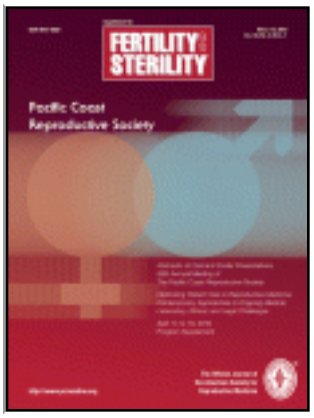

Fertility and Sterility

Volume 93, Issue 5, Supplement 1, Pages S1-S24 (15 March 2010)

Oral presentations

7. 

Fresh Autologous In Vitro Fertilization is Associated with Increased Incidence of Ectopic Pregnancy when Compared with Oocyte Donation and Frozen-Thawed Embryo Transfer Cycles

Pages S5-S6

B.S. Shapiro, S.T. Daneshmand, F.C. Garner, M. Aguirre, C. Hudson, S. Thomas

8. 

The Quality of the Oocyte Cohort is Affected by the Magnitude of the Luteal Hormone Surge After the Use of Gonadotropin-Releasing Hormone Agonist to "Trigger" Oocyte Maturation

Page S6

B.S. Shapiro, S.T. Daneshmand, H. Restrepod, F.C. Garner, M. Aguirre, C. Hudson

9. 

Ethics in Reproductive Medicine: Identifying Educational Needs

Page S6

A. Stein, P. Kaplan

10. 

Gestational Outcome After Therapy for Intrauterine Adhesions

Page S6

C. March, R. Israel, R. Marrs, G. Ringler, J. Vargyas

11. 

First Clinical Results with Preimplantation Genetic Diagnosis Using Array Comparative Genome Hybridization

Page S7

Munne Santiago, C. Wagner, P. Colls, K. Wiemer, J. Fischer, D. Hill, B. Kaplan, H. Danzer, M. Surrey, M. Opsahl

12. 

Progesterone Administration Antagonizes the Effect of Estradiol on Endothelium-Dependent Vasodilation and Cardiovagal Baroreflex Sensitivity in Young Healthy Women

Page S7

J. Miner, M. Smith, E. Martini, V. Brunt, P. Kaplan, J. Halliwill, C. Minson

13. 

An Estrogen-Related Gene Signature in Breast Cancer Tissue Predicts Responsiveness to Aromatase Inhibitors

Page S7

I. Moy, S. Bulun, A. Rademaker

Poster presentations

FERTILITY AND STERILITY

OFFICIAL JOURNAL OF THE AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE, Society for Reproductive Endocrinology and Infertility, Society of Reproductive Surgeons, Society for Assisted Reproductive Technology, Society for Male Reproduction and Urology, and the Pacific Coast Reproductive Society.

FERTILITY AND STERILITY®
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Scientific Papers to Be Presented at the Fifty-Eighth Annual Meeting of the Pacific Coast Reproductive Society April 14–18, 2010 Renaissance Esmeralda Conference Center Indian Wells, California

The program abstracts in this booklet are provided to the members of the Pacific Coast Reproductive Society (PCRS) and others for their use in planning for the Annual Meeting. The abstracts are those that will be presented in both oral and poster sessions and are published in the order of their presentation. Abstracts of special lectures and clinical seminars are not included. The abstracts are printed exactly as submitted.

The PCRS welcomes practicing physicians, academicians, nurses, allied health care professionals, residents, fellows, postdoctoral fellows, and trainees specializing in reproductive medicine and infertility.

The 2010 program theme, *Optimizing Patient Care in Reproductive Medicine: Contemporary Approaches to Ongoing Medical, Laboratory, Ethical, and Legal Challenges*, will be addressed in a series of workshops, scientific sessions, special lectures, oral and poster presentations, group and round table discussions.

This continuing medical education program provides opportunities for reviewing and updating current knowledge and skills as well as exposure to new concepts relating to specific areas of research and clinical practice in human fertility to assist physicians and allied health care providers in self-assessment of skills and knowledge in their ongoing quest for continuous performance improvement.

For more detailed information about PCRS and its Annual Meeting and Postgraduate Course, visit the PCRS Website athttp://www.pcrsonline.org.

Table of Contents

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"Where cutting edge information blends with intimate collegiality."

Accreditation

The Pacific Coast Reproductive Society (PCRS) is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians. The Pacific Coast Reproductive Society takes responsibility for the content, quality, and scientific integrity of this continuing medical education activity.

The PCRS designates this continuing medical education activity for a maximum of 20.3 credit hours in Category 1 of the Physician's Recognition Award of the American Medical Association. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Needs Assessment/Practice Gaps

PCRS uses multiple sources of data to identify practice gaps and assess needs.
Practice gaps will be addressed during the 2010 program by designing educational activities to meet the following needs:

- Physicians and allied health care workers in the field of reproductive medicine need educational activities that improve their knowledge, skills, and performance as interactive members of the medical team (including laboratory technicians and nurses).
- Physicians and allied health care workers in the field of reproductive medicine need educational activities related to the ethical and legal complexities of reproductive medicine.
- Physicians and allied health care workers in the field of reproductive medicine need educational activities related to new technologies and advancements in the areas of recurrent pregnancy loss, preimplantation genetic diagnosis and screening (PGD and PGS), ovarian stimulation protocols, methodologies for PGD and PGS, premature ovarian failure, sexual dysfunction, and stem cell research.
- Physicians and allied health care workers in the field of reproductive medicine need educational activities that will aid them in providing improved care for patients of different ethnic groups, different health issues (i.e., cancer patients), and differing levels of resources.

Overall Expected Learning Outcomes

Based upon the above needs/gaps in practice, the PCRS program committee design for the 2010 Annual Meeting provides a series of postgraduate courses, interactive plenary sessions, workshops, and round table discussions providing the opportunity for physicians and their teams to recognize, discuss, and rectify those practices, or lack thereof, which significantly effect optimal outcomes for their patients in the everyday practice of reproductive medicine.

At the completion of the 2010 Annual Meeting, participants will be able to:

- Determine the scope of the ethical and legal complexities of advances in PGD and PGS with regards to the impact these technologies can have on patients.
- Define the major biological underpinnings in the female and male reproductive systems required for establishment of a healthy pregnancy.
- Explore the current strategies available to clinicians and embryologists to maximize the chances for helping patients achieve healthy pregnancies.
- Recognize issues facing the RE nurse in patient care.
- Explore the medical and psychological impact of sexual dysfunction in men and women and the clinician's role in treatment.
- Determine the scope of the ethical and legal complexities of advances in PGD and PGS with regards to the impact these technologies can have on the patients for whom we care.
- Identify programs providing infertility treatment in resource-poor countries and describe how some of these strategies may be applied to patients in the United States.

For complete needs assessment and overall expected learning outcomes, please see information at www.pcrsonline.org/meetings.htm, *Needs Assessment and Expected Learning Outcomes*.

PCRS Program Schedule 2010 Annual Meeting

Wednesday, April 14, 2010

8 am PCRS Golf Tournament
1 to 4 pm Registration
4 to 7 pm Exhibit Set Up
5 to 7:30 pm Board of Directors Meeting

Thursday, April 15, 2010

7 am to 4:30 pm Registration
7 to 8 am Continental Breakfast

8 to 8:45 am **Plenary Session**
Hypo- and Hyper-responders in IVF-Optimizing Treatment Protocols to Obtain the Best Eggs, Embryos, and Pregnancies
Richard T. Scott, Jr., MD, HCLD

9 am to 1 pm Morning Postgraduate Courses
PG I: Establishing a Healthy Pregnancy
Chair: Richard J. Paulson, MD
Preconception Genetic Screening: Tailoring to the Ethnicity of the Patient, Amy Vance, MS, CGC
Lifestyle Behaviors and Environmental Toxins: Effects on Male Fertility
Rebecca Z. Sokol, MD
Break in Exhibit Hall

10 to 10:45 am Postgraduate Courses Resume
Choosing the Best Embryo for Transfer, Richard T. Scott, Jr., MD
The Endometrium: Current Research on Endometrial Physiology and Testing for Assessment of Competency, Steve Young, MD, PhD
Luteal Phase Support, Richard J. Paulson, MD
Postgraduate Course II Challenges Faced by REI Nurses
Chair: Joy Z. Golden, ANP-C
From Sperm Collection to Suppositories: The Straight Goods You Will Hear as an Infertility Nurse, Jocelyn C. Smith, RN
Dealing with Psychological Stresses in Infertility Nursing
Andrea Braverman, PhD
Legal Issues in the Infertility Practice, Melissa Brisman, JD
Lunch Break in Exhibit Hall

2 to 5:15 pm Afternoon Postgraduate Courses
PG III: Genomics, Metabolomics, and the IVF Lab
Chair: William G. Kearns, PhD
Microarrays, William G. Kearns, PhD
Single Gene Disorders, Garry Cutting, MD
Comparative Genomic Hybridization (CGH) on Metaphase Chromosomes, Dagan Wells, PhD
Metabolomics and Proteomics, Denny Sakkas, PhD
IVF Laboratory, Barry Behr, PhD
PG IV: Reproduction: Is It the Seed or the Soil?
Chair: Marcelle Cedars, MD
Ovarian Aging: Diminished Ovarian Reserve—What Is It and Why Do We Care? Marcelle Cedars, MD
Ovarian Aging: Premature Ovarian Failure, Margo Fluker, MD
Endometriosis: Is There an Impact on the Egg or the Endometrium? Eric Surrey, MD
Recurrent Pregnancy Loss: State of the Art in Diagnosis and Treatment, Mary D. Stephenson, MD, MSc
5:45 pm Opening General Session and Reception
Medical and Psychological Implications of Sexual Dysfunction in Men and Women
Irwin Goldstein, MD

Friday, April 16, 2010

7 am to 4:30 pm Registration
7 to 8 am Continental Breakfast
Scientific Session I
8 to 8:50 am Plenary Lecture: *Ethics of Human Stem Cell Research: Philosophical Perspectives on Biological Capabilities,* Laurie Zoloth, PhD
9 am Presentation of Papers 1 through 3

9:45 to 10:15 am Break in Exhibit Hall

10:15 am to 1:15 pm **Scientific Session II**
Presentation of Papers 4 and 5
Ethical and Legal Challenges of Preimplantation Genetic Diagnosis (PGD) and Screening (PGS)
Moderator: Andrea Stein, MD
Current PGD Technology and What the Future May Hold, William G. Kearns, PhD
Ethical Perspectives, Laurie Zoloth, PhD
Legal Perspectives, Judith Daar, JD
Professional Society Oversight: How Can Societies Promote Evidence-Based Practice? Robert Rebar, MD

1:15 to 2 pm Lunch Break in Exhibit Hall

2:15 to 4:30 pm **Workshops**

Bench Talk
Facilitator: Joe Conaghan, PhD

Practice Management
Facilitator: Denise M. Koenes, BS, MPA

Ask the Experts
G. David Adamson, MD, Richard T. Scott, Jr., MD, HCLD, Marcelle Cedars, MD

Male Infertility
Facilitator: Craig Neiderberger, MD

Fellows
Facilitators: Russell Foulk, MD

Nurses
Facilitators: Joy Z Golden, RNC, ANC, and Jocelyn C. Smith, RN

Ethics in Reproductive Medicine
Facilitator: Laurie Zoloth, PhD

5:15 pm **Fellows' and First-Timers' Reception**
6 pm **Poster Session/Reception**

Saturday, April 17, 2010

7:15 to 1:30 pm Registration
7:15 am to 8:30 am **Round Table Discussions**
8:30 am **Scientific Session III**
Plenary Lecture
Fertility Preservation in the Cancer Patient, Lynn Westphal, MD
Presentation of Papers 6 to 8
10:30 to 11 Break in Exhibits

11 am to 1:45 pm **Scientific Session IV**
Presentation of Paper 9
Psychological Stress Associated with Infertility and Fertility Treatment in Different Ethnic Populations, Andrea Braverman, PhD
Male Infertility: A Man Is More Than Just a Semen Analysis, Craig Niederberger, MD
For All Involved in the Care of the Infertility Patient: The Latest and Greatest in the IVF Lab, Juergen Lieberman, PhD

2 to 4 pm Poolside Networking, Rest and Relaxation, and Sand Castle Contest

7 to 11 pm **Awards Dinner**

Sunday, April 18, 2010

9:30 to 11:00 am Children's Breakfast
9:45 to 11:00 am Sunday Program/ Breakfast
Providing Infertility Treatment in Resource-Poor Countries and Discussions of Minimal Stimulation IVF as It May Apply to Fertility Treatment in the U.S., G. David Adamson, MD

FOR COMPLETE INFORMATION AND TIMED SCHEDULE, PLEASE VISIT THE PCRS WEBSITE AT pcrsonline.org

O-1

Follicle-Stimulating Hormone Receptor (FSHR), Müllerian-Inhibiting Substance (MIS), and MIS-II Receptor Expression in Human Ovarian Preantral Follicle Stages. Travis W. McCoy,[a] Xian Li,[a] Steven T. Nakajima,[a] Mary E. Fallat,[c] Zhenmin M. Lei,[a] Yong Siow.[b] [a]Obstetrics and Gynecology and [b]Department of Pediatric Surgery, University of Louisville, Louisville, Kentucky.

Background: Ovarian antral follicles are gonadotropin dependent, however, the point at which growing follicles become sensitive to FSH is not clear in humans.

Objective: To use real-time polymerase chain reaction (PCR) of enzymatically isolated follicles to evaluate MIS, MISRII, and FSHR mRNA concentrations in ovaries from normal, polycystic, and pregnant women to accurately determine the stage at which these factors are expressed and whether the expression differs by ovarian morphology.

Materials and Method(s): Ovarian cortex samples were collected from six patients undergoing surgery for other indications, two at cesarean section, two with normal ovaries, and two with polycystic ovary syndrome. A portion of the sample was fixed in formalin; the remainder was enzymatically digested using collagenase and DNase. Follicles were classified by developmental stage using an inverted microscope and were individually isolated, placed into PCR tubes with Trizol, and frozen. Two to three follicles of the same stage were pooled for each patient. Total RNA was extracted and reverse transcribed into cDNA, and levels of FSHR, MIS, and MISRII mRNA were measured by quantitative PCR using gene expression assays from Applied Biosystems. IHC was performed on 10% buffered formalin-fixed and paraffin-embedded sections using avidin-biotin immunoperoxidase complex kits.

Result(s): Follicles in all preantral stages were available for analysis in all patients. MIS mRNA was detected in all stages (27/30, 90%). MISRII mRNA was not detected in any primordial follicle but was present in nearly all follicles in all other stages (27/30, 90%). FSHR mRNA was detected in follicles of all stages, including the primordial follicles of three of five patients. The expression of FSHR did not vary by ovarian morphology. Immunohistochemistry (IHC) was performed for FSHR and MIS, showing weakly positive staining at the primordial stage, with increasing intensity in advancing stages. MISRII antibody was not available for IHC.

Conclusion(s): MIS and FSHR mRNA was expressed in all developmental stages. MISRII mRNA was detected only in transitional and later stages. The findings of MIS and FSHR expression was confirmed by IHC. This pattern of gene expression suggests that MIS plays a critical autocrine/paracrine role during early human ovarian follicle growth and also challenges the classic dogma of the preantral stages being gonadotropin independent.

Support: University of Louisville Research Initiation Grant, Woodson Foundation, Kosair Charities, and Norton Health Community Trust Grant.

O-2

Serum Anti-Müllerian Hormone (AMH) as a Predictor of Ovarian Response and Individual Cycle Outcome in Women Undergoing Repetitive Egg Donation Cycles. J.C. Escobar,[a] S.S. Patel,[a] B.R. Carr,[a] K.D. Doody,[a,b] K.J. Doody.[a,b] [a]Department of Reproductive Endocrinology and Infertility, University of Texas at Southwestern Medical Center, Dallas; and [b]Center for Assisted Reproduction, Bedford, Texas.

Background: AMH measurement is increasingly being used for the prediction of the extremes in ovarian response to gonadotropin stimulation during IVF. Previous studies have suggested that serum AMH is a good predictor of ovarian reserve, has minimal cycle day-to-day variability, and is not affected by GnRH agonists, making it ideal for IVF.

Objective(s): To (1) determine the intercycle trend of serum AMH levels in women undergoing repetitive egg donation, (2) determine whether the serum AMH value before a specific egg donation cycle predicts the IVF cycle outcome, and (3) assess whether intercycle differences in AMH predict cycle response.

Materials and Method(s): All patients in our center undergoing egg donation cycles between the years 2001 and 2007 were included in the study. Only donors who underwent four or more cycles were included in the analysis. Serum AMH levels at cycle start were analyzed retrospectively. Statistical analysis was conducted using fitted linear mixed models to evaluate continuous outcomes, including the total gonadotropin dose (IU) and peak E_2 levels. Binomial mixed models were used to analyze discrete outcomes, including the total number of eggs retrieved and the total number of blastocysts observed.

Result(s): A total of 36 patients underwent 167 egg donation cycles. AMH levels, ranging from 0.27 to 17.65 ng/mL, positively correlated with the peak E_2 level, the total number of eggs retrieved, and the number of grade 3 embryos observed ($P<.0001$), in addition to the number of embryos progressing to the blastocyst stage ($P<.004$). AMH levels negatively correlated with the total gonadotropin dose (IU) administered during the cycle ($P<.0001$). One-third (12/36) of the patients had at least one AMH value diverging $\geq 50\%$ from their overall mean AMH for all cycles. Subgroup analysis of these patients with significant intercycle variation did not reveal a significant correlation between deviations in AMH levels at the time of cycle start and IVF cycle outcomes.

Conclusion(s): Our study demonstrates that serum AMH levels provide valuable prognostic information regarding IVF cycle outcomes in repetitive egg donors. The wide range of serum AMH levels within this population reiterates the usefulness of serum AMH measurement, even in this healthy donor population. Intercycle AMH variability was also frequently observed; nevertheless, this difference did not predict clinical outcome. At this time there is no clear benefit for repetitive measurement of serum AMH levels in patients undergoing multiple egg donation cycles.

O-3

Fresh Autologous In Vitro Fertilization is Associated with Increased Incidence of Ectopic Pregnancy when Compared with Oocyte Donation and Frozen-Thawed Embryo Transfer Cycles. B.S. Shapiro,[a,b] S.T. Daneshmand,[a,b] F.C. Garner,[a,b] M. Aguirre,[a] C. Hudson,[a] S. Thomas.[a] [a]Fertility Center of Las Vegas; and [b]University of Nevada School of Medicine, Department of Obstetrics and Gynecology, Las Vegas, Nevada.

Background: Fresh autologous IVF cycles have been associated with an increased risk of ectopic pregnancy when compared with natural pregnancies. The cause has been alleged to be uterine peristalsis induced by supraphysiologic E_2 levels after controlled ovarian stimulation (COS).

Objective(s): To compare the incidence of ectopic pregnancy after blastocyst transfer in cycles using frozen-thawed embryos and in fresh oocyte donor cycles against a control group of fresh autologous transfers.

Materials and Method(s): Patients or donors underwent COS with exogenous gonadotropins under the GnRH antagonist protocol. Collected oocytes were inseminated by intracytoplasmic sperm injection. Fresh embryos were cultured to the blastocyst stage before transfer. Thawed embryos were either supernumerary blastocysts or else thawed bipronuclear oocytes cultured to the blastocyst stage before transfer. All cycles occurred in the 5-year period ending December 31, 2008. Gestational carrier cycles were included as oocyte donation cycles. Pregnancy was identified through rising serum hCG titers. Ectopic pregnancy was characterized by adnexal mass observed on ultrasound or else persistent abnormally rising hCG titers with no observed intrauterine sac. Wilcoxon's test was used to compare numeric variables. Fisher's test was used to compare nominal variables. To control the type I error rate in multiple comparisons, a difference was considered significant if $P<.025$ (Bonferroni's correction).

Result(s): There were 181 fresh oocyte donation cycles with ET, 941 thawed-embryo transfers, and 1136 fresh nondonor blastocyst transfer cycles in the study period. Patients receiving fresh autologous transfer were significantly younger than recipients of donated oocytes ($P<.0001$) but did not differ from those receiving thawed-embryo transfer. The number of transferred embryos was not significantly different in any comparison. The incidence of ectopic pregnancy was significantly greater after fresh autologous transfer than after thawed-embryo transfer ($P<.0001$) or fresh transfers in oocyte donation cycles ($P = .0162$). In cycles achieving pregnancy, the incidence of ectopic pregnancy was significantly greater in fresh autologous cycles than in thawed embryo cycles ($P<.0001$) or in oocyte donation cycles ($P = .0019$).

	Donor	Thawed	Fresh
Transfer cycles	182	941	1136
Patient age, years	39.4 ± 5.3	34.6 ± 5.1	34.6 ± 5.0
Embryos transferred	2.0 ± 0.5	2.0 ± 0.5	2.0 ± 0.5
Pregnancies (+hCG)	162	692	692
Ectopic pregnancies	0	5	32
Ectopics per pregnancy, %	0	0.72	4.6
Ectopics per transfer, %	0	0.53	2.8

Conclusion(s): Fresh transfer after ovarian stimulation is associated with an increased incidence of ectopic pregnancy when compared with oocyte donation cycles and cycles using thawed embryos. This effect might result from the uterine effects of COS.

O-4

The Quality of the Oocyte Cohort is Affected by the Magnitude of the Luteal Hormone Surge After the Use of Gonadotropin-Releasing Hormone Agonist to "Trigger" Oocyte Maturation. B.S. Shapiro,[a,b] S.T. Daneshmand,[a,b] H. Restrepod,[c,d] F.C. Garner,[a,b] M. Aguirre,[a] C. Hudson.[a] [a]Fertility Center of Las Vegas; [b]University of Nevada School of Medicine, Department of Obstetrics and Gynecology; [c]Children's Heart Center; and [d]University of Nevada School of Medicine, Department of Pediatrics, Las Vegas, Nevada.

Background: The GnRH agonist "trigger" is reportedly effective at maturing oocytes while avoiding ovarian hyperstimulation syndrome (OHSS) risk. However, the magnitude of the pituitary release of LH cannot be controlled and may be suboptimal in some infertile patients.

Objective(s): To determine whether there is a relationship between oocyte cohort parameters (yield, maturity) and the serum LH concentration after GnRH agonist trigger.

Materials and Method(s): Patients or donors underwent ovarian stimulation with gonadotropins under a GnRH antagonist protocol. Follicular development was monitored on ultrasound, and the number of follicles >10 mm in diameter was recorded on the morning before trigger. Those at significant risk of OHSS were given GnRH agonist (4 mg leuprolide acetate) trigger when the median follicle size reached 16 mm. Serum LH was measured the following day. Oocytes were collected 34–35 hours after trigger. Wilcoxon's test was used to compare LH values.

Result(s): There were 255 GnRH agonist triggers in the 69-month period beginning January 1, 2004. The mean patient age was 29.2 years (range, 19–44 years), the mean serum E_2 level on the day of trigger was 5912 pg/mL (range, 674–16,626 pg/mL), the mean number of follicles was 34.6 (range, 7–84), and the mean number of oocytes collected was 27.7 (range, 0–71).

LH levels were measured 3.5–20.2 hours (mean, 10.6 hours) after trigger. To remove the variation in measured LH caused by varied post-trigger LH measurement times, an exponential decay model was used to normalize the LH levels to estimated levels at 12 hours post-trigger (LH_{12}). Linear regression revealed positive correlations between LH_{12} and the number of oocytes collected per follicle ($P = .0006$) and the number of metaphase II (MII) oocytes collected per follicle ($P = .0086$). The distributions of the total oocyte/follicle and MII oocyte/follicle ratios were examined, and the lowest 2.5% of each distribution were labeled as "low." Low oocytes per follicle occurred when fewer than 0.4 oocytes were collected per follicle, while low MII oocytes per follicle occurred when fewer than 0.2 MII oocytes per follicle were collected. Low eggs per follicle corresponded with a lower LH_{12} value compared with those that were not low (mean, 21.9 vs. 64.6 IU/L; $P = .0029$). Low MII oocytes per follicle corresponded with lower LH_{12} values compared with those that were not low (mean, 26.3 vs. 64.8 IU/L; $P = .0036$).

Conclusion(s): The LH surge after GnRH agonist trigger varies considerably in magnitude and is sometimes suboptimal for oocyte maturation.

Support: None.

O-5

Ethics in Reproductive Medicine: Identifying Educational Needs. A. Stein[a] P. Kaplan.[b] [a]University of Southern California and UCLA-Santa Monica Hospital, Los Angeles, CA; and [b]Oregon Health and Sciences University, Eugene, OR.

Background: Ethics education is an integral component of current postgraduate, medical, and residency education. Given rapid technological progress in reproductive medicine and recent highly publicized cases indicating deviation from current American Society of Reproductive Medicine Ethics and Practice Committee Guidelines, we conducted a small study on behalf of the Pacific Coast Reproductive Society (PCRS) to determine meeting participants' experiences, knowledge, and opinions in ethics.

Materials and Method(s): A survey was distributed during the initial plenary session to all attendees at the April 2009 PCRS Annual Meeting. The survey was collected at the end of the 1-hour session.

Result(s): Of approximately 150 surveys distributed, attendees returned 83 completed surveys. The trraining levels of survey participants included an M.D., 54 (65%); Ph.D., 12 (14%); and other, 17 (20%; M.B.A., N.P., M.A., and B.A., among others).

Gender included 47% male and 53% female respondents. Fifty percent reported greater than 20 years of practice experience.

The percent of respondents correctly identifying the basic tenets of ethics (Beauchamp TL, Childress JF. Principles of Biomedical Ethics. 6th ed. New York: Oxford University Press, 2009; out of 11 choices) included autonomy, 43%; justice, 55%; beneficence, 65%; and nonmaleficence, 63%. Current medical school curricula may include veracity and integrity, identified 28% and 57% of the time, respectively. Other choices included reform, volunteering, cleanliness, humility, and education (10%, 6%, 6%, 22%, 28%, respectively). Sixty-two percent of survey participants reported attendance at medical ethics or professionalism lectures, courses, or other activities in the past year.

Few respondents thought laws should be enacted to regulate IVF clinics (10%), but 26% and 46% felt egg donor recruiters and surrogacy negotiators, respectively, should have laws to regulate them.

When asked to list the "most important issues facing reproductive medicine today and in the future," respondents most frequently included issues surrounding: multiple births, embryonic stem cell research and use, mandated outside control, costs, lack of oversight/discipline, ethics, advertising, and issues with frozen embryos.

Summary: This small survey reflects the concern of professionals in reproductive medicine with several major themes (current and future). Fundamental and ongoing ethics education at all levels and stages seems necessary as less than two-thirds of PCRS respondents could identify the fundamental principles of ethics. This might reflect the length of time since professional education and/or the diversity of professions surveyed.

Conclusion(s): Reproductive practitioners are very concerned about the major ethical issues facing their specialty. Continued ethics and professional training is essential at all levels and stages for this sensitive area of medicine.

O-6

Gestational Outcome After Therapy for Intrauterine Adhesions. C. March,[a,b] R. Israel,[b] R. Marrs,[a] G. Ringler,[a] J. Vargyas.[a] [a]California Fertility Partners and [b]Division of Gynecology, Keck School of Medicine of the University of Southern California, Los Angeles, California.

Background: The literature is replete with manuscripts detailing the adverse outcome of pregnancies that occur after the treatment of intrauterine adhesions. Our initial experience was considerably different, a factor we attributed to a therapeutic approach that included verifying that the uterine cavity had been normalized before recommending that conception be attempted.

Objective(s): To expand upon our findings published in 1981 via a much larger number of patients, most of whom have had uterine ultrasound as an additional method of follow-up.

Materials and Method(s): Between February 1974 and April 2009, 1240 infertile patients underwent treatment for intrauterine adhesions. Except for three hysterotomies, treatment was by hysteroscopic adhesiolysis, often under laparoscopic guidance. Two hundred eleven (17%) patients had surgery on more than one occasion, including two patients who underwent surgery five times before a normal uterine cavity could be achieved. Patients were followed for a minimum of 4 months. One or more other infertility factors were identified in 474 patients (38%).

Result(s): Of these 1240 patients, 744 (60%) conceived 776 times. Pregnancies occurred in 74% of those whose corrective surgery resulted in a normal uterus, whereas only 11% of those whose repairs were incomplete conceived. There were 126 (16.2%) spontaneous and five therapeutic abortions. Most deliveries were vaginal, including among those women who had prior uterine perforation(s). Cervical incompetence (n = 13) and placenta accreta (n = 10) were the most common complications. Four patients with placenta accreta underwent hysterectomy. Two pregnancies were complicated by IUGR and were delivered and 26 and 28 weeks of gestation.

Conclusion(s): Pregnancies after treatment of intrauterine adhesions are usually uncomplicated; however, monitoring for cervical incompetence and for errors of placentation is critical to optimize outcomes.

Support: None.

O-7

First Clinical Results with Preimplantation Genetic Diagnosis Using Array Comparative Genome Hybridization. Munne Santiago,[a] C. Wagner,[b] P. Colls,[a] K. Wiemer,[c] J. Fischer,[a] D. Hill,[d] B. Kaplan,[b] H. Danzer,[d] M. Surrey,[d] M. Opsahl.[c] [a]Reprogenetics, Livingston, New Jersey; [b]Fertility Centers of Illinois, Highland Park, Illinois; [c]Northwest Center for Reproductive Sciences, Kirkland, Washington; and [d]ART Reproductive Center, Beverly Hills, California.

Background: Seventy percent of embryos of women of advanced maternal age (AMA) and 50% of their blastocysts are chromosomally abnormal. These abnormalities contribute to low implantation rates and high miscarriage rates with increasing maternal age. Although few dispute the hypothesis that preimplantation genetic diagnosis should improve ongoing pregnancy rates, differences in methodology have yielded conflicting results when day 3 biopsy and fluorescence in situ hybridization (FISH) analysis have been used. Recent studies with comparative genome hybridization (CGH) combined with blastocyst biopsy and replacement on the next cycle have provided very high ongoing pregnancy rates (80%) and implantation rates (60%). However, CGH is not compatible with day 3 biopsy and day 5 replacements. A superior technique is array CGH (aCGH), which can provide results in 24 hours for all chromosomes per multiple loci.

Objective(s): To report the first pregnancy results using aCGH.

Materials and Method(s): Array CGH was performed on 46 patients from three fertility centers. The average maternal age was 37. Indications were AMA ($\geq$38, n = 22), recurrent pregnancy loss (RPL), or other and age >38 years old (n = 24). A total of 465 embryos were analyzed. Two different DNA amplification methods were used. Some abnormal embryos were reanalyzed by FISH for those chromosomes found abnormal by aCGH to determine the error rate of aCGH. All embryos were replaced on day 5.

Result(s): With the initial amplification method, 12% (n = 163) of single blastomeres did not produce results, compared with only 2% (n = 302; $P<.001$) with the second method, which is the one currently in use. In total, 465 embryos were biopsied, of which 431 gave aCGH results. Of these, 40.1% were normal (28% in the AMA group and 51% in the rest). After reanalyzing 87 abnormal embryos, six were normal by FISH (6.9% error rate). We had pregnancy outcomes in 30/46 of the patients. Of those, 71% (15/21) and 33% (3/9) of RPL (or other) and AMA patients, respectively, become pregnant (+sac). Implantation rates were, respectively, 64% (23/36) and 40% (4/10).

Conclusion(s): We report the first pregnancies in the United States after aCGH of cleavage-stage embryos. The current amplification method proved to be very efficient in amplifying single cells (2% no amplification). The error rate (6.9%) was identical to our FISH error rate and was attributed to the reported 7% of mosaics with <50% abnormal cells. The implantation and pregnancy rates were superior to our FISH results but inferior to those reported by day 5 biopsy CGH results, indicating that day 5 may be a better stage to biopsy embryos.

O-8

Progesterone Administration Antagonizes the Effect of Estradiol on Endothelium-Dependent Vasodilation and Cardiovagal Baroreflex Sensitivity in Young Healthy Women. J. Miner,[a] M. Smith,[a] E. Martini,[a] V. Brunt,[a] P. Kaplan,[a,b] J. Halliwill,[a] C. Minson.[a] [a]Department of Human Physiology, University of Oregon, Eugene; and [b]Division of Reproductive Endocrinology, Department of OB/GYN, Oregon Health Sciences University, Portland, Oregon.

Background: Our group has previously investigated the effect of estrogens and progestins on cardiovascular health. In one such study, we found that medroxyprogesterone acetate antagonizes the beneficial effects of E_2 on endothelial function. Several studies are currently investigating the effect of P administration on vascular health in postmenopausal women. However, there is relatively little research that explores the cardiovascular effects of P on young healthy women.

Objective(s): To examine the acute effects of P and E_2 on endothelium-dependent vasodilation and cardiovagal baroreflex (CVBR) sensitivity in healthy reproductive-aged women.

Method(s): We suppressed endogenous estrogens and P in 31 premenopausal women for 10 days using a GnRH antagonist (GnRHa). On day 4, subjects were tested and then supplemented with either 0.1 or 0.2 mg transdermal E_2 (GnRHa + E_2; n = 8) or 200 mg oral micronized P (GnRHa + P_4; n = 8) per day. On day 7, subjects were tested and began supplementation with both hormones (GnRHa + P_4 + E_2) and were tested again on day 10. Flow-mediated vasodilation (FMD) of the brachial artery was assessed in 16 of the women using B-mode arterial ultrasound, combined with synchronized Doppler analysis. CVBR sensitivity was assessed in all 31 women by lowering and raising blood pressure with IV administration of sodium nitroprusside and phenylephrine. CVBR sensitivity was determined as the slope relating the R-R interval and systolic blood pressure.

Result(s): Significant differences were observed when comparing FMD in GnRHa (7.85 $\pm$ 2.77%) and GnRHa + E_2 conditions (10.14% $\pm$ 1.40%; $P<.05$). The E_2 increase was abolished when P was also supplemented (6.27% $\pm$ 2.41%). In contrast, GnRHa + P_4 (6.66% $\pm$ 2.56%) did not significantly alter FMD from GnRHa (7.80% $\pm$ 2.76%) and GnRHa+P_4 + E_2 (7.40% $\pm$ 3.02%). However, a multilevel prediction model demonstrates that P ($P<.02$) and E_2 ($P<.01$) predict FMD within subjects. CVBR slopes from GnRHa-only (14.07 $\pm$ 1.17) and GnRHa + P_4 + E_2 conditions (14.12 $\pm$ 1.23) did not differ. However, CVBR sensitivity slopes were significantly larger in the GnRHa + P_4 condition (17.18 $\pm$ 1.28) in comparison with other conditions. Alternatively, the GnRHa + E_2 administration led to a significantly smaller slope than the other conditions (12.33 $\pm$ 1.21).

Conclusion(s): These data suggest that acute P administration antagonizes the effect of estrogen on endothelium-dependent vasodilation and that acute P and estrogen antagonize each other with respect to CVBR slopes.

Support: National Institutes of Health grant no. HL081671.

O-9

An Estrogen-Related Gene Signature in Breast Cancer Tissue Predicts Responsiveness to Aromatase Inhibitors. I. Moy, S. Bulun, A. Rademaker. Northwestern University, Robert H. Lurie Comprehensive Cancer Center, Chicago, Illinois.

Background: Breast cancer, in a majority of premenopausal patients and in approximately 75% of postmenopausal women, is a hormone-dependent disease that relies on the mitogenic effects of estrogen to drive carcinogenesis. The expression of estrogen receptor alpha (ERa) at clinically significant levels is present in approximately 80% of human breast carcinomas. Aromatase inhibitors (AIs) are the most effective class of drugs in the endocrine treatment of ERa-positive breast cancer, with a 50%–60% response rate.

Objective(s): To determine whether intratumoral protein or mRNA levels of estrogen-related genes could be used as molecular predictors of AI responsiveness in postmenopausal women with advanced breast cancer.

Method(s): Primary breast carcinomas from 116 women who subsequently developed advanced breast cancer and were treated with an AI were analyzed by immunohistochemistry (IHC) for ERa and PR. The mRNA levels of aromatase, AKR1C3, ERa, PR, cathepsin-D, and BRCA1 were compared between responders and nonresponders using the Wilcoxon rank sum test and receiver operating characteristic analysis. Logistic regression and multivariate analysis were performed to determine any beneficial trends of response.

Result(s): IHC analysis was successfully performed on 112 of 116 patients. Fifty-five of 98 (56.1%) ERa-positive tumors and two of 14 (14.3%) tumors considered to be ERa-negative responded favorably to AI treatment either by complete or partial response or stable disease for at least 6 months. There was no statistical difference between ERa IHC versus ERa mRNA in predicting AI responsiveness. The predictive value of ERa mRNA and PR mRNA for AI responsiveness was comparable (ERa: area under the curve = 0.691, $P = .0004$; vs. PR: AUC = 0.679, $P = .0014$). ERa + PR mRNA provided an improved specificity of 36% over ERa and/or PR IHC (16%) in predicting AI responsiveness in our patient population ($P = .0009$).

Conclusion(s): Real-time polymerase chain reaction analysis of estrogen-related genes in breast tumors can provide important molecular predictors of response to AI treatment. Combined ERa/PR mRNA provided improved specificity in predicting AI responsiveness when compared with the traditional use of IHC.

Support: Northwestern Medical Foundation, National Institutes of Health (CA67167), and Breast Cancer Research Fund.

P-1

Effect of In Vitro Fertilization Lead Follicle Size on Trailing Oocyte Maturation. M. Amols, N. Rollene, R. Gada, J. Jensen, C. Coddington Department of Reproductive Endocrinology and Infertility at the Mayo Clinic, Rochester, Minnesota.

BACKGROUND: Follicular size has been a marker used to time hCG administration during IVF cycles. HCG is commonly given to trigger final oocyte maturation when the lead follicle reaches 18 mm. In cycles with a single lead follicle that is significantly larger than remaining follicles (trailing cohort), this may result in premature triggering and recovery of immature oocytes from the trailing cohort.

OBJECTIVE(S): To determine whether allowing a lead follicle's size to grow to >18 mm affects oocyte recovery and maturation rates in IVF cycles.

MATERIALS AND METHOD(S): A retrospective chart analysis was performed from all IVF patients seen between 2004 and 2009. Inclusion criteria were a single lead follicle $\geq$ 20 mm, the next largest follicle within the trailing cohort $\geq$2 mm behind ($\sim$1 day's growth) the lead follicle, and IVF cycle completed through retrieval. The trailing cohort was defined as four or more follicles within 3 mm of each other. Variables compared between women who met inclusion criteria and controls are listed in the table. Two-sample *t*-test analysis was used to compare these groups. Statistical analysis was performed with JMP version 8.0.

RESULT(S): One hundred cases met the inclusion criteria. There was no statistical difference in age between the study group and the control group. See the table.

CONCLUSION(S): Women with a lead follicle that was allowed to grow to >18 mm had similar numbers of oocytes retrieved and maturation rates comparable to controls. Presumably, these women may have had fewer oocytes recovered and lower maturation rates if hCG had been administered earlier, when the lead follicle was 18 mm. Allowing the lead follicle to continue to grow may permit a larger number of oocytes in the trailing cohort to mature. Using the size of the lead follicle alone to determine hCG administration may not be as critical as once believed.

SUPPORT: Departmental funds.

TABLE 1.

Outcomes	Study (n = 100), mean	Control (n = 342), mean	*P*
Days of stimulation	10.97 ± 1.61	10.68 ± 1.73	.1377
No. of oocytes retrieved	13.45 ± 7.05	12.51 ± 6.22	.1976
No. of mature oocytes (M2)	9.91 ± 5.60	9.38 ± 5.23	.3834
Oocyte maturity rate (M2)	75.79 ± 21.67	75.19 ± 19.12	.7865

Note: M2 = metaphase 2.

P-2

Cumulative Pregnancy Rates Offer a More Comprehensive View of Overall In Vitro Fertilization Success for a Given Cycle than Fresh or Frozen Pregnancy Rates Alone. D.E. Battaglia, D.L. Eaton, K. Sadler-Fredd, P.E. Patton. Oregon Health and Science University Fertility Consultants, Oregon Health and Science University, Department of Obstetrics and Gynecology, Portland, Oregon.

BACKGROUND: IVF pregnancy rates (PR) after a fresh ET or frozen ET highly correlate with the number of embryos transferred and maternal age. To minimize the risk of high-order multiple gestation, many programs limit the number of fresh embryos transferred, especially when excess embryos are available for cryopreservation. An important clinical question is what is the comprehensive chance of achieving a pregnancy after a controlled ovarian hyperstimulation cycle (COH) when the opportunity for both a fresh and frozen ET exist? Unfortunately, PR for fresh ET and frozen ET are usually reported separately. Therefore, the cumulative PR after a single COH cycle is largely under reported.

OBJECTIVE(S): To analyze retrospectively outcomes for patients in all age groups who had embryos cryopreserved after their fresh ET. Our objective was to determine a cumulative PR for patients with either fresh ET or subsequent frozen ET when pregnancy was not achieved with the fresh ET.

MATERIALS AND METHOD(S): Four hundred eighty-eight COH cycles were examined from January 2007 through June 2009 in which a fresh ET occurred along with embryo cryopreservation. These cycles represent 65.5% of all IVF cycles during this period. The overall PR (all age groups + donor egg) with a fresh ET was 54.3%, while the overall PR with frozen ET was 43.5%. To provide a more comprehensive assessment of success per COH, we compared the PR for fresh ET in different age groups with the cumulative PR for each group (including those who may have had a frozen ET with the same embryo cohort as the fresh ET). The outcomes were divided among several maternal age groups, including <36, 36–39, >39 years of age and donor oocyte cycles. Statistical analysis between fresh ET and cumulative PR was performed using Fisher's exact test with a 2 × 2 contingency table. $P<.01$ was considered statistically significant.

RESULT(S): The results are presented in the table.

CONCLUSION(S): Cumulative PR for patients who had embryos cryopreserved rose significantly in all age groups except for the >39 group. The cumulative PR in a single COH cycle exceeded 75% in both the <36 and donor egg groups, and the triplet PR was 1.1%. On the basis of the cumulative PR, these data support the transfer of a limited number of fresh embryos when there is a future option of frozen ET. The calculations of clinic-specific cumulative PR provides an important basis for patients to assess their overall chance of success from a single COH cycle and manage their decisions on the number of embryos for transfer with the aim of limiting the risk of high-order multiple gestations.

TABLE.

Age group	n	Average age	Average no. of ETs	No. pregnant (%) Fresh ET (%)	No. pregnant (%) Cumulative (%)	*P*
<36	258	31.4	2.1	147 (57.0)	198 (76.7)	<.0001
36–39	120	37.1	2.3	57 (47.5)	81 (67.5)	.0026
>39	28	40.9	2.9	11 (39.3)	14 (50.0)	.59[a]
Donor egg	82		1.9	50 (61.0)	69 (84.2)	.0015

[a] Statistically significant.

P-3

Clinical Outcomes with a Fixed Recombinant Follicle-Stimulating Hormone (rFSH)/Gonadotropin-Releasing Hormone Antagonist Protocol in a Large North American Cohort of In Vitro Fertilization/Intracytoplasmic Sperm Injection Patients. R. Boostanfar,[a] H. Witjes,[b] B. Mannaerts,[b] K. Gordon,[c] M. Mahony.[c] on behalf of the Engage investigators [a]Huntington Reproductive Center, Tarzana, California; [b]Schering-Plough Research Institute, Schering-Plough, a Division of Merck & Co., Oss, The Netherlands; and [c]Schering-Plough, a Division of Merck & Co., Kenilworth, New Jersey.

BACKGROUND: In a recent, prospective, double-blind, randomized, IVF trial (Engage), subjects in the reference group were treated with a standardized rFSH/GnRH antagonist protocol. The North American (NA) cohort made up 54% of these subjects, providing an opportunity to study the impact of patient demographics and clinical characteristics on clinical outcome with this simplified treatment regimen.

METHOD(S): In this retrospective analysis, data collected from 14 centers in NA were analyzed. Patients (n = 403) were treated once daily with 200 IU rFSH follitropin beta (Follistim AQ Cartridge/Puregon, NV Organon, The Netherlands) starting on day 2–3 of menses, followed by daily rFSH ($\leq$ 200 IU/day) from controlled ovarian hyperstimulaton (COS) day 8 onward, as required, to meet the criterion of at least three follicles $\geq$17 mm for hCG (Pregnyl, NV Organon) administration. All received 0.25 mg of the GnRH antagonist ganirelix (Ganirelix Acetate, NV Organon) daily from COS day 5 until induction of oocyte maturation by urinary hCG. EET was on day 3 or day 5 with one or two embryos transferred. Ongoing pregnancy rate (PR) and implantation rate (IR) were examined across patient age, occurrence of a previous IVF cycle, number of oocytes retrieved, stimulation day 1 serum FSH, and cause of infertility.

RESULT(S): In this NA cohort, 403 subjects were randomized to the rFSH/ganirelix reference arm, 399 (99%) had an oocyte retrieval, and 380 (94.3%) had an ET with equivalent day 3 (48.9%) and day 5 (49.5%) ETs; 88.9% had two embryos transferred. Mean age, weight, and body mass index were 31.7 years, 68.1 kg, and 25 kg/m^2, respectively. Ongoing PR was 45.7%, and IR was 36.8%. The table summarizes PR and IR stratified by

patient demographics and clinical characteristics: younger patients and those without a previous IVF cycle trended toward a higher PR and IR; oocyte number lowered PR only when less than six oocytes were obtained More oocytes and good-quality embryos were obtained in younger patients (18–29 years: 15.7 [7.0] and 6.3 [4.6]; compared with older patients 30–33 years: 14.0 [7.4] and 5.3 [4.8]; and 34–36 years: 11.1 [7.0] and 4.4 [3.6], respectively).

CONCLUSION(S): A simplified, patient-focused rFSH/GnRH antagonist treatment regimen attained high treatment success for patients across demographics and clinical characteristics within this study population. As often seen in everyday clinical practice, a trend toward higher PR was observed for the best prognosis patients.

KEY WORDS: Follitropin beta, rFSH, GnRH, ongoing pregnancy rate

SUPPORT: Financial support for this study was provided by Schering-Plough, a Division of Merck & Co.

TABLE. Clinical outcome by patient demographics and clinical characteristics.

	% PR (95% confidence interval)	IR, %
Age:		
18–29 (n = 101)	53.5 (43.3; 63.5)	43.2
30–33 (n = 149)	42.3 (34.2; 50.6)	35.5
34–36 (n = 153)	43.8 (35.8; 52.0)	34
Previous IVF cycle:		
0 (n = 342)	47.1 (41.7; 52.5)	38.3
1–3 (n = 61)	37.7 (25.6; 51.0)	28.8
Oocyte no.		
>18 (n = 93)	48.4 (38.0; 58.9)	38.2
13–18 (n = 93)	47.3 (36.9; 57.9)	39.9
6–12 (n = 160)	46.9 (39.0; 54.9)	35.1
<6 (n = 55)	34.5 (22.2; 48.6)	34.1
Stimulation day 1 FSH:		
<6 (n = 145)	37.9 (30.0; 46.4)	31.2
6–8 (n = 150)	52.7 (44.4; 60.9)	42.1
>8 (n = 55)	41.8 (28.7; 55.9)	33.3
Cause of infertility:		
Male factor (n = 168)	48.2 (40.5; 56.0)	38
Tubal (n = 109)	43.1 (33.7; 53.0)	37
Endometriosis (n = 95)	45.1 (35.0; 55.8)	38.2
Unexplained (n = 131)	46.6 (37.8; 55.5)	37.3

P-4

A Comparison of Clinical Pregnancy Rates and Multiple Gestation Rate with Two Versus Three Embryos Transferred with Pairs Matched for Embryo Quality. E. Borman[a] J.H. Check.[b] [a]UMDNJ, School of Osteopathic Medicine, Stratford, New Jersey; and [b]Robert Wood Johnson Medical School at Camden, Cooper Hospital/University Medical Center, Department of Obstetrics and Gynecology, Division of Reproductive Endocrinology and Infertility, Camden, New Jersey.

BACKGROUND: It has been shown that blastomere number is a better predictor of achieving pregnancy than fragmentation index. In a previous study of single-embryo transfer in women with diminished oocyte reserve, the clinical pregnancy rate for 6- 8-cell day 3 embryos was 40.4% versus only 6.6% for 4- to 5-cell embryos.

OBJECTIVE(S): To evaluate pregnancy rates and multiple birth rates according to the number of embryos transferred and the number of embryos with six or more blastomeres.

MATERIALS AND METHOD(S): IVF cycles over 10 years were reviewed according to whether two or three embryos were transferred in women aged <38. The clinical pregnancy rate (CLPR) (live fetus 8 weeks from conception) and multiple gestation rate (MGR) in women receiving two versus three embryos but matched according to embryo quality based on blastomere number were compared.

RESULT(S): The CLPRs with none of the embryos having six or more blastomeres were 21.6% (19/88) versus 30.2% (26/86) for two versus three embryos transferred (P=.26). The respective MGRs were 10.5% (2/19) versus 38.5% (10/26; P=.08, but four of 26 [15.3%] were triplets). For ETs with only one embryo with six or more blastomeres, the CLPR was 26.7% (50/187) versus 39.7% (90/227; P=.008) for two versus three ETs, and the MGRs were 32% (16/50) versus 31.1% (28/90; P = NS) with triplets in five cases (17.8%). For two embryos with six or more blastomeres, the CLPRs were 46.1% (235/510) versus 46.3% (136/294; P = NS). The respective MGRs were 35.7% (84/235) versus 40.4% (55/136) with triplets in eight cases (5.8%). When all three embryos had six or more blastomeres, the CLPR was 54.6% (482/882), which was significantly higher than when transferring two embryos of similar quality (46.1%, 235/510; P=.0025). The MGR of all three transferred with six or more blastomeres was 52.7% (254/482) versus the case with only two embryos (35.7%, 84/235; P<.0001). The triplet rate was 32.3% (82/254).

CONCLUSION(S): There is an improved chance of a CLPR with more embryos transferred especially where there is a greater percentage with six or more blastomeres. However, there does not seem to be safety in preventing multiple gestations if there are less quality embryos being transferred. We suggest that each IVF center present their data in a similar fashion to the couple seeking pregnancy by IVF-ET so that after being properly counseled on the risk of multiple gestations versus estimated pregnancy rates they can decide on two versus three embryos transferred on the basis of on embryo quality.

SUPPORT: None.

P-5

Impact on Blastulation Potential Relative to Day 3 Cell Number at Biopsy. N. Buehler,[a] C. Briton-Jones,[a] M. Surrey,[b] H. Danzer,[b] D.L. Hill.[a] [a]ART Reproductive Center and [b]Southern California Reproductive Center, Beverly Hills, California.

BACKGROUND: Almost two decades of molecular genetic screening of day 3 preimplantation embryos has demonstrated poor correlation between good morphology/cleavage rate and aneuploidy, especially in embryos from women of advanced prematernal age (>38 years). Biopsied, good-quality embryos continue on a normal growth trajectory in vitro. Cohen et al. reported in 2007 that the implantation potential of an 8-cell, high-grade embryo drops from 20% and 17.5% from a single blastomere biopsy.

OBJECTIVE(S): To examine whether embryos of slower than optimal cleavage rate had the potential to establish a viable pregnancy after removing a blastomere for the purpose of genetic screening. This study aims to distinguish varying degrees of implantation potential by correlating blastulation rates on culture day 5 with day 3 cleavage stage at biopsy.

DESIGN: Case cohort study.

MATERIALS AND METHOD(S): A total of 1819 embryos had a single blastomere removed using a Zilos IR laser for zona opening to facilitate blastomere removal on the morning of culture day 3. Cell stage was recorded before biopsy. Day 5 blastulation rates were calculated for each category.

RESULT(S): Blastulation rates postbiopsy among the three groups were linear: 117 embryos of <6 cells at 2.3%, 410 embryos of 6–7 cells at 26%, and 1271 embryos with >7 cells at 63% blastulation. Good-quality blastocysts post–embryo biopsy were more prevalent in embryos that had greater than 8 cells at the time of biopsy. Embryos with 5 cells or less did not blastulate. Sixteen six-cell embryos (8.6%) and 52 7-cell embryos blastulated (23.2%), which was significantly different from embryos with ≥8 cells, 504 of which blastulated (62%; P< .0001).

CONCLUSION(S): Embryos of 5 cells or less on day 3 have almost no implantation potential and should not be biopsied. It appears that too much total embryonic volume is removed at this cleavage stage to recover. Anecdotal results in our center suggest that slow cleavage rate, high-grade embryos delayed for biopsy to culture day 4 have implantation potential if they have advanced to ≥7 cells at that time.

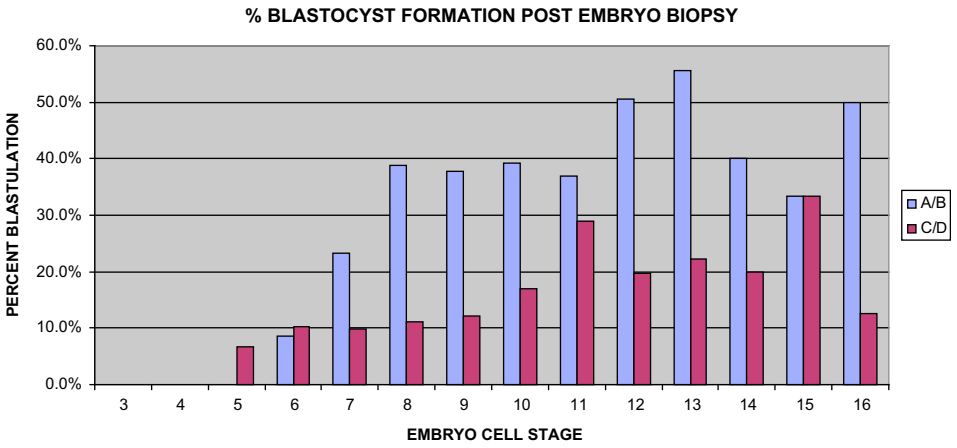
P-6

The Impact of Intercycle Variation on Predictive Parameters of Ovarian Reserve in the Xpect Trial. R. Buyalos,[a] H. Witjes,[b] B. Mannaerts,[b] K. Gordon.[c] [a]Fertility and Surgical Associates, Thousand Oaks, California; [b]Schering-Plough Research Institute, Schering-Plough, a Division of Merck & Co., Oss, The Netherlands; and [c]Schering-Plough, a Division of Merck & Co., Kenilworth, New Jersey.

BACKGROUND: For each new IVF patient, the treating clinician must decide on an initial starting dose of gonadotropin before the actual stimulation cycle. A number of factors predicting the ovarian reserve may be used for this purpose; however, the cycle-to-cycle variation factors are unknown.

OBJECTIVE(S): To assess the intercycle variation of these potential predictive factors of ovarian response.

MATERIALS AND METHOD(S): Basal (day 1, 2, or 3) serum levels of anti-Müllerian hormone (AMH), FSH, E_2, inhibin-B, T, LH, P, and



ultrasound parameters (antral follicle count [AFC] and ovarian volume) were measured in successive cycles. Spearman's rank correlation coefficients (ρ) were calculated for the correlation between values measured in consecutive cycles.

RESULT(S): Several potential predictive factors demonstrated considerable intercycle variation. The median values in consecutive cycles and the correlation between potential predictive factors are summarized in the table.

CONCLUSION(S): Correlation between the 2 assessment days was relatively high for serum AMH and T, indicating that the levels of these hormones were less affected by intercycle variation than other parameters. Among the potentially predictive factors for ovarian reserve, AMH was the least subject to intercycle variation, indicating that it may be useful in predicting ovarian response even when levels are determined before the cycle in which treatment is initiated.

TABLE. Endocrine and ultrasonographic parameters assessed in cycles 1 and 2.

	Cycle 1, median (range)	Cycle 2, median (range)	Correlation ρ (95% CI)
Serum AMH, ng/mL	1.84 (0.1, 6.9), n = 136	1.91 (0.1, 10.9), n = 137	0.88 (0.83; 0.91)
AFC	12.0 (1, 38), n = 196	11.0 (2, 33), n = 198	0.67 (0.58; 0.74)
Serum FSH, IU/L	6.16 (0.1, 13.1), n = 189	6.67 (3.1, 15.6), n = 173	0.63 (0.53; 0.71)
Serum E_2, pmol/L	110.5 (25, 407), n = 189	100.6 (25, 760), n = 173	0.54 (0.42; 0.64)
Serum inhibin B, pg/mL	49.8 (5, 205), n = 189	47.9 (5, 139), n = 173	0.53 (0.42; 0.63)
Serum T, nmol/L	1.04 (0.2, 3.3), n = 189	1.11 (0.2, 3.5), n = 173	0.84 (0.79; 0.88)
Serum LH, IU/L	4.58 (0.3, 15.5), n = 189	4.97 (1.9, 17.4), n = 173	0.56 (0.45; 0.66)
Total ovarian volume, mL	11.98 (3.4, 46.6), n = 190	10.92 (1.9, 35.7), n = 194	0.48 (0.36; 0.58)
Serum P, nmol/L	1.47 (0.6, 21.0), n = 189	1.61 (0.6, 14.5), n = 173	0.29 (0.13; 0.43)

P-7

Day 3 Versus Day 5 Embryo Transfer in Women of Advanced Maternal Age. W. Chang, C. Briton-Jones, N. Buehler, H. Danzer, M. Surrey, D.L. Hill. ART Reproductive Center, Beverly Hills, California.

BACKGROUND: There remains controversy in the literature regarding whether ET after 3 days of embryo culture or after 5 days of embryo culture may be more beneficial to women of advanced maternal age.

OBJECTIVE(S): To compare the clinical pregnancy rates in women 40 years old or older after ET after 3 or 5 days of embryo culture.

MATERIALS AND METHOD(S): Couples in which the female partner was 40 years old or older who presented for assisted reproductive treatment between January 1, 2008, and December 31, 2008, were invited to participate in the study. Patients using oocyte donors were excluded from the study. The day for ET was determined by the treating physician. The clinical pregnancy rate was compared between patients receiving ET after 3 days of embryo culture and after 5 days of embryo culture. To determine significant differences between the day 3 and day 5 ET groups, we compared the patient age, the total number of oocytes retrieved, the number of embryos cryopreserved, and the number of embryos transferred. The nonparametric Fisher's exact test was used to determine statistically significant differences for proportions, and the unpaired Student's t-test was used for group means. $P<.05$ was considered statistically significant.

RESULT(S): Two hundred ninety-three cycles were included in the study; 41 cycles did not have an ET; 35 of these were due to cryopreservation of all embryos and six cycles failed to have embryos of suitable quality to transfer. One hundred forty-one cycles had ET after 3 days of embryo culture, and 111 cycles had ET after 5 days of embryo culture.

CONCLUSION(S): This study demonstrates that high clinical pregnancy rates are achievable in women of advanced maternal age after day 5 ET. Our data indicate that a physician's decision to transfer on day 3 or day 5 appears to be influenced by the number of oocytes retrieved.

	Clinical pregnancy (%)	Age, X ± SD	No. of oocytes retrieved, X ± SD	No. of embryos cryopreserved, X ± SD	No. of embryos for ET, X ± SD
Day 3	37/141 (26.4)	42.05 ± 1.69	6.58 ± 3.71	0.05 ± 0.33	3.42 ± 1.69
Day 5	45/110 (40.9)	41.41 ± 1.34	12.26 ± 5.65	0.33 ± 0.82	2.73 ± 1.66
P	< .004	< .001	< .0001	< .0003	< .001

P-8

The Effect of Donated Oocytes or Embryos on Preterm Delivery and Birth Weight in Women with Multiple Gestation. J.H. Check, S. Patel, J.K. Choe, D. Brasile. UMDNJ, Robert Wood Johnson Medical School at Camden, Cooper Hospital/University Medical Center, Department Obstetrics and Gynecology, Division of Reproductive Endocrinology and Infertility, Camden, New Jersey.

BACKGROUND: Some studies have suggested an increased risk of preeclampsia or hypertension and thus pregnancy losses from preterm delivery. However, other studies, for example, one presented at the 2009 American Society for Reproductive Medicine, found no risk of prematurity after single ET derived from donor oocyte recipients or entire donated embryos.

OBJECTIVE(S): To see whether the short duration of exposure to nonmaternal antigens when using donated oocytes and the short duration of exposure to both maternal and paternal antigens when using donor embryos

may result in inadequate immune suppression, causing an even greater risk of preterm delivery and low birth weight when there is a multiple gestation.

MATERIALS AND METHOD(S): A retrospective cohort analysis over a 12-year time period was performed. The days of gestation were divided into five categories from full term to very severe preterm. Comparisons were made between women having embryos transferred derived from donor oocytes (either fresh or frozen embryos) where paternal antigens were present in the fetus, donor embryos (where there were no maternal or paternal antigens), and controls receiving frozen ETs (where both maternal and paternal antigens were present).

RESULT(S): For women with multiple births, the incidence of severe or very severe preterm births was 8.7% (10/114) versus 8.2% (16/194) for controls. The mean birth weights (grams) were 2210.9 for donor oocytes fresh embryos, 2279.2 for donor egg frozen transfer, 2294.3 for donor embryo frozen, and 2432.8 for controls.

CONCLUSION(S): Similar to conclusions made from studying singleton pregnancies, the carrying of embryos with foreign maternal and even foreign maternal and paternal antigens does not seem to lead to inadequate immune suppression resulting in preeclampsia, hypertension, and so on, which would cause a greater likelihood of preterm delivery even with the added risk of multiple gestation.

SUPPORT: None.

	Full term	Mild preterm	Moderate preterm	Severe preterm	Very severe preterm
Days	≥259	238–258	196–237	168–195	≤167
Donor oocyte fresh, %	1.59 (n = 1)	27.12 (n = 16)	61.0 (n = 36)	5.0 (n = 3)	5.0 (n = 3)
Donor oocyte frozen, %	0 (n = 0)	42.86 (n = 12)	50.0 (n = 14)	7.14 (n = 2)	0 (n = 0)
Donor embryo frozen, %	11.11 (n = 3)	48.15 (n = 13)	33.3 (n = 9)	7.14 (n = 2)	0 (n = 0)
Control frozen embryo, %	3.61 (n = 7)	51.55 (n = 100)	36.6 (n = 71)	5.15 (n = 10)	3.09 (n = 6)

P-9

A Comparison of Three Types of Therapies for Three Different Ovulation Disorders in Establishing Pregnancies and Evaluation of Laboratory Parameters that Could Influence the Outcome. J.H. Check, D. Brasile, J. Liss, J. Cohen. UMDNJ, Robert Wood Johnson Medical School at Camden, Cooper Hospital/University Medical Center, Department Obstetrics and Gynecology, Division of Reproductive Endocrinology and Infertility, Camden, New Jersey.

BACKGROUND: A previous study found a much higher pregnancy rate in infertile women with luteal phase defects (LPD) treated by supplemental P alone versus follicle-maturing drugs (FMD) when they attained a mature follicle (18–24 mm and serum E_2 >200 pg/mL) in a natural cycle. However, FMDs provided better pregnancy rates than P supplement in women with regular menses, releasing the oocyte before full follicular maturation was achieved.

OBJECTIVE(S): To compare pregnancy rates in women with clear-cut anovulation treated with FMDs and supplemental P (group 1) versus women releasing the oocyte before maturation treated with FMDs with added P supplementation (group 2) versus those with LPD and mature follicles treated with P alone (group 3).

MATERIALS AND METHOD(S): Consecutive couples limited to females ≤39.9 years old with a minimum of 1 year of infertility who did not have a problem that required IVF-ET were selected for evaluation. They had to demonstrate one of three types of ovulation disorders described above. There were no exclusions for day 3 serum FSH. Group 1 was treated with either clomiphene citrate or low-dose FSH, group 2 by low-dose FSH started day 8 or later, and group 3 by luteal phase P supplementation vaginally. Groups 1 and 2 also received P supplementation. Pregnancy rates were determined within three treatment cycles.

RESULT(S): Fifty-five couples were evaluated. The median age was 33 years. The mean length of infertility was 2.1 ± 0.9 years. Primary versus secondary infertility was 44% versus 56%; 124 treatment cycles were evaluated. Group 1 had a clinical pregnancy in 20/60 cycles (33.3%) versus 9/23 (39.1%) for group 2 versus 10/41 (24.4%) for group 3. A live fetus was documented at 8 weeks from conception in 30.0% (18/60), 30.4% (7/23), and 19.5% of cycles in these three groups, respectively. The median number of follicles for group 1 was 1.5 versus 1 for groups 2 and 3.

CONCLUSION(S): There was a significantly higher viable pregnancy with FMDs and P (25/83, 30.1% for groups 1 and 2 combined) versus P alone for group 3 (8/41, 19.5%). This could possibly be related to a greater likelihood of group 3 women having some other occult infertility factor rather than an ovulatory defect or maybe some apparently normal follicles are not quite mature enough and require FMDs.

SUPPORT: None.

P-10

Comparison of Pregnancy Rates after Frozen Embryo Transfer Using a Graduated Estrogen-Progesterone Regimen Versus Natural Cycle Using a Modified Slow-Cool Method that Avoids the Programmable Freezer. P. Chen, J.H. Check, C. Wilson. UMDNJ, Robert Wood Johnson Medical School at Camden, Cooper Hospital/University Medical Center, Department Obstetrics and Gynecology, Division of Reproductive Endocrinology and Infertility, Camden, New Jersey.

BACKGROUND: Many IVF centers predominantly use a graduated artificial estrogen/P regimen for frozen-thawed ETs due to high pregnancy rates seen in donor oocyte recipients using this protocol and the relative simplicity of monitoring. The lower cost of natural oocyte retrieval and the realization that controlled ovarian hyperstimulation (COH) may hinder implantation in some women have caused a renewed interest in this method. Thus, when conception fails after fresh ET after a traditional COH regimen, but very few embryos remain, a natural cycle oocyte retrieval and combined fresh and frozen-thawed ET could be used without much price increase over the frozen ET itself. However, this strategy would be less valuable if the natural cycle protocol produced a lower pregnancy rate after frozen ET.

OBJECTIVE(S): To retrospectively evaluate and compare pregnancy rates in women who chose the natural cycle for frozen ET owing to either side effects of estrogen or potential risks to those using the graduated estrogen/P regimen.

MATERIALS AND METHOD(S): The graduated estrogen P regimens used oral E_2 2 mg for 5 days, 4 mg for 4 days, and then 6 mg for ≥5 days until adequate endometrial thickness (≥8 mm) was achieved. The E_2 dosage would then continue, and vaginal P (either 90 mg Crinone vaginal gel, 100 mg Endometrin 3×/daily, or 200 mg twice daily P vaginal suppositories plus 100 mg IM daily) was added. Transfer of day 3 frozen-thawed embryos ensued after assisted embryo hatching on day 4 of P. For natural cycles, ovulation would be determined by follicular monitoring and the frozen-thawed embryos would be transferred 3 days after ovulation. One of the aforementioned vaginal P medications would be started on the day of ovulation. The cryopreservation technique was a simplified slow cool method avoiding the programmable freezer and using a one-step removal of cryoprotectant.

RESULT(S): Clinical and delivered pregnancy rates for natural cycles were 31.4% (65/207) and 27.1% (56/207), respectively, versus 37.6% (1049/2787) and 32.2% (898/2787), respectively, for the graduated estrogen protocol (χ^2, P=.36 and P=.14).

CONCLUSION(S): Although the natural method may reduce the frozen ET pregnancy rate by about 20%, this could easily be offset by the transfer of a fresh embryo, especially if only lower quality frozen embryos remained. Furthermore, this study reaffirms that slow cool methods avoiding the programmable freezer may produce good pregnancy rates that are comparable to the recent highly touted method of vitrification.

SUPPORT: None.

P-11

A Matched Controlled Study to Determine the Effect of Diminished Egg Reserve on Pregnancy Rates Without In Vitro Fertilization. J.K. Choe, J.H. Check, J.R. Liss, R. Cohen, D. Brasile. UMDNJ, Robert Wood Johnson Medical School at Camden, Cooper Hospital/University Medical Center, Department Obstetrics and Gynecology, Division of Reproductive Endocrinology and Infertility, Camden, New Jersey.

BACKGROUND: Although some studies suggest that live deliveries are highly unlikely with diminished oocyte reserve at any age even with IVF-ET and the transfer of normal appearing embryos, other studies disagree and suggest reasonable pregnancy rates as long as mild or no ovarian stimulation is used with luteal phase support with P.

OBJECTIVE(S): To determine how much of a negative impact diminished egg reserve has on pregnancy rates without IVF.

MATERIALS AND METHOD(S): An infertile woman age ≤37 presenting with primary or secondary infertility whose day 3 serum FSH was >12 mIU/mL was matched to the very next infertile woman whose day 3 serum FSH was <10 mIU/mL. The matching was based on age, primary versus secondary infertility, and length of infertility. The females were only included if they were found to be anovulatory or had a follicular maturation or luteal phase defect and were euestrogenic. IUI was only performed if there was mild oligoasthenozoospermia or poor postcoital test. Clinical (viable fetus at 8 weeks from conception) and live delivered pregnancy rates were compared between these two groups during a 6-month therapy period (unless a pregnancy occurred first).

RESULT(S): There were 24 women in each group. The average age of the normal FSH versus high FSH group was 32.2 versus 33 years. The average length of infertility was 2.9 versus 2.4 years. There were 17 (70.8%) women in the normal FSH group who achieved a clinical pregnancy versus 10 (41.6%) in the high FSH group (P=.08). The respective live delivered pregnancy rates were 62.5% (n = 15) and 33.3% (n = 8; P=.08). The average time to conceive for those with pregnancies in the normal FSH group was 3.1 cycles versus 3.22 cycles for high FSH. The mean FSH for the normal FSH group was 6.1 ± 2.8 mIU/mL versus 20.6 ± 7.5 mIU/mL for the high FSH group.

CONCLUSION(S): The live delivered pregnancy rate during a 6-month treatment interval was twice as high in those with normal FSH versus increased serum FSH. Nevertheless, the 33.3% live delivery pregnancy rate was reasonably good, especially when some studies suggest pregnancies are not possible even with IVF-ET in women with elevated day 3 serum FSH levels ≥15 mIU/mL. It should be noted that these pregnancies were achieved without controlled ovarian hyperstimulation or automatic IUI.

SUPPORT: None.

P-12

Embryos that Fail to Divide from Day 2 to 3 Still Have a Fairly Good Chance of Successful Implantation. J.K. Choe, D. Horwath, J.H. Check, D. Summers-Chase, W. Yuan. UMDNJ, Robert Wood Johnson Medical School at Camden, Cooper Hospital/University Medical Center, Department Obstetrics and Gynecology, Division of Reproductive Endocrinology and Infertility, Camden, New Jersey.

BACKGROUND: When women have several embryos to choose from, usually embryos that fail to divide from 48 to 72 hours are not chosen for transfer. At best, if the total number of embryos is small they may be included with others that did cleave to 72 hours, but it is not possible to determine which embryo was responsible for a pregnancy.

OBJECTIVE(S): To determine whether pregnancy is possible and if so how likely to occur after transferring embryos that have had cleavage arrest.

MATERIALS AND METHOD(S): A retrospective review of all single fresh ETs from January 1, 1997, to February 28, 2009, in women aged ≤42 where the embryos failed to show any division from 48 to 72 hours was performed. The clinical pregnancy rate (viable fetus 8 weeks), viable/ongoing pregnancy rate (viable fetus at 12 weeks), and live delivered pregnancy rates were then determined. No exclusions were made. Many of these women had diminished egg reserve as manifested by diminished antral follicle count and relatively high day 3 serum FSH, but they could also have been with a group with poor fertilization where there was only one embryo fertilized and it had cleavage arrest. The only requirement was that there were no less than four blastomeres.

RESULT(S): There were 15 ET cycles identified that had the transfer of only a single embryo that showed no further division from 48 to 72 hours. Clinical and viable pregnancies occurred in three (20% per transfer). One woman had an amniocentesis that showed trisomy 21, and a pregnancy termination was performed at 5 months, so the live delivery rate per transfer was 13.3%.

CONCLUSION(S): These data show that an embryo failing to divide from day 2 to 3 could still achieve a reasonable implantation rate. Thus, on the basis of these data, the couple/physician may want to reconsider whether they want embryos that appear to have cleavage arrest to be discarded as is usually done or consider ET. One caveat is that one of three pregnancies resulted in a trisomy. It is not clear whether this was fortuitous or whether it is possible that embryos with cleavage arrest have a greater chance of aneuploidy. The couple needs to consider this in their decision as to whether to transfer them or not.

SUPPORT: None.

P-13

Changing Protocol to All Day 5 Embryo Transfers Regardless of Number of Embryos Available on Day 3 Increases Implantation Rate and Reduces the Number of Embryos Transferred. A. Coates, C. Pospisil, R. Matthews, R.K. Matteri. Oregon Reproductive Medicine, Oregon.

BACKGROUND: ET is traditionally performed on either day 3 or day 5 depending on the availability of embryos for transfer. When a large cohort of embryos is available, day 5 ET allows for better embryo selection based on blastocyst morphological criteria. However, when few embryos are available, the decision becomes whether to put back all good-quality embryos on day 3 or wait until day 5 to transfer embryos that form a blastocyst.

OBJECTIVE(S): To determine whether the pregnancy rate would improve in patients of poorer prognosis, those with fewer than four embryos, if all embryos were grown to day 5.

MATERIALS AND METHOD(S): Before 2008, patients undergoing an autologous IVF cycle who had 3 or fewer good-quality embryos (8 cells of grade 1 or 2) available on day 3 had embryos transferred on day 3. If there were four or more good-quality embryos available on day 3, embryos were grown to day 5. After 2008, all embryos were grown to day 5 regardless of number available on day 3.

Ninety-six cycles in 2008 that would have previously met day 3 ET criteria but were grown to day 5 using the new protocol were compared with 71 cycles in 2007 with day 3 ETs. Patients were separated into two age groups (≤35 and 36–40). Data for 2007 and 2008 were retrospectively analyzed for mean number of embryos transferred, clinical pregnancy rate, implantation rate (presence of fetal heart), and the number of cycles cancelled owing to failure to grow to day 5.

RESULT(S): Significantly more embryos were transferred in 2007 in both patient age groups compared with in 2008. Pregnancy rates were increased in 2008 for all patients, although this was not statistically significant. Implantation rates were significantly improved in poorer prognosis patients regardless of age when all embryos were transferred on day 5. Cancellation rates were not significant between groups.

CONCLUSION(S): Implantation rates increased when embryos were transferred on day 5 in patients with poorer prognosis. This may be due to more favorable uterine conditions and decreased uterine contractility. Using day 5 ET for all patients would be ideal in a program that has a good blastocyst growth rate to increase the implantation rate in poorer prognosis patients and decrease the number of embryos transferred to limit the incidence of high-order multiples.

SUPPORT: None.

TABLE.

Age	2007	2008
<35 Years old:		
No. of ETs	35	57
Cancellations	1	1
Mean embryos transferred	2.9[a]	2.0[a]
Clinical ongoing %	48.5	61.5
Implantation rate, % FHB	23[b]	44.2[b]
36–40 Years old:		
No. of ETs	36	39
Cancellations	1	5
Mean embryos transferred	2.9	2.2
Clinical ongoing %	27.8	41
Implantation rate, % FHB	9.5[b]	27.1[b]

[a] .
[b] P<.001.

P-14

Prevalence of Intermediate and High-Normal FMR1 Cytosine/Guanine/Guanine (CGG) Repeats Among Fertile Women. C.B. Coulam R.S. Jeyendran. Andrology Laboratory Services and Millenova Immunology Laboratories, Chicago, Illinois.

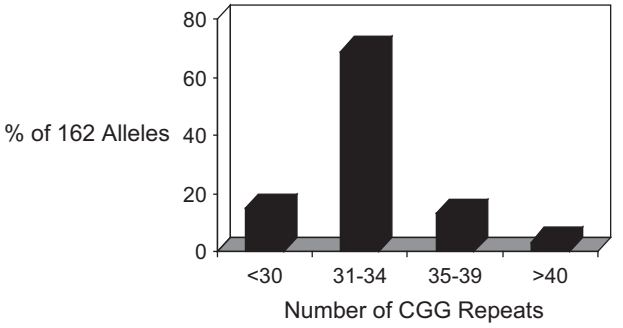
BACKGROUND: Studies attempting to precisely define the range of the number of CGG repeats on the FMR1 (fragile X) gene that correlate with infertility associated with ovarian dysfunction are limited by the absence of comparison with fertile control data.

OBJECTIVE(S): To evaluate the number of CGG repeats of the FMR1 gene among fertile women.

MATERIALS AND METHOD(S): Eighty-one women conceiving one to 10 children within 1 year of trying had buccal swabs taken. DNA was extracted using the Qiagen DNA mini kit. Analysis of fragile X was performed as follows: a 3.0-μL DNA sample was amplified by polymerase chain reaction (PCR) amplification in 20 μL volumes containing 13 μL high GC PCR buffer, 0.8 μL fragile X primers, 1.2 μL TR PCR enzyme mix, and 2.0 μL DNase/RNase free water. The number of CGG repeats was determined on a silver stained sequencing gel (6% acrylamide gel containing 7 M urea).

RESULT(S): The frequency of CGG repeats among fertile women was as follows:

CONCLUSION(S): The mean $\pm$ the 95th percent confidence interval (CI) percentile for the number of CGG repeats among fertile women is 32.3 (95% CI, 31.7–32.8).



P-15

Is it Possible to Distinguish a Difference in Response Between 200 U and 225 U of Follistim AQ Cartridges in Young Women Undergoing In Vitro Fertilization? The Follistim AQ Study Group: M. Feinman, M. Jacobs, K. Doody, L. Barmat, and J. Stelling.

BACKGROUND: When the Follistim AQ Cartridge was first introduced, its original manufacturer, Organon, produced pharmacokinetic data to show that their pen device was 18% more efficient at delivering the FSH than at delivering conventional reconstituted lyophilized powder.

OBJECTIVE(S): To see whether such small differences in dose could produce a clinically detectable difference in response.

MATERIALS AND METHOD(S): Institutional Review Board approval was obtained for this study. The study was designed as a multicenter, prospective, nonblinded, randomized, controlled trial, multicenter trial. One hundred two women under age 35 with FSH $<$10 and body mass index $<$30 underwent IVF treatment in five centers. Intracytoplasmic sperm injection was used when appropriate for male factor or medical history. The physicians were given the choice of performing day 3 or day 5 transfers, with an intent to transfer two or fewer embryos, unless medically indicated, but in both cases, a maximum of two embryos were transferred. All women received a 2–3 weeks of oral contraceptives before gonadotropin initiation. On the fifth pill-free day, women were assigned to begin daily injections of 200 IU (group A) or 225 IU (group B) of Follistim AQ, using the pen device. Daily doses of Ganirelix were commenced when the lead follicles were 14 mm. Women were given 5–10,000 IU of hCG when two follicles measured 18 mm. Ovum pickup was performed 35 hours after hCG. P supplementation was left to the discretion of the physicians. Peak E_2 levels, egg numbers, and pregnancy rates were compared in both groups. Statistical significance was evaluated with one-way analysis of variance.

RESULT(S): Fifty-one women from each group completed treatment. Peak serum E_2 levels were similar (group A, 1892 $\pm$ 863 pg/mL; group B, 2311 $\pm$ 1466 pg/mL, NS, P=.087), as was egg number retrieved (group A, 19 $\pm$ 9 eggs; group B, 18.4 $\pm$ 9 eggs, NS, P=.78). Clinical pregnancy rates were also similar in both groups (group A = 42%, group B = 41%, NS, P=.934). One woman in group A was hospitalized for severe ovarian hyperstimulation syndrome.

CONCLUSION(S): While pharmacokinetic data show Follistim AQ to be 18% more efficient compared with vial forms of FSH, we could not detect a difference in clinical response using slightly different doses of the hormone. However, our results suggest that young, good-prognosis patients undergoing IVF can successfully use 200 IU of Follistim AQ at a considerable financial savings.

SUPPORT: This investigator-initiated study was supported by Schering Plough, Corp.

P-16

The Role of Ovarian Mechanical Rigidity and Extracellular Matrix in Polycystic Ovary Syndrome and Obesity. J. Hirshfeld-Cytron,[a,b] T. Wellington,[a,b] J. Jozefik,[a,b] L. Shea,[c] T. Woodruff T.[a,b] [a]Department of Obstetrics and Gynecology, Feinberg School of Medicine, Northwestern University, Chicago; and [b]Center for Reproductive Science and [c]Department of Chemical and Biological Engineering, Northwestern University, Evanston, Illinois.

BACKGROUND: Polycystic ovary syndrome (PCOS) is the most common endocrinopathy of reproductive-age women. It has long been debated whether the ovarian dysfunction is intrinsic to the ovary or due to abnormalities of the hypothalamic-pituitary axis. The role of the extracellular matrix and ovarian stroma has received less attention. In our three-dimensional in vitro follicle maturation system using a mechanically rigid microenvironment, the androgen predominating hormone profiles and growth patterns of the secondary follicles phenocopy PCOS patients.

OBJECTIVE(S): To evaluate PCOS and normal control ovaries from archived surgical tissues for the presence of the most abundant extracellular matrix proteins: collagen, laminin, and fibronectin. We also determined whether age or obesity impact the ovarian physical rigidity or stromal protein in a mouse model.

MATERIALS AND METHOD(S): Ovarian tissue specimens from 13 PCOS patients, body mass index (BMI) 38.5 $\pm$ 3.3 kg/m^2, were used. Nine healthy, eumenorrheic subjects, BMI 34.2 $\pm$ 3.0 kg/m^2, were used as controls. Tissues were evaluated by Masson-Trichrome and immunostaining. We further evaluated adult mice from three time points (days 49, 100, and 270) and a diet-induced obese cohort at 100 days. A difference in mouse stromal tissue rigidity was qualitatively noted with increased rigidity at the oldest and obese cohorts. This was quantified by ranking whole ovary rigidity on a scale and protein analysis of an ovarian stromal marker, vimentin, by western blot.

RESULT(S): Laminin staining was greater in normal controls than in PCOS subjects, predominately staining on the cells lining the follicular cysts. The ovaries of the lean PCOS subjects (n = 3) exhibited staining intensity greater or equal to control ovaries. Fibronectin PCOS staining was also most like controls in the leanest PCOS subjects. Collagen staining was more robust in the PCOS cohort as it was most prominent in atretic follicles and the enlarged cortical capsule. The oldest and obese mouse cohorts scored the highest rigidity index. Vimentin protein analysis was statistically higher in the oldest, with a trend seen in the obese when both were compared with the younger, leaner animals.

CONCLUSION(S): The connection of the physical environment of tissue to function is increasingly being demonstrated in disease processes. The extension of this concept to the ovary has been demonstrated in vitro and is now being supported by differing PCOS extracellular matrix composition and increased stroma and physical rigidity of mouse tissue in older and obese cohorts.

SUPPORT: National Institutes of Health/National Institute of Child Health and Human Development grant no. U54 HD041857 and the Oncofertility Consortium grant nos. UL1DE019587 and RL1HD058295.

P-17

First Clinical Application of DNA Microarrays for Translocations and Inversions. D.S. Johnson, M. Hill, M. Abae, J. Frederick, M. Swanson, M. Rabinowitz.

BACKGROUND: Balanced chromosomal translocations and inversions are a common source of infertility because chromosomal segregation and/or recombination can result in lethal genetic disease in offspring. To detect unbalanced structural abnormalities and therefore avoid transfer of nonviable embryos, IVF physicians rely on fluorescent in situ hybridization (FISH) for preimplantation genetic diagnosis (PGD). New molecular methods, such as DNA microarrays, might improve these types of analysis. We previously developed and validated methods for DNA microarray-based aneuploidy screening that are compatible with day 5 transfer.

OBJECTIVE(S): To apply an extension of these methods to help infertile patients harboring balanced translocations or inversions.

MATERIALS AND METHOD(S): We performed preclinical experiments using amplified single cells applied to DNA microarrays to show that we could diagnose deletions at a resolution of approximately 5 megabases and duplications at a resolution of approximately 20 megabases. We then identified three families at risk of conferring unbalanced chromosome abnormalities to their offspring. Single blastomere biopsies were performed at day 3 postfertilization, amplified, and applied to DNA microarrays. The information was then used to make transfer decisions on day 5.

RESULT(S): In the first family, the mother carried a balanced pericentric inversion of chromosome 20 [46,XXinv(20)(p12q11.2)]. Out of six biopsied

embryos, we identified one euploid embryo and one embryo with a deletion on the p arm of chromosome 20 and duplication on the q arm of chromosome 20, consistent with expectations given the mother's lesion. The euploid embryo was transferred but failed to implant. In the second family, the mother carried a balanced inversion on chromosome 3 [46,XXinv(3)(p13q29)]. Out of eight biopsied embryos, we identified no euploid embryos and no embryos carried an unbalanced translocation of chromosome 3. No embryos were transferred. In the third family, the father carried a balanced translocation of chromosomes 8 and 10 [46,XY t(8;10)(q22.1;q23.2)]. Out of 10 embryos, none were euploid and five harbored paternal unbalanced translocations consistent with expectations given the father's unbalanced translocation. No embryos were transferred. The diagnoses of some embryos were confirmed at the blastocyst stage.

CONCLUSION(S): We have successfully used DNA microarrays to detect unbalanced chromosome structural abnormalities in single-blastomere biopsies.

SUPPORT: This work was partially funded by grant no. 2R44HD054958 from the United States National Institute of Child Health and Human Development.

P-18

Cabergoline and Ganirelix Therapy for Early Moderate to Severe Ovarian Hyperstimulation Syndrome (OHSS) Results in Faster Recovery than in Early Untreated OHSS. Z. Khan, N. Rollene, M. Amols, R. Gada, C. Coddington. Mayo Clinic Division of Reproductive Endocrinology, Rochester, Minnesota.

OBJECTIVE(S): To determine whether early-onset OHSS patients treated with cabergoline and ganirelix have more rapid symptom improvement and require less urgent care when compared with those with untreated early OHSS.

DESIGN: Retrospective cohort study.

MATERIALS AND METHOD(S): Consecutive patients with moderate to severe early OHSS between retrieval and ET from August 2008 until the present were included (n = 6). Early OHSS was defined as the development of symptoms presenting within 10 days from βhCG injection. All embryos were frozen, and patients received cabergoline 0.5 mg daily for 7 days and ganirelix 250 μg daily for 2 days. Day 0 was defined as the first day of treatment. Serial weights, number of urgent visits, and days of hospitalization were recorded. Controls were historical patients (n = 11) diagnosed with early-onset OHSS before initiation of the cabergoline/ganirelix protocol. Potential controls were excluded if no serial weights were documented in the medical record. Day 0 was defined as the date of diagnosis. The groups were compared using the Wilcoxon rank-sum test.

RESULT(S): The results are presented in the table.

CONCLUSION(S): This is the first report comparing patients treated with cabergoline and ganirelix in early-onset OHSS with early OHSS patients who did not receive therapy. Treated patients had more rapid weight loss at each time point, fewer unscheduled visits, and no hospital admissions. This protocol may represent a rapid and cost-effective outpatient therapy for patients diagnosed with moderate to severe early-onset OHSS.

SUPPORT: None.

TABLE.

	Treatment, median (25%, 75%)	Control, median (25%, 75%)	*P*
Age	27.0 (25.3, 33.0)	32.0 (29.0, 34.0)	.13
Body mass index	23.3 (19.9, 24.8)	20.8 (20.4, 21.2)	.51
FSH units used	4125 (1663, 4425)	1500 (1200, 1875)	.04[a]
Peak E_2, pg/dL	6430 (5065, 8970)	3335 (2481, 3890)	.003[a]
Follicles at retrieval	53.5 (49.3, 55.5)	35.5 (30.8, 44.8)	.03[a]
Oocytes	30.5 (18.0, 40.0)	25.0 (17.0, 31.0)	.56
Weight change at day 2, kg	−0.7 (−0.9, −0.5)	+1.8 (+0.9, +2.8)	.003[a]
Weight change at day 4, kg	−1.4 (−1.8, −1.4)	+0.7 (+0.5, +1.4)	.004[a]
Weight change at day 7, kg	−2.7 (−3.1, −1.8)	−0.4 (−0.9, +1.6)	.03[a]
Unscheduled visits	0.0 (0.0, 0.3)	2.0 (1.0, 3.0)	.001[a]
No. of days of hospitalization	0.0 (0.0, 0.0)	6.0 (5.0, 11.0)	< .001[a]

[a].

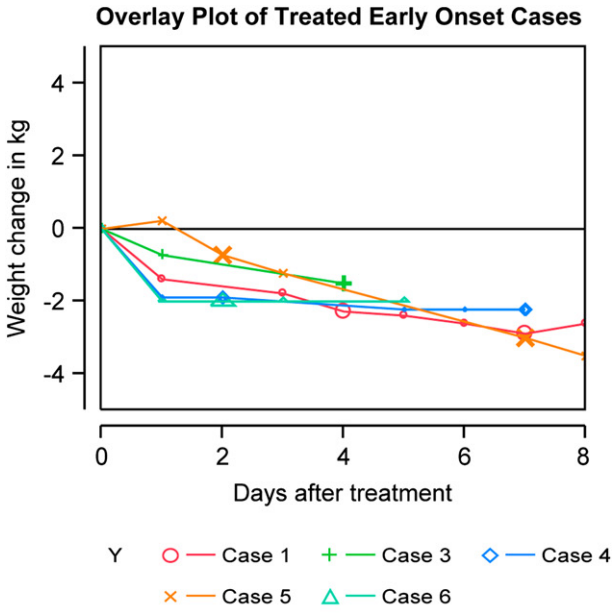
P-19

A Comparison of Blastocyst Slow Freeze and Vitrification in Frozen Blastocyst Transfer. C. Khoury, J. Frederick, B. Behr, D. Potter. Huntington Reproductive Center, Laguna Hills, California.

OBJECTIVE(S): To evaluate the blastocyst vitrification technique and the slow freezing technique with regard to survival rate and clinical pregnancy rate.

DESIGN: Retrospective clinical study of frozen blastocyst transfer (FBT) cycle outcomes comparing slow freeze and vitrification.

MATERIALS AND METHOD(S): We performed 120 cycles of FBT between January 2005 and October 2008. Before March 2007, blastocysts



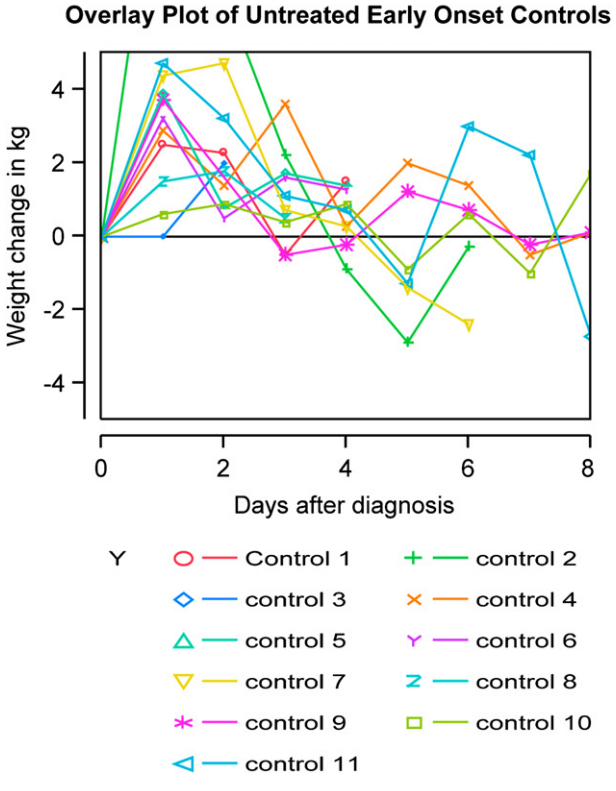


TABLE.

Age, years	Group	No. of cycles	No. of cycles transferred	% No transfer	Clinical pregnancy rate, %	Survival rate, %	Average no./FBT
35.7	A, slow freezing of blastocysts	100	93	7%	35 (33/93)	71 (237/335)	2.51
35.9	B, vitrification of blastocysts	20	20	0%	45 (9/20)	92 (54/59)	2.45

were frozen using a freeze control Cryo bath and Irvine Scientific blastocyst freezing media. From March 2007, all blastocysts were vitrified using the Irvine Scientific Cryo Tip closed system.

Blastocysts were cultured in SAGE blast media before transfer. Blastocyst transfers were performed in hormone replacement cycles. All transfers were performed under standard conditions using ultrasound guidance.

RESULT(S): There was no significant difference between the group receiving slow freezing blast and those receiving blast virtification for the number transferred ($\chi^2 = 0.48$, P=.49) and pregnancy rate ($\chi^2 = 0.29$, P=.59). However, there was a significant difference in %NT ($\chi^2 = 5.32$, P=.02) and survival rate between the two groups ($\chi^2 = 10.17$, P=.001). The group receiving blast vitrification had a higher proportion of transfer and survival.

CONCLUSION(S): Vitrification with the cryo tip is an efficient, fast, simple procedure for freezing blastocysts. These results indicate that vitrification of human blastocysts provides a safe and viable alternative to current slow freezing protocols. This study shows that the Cryo Tip vitrification method provides a better survival rate that should result in a better clinical outcome. Vitrification of blastocysts is our standard protocol for cryopreservation.

P-20

Preimplantation Genetic Screening (PGS) for Aneuploidy Using 24 Chromosome Parental Support Technology. C. Khoury, B. Behr, J. Frederick, D. Potter. Huntington Reproductive Center, Laguna Hills, California.

OBJECTIVE(S): To report our experience of PGS with Gene Security Network (GSN) parental support over a 1-year period performed at Huntington Reproductive Center Fertility, Laguna Hills. Parental support is a bioinformatic technology developed by GSN that uses genetic data from the parents as a reference for Illumina microarray results on the embryo to detect aneuploidy across 24 chromosomes (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, X,Y) with 99% or greater reliability for at least 85% of all chromosomes tested.

DESIGN: A retrospective analysis of PGS cycles with GSN parental support for aneuploidy testing.

MATERIALS AND METHOD(S): PGS for aneuploidy testing on 314 cleaving embryos from 35 initiated cycled using GSN's parental support technology. Single blastomeres with an intact nucleus were biopsied on day 3 using a laser, the 1.48-micron Infrared diode Zilos (Hamilton Biosciences Research, Beverly, MA). The mean maternal age was 37.1 ± 3.6 years. One blastomere per embryo was isolated. No fixing of the nucleus in the IVF lab was required. Each blastomere was placed in 5 μL of washing buffer in a clear conical tube and repeated for as many blastomeres per patient. The tube rack was transferred to −15°C to −25°C for 1 hour and thereafter was delivered with dry ice to GSN.

RESULT(S): Thirty-one percent (93/300) of embryos were euploid. Sixty-one blastocysts were transferred in 34 biopsied transferred cycles. Thirteen blastocysts were frozen for future use. Sixty-nine percent (207/300) of embryos had aneuploidy results. Four percent (14/314) of embryos were not diagnosed owing to poor embryo quality. No transfer occurred on one couple owing to chromosome abnormality in all embryos analyzed. An average of 1.8 ± 0.7 blastocysts were transferred per ET. Fourteen of 34 patients became pregnant, with a clinical pregnancy rate of 41%.

CONCLUSION(S): With a full karyotype we had 69% of embryos that had some aneuploidy detected, with a low no result rate (4%) and a very good pregnancy rate of 41% after PGS. Before routine application of PGS can be recommended, more data are needed to confirm the outcome.

TABLE.

Mean age	No. of embryos tested	Aneuploidy rate	Incomplete or no results	Clinical pregnancy rate/ET
37.1 ±3.6	314	207/300 = 69%	14/314 = 4 %	14/34 = 41%

P-21

Ovarian Tissue Cryopreservation: Expanding The Fertility Preservation Options for Female Cancer Patients. L.A. Kondapalli,[a] M. Prewitt,[a] T.K. Woodruff,[b] C.R. Gracia.[a] [a]Division of Reproductive Endocrinology and Infertility, University of Pennsylvania, Philadelphia, Pennsylvania; and [b]Department of Obstetrics and Gynecology, Northwestern University, Chicago, Illinois.

BACKGROUND: Long-term survivorship issues are emerging as the number of cancer survivors increases. Recent developments in techniques to preserve female fertility after cancer treatment have improved the outlook for patients facing premature infertility due to cancer therapies. While embryo and oocyte cryopreservation are established approaches to fertility preservation, cryopreservation of ovarian tissue is a promising option that precludes the need for ovarian stimulation and a sperm source.

OBJECTIVE(S): To report our initial experience with ovarian tissue cryopreservation at our large academic reproductive center.

MATERIALS AND METHOD(S): In this retrospective analysis, data were reviewed from women presenting to the oncofertility program at the University of Pennsylvania. Ovarian tissue cryopreservation was offered as an Institutional Review Board–approved experimental protocol to cancer patients ages 18–42 as part of the Oncofertility Consortium clinical initiatives. Variables included in the analysis were patient age, cancer diagnosis, history of cancer treatment, previous menstrual and fertility history, serum endocrine values of ovarian reserve, and antral follicle counts at the time of initial consultation.

RESULT(S): After comprehensive consultation and discussion of fertility preservation options, completion of informed consent, coordination of care with oncology, and all preoperative screening, five patients elected ovarian tissue cryopreservation. The average age of patients was 27.9 and ranged from 18.6 to 36.4 years. All patients reported regular menstrual cycles, and two patients had previous pregnancies. Of the four patients in the follicular phase, the average serum FSH was 7.9, ranging from 1.0 to 12.1 mIU/mL, with an average of 11 antral follicles, ranging from three to 31. Although laparoscopic approach was used on all patients, two patients selected complete oophorectomy, while three underwent ovarian biopsies only. Further characteristics are outlined in the table 1.

CONCLUSION(S): As cancer survivorship increases, the preservation of fertility in women has become an increasingly relevant unmet need. While embryo cryopreservation is the only established method used to preserve fertility, many alternative techniques are currently being developed. Ovarian tissue cryopreservation with subsequent transplantation or in vitro follicle maturation offers a new strategy for fertility preservation.

SUPPORT: This work was supported by the Oncofertility Consortium, an interdisciplinary team funded through RL HD058296.

TABLE. Baseline characteristics of patients electing ovarian tissue cryopreservation at the University of Pennsylvania.

Patient	Age	Cancer diagnosis	FSH, mIU/mL	E_2, pg/mL	Ovarian volume, mm^3	Total AFC	Specimen
A[a]	25.9	Acute lymphoblastic leukemia[b]	1.0	2.7	7934	3	Ovary
B[a]	32.3	Hodgkin's lymphoma[b]	12.1	45.7	1732	4	Biopsy
C	26.4	Breast cancer	9.6	50.7	9744	6	Biopsy
D	36.4	Breast cancer	8.8	19.9	6631	31	Ovary
E	18.6	Ewing's sarcoma	147.9	1.7	6257	31	Biopsy
Mean	27.9		35.9	24.1	6460	15	

[a] Patient underwent embryo cryopreservation as well.
[b] Previous chemotherapy.

P-22

Ongoing Pregnancy Rates with Daily Recombinant Follicle-Stimulating Hormone/Gonadotropin-Releasing Hormone Antagonist Protocol in a Large North American Cohort of In Vitro Fertilization/Intracytoplasmic Sperm Injection Patients by Day of Embryo Transfer. A. Lifchez,[a] Z.P. Nagy,[b] H. Witjes,[c] B. Mannaerts,[c] K. Gordon,[d] M. Mahony.[d] on behalf of the Engage investigators [a]Fertility Centers of Illinois, SC, Chicago, Illinois; [b]Reproductive Biology Associates, Atlanta, Georgia; [c]Schering-Plough Research Institute, Schering-Plough, a Division of Merck & Co., Oss, The Netherlands; and [d]Schering-Plough, a Division of Merck & Co., Kenilworth, New Jersey.

BACKGROUND: The reference arm of a recent, randomized, double-blind, clinical trial (Engage) included a large cohort of patients from North American (NA) sites. Patients randomized to this reference arm were treated with a standardized rFSH/GnRH antagonist protocol but could have a day 3 or day 5 ET with one or two embryos transferred.

OBJECTIVE(S): To evaluate efficiency outcomes related to ET options for the NA cohort.

MATERIALS AND METHOD(S): On day 2–3 of menses, 403 patients began treatment with once-daily rFSH 200 IU follitropin beta (Follistim AQ Cartridge/Puregon, NV Organon, The Netherlands) SC, followed by daily rFSH (maximum 200 IU) from stimulation day 8 onward. All patients received 0.25 mg ganirelix (Ganirelix Acetate, NV Organon) from stimulation day 5 onward until the criterion for oocyte induction (three follicles $\geq$17 mm) with urinary hCG (Pregnyl, NV Organon) was met. Ongoing pregnancy rate (PR) was assessed $\geq$10 weeks after single ET (SET) or double ET (DET).

TABLE.

Day of ET	Ongoing PR	Singleton rate	No. of embryos transferred	Ongoing PR	Pregnancy type	Singleton rate[a]
Day 3 (n = 186)	44.6 (n = 83)	72.3 (n = 60)	SET (n = 24)	20.8 (n = 5)	Singleton	100 (n = 5)
			DET (n = 162)	48.1 (n = 78)	Singleton	70.5 (n = 55)
					Twin	29.4 (n = 23)
Day 5 (n = 188)	53.2 (n = 100)	70.0 (n = 70)	SET (n = 17)	52.9 (n = 9)	Singleton	100 (n = 9)
			DET (n = 171)	53.2 (n = 91)	Singleton	67.0 (n = 61)
					Twin	33.0 (n = 30)

[a] Singleton rate significantly increased in SET compared with DET (day 3 + day 5 ETs, P=.01).

RESULT(S): Mean age, weight, and body mass index were 31.7 years, 68.1 kg, and 25 kg/m^2, respectively. A total of 399 (99.0%) patients had an oocyte retrieval, and 380 (94.3%) had an ET; 48.9% had day 3 ETs, and 49.5% had day 5 ETs. The majority of patients (88.9%) had a DET. The mean ($\pm$SD) number of oocytes obtained per attempt was 13.3 ($\pm$7.5), yielding 7.8 ($\pm$5.0) embryos and 5.2 ($\pm$4.4) good-quality embryos. On both day 3 and day 5, 1.9 (0.3) embryos and 1.5 (0.7) good-quality embryos were transferred. For the intent-to-treat group, ongoing PR per attempt was 45.7% and multiple PR was 28.8%, with 48.6% of patients having embryos cryopreserved. PRs for day 5 compared with day 3 were numerically increased (53.2% vs. 44.6%, respectively). The mean number ($\pm$SD) of embryos cryopreserved on day 3 (4.4 [SD $\pm$3.6]) was slightly higher than on day 5–6 (3.1 [$\pm$2.1]). The table presents the ongoing PRs and multiple PRs for day 3 and day 5 ETs after SET or DET.

CONCLUSION(S): Ongoing PRs and the number of cryopreserved embryos available for a subsequent thawed ET were high for patients treated with a simplified rFSH/GnRH antagonist protocol. SETs (day 3 and day 5) significantly reduced the twinning risk in comparison with DETs with no difference in PRs when ET was performed at the blastocyst stage (day 5), suggesting that day 5 eSET may be an efficient and safe strategy in this patient population.

KEY WORDS: Follitropin beta, rFSH, ongoing pregnancy rate, embryo transfer, cryopreservation, oocytes.

SUPPORT: Financial support for this study was provided by Schering-Plough, a Division of Merck & Co.

P-23

The Reproductive Impact of a "Normal Variant" Parental Karyotype. M. Luna,[a,b] G. Vela,[a,b] E. Flisser,[a] A.B. Copperman,[a,b] L. Grunfeld,[a,b] B. Sandler.[a,b] [a]Reproductive Medicine Associates of New York; and [b]Department of Obstetrics and Gynecology and Reproductive Science, Mount Sinai School of Medicine, New York, New York.

BACKGROUND: Morphologic chromosome variants are quite common, but the clinical significance of "minor" or "normal" cytogenetic polymorphisms in reproduction is controversial. Although some investigators have associated karyotypic heteromorphisms with fetal loss, others have failed to observe any consistent correlation with reproductive potential.

TABLE.

	Male affected, n = 22	Female affected, n = 17	P
Mean oocyte age	33.3 $\pm$ 3.0	36.3 $\pm$ 4.6	.02
Mean oocytes retrieved	14 $\pm$ 6.3	17.1 $\pm$ 11.6	.31
Fertilization, 2 pronuclei/ retrieved oocytes (%)	158/295 (53.6)	166/290 (57.2)	.42
Mean no. of embryos transferred	2.7 $\pm$ 0.9	3.1 $\pm$ 1.2	.20
Implantation rate (%)	13/45 (28.9)	15/53 (28.3)	.87
Clinical pregnancy per ET (%)	9/17 (52.9)	9/17 (52.9)	.73
Loss rate (%)	1/9 (11.1)	2/9 (22.2)	1.0
Cancellation rate (%)	5/22 (29.4)	0/17	.10

OBJECTIVE(S): To describe the IVF outcomes of infertile couples with normal variant karyotypes.

DESIGN: Retrospective analysis.

MATERIALS AND METHOD(S): All couples in which one partner had a normal variant karyotype who underwent IVF cycles from April 2003 to February 2009 were included. A normal variant included the after cytogenetic polymorphisms: the presence of a marker chromosome, inversion of chromosome 9 or chromosome Y, <5% mosaicism of analyzed cells, or the presence of heterochromatic blocks. Couples were classified according to the gender of the partner diagnosed with the chromosomal variant. Mean oocyte age, number of retrieved oocytes, fertilization rates, mean number of transferred embryos, implantation rate, clinical pregnancy rate, and spontaneous loss rates were analyzed by t-test and χ^2 analysis using Analyze It.

RESULT(S): Twenty-four couples were identified (12 variant males and 12 variant females) who underwent 39 IVF cycles. In the male group, 22 cycles were completed, including two oocyte donation cycles. In the female group, 17 cycles were performed, all with autologous oocytes. Variant karyotypes were (male:female): marker chromosome present (3:1), chromosome 9 inversion (3:1), mosaicism (2:8), and heterochromatic blockage (4:2). Indications for undergoing IVF included idiopathic (2:3), diminished ovarian reserve (3:3), ovulatory dysfunction (3:1), male factor (3:2), tubal factor (1:2), and recurrent pregnancy loss (0:1). The table demonstrates the results of both groups. No difference in outcome was noted for any parameter analyzed.

CONCLUSION(S): In our limited series, couples with normal variant karyotypes have satisfactory outcomes when undergoing IVF. There was no difference in response to ovarian stimulation or in the incidence of reproductive loss. Additionally, the outcome is not influenced by the gender of the carrier partner.

SUPPORT: None.

P-24

A Significantly Elevated First β Human Chorionic Gonadotropin Level in the Presence of a Singleton Gestation Does: No Reason to Worry. M. Luna,[a,b] G. Vela,[a,b] B. Sandler,[a,b] F. Arredondo,[c] L. Grunfeld,[a,b] A.B. Copperman.[a,b] [a]Reproductive Medicine Associates of New York; [b]Department of Obstetrics and Gynecology and Reproductive Science, Mount Sinai School of Medicine, New York, New York; and [c]Reproductive Medicine Associates of Texas, San Antonio, Texas.

BACKGROUND: Improved sensitivity and specificity of immunoassays for βhCG have made this a powerful diagnostic aid applicable to several clinical disorders of pregnancy. Low early levels of βhCG or abnormal doubling time is unequivocally associated with a higher incidence of spontaneous abortion. Abnormally elevated levels of βhCG have been associated with multiple gestation, molar gestation, and specific ovarian or gestational malignancies.

OBJECTIVE(S): To describe pregnancy outcomes of patients who underwent IVF and present with βhCG levels more than 2 SD above the mean for singleton gestations.

DESIGN: Retrospective data analysis.

MATERIALS AND METHOD(S): Our IVF database was searched to identify all IVF pregnancies in which the first βhCG determination was performed 14 days after oocyte retrieval. Results were tabulated, and a cutoff of 300 mUI/mL was identified to approximate levels 2 SD above the mean.

TABLE.

Delivered/ongoing pregnancies, n = 47		Losses, n = 5	
βhCG Day 14	βhCG Day 16	βhCG Day 14	βhCG Day 16
352.3 ± 69.8	447.4 ± 163.4	361.4 ± 37.2	293.8 ± 96.5

Follow-up βhCG levels 48 hours after the first test were recorded. All pregnancies that resulted in more than one implantation, determined by the number of gestational sacs seen 9 days after the βhCG test, were excluded from the study. Pregnancies resulting from frozen ETs and donor oocyte cases were included. Demographics of study population and pregnancy outcomes were recorded.

RESULT(S): A total of 52 pregnancies were identified with βhCG levels >300 mUI/L. Sixteen cases (30.8%) resulted from oocyte donation, six (11.5%) from frozen ETs, and the remaining 30 cases (57.7%) from fresh self IVF cycles. The mean oocyte age was 33.1 ± 5.8 years. Twenty-four cases (46.2%) resulted from blastocyst transfers, and 28 cases (53.8%) from cleavage-stage transfers. The mean number of embryos transferred was 2.6 ± 0.9. The first mean βhCG level was 351.9 ± 66 mIU/L, and the repeat βhCG was 785.2 ± 205.7 mIU/L. Forty-two pregnancies have successfully delivered, while five are ongoing. Of these, five cases had a repeat βhCG level that increased <80% from the first test. Five patients (9.6%) had a loss, four of which occurred before seeing the fetal heart and presented with less than doubling βhCG levels 48 hours after the first test. One pregnancy was lost at 9 weeks owing to monosomy X but presented with adequately rising βhCG levels. The table demonstrates the βhCG levels of each of the groups.

CONCLUSION(S): Based on our results, extremely elevated βhCG levels are not associated with an increased risk of a molar gestation or aneuploidy, as demonstrated by the low loss rate and high delivery/ongoing pregnancy rate of 90% in our study group. Even in this subset of patients with a first high βhCG level, failure of the βhCG level to double in 48 hours was an indicator of poor prognosis. It is possible that the five patients with an elevated first βhCG who did not double might have had a vanishing twin that was not sonographically visualized. Patients should be reassured that an initial elevated βhCG level appears to be associated with healthy trophoblastic activity and is not predictive of adverse outcome.

SUPPORT: None.

P-25

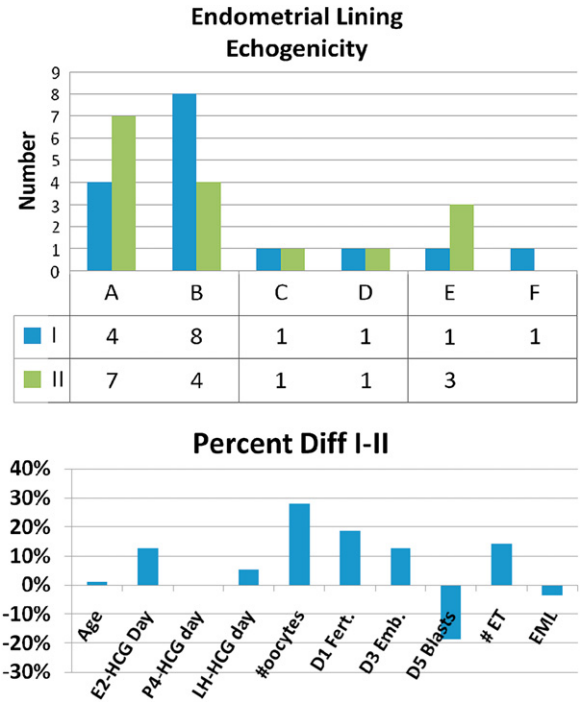
Impact of Follicle-Stimulating Hormone and Human Menopausal Gonadotropin Dosage Ratios on Echogenicity and Progesterone Concentrations in In Vitro Fertilization Patients. Paul C. Magarelli, M.D., Ph.D.,[a] Robert Kiltz, M.D.,[b] Drew Moffitt, M.D.,[c] Alan Decherney, M.D.[d] [a]Genesis Network for Reproductive Health, Irvine, California; [b]Reproductive Medicine and Fertility Center, Colorado Springs, Colorado; [c]CNY Fertility, Syracuse, New York; and [d]Arizona Reproductive Medicine, Phoenix, Arizona.

OBJECTIVE(S): To determine the impact of FSH and hMG dosage ratios on endometrial echogenicity (EE) and P (P4) concentrations in IVF patients.

DESIGN: Prospective, randomized, controlled pilot study.

PATIENT(S): The Genesis Network consists of 12 private and university-based reproductive endocrinology and infertility/IVF practices dedicated to advancing the science and application of advanced reproductive technologies. Participation was voluntary for each of the practices. Female patients between the ages of 34 and 42 years who have been designated eligible for IVF using their own eggs and who fulfill the additional inclusion criteria will be asked to participate in the study. All patients will be consented with an Institutional Review Board–approved form.

INTERVENTION(S): The study will consist of two experimental groups: patients who receive a 1:1 vial ratio of FSH:hMG throughout the stimulation cycle (1:1 group I) and those who begin ovarian stimulation with a ratio of at least 3:1 FSH:hMG (low-dose hMG group or group II). The FSH dose for the low-dose hMG group may be more than three vials if determined by individual patient necessity. Forty-one patients were enrolled and randomized. Inclusion criteria were as follows: body mass index ≤34 kg/m^2, basal FSH ≤12 IU/mL, male partner 18–60 years of age with viable sperm in the ejaculate or donor sperm, willingness to undergo intracytoplasmic sperm injection, and normal uterine cavity as assessed by HSS, hysterosalpingogram, and/or hysteroscopy within 1 year of enrollment.



MAIN OUTCOME MEASURE(S): EE and P4 levels on the day of hCG administration, duration of stimulation, peak E_2 levels, number of oocytes, and pregnancy outcomes.

RESULT(S): EE results were different between the two groups. The patients treated with the 1:1ratio (group I) had a preponderance of type B lining, and those in group II had type A lining. When both groups were compared, there were no statistically significant differences ($P<.05$) between age, E_2 on day of hCG, LH on day of hCG, P4 levels post-hCG, oocytes retrieved, day 1 fertilization, day 3 embryos transferred, blastocysts transferred, endometrial lining (EML) measurements, and positive pregnancy reported. There were trends toward higher E_2 levels in group I and higher numbers of oocytes in group I.

CONCLUSION(S): The ratio of FSH to hMG does not appear to significantly alter known outcomes for IVF: number of eggs retrieved, fertilized, or pregnancy outcomes. There did appear to be differences noted regarding type of EML, number of oocytes retrieved, and peak E_2 level. These data support the widely published EMBRACE I and II studies.

KEY WORDS: IVF, hMG, Bravelle, Menopur, urofollitropin, FSH, LH, hCG.

P-26

Clinical Application of a Novel Ovarian Reserve Test. Paul C. Magarelli, M.D., Ph.D. Reproductive Medicine and Fertility Center, Colorado Springs, Colorado.

OBJECTIVE: To determine the utility of the Ovarian Assessment Report (OAR), a novel ovarian reserve test, in a clinical setting.

Design: Retrospective clinical study.

SETTING: Reproductive endocrinology and infertility IVF private practice.

PATIENT(S): Two hundred seventy-nine infertile women undergoing basic evaluations for infertility and controlled ovarian hyperstimulation with gonadotropins and GnRH agonist and antagonist for IVF-ET.

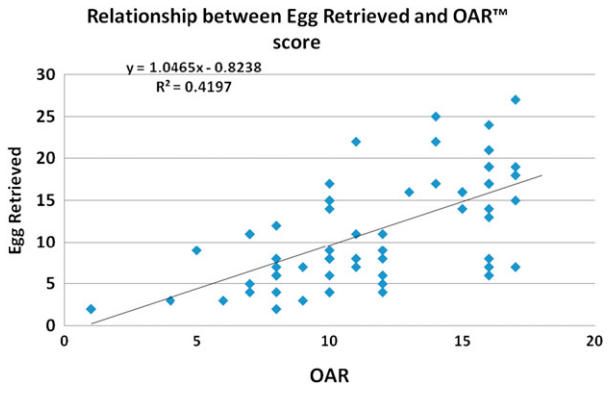
INTERVENTION(S): OAR labs were drawn on days 2–4 of the menstrual cycle during infertility evaluation and before and after IVF treatments.

MAIN OUTCOME MEASURE(S):Correlations among OAR and age, number of eggs retrieved, and embryos transferred were analyzed. Cycles were grouped according to those that achieved pregnancy versus those that did not.

RESULT(S): The assessment of ovarian reserve by OAR appears to be consistent with our basic understanding of ovarian physiology. The slope of the line representing the relationship with age and OAR scores is negative (−0.4). The R^2 was not significant given the low numbers and large variations in the patient population. When data were analyzed for a subset of the women

TABLE.

Demographics	OAR pregnant	OAR not pregnant	*P*, all not significant
Average age	32.0	32.5	.80
Average OAR score	11.64	11.39	.84
Average no. of eggs retrieved	12.4	10.3	.29
No. of ETs:			
Day 3 average	2.74	2.40	.35
Blastocyst average	2.00	2.00	1.00
Variations in OAR based on age			OAR SD
Women <35			2.18
Women ≥35			1.85



undergoing IVF, the groups were subdivided into those who achieved pregnancy and those who did not. Average age was similar, as were the stimulation protocols. OAR scores were not significantly different between the pregnant and nonpregnant groups ($P > .05$). There were no significant differences in number of eggs retrieved, day 3 embryos transferred, or blastocysts transferred. Numerically, more eggs were retrieved and more embryos transferred in the pregnant group. There was a trend for an OAR score to be lower than the numbers of eggs retrieved in the pregnant group and higher than the number of eggs retrieved in the nonpregnant group. Variations in OAR scores were more pronounced in the younger than in 35-year-old group versus the older group, although not statistically significantly different ($P > .05$).

CONCLUSIONS: The evaluation of ovarian reserve can be enhanced with the determination of an OAR score (which consists of a proprietary mathematical integration of FSH, LH, E_2, anti-Müllerian hormone, and inhibin). The clinical correlation within one's own reproductive endocrinology and infertility practice requires numbers greater than the current study provides. The study indicates that OAR can predict numbers of eggs retrieved but not pregnancy. It can be used clinically to augment the clinician's understanding of predictions of numerical outcomes and may provide a tool to modify treatment protocols. The observation that a variance in OAR score and eggs retrieved may predict outcomes is under further study.

KEY WORDS: IVF, ovarian assessment report, ovarian reserve testing, AMH, inhibin, FSH, LH

P-27

Successful Corifollitropin Alfa Treatment Resulting in 500 Live-Born Infants to Date. J. Oberyé,[a] D. Passier,[a] M. Mahony,[b] B. Mannaerts,[a] M. Bonduelle.[c] on behalf of all investigators participating in the Care pregnancy follow-up protocols [a]Schering-Plough Research Institute, Schering-Plough, a Division of Merck & Co., Oss, The Netherlands; [b]Schering-Plough, a Division of Merck & Co., Kenilworth, New Jersey; and [c]UZ Brussels, Brussels, Belgium.

BACKGROUND: Corifollitropin alfa is a new recombinant fertility hormone that is able to initiate and sustain follicular growth for an entire week and replaces seven daily injections of gonadotropins. Accordingly, this is a further improvement of the simplified, patient-centered GnRH antagonist regimen. The development program of corifollitropin alfa consisted of several trials that showed that the drug was safe and efficacious in terms of the number of oocytes obtained and ongoing pregnancy rates. As the ultimate goal of controlled ovarian stimulation (COS) for assisted reproductive technology (ART) is achieving a healthy baby, follow-up protocols have been conducted to assess that the newly developed infertility treatment is safe for pregnant women and their offspring.

MATERIALS AND METHOD(S): Information on women who became pregnant in one of six trials completed so far in the corifollitropin alfa development program has been collected through routine assessments. Safety in the offspring was assessed from medical examinations at birth and within 3 months thereafter. Any abnormalities were recorded as adverse events and subsequently adjudicated by an external medical expert as minor or major congenital malformations.

RESULT(S): In phase 2 feasibility and dose-finding trials, data were collected on 68 women who became pregnant after being treated with different dosages of corifollitropin alfa. Of these, 64 women gave birth to 76 live-born infants. In large controlled phase 3 trials that applied the optimal corifollitropin alfa doses of 100 and 150 μg for women weighing $\leq$60 kg and >60 kg, respectively, data were collected on 363 women pregnant after corifollitropin alfa treatment and compared with data on 331 women who became pregnant after rFSH (follitropin beta) treatment. Eventually, 332 women treated with corifollitropin alfa gave birth to 424 live-born babies. In the rFSH treatment group, there were 303 treated women with 370 live-born babies. Pregnancy complications and neonatal characteristics including weight, head circumference, and APGAR scores assessed at birth and follow-up were similar between treatment groups. Evaluation of the incidence of major congenital malformations revealed no difference between the treatment groups. In the controlled trials, major malformations were detected in 4.0% and 5.4% of live-born infants after their mothers were treated with corifollitropin alfa or rFSH, respectively (odds ratio, 0.73; 95% confidence interval, 0.38–1.42).

CONCLUSION(S): To date, 500 infants have been born after COS treatment for ART with corifollitropin alfa. The available pregnancy and neonatal follow-up data indicate that this new sustained follicle stimulant is safe for both mothers and their offspring.

SUPPORT: Financial support for this study was provided by Schering-Plough, a Division of Merck & Co.

P-28

The Prevalence of Cytomegalovirus Seropositivity is Lower in Women with a Female Partner. J.D. McCarthy, X. Xu, J. Swain, S. Fisseha. Department of Obstetrics and Gynecology, University of Michigan Medical Center, Ann Arbor, Michigan.

BACKGROUND: Cytomegalovirus (CMV) is the leading cause of congenital infection in the United States and is associated with long-term sequelae such as vision and hearing loss, mental retardation, and death. Primary CMV infection in the first half of pregnancy carries the greatest risk, and concerns with CMV arise in seronegative women who are exposed to seropositive semen. This may be of special concern in regard to therapeutic donor insemination (TDI).

OBJECTIVE(S): To determine whether the prevalence of immunoprotective CMV seropositivity is different in women undergoing TDI based on the gender of the woman's partner(s).

MATERIALS AND METHOD(S): A cohort of 83 women were identified who had gone through at least one cycle of TDI. CMV serum status was available for 44 of them. Data on these 44 women were used for analysis. Women were grouped according to the gender of their partner (female vs. male). For women with a current partner at the time of TDI, the reported gender of their partner was used to determine the group. Eight women reported not having a current partner at the time of TDI, of whom all had a history of only male partners based on their medical records. CMV status was categorized as IgG positive or negative. Fisher's exact tests and Student's *t*-tests were used to compare subject characteristics and serum status between groups.

RESULT(S): Women with a male partner (n = 25) had a CMV seropositivity rate of 40.0%, while among women with a female partner (n = 19) the rate was only 10.5% (P=.042). There was no difference in age or ethnicity between the two groups.

CONCLUSION(S): We demonstrate that women with female partners undergoing TDI have a lower prevalence of CMV seropositivity than women with male partners. This may be due to the fact that CMV can be spread through sexual contact particularly via semen. Further replication of our findings in other clinical settings is warranted to provide a clearer understanding of the prevalence of CMV seronegativity in the female same-sex couple population—and relatedly, their risk for CMV transmission in pregnancy after TDI using CMV seropositive semen. Further evaluation of the risk of CMV infection after TDI is necessary to enhance counseling for these couples.

SUPPORT: NIHLRP (JDM).

P-29

Quality Control of Incubator CO_2: Old-Fashioned Fyrite Versus Newfangled Electronic Analyzer. C. McDonald, Z. Haimowitz, E. Bensche, A. DeVenuta, C. Moyer, A. Copperman, J. Barritt.

BACKGROUND: Cell culture systems require vigilant attention to QC and QA. In clinical IVF, maintaining optimal culture conditions is required for production of high-quality embryos and for achieving a high pregnancy rate. While technological advances are highly sought after, embryologists are often cautious if not recalcitrant about altering standard procedures. As a result, existing and functioning methodologies do not easily lend themselves to change. During a 2-week period, we undertook an extensive analysis of our incubator CO_2 monitoring protocol and its effect on culture media pH by comparing our traditional fyrite instruments to a new certified/calibrated digital CO_2 analyzer.

DESIGN: Prospective equipment QC comparison.

MATERIALS AND METHOD(S): We measured CO_2 percent in 13 HERA cell 150 incubators using 2 liquid 0-7% CO_2 Fyrite Gas Analyzers (Bacharach) and a digital Bacharach 2820 CO_2 analyzer. Measurements replicated the lab's standard daily QC procedure but added duplicate back-to-back measurements with both the liquid fyrites and the digital instrument. Incubators were randomly grouped, and CO_2 calibrated to either the fyrite or digital analyzer (fyrite 5.5%, n = 5; digital 5.5%, n = 4; fyrite 6.0%, n = 2; digital 6.0%, n = 2). Using an Oakton pH series 10, we took daily pH measurements of Quinn's Cleavage (SAGE) and G2.5 (Vitrolife) after media had equilibrated ~18 hours. Results were analyzed using analysis of variance and *t*-test.

RESULT(S): CO_2 readings significantly differed between the fyrites (A vs. B) and the digital analyzer (see table). The digital analyzer consistently gave lower values for both 5.5% and 6.0% calibrated incubators compared with the fyrites. The electronic analyzer also displayed greater precision, showing less variability. All pH readings remained within manufacturer specifications, however, the differences in pH were consistent; that is, incubators calibrated with the digital analyzer resulted in a slightly decreased pH.

CONCLUSION(S): Measuring CO_2 levels by liquid fyrite has been a standard QC protocol in labs for years. Although the instrument is cumbersome and time-consuming to use, provides variable accuracy in results, and may be toxic to user and embryos, many labs are hesitant to switch techniques. In this study, a calibrated digital analyzer produced significantly lower CO_2 readings with higher precision in a shorter time period without toxic hazards. Subsequent incubator calibrations resulted in decreased media pH, although still within manufacturer specifications. In future studies we will continue monitoring with both liquid fyrite and the calibrated digital analyzer to assess overall lab success rates and clinical outcomes (fertilization, blastulation, and implantation).

TABLE.

Incubator CO_2% and calibration type	Liquid fyrite A, mean ± SD (range)	Liquid fyrite B, mean ± SD (range)	Digital analyzer, mean ± SD (range)	pH
5.5% by Liquid	5.71 ± 0.10[a] (5.61–5.81)	5.5 ± 0.19[a] (5.31–5.69)	4.91 ± 0.06[a] (4.85–4.97)	7.2b
5.5% by Digital	6.11 ± 0.10[c] (6.01–6.21)	5.98 ± 0.30[c] (5.68–6.28)	5.72 ± 0.07[c] (5.65–5.79)	7.16b
6.0% by Liquid	6.16 ± 0.09[d] (6.07–6.25)	5.98 ± 0.18[d] (5.80–6.16)	5.59 ± 0.16[d] (5.43–5.75)	7.26e
6.0% by Digital	6.45 ± 0.12 (6.33–6.57)	6.26 ± 0.28 (5.98–6.54)	6.10 ± 0.07 (6.03–6.17)	7.24e

[a,b,c,d,e]$P<.05$.

P-30

Development of a Fertility Preservation Program and First Year Experience at the University of Utah and the Utah Center for Reproductive Medicine. C. Milroy,[a] B. Emery,[b] M. Gibson,[a] C.M. Peterson,[a] A. Hammoud,[a] D. Carrell,[b,c] K. Jones.[a] [a]Department of Obstetrics and Gynecology, Division of REI, [b]Andrology and IVF Laboratories, Department of Surgery, Division of Urology, and [c]Department of Physiology, School of Medicine, University of Utah, Salt Lake City, Utah.

BACKGROUND: Gonadal toxicity with sterility/subfertility is one of the most devastating effects of cancer treatment. Many cancer patients report a desire for future offspring, however, the literature suggests that less than half of men and women will receive information about their reproductive potential and options after cancer treatment from their providers.

OBJECTIVE(S): To describe the implementation of a fertility preservation (FP) program and review the first year experience.

MATERIALS AND METHOD(S): The Utah FP program systematically provides educational materials and training to oncology staff, prompt dissemination of information to patients, expedited referrals, and advanced reproductive technology to cancer patients facing loss of fertility in the Intermountain West. FP databases were created to track patient referrals, demographics, and outcomes.

RESULT(S): Sixty-seven patients requested and received FP consults in 2009 (52 males, 16 females) in comparison with 58 patients in 2008 (54 males, 4 females). In 2009, the average age was 29.5 years (15–54 years) for males and 28.6 years (19–40 years) for females. All 52 men participated in sperm banking one to six (mean, 1.8) times before chemotherapy. Three patients had azoospermia, and 44% of male patients had results indicating significant sperm quality deficits that would require IVF with intracytoplasmic sperm injection (ICSI) in the future. The most common male cancers were testicular (n = 22), leukemia/lymphoma (n = 9), gastrointestinal (n = 5), and prostate (n = 5). Of 16 women accessing the FP program, 11 were childless. Six of the 16 women initiated a form of FP: two oocyte freezing, and four GnRH agonist therapy. Of the 10/16 women that failed to begin an FP program, six cited prohibitive costs, three cited time constraints of their cancer treatment, and one was ineligible owing to ovarian metastases. The most common cancer diagnoses in women seeking consultation were breast (n = 4), cervical (n = 4), and leukemia/lymphoma (n = 3).

CONCLUSION(S): The collaborative efforts of the Utah Center for Reproductive Medicine FP Program have provided cancer survivors with fertility aspirations options to therapy. A 300% increase in female FP consults was observed in the year after initiation of the FP program, whereas no increase in male consults was observed. Male cancer patients had a high rate of abnormal sperm concentrations and progressive motility counts that would require IVF with ICSI. Female cancer patients cited treatment costs and time constraints of their cancer treatment as significant barriers to initiating FP.

SUPPORT: Internal.

P-31

Cryopreserving Day 3 Embryos and Blastocysts Created from Donor Oocytes Results in a Reduced Number of Frozen Embryos Without Jeopardizing Pregnancy Rates. M. Pavone, J. Innes, R. Kazar, J. Zhang. Obstetrics and Gynecology, Northwestern University, Chicago, Illinois.

OBJECTIVE(S): To establish whether freezing embryos created from anonymous oocyte donors at the zygote, embryo (day 3), or blastocyst stage influences their thaw survival, maturation, and implantation rates.

DESIGN: We conducted a retrospective review examining embryos created from oocyte donors from 2002–2008 at the IVF Program at Northwestern University.

MATERIALS AND METHOD(S): Slow freezing with a controlled cooling rate was performed on all zygotes, day 3 embryos, and blastocysts. All patients had endometrial priming with estrogen and P. Zygotes and day 3 embryos were thawed 2 and 1 day, respectively, before transfer. Blastocysts were thawed and transferred on day 5. Survival rates refer to the number of zygotes, day 3 embryos, or blastocysts viable after thaw. Implantation was defined as observing fetal heart motion on ultrasound. Fisher's exact test was used for data analyses.

RESULT(S): The average age of oocyte donors was 25. A total of 290 zygotes, 513 day 3 embryos, and 47 blastocysts were frozen, thawed, and transferred from January 1, 2002, through January 1, 2009. The thaw survival rate was 91% for zygotes, 98% for day 3 embryos, and 98% for blastocysts. The percent of zygotes and day 3 embryos that developed after the thaw was 81% and 91%, respectively. The implantation rate per number thawed was 10% for zygotes, 12% for day 3 embryos, and 17% for blastocysts. The implantation rate per number transferred was 18% for zygotes, 17% for day 3 embryos, and 18% for blastocysts. Significantly more day 3 embryos survived the thaw and developed before transfer compared with zygotes. Significantly more zygotes needed to be thawed than day 3 embryos or blastocysts to yield equal numbers for transfer (Fisher's exact test, $P<.05$).

CONCLUSION(S): When egg quality is not a factor, it appears that growing embryos to day 3 or blastocyst stage results in an improved thaw survival rate without jeopardizing overall pregnancy rates. This practice will lead to fewer frozen embryos, which may be appealing to IVF labs and patients for ethical, religious, and financial reasons.

SUPPORT: None.

P-32

Magnetic Resonance Imaging of Topical Microbicide Formulations in the Pigtailed Macaque: Product Distribution and Transport. D. Patton. Department of Obstetrics and Gynecology, University of Washington, Seattle, Washington.

BACKGROUND: Magnetic resonance imaging (MRI) provides a noninvasive, high-resolution, in vivo method to image the female pelvis because of its excellent spatial resolution and inherently high soft tissue contrast. With continued research efforts to develop topical microbicides for the prevention of sexually transmitted infections and HIV, the need to further investigate safety issues in terms of location and duration of retention of the product within the lower and potentially upper reproductive tract has heightened.

OBJECTIVE(S): To use MRI technology to evaluate the distribution and transport of prototype gel and film formulations of topical microbicide candidates in the vaginal environment of the pigtailed macaque.

MATERIALS AND METHOD(S): Prohance, a gadolinium chelate, was mixed in a 1:100 ratio with Gynol II for MRI. A 1.5 Tesla Signa scanner optimized with a specialized pelvic coil was used for MRI. Sagittal and axial sections of the macaque's pelvic cavity were imaged before gel application to establish anatomic landmarks (vaginal canal, cervix, uterus). Two milliliters of the gadolinium-Gynol II mixture was administered to the vaginal fornix. Five minutes and 1 hour after gel application, repeat MRI images were obtained.

Vaginal films, enhanced with MultiHance contrast media at a 1:200 concentration, were placed onto the face of the cervix in each of three macaques. MRI images were collected from approximately 30 minutes and out to 5 hours after film placement.

RESULT(S): Gadolinium enhancement was apparent in the vaginal canal and surrounding the cervix. Upward migration of Gynol II product from the vagina to the endometrium was not noted by 1 hour postapplication. Sagittal images through the pelvis of macaques with vaginal film in place showed MultiHance- (Gd) labeled film material in the vagina. At 36 minutes, the Gd-enhanced film material had dispersed throughout the vaginal canal. At 1.2 hours, Gd signal outlined the entire vaginal canal and cervical cap but did not appear to have entered the cervical os. At 2.5 hours after film placement, the Gd signal was strong throughout the vaginal canal and up to the cervical os but not evident in the endocervical canal or uterus.

CONCLUSION(S): These findings suggest that MRI can be used to successfully monitor product dispersion (gel or film) within the vaginal vault and the potential subsequent upward migration to the uterus and the intraabdominal cavity.

SUPPORT: National Institutes of Health grant nos. U19 AI051661 and WaNPRC-RR00166.

P-33

Fertilization Rate of Poor-Quality Sibling Oocytes after Intracytoplasmic Sperm Injection and In Vitro Fertilization. M. Ribeiro,[a] N. Buehler,[a] C. Briton-Jones,[a] H. Danzer,[b] M. Surrey,[b] S. Ghadir,[b] W. Chang,[b] D.L. Hill.[a] [a]ART Reproductive Center and [b]Southern California Reproductive Center, Beverly Hills, California.

BACKGROUND: While intracytoplasmic sperm injection (ICSI) was first developed to combat male factor infertility, it is now commonly used to prevent fertilization failure in patients with primary infertility and in women >38 years of age, who are at greater risk for poor oocyte quality and fewer oocyte numbers after controlled ovarian hyperstimulation. The cost of ICSI, its potential risks, and its real benefit for certain infertility categories leads to debate about the validity of using this procedure indiscriminately.

OBJECTIVE(S): To compare with a case cohort study the fertilization rates in sibling oocytes from couples with primary unexplained infertility, normal semen parameters, and poor oocyte quality inseminated by ICSI or IVF.

MATERIALS AND METHOD(S): All patients presenting for assisted reproductive treatment with primary unexplained infertility and poor oocyte quality determined at oocyte retrieval between January 2008 and October 2009 were included in this study. Sibling oocytes from each patient were randomly assigned for insemination by ICSI or by IVF. The Wilcoxon signed rank nonparametric statistical test was used to determine significant differences.

RESULT(S): Thirty patients with a total of 375 oocytes were evaluated in this study. No statistically significant difference was observed between the fertilization rate after ICSI or IVF in sibling oocytes.

CONCLUSION(S): There was no difference in the fertilization rates between ICSI and IVF in primary infertility patients with poor oocyte quality. This study demonstrates that conventional IVF as a method for insemination is equally effective as ICSI in these predicted poor-outcome patients. This is an ongoing study. The relatively small subject numbers to date are insufficient to determine whether the increase in fertilization rate seen in the older women with IVF compared with ICSI may indeed show statistical significance if the trend is maintained in a larger study group.

TABLE. Fertilization rate post-ICSI or post-IVF.

Age	<35	35–37	38–40	41–42	>42	Total
ICSI, %	59	67	53	60	52	60
IVF, %	61	69	82	73	72	69

Note: No differences were statistically significant.

P-34

Migraine History is a Major Risk Factor For Ovarian Hyperstimulation Syndrome. N. Rollene,[a] Z. Khan,[a] M. Amols,[a] R. Gada,[a] D. Schroeder,[b] C. Coddington.[a] [a]Division of Reproductive Endocrinology and [b]Division of Biostatistics, Mayo Clinic, Rochester, Minnesota.

BACKGROUND: Previously we described an association between migraines and ovarian hyperstimulation syndrome (OHSS) in a case series.

OBJECTIVE(S): To confirm this observation through the use of a case-control study. Our primary objective is to further investigate the association of migraines and OHSS, and our secondary objective is to identify risk factors predictive of OHSS.

MATERIALS AND METHOD(S): A 1:2 matched case-control study was performed that identified 114 cases of OHSS at the Mayo Clinic from 1993 to 2009. For each case, two controls matched on the date of service (±1 month) and type of stimulation (IVF or superovulation) were identified. Statistical analysis was performed using conditional logistic regression taking into account the 1:2 matched set study design. Odds ratios (OR) and 95% confidence intervals (CI) were calculated. $P<.05$ was considered statistically significant.

RESULT(S): Risk factors that were found to be statistically significant in a univariate analysis were included in a multiple conditional logistic regression model with the exception of day 3 FSH and antral follicle count (AFC), which were missing on greater than 30% of the sample owing to practice variance over the study period.

Patients who developed OHSS were significantly more likely to be younger, have a lower day 3 FSH, and higher AFC when compared with matched controls. They were also more likely to be diagnosed with a multiple gestation or polycystic ovary syndrome (PCOS) and have a history of migraines. Using multiple logistic regression, the likelihood of developing OHSS was significantly increased with a history of PCOS (OR = 3.72; CI, 2.15–6.45), multiple gestation (OR = 2.53; CI, 1.25–5.11), and migraines (OR = 3.04; CI, 1.70–5.44).

CONCLUSION(S): The clinical manifestations of OHSS arise from increased capillary permeability, but its exact etiology remains unknown. Research involving dopamine agonist use in animal models and most recently in

TABLE 1. Univariate analysis of potential predictors of OHSS.

Risk factor	Cases (n = 114)	Controls (n = 228)	OR (CI)	*P*
Age	30.5 ± 3.8	31.9 ± 4.2	0.92 (0.87-0.98)	.004*
Day 3 FSH, IU/L	6.3 ± 2.8	7.2 ± 3.6	0.85 (0.74-0.97)	.018*
AFC	29.9 ± 11.9	21.0 ± 11.5	1.08 (1.04–1.13)	<.001*
Uterine stripe, mm	11.5 ± 2.4	11.6 ± 2.7	1.00 (0.90–1.11)	.993
Body mass index, kg/m^2	26.3 ± 6.7	26.1 ± 6.3	1.00 (0.97–1.04)	.850
Caucasian race	97 (92.4)	196 (89.1)	1.60 (0.70–3.69)	.269
Nulligravid	68 (59.7)	133 (58.3)	1.06 (0.66–1.72)	.806
LH used in cycle	19 (16.7)	47 (20.6)	0.72 (0.37–1.39)	.328
Multiple gestation	30 (26.3)	33 (14.5)	2.20 (1.23–3.96)	.008*
PCOS	60 (52.6)	41 (18.0)	4.50 (2.70-7.47)	<.001*
Migraines	28 (24.6)	16 (7.0)	5.16 (2.41–11.06)	<.001*

Note: Data are presented as mean ± SD for continuous risk factors and n (%) for binary risk factors. Data were analyzed using conditional logistic regression taking into account the 1:2 matched set study design. For continuous risk factors the OR presented corresponds to a 1-unit increase in the given risk factor.

TABLE 2. Multiple logistic regression.

Risk factor	OR (CI)	*P*
Age	0.96 (0.90–1.02)	.162
Multiple gestation	2.53 (1.25–5.11)	.010*
PCOS	3.72 (2.15–6.45)	<.001*
Migraines	3.04 (1.70–5.44)	<.001*

humans has shown it to decrease capillary permeability. Migraines are also associated with vascular aberrations and dopaminergic dysregulation. The etiology of migraines has not been conclusively determined. Dysregulation of dopamine pathways may be operative in both migraines and OHSS. This case-control study confirms our initial report of an association between migraines and OHSS. We hypothesize there may be a gene variant that predisposes women to both migraines and OHSS. Our ongoing studies focus on elucidation of the underlying molecular mechanisms that could translate into optimizing identification of disease susceptibility and individualized treatment.

SUPPORT: None.

P-35

In Vitro Fertilization Outcomes in Superpoor Responders: Effect of Microdose Human Chorionic Gonadotropin Boost. L. Rubal, N. Opper, K. Bendikson, K. Chung, R. Paulson. Department of Obstetrics and Gynecology, Los Angeles County-University of Southern California, Los Angeles, California.

BACKGROUND: No single stimulation regimen has been proven to be superior to others in the management of IVF in poor responders. We sought to maximize ovarian stimulation in a subgroup of superpoor responders, who are defined as those who had previously failed to respond to stimulation after oral contraceptive and/or leuprolide acetate downregulation. These patients may respond to exogenous FSH or hMG administered at the time of menses, but when GnRH antagonist is administered in the late follicular phase to prevent premature ovulation, further ovarian stimulation may stall in spite of maximal doses of FSH. We hypothesized that microdose hCG boost (100 IU daily) may allow for continued ovarian stimulation after GnRH antagonist administration in these cycles.

OBJECTIVE(S): To examine the effects of microdose hCG boost addition to the GnRH antagonist protocol in superpoor responders with regard to E_2 levels, number of follicles, and number of oocytes retrieved.

MATERIALS AND METHOD(S): Retrospective cohort analysis. Superpoor responders were defined as noted above. Nineteen subjects were included. All underwent ovarian stimulation initiated at the time of menses with a combination of hMG, FSH, and/or clomiphene. GnRH antagonist (GnRHant) was administered when the lead follicle reached 14 mm or more. Microdose hCG boost (100 IU daily) was used in conjunction with GnRHant. Ovulation was triggered with 10,000 IU of hCG.

RESULT(S): The median (range) age was 40 (19–45) years old. The peak E_2 level was 617 (255–1123) pg/mL. The number of large (>14 mm) follicles at hCG administration was four (2–11). There were 7 (3–14) oocytes retrieved, of which 4 (0–10) were mature. Five patients underwent oocyte cryopreservation, and 14 underwent ET. Six of 14 (43%) cycles resulted in a positive hCG value, of which four (29%) were delivered or ongoing. In all cases, serum hCG levels before ovulation triggering were <5.0 mIU/mL.

CONCLUSION(S): Microdose hCG boost in conjunction with GnRHant provides continued ovarian stimulation in superpoor responders already on maximum doses of gonadotropins. One hundred international units of hCG daily for up to 9 days does not induce ovulation or result in elevated hCG levels in the serum. Microdose hCG boost may be useful in providing additional ovarian stimulation in superpoor responders.

P-36

Chromatin Intact Sperm Recovery is Higher after Glass Wool Column Filtration as Compared with the Density Gradient Centrifugation Procedure. R. Sauer,[a] R. Jeyendra,[b] C. Coulam.[c,d] [a]National Institute of Perinatology, Mexico City, Mexico; [b]Andrology Laboratory Services, Inc., and [c]Millenova Immunology Laboratories, Chicago; and [d]Rinehart Center for Reproductive Medicine, Evanston, Illinois.

	DNA fragmentation index, %	High DNA stainability, %	Sperm concentration $\times 10^6$/mL	Overall sperm motility, %	Progressive sperm motility, %
Ejaculate	$12.1 \pm 2.0^{a,d}$	10.4 ± 0.6^{a}	87.4 ± 7.6^{a}	63.8 ± 3.5^{a}	44.8 ± 16.5^{a}
GWF	$6.6 \pm 2.2^{b,c}$	7.2 ± 0.7^{b}	25.5 ± 4.5^{b}	88.9 ± 2.1^{b}	60.2 ± 26.7^{b}
DGC	$10.9 \pm 2.6^{c,d}$	6.9 ± 0.7^{b}	33.0 ± 4.2^{b}	70.4 ± 4.3^{a}	41.5 ± 24.3^{a}
$P \leq$	.01	.0001	.0001	.0001	.003

Note: Mean ± SEM. Mean values with a common superscript in the vertical column were not significantly different (P>.05) from each other; n = 20.

OBJECTIVE(S): To define whether density gradient centrifugation (DGC) and glass wool filtration (GWF) will yield a population of sperm with significantly improved DNA quality.

DESIGN: Comparative.

MATERIALS AND METHOD(S): Equal aliquots of ejaculates from 20 men with normal semen parameters according to the World Health Organization were prepared for GWF and DGC procedures to compare sperm quality including the chromatin integrity. One hundred microliters of unprocessed ejaculate, filtered sperm, and sperm obtained after gradient procedure were plunged into liquid nitrogen and stored until analysis for chromatin integrity using the Sperm DNA Integrity assay.

RESULT(S): Sperm analysis results for chromatin integrity (DNA fragmentation index and high DNA stainability), sperm concentration, and sperm overall and progressive motility are shown in the table.

CONCLUSION(S): GWF improves the percentage of sperm DNA fragmentation.

P-37

Use of Testicular Sperm/Intracytoplasmic Sperm Injection Yields High Pregnancy Rates in Couples who Failed Multiple In Vitro Fertilization Cycles Owing to High Levels of Sperm DNA Fragmentation. P. Werthman, R. Boostanfar, W. Chang, K. Chung, H. Danzer, T. Koopersmith, G. Ringler, M. Shamonki, M. Surrey, M. Vermesh, J. Wilcox.

BACKGROUND: Sperm DNA damage (fragmentation) is a known cause of male factor infertility and has been shown to negatively impact pregnancy outcomes in couples undergoing IVF with intracytoplasmic sperm injection (ICSI). Previous studies have shown that sperm DNA damage may occur after the sperm have exited the testicle and that levels of DNA fragmentation are lower in testicular sperm than in ejaculated sperm.

OBJECTIVE(S): To evaluate the results of IVF/ICSI using testicular sperm in couples who failed to achieve pregnancy on prior IVF cycles and who had high levels of sperm damage as a cause of their infertility.

MATERIALS AND METHOD(S): We retrospectively reviewed the charts of 24 consecutive patients who underwent testicular sperm extraction for use with ICSI between January 1, 2008, and August 1, 2008. All patients had sperm present in the ejaculate that tested with a high DNA fragmentation index (DFI) as measured by sperm chromatin structure assay. All patients had failed to achieve pregnancy during prior IVF cycles using ejaculated sperm. In an effort to improve the chances of conception, couples elected to have sperm harvested directly from the testicle and used for IVF/ICSI. Ovarian hyperstimulation was performed by one of 10 different reproductive endocrinologists at five different assisted reproductive technology laboratories in the Los Angeles area. Testicular sperm extraction was performed by a single surgeon (PW) on the day of oocyte retrieval or 1 day prior.

RESULT(S): All men had at least one abnormal semen parameter and a high DFI (>30%) ranging from 32% to 82%, with a mean of 51.6%. The etiology of sperm damage included varicocele, pyospermia, infection, partial obstruction, cryptorchidism, steroid abuse, and idiopathic. The average age of the female partner was 36.4 years, with a range of 32–46 years. Two couples used an egg donor, and the wives' ages were excluded from the aforementioned calculation. All couples had undergone between one and seven prior ICSI attempts with a mean of three failed cycles. A pregnancy rate of 62.5% was achieved when testicular sperm were used. An 83% pregnancy rate was achieved when the DFI was over 65%. A 75% pregnancy rate was achieved in couples who underwent four or more prior failed IVF cycles.

CONCLUSION(S): These data show that the use of testicular sperm/ICSI provides an efficient treatment option for couples who fail multiple IVF cycles because of high levels of sperm DNA fragmentation. Neither

the degree of sperm DNA damage nor the number of prior failed IVF cycles appeared to affect the ability to achieve pregnancy when testicular sperm were used.

P-38

Primary Infertility Associated with Neuroendocrine Tumor (Carcinoid) of the Appendix. B.B. Swelstad L.A. Kolp. Johns Hopkins Hospital Department of Gynecology and Obstetrics, Division of Reproductive Endocrinology and Infertility, Baltimore, Maryland.

BACKGROUND: Neuroendocrine tumors (NETs) of the appendix (formerly called appendiceal carcinoids) occur most often in acute appendicitis, ranging from 1/100 to 1/300 cases, and are rarely suspected before histological examination. Appendicoliths occur in approximately 30% of acute appendicitis, with only 10% of these seen radiographically. During pregnancy, appendicoliths are associated with a higher rate of complicated appendicitis with perforation and abscess formation.

OBJECTIVE(S): To report the first case of primary infertility associated with an appendiceal NET.

MATERIALS AND METHOD(S): Case report.

RESULT(S): A 34-year-old married primipara was evaluated for primary infertility of unknown etiology for 2 years' duration. She reports her usual state of good health without any problems. Her past medical, surgical, gynecological, family, and social history, and review of systems are noncontributory.

Physical examination and transvaginal pelvic ultrasound were both normal. Initial evaluation included menstrual cycle day 2 labs (FSH, E_2, TSH, free T4, and PRL), a hysterosalpingogram, and a semen analysis. All laboratory levels for both partners were within acceptable ranges. Hysterosalpingogram revealed a normal uterine cavity with bilateral tubal patency and a round 3-cm laminated calcified density in the right pelvis, far above the level of other pelvic structures. The calcified mass was not likely an ovarian dermoid and was too large for a gallstone or renal calculus. Since the mass was not related to her clothing or jewelry and was not an artifact from the radiology equipment, the pelvic density was regarded as a large appendicolith or foreign body in the gastrointestinal tract.

Pelvic computed tomography scan with bone window enhancement revealed two large calcifications in the lower right pelvis, the smaller one in the more distal aspect of the appendix measuring 0.9×0.8 cm and the larger in the more proximal aspect of the appendix measuring 1.7×1.2 cm. No significant appendiceal inflammation was noted to suggest acute appendicitis. No significant intrapelvic adenopathy, free fluid, or suspicious bony lesions were visualized.

An operative laparoscopy with appendectomy was performed. Normal female pelvic anatomy was seen. Histopathology was consistent with an appendiceal NET with negative margins extending to the subserosa. Postoperatively she did well and within 2 months after surgery conceived a spontaneous pregnancy.

CONCLUSION(S): This case highlights the importance of understanding the differential diagnosis for pelvic masses detected by hysterosalpingogram in reproductive-age women. Appendiceal NETs have an excellent overall prognosis, however, consideration for colorectal cancer screening is important later in life.

P-39

Transgene Independent Germ Cell Differentiation From Human Embryonic Stem Cells (hESCs). N.D. Tran, D. Lair, M. Kissner, M. Conti, R. Blelloch. [a]Department of Obstetrics and Gynecology, Center for Reproductive Sciences, University of California, San Francisco Medical Center, San Francisco, California.

BACKGROUND: The ability to generate mature germ cells from hESCs represents a potential treatment for patients with infertility as well as an essential means of studying the mechanism of germ cell differentiation.

OBJECTIVE(S): To investigate the feasibility of efficient production of human primordial germ cells (PGCs) from hESCs.

MATERIALS AND METHOD(S): Primary H9 hESCs (X/X) were cocultured with CF-1 MEFs in an optimized differentiation cultured media in the absence of fetal bovine serum. Culture medium was changed every day. Cell colonies were collected and stained with antibodies against SSEA-1, cKit, and VASA to evaluate the presence of PGCs by flow cytometry analysis. Populations of SSEA1+/cKit+ and SSEA1-/cKit- cells were sorted by flow cytometry and analyzed for mRNA expression of germ cell markers as well as embryonic germ cell (EGC) forming potential.

RESULT(S): High numbers of PGCs (SSEA1+/cKit+) were consistently generated from primary H9 hESCs after differentiation (5%–10%). Additionally, these PGCs also expressed VASA and OCT-4 as assessed by immunofluorescent staining and *Stella, Blimp1, Nanog, Dazl, ZP3*, and *AMH* by qRT-PCR. Meiotic activity in PGCs was confirmed with the upregulation of *Stra8, Scp1*, and *Scp3* by qRT-PCR. Confocal microscopy demonstrated nuclear expression of SCP3 in 29% of PGCs. Conversely, germ cell and meiotic markers were absent in the SSEA1-/cKit- population. When sorted PGCs were further cultured, only SSEA+/cKit+ cells were able to form EGC colonies. PGCs were efficiently generated by differentiation of EGCs (~10%) even after eight passages. Furthermore, complete CpG demethylation at the H19 locus was demonstrated in PGCs by bisulfite sequencing.

CONCLUSION(S): These studies demonstrated that an efficient number of PGCs could be consistently generated by differentiation of primary H9 hESC under optimal conditions. The ability to produce PGCs and EGCs from primary hESC without the need for a transgenic marker is unique and represents an ideal model to study human germ cell biology.

P-40

How Should We Counsel In Vitro Fertilization Patients who Conceive Monozygotic Pregnancies? G. Vela,[a,b] M. Luna,[a,b] J. Barritt,[a,b] B. Sandler,[a,b] L. Grunfeld,[a,b] A.B. Copperman.[a,b] [a]Reproductive Medicine Associates of New York and [b]Department of Obstetrics and Gynecology and Reproductive Science, Mount Sinai School of Medicine, New York, New York.

BACKGROUND: A higher incidence of monozygotic (MZ) twinning has been reported in pregnancies conceived using assisted reproductive technology (ART). While there have been many studies focusing on the etiology of this phenomenon, there have been only a few that focused on their ultimate reproductive outcome.

OBJECTIVE(S): To analyze the outcomes of IVF-conceived MZ pregnancies.

MATERIALS AND METHOD(S): IVF-conceived MZ pregnancies between June 2002 and June 2008 were retrospectively identified and included in the study. A high-order multiple pregnancy (HOMP) was defined as the presence of more than two fetal poles in the presence of fetal cardiac activity. Outcomes were compared by pregnancy fetal order and pregnancy reduction status. Spontaneous reduction (SR), multifetal therapeutic reduction (MFR), number of newborns per delivery, pregnancy loss, perinatal mortality, gestational age at delivery, and birth weight were recorded. Analysis of variance and χ^2 were used for statistical analysis.

RESULT(S): In total, 73 of 3426 pregnancies (2.1%) were identified as MZ; 70 met the inclusion criteria for the study. Overall, 36 (51.5%) cases were MZ twins (non-HOMP), and 34 cases (48.5%) were HOMPs (MZ twins plus additional fetus[es]). In the HOMP group, only 2.9% (1/34) had a complete pregnancy loss, while 38.8% (14/36) of the non-HOMP cases were lost by 20 weeks of gestation. No significant differences regarding gestational age at delivery, birth weight, or perinatal death per newborn were found between these groups. HOMPs were therapeutically reduced, spontaneously reduced, or nonreduced in 58.5%, 32.3%, and 11.7% of cases, respectively. See the table for outcomes of HOMPs by reduction status.

CONCLUSION(S): MZ twinning is encountered in a small but significant number of ART-derived pregnancies. The prognosis for these patients is poor, particularly for single-implantation MZ pregnancies and for nonreduced HOMPs. Patients who do not spontaneously reduce a MZ-HOMP by 12 weeks may benefit from therapeutically reducing the MZ component of the pregnancy.

TABLE. Outcome of MZ-HOMPs by reduction status.

	Nonreduced (n = 4)	SR (n = 11)[a]	MFR (n = 20)[a]
Newborns/delivery	$3.0 \pm 0.0^{b,c}$	1.3 ± 0.6^{b}	1.2 ± 0.4^{c}
Gestational age, weeks	28.1 ± 7.7^{b}	33.5 ± 3.4^{c}	$37.8 \pm 3.2^{b,c}$
Birth weight, g	$1110.0 \pm 731.6^{b,c}$	$2120.4 \pm 899.9^{b,d}$	$2796 \pm 865.8^{c,d}$
Neonatal death/ newborn (%)	6/12 (50)[b,c]	0/15 (0)[b]	0/24 (0)[c]

[a]One patient had both an SR and an MFR.
[b,c,d]$P<.05$.

P-41

Young Patients who Succeed at In Vitro Fertilization Should not be Overconfident and Delay Future Attempts. G. Vela,[a,b] E.D. Flisser,[a] M. Luna,[a,b] B. Sandler,[a,b] T. Mukherjee,[a,b] A.B. Copperman.[a,b] [a]Reproductive Medicine Associates of New York and [b]Department of Obstetrics and Gynecology and Reproductive Science, Mount Sinai School of Medicine, New York, New York.

BACKGROUND: Multiple social, economic, and personal factors affect patients' decisions regarding family building and birth spacing. Overcoming infertility through successful IVF treatment may unduly bias patients' perceptions regarding the likelihood of future treatment success. Scientific data for medical recommendations regarding birth spacing after infertility treatment are largely anecdotal.

OBJECTIVE(S): To determine the effect of intercycle rest intervals in subsequent IVF cycles after a successful one.

MATERIALS AND METHOD(S): All patients undergoing a subsequent IVF cycle with autologous oocytes after successful IVF were retrospectively analyzed. The intercycle interval was calculated for each patient, and they were grouped as follows: <2, 2–2.9, and ≥ 3 years between cycles. Implantation, pregnancy, and loss rates were evaluated.

RESULT(S): After a successful IVF pregnancy, 232 patients returned for subsequent fresh IVF treatment. The overall clinical pregnancy rate was 56.4% (131/232). A correlation of -0.35 (95% confidence interval, -0.47 to -0.24, $P<.0001$) between intercycle interval and patient age at the first successful cycle was observed.

CONCLUSION(S): After successful IVF treatment, younger women wait longer before attempting a subsequent IVF. This may result from a false impression that young age at the time of success improves the likelihood of achieving a pregnancy in later treatment cycles. In our study, patients who waited longer than 3 years after successful IVF were younger but demonstrated a trend toward reduced pregnancy rates, despite having lower day 3 FSH levels. Infertile couples should be counseled regarding the influence of birth spacing and chronologic aging on the success of future infertility treatment.

TABLE. Subsequent IVF outcome by intercycle time interval.

	<2 Years, n = 95	2–2.9 Years, n = 94	≥ 3 Years, n = 43	*P*
Age	37.0 ± 4.2	36.8 ± 3.7	35.3 ± 3.4	.06
FSH, U/L	8.6 ± 3.1[a]	9.3 ± 4.0[b]	7.1 ± 1.8[a,b]	$<.05$
Peak E_2, pg/mL	1995 ± 973	1989 ± 1045	2132 ± 1104	.70
No. of oocytes retrieved	15.2 ± 7.9	13.9 ± 7.1	16.2 ± 10.0	.26
ICSI rate, %	51.5	52.1	58.1	.75
Blastocyst transfer rate, %	31.8	39.1	40.0	.51
No. of embryos transferred	2.6 ±1.1	2.5 ± 0.9	2.2 ± 1.1	.07
Implantation rate, %	33.2	29.9	29.1	.65
Clinical pregnancy rate, %	61.0	55.3	48.8	.39
Loss rate, %	20.6	25.0	4.7	.14

Author and Page Index