Oncofertility: The Preservation of Fertility Options for Young People with Cancer

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Preservation of Fertility After Cancer

- Life preserving treatments
  - Chemotherapy
  - Radiation
  - Surgery

- Can threaten fertility

...exploring and expanding options for the reproductive future of cancer survivors

Thursday, January 20, 2011
Who is at risk?

- More than **1.4 million people** are diagnosed in the U.S. with cancer annually.

- 10 million new cases of cancer are diagnosed **globally** each year.

- **10%** of these individuals are in their reproductive years (up to 45 years old).

- Approximately **11% of breast cancer patients** are diagnosed before the age of 40 years old.

  Jeruss and Woodruff, *NEJM*, 2009

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How big is the fertility problem?

- In 2006, estimated 1,700,000 female cancer survivors in US who were <40 at diagnosis.

- 20% reduction in achieving first pregnancy in pediatric survivors.

- 50% decrease in women diagnosed as young adults.

- Estimate that 748,000 currently have had their childbearing interrupted (plus another 38,500 per year).

Shover, personal communication
Fertility concerns beyond cancer treatment?

- Patients with **rheumatologic diseases** such as lupus, RA, and ulcerative cells
- **MS** patients receiving new generation treatments
- Patients undergoing **bone marrow or stem cell transplants** for an indication
- Individuals with **genetic mutations** that lead to loss of fertility and early menopause (e.g. Tuners Syndrome, Fragile X Carriers)
- Individuals who carry a **mutation** that predisposes that individual to certain types of cancer and anticipated treatment-induced risk of infertility (BRCA, MLH, MSH, APC, MEN)

Hirshfield, Gracia and Woodruff, *submitted*

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The Mission of the Oncofertility Consortium

To focus on the fertility threat poised by cancer treatment and serve as an authoritative voice for patients while creating corridors of discovery between research disciplines, clinical practice and training that can be created at the intersection of oncology, pediatrics, reproductive science, policy research, reproductive health law, bioethics, communication science, and cognitive and learning science.

...exploring and expanding options for the reproductive future of cancer survivors

This work was supported by the Oncofertility Consortium
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Fundamental Question:
What regulates follicle growth and oocyte maturation?
How can eggs and follicles be preserved without damage?

Scientific Community:
New Ideas or Approaches

Family

Cancer Survivor

Parents

Urgent Unmet Need:
Preservation of Fertility options after cancer

Legal, Ethical, Insurance

Information Gap:
Silo spanners, Building a Common Language, Integration Between Specialties

Oncofertility Multidiscipline Patient Management Board

Reproductive Endocrinologist

New Scholar

Oncologist

the Oncofertility Consortium

Woodruff, TK  Nature Review 2010
http://oncofertility.northwestern.edu/branding-materials
ASCO and ASRM practice guidelines

**ASCO**
- Discuss at the earliest possible moment potential fertility impairment
- Prompt referral to qualified specialist if patient is interested
- Promote clinical trials to advance state of knowledge

**ASRM**

“Parents may act to preserve fertility of cancer patients who are minors if the child assents and the intervention is likely to provide net benefits to the child”

**Oncologists** - limited time to act
- Multidisciplinary approach (allied health professional)
- Survivorship is paramount
- Small window of opportunity

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Options for men and boys

- Sperm Bank
- Testis Biopsy
- Donor Sperm
- Adoption

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Options for women and girls

- Embryo/Egg Bank
- Adoption, Surrogacy
- Natural Pregnancy
- Ovarian Cryopreservation

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In Follicle Maturation Provides Tool for Discovery

To see training videos and view additional references please visit:  http://oncofertility.northwestern.edu/

Pangas et al., Tissue Eng. 2003; Kreeger, et al., BOR, 2005; Biomaterials, 2006; West et al., Biomaterials. 2007; Xu et al., Biomaterials, 2006; BOR, 2009
New discoveries...basic

- Egg quality (aging)
- Ovarian context (rigidity)
- Gene networks
- Mechanisms of ovulation and lutenization
- *In vitro* assay for new chemotherapeutics

unpublished, Barnhart, Barrett, Duncan, Galdones, Kim, Xu
New discoveries...societal

- Legal concerns
- Religious constraints
- Ethics discussion
- Historical context
- Patient-Provider communication and decisions

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Dolin et al., *SCLR*. 2009
Zoloth L et al., AJB, 2008
Campo-Engelsten, L *JCO*, 2010
Gardino et al, *JARG*, 2010

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Take home message

Practice guidelines exist and recommend that the fertility threat associated with cancer treatment be discussed with all young cancer patients.

Options exist!

The Oncofertility Consortium was funded to:
- solve and intractable problem
- engage basic biology and social science
- create a global community of practice that is coordinated and sustainable

...exploring and expanding options for the reproductive future of cancer survivors
Our goal is to build the global program as a team and in so doing...

...expand options for the reproductive future of cancer survivors
When oncologists and fertility scientists and clinicians work together, patient needs are met and can

*change a devastating diagnosis into life-affirming interventions.*
Thank you!