EXHIBIT 9

IN THE UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF ARKANSAS CENTRAL DIVISION

FREDERICK	W.	HOPK	KINS,	M.D.	, M.l	Р.Н.	et
al.,							

Plaintiffs,

CIVIL ACTION

v.

Case No. 4:17-CV-00404-KGB

LARRY JEGLEY, et al.,

Defendants.

DECLARATION OF KATHARINE D. WENSTROM, M.D. IN SUPPORT OF PLAINTIFFS' SECOND MOTION FOR A PRELIMINARY INJUNCTION AND/OR TEMPORARY RESTRAINING ORDER

- I, Katharine D. Wenstrom, M.D., pursuant to 28 U.S.C. §1746, declare under penalty of perjury that the following is true and correct:
- 1. I am a physician licensed to practice medicine in the state of Rhode Island. I received my medical degree from Case Western Reserve University School of Medicine, and completed a residency in obstetrics and gynecology ("OBGYN") and a fellowship in maternal-fetal medicine at the University of Illinois in Chicago Hospital. I then completed a second fellowship in medical genetics at the University of Iowa Hospital.
- 2. I have been Board Certified by the American Board of Obstetrics and Gynecology in OBGYN since 1992 and in Maternal-Fetal Medicine since 1994, and by the American Board of Medical Genetics since 1990. I am currently a Professor of Medical Science at the Warren Alpert Medical School of Brown University. I was previously a professor of OBGYN and the director of the Division of Maternal-Fetal Medicine at Women & Infants Hospital of Rhode Island, as well as director of Prenatal Genetics. I have served as the president of the Society for

Maternal-Fetal Medicine, and have been a member of the executive board of the American College of Obstetricians and Gynecologists. I have published more than 100 peer-reviewed research papers, as well as a variety of articles, commentaries, and book chapters on topics in maternal-fetal medicine and genetics.

- 3. My current *curriculum vitae*, which more fully sets forth my experience and credentials, is attached as Exhibit A.
- 4. I have reviewed the declarations of Lori Williams and Dr. Willie Parker. I understand based on those declarations that none of the physicians who provide abortion care at Little Rock Family Planning Services have training or experience with using potassium-chloride ("KCl") injections to induce fetal demise.

THE BAN ON D&E AND KCI INJECTIONS

- 5. I have reviewed Act 45 (the "D&E Ban" or the "Ban"). Based on my training and experience, it is my opinion that, as written, this law bans dilatation and evacuation ("D&E") abortion procedures.
- 6. I understand that the State has argued that injection of KCl is a safe and effective means for physicians who provide abortion care in Arkansas to ensure fetal demise before performing a D&E and thereby circumvent the Ban. I adamantly disagree.

Background Relating To The Use Of KCl Injections

7. Some physicians with advanced training are capable of inducing fetal demise using intracardiac (fetal) administration of KCl via a transabdominal injection performed with ultrasound guidance. To cause demise, KCl is rapidly injected in the fetal heart using a 7-to-9-inch needle that must be guided extremely carefully through the patient's abdominal and uterine walls, into the uterus and amniotic fluid, and then into the fetal chest and directly into the fetal

heart. Ultrasound is thereafter used to confirm asystole (no cardiac activity). If there are no complications, the entire procedure, start to finish, typically takes approximately 60 minutes. Due to dilution, KCl will not cause fetal demise when injected into amniotic fluid; injection into the fetal heart is required to safely and effectively perform the procedure.

- 8. The fetal heart is approximately the size of a pea at 14 weeks into a pregnancy after a patient's last menstrual period ("LMP"), and roughly the size of an olive at 20 weeks LMP.
- 9. KCl injections are typically used in the context of selective termination in a multifetal pregnancy, i.e., when a person is pregnant with more than one fetus and wishes to reduce the risk of preterm birth, or when one fetus has an anomaly. Multifetal pregnancy reduction generally confers medical benefits by reducing the risks associated with multifetal gestation.
- 10. I have performed approximately 200 intracardiac KCl injections, including approximately 50 for patients who were in the second trimester of their pregnancy at the time of the procedure.

Training Required for KCl Injections

- 11. An intracardiac injection of KCl is nearly 100% effective in inducing fetal demise, but the procedure requires an extremely high level of skill, and is thus almost exclusively performed by OBGYNs who are specialists in maternal-fetal medicine ("MFM"). MFM is an OBGYN sub-specialty involving an additional three-year training program after residency with extensive, advanced training at a major medical center and a focus on high-risk pregnancies. Training to perform KCl injections is not included in OBGYN residency training, and KCl-injection training is included in only a few MFM programs.
 - 12. Admission to MFM fellowship programs is extremely competitive, and

fellowships are full-time obligations. Acceptance into an MFM program, however, does not guarantee that a physician will receive KCl-injection training. Physicians must seek out specific MFM programs with tertiary Fetal Therapy Centers (e.g., in New York, Philadelphia, or Texas) if they are interested in obtaining the training necessary to perform intracardiac KCl injections.

- 13. Moreover, training in and competence to perform KCl injections has become increasingly rare and difficult to obtain in recent years, because the high-order multifetal pregnancies that were common from the 1980s to the early 2000s have become less common in view of (among other things) advances in in-vitro fertilization laboratory techniques.
- 14. Before a physician can be trained to competently perform KCl injections, the clinician must obtain advanced ultrasound training, which is not generally available in Family Practice or OBGYN residencies. During a Family Practice residency, residents usually learn only certain limited ultrasound skills, such as dating a pregnancy, confirming the intrauterine location of the pregnancy (e.g., to rule out an ectopic pregnancy), or determining fetal position. OBGYN residents learn only a few additional skills, such as evaluation of placental location or rudimentary evaluation of fetal anatomy. KCl injections, however, require a physician to use a two-dimensional ultrasound image to visualize and guide a needle through three-dimensional maternal and fetal structures, while the fetus is moving. During my MFM fellowship, I received hundreds of hours of highly specialized ultrasound training that served as a necessary foundation for KCl-injection training.
- 15. During my maternal fetal medicine fellowship, I was trained to do two advanced ultrasound guided needle procedures that were essential to acquiring the skills required for more technically difficult KCl injections. Specifically, I was first trained to perform (i) genetic amniocentesis (a procedure done in the early second trimester in which a fine needle is inserted

through the maternal abdomen and into the uterus under ultrasound guidance in order to remove amniotic fluid for genetic testing of the fetus) with approximately 40 to 50 training procedures; and then (ii) cordocentesis (a second or early-third trimester procedure in which a needle is inserted into the umbilical cord under ultrasound guidance to obtain a fetal blood sample for testing) with approximately 20 to 30 procedures after achieving mastery of genetic amniocentesis. During my medical genetics fellowship, I then assisted a mentor in performing intracardiac KCl injections before performing the procedure myself, under his supervision.

- 16. A physician who does not have experience performing many dozens of ultrasound-guided needle procedures (such as the genetic amniocentesis and cordocentesis procedures described above) would first need to become expert in performing prenatal ultrasound exams, and then need to perform at least 30 to 40 KCl injections under the direct supervision of a trained expert before he or she could be trained to competency and perform the procedure with confidence that it would not cause additional stress or risk to the patient or fetus.
- 17. In view of the relatively low volume of available KCl-injection procedures, I have been able over the course of the last 20 years to train only two MFM fellows in administering KCl injections, one of whom was not able to participate in enough procedures to be trained to competency. When I was on faculty from 2009-2018 at Women and Infant's Hospital (a tertiary women's hospital in Providence, Rhode Island that does 8,700 deliveries a year), I was the only physician trained in the procedure. I am not currently aware of any other physicians in Rhode Island who are trained in the procedure, and am aware of at most only two other physicians in the greater Boston area who are trained in the procedure.
- 18. It would be extremely difficult, if not impossible, for an OBGYN (even with advanced training in Family Planning) or a Family Medicine physician to obtain the training

necessary to safely and effectively perform intracardiac KCl injections in an outpatient setting:

- a. Any physician seeking KCl-injection training would need to take significant time off from his or her practice and, as discussed below, likely move to another part of the country (potentially uprooting their entire family to do so), which for many physicians would not be feasible from a financial or personal standpoint.
- b. He or she would also need to find a qualified MFM or medical-genetics OBGYN physician who is willing to provide the training and has a high enough case volume that he or she could train the physician to competency within a reasonable period of time. As described above, the number of such programs is quite limited. Moreover, I am not aware of any training programs in the country that would permit a physician to participate in the program solely to learn KCl injections; most physicians obtain KCl-injection training by completing a three-year MFM fellowship program.
- 19. Even if it were possible to obtain the necessary training and exposure, it is nevertheless possible that a physician still would not be able to acquire the skills to safely perform the procedure. Achieving competency in the procedures that OBGYNs and Family Medicine physicians routinely provide (including abortion procedures) does not necessarily mean that the physician will become competent to perform highly technical ultrasound-guided needle procedures like KCl injections. No matter their level of training, in my experience, certain physicians simply do not have the requisite hand-eye coordination and skill in ultrasonography necessary for KCl injections.
- 20. Moreover, a trained physician is not the only medical professional necessary to safely and effectively perform KCl injections. The procedure also requires the assistance of a

trained and sophisticated ultrasound technician, or another physician, who can accurately guide the ultrasound transducer so that the physician performing the injection has—at certain times—both hands available for the procedure. Even an otherwise highly qualified ultrasound technician is not necessarily experienced enough to support an MFM while performing an intracardiac KCl injection.

21. In a typical intracardiac KCl injection, the physician holds the needle in one hand and the ultrasound probe in the other, while either another experienced doctor or ultrasound technician helps adjust the ultrasound equipment as needed to optimize imaging of the needle and the target to assist in accurate needle guidance. Precise timing of the needle insertion is essential because the fetal position can change rapidly. When the needle reaches the fetal heart (after passing through the abdomen, uterus, amniotic sac, and fetal chest), the physician passes the probe to the fellow or ultrasound technician so that the physician can remove the stylet (i.e., the plug in the inside of a hollow needle), attach a syringe containing saline that is injected to confirm the location of the needle, then attach the syringe containing KCl, and then inject the solution under direct ultrasound visualization, all while ensuring no displacement of the needle during maternal or fetal movements. The needle must then be held in place for 2-3 minutes so that additional KCl can be administered if asystole is not confirmed.

Risks Associated With KCl Injections

- 22. Intracardiac KCl injections are associated with a number of maternal health risks that, in my opinion, are not justified in circumstances where a physician is performing the procedure solely to comply with the D&E Ban. For example:
 - a. There are risks of maternal tissue damage and severe pain if the KCl is inadvertently injected into the uterine muscle, and maternal cardiac arrest if the

- KCl is inadvertently injected into a maternal blood vessel.¹
- b. There are risks of infection or chorioamnionitis (a serious condition in which the membranes surrounding the fetus are infected by bacteria) resulting from the transfer of bacteria from the maternal skin surface into the uterus.
- c. Although it is unlikely if a KCl injection is performed by a trained physician, an unsuccessful procedure could result in sepsis or the need for a hysterectomy.
- 23. Additionally, KCl injections can be very complicated (or even impossible) in women with common conditions such as obesity or uterine fibroids, which increase the risks of the procedure.
 - a. When a patient is obese, the clinician must use a longer needle for the injection.

 This requires clinicians to be even more precise as they guide the needle, which is further complicated by suboptimal visualization of fetal structures by ultrasound due to the increased thickness of the maternal abdominal wall. A reason one of the fellows I attempted to train in KCl injections could not be trained to competency is that many of the patients who presented for treatment were obese, and he was unable to perform the procedures—even under my supervision—in view of that complicating factor.
 - b. If a patient has uterine fibroids (benign growths in the uterine wall), which as many as 50% of reproductive-age women do, accessing the uterus with a needle may be extremely difficult. Uterine fibroids can distort the uterine cavity, restrict fetal movement and positioning, and severely limit the angles or approaches available to the physician to reach the fetal heart. Pushing a needle through a

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¹ G.A. Coke *et al.*, *Maternal Cardiac Arrest Associated with Attempted Fetal Injection of Potassium Chloride*, 13 INT'L J. OBSTETRIC ANESTHESIA 287 (2004). This case report also demonstrates the substantial risks associated with performing KCl injections without the appropriate ultrasound equipment and professionals.

fibroid would be extremely difficult and is not advised. If a fibroid restricts the fetus to an unapproachable position or blocks the fetal heart, the procedure is potentially impossible.

- 24. The procedure itself can be an upsetting and uncomfortable experience for the patient, especially in view of the size of the needle. This is relevant because a patient's pain tolerance and anxiety level may make the procedure even more difficult. The patient is awake throughout the procedure, and will feel pain when the needle penetrates the skin and the uterus. Although a local anesthetic can be used to numb the skin, uterine pain cannot be prevented. The uterus is a muscle that contracts when penetrated, and the patient will feel extreme cramping for at least the duration of the procedure. Some patients are unable to stay completely still for the duration of the procedure, or cannot tolerate the uterine cramping or even the penetration of the needle. Further, if a woman's breathing intensifies due to anxiety or fear during the procedure, this can alter fetal positioning, further interfering with the procedure and increasing its difficulty.
- 25. In the event that the initial procedure is unsuccessful, a second procedure must be performed. Undergoing the procedure twice is extremely physically and emotionally stressful for the patient, and subjects her to risks all over again. Continuing a pregnancy after an incomplete KCl injection could be dangerous and thus medically inappropriate, given the risks to maternal health and likely harm that would result to the fetus.

* * * *

26. In sum, KCl injections are not a feasible means for abortion providers at Little Rock Family Planning Services to ensure fetal demise before every D&E, and mandating use of the additional procedure would subject patients to increased risk of harm with no corresponding benefit. If a physician who is untrained and inexperienced in performing these procedures began

an intracardiac KCl injection and could not complete it—a scenario that, in my opinion, is extremely likely—the patient would be forced to endure another unnecessary procedure to seek to induce demise, continue her pregnancy (despite increased risks), or try to seek care in another state.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 16th day of November, 2020.

Katharine D. Wenstrom, M.D.

Katharine DWenst MD

EXHIBIT A

CURRICULUM VITAE

KATHARINE D. WENSTROM, M.D.

CURRENT POSITION: Professor of Medical Science

The Alpert Medical School of Brown University

July 2018- present

PREVIOUS Professor, Obstetrics & Gynecology

POSITIONS: Director, Division of Maternal Fetal Medicine

Department of Obstetrics and Gynecology Women's and Infant's Hospital of Rhode Island

The Alpert Medical School of Brown University

Providence Rhode Island July 2009- July 2018

Professor, Obstetrics & Gynecology

Co-Director, Center for Advanced Maternal and Fetal Care

Departments of Pediatric Surgery and Obstetrics and Gynecology

Vanderbilt University School of Medicine

Nashville, Tennessee August 2006- May 2009

Professor, Obstetrics & Gynecology

Director, Division of Reproductive Genetics and

Maternal-Fetal Medicine

Department of Obstetrics and Gynecology

University of Alabama at Birmingham

October 1998- April 2006

Professor, Human Genetics

University of Alabama at Birmingham

October 1998-April 2006

Director, Medical Genetics Residency Program,

University of Alabama at Birmingham,

2000 - 2003

Medical Director, Reproductive Genetics Screening

& Diagnostic Laboratory

University of Alabama at Birmingham

August 1994- April 2006

Associate Professor Division of Maternal-Fetal Medicine University of Alabama at Birmingham August 1994 - Sept. 1998

Assistant Professor Division of Maternal-Fetal Medicine University of Alabama at Birmingham August 1992 - July 1994

Assistant Professor Division of Maternal-Fetal Medicine Acting Director of Prenatal Diagnosis University of Iowa Hospitals and Clinics July 1, 1990 - June 30, 1992

EDUCATION:

Case Western Reserve University Cleveland, OH 09/1972 – 06/1976 B.A. Biology, Cum Laude, 1976

Case Western Reserve University School of Medicine Graduate School (PhD Program), Department of Pathology Cleveland, OH 09/1976 – 06/1977

Columbia University Graduate School of Arts and Sciences Graduate School (PhD Program), Pathology New York City, NY 09/1977 – 06/1979 M.A. Pathology, 1979

Case Western Reserve University School of Medicine Cleveland, OH 09/1979 - 05/1983 M.D., 1983

Brown University, Providence, RI, M.A. (ad eundem), 2010

RESIDENCY:

University of Illinois Hospital
Department of Obstetrics and Gynecology
Chicago, IL 07/1983 - 06/1987
W.N. Spellacy, M.D., Chairman

FELLOWSHIPS: University of Illinois Hospital

Department of Obstetrics and Gynecology

Division of Maternal Fetal Medicine Chicago, IL 07/1987 - 06/1989 S.A. Gall, M.D., Program Director

University of Iowa Hospital Division of Medical Genetics

Iowa City, IA 07/1988 - 06/1990 J. W. Hanson, M.D., Program Director

BOARD CERTIFICATION: Diplomat of the American Board of Medical Genetics, 1990 (lifetime)

Diplomat of the American Board of Obstetrics and Gynecology, 1992;

Recertified annually through present

Diplomat of American Board of Obstetrics and Gynecology,

Subspecialty Maternal-Fetal Medicine, 1994 Recertified annually through present

LICENSURE:

Rhode Island License # 13064

Massachusetts License # 242104

Connecticut License # 049169 (inactive) Alabama License #16316 (inactive)

Tennessee License # MD 0000041656 (inactive)

RECENT HOSPITAL APPOINTMENTS: Women and Infants Hospital of Rhode Island Medical Staff, July 2009 to July 2018 Director, Division of MFM, 2009 to 2018

Southcoast Hospitals Group (St. Lukes Hospital, New Bedford, MA; Charlton Hospital, Fall River, MA; Tobey Hospital, Warham, MA)

Medical staff, 2010 to 2018

Director, MFM Services, 2010 to 2018

Director, Obstetric Executive Committee, 2010 to 2013

Backus Hospital, Norwich CT Medical Staff, 2010 to 2017

Memorial Hospital of Rhode Island, Pawtuckett, RI Medical Staff, 2013 to 2017

MEMBERSHIPS:

American Gynecologic and Obstetric Society, 2001- present American College of Obstetrics and Gynecology – Fellow Society for Gynecologic Investigation -- Regular Member Society of Maternal-Fetal Medicine -- Regular Member American Society of Human Genetics American Institute of Ultrasound in Medicine Teratology Society Alpha Omega Alpha

AWARDS, HONORS:

Society for Gynecologic Investigation President's Achievement Award, 2001

Society for Maternal-Fetal Medicine, Genetics Oral Presentation Award, January, 1999:

Wenstrom KD, Owen J, Chu DC, Boots L.

"Prospective evaluation of free beta hCG and dimeric inhibin A for aneuploidy detection." Society of Maternal-Fetal Medicine, San Francisco, CA, January 1999

Society for Perinatal Obstetrics, Genetics Oral Presentation Award, January 1997:

Wenstrom KD, Owen J, Chu DC, Boots L.

"Alphafetoprotein, free beta human chorionic gonadotrophin, and dimeric inhibin A produce the best results in a three-analyte multiple marker screening test for fetal Down syndrome". Society of Perinatal Obstetricians, Anaheim, CA, January 1997.

ACOG Annual Meeting First Prize for best scientific paper, 1995: Chapman SJ, Brumfield CG, Wenstrom KD, DuBard MB "Pregnancy Outcomes Following False Positive Multiple Marker Screening Tests."

Society for Perinatal Obstetricians Poster Award, 1995:

<u>Wenstrom KD,</u> Weiner C, Merrill D, Neibyl J.

A placebo-controlled trial of the terbutaline pump for prevention of preterm delivery. Society of Perinatal Obstetricians, Atlanta, GA, Jan 1995

Society for Perinatal Obstetricians Poster Award, 1995: Wenstrom KD, Hauth J, Goldenberg RL, DuBard M, Lea C.

The effect of low-dose aspirin on the development of preeclampsia in women with elevated hCG. Society of Perinatal Obstetricians, Atlanta, GA, January 1995.

"Outstanding Reviewer" (Top 5%) for the American Journal of Obstetrics and Gynecology, 2003, 2004, 2005

"Outstanding Reviewer" (Top 10%) for Obstetrics and Gynecology, 2001 to present

Academic Keys Who's Who in Medical Sciences Education, 2005- present

Elected to "Best Doctors in America®" annually from 2001 to present

Elected to "The Best Doctors for Women" annually from 2001 to present

Good Housekeeping's "Best Doctors for Women" - August 1997

Listed in "Guide To America's Top Physicians", 2004 to present

Listed in "America's Top Obstetricians and Gynecologists" (Consumer's Research Council of America), 2011

Listed in American Men and Women of Science, 2013- -present

Resident Medical Education Excellence in Teaching Award, Brown Alpert Medical School, 2010, 2011, 2012, 2013, 2017, 2018

Resident Top Hospital-Based Faculty Teacher of the Year, 2011-2015

Undergraduate Hospital Based Faculty Excellence in Teaching Award, 2016

Chief Resident Excellence in Teaching Award 2013

GRANT REVIEW: March of Dimes Committee A (Grant Review); 2001, 2002

NIH Obstetrics and Maternal-Fetal Biology Subcommittee, 2002-2007 Chairman, 2006-2007

Food and Drug Administration /Office of Orphan Products Grant Review Panel, May 2018

Food and Drug Administration /Office of Orphan Products Grant Review Panel, December , 2018

EDITORIAL BOARDS: American Journal of Perinatology, 2001 to 2010

American Journal of Obstetrics and Gynecology, Advisory Board for Subspecialty Areas (Genetics and Teratology) 2002 to present

JOURNAL EDITOR: Obstetrical and Gynecological Survey,

Editor -in-Chief for Obstetrics, July 2005 to March 2011

BOARD OF DIRECTORS:

Society for Maternal-Fetal Medicine, 1998 to 2009

Immediate Past President 2008-2009

President- 2007-2008 President-Elect, 2006-2007

Secretary Treasurer, 2004 to 2006

Assistant Secretary Treasurer, 2001-2004

Board Member 1998-2000

American College of Obstetricians and Gynecologists (ACOG)

Executive Board of Directors, 2007-2009

PROFESSIONAL SERVICE:

American College of Obstetricians and Gynecologists (ACOG)

Committee Memberships:

CREOG Exam, 1999-2000

Genetics (SMFM Representative), 1998-2000

Obstetric Practice (SMFM Representative), 1998 to 2005

Obstetric Bulletins, 2001-2004

ACOG Postgraduate Courses:

Controversies in Obstetrics. Speaker, February, 1996

Antepartum and Intraparturn Fetal Assessment. Speaker, December 1997

Medical Complications of Pregnancy. Course Director, July 1998

Controversies in Obstetrics. Speaker, December 1999

Medical Complications of Pregnancy. <u>Course Director</u>, February 2001

Controversies in Obstetrics. Speaker, February, 2002

Controversies in Obstetrics. Speaker, December, 2003

Controversies in Obstetrics. Speaker, September, 2004

Management of Multiple Gestation, Course Director, May, 2006.

Noninvasive Prenatal Testing, Speaker, May, 2015

Precis Editorial Task Force, 2003-2005

Society for Maternal Fetal Medicine:

Member, Board of Directors, 1998 to 2009 (see above)

Chairman, Publication Committee, 2003 to 2007

Member, Finance Committee, 2001 - 2006

Postgraduate Course Participation:

Genetics. Speaker - SMFM Meeting, 1998

Genetics. Course Director - SMFM Meeting, 2004

Genetics. *Speaker -* SMFM Meeting, 2006 Genetics. *Course Director -* SMFM Meeting, 2009 Putting the "M" Back in MFM - SMFM meeting, 2017

Masters Series Lectures:

SMFM Meeting, 1999 SMFM Meeting, 2000 SMFM Meeting, 2006 SMFM Meeting, 2007

MFM Fellows Lectures

Fellows Retreat –Speaker. October 1997 Fellows Retreat –Speaker. October 1999 Annual Fellows Talk—Invited Speaker, SMFM Meeting, 2003

American Gynecologic and Obstetric Society:

Fellowship Committee, 2001-2003 Program Advisory Committee, 2004-2007

State of Rhode Island

Prematurity Prevention Task Force, Chairman 2013- 2018

BOARD EXAMINER: Maternal Fetal Medicine, 1996 - 2000

General Obstetrics & Gynecology, 1997 – 2001

INVITED
PARTICIPATION
IN NATIONAL
WORKSHOPS:

Food and Drug Administration / Cellular, Tissue, and Gene Therapies Advisory Committee Panel Member, February 2014

NICHD, SMFM, and ACOG Workshop on "Prevention of the First Cesarean" (Presenter, Co-Author of Summary), February, 2012

NICHD Workshop on Preconception Care, Invited Participant (Speaker), April, 20

Food and Drug Administration / NIH Health Advisory Committee on Reproductive Drug Products, Panel Member, August, 2006 (17 α- hydroxyprogesterone caproate)

NICHD Prenatal Screening Workshop, Invited Participant (Speaker), December, 2005

NICHD Workshop on the Border of Viability, Invited Participant (Speaker), March, 2004

Food and Drug Administration / NIH Health Advisory Committee on Reproductive Drug Products, Panel Member, December, 2003 (OCPs with folic acid)

Food and Drug Administration / NIH Conference on Drugs in Pregnancy, Panel Member, December 2000

NIH Recombinant DNA Advisory Committee; Gene Therapy Policy Conference: "Prenatal Gene Transfer: Scientific, Medical, and Ethical Issues", Invited Participant (Speaker), January, 1999

NIH Workshop, Pharmacodynamic Differences Between Men and Women, Invited Participant (Speaker), May 1999

CDC Workshop on State-Based Birth Defects Surveillance, Invited Participant (Speaker), September 1992

PEER JOURNAL REVIEWER:

New England Journal of Medicine

British Journal of Obstetrics and Gynecology

Obstetrics and Gynecology

American Journal of Obstetrics and Gynecology

Gynecologic and Obstetric Investigation

International Journal of Gynecology and Obstetrics

Reproductive Medicine Birth Defects Research

American Journal of Perinatology

Journal of Maternal-Fetal Medicine

Obstetric Medicine

Expert Review of Cardiovascular Therapy

Life Sciences

Journal of Developmental Origins of Health and Disease

International Journal of Gynecologic Cancer Society for Maternal Fetal Medicine (Abstracts) Society for Gynecologic Investigation (Abstracts)

The Application of Clinical Genetics

GRANTS/FUNDING:

National Institutes of Health 1 R03 HD4158-01: Primary Investigator "The Molecular Genetic Basis of Cardiac Defects" \$100,000 (1/2001-1/2003)

UAB Health Services Foundation General Endowment Fund, Primary

Investigator; "First Trimester Down Syndrome Screening and

Diagnosis" \$ 259,500. 1/2003-1/2005

Low Birthweight PORT: <u>Investigator</u>
Agency for Health Care Policy & Research Contract #290-92-0055
U.S. Dept. Of Health & Human Services, Public Health Service

ACADEMIC COMMITTEES:

University of Alabama:

Obstetrics and Gynecology Promotions Committee, 2004 -2006

Resident Education Committee, 1998 –2006

Obstetrics & Gynecology Conference Committee 1994-2000

Perinatal Morbidity and Mortality Committee, 1992 - 2002

Kirklin Clinic Practice Committee 1994-1998

Genetics Search Committee 1996-1997

Hospital Executive Director Search Committee 1998-1999

Genetics Search Committee 1998 - 2000

Psychiatry Search Committee 2000 – 2002

Women and Infants Hospital of Rhode Island:

Ob Gyne Executive Committee, 2009 to 2018

Ob Gyne Promotions Committee, 2009-2018

Resident Review Committee, 2009 to 2018

Ob Gyne Practice Guidelines Committee, 2009 to 2018

Chairman, 2013- 2018

Quality Council, 2009 to 2018

Utilization Review Committee, 2009 to 2014

WIH Ambulatory EMR Steering Committee, 2009 to 2017

Genetics Search Committee, 2011-2012; 2014-2015

Ambulatory Division Director Search Committee 2012-2014

CNE Obsetrics Working Group, 2013-2017

BC/BS Maternity Bundle Working Group, 2013-2015

Chair of Medicine Search Committee, 2013-2015

Repro-Endocrinology Division Director Search Committee, 2013-2015

Professional Revenue Cycle Committee, 2014-2017 (Chair, 2015- 17)

Maternal Fetal Medicine Academic Search Committee (Chair), 2015-17

Labor and Delivery Planning Committee, 2015- 2017

Brown Alpert Medical School

Committee on Medical Faculty Appointments, 2015- present

TEACHING:

Director, Medical Genetics Residency Program (UAB), 2000-2003

Clinical & Research Mentor, Combined Maternal-Fetal Medicine/Genetics Fellowship (UAB) , 2000 - 2006

Tutorial in Genetics (UAB), MFM Fellows, every other year, 1993 - 2006

Clinical and Research Mentor, MFM Fellowship, 1992 - present

Lecturer, Reproductive Genetics, 2nd Year Med.School (UAB),1994 – 2006

Lecturer, Ob-Gyne, 3rd Year Med. School (UAB), 1992 - 2006 Lecturer, Masters Program, Maternal and Child Health (UAB), 1996 – 2005

Tutorial in Genetics (WIH), MFM and REI Fellows, 2015, 2017

TEXTBOOKS: Co-Author, Williams Obstetrics, 21st Edition, McGraw-Hill Inc, May 2001;

Co-Author, Williams Obstetrics, 22nd Edition, McGraw-Hill Inc., March, 2005

PEER REVIEWED PUBLICATIONS

- 1. Wenstrom KD, Gall SA: Incidence, morbidity and mortality, and diagnosis of twin gestations. Clin Perinatol 1988; 15:(1), 1 -11.
- 2. Wenstrom KD, Parsons MT: The prevention of meconium aspiration in labor using amnioinfusion. Obstet Gynecol 1989;73:(4), 647-651.
- 3. Wenstrom KD, Gall SA: HIV Infection in Pregnancy. Obstet Gynecol Clin NA 1989;16:627-641.
- 4. <u>Wenstrom KD</u>, Williamson RA, Hoover, WW, Grant SS: Achondrogenesis type II (Langer Saldino) in association with jugular lymphatic obstructive sequence. <u>Prenat Diagn</u> 1989;9:527-532.
- 5. <u>Wenstrom KD</u>, Zuidema LJ: Determination of the seroprevalence of human immunodeficiency virus infection in gravidas by non-anonymous vs anonymous testing. Obstet Gynecol 1989;74:558-561.
- 6. Weiner CP, Grant SS, Hudson J, Williamson RA, <u>Wenstrom KD</u>: Effect of diagnostic and therapeutic cordocentesis upon maternal serum alpha fetoprotein concentration. Am J <u>Obstet</u> Gynecol 1989;161:706-708.
- 7. Weiner CP, Heilskov J, Pelzer GD, Grant SS, <u>Wenstrom KD</u>, Williamson RA: Normal values for human umbilical venous and amniotic fluid pressures and their alteration by fetal disease. <u>Am J Obstet Gynecol</u> 1989; 161:714-717.
- 8. Weiner CP, Pelzer GD, Heilskov J, Wenstrom KD, Williamson RA: The effect of intravascular transfusion on umbilical venous pressure in anemic fetuses with and without hydrops. <u>Am J Obstet Gynecol</u> 1989; 161:1498-1501.
- 9. <u>Wenstrom KD</u>, Weiner CP, Williamson RA, Grant SS: Prenatal diagnosis of fetal hyperthyroidism using cordocentesis. Obstet Gynecol 1990;75:1-5.

- 10. Pollack KL, Chestnut DH, <u>Wenstrom KD</u>: Anesthetic management of a parturient with Eisenmenger's syndrome. Anesth Analg 1990;70:212-215.
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- 33. Wenstrom KD. Precis XIII Teratogenic Exposures . Gilstrap, LC 111, Obstetrics section editor. American College of Obstetricians, 1997.
- 34. <u>Wenstrom KD</u>. Precis XIV Prenatal Diagnosis of Genetic Disorders. American College of Obstetricians, 2010.
- 35. Wenstrom KD. Precis XIV Teratogenic Exposures . American College of Obstetricians, 2010.
- 36. Wenstrom KD. Precis XIV Preconception Counseling. American College of Obstetricians, 2010.
- 37. Wenstrom KD. Precis XIV Substance Abuse. American College of Obstetricians, 2010.
- 38. Wenstrom KD. Genetic Amniocentesis. Protocols in High Risk Pregnancy, 5th Edition . Queenan JT, Hobbins JC, Spong CY, editors, 2010
- 39. Wenstrom KD. Cardiac Disease. Protocols in High Risk Pregnancy, 5th Edition. Queenan JT, Hobbins JC, Spong CY, editors, 2010
- 40. O'Brien BM, <u>Wenstrom KD</u>. Down Syndrome Screening in the First and Second Trimesters of Pregnancy. US Obstetrics and Gynecology, 2010; 4: 58-65.
- 41. O'Brien BM, Wenstrom KD. Navigating Among the Options in Antenatal Screening. JWWH 2011
- 42. Wenstrom KD. Cardiac Disease. Protocols in High Risk Pregnancy, 6th Edition. Queenan JT, Hobbins JC, Spong CY, editors, 2015
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*See also Obstetrical and Gynecological Survey, 5 commentaries a month from July 2005 to March 2011

ABSTRACTS/PRESENTATIONS (ORAL PRESENTATIONS*)

1. <u>Wenstrom KD</u>, Parsons MT: Maternal blood urea nitrogen creatinine ratio and pregnancy outcome. The Society of Perinatal Obstetricians, Lake Buena Vista, Florida, February, 1987.

- 2. <u>Wenstrom KD</u>, Parsons MT: The prevention of meconium aspiration in labor using amnioinfusion. The Society of Perinatal Obstetricians, Las Vegas, Nevada, February, 1988.
- 3. Zuidema LJ, <u>Wenstrom KD</u>: Once a gestational diabetic, not always a gestational diabetic. The Society for Gynecologic Investigation, Baltimore, Maryland, March, 1988.
- 4. Wenstrom KD, Zuidema LJ: Voluntary Human Immunodeficiency Virus (HIV) Testing Does Not Accurately Identify All HIV Positive Gravidas. The Society of Perinatal Obstetricians, New Orleans, Louisiana, February, 1989.
- 5. Weiner CP, Grant SS, Hudson J, Williamson RA, <u>Wenstrom KD</u>: Effect of Diagnostic and Therapeutic Cordocentesis Upon Maternal Serum Alpha Fetoprotein (MSAFP). The Society of Perinatal Obstetricians, New Orleans, Louisiana, February, 1989.
- *6. Wenstrom KD, Williamson RA, Weiner CP, Yuh WYC: MRI of Anomalous Fetuses. International Fetal Medicine and Surgery Society, Pacific Grove, California, June, 1989.
- 7. <u>Wenstrom KD</u>, Muilenberg AC, Patil SR, Hanson JW: A unique phenotype associated with a pericentric inversion of chromosome 6 in three generations. American Society of Human Genetics, Baltimore, Maryland, November, 1989.
- 8. Wenstrom KD, Weiner CP, Williamson RA: The Significance of Absent Diastolic Flow in the Umbilical Artery Detected During Antepartum Evaluation of High Risk Patients. The Society of Perinatal Obstetricians, Houston, Texas, January, 1990.
- 9. <u>Wenstrom KD</u>, Weiner CP, Williamson RA: Effect of Gestational Age and Disease on Fetal Liver Function. The Society of Perinatal Obstetricians, Houston, Texas, January, 1990.
- *10. Sipes SL, Weiner CP, Wenstrom KD, Williamson RA, Grant SS: The Association Between Fetal Karyotype and Mean Corpuscular Volume. The Society of Perinatal Obstetricians, Houston, Texas, January, 1990.
- *11. Weiner CP, <u>Wenstrom KD</u>, Williamson RA: The Results of Direct Evaluation and Treatment of Fetal Hemolytic Disease. The Society of Perinatal Obstetricians, Houston, Texas, January, 1990.
- 12. Weiner CP, Hudson J, Williamson RA, <u>Wenstrom KD</u>, Grant SS: The Effect of Fetal Disease Upon Fetal Serum Alpha Fetal Protein (FSAFP). The Society of Perinatal Obstetricians, Houston, Texas, January, 1990.
- 13. Weiner CP, Williamson RA, <u>Wenstrom KD</u>: The Effect of Fetal Disease Upon CPK-Isoenzymes. International Society of Fetal Medicine and Surgery. New Zealand, February, 1990
- Weiner CID, Wenstrom KD, Williamson RA: Intravascular Transfusion for the Treatment of Nonhemolytic Fetal Anemia. International Society of Fetal Medicine and Surgery, New Zealand, February, 1990.

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- *17. Weiner CP, Williamson RA, Wenstrom KD, Mueller G, Grant SS, Pelzer GD, Heilskov J: Effect of Gestation Upon Hematocrit Decline After Fetal Intravascular Transfusion (IVT). Society for Gynecologic Investigation, St. Louis, Missouri, March 1990.
- 18. Sipes SL, Weiner CP, Williamson RA, <u>Wenstrom KD</u>: Fetal Echogenic Bowel on Ultrasound: Is There Clinical Significance? Society of Perinatal Obstetricians. San Francisco, California, January 1991.
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- 57. Wenstrom KD, Owen J, Chu DC, Boots L. Elevated second trimester dimeric inhibin A levels identify Down syndrome pregnancies. Society for Perinatal Obstetricians, Anaheim, CA, January 1997.
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- *60. Wenstrom KD, Owen J, Chu DC, Boots L. Alphafetoprotein, free beta human chorionic gonadotrophin, and dimeric inhibin A produce the best results in a three-analyte multiple marker screening test for fetal Down syndrome. Society for Perinatal Obstetricians, Anaheim, CA, January 1997. (Winner, Best Oral Presentation Award)
- 61. Wenstrom KD, Owen J, Chu DC, Boots L. Free beta hCG subunit versus intact hCG in the multiple marker screening test for fetal Down syndrome. Society for Perinatal Obstetricians, Anaheim, CA, January 1997.
- 62. Brumfield CG, DuBard M, Cliver S, Owen J, Davis RO, <u>Wenstrom KD</u>. Sonographic measurements and ratios in fetuses with trisomy 18. Society for Perinatal Obstetricians, Anaheim, CA, January 1997
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- 65. Davis RO, Andrews WW, DuBard M, <u>Wenstrom KD</u>, Hauth JC. Mid-trimester interleukin-6 levels in twin pregnancies. Society for Perinatal Obstetricians, Anaheim, CA, January 1997.
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- 73. Bajaj P K, Wenstrom KD, DuBard M, Cliver S. Is sonographic EFW less accurate in breech presentation? Society for Perinatal Obstetricians, Miami, Florida, February 1998.
- 74. Biggio JR, <u>Wenstrom KD</u>, DuBard M. Does hydramnios indicate adverse perinatal outcome? Society for Perinatal Obstetricians, Miami, Florida, February 1998.
- 75. Guinn DA, Goepfert AR, Owen J, <u>Wenstrom KD</u>, Hauth JC. Terbutaline pump for prevention of preterm delivery: A double blind, placebo-controlled trial. Society for Perinatal Obstetricians, Miami, Florida, February 1998.

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- 77. Brumfield CG, Skinner K, Davis RO, <u>Wenstrom KD</u>, Owen J, Lea C. Mid-trimester fetuses with Trisomy 18: Comparing ultrasound findings to multiple marker test results. Society for Perinatal Obstetricians, Miami, Florida, February 1998.
- 78. Owen J, Hardin M, <u>Wenstrom KD</u>, Hsu C, Boots LR. Use of non-population based normative analyte values degrades the performance of the multiple marker test for Down syndrome. Society for Perinatal Obstetricians, Miami, Florida, February 1998.
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- 80. Johanning GL, Tamura T, <u>Wenstrom KD</u>, Johnston KE. 5,10-methylenetetrahydrofolate reductase geneotypes in fetuses with neural-tube defects. Experimental Biology'98, San Francisco, CA, April 1998.
- 81. *Wenstrom KD, Owen J, Chu DC, Boots L. Prospective evaluation of free ' hCG and dimeric inhibin A for aneuploidy detection. Society for Maternal Fetal Medicine, San Francisco, CA, January 1999.
- 82. Wenstrom KD, Owen J, Boots L, DuBard M. Ultrasound dating does not improve multiple marker screening test performance. Society for Maternal Fetal Medicine, San Francisco, CA, January 1999.
- 83. Wenstrom KD, Descartes M, Franklin J, Cliver SP. A five year experience with Fragile X screening of high risk gravidas. Society for Maternal Fetal Medicine, San Francisco, CA, January 1999.
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- 85. Wenstrom KD, DuBard M. Does a fetal neural tube or congenital heart defect indicate increased risk of maternal hypertension? Society for Maternal Fetal Medicine, Miami, FL, February 2000.
- 86. Wenstrom KD, DuBard M, Owen J, Johanning G, Tamura T. The relationship of amniotic fluid homocysteine and the 677C → T MTHFR mutation to spontaneous pregnancy loss in women with a history of NTD. Society for Maternal Fetal Medicine, Miami, FL, February 2000.
- 87. Wenstrom KD, Wason CJ. Preconception counseling by MFM subspecialists is efficient and cost-effective. Society for Maternal Fetal Medicine, Miami, FL, February 2000. 8

- 88. Biggio JR, Wenstrom KD, Owen J, Oakes WJ. Fetal open spina bifida: In Utero Natural history. Society for Maternal Fetal Medicine, Reno, NV, February 2001.
- 89. Biggio JR, Owen J, <u>Wenstrom KD</u>, Oakes WJ. Can prenatal ultrasound findings predict ambulatory status in fetuses with open spina bifida (OSB)? Society for Maternal Fetal Medicine, Reno, NV, February 2001.
- 90. Ramsey P, Andrews, WW, Goldenberg RL, <u>Wenstrom KD</u>, Johnston K, Tamura T. Elevated amniotic fluid ferritin levels are associated with inflammation-related pregnancy loss following midtrimester amniocentesis. Society for Maternal Fetal Medicine, Reno, NV, February 2001.
- 91. Wenstrom KD, Faye-Petersen OM, Johanning GL. DNA methylation and tissue cellularity in hypoplastic left ventricles. Society for Maternal Fetal Medicine, San Francisco, February 2003.
- 92. Biggio JR, Owen J, <u>Wenstrom KD</u>, Neely C. Elevated midtrimester maternal serum dimeric inhibin-A is associated with small for gestational age infants. Society for Maternal Fetal Medicine, San Francisco, February 2003.
- 93. Biggio JR, Ramsey PR, Cliver SP, Lyon M, Goldenberg RL, <u>Wenstrom KD</u>. Elevated midtrimester amniotic fluid matrix metalloproteinase-8 levels are a marker for subsequent preterm premature rupture of membranes. Society for Maternal Fetal Medicine, San Francisco, February 2003.
- 94. Gala R, Biggio J, Ramsey, P, Wenstrom KD. Cystic Fibrosis Screening: To Screen or Not To Screen. Society oforMaternal Fetal Medicine, New Orleans, February, 2004
- 95. Wenstrom KD, Cliver S, Goldenberg R, Rostrand S. In children born IUGR, normalization of weight by age 5 may be associated with hypertension. Society for Maternal Fetal Medicine, Reno, February 2005
- 96. Ho M, Cliver S, <u>Wenstrom KD</u>. Perinatal outcome in multifetal gestations complicated by intrauterine fetal demise. Society for Maternal Fetal Medicine, Miami, February 2006
- 97. Gyamfi C, Blumenfeld Y, Ramsey P, Foley M, Kilpatrick S, Wenstrom K. The current state of MFM fellowships: results from the SMFM fellow survey. AJOG 2009; 201 (6): S47
- 98. Wenstrom K, Erickson K, Schulkin J. Are generalist obstetrician -gynecologists satisfied with their MFM Consultants?: A survey . AJOG 2010; 201 (6): S202
- 99. Johnson J, Anderson B, Raker C, <u>Wenstrom K</u>. Timing of delivery with placenta previa: maternal and neonatal outcomes AJOG 2010; 201 (6): S74
- 100. Johnson J, Anderson B, Raker C, Wenstrom K. Elective induction at term and adverse neonatal outcomes AJOG 2010; 201 (6): S124
- 101.Wenstrom KD, Obrien BO, Johnson J. Does advanced maternal age (AMA) alone increase the risk of structural fetal anomalies? AJOG 2012; 208(1): S16

FILM

 Spellacy WN, <u>Wenstrom KD</u>: Cesarean Section. Produced by Davis & Geck. Shown at the 37th Annual meeting of the American College of Obstetricians and Gynecologists, Atlanta, GA, May 1989.

SELECTED LECTURES & COURSE PARTICIPATION

University of Iowa Annual Postgraduate Course -- 1991, 1992

<u>University of Iowa Statewide Faculty Lecture Series</u> -- 1990, 1991, 1992

Grans Rounds, Baptist Medical Center, Medical Center East, UAB Huntsville -- 1993

<u>UAB Annual Meeting: Progress in Obstetrics and Gynecology</u> –Speaker. 1993--1996, 1998, 1999, 2001, 2002, 2003, 2004, 2005

American College of Obstetricians and Gynecologists Postgraduate Course: "Controversies in Obstetrics" –Speaker. February 12 - 14, 1996

Visiting Professor-Michigan State University, Grand Rapids, MI -- April, 1996

Visiting Professor-Medical College of Georgia -- February 1997

University of Kentucky at Louisville –Speaker. May 1997

<u>Society of Perinatal Obstetricians Fellows Retreat</u> –Speaker. San Antonio Texas, October 1997

Visiting Professor, University of South Florida, Tampa -- October 1997

<u>American College of Obstetricians and Gynecologists Postgraduate Course</u>: Antepartum and Intrapartum Fetal Assessment –Speaker. December 1997

<u>Society of Perinatal Obstetricians Postgraduate Course</u>: Genetics. <u>Course Director</u> – January 1998

Society of Perinatal Obstetricians: Moderator, Genetics Oral Session -- January 1998

Visiting Professor-University of Kentucky at Louisville, April 1998

American College of Obstetricians and Gynecologists Postgraduate Course: Medical Complications of Pregnancy. *Course Director* -- July 1998

March of Dimes: Genetics Training- Speaker, Birmingham, AL - September 1998

Perinatal Social Work Conference- Speaker, Birmingham, AL - October 1998

Southwestern Gynecologic Assembly- Speaker, Dallas, TX - December 1998

Society for Maternal-Fetal Medicine (Formerly SPO): Masters' Talk, January 1999

<u>Society for Gynecologic Investigation</u>: Moderator, Clinical Perinatology Oral Session-March1999

University of Utah- Speaker. Park City, Utah-March 1999

Society for Maternal Fetal Medicine Fellows Retreat –Speaker. October 1999

<u>American College of Obstetricians and Gynecologists Postgraduate Course</u>: "Controversies in Obstetrics"-Speaker. December 1999

Society for Maternal Fetal Medicine: Masters' Talk, February 2000

Society for Maternal Fetal Medicine: Moderator, Prematurity Session, February 2000

Society for Gynecologic Investigation: Mini Symposium on Genetics-Speaker. March 2000

Grand Rounds, University of Kentucky at Louisville, KY-April 2000

American Gynecological and Obstetrical Society Membership Presentation, September 2000

<u>American College of Obstetricians and Gynecologists Postgraduate Course</u>: "Medical Complications of Pregnancy" Course Director - Feb 2001

<u>Society for Gynecologic Investigation</u>: Moderator, Clinical Perinatology and Genetics -March 2001

Alabama ACOG Spring Meeting –Speaker. May 2001

25th Ross Seminar on Perinatal Medicine - Speaker. June 2001

Visiting Professor-Wake Forest University, Winston-Salem, NC - October 11-13, 2001

Visiting Professor- University of Alabama, Tuscaloosa, AL - October, 2001

Visiting Professor- University of Indiana, Indianapolis, IN - November, 2001

American College of Obstetricians and Gynecologists Postgraduate Course: "Controversies in Obstetrics" – Speaker. Feb 28-March 2, 2002

St. John's Mercy Medical Center, St. Louis, MO-Speaker. April , 2002

Women's Health Care, P.C., Newburgh, IN-Speaker. April, 2002

26th Ross Seminar on Perinatal Medicine –speaker. June 2002

<u>Visiting Professor, Resident Graduation Day, University of South Florida, Tampa, FL-June 2002</u>

North East Ohio University College of Medicine-Speaker. November 2002

Society for Maternal Fetal Medicine Fellows Talk - February, 2003

Visiting Professor, Wayne State, Detroit, MI - March 11, 2003

27th Ross Seminar on Perinatal Medicine - Speaker. June 2003

American College of Obstetricians and Gynecologists Postgraduate Course: "Controversies in Obstetrics" – Speaker. Dec 4-6, 2003

<u>Society for Maternal-Fetal Medicine Postgraduate Course</u>: Genetics. <u>Course</u> <u>Director</u> - February, 2004

<u>28th</u> <u>Seminar on Perinatal Medicine</u>-The AAP Perinatal Section and Abbott Nutrition. Speaker. June 2004

American College of Obstetricians and Gynecologists Postgraduate Course: "Controversies in Obstetrics" –Speaker. Sept 9-11, 2004

<u>Tenth Annual Perinatal Medicine Conference</u>, Northside Hospital, Atlanta, Georgia- Speaker. October, 2004

Visiting Professor, University of Illinois, October, 2004

<u>Symposia Medicus 11th Annual Florida Winter Perinatal Symposium,</u> Marco Island, FL-Speaker. November, 2004

Cleveland Society of Obstetrics and Gynecology, Cleveland Ohio January, 2005

<u>Alabama Department of Public Health and Emory University</u>, Satellite Conference on Folic Acid: Past, Present and Future-Speaker. January 2005

Society for Maternal-Fetal Medicine: Moderator, Genetics Oral Session- January 2005

<u>Visiting Professor-University of Miami</u>, Miami, Florida, March , 2005 Visiting Professor-Case Western Reserve University, Cleveland, Ohio September 2005

Vanderbilt University, Annual Perinatal Medicine Course-Speaker. December 2005

<u>Dru Carlson Memorial Ultrasound Symposium,</u> Los Angeles California- Speaker. January 2006

Society for Maternal-Fetal Medicine, Genetics Course- Speaker. February 2006

Society for Maternal-Fetal Medicine, Masters Series Lecture, February, 2006

American College of Obstetricians and Gynecologists Course: "Management of Multiple Gestation" – Speaker. May 9-10, 2006. Washington, D.C

<u>29th</u> <u>Seminar on Perinatal Medicine</u>-The AAP Perinatal Section and Abbott Nutrition. Speaker. June 2006

NIH conference for MFM and Neonatal Fellows. Aspen, Colorado; August, 2006

<u>Vanderbilt University Annual Perinatal Medicine Conference</u>: "Why our Babies Die"- Speaker. September 2006

Society for Maternal Fetal Medicine, Masters Series Lecture, February 2007

ACOG Section IX Annual Meeting- Keynote Speaker April 2007

Society for Fetal Urology, Anaheim, California- Featured Speaker, May 2007

30th Seminar on Perinatal Medicine-The AAP Perinatal Section and Abbott Nutrition. Speaker. June 2007

<u>American Association of Pediatrics Annual NeoPrep Course</u>- Speaker. Atlanta, GA August, 2007

<u>CWRU Annual Perinatal Medicine Course,</u> Cleveland, Ohio- Featured Speaker. October, 2007

<u>Vanderbilt University Annual Perinatal Medicine Course</u>, Nashville, TN- Speaker. November, 2007

16th Annual Ob/Gyn Ultrasound Update for Clinical Practice, Ft Lauderdale, FL- Featured Speaker. November, 2007

31st Seminar on Perinatal Medicine-The AAP Perinatal Section and Abbott Nutrition. Speaker. June 2008

<u>Society for Maternal-Fetal Medicine</u>, Genetics Course, Speaker, <u>Course Director</u> - February 2009

Stump the Professor- Speaker. ACOG annual meeting, Chicago IL May 2009

<u>Tsunami of Genetics, Genetics Course</u>; Brown Alpert School of Medicine, Speaker, October, 2009

Mt Auburn Hospital Annual Ob Gyne Meeting, Cambridge MA, Speaker, November, 2009

Grand Rounds, Sturdy Memorial Hospital, December, 2010

Grand Rounds, Yale University Department of OB Gyne, New Haven, CT, January 2011

New England Obstetric and Gynecologic Society Annual Meeting, Speaker, Sturbridge, MA, April 2011

Visiting Professor, University of Oklahoma, Tulsa, Resident Research Day May, 2012

Grand Rounds, Brown University School of Medicine, Women and Infants Hospital September, 2012

Phoenix Perinatal Associates and Banner Good Samaritan Hospital Annual Obstetrics Course, Phoenix, AZ. Speaker. March 2013

Central Jersey Health Consortium and the Partnership for Maternal and Child Health of Northern New Jersey, Iselin, NJ. Speaker. May 2013

Grand Rounds, Saint Peter's University Hospital, New Brunswick NJ, September 2013

Grand Rounds, Brigham and Womens Hospital, Boston MA, October 2013

Lamaze International Annual Conference, Kansas City KA. Keynote Speaker, Sept, 2014

Midwifery Week Annual Conference, Providence RI, Keynote Speaker, October, 2014

Grand Rounds, Brown University School of Medicine, Women and Infants Hospital October, 2014

American College of Obstetricians and Gynecologists Annual Meeting. Course Speaker: "Update on Noninvasive Prenatal testing (NIPT): Indications, Benefits, Limitations, and the Future", May 4, 2015, San Francisco, CA

Maryland Perinatal Safety Center Perinatal/Neonatal Learning Network. Course Speaker, June 11, 2015

<u>Annual National Birth Defects Prevention Network</u> Annual Meeting, Invited Speaker. Arlington VA, October 2015

Annual Perinatal Update, Invited Speaker. Savannah Georgia, March 2016.

Society for Maternal Fetal Medicine annual meeting, Course Speaker. "Keeping the "M" in MFM" Las Vegas NV, 2017