Beth Israel Deaconess Medical Center

A teaching hospital of Harvard Medical School

Annual Report 2005

Obstetrics & Gynecology

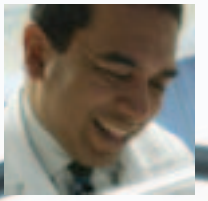
Beth Israel Deaconess Medical Center

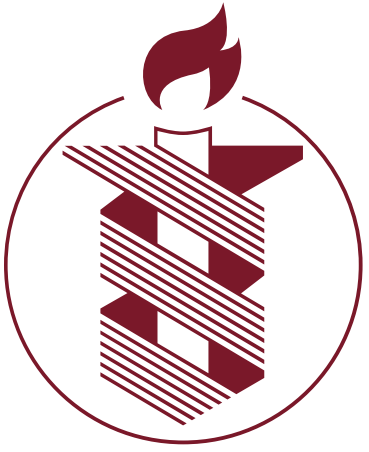
A teaching hospital of Harvard Medical School

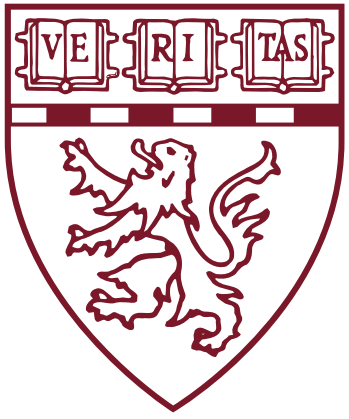
Beth Israel Deaconess Medical Center, 330 Brookline Avenue, Boston, MA 02215
www.bidmc.harvard.edu
617 667 4165

Annual report by Pickett Design. www.pickettdesign.com

Contents







Beth Israel Deaconess Medical Center is based upon a foundation

Hello

The Beth Israel Deaconess Medical Center, a major teaching hospital of Harvard Medical School, is known for exemplary patient care, leading edge clinical and basic science research, and outstanding educational programs. The Department of Obstetrics and Gynecology takes great pride in providing state of the art care for women, delivered with a personal touch and respect for diversity.

At Beth Israel Deaconess Medical Center, our greatest assets are our staff and patients. Our extraordinary group of attending physicians, residents, and medical students work in partnership with our world-renowned nurses. This unique relationship raises our quality of patient care a notch above the rest. Social workers, administrators, support staff, and physicians in our related fields complete the team. Our diverse patient population hails from various ethnic and socioeconomic backgrounds, and together we care for all of them.

As a major teaching hospital of Harvard Medical School, the department offers a residency program in obstetrics and gynecology, fellowship programs in reproductive endocrinology and urogynecology, and teaches OB/GYN and women's health to 40% of Harvard Medical Students. Residents participate in the care of all patients; hence there is no two-tiered model of care in the department. We care for all patients together, and believe that it takes a team effort to deliver safe and excellent healthcare.

In addition to serving our patients, the Medical Center is committed to being active in our local and international community. Service to community is at the core of the religious tradition of both of our founding hospitals, and an important part of our mission. We have a covenant to care for the underserved and to work to change disparities in access to healthcare. We know that to be successful we need to learn from those we serve.

The Department of Obstetrics and Gynecology at Beth Israel Deaconess Medical Center is based upon a foundation of individuals who are passionate about their work and wish to make a difference in the world. Our cutting edge research in basic and clinical research is at the forefront of critical women's health issues. Our department allows obstetrician/gynecologists a myriad of opportunities — research, public health, education, or clinical medicine. We strive to be a leader, both locally and internationally, in women's healthcare.

Benjamin P. Sachs, MD
Chairman

of individuals who are passionate about their work and wish to make a difference in the world.

Beth Israel Deaconess Medical Center Achievements

1922

The first administration of insulin in New England occurred at Deaconess Hospital

1960

The first implantable cardiac pacemaker was developed at Beth Israel Hospital

1972

The first Rights of Patients statement in the nation implemented at Beth Israel Hospital

1983

The first successful liver transplant in New England was performed at the Deaconess Hospital

1986

The first baby conceived through in vitro fertilization in Massachusetts was delivered at Beth Israel Hospital

1991

The first evidence that abnormalities in the visual system of the brain could help explain problems of people with dyslexia was discovered by Beth Israel researchers

1995

New England's first minimally invasive coronary bypass surgery was performed at Deaconess Hospital

Who we are

Department of Obstetrics and Gynecology

The Department of Obstetrics and Gynecology provides comprehensive, compassionate, integrated healthcare to women of diverse backgrounds. Services include preventive women's healthcare, reproductive endocrinology and fertility treatment, low and high-risk pregnancy care, and cancer care for women. The department's goal is to approach life-cycle events with a combination of holistic care and state-of-the-art medical intervention. Program staff includes physicians, nurses, nurse practitioners, social workers, and many other individuals who work collaboratively to provide care. Interns, residents, and medical students work under the direct supervision of an attending physician.

Harvard Medical School

Established in 1782, the Harvard Medical School mission is to create and nurture a community of the best people committed to leadership in alleviating human suffering caused by disease. Under the leadership of Dean Joseph B. Martin, MD, Ph.D., HMS attracts the best and brightest students. The class of 2008 represents a distillation of the hopes and aspirations of a substantial number of Americans. More than 5,300 students aspired to enter HMS in the fall of 2005, resulting in a class numbering 165. Each student was selected on the basis of many achievements in life to have a special spark of creativity or broad interest that will make them the leaders of tomorrow, whether in the art or the science of medicine.

Beth Israel Deaconess Medical Center

A major teaching affiliate of Harvard Medical School (HMS), Beth Israel Deaconess Medical Center (BIDMC) is renowned for excellence in patient care, biomedical research, teaching, and community service. Located in the heart of Boston's medical community, it hosts nearly three quarters of a million patient visits annually in and around Boston. BIDMC provides an exceptionally caring environment for patients and families. The BIDMC is proud to be the official hospital of the World Champion Boston Red Sox.

1995

The first deep brain stimulator implantation for the treatment of Parkinson's disease in New England was performed at Deaconess Hospital

1998

Beth Israel Deaconess Medical Center performed the first adult live-donor liver transplant in New England

1998

A patent was issued for the Cohn Cardiac Stabilizer, developed by BIDMC cardiothoracic surgeon William Cohn, MD, allowing coronary artery bypass surgery to be performed without the use of a heart-lung machine

2002

Beth Israel Deaconess Medical Center became the only clinical trial site in Boston to test a new therapeutic AIDS vaccine on normal, healthy adults

2003

BIDMC researchers discovered the probable cause of pre-eclampsia — published in The New England Journal of Medicine and The Journal of Clinical Investigation

2003

BIDMC joined a select list of hospitals nationally conducting the first clinical trial of the AbioCor® Implantable Replacement Heart

2004

Beth Israel Deaconess Medical Center reports s-Flt1 factor involved in preeclampsia in The Journal of the American Medical Association

Clinical

Maternal-Fetal Medicine

Benjamin Sachs, MD
Division Director

Mission Statement

The mission of the Division of Maternal-Fetal Medicine is to continually provide excellent obstetrical care to all patients, to function as a resource for community and medical center-based general obstetricians, to improve understanding of obstetrical conditions and treatments, and to train physicians to provide the highest caliber obstetrical care.

Accomplishments and Goals

The division is dedicated to providing quality obstetrical care to women with vastly different complications that directly affect pregnancy. The division of maternal-fetal medicine provides high-risk obstetrical care to patients who have been referred from all over New England. The number of deliveries for the division has continued to increase over the past year. Patients are followed throughout their pregnancy by their own maternal-fetal medicine specialist, and in many cases are also delivered by them. This ensures the highest quality of care, as well as continuity of care. These are especially important to patients who may have serious medical or fetal complications.

Many community hospitals in the metro Boston region, as well as parts of southern New Hampshire, Nantucket Island, and even Bermuda have sent patients to the maternal-fetal medicine service in recognition of the highly specialized and quality care that is given. In addition, the division continues to support retrotransfers of infants back to the referring hospital when the level of care can be provided in that setting.

Under the direction of Dr. Benjamin Sachs, each of our perinatologists has specialized in an area of interest, allowing the program to flourish. Dr. Bruce Cohen with multiple gestations and the outreach programs; Dr. Ian Grable with the Joslin Diabetes Program; Dr. Tamara Takoudas with resident education and quality improvement; Dr. Jeffrey Johnson with maternal medical complications including prematurity and also fetal therapy; and Dr. Kee-Hak Lim with hypertensive disorders in pregnancy and the First and Second Trimester Genetics Program.

The perinatologists continue to provide ultrasounds, prenatal care and consultative services at Beth Israel Deaconess Medical Center and the affiliated off-site practices. The division offers diagnostic and consultative services at seven community hospitals. Our satellite programs are located in Beverly, Brockton, Cambridge, Concord, Framingham, Nantucket Island, Reading, and Winchester. We also provide services at one of the Boston free-standing neighborhood health centers.

We also continue our collaboration with the Advanced Fetal Care Center at Children's Hospital of Boston, headed by Dr. Rusty Jennings, pediatric surgeon. Dr. Jennings' collaboration with our perinatology staff has expanded our options for treatment to include the postnatal period for families with the diagnosis of certain fetal abnormalities, or complications of identical twin pregnancies.

Diabetes and Pregnancy Program

Women with diabetes, including those who develop diabetes during pregnancy, require special attention. Diabetes care is critical, both before and after conception, to ensure the health of both mother and child. The Diabetes and Pregnancy Program, a

Hospitals in the greater Boston area, New Hampshire,

service of Joslin Clinic and BIDMC, offers specialized, state-of-the-art diabetes care designed to meet patient's individual needs. The program is a collaborative effort of Joslin Clinic's skilled medical staff and the high-risk maternal-fetal medicine specialists at BIDMC. Through the program, patients receive care from a multi-disciplinary team of providers at one convenient location. Specialists in diabetes, including physicians, nurse practitioners, nurse educators, nutritionists and others, provide treatment. Maternal-fetal specialists provide obstetrical care, combining the latest medical expertise and technology with personalized care to meet patient's unique needs.

OB Ultrasound - The Radiology Department at the BIDMC has 6 rooms in our outpatient clinical center devoted to Ob/gyn ultrasound with Phillips 5000 and IU22 machines allowing for top of the line imaging with 2D and 3D probes, and real-time capability. We also offer Ob/gyn ultrasound services at centers in the community and for inpatients. Our volume is approximately 16,000 OB/GYN examinations on-site per year. We train residents and fellows in the radiology and Ob/gyn departments. In addition to imaging, procedures performed

Nantucket Island, and even Bermuda have sent patients to our maternal-fetal medicine service.

include hysterosalpingography, sonohysterography, amniocentesis, pelvic drainages and guidance for chorionic villous sampling. We also offer obstetric magnetic resonance imaging for cases where sonographic examination is inconclusive.

Education

The division continues to focus on education for the patients, physicians, and residents. We have regular patient and provider satisfaction surveys done. Our results consistently emphasize that our commitment to quality of care is outstanding. Mary Rooney-Belmonte, R.N. and Michelle Christman, R.N., provide patient contact and education throughout pregnancy. They also provide updates to referring physicians regarding the status of their patients during their stay at BIDMC. Mary Rooney-Belmonte, R.N., is also involved in education for nursing and physicians at several of the off-site practices.

The division provides clinical and administrative support for the Labor and Delivery unit and the antepartum fetal testing service. It also offers an intensive educational milieu for residents, medical students, and attending staff. There is a close relationship between the maternal-fetal medicine division and many other service and research units in the medical center, at the medical school, and the Harvard School of Public Health. Frequent clinical interchanges occur with anesthesiology, neonatology, genetics, radiology, renal medicine, endocrinology, and hematology. A second-year resident and the obstetrical chief resident work in concert with the perinatal team in all academic and patient care matters.

Division members work collaboratively to provide education conferences, as well as 'hands-on' clinical experience. The focus of this education is to provide an opportunity for community practitioners to foster their skills in caring for medically compromised patients, including the sharing of practice guidelines. This program incorporates the latest evidence-based research into clinical practice.

Research

Dr. Kee-Hak Lim has a ground breaking research project investigating preeclampsia and potential diagnostic and curative therapy for patients affected. It is being supported through a grant from Johnson & Johnson pharmaceuticals. He is also a co-investigator on a NIH funded project investigating the role of trophoblasts and angiogenic molecules in development of preeclampsia. In addition, he is working on applying Diffuse Reflectance Spectroscopy in isolating fetal cells from maternal circulation. This work is done in collaboration with Dr. Lev Perelman and is funded by NIH.

Dr. Jeffrey Johnson has a multicenter project involving prediction of prematurity and therapy with progesterone supplementation, which is supported by a grant from the March of Dimes.

All members of the MFM division are collaborating with Dr. Deborah Levine in radiology on a NIH-funded study evaluating the role of fetal MRI in diagnosing fetal intracranial abnormalities. Obstetric magnetic resonance imaging projects include use of MR in diagnosing pregnant patients with right lower quadrant pain, and accuracy of MR (and impact on patient care) in cases of complex fetal anomalies. An NIH grant ($450-500,000 direct costs per year for 5 years) funds a study of fetal ventriculomegaly and correlation of prenatal ultrasound and MR indices with postnatal outcomes.

Goals

To enhance and improve obstetrical care delivered to pregnant women with a wide-range of medical, surgical and obstetrical complications by promoting patient safety, education and research.

Gynecologic Oncology

Young B. Kim, MD
Division Director

Mission

The Division of Gynecologic Oncology is dedicated to superior clinical care, teaching, and research for women with cancer of the reproductive tract.

Clinical Services

The Division of Gynecologic Oncology conducts an active clinical program for the management of gynecologic cancer. The division works in a multidisciplinary fashion with medical oncologists, radiation oncologists, and pathologists in order to optimally treat women with cancer of the reproductive tract. The spectrum of therapeutic options includes surgery (encompassing radical and ultra-radical procedures), radiation, chemotherapy, and biological therapies. Our newest member of the division, Dr. Christopher Awtrey's clinical expertise includes minimally invasive and general gynecologic surgery for cancers of the ovary, uterus and cervix. He also have a special interest in surgery to preserve fertility in early-stage cervical and ovarian cancers. Clinical outreach programs are currently in operation at Mount Auburn Hospital and Brockton Hospital. These programs provide on-site surgical consultation.

Dr. Young Bae Kim, Director of the Division of Gynecologic Oncology, provides expert care for patients, while leading the surgical training of our residents.

Colposcopy and Laser Surgery Unit

Louis Burke, MD
Director

The Colposcopy and Laser Surgery Unit is a referral clinic for patients with benign diseases of the vulva, vagina, and cervix. Most patients are referred for the evaluation of abnormal Pap smears. Patients with human papillomavirus infection are also seen. Women with a history of in utero diethylstilbestrol (DES) exposure are followed in the clinic. Treatment modalities such as CO2 laser surgery and loop electrosurgical excision procedure (LEEP) are offered.

Chief Resident Holly Khachadoorian, MD, gets instruction on performing a simulated LEEP procedure in Resident Workshop from Dr. Louis Burke, Director of the Colposcopy and Laser Surgery Unit

Education

Two residents - one PGY2 and one PGY4 - rotate on the oncology service along with third-year Harvard Medical School Students and fourth-year sub-interns in gynecologic oncology. The division sponsors a weekly Gynecologic Oncology Tumor Board, a multi-disciplinary conference attended by members of this service as well as pathologists, radiologists, medical oncologists, and radiation therapists, to discuss every patient's clinical course and treatment options. The division also sponsors a gynecologic oncology journal club and a research meeting. Residents are responsible for daily rounds, assistance at surgical procedures and presentation of patients at Tumor Board.

During the residents' rotation on the gynecologic oncology service, they participate in the colposcopy/laser ambulatory clinics. They are taught the principles of colposcopy and the place of laser surgery in gynecology. Training of residents is provided in colposcopy, CO2 laser, electrosurgery, and cervicography. This rotation provides the resident with the opportunity to become an accomplished colposcopist and laser surgeon.

Research

The division has an active clinical research program under the direction of Dr. Stephen Cannistra, MD, a nationally recognized medical oncologist with particular expertise in ovarian cancer. A number of clinical trials are open to patient accrual through the Dana-Farber/Harvard Cancer Center. The division is also a participating institution of the Gynecologic Oncology Group.

Reproductive Endocrinology and Infertility

Mission

The mission of the Division of Reproductive Endocrinology and Infertility (REI) is to provide a broad spectrum of investigative and therapeutic modalities for the full range of reproductive and endocrine disorders. The division provides cutting edge research and education for future physicians and the community.

Clinical Care

The division's clinical care services include a highly successful in-vitro fertilization program (Boston IVF), andrology and gynecologic endocrinology laboratories for neuroendocrine and dynamic endocrine testing, assessment of sperm and ovum fertilization potential, as well as micro-surgical operating facilities. Established in 1986, Boston IVF has earned an impeccable reputation in the national and regional medical communities as one of the first and most successful advanced fertility treatment facilities in the United States. An unmatched commitment to scientific and clinical research has resulted in a number of significant "firsts" in New England, including the first deliveries for GIFT, embryo cryopreservation, donor oocyte, and the first baby born from ICSI. Boston IVF developed quality standards and objectives to not just improve what they do, but to set the bar for quality care in reproductive medicine. As a result of this work, Boston IVF earned the unique distinction of becoming the first fertility provider in North America to become certified to ISO 9001:2000 standards.

Boston IVF is a full-service clinical and academic reproductive endocrinology center that includes as its primary focus the largest ART (assisted reproductive technology) program in the US. Its clinical services include medical and surgical management of couples with reproductive failure, identification and management of menstrual abnormalities and their lifelong associated health hazards, management of menopause, the surgical repair of congenital reproductive anomalies, and care of young girls and women with pubertal abnormalities. The Boston center is located four blocks from the main Beth Israel Deaconess Medical Center campus; additional centers are located in Cambridge, Framingham, Quincy and Waltham. Patients are also seen in offices in New Hampshire, Maine and on Nantucket Island. Patients can meet with their Boston IVF physician and perform necessary diagnostic and monitoring at any of these locations. In addition, Boston IVF brought the first infertility care by a reproductive endocrinologist to Bermuda. Patients are seen in Bermuda several times a year and come to Boston IVF for ART.

Over 50,000 patient visits per year occur at Boston IVF, including approximately 500 reproductive surgeries, over 2,000 IVF and 5,000 non-IVF ART cycles each year. More than 10,000 babies have been born as a consequence of ART procedures performed at Boston IVF. Surgeries include diagnostic and operative endoscopy (laparoscopy/hysteroscopy) for developmental and acquired reproductive tract abnormalities in both men and women, laparotomy for developmental uterine anomalies, uterine fibroids, and severe endometriosis that cannot be treated by endoscopic surgery, corrective surgery to treat vaginal agenesis and other reproductive tract anomalies, and endometrial ablative surgeries for abnormal uterine bleeding. The full-service ART program incorporates state-of-the-art methods, including IVF, ICSI, assisted hatching, and a donor oocyte program.

Education

The Division of Reproductive Endocrinology and Infertility provides a well-rounded program of teaching and clinical activities to enable students, residents, and fellows to become well-versed in the basic scientific aspects of the field, as a foundation upon which to build a strong understanding and competency in clinical evaluation and management of relevant problems. The division is actively involved in the Harvard Medical Student teaching.

Residents and fellows are involved in the in-hospital medical management and surgical care of the patients admitted under the aegis of the division. Patients with menstrual abnormalities are referred to a monthly endocrine clinic at the BIDMC Shapiro Center that the REI fellows and OB/GYN residents are involved in. Teaching in the clinical setting is supplemented by a formal patient review conference following the weekly clinic session, monthly grand rounds presentations, periodic didactic talks and a weekly conference, as well as bedside and operating room teaching on an ongoing basis.

The fellowship training program is a three-year program designed to provide the fellow a protected basic research experience and a well-rounded clinical experience with exposure to all aspects of reproductive endocrinology and a very high-volume ART program. The first 18 months is devoted primarily to basic science research with the divisional investigations in the areas of molecular aspects of reproduction. Numerous other possibilities exist within the Harvard system for this basic research. During this time, one session a week is spent in a well-rounded REI clinical setting. The last 18 months is primarily devoted to the clinical experience with an additional research time allotment.

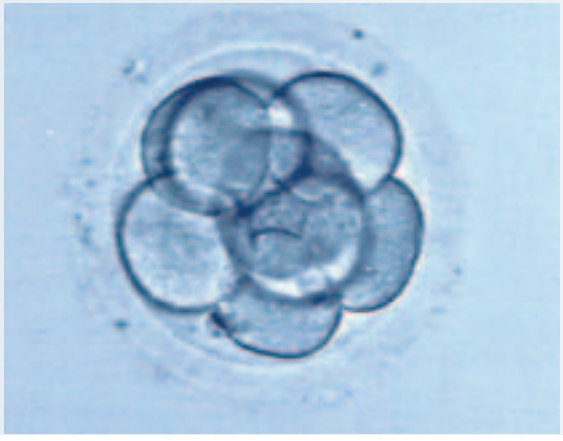
All aspects of reproductive endocrinology are represented including pediatric, adolescent, medical endocrinology, contraception, and male and female infertility. During the last 6 months, 30% of time is available for outcomes-oriented research or to return to the basic laboratory. The fellow spends one weekend monthly performing numerous ART procedures during all three years. Weekly conferences include: RE case conference, lecture series (outside and institutional lectures), IVF/Research, grand rounds and monthly journal clubs.

Research

The molecular genetics laboratory, under the direction of Anny Usheva, Ph.D., includes state-of-the-art facilities for identification of genes and analyzing gene expression. The molecular biochemistry laboratories are fully equipped for experiments in reproductive physiology, endocrinology, and membrane biochemistry. The molecular laboratory has centered much of its work around the study of women with congenital absence of the uterus and vagina to identify genes involved in müllerian development. More recently it has initiated a large study to investigate the processes involved in ovarian aging in mice and humans.

The Division of Reproductive Endocrinology and infertility and Dr. Richard Reindollar, Division Director from 1996-2005, was awarded grants by the National Institute of Health for the two largest infertility studies funded at a single site. The FASTT Trial, Conventional Infertility Therapy vs. Fast Track to IVF. These investigations are studying two different infertility treatment paradigms for couples with the female partner under 40 years of age. The FORTT Trial, Optimal Infertility Therapy RCT: Women 40 and Older, recruitment presently underway, is analyzing treatment paradigms for couples with the female partner ages 40-43 years of age. These studies are being performed with members of the Harvard School of Public Health. Boston IVF has a large database and high patient volume, which provides an ideal resource for both federally-funded and non-funded clinical studies.

Members of the division are involved in local and national activities. Alan Penzias, MD, was recently elected to the board of directors of the American Infertility Association and is the past president of the New England Fertility Society. Michael M. Alper, MD, was appointed to the medical advisory committee of the American Infertility Association. Dr. Alan Penzias, Dr. Richard Reindollar, and Dr. Robert Weiss were selected to be included in the national listing Best Doctors in America 2003-2004, representing the top 5% of doctors in over 400 subspecialties of medicine. In addition, division members have been active in local and national presentations at grand rounds, postgraduate courses and annual meetings. They have also published many articles, abstracts, books, and chapters and served on editorial and national boards.



The Division of Reproductive Endocrinology and Infertility is investigating the process of ovarian aging in mice and in humans.

Division of Clinical Gynecology

David Chapin, MD
Division Director

Mission

The Division of Clinical Gynecology directs integrated, high-quality care to patients with gynecologic disorders.

Clinical Care

All the clinical subspecialties of clinical gynecology are practiced in this department, including urogynecology, minimally invasive surgery, and geriatric surgery. Pathophysiologic mechanisms of disease states and rational therapy are emphasized, especially with regard to the type and the proper timing of operative procedures. Principles of pre- and post-operative care principles are stressed. The Gynecologic Triage Unit, where patients with gynecologic emergencies are seen by residents and staff from our department, is directed by this division. This unit allows residents and students to make the initial diagnosis and treatment plans on patients, an increasingly rare opportunity.

Education

Residents are given increasingly greater responsibility for total care of gynecologic patients as they show the capability to accept such responsibility. Technical surgical skill in abdominal and vaginal procedures are taught in a progressive manner over the course of the program so that residents acquire the full range of skills expected of highly competent practitioners before they complete the program. The case load proves quite sufficient for these purposes because, without exception, every operative procedure done by a member of the faculty of this department is expected to be a learning experience for the residents.

In addition to daily patient management and teaching rounds, bedside and operating theater teaching are carried out on all cases, and there are regular staff and resident conferences held on subject matters of relevance.

photo: Bruce Wahl

Dr. Christopher Awtrey, Gynecologic Oncologist, is bringing new surgical techniques in minimally invasive surgery to the department.

Urogynecology

Peter L. Rosenblatt, MD
Director

Mission

The mission of the division of urogynecology and reconstructive pelvic surgery is to provide comprehensive evaluation and management of disorders of the female genitourinary tract, including urinary incontinence and pelvic organ prolapse.

By offering a variety of treatment options for any specific condition, the division empowers women with the ability to actively participate in the decision-making aspect of their care. The division also provides clinical teaching in the field of urogynecology to medical students, residents and clinical fellows.

Clinical Care

The division of urogynecology was established in 1995 by Dr. Peter Rosenblatt, and has grown over the years to become the largest urogynecology and reconstructive pelvic surgery center in Massachusetts. The division is well-established throughout New England as a referral center for complicated urogynecologic disorders. Patients are referred for basic and complex evaluation of incontinence and pelvic organ prolapse, as well as for conservative and surgical management of these and other benign gynecologic conditions. The clinical office staff provides a wide variety of services including complex multichannel urodynamic testing, biofeedback, peripheral afferent electrical nerve stimulation (and other forms of pelvic floor rehabilitation), behavioral modification and patient education. Physical therapists trained specifically in pelvic floor rehabilitation are available within the offices to provide conservative treatment of incontinence, pelvic pain and other related conditions. Periurethral bulking agents are also used in the office for the treatment of stress incontinence, as an alternative to more invasive surgery. The staff of the division maintains a busy surgical practice, with inpatient and outpatient procedures currently being performed at five area hospitals. With an emphasis on minimally-invasive surgical procedures, the staff offers vaginal, abdominal and laparoscopic surgical procedures. A particular emphasis has been placed on developing innovative laparoscopic techniques, in order to perform procedures in a minimally-invasive fashion that were previously only able to be performed via laparotomy. In terms of urogynecologic surgery, the staff currently performs laparoscopic Burch bladder neck suspension, paravaginal cystocele repair, uterosacral ligament suspension, sacrocolpopexy and sacrocervicopexy, which is becoming a popular alternative to hysterectomy for uterine prolapse. In addition, laparoscopic supracervical hysterectomy and laparoscopic myomectomy are being performed on a regular basis. The staff has also been performing sacral nerve stimulation for refractory urge incontinence for the past five years. Over the past five years, over 1,000 tension-free vaginal slings have been performed by physicians within the division of urogynecology. This minimally-invasive, extremely effective and durable procedure has grown in popularity and has become a gold-standard in the treatment of female stress urinary incontinence. In addition, the physicians offer traditional autologous fascial slings for this condition.

Research

The division of urogynecology has been active in clinical research for the past six years. Prospective trials have included the use of peripheral afferent nerve stimulation for urge incontinence, endopelvic fascial shrinkage using radio- frequency bipolar

energy for stress incontinence, and a randomized trial comparing laparoscopic Burch to the tension-free vaginal tape (TVT) suburethral sling.

Teaching

All the members of the division are actively involved in clinical teaching. Students from HMS participate both in the office setting, as well as in the operating room. Third-year residents in OB/GYN from BIDMC each spend a 10-week rotation with the physicians of the division, with an emphasis on learning minimally-invasive laparoscopic techniques.

Fellowship

The Fellowship Program in Urogynecology at Mt. Auburn Hospital is a three - year, fully-accredited, clinical and research program, which began in 1999. The program consists of exposure to office evaluation and conservative management options, extensive urogynecologic surgical volume and performing clinical research in the field. The emphasis of the third year of the program is to complete original research and further develop teaching skills.

Division of Clinical Genetics

Virginia Kimonis, MD
Director

Kee-Hak Lim, MD
Associate Director

Mission

The Clinical Genetics Program provides high quality, compassionate genetic counseling for families with concerns about hereditary conditions.

Clinical Care

Genetic counseling and evaluation is offered for patients concerned about a hereditary condition in their family or a child with a birth defect or mental retardation. We offer counseling for pregnancy for women age 35 or over at delivery, and for women with family histories of genetic or rare conditions. The goal of genetic counseling is to provide accurate information, which enables individuals, and families to make their own fully informed decisions.

image: Matt Harter

Program staff meets one-on-one with families to discuss their concerns, provide risk assessments, and aid in choosing further testing and decision-making. For couples that desire further testing, the staff follows up with the family to discuss the results. In the event of abnormal results, ongoing supportive counseling is provided. Additionally, Clinical Genetics works closely with the social work department and the referring provider for families who may need additional care. Test Results BIDMC offers prenatal diagnostic services including chorionic villus sampling, amniocentesis, ultrasound visualization of the unborn fetus, cytogenetic, biochemical and molecular genetic analysis, and fetal blood testing.

The department works closely with the Cytogenetics Laboratory at the Beth Israel Deaconess Medical Center to assure that results of chromosome analysis are accurately conveyed to both patients and providers. The department's many community resources provide families with additional information and support. Families receiving complex genetic information receive a letter summarizing the information discussed during their genetic counseling session. At the hospital, staff mem-

bers meet with families who deliver a baby with a possible genetic disorder or birth defect to coordinate their infant's care with genetics consultants at Children's Hospital so that the families experience a smooth transition from one service to the other.

Education

Monthly interdisciplinary rounds are held for genetics, perinatology, OB/GYN, neonatology, radiology, cytogenetics, and social work to discuss patients continuing pregnancies with expected anomalies. Medical students and residents participate in ambulatory consults.

Department of Neonatology

DeWayne Pursley, MD, MPH
Neonatologist-in-Chief

Mission

The Department of Neonatology is committed to providing personalized, high-quality care to newborn patients and their families. The department is also committed to maintaining a stimulating, supportive environment for teaching and research that conveys and enhances knowledge of newborn health and care.

Clinical Care

The Neonatal Intensive Care Unit (NICU) program provides care to over 1,500 newborns each year. More than 800 of these newborns require admission to the unit, while the remainder are evaluated and triaged to the newborn nursery. The NICU average daily census is now 368/19/2005.

The multi-disciplinary NICU team provides comprehensive, family-oriented care. The team, which includes nurses, physicians, neonatal respiratory therapists, social workers, neonatal dieticians, an occupational therapist, and a pharmacist, is extensively trained in the care of the high-risk newborn and provides a full range of services for neonatal patients and support for their families. Through a tightly integrated consultation system with the maternal-fetal medicine staff, genetic counselors, and Children's Hospital pediatric sub-specialists, the NICU team monitors all maternal admissions likely to result in the delivery of a newborn requiring intensive care and then provides necessary care in a coordinated multi-disciplinary model.

The NICU continues to provide cutting-edge therapy through new technologies, including inhaled nitric oxide for pulmonary hypertension. It also makes potentially groundbreaking clinical research protocols available to eligible patients.

The multidisciplinary Neonatal Intensive Care Unit provides comprehensive, family-oriented care for newborns with special medical needs.

Newborns resulting from community hospital maternal-fetal transfer and delivery, continue to represent a significant number of the patients in the NICU. The NICU is able to retro-transfer the great majority of these patients back to their community hospitals when clinically ready. Additionally, many of the newborns whose mothers' care originated at BIDMC are also transferred to their local community hospitals.

Neonatal nurse practitioners, working under the clinical supervision of department faculty, remain active in the care of high-risk newborns at BIDMC. Together with attending neonatologists, they provide around-the-clock coverage in the NICU, and participate in the teaching of nurse practitioner students as well as Harvard Medical School students.

Neonatal-perinatal fellows continue to serve an important clinical role in the NICU. During monthly rotations they continue to bring new knowledge and clinical innovations, which support the unit's goal to provide care at the leading edge.

Newborn Nursery

The Cochran Newborn Service provides comprehensive newborn care to those infants whose primary pediatric providers are not members of the BIDMC staff. This service has grown substantially over recent years and in 2003 provided care to over 2000 newborns.
All nursery babies undergo hearing screening under a program that was among the first universal newborn screening programs developed in the Commonwealth and has been lauded by the Massachusetts Department of Public Health.
Car seat position testing is also provided to all premature infants prior to discharge.

Education

Beth Israel Deaconess Medical Center continues to be one of the four clinical training sites for the ACGME approved Children's Hospital neonatal-perinatal medicine training program. This program provides fellows with a strong clinical base, as well as research training. Fellows in this program rotate monthly through BIDMC, providing care to newborns and their families and honing their team leadership and patient management skills in the NICU and high-risk antepartum consult service.

photo: Bruce Wahl

DeWayne Pursley, Chief of the Department of Neonatology, leads the effort in teaching residents and fellows how to care for our youngest patients

Eight of the current 18 fellows are currently also receiving research mentoring from BIDMC neonatology faculty.

Each year, the department of neonatology offers an AAP-approved training course in neonatal resuscitation to all obstetrical and anesthesia residents. First-year residents receive their initial training, while all other residents are offered annual refresher courses. The department also offers formal clinical training through Harvard Medical School for HMS-III students on a five-day rotation through the newborn nursery, and HMS-IV students on a month-long elective subinternship in the NICU.

Departmental goals include the further development of innovative technology for education; intensive, direct mentoring of active learners throughout the process of providing newborn care; ongoing monitoring of student satisfaction in meeting learning objectives; and the seamless integration of teaching into policies, practices, and routines of newborn care.

The Department of Neonatology is committed to maintaining a stimulating, supportive environment for teaching and research.

Research

The mission of the department of neonatology research program is to advance neonatal health and healthcare through excellence and innovation across the spectrum of clinical research. Research activities of department faculty span the spectrum of clinical research and include outcomes research, clinical informatics, decision analysis, decision support, econometric analysis, clinical epidemiology, clinical trials, long-term follow up, health policy analysis, organizational behavior, and program evaluation.

In recent months, funding has been utilized to refine the infrastructure of the research program. New positions to support administration, study coordination, biostatistical support, and data management have recently been filled.

Current efforts are focused on identifying new research opportunities, fostering further collaborations with other departments and institutions, and developing or refining programs in neonatal clinical research training.

photo: Bruce Wahl

It takes a village to deliver a baby. The Labor and Delivery team consists of nurses, doctors, support staff, residents, and students.

photo: Bruce Wahl

Harvard Medical School

We are the "small college" residency experience of Harvard Medical

Education

Residency Training in Obstetrics and Gynecology

Hope A. Ricciotti, MD
Program Director

Young Bae Kim, MD
Associate Program Director

The Beth Israel Deaconess Medical Center Residency Program in Obstetrics and Gynecology consists of 20 residents (5 residents per year). Our principle clinical site is Beth Israel Deaconess Medical Center, which is adjacent to the Harvard Medical School Campus in the Longwood Medical area. One rotation occurs at Mount Auburn Hospital in Cambridge. The size of our residency program allows a feeling of smallness and individuality that is partnered with an emphasis on evidenced based medicine and research.

Our unique blend of academic rigor, combined with empathic and individualized care, makes us unique. Residents go on to pursue the finest fellowships, masters in public health, and academic medical careers.

Recent research/elective projects have included clinical investigations in infertility, evaluations of medical errors, evaluation of educational teaching techniques, basic science investigations in reproductive endocrinology, international health projects in third world countries, and web-based educational projects.

Dr. Mimi Yum, Co-Director of the Harvard Medical School OB/GYN Core Clerkship, leads curriculum development and the Resident as Teacher program.

Women's Health Education at Harvard Medical School

Hope A. Ricciotti, MD
Vice-Chair for Education
Co-director, Medical Student Program

Mimi Yum, MD
Co-director, Medical Student Program

The department of obstetrics and gynecology at BIDMC plays a leading role in teaching women's health to Harvard Medical Students. Sex and gender differences in health and disease have been recognized in many fields over the last two decades, creating a significant new body of knowledge that warrants inclusion in medical curricula. Our goal is to ensure that all students, regardless of specialty, are prepared for the challenge of the complex health needs, both clinically and in research, of women.

With this in mind, physician educators from our department lead the ongoing effort to incorporate women's health into the Year I and II curriculum at Harvard Medical School. Our department provides

School. Research and academic pursuits by residents are highly valued and supported.

leadership in directing the third year core clerkship in obstetrics and gynecology at the Harvard teaching hospitals. Finally, we offer specialized electives and sub-internships to year IV students in women's health.

Year I and II Curriculum Reform in Women's Health
Physician educators from our department work in partnership with course directors and educators at Harvard Medical School, in order to ensure the complete incorporation of women's health into the Harvard Medical School Curriculum. The reform process is a continuous and on-going one, which includes regular assessment and integration of important topics in women's health throughout the four-year undergraduate medical curriculum.

Core OB/GYN Clerkship

The department of obstetrics and gynecology offers a core OB/GYN Clerkship experience for third year Harvard Medical Students. Approximately one-third of students enrolled at Harvard Medical School rotate through this clerkship. This course offers a core clerkship experience that aims to approximate the actual delivery of care in women's health. One-third of time is spent in the ambulatory setting, one-third in labor and delivery, and one-third in the gynecologic operating room. Students and residents in OB/GYN at the BIDMC are involved with all patients both private and "clinic". Therefore students are taught not only by the house staff, but also by faculty and private physicians. This allows for a breadth of experience in types of patients encountered and teaching styles.

The ambulatory experience is based upon a preceptor model in which each student is paired with a general OB/GYN faculty preceptor who directs the outpatient experience. This outpatient experience is longitudinal throughout the clerkship - the student has an ambulatory session once a week with their core preceptor. This maintains continuity in both patient care and the student's own learning under the preceptor's guidance. In addition, students have a weeklong outpatient experience that includes sessions in reproductive endocrinology, maternal fetal medicine, gynecologic oncology, urogynecology, genetics, antenatal testing, and community health.

The labor and delivery experience includes participation in normal deliveries, cesarean deliveries, high-risk obstetrics, and high-risk antepartum care. The gynecologic experience includes participation in general gynecology, gynecologic oncology, and urogynecologic surgery. Weekly formal bedside rounds with the department chairman round out

the experience. A mid-clerkship lunch with the clerkship directors allows for informal feedback and career counseling.

Dr.'s Hope Ricciotti and Mimi Yum serve as clerkship co-directors. Dr. Hope Ricciotti serves as the Harvard Medical School OB/GYN Clerkship Committee Director, a role in which she ensures common clerkship objectives, evaluation, and grading are performed across clerkship sites. In this role, she serves as liaison between Harvard Medical School and department chairs from the various teaching sites.

Fourth Year Electives

The department of obstetrics and gynecology offers several advanced electives in women's health to fourth year medical students. These electives are open to both Harvard Medical Students and selected students from outside institutions.

Sub-internship in Obstetrics and Maternal Fetal Medicine– Dr. Kee Hak Lim, a maternal-fetal medicine specialist, serves as course director.
Sub-internship in gynecologic oncology - Dr. Young Bae Kim, Division Director, serves as course director.

photo: Bruce Wahl

Hope Ricciotti, Vice Chair for Medical Education, instructs the residents and students in prenatal care.

Educational Research Projects – Physician educators from the department are active in educational research, evaluating new teaching methods, tools, and technology in order to improve teaching methods and lead the larger education community in these methods.

Fellowship Program in Reproductive Endocrinology

The Beth Israel Deaconess Medical Center/Harvard Medical School fellowship training program in Reproductive Endocrinology and Infertility is entering its ninth year. This board - certified three-year fellowship provides comprehensive training with a very broad clinical experience and exposure to cutting-edge basic and outcomes research. Each fellow spends the first eighteen months of this fellowship in the division-based science laboratory, and the second eighteen months in extensive clinical training. During the first year of the clinical experience, concentrated time is spent in rotations, not only with reproductive endocrinologists, but also with other subspecialists such as medical endocrinologists, pediatric endocrinologists and a male infertility specialist.

Boston IVF serves as the clinical component of the fellowship training program. It is the largest in vitro fertilization program in the United States, providing fellows with a unique and extensive clinical experience in all aspects of reproductive care. In addition, the fellows participate in clinical faculty practices that include a number of patients with pure reproductive endocrine problems, ranging from intersex disorders through menstrual abnormalities and menopause. The basic science research is usually performed within the division laboratory at BIDMC. Under the direction of Anny Usheva, Ph.D., this laboratory provides cutting-edge molecular technology training and propels the fellows into separate areas of potentially long-term research. For a number of years, the laboratory has studied the molecular basis of mullerian defects. More recently, it has begun to focus on ovarian aging, both in the mouse model and humans. Studies have been initiated to better understand the recruitment of the dominant follicle. Fellows may also elect to perform their basic research in one of the many laboratories within the HMS system.

Over the past nine years, eight fellows have completed the BIDMC fellowship training program; four of these fellows presently practice within universities, one is in a private practice affiliated with a teaching program, and three are presently in private practice. The research, teaching and clinical experiences provided by this fellowship program have made it one of the most popular and sought after training programs in the country. Each year, more than one hundred fellowship applications are received for the one available position.

Faculty, residents, and students enjoy a coffee break in our outdoor cafe.

The Fellowship Program in Reproductive Endocrinology and Infertility is highly competitive, with more than 100 applicants for the one available position per year for this three-year program.

Obstetrical Service
July 1, 2004—June 30, 2005

Cesarean deliveries - Total	1886
Cesarean deliveries - Primary	1254
Cesarean delivery rate	39%
Vaginal Birth after Cesarean delivery	71
Breech delivered vaginally	8
Forceps deliveries	17
Vacuum (extraction) deliveries	162
Multifetal delivered vaginally	14
Pregnant diabetics (admitted/discharged) Type I, II, and gestational	346
Pre-eclampsia, gestational hypertension & chronic hypertension patients (admitted/discharged)	320
Low birth weight infants (500 - 2500 grams)	519
Cardiac disease in pregnancy	18
Total Deliveries	**4842**

Gynecology Service
July 1,2004—June 30, 2005

Dilation and curettage	842
Cervical cone biopsy	21
Cervical Laser/LEEP/LOOP	85
Colporraphy/AP repair	36
Hysterectomy - Total, all types	525
- Radical	7
- Abdominal /or lap assisted abdominal	417
- Laparoscopically assisted vaginal hysterectomy	25
- Vaginal with repair or TVT/cysto	48
- Vaginal without repair	28
Hysteroscopy - Total , all types	378
- Hysteroscopy	356
- Hysteroscopy with ablation	34
Laparoscopy-diagnostic and operative	248
Mini-Laparotomy	39
Myomectomy	75
Ovarian cystectomy	25
Resection pelvic mass	72
Trans-vaginal Tape, with or without AP repair	109
Tubal ligations—Total, all types	76
- Laparoscopic	67
- Postpartum	9
Vulvar or vaginal laser therapy	16
Vulvectomy-partial or radical	14
Total Cases	**2711**

Nursing

Mission

OB/GYN Nursing is committed to caring for the women for the full continuum of their life cycle healthcare needs. We are committed to continuity of care by the practice of primary nursing.

The obstetrical division of nursing is composed of labor and delivery, high-risk antenatal, postpartum, and newborn nursery. Special services include the neonatal intensive care unit (NICU), lactation support services, and the ambulatory testing unit. Additional supports for patients are provided through the Learning Center, childbirth education and the baby carriage. The gynecologic nursing division provides full in-patient care, including management of complex gynecologic surgical and oncology patients.

We are proud to have inherited the rich legacies of professional nursing that were associated with both the Beth Israel and Deaconess Hospitals before our merger in 1996. Since then, we have continued to establish exemplary, integrated programs of service and support that will help to ensure continued excellence in nursing practice into the Millennium.

OB/GYN Quality Improvement Assurance

Mission

The mission of the OB/GYN quality improvement/assurance group at Beth Israel Deaconess Medical Center is to monitor care delivered to the obstetric and gynecologic patient population. Patient safety is one of the greatest challenges facing our healthcare system. According to the Institute of Medicine Report (published in 2000), between 44,000 and 98,000 deaths occur in hospitals in the United States every year due to adverse events. It is our moral obligation to improve the safety of childbirth, and in the process we can reassure the public and our legislatures.

Quality Assurance Committee

The Quality Assurance Committee cases are selected for review based on indicators defined by JCAHO, ACOG and Harvard Risk Management Foundation. Information is gathered from the admitting department's list of discharge codes, OR reports, and the OB database. All staff members in the OB/GYN department are encouraged to submit provider-raised issues to the OB/GYN quality assurance department if they have a specific concern regarding a patient's care.

The OB/GYN Quality Assurance Committee consists of staff representing all divisions and call groups within the department of OB/GYN. Members of the committee serve for a minimum of two years and render the commitment needed to achieve the goals of monitoring and enhancing quality patient care.

Quality Improvement Committee

The focus of continuous quality improvement is on improving the processes of care rather than on identifying individual deficiencies. Continuous quality improvement requires ongoing monitoring and evaluation of clinical patient care. Priorities are given to the aspects of care that are high volume, high risk and problem prone.

The OB/GYN Quality Improvement Committee is multi-disciplinary with representation from all divisions within the department of OB/GYN including obstetrics, gynecology, OB anesthesia, nursing, reproductive endocrinology and neonatology.

The committee identifies problems based on data analysis, referrals from the Quality Assurance Committee and provider-raised issues. Focus areas include processes of care, variation and causes of variation, and prevention of adverse outcomes or

near misses. Once a problem is identified, data is obtained to verify the problem. An action plan is then formulated and disseminated to the appropriate personnel.

Reviewing departmental statistics and trending of selected data is another component of the OB/GYN Quality Improvement Committee. This enables the committee to identify areas in need of improvement and to develop improvement processes based on current literature for performance enrichment.

The OB/GYN quality assurance/ improvement teams work to improve patient safety in the Department. We utilize a special emphasis on teamwork and formal annual team training seminars.

Social Work

Barbara Sarnoff Lee, M.S.W.
Director

Mission

The OB/GYN social work division provides direct OB/GYN clinical care, consultation and education to patients, families and staff at BIDMC. The staff has expertise in women's health issues across the developmental life cycle. They also have specialized knowledge as it pertains to high-risk pregnancies, HIV- AIDS in women, perinatal bereavement, pregnancy termination, gynecological cancers, child welfare issues, substance abuse, domestic violence, and menopause. In addition to the direct clinical care and counseling with patients and families, the social work department sponsors several specialty programs, through the Center for Violence Prevention and Recovery, to address the health risks associated with violence. The Center for Violence Prevention and Recovery encompasses Safe Transitions, a domestic violence intervention program, and the Rape Crisis Intervention Program. Safe Transitions — Domestic Violence Intervention Program Crisis intervention —Advocacy and counseling for patients and staff who are in coercive, controlling or abusive relationships.

Consultation — Staff are on call 24 hours, 7 days a week to provide guidance and resource information to other members of the staff and their patients

Safe Bed — Safe Transitions is one of the first and only Boston-based programs to provide anonymous, free overnight shelter for patients for whom it would be unsafe to return home and who have no safe alternatives

Support Groups — These groups provide a forum for patients and staff to share their stories and strategies for survival. Outreach efforts have been made to particular area colleges and universities to initiate an education/support group for graduate and undergraduate students

Rape Crisis Intervention Program

- Emergency department, medical and psychological services for sexual assault patients. Trained rape crisis counselors provide crisis counseling for rape trauma patients
- Follow-up crisis counseling for sexual assault patients and their family and friends, which focuses on the emotional impact of the trauma
- Follow-up medical care through OB/GYN services
- In-service training for multi-disciplinary hospital staff in treating rape trauma
- Clinical research on treatment and recovery from sexual assault

These programs represent our commitment to healthcare

Social Mission

Community Medicine

Martin November, MD, MBA
Director

The Community Medicine service provides obstetric and gynecologic care to a culturally and ethnically diverse population of urban and suburban women. All inpatient obstetric care, including labor and delivery and in-patient gynecology, takes place at Beth Israel Deaconess Medical Center in Boston. In keeping with the concept of primary care, a primary obstetrician/gynecologist coordinates care for all women at her site. Each physician works with the support staff at the Neighborhood Health Center to ensure the patient's transition in and out of the hospital is seamless.

International Health Care

Benjamin P. Sachs, MD
Director

The department has developed and raised funds for women and children's health centers in a number of developing countries, and is committed to education of physicians and healthcare workers internationally. Funded through multiple sources, including USAID, Harvard Medical International, and philanthropy, this work enhances our own ability to provide healthcare and to teach our residents and medical students the principles of culturally competent care.

The Parent Connection

Christine Sweeney, LICSW
Program Director

Welcoming a new baby into the home can be both an exciting and overwhelming experience, especially for first-time parents. At BIDMC, our patients represent a very diverse group of parents. However for most, adjusting to parenthood is a major transition in the life of any individual and couple. The Parent Connection, the only hospital-based program of its kind in Boston, provides families with continued support after they leave the hospital through three distinct areas of service: the mentoring moms program, support groups, and a monthly lecture series.

Under the department of OB/GYN, and initially sponsored by the Friends of Beth Israel Deaconess Medical Center, the program began in 1999. For any first time parents who deliver at the medical center, the Parent Connection offers mentoring moms support. Volunteer mentors provide new parents weekly phone call support through the first three months postpartum, offering encouragement and reassurance as families learn the unique behaviors of their baby. Common issues that new parents raise are questions around breastfeeding, infant sleep, the decision to return to work, and the change in identify from career to at home mom. Volunteers are trained to recognize the signs/symptoms of postpartum mood disorders and help patients get connected to appropriate resources in the community and in the medical center. Most importantly, mentoring moms help new parents realize that they are not alone in their struggles and that they are cared for after they leave the medical center. All volunteer mentor parents participate in a special training program and are supervised on an ongoing basis through monthly meetings at which they discuss their questions and experience with a licensed social worker and each other.

for all women and children

in the world and are part of our mission.

Parent Connection support groups give new parents the opportunity to meet other new parents in their community, share experience, questions, challenges, and make new friends. A special group for gay and lesbian parents allows for a safe and compassionate environment for meetings to discuss general parenting issues as well as issues specific to being in a same-sex partnership and raising children. The groups are all offered free of charge and open to any new parent in the community.

The goal of the Parent Connection is to enhance parenting skills by providing new families support in their adjustment to parenthood, to link families into both medical center and community-based resources, and to encourage a long lasting relationship to Beth Israel Deaconess Medical Center. By intertwining the services of volunteers, hospital staff and community services, the Parent Connection helps families begin parenting on a positive note.

Accomplishments and Research

Our accomplishments and research reflect the diversity that is valued in our department. The Department of Obstetrics and Gynecology at BIDMC has been fortunate to be awarded — millions of dollars in federal and non-federal grants, for 2005 and beyond. We are very proud of our clinical, basic science, public health, and educational research projects. Through close collaboration with other departments at the medical center and at Harvard Medical School, the department has a varied and prolific research program. Our interdepartmental collaborative efforts are the basis of successful research developments, as they allow significant advances in our understanding of disease and the delivery of healthcare. Our collaborations on the pathogenesis of preeclampsia and cystic fibrosis have led to exciting basic research findings and potential new clinical therapies. The department also places special emphasis on epidemiology and public health policy as it relates to women's health both in the United States and abroad. Additionally, the department is a leader in the national effort to improve patient safety. Finally, in concert with Harvard Medical School, the department is a leader in educational research in women's health.

International Health Care

Under the leadership of Benjamin P. Sachs, MB.BS, Harold H. Rosenfield Professor, Harvard Medical School; Professor, Harvard School of Public Health; Chief Obstetrics, Gynecology and Reproductive, the department has initiated, led and participated in several public health projects to improve the health of women internationally. The department has developed and raised funds for women and children's health centers in a number of developing countries. The funding has been provided through multiple sources, including USAID and philanthropy. These clinical programs have been used as laboratories for developing new approaches to primary healthcare for women and children, as well as pro-

Sadia Haider (Chief Resident 2005) and Julio Mazul (not pictured - Senior Resident 2005) participated in Harvard Medical International's program at Sri Ramanchandra Medical Center and Research Institute in India. Dr's Haider and Mazul participated in healthcare delivery and professional education of the faculty.

fessional education for international faculty. In addition they provide educational experiences for our residents and faculty interested in international health. By virtue of Dr. Sach's position on the Board of Harvard Medical International, the department participates in Harvard Medical International's outreach to improve healthcare and education worldwide. Residents are given the opportunity annually to participate in women's health in countries at Harvard Medical International sponsored sites.

Each of the clinics listed below were developed with our assistance for a finite period of time. After which, operation of the clinic was turned over to the local authorities. Transfer of authority was successfully achieved in each case.

Σ

(1987): High-risk obstetrics center, Children's Hospital, Quezon City

Armenia, Yerevan (1992 – 1996): Primary care program for women - 82,000 patient visits

Ukraine, Dniepropetrovsk (1999 – present): Primary care program for women and children, Dniepropetrovsk – 20,000 patient visits per year

Faculty and resident participants have brought their own special expertise to these far away sites

Dr. Johanna Perlmutter – Contraception and preventive women's healthcare

Dr. Louis Burke – Colposcopy and LLETZ

Dr. Ian Grable – High risk obstetrics and diabetes in pregnancy

Preeclampsia / Hypertensive Disorders of Pregnancy

A research collaboration between the Department of Obstetrics and Gynecology and the Department of Medicine has resulted in a major breakthrough into the underlying cause and potential treatments for preeclampsia. Under the direction of S. Ananth Karumanchi, MD, Assistant Professor in Medicine and Obstetrics and Gynecology, Harvard Medical School, a major discovery into the underlying cause of preeclampsia has been discovered. Collaborating from Maternal Fetal Medicine is Dr. Kee Hak Lim, Associate Professor of Obstetrics and Gynecology and Reproductive Biology. This research builds upon earlier findings that Dr. Karumanchi and his

An interdepartmental research collaboration between the Departments of Internal Medicine and OB/GYN has resulted in a major discovery into the underlying causes and potential treatments for preeclampsia.

coworkers had previously discovered that a substance called soluble fms-like tyrosine kinase 1 (sFlt-1) circulates in large quantities in the bloodstreams of women with preeclampsia, and that sFlt-1 injected into the bloodstream of pregnant rats caused a preeclampsia-like illness. When compared to women who did not have preeclampsia, women who later developed the condition had elevated blood levels of sFlt-1, before their preeclampsia occurred. Conversely, beginning early in their pregnancies, these women had lower levels of a substance known as placental growth factor (PlGF) in the blood than did women who did not develop preeclampsia. Flt-1 sits on the surface of the cells that line the inside of blood vessels. Like a key fits into a lock, VEGF and PlGF bind to Flt-1, and in the process trigger a chain of chemical reactions inside the cell. The Flt-1 molecule also exists in a soluble form as well, which does not sit on the cell surface but instead circulates in the bloodstream. The soluble Flt-1 binds to VEGF and PlGF, preventing them from acting on the cells that line the inside of blood vessels. Pregnant women who carry normal pregnancies to term also have sFlt-1 in their blood, however, at much lower levels, and much later in the pregnancy- shortly before birth. The landmark findings appeared in the February 12, 2004 issue of The New England Journal of Medicine, and in the January 5, 2005 issue of the Journal of the American Medical Association.

The researchers are currently looking at the urine and blood of pregnant women to determine if a simple test may be used as a predictor for preeclampsia. In addition, it is hoped that this research may help in the ultimate development of a treatment for preeclampsia.

The NIH, the National Institute of Diabetes and Digestive and Kidney Diseases, and the Department of Obstetrics and Gynecology at BIDMC provided funding for the research.

Patient Safety and Health Care Quality

Under the direction of Dr. Benjamin Sachs, MD, Harold H. Rosenfield Professor, Harvard Medical School; Professor, Harvard School of Public Health; Chief, Department of Obstetrics and Gynecology, the department has become a national leader in the movement to systematically improve patient safety and healthcare quality. Dr. Sachs is the principal investigator in a national randomized control trial funded by the Department of Defense that includes 15 hospitals. The purpose of the project is to implement and evaluate the role of team training to significantly reduce medical errors in obstetrics. The goal of this project is to demonstrate a 40% reduction in medical errors, as well as improvement in patient and staff satisfaction. The project has been assisted by many national organizations including the American College of Obstetrics and Gynecology.

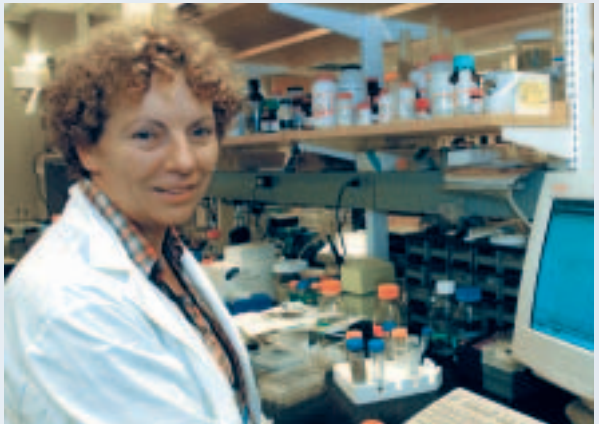
Team meeting on Labor & Delivery is a time for interdisciplinary patient care plans to be discussed to maximize healthy outcomes.

Team training has been fully implemented and is part of the standard daily working environment on Labor and Delivery at Beth Israel Deaconess Medical Center. Other areas in the medical center are currently implementing this training, including the operating rooms and intensive care units.

Dr. Sachs and a team of researchers and clinicians are leading the national movement for patient safety, speaking at national meetings in order to bring our brand of safety and study results to the national forefront. Physician leaders Susan Mann, MD and Ronald Marcus, MD, and nursing leaders Penny Greenberg R.N., and Barbara Stabile R.N. have been active both locally and nationally in promoting this important work.

Reproductive Endocrinology Boston IVF

The Division of Reproductive Endocrinology and Infertility conducts a robust array of both basic and clinic research programs. The basic science program is led by Anny Usheva-Simidjiyska, Ph.D., Assistant Professor at Harvard Medical School. Funded by an NIH R01—National Heart, Lung and Blood Institute grant and industry, the goals of the reproductive endocrinology and infertility research lab have been to study major genes and pathways Involved In reproduction, with a special focus on the molecular pathways involved in ovarian aging in mice and humans. Researchers are applying basic biochemical, physical, and structural analyses, together with clinical research, to search for molecular markers of follicular selection/ recruitment and ovarian aging. A woman's ability to conceive depends on the supply of oocytes, their quality and ovarian functionality. As women age, ovarian dysfunction is a frequent cause of infertility, but the molecular mechanisms underlying this ovarian dysfunction are poorly understood.



Anny Usheva-Simidjiyska, Ph.D., directs the basic science research program in the Division of Reproductive Endocrinology and Infertility.

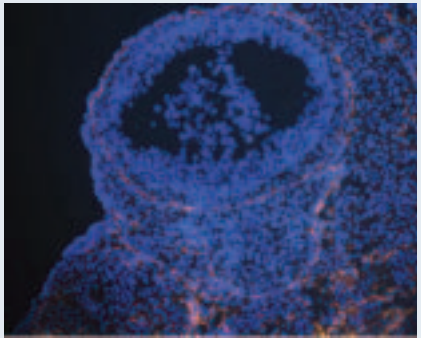
Based on previous studies showing age-associated changes at RNA and protein levels in rodent tissues, the BIDMC researchers believe that the profound decline in ovarian function is marked by altered gene expression and the protein profile. Dr. Uusheva- Simidjiyska and her team of researchers are comparing the gene expression profile by applying DNA array analyses on gene libraries from young and retired female mouse breeders. They are searching for fertility- and infertility-specific ovarian phenotypes as a function of ovarian aging and reproductive ovarian functionality. The creation of a map of the protein network is helping to determine how proteins interact with each other in relation to aging and infertility. A variety of analytical methods are applied to identify age-dependent modified proteins and the nature of the modification.

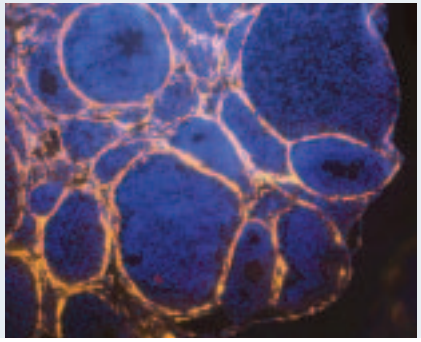
This information has tremendous applications for detecting potential protein targets for drug therapy of age related ovarian dysfunction and infertility that are Independent of the normal loss of germ cells or related to premature germ cell loss. In addition, investigators are searching for non-invasive nanotechnology-based physical methods to predict follicular quality based on changes in the electronic futures of the follicular fluid. Related projects on

ovarian aging include gene expression profiling of granulosa cells of young and aged women undergoing in vitro fertilization (investigators are Richard Reindollar, David Ryley, Alison Zimon, and Tiffany Von Wald).

Clinical research in the division is enhanced by the tremendous patient database afforded by Boston IVF, the largest fertility center in the United States. Boston IVF has a large database and high patient volume, which provides an ideal resource for clinical studies. Dr. Richard H. Reindollar, former director of the division for many years, and now Department Chair at Dartmouth Medical School, continues to work with the division on federally funded projects. Under his leadership, the division was awarded grants by the National Institute of Health (NIH). A collaboration continues on this work with co-investigators in the REI Division at the BIDMC. Entitled "Conventional Infertility Therapy versus Fast Track to IVF," researchers are studying two different infertility treatment paradigms for couples with the female partner under 40 years of age. The FORTT Trial, Optimal Infertility Therapy RCT: Women 40 and Older, is analyzing treatment paradigms for couples with the female partner ages 40-43 years of age. These studies are being performed with members of the Harvard School of Public Health.

Dr. Alan Penzias is Associate Director of the Division of Reproductive Endocrinology and Infertility at BIDMC. Dr. Penzias' research has focused on optimizing outcomes and clinical approaches to infertility treatment. He is a co-investigator and member of the steering committee on the FASTT Trial. Dr. Penzias' early research in ART began with studies of the GIFT procedure. He published a suite of papers on the decline in success rates with advancing age and the optimal number of oocytes to transfer, along with simplification of the technique. He conducted one of the first prospective randomized trials of GnRH agonists for use in IVF, a study that was selected as a prize paper by the American College of Obstetricians and Gynecologists. Other research has been aimed at the optimization of stimulation parameters and conditions in ART. These include the impact of baseline ovarian cysts prior to gonadotropin stimulation, the predictive value of early pituitary suppression on IVF outcome; sonographic follicular size and shape on oocyte maturity and fertilization rates; and corpus luteum lifespan and luteal phase support following ART. He has co-authored studies of granulosa cells obtained at egg retrieval using flow cytometry to evaluate the impact of age and stimulation regimen on cell cycle parameters. In addition he has co-authored studies of eggs that failed to fertilize following ICSI with biochemical evaluation of their zona pellucidae and decondensation patterns of their maternal and paternal chromatin. He has also studied the adverse impact of ART with respect to multiple pregnancy co-authoring papers on the costs, neonatal morbidity and mortality of triplet pregnancy.





Fluorescent microscopy of smooth muscle alpha actin expression and distribution in mouse ovaries: Y – young ovary; O- ovary from 8 m old retired breeder. Nuclear staining was performed with hoehst (blue). Smooth muscle alpha actin was stained with FITC- conjugated primary anti - alpha actin antibody (yellow). Cryosections were prepared from frozen mouse ovary.

Doug Powers, Ph.D., from Boston IVF has partnered with the Department of Biology at Harvard University to develop stem cell lines from donated cryopreserved embryos. Made possible by a grant from the Howard Hughes Foundation, this important program allows patients the option of

donating frozen embryos for the development of potentially disease fighting stem cell lines. Other division research areas include evaluation of the causes of mullerian agenesis, cryopreservation of human oocytes, low responders to IVF, and the effects of High Body Mass Index on fertility.

Gynecologic Oncology Research

The Division of Gynecologic Oncology has a research program under the direction of Stephen Cannistra, MD, head of Gynecologic Medical Oncology at Beth Israel Deaconess Medical Center and Professor of Medicine at Harvard Medical School. The program includes a number of ongoing projects, including investigation into the role of microarrays in predicting response to chemotherapy for patients with ovarian cancer, and a number of clinical trials investigating the role of new therapies for such patients. Perhaps most exciting is the study of new biologic therapies for advanced ovarian cancer, such as angiogenesis inhibitors. Many of the clinical trials are open through the collaborative efforts of the institutions comprising the Dana-Farber/Harvard Cancer Center, of which Beth Israel Deaconess is a founding member. The program also maintains a tumor bank for use in basic science investigations in ovarian cancer.

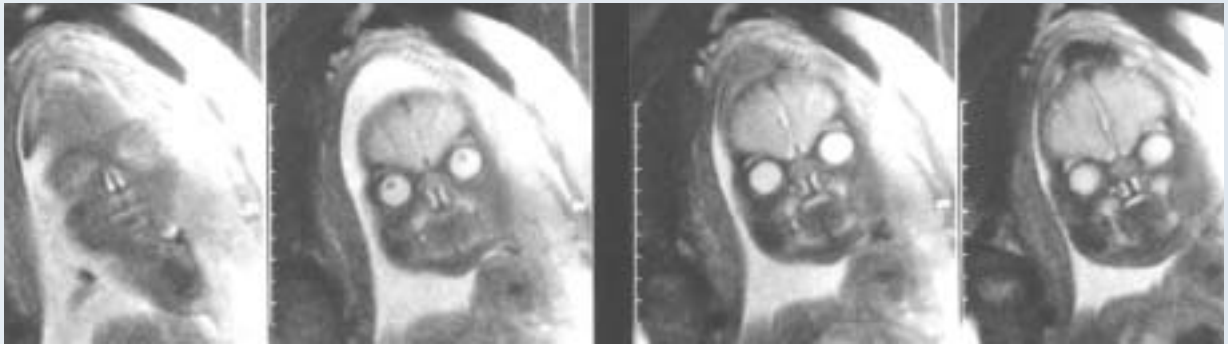
Prenatal Diagnosis with Obstetric MRI

Prenatal Diagnosis with Obstetric MRI

Deborah Levine, MD, is an Associate Professor of Radiology and Obstetrics and Gynecology at Harvard Medical School and BIDMC. She is also co-chief of ultrasound and director of OB/GYN ultrasound. Dr. Levine's research interest is improving prenatal diagnosis with use of obstetric MRI. Her major research is funded by an NIH R01 grant entitled "MRI of Fetal Ventriculomegaly: Morphology and Outcome." This research project evaluates fetal central nervous system anomalies seen on MRI and compares them with ultrasound, in order to correlate imaging findings with postnatal outcomes. Other research interests include imaging of abdominopelvic pain in pregnancy, optimizing imaging techniques for fetal MRI, and assessment of adnexal masses.

Medical Education Research Women's Health

The department values teaching of residents and medical students. Several innovative teaching methodologies utilizing computer simulation and standardized patients are utilized to complement the traditional curriculum. Evaluation of these new teaching modalities is performed, so that formal assessment is part of all new academic endeavors. Led by Hope Ricciotti, MD, Associate Professor of Obstetrics, Gynecology and Reproductive Biology, Harvard Medical School; Chair, OB/GYN Clerkship Committee, Harvard Medical School, and working



Dr. Deborah Levine, Director of OB/GYN Ultrasound, is investigating the use of obstetric MRI in prenatal diagnosis.

in collaboration with Harvard Medical School and the Harvard Center of Excellence in Women's Health, the department has developed and raised funds for projects that enhance medical education in women's health. These educational projects are multi-disciplinary endeavors, bringing together physicians and educators from other disciplines to improve the education of medical students and to enhance the teaching skills of residents. The funding has been provided through multiple sources including, the US Health and Human Service Department, Pharmaceuticals, the Macy Foundation, the BIDMC Department of OB/GYN, and Harvard Medical School. Current educational research projects include a randomized trial of an Obstetrical Virtual Patient as teaching tool for medical students, and evaluation of the Resident as Teacher program, and curriculum reform in women's health.

Harvard Center of Excellence in Women's Health - Funded by HHS since 1999, our department provides the leadership in educational projects to enhance the teaching of medical students in women's health as well as to enhance the women's health education of internal medicine residents. Dr. Hope Ricciotti serves as Deputy Director for Education.

Women's Health Theme - Harvard Medical School - Funded by Harvard Medical School as well as the Lily Foundation for Women's Health, our department leads the effort to better integrate women's health into the Harvard Medical School Curriculum.

Obstetrical Virtual Patient Project - Funded by the Macy Foundation, Hope Ricciotti, MD, authored a normal pregnancy virtual patient as part of a full series produced by the Shapiro Institute for Education and Research. The educational effect of the OB Virtual Patient as a teaching tool is currently being evaluated in a randomized, controlled study of Harvard Medical Students utilizing a standardized patient for assessment, funded by the department of obstetrics & gynecology.

Resident as Teacher Program - Our department is committed to teaching our residents to be academic teachers, and is working jointly with the HMS Resident as Teacher Program to formally enhance our resident curriculum by providing instruction on teaching skills. Led by Clerkship Co-Director Mimi Yum, the Resident as Teacher program trains residents to be better teachers, and formally assesses the progress made through this program.

Soy Supplement as a Treatment for Menopausal Hot Flashes

A collaboration among the Departments of Obstetrics and Gynecology, Medicine, and Surgery has allowed a clinical trial to flourish that tests the effectiveness of a novel soy supplement on the treatment of hot flashes. The effect of a novel daidzein-rich isoflavone-aglycone extract prepared from soy on hot flash frequency and severity in menopausal women is being investigated through a randomized placebo-controlled trial. Co-principal investigators Hope Ricciotti, MD, and George L Blackburn, MD, Ph.D., a renowned nutrition scientist and Professor of Surgery at Harvard Medical School, along with co-investigators Lalita Khaodhiar, MD, Weijun Pan, MD, and Jinrong Zhou, Ph.D. have previously published promising feasibility data and safety data on this novel soy supplement. Isoflavones are one of the several classes of phytoestrogens, compounds that can exert both estrogenic and antiestrogenic properties. Daidzein and genistein are isoflavones that are found in rich supply of soybeans and soy products. Available data on isoflavone in treatment of menopausal symptoms has been inconclusive and the studies with positive results have reported only a slight response. This in

part may be due to differences in methods used to isolate isoflavones, concentrations of bioavailable isoflavone and composition of isoflavones used. In this randomized controlled study, an examination of the effect of a novel daidzein-rich isoflavone-aglycone extract from soy germ fermentation with Koji fungus (Aspergliius awamori) producing glycosidase efficiency on the severity and frequency of hot flashes in postmenopausal women is being conducted. Results are due to be reported in early 2006.

Optical Detection of Disease

Lev T. Perelman is Associate Professor at Harvard Medical School and Director of Biomedical Imaging and Spectroscopy Laboratory at the Department of Obstetrics and Gynecology, Beth Israel Deaconess Medical Center. Prior to that he was Principal Scientist at MIT where his research interest was using optical spectroscopy to diagnose disease. He conceived and developed biomedical light scattering spectroscopy (LSS) recently applied for non-invasive detection of early precancerous changes in epithelial tissues and tissue characterization on sub-cellular scale. His present research interest involves application of optics to obstetrics and gynecology, cell biology and detection of disease.

Optical Detection of Preinvasive Cancer

The purpose of this program is to provide a physician with a diagnostic screening tool which will enable him to rapidly survey the epithelial tissue in vivo and allow him to determine with high probability and in real-time, regions of dysplasia and carcinoma. It will be able to distinguish between the categories of adenocarcenoma, high-grade dysplasia, low-grade dysplasia, indefinite for dysplasia and non-dysplastic tissue. It will be able to perform measurements of the full length of an organ in about ten minutes and provide the information in real time. Suspicious areas can then be biopsied and the diagnosis verified. This approach is vastly superior to the present strategies of performing either systematic or random biopsies. Thus, it will provide a powerful tool for screening large population of patients for early precancerous changes. This instrument will be based on the technique of light scattering spectroscopy (LSS), which has been demonstrated in a proof-of-principle study to be able to perform such measurements in the epithelial tissue of different organs. The advantages of the proposed technique are that it greatly simplifies the time and labor involved in performing screening and obtaining diagnoses, will cause less patient discomfort, require fewer biopsies, and it can help the pathologist to base his diagnosis on uniform quantitative criteria, making the diagnosis more consistent. Because of these advantages, it should vastly improve the probability of detecting potential malignancies in the early stages, when cures are possible, and it should be highly cost effective. Since tissue is not necessarily removed, it makes possible progression studies. Such studies may determine accurate predicative factors for the outcome of the disease, and thus simplify the decision in the choice of treatment.

Dynamic Monitoring of Sub-Cellular Morphology

The overall objective of this project is to develop a novel optical imaging technique, Confocal Light Scattering Spectroscopic (CLSS) Microscopy, capable of non-invasively determining the dimensions and other physical properties of single subcellular organelles with five nanometer accuracy. CLSS microscopy combines the principles of light scattering spectroscopy (LSS) with confocal microscopy. LSS is an optical technique that relates the spectroscopic properties of light elastically scattered by small particles to their size, refractive index and shape. The multispectral nature of LSS enables it to measure internal cell structures much smaller than the diffraction limit without damaging the cell or using exogenous markers, which could affect cell

function. Scanning the confocal volume across the sample creates an image. The CLSS microscope provides unique capabilities to study cell interactions with the environment, cell reproduction and growth and other functions of viable cells, which are beyond the capabilities of other techniques.

Human embryo development and quality, as well as response to environmental factors, might be monitored progressively at all critical stages, using CLSS. For example, when cells are in metaphase, CLSS could provide information concerning the number and shape of chromosomes present. Since the CLSS measurement is nondestructive and requires no exogenous chemicals, a given embryo in vitro could be monitored over time before implantation. These kinds of progression studies are not possible with the techniques currently available.

Development of an Optical Spectroscopic Technique for Extracting fNRBC from Peripheral Blood of Pregnant Women for Non-Invasive Prenatal Diagnosis

Present cell-based techniques of prenatal diagnosis (PD) such as amniocentesis and chorionic villus sampling are invasive and present some risks. However, a very small number of fetal cells also appear in the maternal peripheral blood supply during pregnancy. Using these cells for genetic analysis would be minimally invasive and could broaden the application of PD while minimizing the risks. For over two decades, researchers have employed numerous techniques in the attempt to harvest fetal cells from maternal blood for diagnosis and the search has focused on fetal nucleated red blood cells (fNRBC). Despite extensive efforts by various academic research groups and commercial enterprises, reliable detection and isolation of a sufficient number of fNRBC for clinical utility remains a monumental challenge. This is because of their extremely low concentration in the maternal blood, interference by NRBC of maternal origin (mNRBC) and the lack of definitive, broadly applicable identifiers.

The objective of this research program is twofold: (1) to identify definitive native optical biomarkers of rare fetal cells and (2) to develop a fast, simple and robust LSS based technique that will enable significant enrichment and recovery of those cells from maternal peripheral blood. This will enable the development of clinically useful method for fNRBC enrichment and recovery from peripheral maternal blood leading to minimally invasive prenatal genetic testing.

Optical Detection of Alzheimer's Disease

Alzheimer's disease (AD) is the most common form of dementia. It is estimated that in the United States alone, over 4 million people have AD. Prevalence is increasing with the increasing average age of the population. Yet despite recent advances in clinical diagnosis and the search for biological markers, definitive diagnosis of AD still requires neuropathological examination of brain tissue, typically post-mortem. Improved diagnosis of age-associated neurodegenerative diseases is therefore a high priority. Particularly in the current atmosphere of rapid development of pharmaceutical interventions, the need for an in vivo method to detect onset early and to monitor the development of AD are crucial. The neuropathological hallmarks

of AD are senile plaques (SPs) and various forms of neurofibrillary pathology, including neurofibrillary tangles (NFTs), neuritic threads (NTs) and dystrophic neurites surrounding some SPs. Spectroscopic techniques such as near infrared (NIR) fluorescence and Raman scattering have proven useful for identifying AD brain tissue. We are developing an optical technique that will detect differences in absorption and light scattering properties of SPs, NFTs and NTs. In this technique, optical fibers positioned on the patient's scalp will deliver visible and NIR light and will collect reflected light . Since the optical properties of both the overlying skull and brain tissue are dominated by scattering and have rather small absorption, light can penetrate through the skull to probe the chemical and morphological composition of the cortex. By using both light scattering and reflectance spectroscopy we expect to be able to detect both chemical and morphological changes in Alzheimer's brain at the earliest possible stages. We have been working to identify absorption and scattering signatures of Alzheimer's brain and to detect them in order to differentiate diseased (AD) and normal control (non-AD) brains. Recently we have successfully tested our approach in situ on intact post-mortem specimens and in vivo on Alzheimer's patients.

Prototype Confocal Light Scattering Spectroscopic (CLSS) Microscope

Beth Israel Deaconess
Medical Center

A teaching hospital of
Harvard Medical School

www.bidmc.harvard.edu