Safeguard Your Health from Late Complications after a Transplant Using Donor Cells

Celebrating a Second Chance at Life Survivorship Symposium

April 30 - May 6, 2022

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Sarah Cannon Transplant & Cellular Therapy Program at TriStar Centennial
Financial Relationships

No relevant financial relationship(s) exist

Long Term/Late Survivorship Issues in Allogeneic Stem Cell Transplantation

Overview

- Why? Emphasis on quality of survivorship in HCT
- When? Time frames for complications
- What? Broad spectrum of long term/late health problems including lethal complications
- How? Care delivery to survivors
Increasing HCT survivors

More transplants

New focus on long term survivorship

2020: >250,000
2030: >500,000

60% auto HCT; 40% allogeneic HCT
60% aged 18-59


We can only wish.........
Cured, but at what cost?

~80% will have one or more late effects at 5 years

5-year life expectancy is 30% lower than the general population

Cupid-Link, et al. Hem Onc Stem Cell Ther. 2018

Khera, et al. JCO 2012
Martin, et al. JCO 2010

Long term and late effects impact all domains of health
Why do long term and late effects occur?

- Conditioning regimen
  - Gonadal failure
  - Cardiovascular
  - Thyroid failure
  - Endocrine
  - Cataracts
- Pre-transplant/genetic predisposition
  - Osteoporosis
  - Pulmonary failure
  - Second cancers
  - Iron Overload
- Infection
  - c-GVHD
  - Immune dysfunction

Timeframes for complications

- Years: 1, 3, 5, 10, 15, 20, 30, 50
- A-GVHD
- C-GVHD
- Viral
- Relapse
- Thyroid failure
- Male fertility
- Bone loss
- Cataracts
- Pulmonary
- Cardiovascular
- New Malignancies
- HSC exhaustion?
- Aging?
- Neurodegen?

Late effects
Key late effects

- Infections
- Secondary cancers
- Heart
- Lung
- Endocrine/metabolic
- Bone
- Sexuality/infertility
- Iron overload
- General health – fatigue, cramps, sleep,
  “Chemo-brain”
- Mental/emotional

Late Fatal Infections 2+ years after transplant

- Bacterial 55%
- Fungal 18%
- Viral 16%
- Multiple 11%

Norkin, et al. BBMT 2019
Preventing Infections

**Prevention [prophylaxis]**
- Antifungal [“azole”]
- Antiviral [acyclovir]
- Anti PCP/toxo [Bactrim/dapsone]
- Antibacterial [PCN for cGVHD]

**When to start??**
- @ 3months- COVID and Influenza
- @6months PLUS off immunosuppression- routine vaccines

Second Cancers “Subsequent Neoplasms”

- 3-fold higher risk of another cancer after transplant
- An entirely different cancer
- Cumulative doses of chemo and radiation
## Site | Cancer screening & prevention
---|---
### Skin ****
- *Dermatologist skin exam* (annually)
- *Sunscreen* (broad spectrum UVA&UVB, high SPF >30)
  - Avoid peak sun, sunglasses, hats, protective clothing

### Thyroid
- Annual physical exam

### Mouth/throat
- *Stop tobacco / alcohol*
- *Dental exam every 6 months*
  - *HPV vaccination*

### Lung
- *Stop tobacco in all forms*
- *Low-dose CT scan* for high risk:
  - >55 years and ≥30 pack-year smoking history (excluding those who quit >15 years ago)
  - ≥50 and ≥20 pack-year smoking history with additional risk factor (asbestos, family history, second hand smoke)

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## Site | Cancer screening & prevention
---|---
### Breast
- Age 20-40 years: clinical breast exam every 1-3 years
- Age > 40 years: annual clinical breast exam; annual mammogram
- Radiation: Age 25 years or 8 years after radiation, whichever comes first, but no later than age 40 years:
  - *annual clinical breast exam plus annual mammogram or breast MRI*

### Cervical ****
- *Annual Pap test and HPV DNA test*
- *HPV vaccination*

### Esophageal
- Symptom-based screening for GERD or difficulty swallowing:
  - *GI endoscopy*

### Colorectal
- Starting at age 50
  - *Fecal occult blood* or *fecal immunochemical test* annually
    - *Sigmoidoscopy or CT Colonography* every 5 years
  - *Colonoscopy* every 10 years

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Inamato Y et al. BMT 2015
Heart (cardiac) and blood vessel (vascular)

**Risk:**
- 3-4 x higher than general population
- Premature events (first myocardial infarction ~14 years earlier)
- Risk is permanent and tends to increase with time after transplant

**Screening:**
- Start first year after transplant
- Correct blood pressure, cholesterol, diabetes, weight, smoking
- Echocardiogram, CT angiogram/stress test, EKG

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Lung health

**STOP all smoking/vaping**

**Infections**
- Get vaccinated
- Seek medical attention early
Lung injury from GVHD

- **COP “Cryptogenic organizing pneumonia”**
  - Symptomatic early
  - “Pneumonia that does not respond to antibiotics” – fever, cough, breathlessness
  - Chest CT scan
  - Reversible with steroids, 6-12 months of treatment

- **BOS “Bronchiolitis obliterans”**
  - Silent! Generally irreversible once symptoms appear
  - Pulmonary function tests every 3 months if you have cGVHD or 6-12 months otherwise for first 5 years

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**Bone health**

**Osteoporosis/osteopenia**

- 20% osteoporosis by 2 years post-transplant
- Compression fractures (spine/hip)
- Risk: F>M, age, steroids, vitamin D, GVHD, low sex hormone, sedentary lifestyle
- Screening: Vit D levels, bone density scan [DEXA]
- Interventions: Exercise, calcium/vitamin D, bisphosphonates, hormone replacement therapy

**Avascular necrosis**

- Severe pain and joint fractures (hips/knees)
- Risk Factors: Steroids, radiation
- Detection: MRI
- Interventions: Orthopedics
Endocrine and metabolic issues

- Thyroid
  - low thyroid hormone levels
- Diabetes
- Cholesterol
- Sex hormones:
  - low sex drive
  - fatigue
  - vaginal changes and pain
  - erectile dysfunction
  - infertility

  Ovarian failure – hormone replacement up to natural menopause

  Low testosterone – Testosterone supplementation does not work well

General/other health issues

- Fatigue
  - Treat underlying medical cause/pain
  - Reduce work-load to part time
  - Exercise
  - Strategic naps
- Sleep disturbance – CBT, sleep hygiene
- Muscle cramping – hydration, tonic water
- Mental health challenges

- Brain fog (aka chemo-brain):
  - short-term memory loss
  - slow thinking
  - word-finding difficulty
  - learning impaired, executive function
  - may improve 1 to 5 years after transplant
  - cognitive rehabilitation, methylphenidate/modafinil
General/other health issues cont’d

- **Eyes:**
  - Premature cataracts
  - Dry eye syndrome - sunglasses, drops
  - Annual eye exam

- **Mouth:**
  - Dry mouth
  - Cavities
  - Regular dental exam

- **Kidney:**
  - Check urine protein

- **Liver:**
  - Avoid alcohol
  - Improve diet & exercise

- **Iron overload:**
  - Phlebotomy

- **Neuropathy:**
  - Neurologist, foot care

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**Adopt a healthy lifestyle**

- **DIET**
  - healthy, balanced diet including at least five daily servings of fruits and vegetables
  - multivitamins without iron, supplements for calcium and vitamin D

- **EXERCISE**
  - weight-bearing, stretching/yoga, ~20-60 min/day

- **INFECTION** - hand washing

- **SLEEP** - sleep hygiene

- **HABITS** - Stop smoking, stop nicotine, moderate alcohol

- **SPECIALIST CARE** - GYN, DENTAL, EYE, SKIN

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- Diabetes
  - Weight
  - Osteoporosis
  - Cholesterol
  - Heart/vessel health
- Strong bones
  - Fatigue
  - Memory/brain
  - Flexibility
- Fatigue
- Lungs
  - second cancers
- Second cancer
  - quality of life
Survivorship clinic

Simple screening & prevention can greatly improve survivor health

Referring Oncologist

Transplant coordinator

Primary Care

BMT MD

Cancer control
GVHD
Infection

Survivorship visit- Day 100, 6 months, annual

- Dental
- Gynecology
- Endocrine
- Fertility
- Psychology
- Ophthalmologist
- Dermatology
- Pulmonology
- Cardiology
- Infectious Disease
- Clinical Pharmacist
- Social Work

Scholl, et al. EBMT 2018

INDIVIDUALIZED SURVIVORSHIP CARE PLAN

- Given to patient and referring physician/consultants when they return home ~ day 100
- Lists transplant therapy: chemo - radiation, GVHD prevention
- Occurrence of GVHD
- Recommends care based upon age, treatments, sex, current complications
## Where to seek help

### After Transplant Guidelines for Patients
- Transplant guidelines mobile app
  - Customizable 6-month and yearly checkup guidelines
  - Chronic GVHD symptom checker
  - Set reminders (appointments, medicines, etc.)
  - Search “transplant guidelines” in app stores to download
- 6-month and yearly guidelines also available online and print:
  [BeTheMatch.org/CareGuide](https://www.bethematch.org/careguide)

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## CONCLUSIONS

- Late complications are frequent following a transplant with donor cells
- Commit to lifelong follow-up
- Multidisciplinary care - Survivorship clinics +/- individual survivorship care plans
- Own your health -
  - Practice good health (diet, exercise, habits)
  - Know your treatment and the complications
  - Understand future risks
  - Ask questions
OTHER WORKSHOPS WITH MORE INFORMATION

All times Central Time

- **Heart and Vascular Health**: *(Saturday, April 30, 1:30 pm)*
- **Managing Fatigue**: *(Sunday, May 1, 12:15 pm; Thursday, May 5, 12:15 pm)*
- **Secondary Cancers**: *(Sunday, May 1, 1:30 pm)*
- **Infections**: *(Monday, May 2, 11 am)*
- **Lung/Breathing Problems**: *(Monday, May 2, 1:30 pm)*
- **Sexual Health**: *(Monday, May 2, 12:15 pm)*
- **Attention and Memory Problems**: *(Tuesday, May 3, 12:15 pm)*
- **Managing Sleep Problems**: *(Tuesday, May 3, 1:30 pm)*
- **Bone Health**: *(Wednesday, May 4, 12:15 pm)*
- **Build Emotional Resilience**: *(Thursday, May 5, 1:30 pm)*
- **Managing Neuropathy**: *(Thursday, May 5, 2:45 pm)*

WORKSHOPS ABOUT GRAFT-VS- HOST DISEASE

All times Central Time

- **Introduction to GVHD**: *(Saturday, April 30, 1:30 pm)*
- **Your Eyes and GVHD**: *(Saturday, April 30, 2:45 pm)*
- **GVHD of Gastrointestinal Tract and Liver**: *(Sunday, May 1, 11:30 am)*
- **Pulmonary GVHD**: *(Monday, May 2, 1:30 pm)*
- **Pelvic Floor Exercises for Vulvar GVHD**: *(Tuesday, May 3, 11 am)*
- **Skin GVHD**: *(Tuesday, May 3, 2:45 pm)*
- **Your Mouth and GVHD**: *(Wednesday, May 4, 11:00 am)*
- **How Rehabilitation Medicine Helps GVHD Patients**: *(Friday, May 6, 11:00 am)*
- **Rehabilitation Therapies (Exercises and Assistive Devices) to Manage Side Effects of GVHD**: *(Friday, May 6, 12:15 pm)*
Questions?

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Celebrating a Second Chance at Life Survivorship Symposium 2022

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We’re here to help every step of the way!