Coping with Post-transplant Issues

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Outline

- Historical prospective
- Long-term Follow Up Posttransplant Population at the Fred Hutch and Seattle Cancer Care Alliance
- Targeting Surveillance Issues
- Resilience
Transplant Activity in the US

**Graph:**
- **Blue line:** Autologous transplants
- **Green line:** Related Donor HCT
- **Orange line:** Unrelated Donor HCT

**Data:**
- The data is incomplete for the year 2012.

**Legend:**
- Transplants on the y-axis range from 0 to 14,000.
- Years range from 1980 to 2012.*

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N = 1418 vs. 1148

↓day 200 non-relapse mortality by 60%

↓overall mortality by 41%

Gooley TA et al. NEJM 2010; 363: 2091
Reasons for improved early mortality

- Transplants in less advanced malignant diseases
- Improved infection control and supportive care
- Better HLA matching
- New immunosuppressive agents and other strategies to decrease the risk of chronic GVHD
- Less toxic regimens
- Use of peripheral blood as source of stem cells
Decreased early mortality after HCT

- Greater number of Hematopoietic Cell Transplant long term survivors world wide
Overall survival increased in the past 30 years

- Among 2 year DFS, subsequent survival:
  - 90% at 5 years
  - 85% at 10 years
  - 80% at 15 years

- Among 5 year DFS, subsequent survival:
  - 80% at 20 years

Flowers and Deeg, HJ in Thomas's HCT, 4th Ed., 2009

Socie et al, NEJM 1999
Bhatia et al, BLOOD 2007
Martin et al, JCO 2010
Fred Hutch HCT Long-term follow Up (LTFU) Population

- > 6,000 posttransplant survivors between 2 months and 43 years after HCT (LTFU Clinical Service)
- > 4,800 posttransplant survivors (LTFU Research)
Patients currently being followed by LTFU Research (N=4819)*

- 5320 – potentially eligible patients
  - 25 (22 refused/off study, 3 no consent for protocol 999)
  - 34 (contact prohibited)
  - 145 (never sent PRQ)
  - 297 (not sent PRQ since 2010)

Courtesy of Stephanie Lee
## Patients currently being followed

<table>
<thead>
<tr>
<th>Diagnoses</th>
<th>&lt; 1</th>
<th>1-4</th>
<th>5-9</th>
<th>10-14</th>
<th>15-19</th>
<th>20-24</th>
<th>25+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Leukemias</td>
<td>55</td>
<td>301</td>
<td>257</td>
<td>154</td>
<td>130</td>
<td>142</td>
<td>229</td>
<td>1268</td>
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<tr>
<td>Aplastic Anemia</td>
<td>1</td>
<td>23</td>
<td>23</td>
<td>23</td>
<td>20</td>
<td>42</td>
<td>164</td>
<td>296</td>
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<tr>
<td>Myelodysplastic syndrome (MCS)</td>
<td>23</td>
<td>101</td>
<td>97</td>
<td>96</td>
<td>55</td>
<td>37</td>
<td>14</td>
<td>423</td>
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<tr>
<td>Chronic lymphocytic leukemia (CLL)</td>
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<td>23</td>
<td>17</td>
<td>12</td>
<td>3</td>
<td>1</td>
<td>0</td>
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<tr>
<td>Chronic myeloid leukemia (CML)</td>
<td>2</td>
<td>16</td>
<td>44</td>
<td>155</td>
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<td>239</td>
<td>136</td>
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<tr>
<td>Lymphoma</td>
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<td>309</td>
<td>255</td>
<td>131</td>
<td>95</td>
<td>70</td>
<td>36</td>
<td>951</td>
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<tr>
<td>Multiple Myeloma</td>
<td>39</td>
<td>303</td>
<td>130</td>
<td>51</td>
<td>8</td>
<td>4</td>
<td>1</td>
<td>536</td>
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<tr>
<td>Solid Tumors</td>
<td>2</td>
<td>24</td>
<td>21</td>
<td>28</td>
<td>66</td>
<td>11</td>
<td>3</td>
<td>155</td>
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<tr>
<td>Other$^2$</td>
<td>15</td>
<td>91</td>
<td>55</td>
<td>40</td>
<td>14</td>
<td>14</td>
<td>15</td>
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<tr>
<td>Multiple diagnoses</td>
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<td>16</td>
<td>7</td>
<td>6</td>
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<tr>
<td><strong>Total</strong></td>
<td>198</td>
<td>1236</td>
<td>915</td>
<td>697</td>
<td>615</td>
<td>560</td>
<td>598</td>
<td>4819</td>
</tr>
</tbody>
</table>

$^1$As of 12/31/13, sent a PRQ since 2010

$^2$Neoplasms, disorders of hematopoietic or immunologic and metabolic inborn errors
Greater number of HCT long term survivors are at an increased risk for late complications
What are the late HCT complications risks

- Chronic GVHD (allogeneic)
- Delayed immune reconstitution (infections)
- Cardiovascular events
- Metabolic syndrome
- Iron overload
- Endocrine complications (growth and development, early menopausal, fertility)
- Ocular complications
- Bone complications (osteoporosis, AVN)
- Development of new cancer
- Psycho-social issues
Targeting Surveillance Issues in HCT Survivors

- Depression, fatigue, aches and pains
- Structured exercise (20 minutes daily)
- Bone health
- Sexual and mental health
- Maintaining ideal weight
- Cancer screening
  - Oral/head and neck exam (twice yearly)
  - Skin (yearly, or more often as indicated)
  - Mammogram
  - Testicle/prostate examination
  - Colonoscopy
- Blood tests to include fasting lipids, blood cell counts, etc.
- Health maintenance and encourage healthy life style (diet, avoid bad habits, solar protection)
Coping with post-transplant issues

- Survivors of Hematopoietic Cell Transplant (HCT) experience high burdens of medical and psychosocial late effects
- Methods to identify and intervene with high risk patients may improve survivorship care and outcomes.
Does the “Fred Hutch” LTFU Model matter?
Survival after chronic GVHD over time
Survival according to CIBMTR risk score in chronic GVHD at two individual Centers

CIBMTR (n=3550)  Seattle (n=268)  Toronto (n=108)

Inamoto, Kim, Flowers et al.  *BLOOD*  2014
Conclusions

• Progress in HCT has lead to a growing population of long term survivors of hematological malignancies and other diseases

• Long-term follow-up of HCT survivors is important and involves prevention, screening, appropriate interventions, counselling and patient education
Acknowledgement

Seattle Hematopoietic Cell Transplant Team
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- Rachel Salit
- David Madtes
- Guang-Shing
- David Madtes
- Guang-Shing Cheng
- Mark Shubert

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- Tracey Godlewski
- Kristen Kindsvogel
- Dow Dunbar (TTC)
- Deb Matson (ID)

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- Judy Campbell (retired)
- Anne Chafee
- Mihkai Wickline
- Rose Rivet
- Elaine Hagan
- Donna Kovich
- Jackie Saxon
- Anne Carlson

Support staff
LTFU Clinical Staff

Also Mihkai Wickline, Rose Rivet and others

Supporting more than 6,000 LTFU patients transplanted in Seattle
LTFU Clinical Service

LTFU Attending physicians
- Stephanie Lee (Research Director)
- Paul Carpenter (LTFU Peds/adult)
- Leona Holmberg (LTFU Autologous)
- Merav Bar (LTFU & TTC)
- Edus Warren (LTFU)
- Mathew Fero (LTFU)
- Rachel Salit (LTFU)
- Laura Connely-Smith (TTC)

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- Karen Syrjala (Psychology)
- Deb Matson (ID)

LTFU Clinical Staff
- Carina Moravec, ARNP
- Judy Campbell, RN
- Colleen Mackinnon, RN
- Anne Chafee, RN
- Donna Kovich, RN
- Elaine Hagan, RN
- Joanne Quinn, RN (TTC)
- Tracey Godlewski, PA-C
- Mary Schubert, ARNP
- Suni Edgar, RN (RN supervisor)
- Colleen Duffy (support staff supervisor)
- Tamarin Jenkins, PCC
- Laurell Haapanen, PCC
- Carmina Politan Edwards, PCC
- Tara Osborne, support staff
- Jesse McLain, support staff
- Bonnie Samsel, team scheduler
- Stevie Jacobson, team scheduler

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