Communicating Reproductive Science to a Doubtful World

Education Strategies in Oncofertility

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Chicago, IL





Mind the Gap!

Reproductive Health = Lifetime of Health
Colliding Epidemics
Silent Killers
Pressure on the Health Care System
Uneven Distribution of Care
Science Knowledge Gap Impacts Health and Decisioning







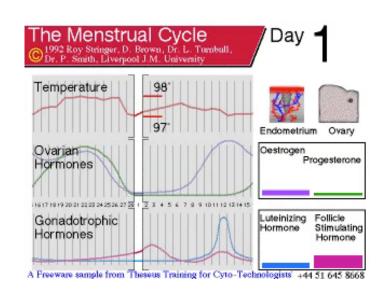




Hypothesis

Advances in twenty-first century medicine requires well-trained basic scientists and clinical investigators who study reproductive science and medicine in partnership with a well-informed public.

Investment in the education of the next generation of innovators will improve the health of our globe.

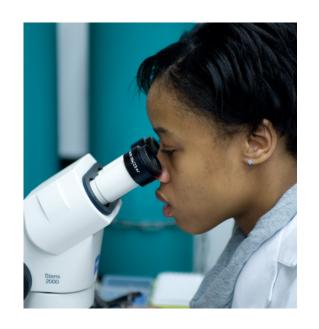












Our Tactics

Priming the Pump - Getting Started

Teaching the Teachers - Scaling

Teaching Ourselves -Sustaining



REPROTOPIA reprotopia.northwestern.edu

REPROTOPIA

REPRODUCTIVE HEALTH EDUCATION FOR ALL











NATIONAL PHYSICIANS COOPERATIVE

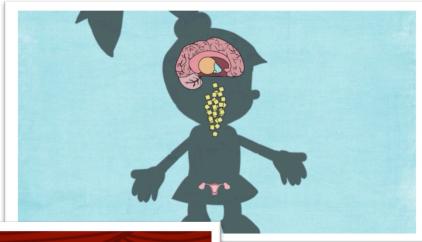


GLOBAL NETWORK

CHILDREN

A New You, That's Who

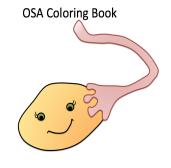




"Anatomy"



"Menstruation"



"Puberty" **PHYSICIANS**



https://vimeo.com/197212084



Live Action Introduction from Teresa



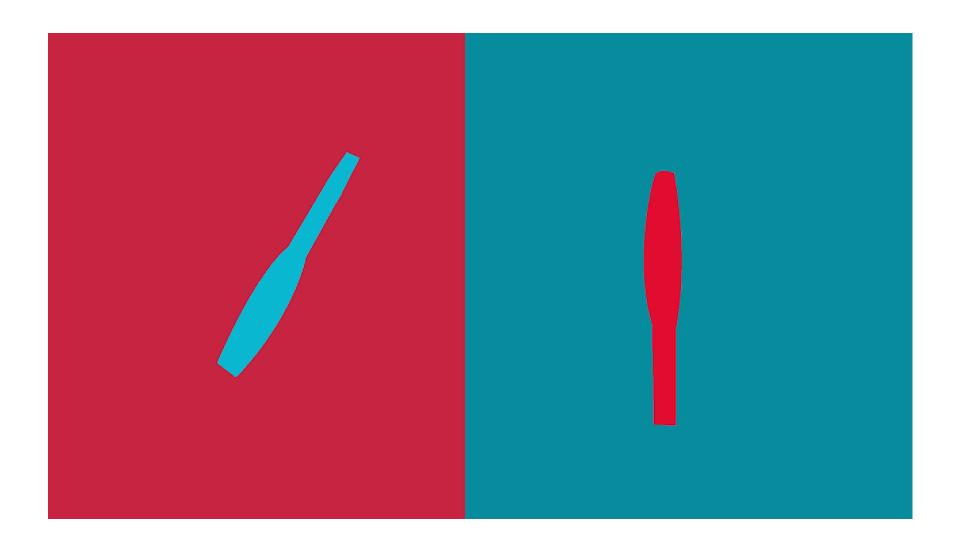
"She provides interesting context for it. I like that she's real. [The intro provides nice] context so kids know at least to regard in higher attention what they're about to see. That sometimes helps to hear from [someone] official before you dive into the information, especially if you're going to transition into cartoons." ~ Mother of a 6th grade boy



Transitional Animation









SUMMATIVE EVALUATION



Method

- n = 50 children in Evanston & Skokie
 - 52% in 5th grade; 48% in 6th grade
 - 40% Female
- Children screened either the videos we created (Treatment) or a set of videos on the scientific method (Control)

Develop Measure of Reproductive Health Knowledge

- Researchers created a list of all facts / information from the videos
- N = 15 undergraduate students sorted facts into essential and non-essential
- Researchers developed a list of 21 multiple choice questions covering essential information

(Collins, 1983)





Sample Item

Where in the woman does a baby grow?

- a. In the vagina
- b. In the uterus
- c. In the stomach

Sample Item

Where in the woman does a baby grow?

- a. In the vagina 8%
- b. In the uterus 65%
- c. In the stomach -27%

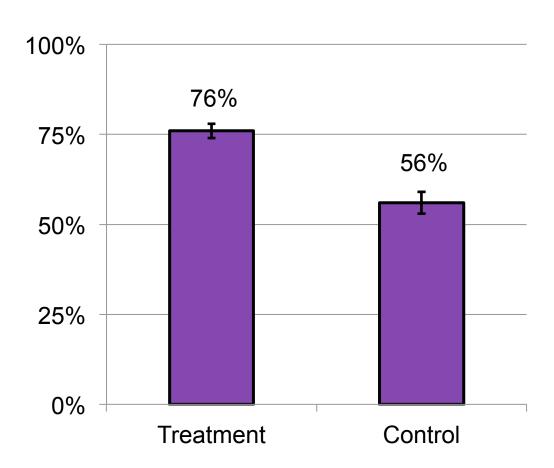
Sample Item

Where in the woman does a baby grow?

| | Treatment | Control |
|----------------|-----------|---------|
| In the vagina | 8% | 8% |
| In the uterus | 76% | 54% |
| In the stomach | 16% | 38% |

Preliminary Results: Learning

- The videos were very effective:
 - -p < .001
 - Cohen's d = 1.46
- Results are robust across child gender and age





Preliminary Results: Appeal

- "I wish we got something like that in school. It's really informative." ~ 6th grade boy
- "It's so good! I think that's excellent. The singing is really good."

 ~ Mother of a 6th grade boy
- "They were funny." ~ 5th grade girl
- "They're pretty catchy. I liked them a lot." ~ 6th grade girl

Future Analyses

- Do results vary by children's...?
 - Attitudes towards the video
 - Prior knowledge
 - Level of pubertal development (as rated by parents)
 - Cognitive skills (verbal memory and fluency)



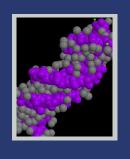
HIGH SCHOOL STUDENTS AND TEACHERS





Biotechnology Professional Development Series

Biotechnology Professional Development Series





Advancing Biotechnology Education in Chicago







Expanding Minds with Real-World Science

Baxter





- Use oncofertility concepts and biotechnology skills to teach high school biology, also for advanced electives
- Developed in partnership with The Woodruff Lab, Feinberg School of Medicine
- Lab activities teach basic science through the context of cancer biology, reproductive biology, and oncofertility
- 1. Biomaterials Lab: Just Bead It
- 2. Male Hormone Lab: You've Got MALE
- 3. Female Hormone Lab: 28 Days Later
- 4. SRY Gene Lab: WhY Are We Different?
- **5. Sea Urchin Lab**: IVF, toxicity, cryopreservation (in development)





Biotechnology Professional Development Series

- 4 Opportunities for Teachers
 - 1. Biotech Symposium
 - 2. Survey of Biotechnology
 - 3. NUBIO
 - 4. Research Experiences for Teachers
- Baxter Boxes and Loaner Kits
- New Elective Course at LMSA
- 2014: 116 Teachers from 87 Schools





Teacher Reactions





NU Biology Investigations in Oncofertility







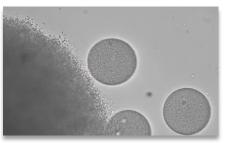
















PHYSICIANS
COOPERATIVE

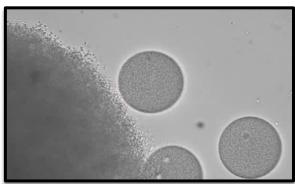


GLOBAL ONCOFERTILITY NETWORK

What makes NUBIO unique?

- Basic science concepts taught through the motivating contexts of cancer, reproduction and oncofertility
- Inquiry-based and hands-on activities drive a "need to know" resulting in better motivation, retention, and application
- Connection to real researchers working on "bench to bedside" clinical problems

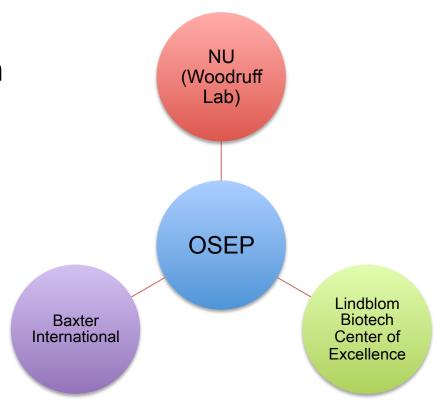




NIH R25 Award # RL5CA133836

Achieving Scalability and Sustainability Through Partnerships

- Biotechnology Center of Excellence at Lindblom Math and Science Academy
- Baxter International's Science@Work Program
- A Model for Scalability and Sustainability

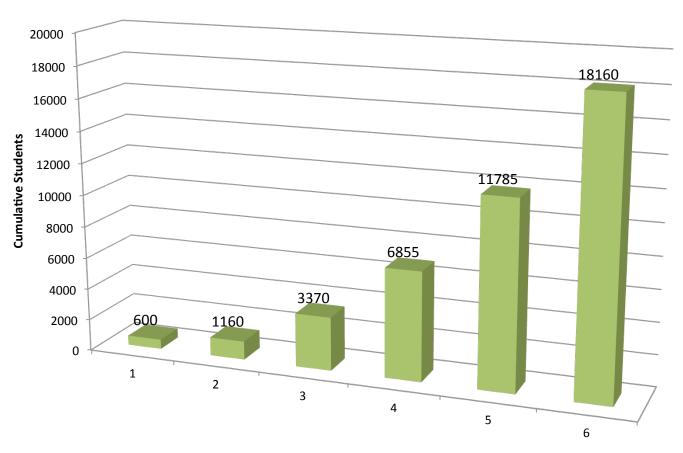






Scalability: Years Since Program Inception

NUBIO



Elapsed Years





Oncofertility Saturday Academy





https://www.youtube.com/watch?v=GCiN2KZqpUc





Oncofertility Saturday Academy

Goals for High School Girls:

- Hands-on laboratory and clinical activities.
- Prepare for college and careers.
- Develop relationships with scientists, doctors and other professionals.
- Be empowered with women's health knowledge.

Goals for Parents/Guardians of the High School Girls:

Develop skills to support their daughter's interest in science and medicine.











Oncofertility Saturday Academy

Goals for High School Science Teachers and Staff:

- Engage in laboratory and clinical activities.
- Develop curriculum and link to the classroom work.
- Reconnect with the love of and reason for teaching
- Create a network of science teachers.

Goals for Community (CPS and beyond):

- Create biology curriculum that is relevant, skill and intellectually-based
- Provide continuous engagement beyond the high school diploma.



OSA Program Components

- Two-Year Model
 - -JOSA, 11th grade students
 - -SOSA, 12th grade students
- Student Selection Process
- Informational Meeting
- Modules
 - After School Workshop
 - Saturday Sessions
- Group Projects
- Graduation





OSA Modules

JOSA – Basic Science

- Module 1: Regulation of Ovarian Function
- Module 2: Gene Expression in the Ovary
- Module 3: Fertilization and Beyond

SOSA – Clinical Medicine

- Module 4: Oncofertility and Surgery
- Module 5: Eggs and Sperm, Oh My!
- Module 6: Doctors for a Day

POSA – Parental Involvement

- Module 7: Supporting the Next
- Generation of Women Leaders in Science and Medicine





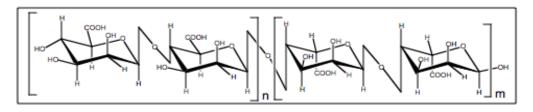




Program Guiding Question

How can we preserve the fertility of cancer patients?

What is bioengineering?



β-D-Mannuronic acid

α-L-Guluronic acid





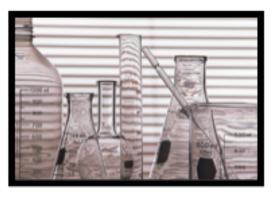
What are the ethics of biomedical research?

- Legal concerns
- Religious constraints
- Ethics discussion











OSA IMPACT



SOSA Sisters



JOSA Sisters



"OSA has given me so much motivation and inspiration to become a doctor. It gave me the insight that I needed to be sure that I wanted to become a doctor."

Antavia

Once an OSA Sister, always an OSA Sister!



PHYSICIANS COOPERATIVE



GLOBAL ONCOFERTILITY NETWORK

Family OSA: Supporting Future Female Scientists, Clinicians and Leaders



- Laboratory Workshop
- Clinical Workshop
- Academic and Career Workshop
- Open forum and evaluation



"This parent workshop was very helpful. I feel more prepared to support my child in making decisions about her future goal of becoming a scientist." OSA Father

The Beyond





Women's Health Science Program for High School Girls and Beyond (WHSP) Student Profile

As a selected participant of a WHSP academy, you have become part of a network of young women who have two commonalities – an interest in science and a drive to be successful. The purpose of this student profile is to share academic- and career-focused information about yourself to the science community. The information you post to your profile will be accessible to other student participants, scientists, clinicians, other professionals and undergraduate/graduate students who have an active role in this program, therefore, it is important that you make this a professional profile. You will be encouraged to update this profile with new information throughout your academic and career trajectory.

Photos

Upload up to three professional photographs of you (ie. professional head shot, doing science, etc.)

My Story

Suggested ideas and questions to answer:
Tell us your story.
'What interests you about science, medicine, and/or
other areas of study?
'Why did you apply to a WHSP academy?
'What have I learmed and/or hope to learn from
participating in a WHSP academy?
'What hobbies, groups, teams, and/or extracurricular
activities do you participate in and enjoy spending your
time doing?

Academic Goals

Suggested ideas and questions to answer:

- Describe your academic accomplishments.
- Describe your high school academic goals.
 Describe the major(s) you are considering to
- pursue in college.

 What colleges are you going to apply to?
- Are you considering going to graduate school after college? If so, describe what you want to study at the graduate level.
- Describe the reason(s), person(s) and/or an experience(s) that inspired you to consider these academic goals.

Career Goals

Suggested ideas and questions to answer:

- Describe the career(s) you are considering.
- Explain why you are interested in this
- Describe the reason(s), person(s) and/or an experience(s) that inspired you to consider this career.
- What do you hope to accomplish in this career?

Quote / Advice

 Share a quote that inspires you.
 What advice or words of wisdom would you give to students who are considering applying to a WHSP academy?

Resume

Upload resume

Modules Completed

This will be completed by program manager/director.



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GLOBAL ONCOFERTILITY NETWORK

OSA Sudan

"OSA instilled a sense of confidence in me, because women are often discouraged when it comes to pursuing careers in science," Eldigair said. "In Sudan, science is really a man's world. I want the girls there to know if they are interested in science that their gender really doesn't define their success."

Fatima Eldigair, OSA 2015





NATIONAL PHYSICIANS COOPERATIVE



GLUBAL ONCOFERTILITY NETWORK

WOODRUFF LAB
Oncofertility Sudan Academy

Students learning about reproductive science around the nation!





Oncofertility National Science Education Network: ONSEN Partnership











NATIONAL PHYSICIANS COOPERATIVE



GLOBAL ONCOFERTILITY NETWORK

COLLEGE

Coursera MOOC

"Introduction to Reproduction"



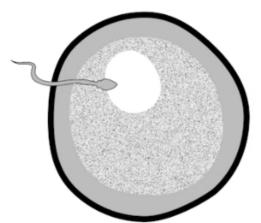
About this Course

Do you have questions about sex hormones or menstrual cycles? This is a crash-course in human reproductive health through fact and biology-based information on a variety of topics. We will cover reproductive anatomy, key biological changes during puberty, sexual biology and contraceptive methods, reproductive disorders, and a special introduction to the exciting field of Oncofertility. Specific lecture titles are as follows: 1) Reproductive Anatomy & Hormones, 2) Menstrual Cycle, Oocyte Maturation, & Sperm Activation, 3) Sexual Biology, Fertilization, & Contraception, and 4) Reproductive Health & Disorders.

The objective of this course is to ensure you understand reproductive health and not confuse reproduction with sex (or having sex). This course was designed with you in mind, and is aimed at providing you with quality information that is meaningful to you and that may be hard to find otherwise. Reproductive health is an area of knowledge that needs to be demystified. We have designed this course for you to examine reproduction through a biological and scientific lens addressing these issues in a comfortable and interactive format that will lead to a better understanding of holistic health, long-term.

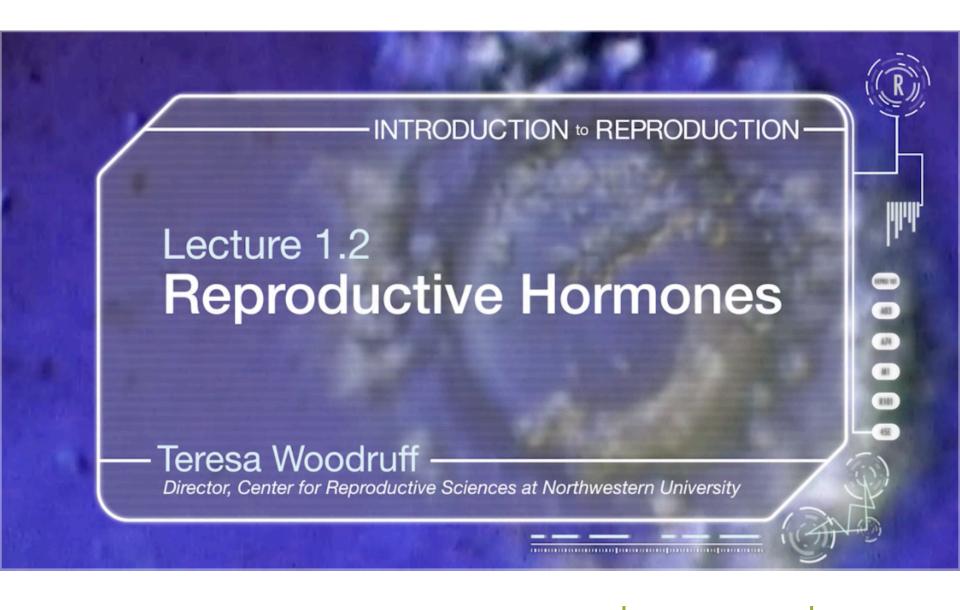
Subtitles available in English

@1-3 hours/week











Video Lectures: Example 1



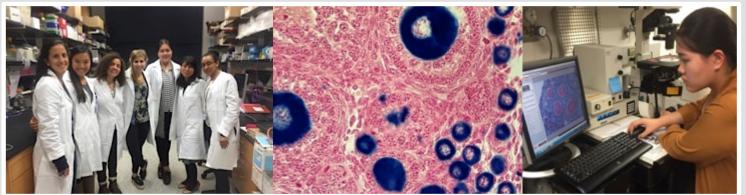


POST-GRAD



Master of Science Reproductive Science and Medicine

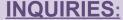
A Degree Program Focusing on Human Reproductive Health



- Complete foundation and advanced topics courses
- Train with clinical, basic, and translational science leaders
- Engage in the Center for Reproductive Science

For information and application: www.tgs.northwestern.edu/admission

Application deadlines: January 20, 2017 and May 15, 2017



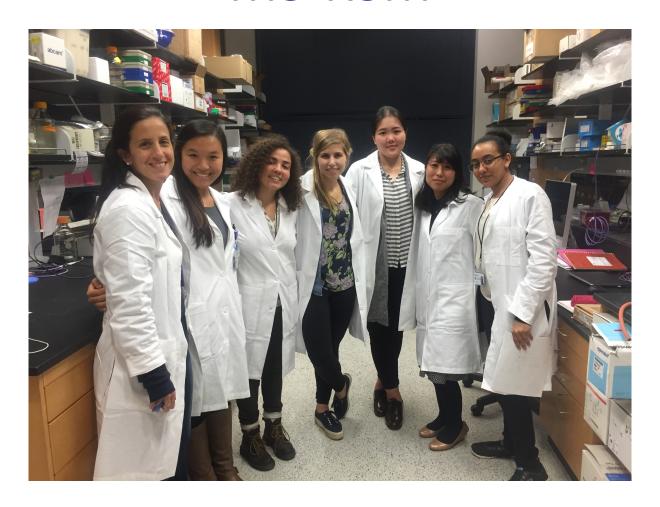
Elizabeth Sefton, PhD
Director of Graduate Studies
Repro-masters@northwestern.edu







MS-RSM





PUBLIC

REPROPEDIA REPRODUCTIVE LEXICON

http://www.repropedia.org

Create a reproductive-focused lexicon to provide the lay public with words they can use to understand reproductive health and biology



An Unlikely Surrogate

POSTED BY ANGELA KRAUSFELDT

SEPTEMBER 14TH uterus

A recent story cancer, fertility read any furth Keep reading

The uterus, also known as a womb, is a muscular, pear-shaped organ located between a woman's rectum and her bladder. During pregnancy, this is where the

lly begged for me to write about it. ere's a caveat I should disclose be daughter's child. Are you following

she was 30 years old, leaving both not be in their future. Even more devastating news would for

she went into surgery to have her uterus removed, doctors informed her that she was actually pregna doctors could not save the fetus, they assured Emily that they would try and save her ovaries so she produce eggs.











Our Goal

Provide **authoritative** and **comprehensible** source of information from reproductive scientists and clinicians









How can you use Repropedia?

Contribute

- Suggest a term and/or definition
- Provide an original photo or diagram from your research
- Volunteer to record a video definition

Educate

- Use it as an educational reference for your students
- Ask peers, students and trainees to contribute

Share

- Subscribe to API so that reproductive health definitions will automatically link to your website (repropedia.org/api/subscribe)
- Spread the word amongst your community

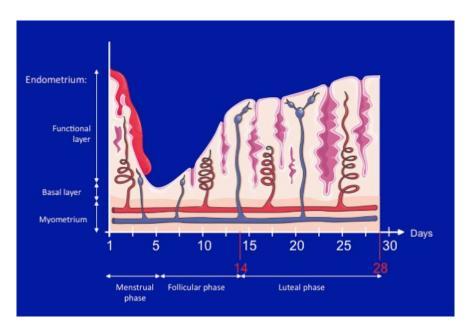
Ask an Expert

Ask an Expert

Do you have a question about a Repropedia term that you wish to have answered by a scientist or clinician? Ask an expert here. One of our board members will get back to you within the week.

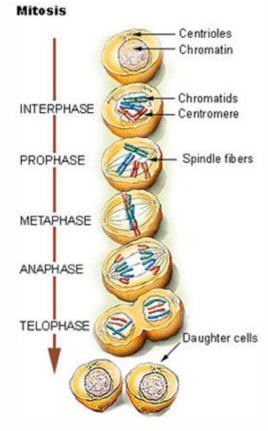
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Images





Figures were produced using Servier Medical Art: www.servier.com



SEER Training Modules, Anatomy and Physiology Module. U. S. National Institutes of Health, National Cancer Institute. 5 April 2011 http://training.seer.cancer.gov/anatomy/reproductive/female/genit alia.html >.





PATIENTS

Patient Education





Es.MyOncofertility.org





PROFESSIONALS



Fellow Education Day

Oncofertility Consortium November 2016

Fellow Education Day

- 10th Annual Oncofertility Consortium Conference: Expanding Access to Emerging and Existing Oncofertility Services
 - November 1-3, 2016, Chicago, IL
- One day multidisciplinary course prior to meeting
- Didactic presentations
- Complex clinical cases reviewed in interdisciplinary teams
- Targeting fellows in REI, male fertility, and oncology
- Society for Reproductive Endocrinology and Infertility (SREI) travel awards
 - First 5-7 REI fellows to register
 - Maximum reimbursement \$1000 per fellow



Learning objectives

At the conclusion of this course, participants should be able to:

- •Describe currently available options for female and male fertility preservation including recent advances in embryo, oocyte, ovarian tissue, sperm, and testicular tissue cryopreservation.
- •Formulate individualized treatment plans for patients throughout the reproductive spectrum who are interested in undergoing fertility preservation through cross-discipline collaboration.
- •Appreciate the interdisciplinary approach necessary to achieve effective fertility preservation and survivorship care.

Course structure

| Topic | Speaker |
|------------------------|---|
| | |
| Fertility Preservation | Jill Ginsberg, MD – Pediatric Oncologist and Director of |
| in the Pediatric | the Cancer Survivorship Program, Children's Hospital of |
| Population | Philadelphia (CHOP) Cancer Center |
| Fertility Preservation | Jim Smith, MD, MS – Urologist and Director of Male |
| in the Male | Reproductive Health, University of California, San |
| | Francisco (UCSF) |
| Team based learning: | Divya Shah, MD, MME – Reproductive Endocrinologist, |
| Pre-pubertal girl and | University of Pennsylvania |
| adult male | Wendy Vitek, MD – Reproductive Endocrinologist and |
| | Director of Fertility Preservation, University of Rochester |
| Advances in Fertility | Teresa Woodruff, PhD – Director Women's Health |
| | · · |
| Preservation | Research Institute, Chief, Division of Obstetrics and |
| | Gynecology-Fertility Preservation |
| Survivorship | Laxmi Kondapalli, MD, MSCE – Reproductive |
| | Endocrinologist and Infertility Specialist, Colorado Center |
| | for Reproductive Medicine |
| Team based learning: | Divya Shah, MD, MME – Reproductive Endocrinologist |
| Early and late | and Infertility Specialist, University of Pennsylvania |
| reproductive female | Wendy Vitek, MD – Reproductive Endocrinologist and |
| reproductive remaic | Infertility Specialist, Director of Fertility Preservation, |
| | |
| | University of Rochester |

Adult learning

The course will be comprised of didactic lectures given by leaders in the field interspersed with complex clinical cases that will be reviewed in interdisciplinary teams.

Participants will be provided supplementary materials for review prior to course attendance in order to facilitate an interactive "flipped classroom" approach to team based learning.

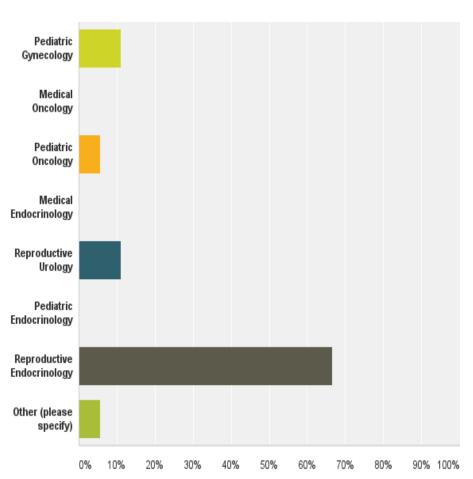


Course participants



- 36 registered participants
- Multi-disciplinary group
- Varied levels of training
- 83% found course structure extremely effective
- 78% felt preliminary readings contributed positively to learning
- 100% felt the depth of both lectures and cases was appropriate

Multi-disciplinary group



- PediatricGynecology
- Pediatric Oncology
- Reproductive Urology
- Maternal-fetal medicine

Majority REI

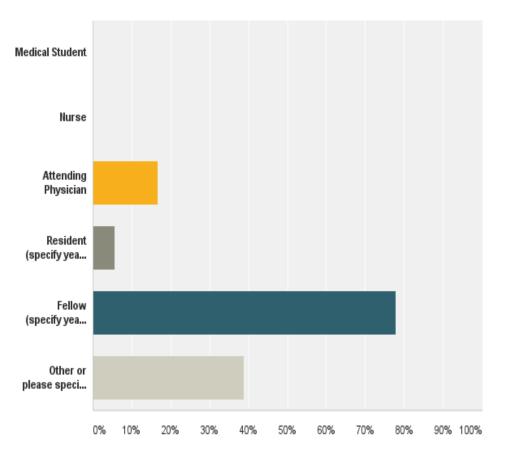


NETWORK

Varied levels of training

- Medical students
- Nurses
- Residents
- Attending physici

Majority fellows

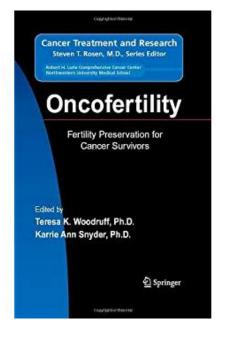


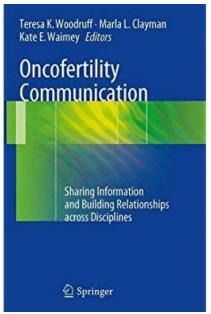


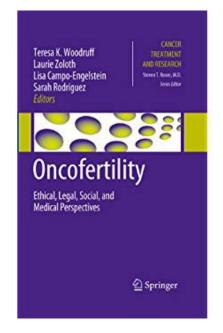


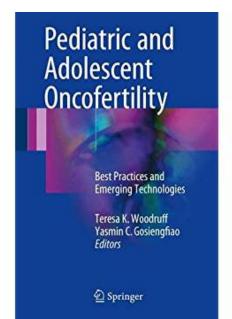
Sample written feedback

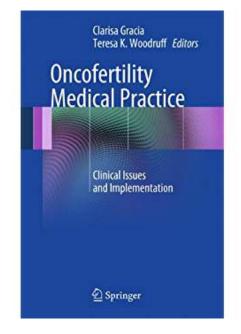
Quite simply, this seminar was superb. My congratulations and appreciation to the organizers. As an REI with 25 years experience, I can say without reservation that I learned a lot. Although designed (and very appropriate) for fellow education, I think this seminar was also perfect for those in my shoes – experienced practitioners that wish to become grounded in concepts related to oncofertility and fertility preservation. I would not change a thing. The mix of lectures and cases was perfect for me. Also, the placement of this seminar before the bulk of the conference helped me tremendously in my awareness during the next two days of presentations. In addition, I greatly enjoyed interfacing with fellows and their fresh up-to-date thinking! I cannot say enough positive or send enough praise! Kudos and thank you to all!

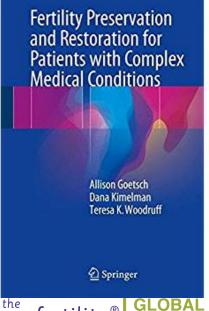












ONCOFERTILITY

NETWORK





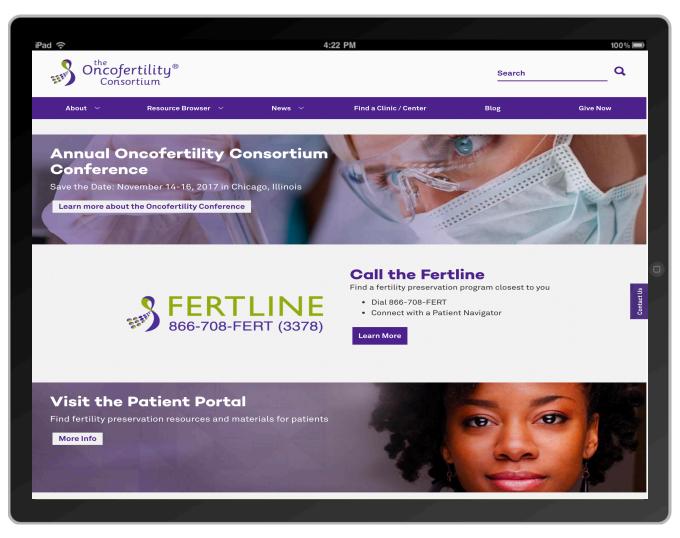
Oncofertility Website





Mobile Compatibility









SAVEMYFERTILITY



An online fertility preservation toolkit for patients and their providers

About Save My Fertility

Provider Pocket Guides

Patient Fact Sheets

Welcome to SaveMyFertility.org

SaveMyFertility.org is an authoritative resource for adult cancer patients and the parents of children with cancer who want to learn more about preserving their fertility before and during cancer treatment, and protecting their hormonal health after treatment.

SaveMyFertility.org also provides information and guidance to oncologists, endocrinologists, and other health care providers concerned with the reproductive health of cancer patients and survivors.



Provider Pocket Guides

Fertility Preservation for Children Diagnosed with Cancer

Fertility Preservation for Men Diagnosed with Cancer

Fertility Preservation for Women Diagnosed with Cancer

Fact Sheets

Children and Cancer:
Protecting Your Child's Fertility and Healthy Puberty

Men and Cancer:
Preserving Fertility and Managing Hormonal Symptoms

Women and Cancer:
Preserving Fertility

Women and Cancer: Managing Hormonal Symptoms



The public education affiliate of The Endocrine Society® 8401 Connecticut Avenue, Suite 900 Chevy Chase, MD 20815-5817 1-800-HORMONE



MyOncofertility
The Oncofertility Consortium®
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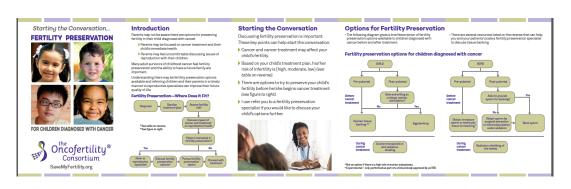


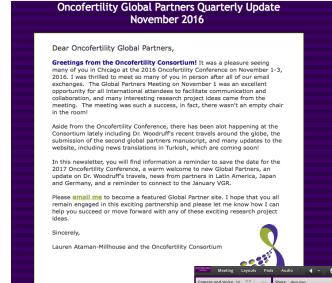
GLOBAL ONCOFERTILITY NETWORK

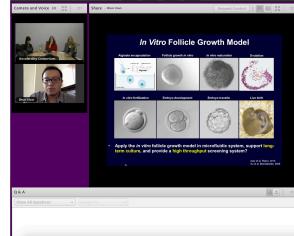
Outreach

Reaching key constituents regularly

- Monthly Newsletters
- Virtual Grand Rounds
- Visiting Scholars
- Website
- Blogs
- Updated
 SaveMyFertility brochures









Oncofertility Blog



News

Find a Clinic / Center

==

BLOG

About ~



February 13, 2017 by Lauren Ataman-M..

Colleagues in Tunisia at the Aziza Othmana ART Center of Tunis completed translating the SaveMyFertility materials into French. This work was completed by Fatma Douik, Khadija Berejeb Kacem, and Marouen Braham under the direction of Mohamed Khrouf (pictured). We thank them for their hard work and appreciate their efforts to make oncofertility materials accessible to patients in their native language.

Resource Browser V

Oncofertility materials are now available in the following languages:

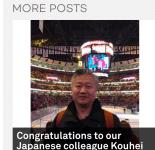
- English
- · Portuguese (Português)
- Japanese (日本語)
- · Turkish (Türkce)
- · Spanish (Español)
- Korean (한국어)
- · French (Français)

Use the resource browser to explore these pages throughout the website. All of the French translations can be found here or by using the language search function in the website.

If you wish to provide translations in your native language, please contact Lauren Ataman-Millhouse, who directs the efforts of the Global Partners Network.

Categories: Global Partner Tags: french, tunisia, mohamed khrouf





Sugimoto by Lauren Ataman-M...

February 9, 2017



by Lauren Ataman-M... January 27, 2017



Pediatric Oncofertility Research Foundation by Brigid Martz Smith January 25, 2017



by Brigid Martz Smith January 24, 2017



by Lauren Ataman-M... January 20, 2017



VGR: Oncofertility in Portugal

by Lauren Ataman-M... January 19, 2017



Summary

Advances in twenty-first century medicine requires well-trained basic scientists and clinical investigators who study reproductive science and medicine in partnership with a well-informed public.

Investment in the education of the next generation of innovators will improve the health of our globe.

