Fertility preservation efforts in children, adolescents and young adults with cancer

SPU meeting 2019

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Things we teach our kids

Inquirer
Knowledgeable
Thinker
Communicate
Principled

Open minded
Caring
Risk taker
Balanced
Reflective
Being a risk taker...

Creative thinking acknowledges and rejects the accepted paradigm to come up with new ideas.
Tubules may show residual foci of spermatogenesis
>100 healthy children reported born after ICSI with testicular sperm from non-mosaic KS men following testicular sperm extraction

What can we learn from this?

• Assumptions are dangerous

• Lack of foresight and restrictive thinking can have important consequences
INNOVATION
Number of sperm needed, over time

Keep trying, and trying

IUI

IVF

ICSI

TODAY!
Baby Grady (GRAft-Derived baby; 2 weeks old)
FEAR, UNCERTAINTY AND DOUBT
• Oncological surgery, chemotherapy and radiation can have a dramatic and long lasting impact on fertility

• Best case scenario, its subclinical
### Post-pubertal males

<table>
<thead>
<tr>
<th>Risk of Infertility</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-pubertal boys</td>
<td>Sperm bank</td>
<td>Sperm bank</td>
</tr>
</tbody>
</table>

**Standard of Care**
Pre-pubertal males

<table>
<thead>
<tr>
<th>Risk of Infertility</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-pubertal boys</td>
<td>?</td>
<td>Testicular Biopsy</td>
</tr>
</tbody>
</table>

Unproven Technology
Fertility Preservation for Patients With Cancer: American Society of Clinical Oncology Clinical Practice Guideline Update


**Key Recommendations**
- Discuss fertility preservation with all patients of reproductive age (and with parents or guardians of children and adolescents) if infertility is a potential risk of therapy
- Refer patients who express an interest in fertility preservation (and patients who are ambivalent) to reproductive specialists
- Address fertility preservation as early as possible, before treatment starts
- Document fertility preservation discussions in the medical record
- Answer basic questions about whether fertility preservation may have an impact on successful cancer treatment
- Refer patients to psychosocial providers if they experience distress about potential infertility
- Encourage patients to participate in registries and clinical studies

ALL!!!
Risk vs. benefit?

What does the procedure entail?

Minimal risk

At time of other interventions/anesthesia
Bottom line

• *In vitro/in vivo* maturation techniques *very likely* to evolve and become feasible in the future

• We have time!
• *In vitro* vs. *in vivo* maturation
  – Transmission of genetic defects, predisposition to cancer/other diseases
  – Reintroduce neoplasm (leukemias)
Too Much
Too Little
Just Right
Rule #1
Do No Harm
Second, Do Good
OUR goal
Fertility Preservation Program

Welcome
About us
What is fertility preservation?
Meet our team
Referrals
In the news
Resources
Contact us

Fertility Preservation Program

For patients at or beyond puberty, egg or sperm samples can be taken and frozen for future use — a relatively novel process itself called "onco-fertility." Until now, though, there was no way to reverse the sterilizing effects of chemotherapy and radiation on the youngest of patients — babies, toddlers and grade-schoolers.

Enter, the SickKids Fertility Preservation Program.

Welcome to our new website! Here, you will find interesting and informative content from some of the world's leading experts in the field.

Keep this site book-marked, as we will be launching more great content to help guide our patients and their families.
SKFPP yearly activity

Total number of consults = 71

- Total number of males = 43
  - Total number of pre-pubertal = 31
    - Total number offered TB = 31
      - Total number accepted TB = 19
    - Total number of post-pubertal = 20
      - Total number offered SB = 14
        - Total number accepted SB = 6
  - Total number of post-pubertal = 20
    - Total number offered TB = 31
      - Total number accepted TB = 19
    - Total number of post-pubertal = 20
      - Total number offered SB = 14
        - Total number accepted SB = 6

- Total number of females = 28
  - Total number of pre-pubertal = 10
    - Total number offered OTC = 10
      - Total number accepted OTC = 2
      - Unable to coordinate = 2
    - Total number of post-pubertal = 8
      - Total number offered OC = 8
      - Total number accepted OC = 0

- Total number offered TB = 31
- Total number offered SB = 14
- Total number offered OTC = 10
- Total number offered OC = 8

- Total number accepted TB = 19
- Total number accepted SB = 6
- Total number accepted OTC = 2
- Unable to coordinate = 2
- Total number accepted OC = 0
<table>
<thead>
<tr>
<th>Age at surgery (years)</th>
<th>Diagnosis</th>
<th>Platelet (x10⁹/L)</th>
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<tbody>
<tr>
<td>7.8</td>
<td>Relapse high risk precursor B cell ALL*</td>
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<tr>
<td>6.4</td>
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<tr>
<td>14.6</td>
<td>Relapsed intravascular large B cell lymphoma*</td>
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<td>8.8</td>
<td>Rhabdomyosarcoma of R parameningeal</td>
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<tr>
<td>13.4</td>
<td>Aplastic anemia</td>
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<td>4.4</td>
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<td>3.8</td>
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<tr>
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<tr>
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<td>Relapsed T cell ALL*</td>
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<tr>
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<td>AML*</td>
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<tr>
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<tr>
<td>1.0</td>
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<td>4.4</td>
<td>Stage IV Neuroblastoma*</td>
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<tr>
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<td>10.1</td>
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<tr>
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<tr>
<td>12.4</td>
<td>Medulloblastoma</td>
<td>327</td>
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<tr>
<td>7.2 + 4.5</td>
<td>* prior chemotherapy</td>
<td>229 + 150.3</td>
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<tr>
<td></td>
<td># prior radiation therapy</td>
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</table>
The message: “I’m willing to bet on you making it”

Parents need hope to function effectively in the face of despair (The Oncologist 2012;17:398–404)
SickKids
Division of Urology

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