Roles: Resident and fellow education in the NICU
Krystle Perez, MD, MPH

Clinical Interest: Providing evidence-based care for critically ill newborns, improving neonatal care and outcomes in developed and developing countries, and medical education.

Scholarly Focus: Dr. Perez’s scholarly focus is on global health specifically revolving around the mechanisms to improve neonatal care and outcomes in low resource environments. Her area of expertise falls primarily in low resource settings in Latin America and the Caribbean.

Administration/Education Roles: Resident and fellow education in the NICU and the Associate Medical Director, Overlake NICU

Taylor Sawyer, DO, MEd

Clinical Interests: Neonatal resuscitation and care of extremely premature infants.

Scholarly Focus: Medical education and the use of medical simulation to improve clinical skills and patient outcomes.

Administration/Education Roles: Dr. Sawyer is the Director of Medical Simulation at Seattle Children's Hospital, Director of the UW/Seattle Children’s Neonatal-Perinatal Fellowship Training Program, Director of Outreach Education for the UW Neonatal Education and Simulation-based Training (NEST) Program, Chair of the American Academy of Pediatrics Section on Simulation and Innovative Learning Methods, an Executive Committee Member of the International Pediatric Simulation Society, a member of International Liaison Committee on Resuscitation (ILCOR) Neonatal Delegation, and a member of the Neonatal Resuscitation Program (NRP) Steering Committee. He is an active educator and is involved in multiple graduate and continuing medical education courses and workshops locally, regionally, and nationally.

Kendra Smith, MD

Clinical interests: Dr. Smith's clinical focus is on lung injury prevention in preterm and term neonates. She works clinically on strategies to minimize lung trauma in infants requiring ventilation due to respiratory failure in the neonatal period.

Scholarly Focus: Dr. Smith is the site Principal Investigator at Seattle Children’s Hospital for two industry-sponsored trials (United Therapeutics trial entitled “Intravenous Remodulin (Treprostinil) as Add-on Therapy for the Treatment of Persistent Pulmonary Hypertension of the Newborn: A Randomized, Placebo-Controlled, Safety and Efficacy Study”, and for the Pfizer study titled “A multi-centre, randomized, placebo-controlled, double-blind, two-armed, parallel group study to evaluate the efficacy and safety of IV Sildenafil in the treatment of neonates with persistent pulmonary hypertension of the newborn or hypoxic respiratory failure and at risk for PPHN, with a long term follow-up investigation of developmental progress 12 and 24 months after completion of study treatment.” She is also working on a hospital-based study entitled “Liquid Assisted Ventilation for Lung Recruitment and Protection in Patients with Congenital Diaphragmatic Hernia Requiring Extracorporeal Life Support” which is funded by private monies from the Ladybug Foundation. To promote improved care for infants while on transport she works with others in the Division on telemedicine for our transport services.

Administration/Education Roles: Dr. Smith is involved in the Extracorporeal Life Support Program at Seattle Children’s Hospital and serves on the Steering Committee, which focuses on improving techniques to maximally support newborn infants not responsive to conventional therapies. She also serves as the
Manager of Divisional Respiratory Care Programs with the goal of promoting improved ventilation strategies for neonates requiring ventilatory support in our region.

Thomas P. Strandjord, MD

**Clinical Interests:** Improving outcomes of premature infants, with particular interest in delivery room resuscitation.

**Scholarly Focus:** Quality Improvement and medical education in newborn care and resuscitation. His current projects include the use of video recording of newborn resuscitations in the education of newborn caregivers. He also studies the use of simulation in the training of medical personnel in the Newborn Resuscitation Program and advanced life support.

**Administration/Education Roles:** He serves as the Medical Director for the neonatal intensive care unit of the University of Washington Medical Center. He also assists in the management of a clinical database of all infants admitted to the University of Washington Medical Center NICU. This database serves as a resource for quality improvement projects and clinical research projects.

Colin Studholme, PhD

**Scholarly Focus:** Fetal and neonatal brain imaging. Dr Studholme has brought expertise in computational imaging, imaging physics and image analysis to pre-natal and post-natal imaging. His group has been developing and applying new imaging and image analysis tools to more accurately and robustly map early brain functional and structural connectivity before and shortly after birth, to provide markers for abnormal development and brain injury. His work at UW has expanded to recruiting and scanning a large cohort of normal pregnancies to construct a reference database for how the normal human brain develops before birth and how brain anatomy varies at different gestational ages during pregnancy. In addition to studying normal brain growth he is involved in projects on neurodevelopmental abnormalities such as ventriculomegaly, fetal alcohol exposure, fetal cardiac abnormalities and intra-uterine growth restriction. In addition to his ongoing research in this area, he is a co-investigator on the randomized controlled trial of Epo neuroprotection in extremely preterm infants (PENUT Trial), with the specific aim of evaluating brain growth of Epo treated infants as compared to controls.

Christopher Traudt, MD

**Clinical Interest:** The application of family-centered care in the Neonatal Intensive Care Unit (NICU). The NICU can be very intimidating to parents and he believes that care of the infant is incomplete without parental guidance throughout the NICU stay.

**Scholarly Focus:** Dr. Traudt participates in ongoing division studies of neurodevelopment and neuroprotection in both animal models and in the PENUT and HEAL trials. His particular expertise is in MRI analysis. He is investigating the effects of neonatal brain injury on cerebellar development.

**Administration/Education Roles:** Associate Medical Director for Valley Medical Center. He is an active teacher of both Residents and Fellows in the NICU as well as in the laboratory setting.

Rachel Umoren, MD

**Clinical Interest:** Education and family support for parents with infants in the NICU
Scholarly Focus: Simulation research with the goals of safe patient care and improved clinical outcomes. Her research interests include the use of emerging technologies, including virtual and augmented reality simulations as an investigative methodology in the areas of teamwork, communication, and neonatal resuscitation in local and global health settings.

Administration/Education Roles: She is the Director of the Neonatal Education and Simulation Training (NEST) Program

Linda Wallen, MD

Clinical Interests: Dr. Wallen is passionate about the practice of evidence-based medicine. She is an avid life-long learner, and applies her knowledge to the care of our critically ill newborns. She is particularly involved with improving the respiratory outcomes of extremely preterm infants.

Scholarly Focus: Coordination of evidence-based guidelines for management of neonatal problems at all Division sites of practice, with the goal of measuring the effect of guidelines on the quality of care.

Administrative/Education Roles: She coordinates the clinical schedule and the delivery of care at all of the NICUs staffed by the Division of Neonatology. She works directly with the medical directors at the community sites to develop strong medical management and excellent care. Additionally, she is working with medical directors at community NICUs to implement guidelines of care and quality improvement initiatives. Dr. Wallen has a passion for teaching and continuing to learn through teaching. She believes that evidence-based practice should be the cornerstone of clinical practice, and is working to establish evidence-based guidelines for management of common neonatal problems.

Elliott M Weiss, MD, MSME

Clinical Interests: Newborn health, ECMO, neonatal bioethics

Scholarly Focus: Dr. Weiss’s primary research interest is in the area of medical decision-making, with a special focus on parents as decision makers for their sick infants in the NICU. This work encompasses several different facets of decision making. For example, how do we decide which NICU interventions require parental awareness, concurrence, verbal agreement, or signed consent? This decision is currently largely influenced by historical factors, local custom, and perceived liability concerns with less consideration of parental preferences. How do we present medical decisions? Insights from behavioral economics suggest that choice architecture and bias are crucially important—and have been largely ignored within medicine. When is a decision made? We structure communication and consent as though decisions are made the moment choices are presented by the physician, but it is likely the decision was made far earlier. In sum, Dr. Weiss aims to understand how parents approach decision-making to better tailor consent practices to their values and preferences.

Administration/Education Roles: Dr. Weiss co-leads monthly resident ethics teaching rounds at the UWMC and SCH NICUs. He is also the track director of neonatal bioethics, which promotes bioethics research among neonatology trainees. He created the Neonatology and Decision-Making interest group that meet twice a month to discuss topics pertinent to clinical and research neonatal ethics. He also serves on the SCH ethics committee.
Stephen Welty, MD

Clinical Interest: General Neonatology, comprehensive care in patients with severe BPD. Non-Invasive Respiratory support.

Scholarly Focus: QA: Guideline development for nasal CPAP and measuring the effect. Guideline and Critical Pathway Development for lowering gestational age at SJMC, measuring outcomes. Mentoring remains a focus for junior faculty and fellows. He is one of the founding members of the national BPD collaborative and remain involved there in an advisory capacity.

Administration/Education Roles: Dr. Welty is the Medical Director of the Franciscan Health System Neonatal service line in the South Sound area.

PUBLICATIONS: JULY 2017 – JUNE 2018

(Faculty, Fellow)

PEER-REVIEWED ARTICLES

2017


13. Kavle J, Mehanna S, Hassan M, Gulsen S, Engmann CM. Program considerations for integration of nutrition and family planning: Beliefs around maternal diet and breast feeding within the context of the nutrition transition in Egypt; Matern Child Nutr 2017; 0:e12469


28. Kamino, Daphne and Studholme, Colin and Liu, Mengyuan and Chau, Vann and Miller, Steven P and Synnes, Anne and Rogers, Elizabeth E and Barkovich, A James and Ferriero, Donna M and Brant, Rollin and others, "Postnatal polyunsaturated fatty acids associated with larger preterm brain tissue volumes and better outcomes.", Pediatric Research, 2017


2018


7. **Chabra S.** Standardized categories of ‘preterm births’ vital to study risks for prematurity. *BJOG.* 2018 Apr;125(5):633-634. PMID:29318714


Reproductive Sciences, 2018 Jan;25(1)


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CHAPTERS, TEXTBOOKS

2017


2018


15. **Colin Studholme**, Ellise Ward, Michael Hirano, Jason Cacutt, Michelle Tiedeman, Kirby Souter, Manjiri Dighe, “The confound of fetal movements on measures of placental function”, the first ISMRM workshop on MRI of the Placenta, Feb 2018


17. **Wallen LD**, Gleason CA. “Perinatal Substance Abuse” in Avery’s Diseases of the Newborn, 10th edition, Elsevier Saunders, 2018

18. Ferrieri P, **Wallen LD**. “Neonatal Bacterial Sepsis and Meningitis” in Avery’s Diseases of the Newborn, 10th edition, Elsevier Saunders, 2018

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**OTHER PUBLICATIONS**

**2017**


**2018**


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**PRESENTATIONS BY INVITATION (JULY 2017 – JUNE 2018)**

**2017**


2. **Batra, M.** “Preventing and Mitigating Physician Burnout to Improve Wellbeing and Resilience.” Pediatric Grand Rounds, Children’s Hospital of Michigan – Wayne State University, Detroit, MI.

3. **Chabra S, Strandjord T, Peeples E.** Longer Non-Invasive Ventilation in Extremely Low Birth Weight Infants is Associated with Increased Risk of Bronchopulmonary Dysplasia, Children’s Hospital
Network Consortium (CHNC) Annual Meeting in Columbus, Ohio, Oct 4 – 6, 2017, Poster Symposium; Shilpi Chabra, presenting author


5. **Chabra S**, Bridges M, McRae M, Strandjord TP. Effects of Sepsis Calculator implementation on breastfeeding rates by empiric treatment of maternal chorioamnionitis-exposed newborns., Clinical Care Congress meeting, Overlake Hospital, Bellevue, Nov 15, 2017, Poster presentation; Shilpi Chabra, presenting author

6. **Chabra S**. Invited Speaker, "Incidence of gastroschisis in Washington state", Pediatric Surgery department of McLane Children's Hospital, Temple, Texas. Sept 2017

7. **Chabra S**. Invited Speaker, "Development of prenatal clinical pathway for gastroschisis ", Pediatric Surgery department of McLane Children's Hospital, Temple, Texas. Sept 2017


9. **Chabra S**. Visiting Professor, “Epidemiology and global incidence of gastroschisis”, Dayton Children's Hospital, Dayton, Ohio. Oct 2017

10. **Chabra S**. Visiting Professor, “Family and Parent Centered care in the NICU,” Dayton Children's Hospital, Dayton, Ohio. Oct 2017


12. **Chabra S**. Visiting Professor, “Parents as partners in Care in the NICU”, Mount Sinai Children's Hospital, Chicago, Illinois. Oct 2017


15. **Chabra S**. Invited speaker, ‘Outcomes of Non-invasive ventilation and Neuromuscular adjustment ventilatory assist (NAVA)’: University of Washington Fellowship Orientation conference, Seattle, WA. Jul 2017
16. **Chabra S.** Invited speaker, ‘Probiotics in neonates’: Pharmacy and Therapeutics Committee meeting, Overlake Hospital, Bellevue, WA. Aug 2017


18. **Chabra S.** Invited speaker, “Neonatal Intensive Care Unit: Annual QI presentation”, Overlake Hospital QI Committee, Overlake Hospital and Medical Center, Bellevue, WA Aug 2017

19. **Chabra S.** Invited speaker, ‘Impact on breastfeeding rates by empiric treatment of maternal chorioamnionitis-exposed newborns’. Pediatrics Section meeting, Overlake Hospital and Medical Center, Bellevue, WA. Sept 2017

20. **Chabra S.** Invited speaker, ‘Neonatal intensive care quality outcomes and goals’. Quality improvement Committee, Overlake Hospital and Medical Center, Bellevue, WA. Sept 2017


22. **Chabra S.** Invited speaker, ‘Decreased admissions to NICU and improved breastfeeding rates by use of sepsis calculator for treatment of maternal chorioamnionitis-exposed newborns: Quality Improvement VON project’. Pediatrics Section meeting, Overlake Hospital and Medical Center, Bellevue, WA. Dec 2017

23. **Chabra S.** Invited speaker, ‘Promoting Provider Resilience and Well-being’. Seattle Children’s Advanced Practice Providers meeting, Overlake Hospital and Medical Center, Bellevue, WA. Dec 2017


27. **Engmann, C.** “From Evidence to policy: What it takes to bridge the gap.” Buenos Aires, Argentina, Chair: International Congress on Nutrition, Nov 2017


33. **Jeanne Krick, MD; Shefali Haldar, BS, PhD(c); Anna Synder, MD, MA; Douglas Opel, MD, MPH.** The Parental Experience of Uncertainty in the Neonatal Intensive Care Unit. Conference on Military Perinatal Research; San Antonio, Texas; Nov 2017 [Platform Presentation].

34. **Hendrickson, M.** Invited Speaker, Introduction to High Frequency Oscillator, Neonatology Fellow orientation lecture, Seattle Children’s Hospital, Seattle WA. Jul 2017.

35. **Jackson, CJ.** Missoula, MT: “Case review of neonatology transfers from Community Medical Center to Seattle Children’s from Oct 2016 through June 2017” Jul 2017.

36. **Jackson, CJ.** Yakima, WA: “Case review of neonatology transfers from Virginia Mason Memorial Hospital to Seattle Children’s during 2017” Sept 2017

37. **Wood T, Moralejo D, Corry K, Gebert JT, Snyder JM, Traudt CM, Juul SE.** Characterization of Motor and Reflex Development in a Novel Ferret Model of Encephalopathy of Prematurity. PAS 2017


39. Gebert TJ, **Wood T, Corry K, Juul SE, Parikh PK.** Curcumin is anti-inflammatory and reduces microglial cell death during oxygen-glucose deprivation. PAS 2017

40. An N. Massaro, Theo Bammler, James MacDonald, **Sandra Juul.** Epigenetic biomarkers of cerebral palsy in extremely low gestational age neonates (ELGANs) – A pilot study. PAS 2017

41. Adam Frymoyer, **Sandra E. Juul**, An N. Massaro, Theo K Bammler, Yvonne W. Wu. High-Dose Erythropoietin Population Pharmacokinetics in Neonates with Hypoxic-Ischemic Encephalopathy
Receiving Hypothermia. PAS 2017

42. Anita Shah, Benjamin Wilfond, Amy Silvia, David Woodrum, Sandra Juul. Parental Attitudes Toward Neonatal Clinical Trial Enrollment. PAS 2017.


47. Smith, K. Pulmonary Hypertension in the Newborn.” Fellow’s Onboarding Lecture. University of Washington, Seattle, WA. July 2017


49. Smith, K. “Extracorporeal Life Support in Neonates.” Presentation, Joint Neonatal, Cardiac, PICU Fellow’s ECLS Class, Seattle Children’s Hospital, Seattle, WA. July 2017


53. Studholme, C. ISMRM Workshop on Motion Correction in MR/MRS. Invited Speaker. Sept 2017

55. **Traudt, C.** Invited Speaker” Fellows Neonatology Fellows Conference, University of Washington Seattle, WA Presentation Title: “High Frequency Jet Ventilator.” Jul 2017

56. **Traudt, C.** Respiratory Care Provider Training Day, University of Washington Medical Center, Seattle WA, Title: High Frequency Jet Ventilator. Oct 2017


60. **Umoren, R.**, An Educators Approach to Developing Usable Prototypes for Serious Games in Open Simulator. 2017 OpenSimulator Community Conference. Dec 10, 2017


62. **Umoren, R.**, Invited speaker. eHBB: Virtual reality technology to improve newborn healthcare delivery in low and middle-income countries. Sept 26, 2017


2018

1. Dighe M, Sienna L, **Chabra S.** Estimation of Fetal Weight in Gastroscisis By Fetal Thigh Thickness. Presented at 2018 American Institute of Ultrasound in Medicine, New York, Mar 2018

2. **Chabra S.** Invited speaker, ‘Promoting wellbeing and development of Resilience in Providers’. Seattle Children’s Advanced Practice Providers meeting, Seattle Children’s Hospital, Seattle, WA. Jan 2018

3. **Chabra S.** Invited speaker, ‘Implementation of Angeleyes Camera system in the NICU’. Faculty meeting, University of Washington Medical Center, Seattle, WA. Feb 2018
4. Chabra S. Invited speaker, ‘AAP guidelines for Hepatitis B vaccine’. Pediatrics Section meeting, Overlake Hospital and Medical Center, Bellevue, WA. Feb 2018

5. Chabra S. Invited speaker, ‘Hepatitis B vaccine: Paradigm shift’. Pediatrics Section meeting, Overlake Hospital and Medical Center, Bellevue, WA. Feb 2018

6. Chabra S. Invited speaker, ‘Neonatal Hepatitis B elimination by 2020’. Seattle Children’s Advanced Practice Providers meeting, Overlake Hospital and Medical Center, Bellevue, WA. Feb 2018


11. Juul, SE. Keynote speaker: A Day with the Newborn; an investment in our future. Title: Neonatal Neuroprotection. St. Christopher’s Hospital for Children, Philadelphia, PA. Jan 26, 2018

12. Juul, SE. Visiting Professor, Washington University, St. Louis Missouri. Grand Rounds. Title: Neuroprotective Strategies for High Risk Newborns. Feb 22- 23, 2018

13. Jeanne Krick, MD; Shefali Haldar, BS, PhD(c); Anna Synder, MD, MA; Elliott Weiss, MD, MSME; Douglas Opel, MD, MPH. The Parental Experience of Uncertainty in the Neonatal Intensive Care Unit. Western Conference on Perinatal Research; Indian Wells, California; Jan 2018 [Platform Presentation].

14. Jeanne Krick, MD. When Parents and Doctors Disagree. Department of Pediatrics Morning Report; Madigan Army Medical Center; Tacoma, Washington; March 2018 [Invited Speaker].

15. Jeanne Krick, MD. A Parent’s Request to Withhold a Cancer Diagnosis from a Teenager. Monthly Bioethics Forum; Madigan Army Medical Center; Tacoma, Washington; March 2018 [Invited Speaker].
16. Jeanne Krick, MD; Shefali Haldar, BS, PhD(c); Anna Synder, MD, MA; Douglas Opel, MD, MPH. The Parental Experience of Uncertainty in the Neonatal Intensive Care Unit. Seattle Children's Resident and Fellow Research Day; Seattle, Washington; Apr 2018 [Platform Presentation].

17. Jeanne Krick, MD; Shefali Haldar, BS, PhD(c); Anna Synder, MD, MA; Douglas Opel, MD, MPH. The Parental Experience of Uncertainty in the Neonatal Intensive Care Unit. AAP District VIII Section on Neonatal Perinatal Medicine Annual Conference; Midway, Utah; Jun 2018 [Platform Presentation].


19. Pratik Parikh, Andrea Joseph, Chih-Chung Chen, Kylie Corry, Tommy Wood, Mike McKenna, Rick Liao, Sandra Juul, Jessica Snyder, Elizabeth Nance. Curcumin-loaded brain-penetrating nanoparticles for the treatment of neonatal HIE. Hershey 2018


23. Smith, K. “Pulmonary Hypertension in the Newborn.” Physician Assistant Fellow’s Lecture. Seattle Children’s Hospital, Seattle, WA. Mar 2018


26. Umoren RA. NICU TeamSTEPPS: Teamwork training for NICU professionals. 2018 Serious Games and Virtual Environments Showcase. 18th International Meeting on Simulation in Healthcare. Los Angeles, CA. Jan 14, 2018. Presenter: R Umoren


32. David Askenazi, Kerry Hancuch, Russell Griffin, Patrick Heagerty, Sandra Juul, Stuart Goldstein, Sangeeta Hingorani. Prevalence of acute kidney injury (AKI) in extremely-low gestational age neonates (ELGANs) stratified by gestational age (GA) groups. PAS platform 2018


34. LC Eldredge, R. Creasy, N. Gove, DE Mayock, SE Juul, S. Ziegler. Examining pulmonary monocyte/macrophage populations in BPD pathogenesis

35. German K, Parikh P, Comstock B, Wittington D, Juul S. Urine hepcidin and iron regulation in preterm infants. PAS 2018

36. German K, P Vu, J Irvine, SE Juul. Reticulocyte Hemoglobin Values in Preterm Infants. PAS 2018


38. Christopher M Traudt, Kerry Hancuch, Dennis Mayock, Manjiri Dighe, Patrick Heagerty, Sandra Juul. Timing and Progression of Cranial Ultrasound (CUS) Abnormalities in Extremely Low Gestation Neonates (ELGANs). PAS 2018

39. Massaro, Bammler, Comstock, Yu and Juul. Dried blood spots (DBS) are not a reliable biospecimen for blood-based biomarkers of brain injury in neonatal. PAS 2018

40. Massaro, Bammler, Comstock and Juul. Epigenetic Mechanisms of Erythropoietin (Epo) Induced Neuroprotection in Extremely Low Gestational Age Neonates (ELGAN). PAS 2018

42. Hallie Morris, Amit Mathur, Jessica Wisnowski, Bryan Comstock, Yvonne Wu, Ashok Panigrahy, Stefan Bluml, **Sandra Juul**, Robert McKinstry. Inter-Rater Agreement of the Washington University Neonatal Brain MRI Scoring System Remains Stable Across Severity of Injury in HIE. PAS 2018

43. Snyder JM, Parikh PK, Corry K, **Wood T**, Larmore M, Johnson B, Moralejo DH, **Traudt CM**, **Juul SE**. Ontogeny Of Toll-Like 3 And 4 Receptor Expression And White Matter Development In The Ferret Brain. PAS 2018

44. Mietzsch U, Nawab O, Strait E, Wisnowski J, **Juul S**, Wu Y: Use of sedation for neonatal MRI: change in practice variation within a multicenter trial

45. Pratik Parikh, Andrea Joseph, Chih-Chung Chen, Kylie Corry, **Tommy Wood**, Mike McKenna, Rick Liao, **Sandra Juul**, Jessica Snyder, Elizabeth Nance. Curcumin-loaded brain-penetrating nanoparticles for the treatment of neonatal HIE. Hershey 2018

46. Jessica L. Wisnowski, Raj Kapur, Gail H. Deutsch, Stefan Bluml, **Sandra E. Juul**. Validating MRS lipids as biomarkers of brain injury in a non-human primate model of neonatal hypoxic-ischemic encephalopathy. Hershey 2018

47. Thomas Wood, Daniel Moralejo, Kylie Corry, Jessica Snyder, **Sandra Juul**. Characterization of Early Pathology and Motor Development in a Novel Ferret Model of Encephalopathy of Prematurity. PAS 2018

University of Washington Division of Neonatology

Faculty Organizational Chart

Mission Statement: We will improve the neonatal outcomes of pregnancy by:

- Providing outstanding evidence based neonatal clinical care
- Educating the next generation of neonatal caregivers
- Advancing neonatal scholarship

ACADEMIC AFFAIRS (OVERSIGHT & DIRECTION):
DIVISION HEAD: Sandra Juul

LEADERSHIP COUNCIL:
Craig Jackson, Taylor Sawyer, Thomas Strandjord, Dennis Mayock, Linda Wallen, Robert DiGeronimo

EDUCATIONAL PROGRAMS:
- Fellowship Training Program
- Pediatric Residency Program
- Medical Students Clerkship
- Faculty CME/Performance Improvement
- Regional Outreach
- NEST

SCHOLARSHIP/RESEARCH:
- Clinical
- Basic/Translational
- Educational/Simulation
- Global Neonatal-Perinatal Health
- Clinical Informatics
- Quality Improvement

CLINICAL AFFAIRS:
- Clinical Operations/NICU
- Medical Direction
- Service Contracts
- Transport Program
- NNP Programs
- High-Risk Infant Follow-Up
- Prenatal Diagnosis/Counseling
- Strategic Planning

NATIONAL/INTERNATIONAL SERVICE:
- World Health Organization
- PATH
- AAP
- MOD
- NIH Study Section