Resources and Reflection on Fertility in CRC

Schedule of Events:
February 5, 2024, 1pm EST
February 12, 2024, 8pm EST

February 5, 2024

February 5th is a live zoom session featuring three doctors in the early onset colorectal cancer space or specialize in oncofertility. We also had the non-profit Worth the Wait presenting on ways to grow one's family post-diagnosis.

Dr. Andreana Holowatyj, PhD, MSCI - Vanderbilt
Dr. Holowatyj is the PI for the PREFACE Study (Preserving Fertility After Colorectal Cancer)
https://www.vumc.org/holowatyj-lab/preface-study

Dr. Kristen Ciombor, MD - Vanderbilt
Dr. Ciombor is an oncologist specializing in gastrointestinal cancers and co-leader of Vanderbilt’s Translational Research and Interventional Oncology Research Program.

Dr. Caitlin Martin, MD - University of Pennsylvania
Dr. Martin is a Reproductive Endocrinology and Infertility doctor and Assistant Professor of Clinical Obstetrics and Gynecology. Her special interests include infertility, fertility preservation, and oncofertility.

Megan Scherer - Executive Director & Co-Founder of Worth The Wait
Megan and her team provide financial support through the form of grants for cancer patients looking to undergo treatments or programs to either preserve their fertility or grow their family.
Elephants and Tea conducted a Healing through Writing workshop. Elephants and Tea is the media brand behind the Steven G Foundation and the only magazine written for and by the AYA community. The team at Elephants and Tea host workshops using writing as a tool to heal and communicate one’s AYA cancer journey.

Lisa Orr and Kayla Fulginiti guided the participants through the writing prompts below. Participants were given 3 minutes to write about how the topic impacts them and were encouraged but not required to share their writing as well as their feelings on these topics. Knowing that you’re not alone during these times of hardship can be extremely beneficial and we thank all of those who participated as well as our hosts for creating this safe environment to explore feelings, heartache, as well as hope for the future.

Writing Prompt 1:
What gives me joy?

Writing Prompt 2:
Describe your current status regarding fertility, family planning or family building. What emotion(s) do you notice while you write?

Writing Prompt 3:
Write about any practices or coping mechanisms that have helped you manage fertility, family building or family planning stress and anxiety. How do they make you feel?

Writing Prompt 4:
I am hopeful about...

Writing Prompt 5:
What I need right now is...
Many hospitals have early onset cancer center’s focusing on CRC. Hospitals with programs like this include: Memorial Sloan Kettering, Cleveland Clinic, Dana Farber, MD Anderson, Sunnybrook, Massachusetts General Hospital, Columbia University, and the University of Cincinnati amongst many others. It can be beneficial to ask your oncologist, or the information center at your hospital to see if your institution has a similar program for early onset patients.

**Worth the Wait**
Easing the financial burden for young adult cancer survivors preserving fertility pre- and post-treatment and starting a family through adoption, IVF, IUI or gestational surrogacy.
[https://worththewaitcharity.com/](https://worththewaitcharity.com/)

**Elephants and Tea**
Elephants and Tea is the media brand behind the Steven G Foundation and the only magazine written for and by the AYA community.
[https://elephantsandtea.org/](https://elephantsandtea.org/)

**Adoption Network Cleveland**
A nonprofit organization providing advocacy, education and support for all those impacted by adoption and foster care.
[https://www.adoptionnetwork.org/service-areas/education-community-outreach/](https://www.adoptionnetwork.org/service-areas/education-community-outreach/)

**Alliance for Fertility Preservation**
They are increasing access to information, resources and access to fertility preservation.
[https://www.allianceforfertilitypreservation.org/](https://www.allianceforfertilitypreservation.org/)

**Allyson Whitney Foundations**
Grants for egg retrieval and sperm banking. [https://allysonwhitney.org/grants/](https://allysonwhitney.org/grants/)

**Baby Quest**
Provides financial assistance through fertility grants to those who cannot afford the high costs of procedures such as IVF, gestational surrogacy, egg and sperm donation, egg freezing and embryo donation (not cancer specific). [https://babyquestfoundation.org/](https://babyquestfoundation.org/)

**Cade Foundation**
Helps couples by providing grants for fertility treatment costs associated or domestic adoption. Their Tinina Q. Cade Foundation™ Family Building Grant is an annual award that provides up to $10,000 to needy, infertile families (not cancer specific).
[https://cadefoundation.org/grants/family-building-grant](https://cadefoundation.org/grants/family-building-grant)
Chick Mission
Provides grants for women for egg/embryo freezing for cancer-related fertility preservation. They partner with clinics in California, Colorado, Illinois, New Jersey, New York and Texas.
https://www.thechickmission.org/

Fertility for Colored Girls
Seeking to provide education, awareness, support and encouragement to African American women/couples and other women of color experiencing infertility and seeking to build the families of their dream. Grants are available.
https://www.fertilityforcoloredgirls.org/gift-of-hope-award-application

Future Family
Surrogacy financing https://www.futurefamily.com

LiveStrong
Offers a financial assistance program for newly diagnosed men and women who are seeking to bank sperm, eggs or embryos prior to cancer treatment.
https://prod-io.livestrong.org/what-we-do/program/fertility

The Oncofertility Consortium
The Oncofertility Consortium is an international, interdisciplinary initiative designed to explore the reproductive future of cancer survivors. https://oncofertility.msu.edu/

Resolve New England
They offer free virtual peer support groups for family building and fertility topics. Their Cancer and Fertility Group meets on the 4th Thursday of each month at 7:30pm EST.
https://resolvenewengland.org/support/

Sam Fund of Expect Miracles
Their Family Building Grants are awarded twice a year to help young adult cancer survivors cover expenses related to medical services such as IVF, IUI, gestational carrier, surrogacy, adoption, and fertility testing. https://expectmiraclesfoundation.org/samfund/

Sunfish
Surrogacy financing https://joinsunfish.com/

The Broken Brown Egg
Empowering, informing and advocating for those experiencing infertility with an emphasis on the Black experience of it. https://thebrokenbrownegg.org/
United Colors of Cancer
Offering programs and fertility financial assistance for members of the BIPOC community. Their Fertility Preservation Award deadline closes 2/14/24. 
https://www.unitedcolorsofcancer.org/ucc-family-preservation-award/

Verna’s Purse
ReproTech’s program which strives to make fertility preservation services available to all individuals who are facing fertility-threatening treatment, therefore we are proud to offer a generous financial assistance program to patients faced with economic challenges, particularly at a time when it is hardest to handle. https://www.reprotech.com/ vernas-purse
Resources and Reflection on Fertility in Colorectal Cancer

Kristen K. Ciombor, MD, MSCI
Associate Professor of Internal Medicine
Division of Hematology/Oncology
Vanderbilt-Ingram Cancer Center
February 5, 2024
Colorectal Cancer

Adenocarcinomas that occur anywhere along the large bowel (ascending, transverse, and descending) into the rectum

Cancer.gov
## 2024 Cancer Statistics

### Male

<table>
<thead>
<tr>
<th>Estimated New Cases</th>
<th>Male</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>prostate</td>
<td>299,010</td>
</tr>
<tr>
<td></td>
<td>lung &amp; bronchus</td>
<td>116,310</td>
</tr>
<tr>
<td></td>
<td>colon &amp; rectum</td>
<td>81,540</td>
</tr>
<tr>
<td></td>
<td>urinary bladder</td>
<td>63,070</td>
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<tr>
<td></td>
<td>melanoma of the skin</td>
<td>59,170</td>
</tr>
<tr>
<td></td>
<td>kidney &amp; renal pelvis</td>
<td>52,380</td>
</tr>
<tr>
<td></td>
<td>non-Hodgkin lymphoma</td>
<td>44,590</td>
</tr>
<tr>
<td></td>
<td>oral cavity &amp; pharynx</td>
<td>41,510</td>
</tr>
<tr>
<td></td>
<td>leukemia</td>
<td>36,450</td>
</tr>
<tr>
<td></td>
<td>pancreas</td>
<td>34,530</td>
</tr>
<tr>
<td></td>
<td>all sites</td>
<td>1,029,080</td>
</tr>
</tbody>
</table>

### Female

<table>
<thead>
<tr>
<th>Estimated New Cases</th>
<th>Female</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>breast</td>
<td>310,720</td>
</tr>
<tr>
<td></td>
<td>lung &amp; bronchus</td>
<td>118,270</td>
</tr>
<tr>
<td></td>
<td>colon &amp; rectum</td>
<td>71,270</td>
</tr>
<tr>
<td></td>
<td>uterine corpus</td>
<td>67,880</td>
</tr>
<tr>
<td></td>
<td>melanoma of the skin</td>
<td>41,470</td>
</tr>
<tr>
<td></td>
<td>non-Hodgkin lymphoma</td>
<td>36,030</td>
</tr>
<tr>
<td></td>
<td>pancreas</td>
<td>31,910</td>
</tr>
<tr>
<td></td>
<td>thyroid</td>
<td>31,520</td>
</tr>
<tr>
<td></td>
<td>kidney &amp; renal pelvis</td>
<td>29,230</td>
</tr>
<tr>
<td></td>
<td>leukemia</td>
<td>26,320</td>
</tr>
<tr>
<td></td>
<td>all sites</td>
<td>972,060</td>
</tr>
</tbody>
</table>

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Siegel R et al, *CA Cancer J Clin* 2024; 1-38
Colon Cancer Epidemiology

Colon Cancer Cases Arising in Various Family Risk Settings

- Sporadic Cases
- Cases with Familial Risk 10% to 30%
- Lynch Syndrome (Hereditary Nonpolyposis Colorectal Cancer) 2% to 3%
- Familial Adenomatous Polyposis <1%
- Hamartomatous Polyposis Syndromes <0.1%
Annual Percentage Change–Based Predicted Incidence Rates of Colon Cancer by Age Compared With Incidence Rate in 2010

Colorectal Cancer Staging

- Superficial → Stage I
- Deep (through muscularis), no nodes → Stage II
- Lymph nodes → Stage III
- Metastatic disease → Stage IV

- Impact of staging on treatments necessary, prognosis
- For all CRC patients of any stage: check for microsatellite instability (MSI-H) or mismatch repair (MMR) deficiency
  - Can affect prognosis and treatment options (immunotherapy), help identify Lynch syndrome
Localized Colorectal Cancer Treatment

• Colon cancer:
  – **Surgery** first with or without adjuvant (postoperative) chemotherapy
  – Chemo: usually FOLFOX or CAPOX

• Rectal cancer (last 15 cm):
  – Significant changes in treatment over the last decade
  – More personalization of treatment based on many factors (stage, location, patient preferences)
  – **TNT** (total neoadjuvant therapy) very common
  – Potential for nonoperative management
Adjuvant Therapy for Colon Cancer

• **What is adjuvant therapy?**
  – Administration of additional therapy following complete surgical removal of all visible tumor

• **Why is it given?**
  – To eradicate any micrometastatic disease and increase cure rates

• **What chemotherapies are used?**
  – 5-fluorouracil (via port) or capecitabine (oral)
  – Oxaliplatin (via port)
CRC Chemotherapy Toxicities

• FOLFOX/CAPOX
  – Cold sensitivity, neuropathy

• FOLFIRI
  – Hair loss, diarrhea

• Common toxicities:
  – Fatigue, nausea, mouth sores, decreases in blood counts, temporary infertility
  – Teratogenic effects (effects on fetus)
Fertility Concerns in CRC Treatment

- Pelvic radiation (rectal cancer)
- Surgery (type, location)
- Chemotherapy (type, amount)
- Timing/sequencing of each treatment
- Planning treatment with future fertility in mind
- Personalization of treatment sequencing, treatment modalities received
Fertility in CRC Survivorship

• Once treatment is complete:
  – Discuss necessary ongoing surveillance with your treatment team
  – CT and MRI scans, colonoscopies and anesthesia
  – Impacts of surveillance and recurrence on fertility
  – Recurrence risk in first 5 years after treatment

• Importance of germline genetic testing
  – Hereditary risk of cancer for you and family members (including children)
Thank you!
Webinar – Fertility preservation/Family Building Options

Caitlin Martin, MD
Assistant Professor, Reproductive Endocrinology and Infertility
University of Pennsylvania
Instagram @drcaitlinmartinmd
Outline

- Fertility Preservation
- How to start a family in survivorship
- Using a surrogate/gestational carrier
- Ovarian transposition
- Donor-conceived options
Fertility preservation options

- *Egg/embryo freezing*
- Ovarian tissue cryopreservation
- Leuprolide acetate suppression
- Ovarian transposition
Egg/Embryo Freezing

IVF Process

Before getting started:
- IVF information video
- Nursing Consult
- Sonohysterogram
- Mock Embryo Transfer
- Semen Analysis
- Genetic Carrier Screening
- Other - ____________

Birth Control Pill

FSH injection daily (for 8-14 days) + Medication to prevent ovulation GNRH antagonist

Period starts after stopping pill Baseline ultrasound and bloodwork to measure follicles and hormone levels

Close monitoring with ultrasounds and bloodwork

Once largest follicles 18-22mm hCG and/or Lupron given
Egg retrieval occurs 36 hours later

Eggs may be fertilized conventionally or with ICSI

Vaginal egg retrieval

Day 1 Fertilized egg (2PN+)
Day 3 6-8 cell embryo
Day 5 Blastocyst
Sperm banking

- Amount of sperm in sample dictates how sperm could be used in the future
How to approach family building

Female
- Female fertility is related to age
- How far out are you from treatment?
- Has your doctor “cleared” you to get pregnant?
- Should you see a high risk pregnancy doctor?
- Are you having menstrual cycles?
- Are you experiencing signs of menopause?

Male
- How far out from treatment are you?
- Any signs of sexual dysfunction?

?is there an inherited gene?
Using a gestational carrier/surrogate

- If received significant pelvic radiation, concern that uterus cannot properly support a pregnancy
- Requires IVF
- Laws vary from state-to-state
- Cost/insurance varies
- Known carrier vs. carrier through an agency
Gestational Carrier Guidelines

- Age: preferably 21-45
- Past pregnancy: ideally at least one term, uncomplicated pregnancy
- Parity: ideally no more than 5 total previous deliveries or three deliveries via cesarean section
- Stable family environment to support her during pregnancy
- Psychological evaluation
- Medical evaluation to be cleared for pregnancy
- Nonsmoker
- Laboratory testing to rule out infectious diseases that could be transmitted to fetus
- Legal representation by qualified legal practitioner experienced with gestational carrier contracts
Ovarian transposition

- Moving ovary out of field of radiation
Donor-conceived options

- Donor sperm
- Donor oocytes (eggs) – known donor vs. through egg bank
- Donor embryos – “embryo adoption”
Adoption
Journey

- The journey is short for some, long for others, we’re here to help guide you along the way
Preserving Fertility After Colorectal Cancer: The PREFACE Study

Andreana N. Holowatyj, PhD, MSCI
Assistant Professor of Medicine and Cancer Biology, Vanderbilt University Medical Center
Board of Directors, Young Adults with Cancer Program, Vanderbilt-Ingram Cancer Center
Research Director, Vanderbilt University School of Medicine
Chair, Scientific Advisory Board, ACPMP Research Foundation
@drholowatyj
Disclosures

Dr. Holowatyj (ANH) reports receiving grants from the National Institutes of Health [NIH], Dalton Family Foundation, Pfizer, American Cancer Society and ACPMP Research Foundation.

ANH chairs the Scientific Advisory Board for the Appendix Cancer Pseudomyxoma Peritonei [ACPMP] Research Foundation and serves on the Board of Directors for the VICC Young Adult Cancers Program.

ANH is a member of the American Joint Committee on Cancer (AJCC) Expert Panel on Cancers for the Lower GI Tract, FightCRC Early-Age Onset Colorectal Cancer Workgroup and the Peritoneal Surface Malignancies Consortium.
Improving reproductive health and clinical care for patients with early-onset CRC

The PREFACE Study aims to comprehensively address needs in reproductive health care that face patients after an early-onset CRC diagnosis.

How do we improve reproductive health care assessment and adherence to clinical guidelines for ALL patients with early-onset CRC?

• Establish fertility and sexual health measurement tools to be used in clinical practice for early-onset CRC.
• Create a resource platform for all patients and providers to be able to publicly access.

How do we support universal insurance coverage of fertility treatment(s) for females and males after an early-onset CRC diagnosis?

• Deliver key biological evidence on colorectal cancer-related infertility among patients of reproductive age.
PREFACE Study: A “personalized” clinical study approach

Clinicaltrials.gov: NCT05239338 (PI: Holowatyj)

Adults ages 18-49 newly-diagnosed with CRC

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Cancer treatment</th>
<th>Surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults ages 18-49 newly-diagnosed with CRC</td>
<td>Neoadjuvant Therapy</td>
<td>Survey / MP*</td>
</tr>
</tbody>
</table>

- Survey
- Blood draw
- Menstrual patterns (MP)*
- Physical activity (PA) Measurement

Clinicaltrials.gov: NCT05239338 (PI: Holowatyj)
Holowatyj Lab/Team
Rebecca Babyak
Rachel Francis
Alexander Adams
Samantha Keller
Lisa Long

PREFACE Study
www.theprefacestudy.org
• prefacelystudy@vumc.org
• (615) 936-6204
• NCT05239338
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- Division of Surgical Oncology
- Department of Surgery
- Department of Radiology

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