

January 2005

## CURRICULUM VITAE

**Name:** Steven A. Ringer, M.D., Ph.D.

**Education:**

1974 B.A.	Brandeis University, Magna Cum Laude
1982 Ph.D.	Case Western Reserve University
1982 M.D.	Case Western Reserve University

### **Postdoctoral Training:**

1982-85	Resident in Pediatrics, Rainbow Babies and Children's Hospital, Cleveland Metropolitan General Hospital, Case Western Reserve University
1983-84	Research Assistant, Marine Biological Laboratories, Woods Hole, MA
1985-88	Fellow in Neonatology, Joint Program in Neonatology, The Children's Hospital, Brigham and Women's Hospital, Beth Israel Hospital, Harvard Medical School, Boston, MA

### **Licensure and Certification:**

1982	National Board of Medical Examiners
1985	Commonwealth of Massachusetts
1986	American Board of Pediatrics
1987	American Board of Pediatrics: Sub-Board in Neonatal-Perinatal Medicine

### **Academic Appointments:**

1987-96	Instructor in Pediatrics, Harvard Medical School
1996-	Assistant Professor of Pediatrics, Harvard Medical School

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### **Hospital Appointments:**

1988- 1998	Attending Neonatologist, Joint Program in Neonatology,
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1998	Harvard Medical School Attending Neonatologist, Harvard Program in Neonatology, Harvard Medical School
1988-1993	Assistant in Medicine (Neonatology) Children's Hospital Boston, MA
1993-	Associate in Medicine (Neonatology) Children's Hospital Boston, MA
1988-	Neonatologist, Beth Israel Hospital, Boston, MA
1988-	Neonatologist, Brigham and Women's Hospital, Boston, MA
1986-	Neonatologist, Newton-Wellesley Hospital, Newton, MA
1986-1997	Neonatologist, Winchester Hospital, Winchester, MA
1986-1990	Neonatologist, Mt. Auburn and Cambridge Hospitals, Cambridge, MA
1996-1999	Consulting Neonatologist, Norwood Hospital, Norwood MA
1998-	Neonatologist, Massachusetts General Hospital, Boston, MA
1998-	Neonatologist, North Shore Children's Hospital, Salem, MA

### **Clinical Responsibilities**

1988	Attending Neonatologist, Brigham and Women's Hospital (4 months)
1989	Attending Neonatologist, Brigham and Women's Hospital (4 months)
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2000	Attending Neonatologist, Brigham and Women's Hospital (3 months)
2001	Attending Neonatologist, Brigham and Women's Hospital (3.5 months)
2002	Attending Neonatologist, Brigham and Women's Hospital (3.5 months)
2003	Attending Neonatologist, Brigham and Women's Hospital (3.5 months)
2004	Attending Neonatologist, Brigham and Women's Hospital (3.5 months)

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### **Major Administrative Responsibilities**

1987-1988	Fellow Coordinator, Neonatal Transport Service,
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	Children's Hospital, Boston, MA
1988-1989	Associate Medical Director, Neonatal Intensive Care Unit, Brigham and Women's Hospital, Boston, MA
1988-1991	Medical Director, Neonatal Respiratory Therapy, Brigham and Women's Hospital, Boston, MA
1988-	Medical Director, Neonatal Laboratory, Brigham and Women's Hospital, Boston, MA
1989-	Medical Director, Neonatal Intensive Care Unit, Brigham and Women's Hospital, Boston, MA. Over 1300 admissions, and additional 2000 short-stay patients, are cared for annually in this 48-bed Level III unit. The patient population includes the full range of neonatal problems, and is enriched by the large Maternal-transfer service and high-risk obstetrics service
1991-1997	Director of Newborn Services, Brigham and Women's Hospital, Boston, MA including the 46 bed Neonatal Intensive Care Unit, and the 76 bassinet Newborn Nurseries. This includes oversight of medical care, unit policies, resident training and fellowship clinical training.
1998	Chief, Division of Newborn Medicine, Brigham and Women's Hospital, Boston, MA, including clinical direction of the Newborn Services, Direction of the faculty group, coordination of activities within healthcare network, directing the Department of Newborn Medicine within the Brigham and Women's Hospital Physician's Organization

**Committee Assignments**

**Partner's Network:**

2001- 2003-	Partners Pediatrics Steering Committee Partners Pediatric Quality Improvement Committee
2002- 2003-	Partners Ethics Leaders Committee Partners Pediatric Planning Committee
2002- 2002- 2003- 2002-	Partners Pediatric Relations Committee Partners Neonatology Group Chair, Partners Neonatology Group Partners Neonatology Quality Assurance Committee

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Hospital:

1988-	Pediatric Review Committee, Chairman, Brigham and Women's Hospital
1988-	Obstetrical Care Committee, Member, Brigham and Women's Hospital
1988-1993	Labor and Delivery Management Committee, Brigham and Women's Hospital
1988-	Medical Records Committee, Member, Brigham and Women's Hospital
1988-	NICU Steering Committee, Chairman, Brigham and Women's Hospital
1988-1991	Perinatal Mortality Committee, Member, Brigham and Women's Hospital
1988-1993	Risk Management Committee, Member, Brigham and Women's Hospital
1988-	Ethics Committee, Member, Brigham and Women's Hospital
1988- 1993	Labor and Delivery Management Committee, Member, Brigham and Women's Hospital
1989-	Intensive Care Committee, Brigham and Women's Hospital
1992-	Medical Staff Executive Committee, Member, Brigham and Women's Hospital
1992-1996	NICU Collaborative Practice Committee, Brigham and Women's Hospital

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1994-2000	Risk Management Committee, Chairman, Brigham and Women's Hospital
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2000-2002 2003-	Ethics Committee, Co-Chair, Brigham and Women's Hospital Ethics Committee, Chair, Brigham and Women's Hospital
1993-1994	Care Improvement Development Project, Member, Brigham and Women's Hospital
1993 Hospital, Boston, MA	Secretary, Medical Staff Organization, Brigham and Women's
1994	Vice Chairperson, Medical Staff Organization, Brigham and Women's Hospital, Boston, MA
1995	Chair-elect, Medical Staff Organization, Brigham and Women's Hospital, Boston, MA
1996  MA	Chairperson, Medical Staff Organization, Brigham and Women's Hospital, Boston
2000	Secretary, Medical Staff Organization, Brigham and Women's Hospital, Boston, MA
2002	Vice Chair Medical Staff Organization Brigham and Women's Hospital, Boston, MA
2003	Chair-Elect, Medical Staff Organization Brigham and Women's Hospital, Boston, MA
2004	Chairperson, Medical Staff Organization Brigham and Women's Hospital, Boston, MA
1996	Vice Chair, Medical Staff Executive Committee, Brigham and Women's Hospital, Boston, MA
1994	Pastoral Care Advisory Committee, Member, Brigham and Women's Hospital
1995-1997	Marketing Steering Committee, Member, Brigham and Women's Hospital
1997- 2004	Ethics Consultation Service, Brigham and Women's Hospital Interim Assistant Director, Ethics Consultation Service, Brigham and Women's Hospital
1998-	NICU Care Improvement Committee, Co-leader
2002-03	Physician Quality of Worklife Committee, Co-chair, Brigham and Women's Hospital, Boston, MA

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**Joint Program in Neonatology /Harvard Program in Neonatology (Departmental):**

1992-	Clinical Research Committee, Chairman
1991-1998	Clinical Executive Committee
1994-1998	JPN Network Steering Committee
1991-	Fellowship Committee
1985-	Clinical Working Group
1991- 2000	Occurrence Review Committee
1988-1998	Quality Improvement Committee
1988-1999	Reorganization Committee

**Government**

1995- Massachusetts,	Maternal Mortality and Morbidity Committee, Commonwealth of Department of Public Health
1998-	Newborn Screening Advisory Committee, Commonwealth of Massachusetts, Department of Public Health
1999-	Perinatal Advisory Committee, Commonwealth of Massachusetts, Department of Public Health
2004	Task Force on Perinatal Regulations, Commonwealth of Massachusetts, Department of Public Health

**Membership in Professional Societies:**

1998-	American Academy of Pediatrics, Fellow
1998-	Section on Perinatal Pediatrics, American Academy of Pediatrics
1998-	American Medical Association
1998-	Massachusetts Medical Society

**Editorial Boards**

1998-	Perspectives in Neonatology, Editorial Board
1996-	ad hoc reviewer, <i>Pediatrics</i> , <i>New England Journal of Medicine</i> , <i>Obstetrics and Gynecology</i>

**Awards and Honors:**

1973	Phi Beta Kappa
1982	Department of Pediatrics Award, Case Western Reserve University
1997	Janeway Award for Excellence in Clinical Teaching, Children's Hospital, Boston, MA
2001-	Partners in Excellence Award, Partners Healthcare Network

**Research, Teaching, and Clinical Contributions**

**A. Narrative Report**

**Clinical Contributions** My clinical practice is in Neonatology, all hospital-based, occurring almost exclusively at Brigham and Women's Hospital (BWH), a major Harvard University-affiliated teaching hospital. This includes 3 to 4 months as Attending physician, directing patient care in the Neonatal Intensive Care Unit. This 46 -50-bed unit has approximately 1400 admissions annually, including critically ill premature and term newborns, infants with genetic disorders or congenital malformations, and less ill (Level II) premature infants. This NICU is the major teaching site for the fellowship in Neonatal-Perinatal Medicine, and for the pediatric residencies of Children's Hospital/Boston Medical Center and The Massachusetts General Hospital. I am the Rotation Director for the resident rotations in the BWH NICU. I also provide in-house faculty coverage in the NICU for 5 nights (or 24-hour weekend day) per month, a major clinical program that I established and coordinate. My responsibilities include direct patient care, clinical supervision and teaching of residents, fellows and medical students in the ICU and delivery rooms, and collaboration in the antenatal management of high-risk pregnancies

As a faculty member of the Antenatal Diagnostic Center at BWH, I provide antenatal consultation for approximately 50-75 women/year who have high-risk pregnancies (due to maternal disorders, pregnancy associated disorders, and identified fetal problems). These consultations include parental counseling and the coordination of postnatal care, including subspecialty consultation. In addition, these consultations include the Newborn Medicine perspective on fetal interventions and treatments. The field of fetal intervention continues to evolve and develop, including a developing number of conditions for which fetal surgery is indicated. I have participated in the development of the fetal intervention program at Brigham and Women's Hospital, and in the coordination of cases requiring fetal intervention and surgery. Along with one other neonatologist, I have participated in the discussions and planning for each case, and have actively provided delivery room and immediate post-partum care for this select group of patients. In addition, because of my role as Co-Chair of the Brigham and Women's hospital Ethics Committee, I have been responsible for coordinating and structuring Ethic Consultations for the caregivers and families involved with these complex cases.

A small percentage of my practice includes Well-Newborn care at Brigham and Women's Hospital, and neonatal care in the delivery room and Special Care Nursery of Newton-Wellesley Hospital, a university-affiliated community hospital. This substantial commitment of time to clinical care and teaching has allowed me to develop extensive expertise and experience in the management of critically ill newborns. The faculty, fellows and nursing staff, consider me to be a clinical leader, and

frequently consult me for help in managing difficult or unusual patients. As Chief of the Division of Newborn Medicine, I am actively involved in the development and implementation of clinical protocols and programs. I serve as a consultant to the Pediatricians practicing at BWH, and to community-based practitioners from eastern Massachusetts and Southern New Hampshire.

**Clinical Administrative Responsibilities:** I am the Chief of the Division of Newborn Medicine at BWH, including the Neonatal Intensive Care unit, the Newborn Nurseries, and I serve as the primary representative of Newborn Medicine on Hospital Committees and as a liaison with other departments. I oversee all administrative functions, including billing, collections, budget and collaborative agreements with Children’s Hospital, and hospitals in the Partners Healthcare System

**Teaching Contributions:** I am committed to providing teaching within the hospital, medical school, locally, regionally, and nationally. I co-developed and co-direct a coordinated Curriculum in Newborn Medicine for residents, and am responsible for teaching sessions on five topics within that curriculum. I developed a pocket manual of Neonatology for residents which we publish, now in its third edition. I teach residents in Obstetrics at BWH, including 3-4 didactic sessions per year as well as teaching at joint conferences and rounds. I teach medical students during their elective rotations in the NICU and in special rounds for HST students. I have participated in the Harvard Macy Institute in Medical Education as a Scholar and as faculty member, and have used the tools from this institute to develop a self-learning curriculum in Neonatology for residents and pediatricians. I am invited to give Grand Rounds at local hospitals several times per year, and I developed a regional program for training in Newborn Resuscitation (part of the American Academy of Pediatrics (AAP)/American Heart Association program). Three years ago I was asked to serve as a faculty member for the Pediatrics Review and Education Program of the AAP, a national teaching program, and I developed and continue to provide the curricular material for an Internet (Worldwide web) teaching site.

**Research Contributions:** I have been the principal or co-investigator for several on-going clinical trials in the BWH NICU, including trials that are part of the NICHD Neonatal Network and locally established studies. These have included trials of erythropoietin therapy in extremely premature infants, early corticosteroid therapy and limited ventilation for preventing chronic lung disease, enhancing growth by augmenting protein intake, and the use of statistical process control in enhancing monitoring data. I have collaborated with investigators from Obstetrics and other departments on additional studies.

Currently, I am the Associate Program Director for Newborn Medicine for the General Clinical Research Center at BWH. In this role I am responsible for coordinating clinical research within the NICU and for supervision of the NICU GCRC research nurse. I work with investigators to coordinate the use of GCRC resources and to streamline data collection between different studies.

Within the GCRC I work with the Program Director and other Associate Program Directors to screen and evaluate potential research protocols and to coordinate resource utilization across the GCRC

**B. Research Funding Information:**

1991-1994	NIH Co-PI Reduction in Cesarean Section Rates by Active Management of Labor
1995	Departmental Funds- Erythromycin Therapy for Feeding Intolerance in VLBW Infants Neonatology PI
2005-	General Clinical Research Center, Brigham and Women’s hospital, Associate Program Director Newborn Medicine

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**Current Research Activities**

Clinical Decision Making in Neonatal Intensive Care and the use of Statistical Process Control in ICU Monitoring

Neonatal Nutrition- Effect of enhanced protein intake on early growth

Serologic Markers for Neonatal Sepsis

Impact of Maternal Epidural Anesthesia on Neonatal Outcome

## **D. Report of Teaching**

### **1. Local Contributions**

#### **a. Medical School**

1990- Present *Newborn Medicine*  
*Course Director*

This is the clerkship in Newborn Medicine at Brigham and Women's Hospital. Four to ten, mostly fourth year students, enroll in one-month clerkships at Brigham and Women's Hospital each year, including students from other medical schools. Over the past three years there have been 2-5 foreign students/ year. As the course director, I arrange the students' schedules, hold individual sessions with them to orient them, and provide individual teaching and review sessions for them. Contact time averages 8-12 hours per student, not including informal sessions during the evening's students are on-call, and 4-6-hours/ month of preparation for teaching sessions.

1987- Present *Introduction to Clinical Medicine- Newborn Medicine*  
*Instructor*

Each year I have been an instructor in the course, teaching the Newborn Physical Examination in two or three sessions, with four or five second year students in each session. Each session requires two to three hours, and includes teaching the examination, observing the students doing an examination, answering questions, and an interactive tour of the Newborn Intensive Care Unit

1993- Present *Special Rounds for HST Students*  
*Lecturer*

These rounds consist of eight two hour sessions held for approximately 30 HST students / year as part of their Introduction to Clinical Medicine. These rounds, the curriculum for which I developed, require several hours of preparation, and include

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discussions of the role of technology in medicine, ethical decision making and the effect of modern medicine, and basic aspects of neonatal intensive care.

**b. Local Teaching (Invited) and Hospital Courses**

1993-97 *Neonatal Nurse Practitioner Program, Northeastern University*  
*Adjunct Faculty*

Two 1 hour invited presentations each year to 6-7 students in the Masters Program for Neonatal Nurse Practitioners. Topics: *Neonatal Respiratory Disease and Air Leak Syndromes*, and *Surgical Emergencies*. Preparation and contact time, approximately 12 hours

1988- *Neonatology Community Outreach Program*

Invited 1-hour presentations at Pediatric Grand Rounds at several local hospitals, attended by 20-50 local pediatricians and obstetricians. 2-4 presentations per year, 25 hours preparation and presentation

Metrowest Medical Center: *Anemia of Prematurity and Erythropoietin*

Metrowest Medical Center: *Chronic Lung Disease in Premature Infants*

Metrowest Medical Center: *Delivery Room Disasters and Difficult Cases*

Emerson Hospital: *Hyperbilirubinemia*

Malden Hospital: *Ethical Decisions in Neonatal Care*

Salem Hospital: *Ethical Decisions in Neonatal Care*

Salem Hospital *Hyperbilirubinemia*

Norwood Hospital: *Neonatal Management Cases*

Cambridge Hospital: *Neonatal Management Cases*

Sturdy Memorial Hospital: *Hyperbilirubinemia*

Newton-Wellesley Hospital: *Hyperbilirubinemia*

Martha's Vineyard Hospital: *Neonatal Sepsis, Neonatal Outcome*

Martha's Vineyard Hospital: *Neonatal Resuscitation, 1997, 1999, 2001, 2003, 2005*

1991- Present *Neonatology Core Curriculum*  
*Organizer and Lecturer*

In 1990, a colleague and I recognized the deficiencies in the educational program for residents during their Neonatology rotations. We noted that the old system of catch-as-catch-can teaching sessions by the monthly Attending often meant that few sessions occurred, or that they were limited in scope. To correct these problems and provide an improved, standardized educational program for every resident, we developed a four part Neonatology Core Curriculum, consisting of approximately 45 lectures/teaching sessions, held during the residents two PL-1 Rotations at Brigham and Women's Hospital NICU, the PL-1 rotation in the Newborn Nurseries, and the PL-2 rotation in the Children's Hospital NICU. We enlisted faculty from the Newborn Medicine and other divisions at Children's Hospital to give monthly lectures on subjects in which they had expertise. Each lecture is repeated monthly for each group of rotation residents.

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To ascertain efficacy of the program we created a brief multiple-choice examination on the topics covered, using questions of our design, and questions taken from the Pediatrics in Review program of the American Academy of Pediatrics. We were able to demonstrate improved test scores after attending these core lectures. We did not attempt to qualitatively assess improvement over the older system, except that resident participation and satisfaction improved.

Each year we publish a revised four-volume syllabus for the curriculum, with teaching materials from each session supplied by the individual lecturers. Every resident is provided with this collection, which averages about 1000 pages in length.

I lead monthly sessions on the following topics: Orientation to Newborn Medicine, Basics of Neonatology, Hyperbilirubinemia, Neonatal Resuscitation, Antenatal/Perinatal Care, and Ethics in Neonatal Care, and have led additional sessions on Neonatal Nutrition, Intraventricular Hemorrhage, and Newborn Screening. Preparation and contact time approximately 12 hours per session, total app. 65 hours per year.

### ***1991 - 97 Perinatology Rounds, Brigham and Women's Hospital***

Perinatology Rounds is a combined conference for Maternal-Fetal Medicine and Neonatology, which meets weekly at BWH. In 1991, we reexamined and then changed the format of these rounds, as they had become increasingly didactic and focused on a single discipline. I presented a one-hour lecture or case discussion monthly, on topics in Neonatology or Perinatology relevant to the perinatal objectives of the rounds. Topics have included: *Decision making in the Delivery room, Antenatal pediatric consults, Liquid ventilation, Hepatitis in the mother and newborn, Tuberculosis in pregnancy, Effect of Preeclampsia on the fetus and newborn, Intracranial hemorrhage in the term newborn, Advances in surfactant therapy, meconium Aspiration, and several others* (preparation and contact time 60 hours/year).

### ***1989- Obstetrical residents teaching rounds***

I have been an invited lecturer in the weekly educational series for residents in Obstetrics. Each year I have presented three to five 1-hour lectures or discussions/year to 15-20 residents. Topics have included: *Newborn resuscitation, Meconium Staining of the Amniotic Fluid, Circumcision, Complications of prematurity, Ethical decision making in Newborn Medicine, Common genetic syndromes, Surfactant therapy and Hyaline Membrane Disease, and Chronic Lung Disease in the premature infant.* (Preparation and contact time approximately 20 hours)

### ***1990- Present Newborn Resuscitation Certification Courses Organizer and Lecturer/Instructor***

Beginning in 1990, I have offered Newborn Resuscitation Courses within the Hospital:

Each year I conduct a special course for all PL-1 Pediatric residents. This course consists of a two-hour didactic component, and two 1-hour practical sessions, for the 35 residents. I also offer review course for PL-2 residents and certification for residents in the Medicine-Pediatrics Residency

I conducted the same course for the 10 residents at Massachusetts General Hospital in 1991-94, and provide review sessions during residency rotations on a monthly or more frequent basis.

Each year I provide a resuscitation course for fellows in Newborn Medicine and provide recertification sessions for all faculty as needed

As part of a commitment to certify all members of the BWH NICU and Labor and Delivery nursing staffs in Newborn Resuscitation, I helped organize 4 -6 courses each year between 1993 and 1998. I was invited to present the two hour didactic portion at 12 of the courses, each attended by 18-25 nurses and respiratory therapists.

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I provide regular course in Neonatal Resuscitation at Community Hospitals, for medical and nursing staff. From 2001 – present I have offered courses at Cape Cod Hospital, Martha’s Vineyard Hospital, and at Brigham and Women’s Hospital for interested pediatricians. The total number of participants has averaged about 45 per year, with preparation and contact time of 20 hours per year.

I have prepared videotape of the didactic component of the course, which is used by nurses and respiratory therapists in the NICU and Labor and Delivery

**1994**                    ***Pediatric Appreciation Day, Children’s Hospital  
Organizer and Presenter***

I participated in the planning for this one-day symposium for practicing pediatricians, held at Children’s Hospital in May 1994. In addition to helping to define a curriculum and organize the conference, I was invited to give a presentation on *Hyperbilirubinemia in the Newborn*, a 20-minute lecture for 60 pediatricians. (Preparation time 15 hours)

**1993-98**                ***Basic Science and Clinical Correlation Conference Series, Joint Program in Neonatology***

Five invited 1 hour lectures to 9 Neonatology fellows: Anemia of Prematurity and Erythropoietin Therapy, and Hyperbilirubinemia: Pathophysiology and Treatment.

**1994-98**                ***Nursing Education Series, BWH***

I worked with two nurses to develop an educational curriculum for nurses in the NICU at BWH. I have presented 8 one-hour lectures to different shifts of nurses, averaging approximately 14 per presentation. Topics include: *Neonatal nutrition, Radiograph interpretation, Sepsis in the Newborn, Apgar Scoring-what it does and doesn’t mean, Anemia of Prematurity, and Ethical Decision Making.*

**1994-97**                ***Career Development Conference Series, JPN***

Two invited 1-hour presentations for this series, designed to aid the fellows and young faculty in their career development. These lectures, attended by 15 fellows and attending physicians, included: *Clinical Research Basics, and Informed Consent*

**1995**                    ***Medical Staff Grand Rounds, Brigham and Women’s Hospital***

Invited 20-minute presentation on *Advances in Surfactant Therapy for Hyaline Membrane Disease*, for 65 physicians at BWH.

**c. Advisory and Supervisory Responsibilities**

**1. Visiting Scholars**

1993-present Supervision of visiting physicians from Korea, Turkey, Taiwan, Switzerland, Colombia, Costa Rica, Panama and Brazil. In 2005 I will host two visiting fellows from Korea (for 3 and 12 months) and one from Turkey (4 months) Each physician visited for between 3 and 12 months and participated in clinical rounds in the NICU under my guidance. Two of the physicians completed clinical research projects under my supervision and direction, and the physician arriving in 2005 for 1 year is preparing a project to complete during her time at BWH.

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**2. Resident Education and Training**

Clinical supervision and teaching for Children's Hospital and Massachusetts General Hospital residents and Fellows in Neonatology in the Neonatal Intensive Care Unit (3-4 clinical months per year).

### **3. Medical Student Research**

1994-96, 1998, 2002, and 2004: Supervision of Medical students for summer research projects. Development of project, teaching of research principles and methodology, Supervision of conduct of the project.

### **4. Undergraduate Student Research -Clinical Projects**

1992-1998: Served as advisor and supervisor to undergraduate pre-medical students from Berkeley University, Williams College, Oberlin College, and Brown University who spent between 3 and 10 weeks observing clinical care in the NICU, participating in educational programs, and completing clinical research projects under my direction. Two of these students have subsequently entered medical school, and a third is employed in molecular biological research.

### **5. High School Students- Honors Projects**

1994-97 Served as advisor and supervisor for four students, from Roxbury Latin, Lexington and Medford High Schools. The students observed clinical care, interacted with physicians and nurses, and each completed a small clinical project under my direction.

### **d. Teaching Leadership**

1989- *Development of Neonatology Core Curriculum:* In collaboration with a colleague, I developed the *Core Curriculum* in Neonatology for residents at Children's Hospital. We identified certain drawbacks and inefficiencies in the conventional method of resident teaching, and developed a standardized, two-year curriculum that guaranteed a global and uniform educational program in Newborn Medicine. We organized a four volume syllabus for the program, and have begun to explore the use of computer based material for use in enhancing the program, and providing a user friendly tool for evaluation of resident satisfaction, and measurement of the success of each of the constituent presentations of the program.

1988- *Co-development and implementation of Resident rotation, NICU*  
In my role as clinical teacher and supervisor for pediatric residents during their NICU rotations, I have worked to create a atmosphere for bedside and informal teaching, a supervisory system of fellow and Attending physician coverage, and a specifically designed physical plant to maximize the opportunities for teaching and training to occur. The BWH NICU is the principal site for learning Neonatology, as the residents spend 3 months there over a three-year residency. In tandem with the Associate Director of the NICU, we have been responsible for the development, implementation, evaluation and evolution of the resident rotations in the NICU and Newborn Nurseries. We have experimented with different models for rounds, rotation structure, and supervisory hierarchies in efforts to find the best possible system for both education and patient care.

1988 *Clinical supervision and teaching, Neonatal-Perinatal Medicine Fellows, Harvard Medical School (3-4 months/ year).*

1990 *Development of Neonatology Handbook.*

To make critical facts and concepts readily available to residents, I have written (with a former resident) a small *handbook of Neonatology*, the "*Way of the NICU*", which is distributed to all residents in the program. This pocket size reference contains

critical information for acute management in the NICU and Delivery room, and basic differential diagnoses for most commonly occurring clinical problems. It is now in its third edition published in –house, and is used at two residency programs in Boston.

*1995-98 Harvard-Macy Clinical Scholars Institute*

In 1995 I was accepted as a clinical scholar at the first Harvard Macy Scholars Institute. This institute, a joint effort of the Harvard Graduate School of Education and the Department of Medical Education at Harvard Medical School, included 27 clinical scholars chosen after a competitive application process from over 200 applicants worldwide. The institute was a three-week intensive course in models of adult learning, approaches to education, and modes of teaching and learning. Each scholar conceived a project in Medical Education, which he or she is charged with developing and completing over the next year. Much of the institute was focused on small group evaluation of the projects and the exchange of ideas and suggestions between scholars, to provide support and direction for the projects.

Unlike most of the projects, which focused on pre-clinical medical education and overall curriculum design, I focused on clinical education during residency and beyond. I have developed, and begun implementing this curriculum in the Resident rotations and with community pediatricians.

From 1996-1998, I have served as a faculty for the Harvard-Macy Institutes of these years, serving as a co-leader of small groups.

**e. Regional and National Contributions**

*1988-93 National Faculty, Newborn Resuscitation Program, American Academy of Pediatrics.*

*1993- Present Regional Faculty, Newborn Resuscitation Program (NRP)*

In 1988, I was one of the first pediatricians and Neonatologists trained in the Newborn Resuscitation Program, as a National Faculty Member of the NRP. I then developed the Newborn Resuscitation Program at Brigham and Women's/Children's Hospitals, and began to hold training courses for pediatricians, nurses, and respiratory therapists. I spawned regional and local programs, by training instructors, at Newton-Wellesley Hospital, Emerson Hospital, Beverly Hospital, Norwood Hospital, Quincy Hospital, Addison-Gilbert Hospital, Charlton Memorial Hospital, Boston Regional Medical Center Hospital, Martha's Vineyard Hospital, Lowell General Hospital, Winchester Hospital, Jordan Hospital, Malden Hospital, and Women and Infant's Hospital. I organized and presented courses at these and other hospitals and at non-hospital sites in Eastern Massachusetts. To date, over 760 caregivers have been directly certified through this program.

The success of the NRP between 1988 and 1993 led to reevaluation and the National Faculty category was deleted thus my current classification as Regional Faculty. I remained as a member of the educational board of the program, and participated in developing questions and case problems for a new examination.

*1999- Pediatric Review and Education Program, American Academy of Pediatrics.* Invited faculty member for PREP The Course, for two six-hour courses with national participation: *The Fetus and Newborn Infant* . This is a new opportunity for teaching leadership in the continuing education of pediatricians from around the United States .

*1998- Theanswerpage.com,* development and implementation of the first web-page devoted to education of physicians in Newborn Medicine, with daily cases and review questions..

### Invited Presentations

1991 ***American Academy of Pediatrics, Annual Meeting, Educational Program***

I participated in the development of a six-hour seminar program in Newborn Medicine for this meeting. I was invited to give two 40-minute presentations to approximately 300 pediatricians. Topics included: *Hyperbilirubinemia* and *Surgical Emergencies*.

1991 ***Society of Obstetrical Anesthesia Practitioners, Annual Meeting***

Invited keynote speaker on *Update on Neonatology*. One hour talk for approximately 350 attendees of the annual meeting

1992 ***American Academy of Pediatrics, Massachusetts Chapter, Annual Meeting***

Invited speaker on *Conflicts between Mother and Baby: Ethical Dilemmas of Neonatal Care*. One-hour presentation for approximately 120 pediatricians.

1993 ***Hot Topics in Neonatology***

Invited presentation on *Variations in Transfusion Practices in Neonatal Intensive Care*, an original research project. Presentation at a national meeting of over 700 Neonatologists.

1993 ***National Association of Neonatal Nurses (NANN) National Conference***

Invited speaker on *Physiologic limits to Viability in Premature Infants*. One hour talk for approximately 150 attendees of the conference

1993 ***New England Community Hospital Neonatology Annual Conference***

Invited speaker on *Anemia of Prematurity and Erythropoietin Therapy*. One hour talk and discussion for 25 Neonatologists representing all of New England

1993 ***Eastern Maine Medical Center, Pediatric Grand Rounds***.

Invited speaker on *Surfactant Therapy- Comparison of Preparations*. One hour lecture and discussion for approximately 25 physicians, nurses and respiratory therapists.

1994 ***Maine Regional Neonatology Conference***

Invited speaker and case discussant in a 6 hour conference devoted to clinical Neonatology. One hour talk on *Chronic Lung Disease in the Premature Infant* and a 90 minute discussion of cases with 50 neonatologists, pediatricians, nurses, respiratory therapists and nurse practitioners. The attendees represented all of the NICUs in Maine

1993-1997      **Perinatal and Neonatal Nursing Conference** (sponsored by Brigham and Women's Hospital Department of Nursing)

Invited speaker for one hour presentations on Ethical Decision-Making in Neonatal Care, Anemia of Prematurity, and Liquid Ventilation, History of Neonatal Care-Lessons from the Past. Regional conference of 75-90 perinatal and neonatal nurses.

1994              **Update in Obstetrics and Gynecology**, Postgraduate Course, Harvard Medical School and Department of Obstetrics and Gynecology, BWH.

Invited presenter for 2-hour workshop on *Newborn Resuscitation*. Approximately 60 obstetricians attended the workshop from the United States and Canada.

1995              *Earlier Discharge of Mothers and Babies*

Coordinator and Moderator of regional conference for 120 physicians and nurses

1996              *National Association of Neonatal Nurses, New Jersey Annual Meeting*

Invited Speaker, Ethical Decision-making in Neonatal Intensive Care and Care of Infants at the End of Life, two 1 hour lectures for 100 nurses. (Preparation and contact time (8 hours)

1996              *National Conference of Neonatal Nursing*

Invited Speaker *Interpretation of Radiographs in the Neonate*. One hour lecture for 200 participants (Preparation and contact time 6 hours)

1996              *American Academy of Pediatrics National Meeting, Boston, MA.*

Invited Lecturer, *Post-discharge Nutrition for Premature Infants*. (Preparation and contact time 8 hours)

1998-99, 2002,03,04      **Update in Obstetrics and Gynecology**, Postgraduate Course, Harvard Medical School and Department of Obstetrics and Gynecology, BWH.

Co-moderator, *Management of Preterm PROM Workshop* and *Update on GBS prophylaxis*. Presentation to approximately 35-40 Obstetricians (Preparation and contact time 6 hours)

1998              *Towards Excellence in End-of-Life Care*, Postgraduate Course, Harvard Medical School and Department of Medical Ethics.

Invited presenter. 30 minute lecture and one hour workshop on *Best Practices of End-of-Life Care for Neonates and their Families*. 150 participants (preparation and contact time 6-8 hours)

- 2005 Ethics Consultation Training- Planning committee and faculty for this one day course in Ethics Consultation, presented to 35 participants from 7 hospitals
- 2003 Partners Ethics Retreat, Planning Committee and Faculty member

**National Meetings**

- 2004 Vermont Oxford Network Annual Meeting, Invited speaker “Development and Implementation of Low cost CPAP in Vietnam/Global Neonatology
- 2004 Allen Lecturer St Josephs Hospital New Jersey “ Fetal Intervention and Surgery”

**International Activities**

- 2001 Turkish Neonatology Society Invited Speaker at National Meeting
- 2001 Korean Neonatology Society, Invited Speaker at National Meeting: “Erythropoietin use in premature infants”
- 2001 Korean Pediatric Society, Invited Speaker at National Meeting “Fetal Intervention and Surgery”
- 2000-present Project Vietnam- Teaching, Care, and Program Development in Vietnam

Twice yearly trips to Vietnam: We have planned and presented seminars on Newborn Medicine, including teaching of resuscitation, respiratory distress, hyperbilirubinemia, infections, Nutrition, and other topics. In addition we have worked with physicians there to improve care through education, program development, provision of care algorithms, and bedside teaching. We have also worked to develop low cost devices for respiratory support, the progress of which has been presented at National Meetings in the United States, and to develop low cost devices for phototherapy. In addition, I have established an email link to Hanoi neonatologists, enabling real time communication and discussion about clinical cases. Currently we are preparing educational programs to improve neonatal care in provincial hospitals in both south and north Vietnam.

## Report of Clinical Activities

*Attending Neonatologist, Newborn Intensive Care Unit, Brigham and Women's Hospital, Boston, MA.(3-4 months/year, 69 nights/weekend in-house faculty coverage*

I am an attending physician in the Harvard Program in Neonatology, which includes faculty and fellows who provide clinical care and teaching in Newborn Medicine, and participate in research. The majority (85%) of my practice is in Neonatal Intensive Care At Brigham and Women's Hospital, there are approximately 9500 births annually. The Neonatal Intensive Care Unit (NICU) consists of 46 beds: 26 acute care beds, and 20 intermediate care/convalescent care beds. High-risk pregnancies represent a disproportionately large segment of the obstetrical population, and as a result, the NICU has an average census of 51 (110%), with approximately 1400 admissions annually. An additional 2000 infants require short-term admissions for evaluation or observation. NICU admissions include all types of complex patient cases, including critically ill premature infants of gestational ages ranging to the limit of viability, critically ill term infants, and infants with congenital malformations and genetic disorders,, infectious diseases, and respiratory disorders. Premature infants who are less ill, but require Level II (intermediate level) care, are also admitted to the NICU.

In each of my attending months I serve as the responsible physician for half of the admitted patients (60-70/ month), both supervising the resident staff, and directly participating in the care of the patients. In addition, I supervise residents and directly take care of infants in the delivery room, and supervise and directly care for short-stay, or "triage" patients (150-180 / month). In some months this is my primary attending responsibility. The BWH NICU is the major teaching site for the Harvard fellowship in Neonatal-Perinatal Medicine, as well for the Neonatology rotations of the pediatric residencies of both Children's Hospital/Boston Medical Center and The Massachusetts General Hospital. My attending responsibilities include bedside and didactic teaching of these residents and fellows. I also collaborate with the members of the obstetrical staff, including the faculty of Maternal-Fetal Medicine, providing Neonatology consultation regarding the management of high-risk obstetrical cases.

Five nights per month, including one 24 hour weekend block, I provide in hospital coverage as the Attending Neonatologist, supervising care and directly providing care to all of the patients in the NICU and delivery rooms. I was responsible, as Director of the NICU, for establishing and coordinating this system of full time faculty coverage by Neonatology, one of the first such programs in the country, and the first in the northeast.

This substantial commitment of time to clinical care and teaching has allowed me to develop extensive expertise and experience in the management of critically ill newborns. The faculty and fellows and the nursing staff consider me to be a clinical leader, and frequently consult me for help in managing difficult or unusual patients.

As Chief of the Division of Newborn Medicine,, I am actively involved in the development and implementation of clinical protocols and programs in the NICU and Well Nurseries..

1988- *Well- Newborn Care:* I provide care for well Newborns at Brigham and Women's Hospitals for whom no pediatrician has been identified, or whose pediatrician does not have privileges at the hospital. This service involves

approximately 28 weekends/year, and intermittent coverage during weekdays. I also provide temporary coverage, for pediatricians who require it, at Brigham and Women's Hospital. I serve as a consultant for the pediatricians practicing at  
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Brigham and Women's Hospital, and for community based practitioners from eastern Massachusetts and Southern New Hampshire. These pediatricians recognize me as an authority of newborn care.

1990- *Antenatal Consultation:* I am a faculty member of the Antenatal Diagnostic Center, an outpatient service of the Department of Obstetrics and Gynecology at Brigham and Women's Hospital which evaluates women with potentially high risk pregnancies. This includes pregnancies complicated by maternal disease, or by the identification of a fetus or fetuses with medical, surgical, or chromosomal abnormalities. Each year I provide consultation to approximately 75 patients who have been referred to the ADC or directly to an obstetrician at BWH. These consultations include counseling the expectant parents, and pre and postnatal coordination of pediatric subspecialty services, including the integration of such services with obstetrical management

1986- *Community Hospital Neonatology Coverage:* As part of our affiliation with Newton Wellesley Hospital, a large community hospital, I provide 2-4 nights of in hospital coverage per month at that hospital. My role is to provide care to patients in the Special Care Nursery ( a Level II Nursery), and consultations on infants in the Well Nurseries, and to care for newborns in the delivery rooms. I also provide antenatal consultations as requested by the Obstetrical staff. In addition, I have served as a consulting neonatologist at Norwood Hospital, another community Hospital.

## **PUBLICATIONS**

### **Original Reports:**

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13. Bhaumik U, Aitken I, Kawachi I, Ringer SA, Orav J, Lieberman E. Narrowing of Sex Differences in Infant Mortality in Massachusetts. *Journal of Perinatology* 24, 2494-99, 2004.
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15. Fischer JE, Harbarth S, Agthe AG, Benn A, Ringer SA, Goldmann DA, Fanconi S. Quantifying Uncertainty – Physicians’ Estimates in Critically Ill Neonates and Children. *Clinical Infectious Disease*. 2004 May 15;38(10):1383-90.
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