

# Staying Safe and Active with Graft-versus-Host Disease (GVHD)

**Celebrating a Second Chance at Life  
Survivorship Symposium**

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# Staying Safe and Active with Graft-versus-Host Disease

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# Financial Disclosure

The presenter has no relevant financial disclosures related to the material in this presentation.



# About the Presenter

- Acute care physical therapist at Stanford Healthcare in Palo Alto, CA since 2016
- Full-time member of the Hematology and BMT teams
- One of only 216 board certified clinical specialists in cancer rehabilitation in the USA



# Learning Objectives

- By the end of this presentation, attendees will be able to:
  - Define Graft versus Host Disease (GVHD) and its prevalence
  - Identify common organ systems affected and common treatments
  - Discuss steroid myopathy and its impact on mobility
  - Identify safe activity and exercise practices with GVHD

# What is Graft Versus Host Disease?

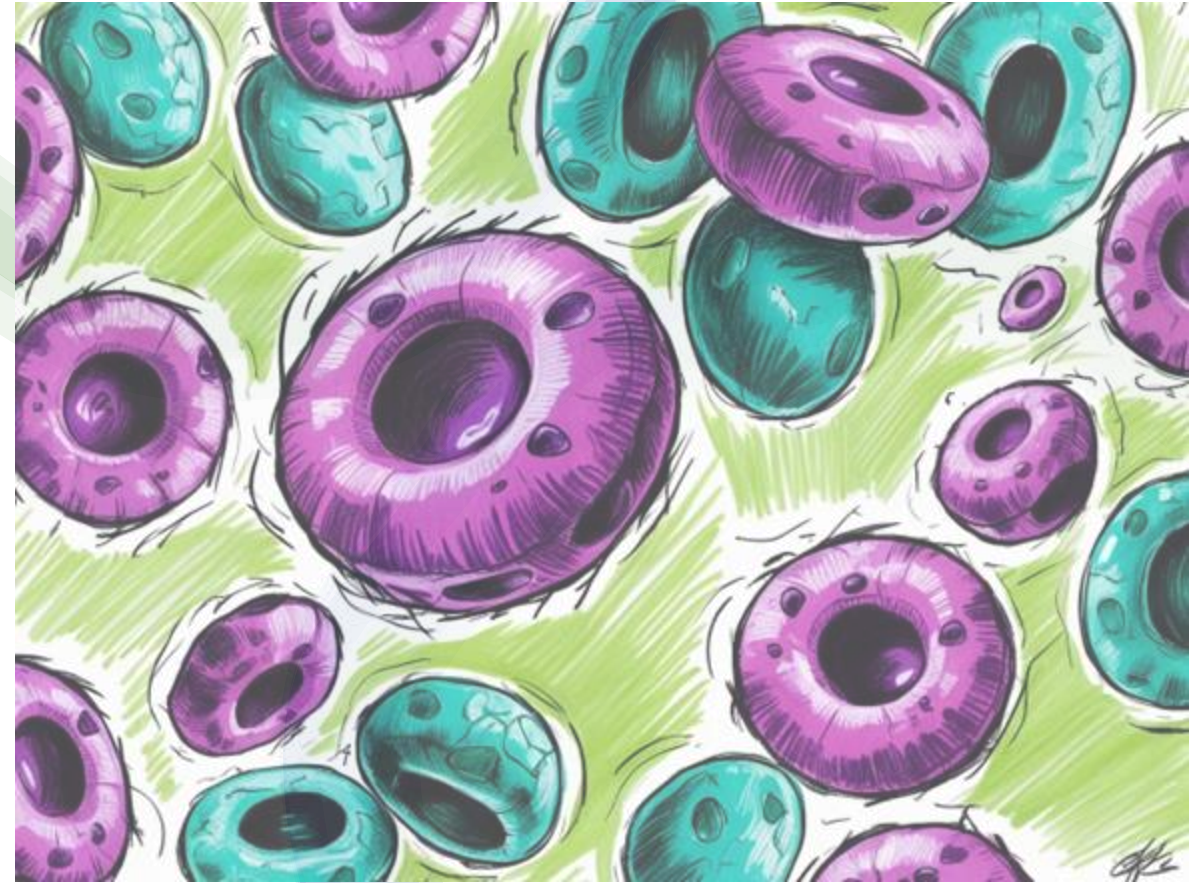


# GVHD Basics

- GVHD is a complication of donor (allogeneic) stem cell transplant
- Donor immune cells see your normal, healthy cells as foreign and attack the transplant recipient
- Any organ system of the body can be affected
- There are two types of GVHD
  - Acute
  - Chronic

# Acute GVHD

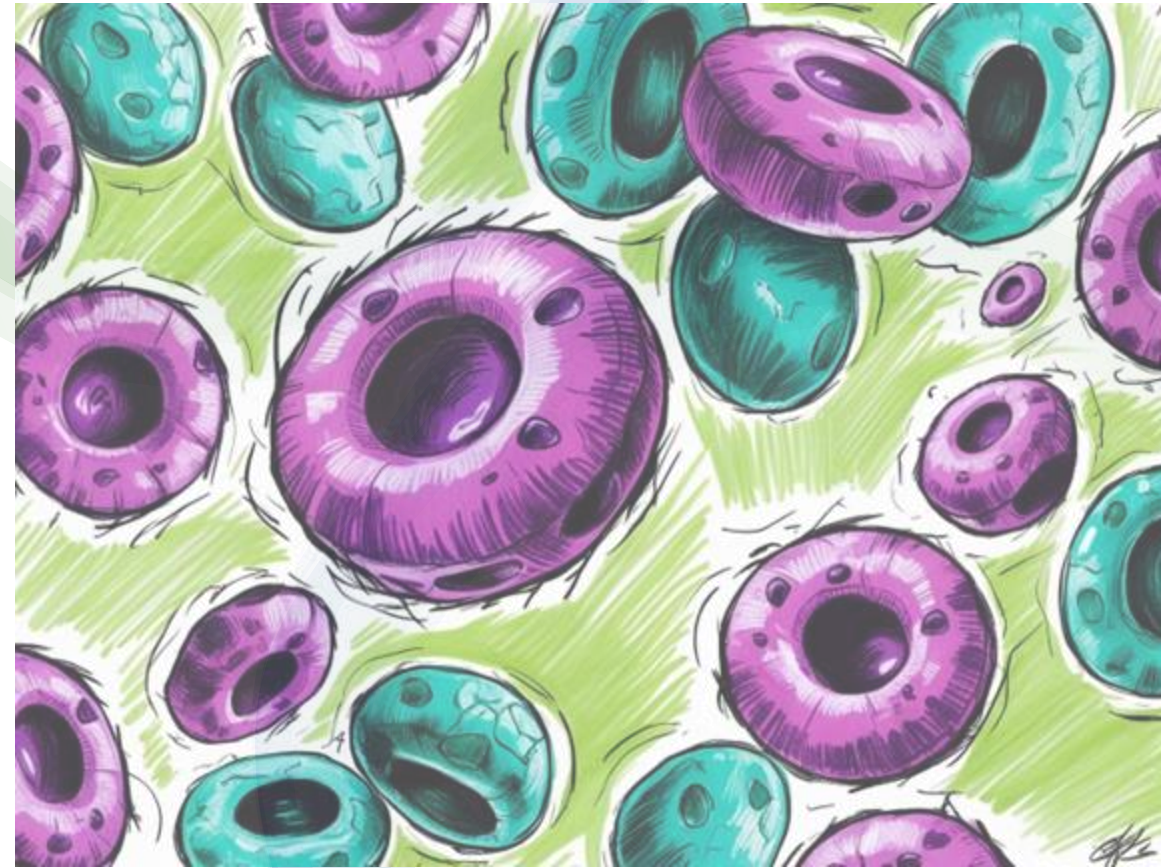
- Acute GVHD usually occurs during the first 3 months after transplant, but can also occur later
- Typically affects:
  - Skin
  - Liver
  - Gastrointestinal (GI) Tract
- Occurs in 30-50% of allogeneic HSCT recipients



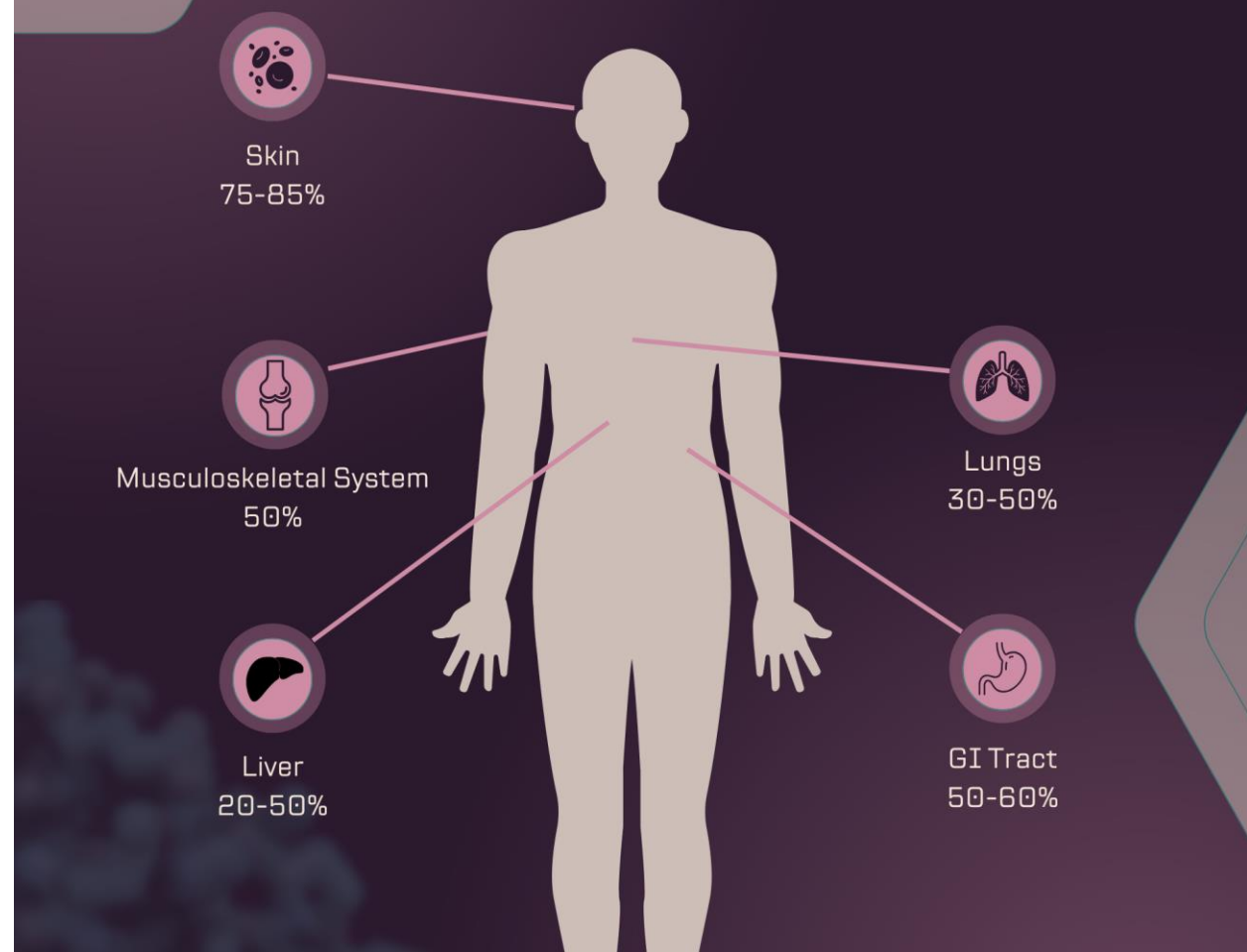


# Chronic GVHD

- Chronic GVHD occurs later after your transplant, typically beyond the first 100 days
- May involve eyes, skin, lungs, mouth, joints, GI tract, other organs
- Occurs in 30-70% of long-term survivors



# Common Sites of GVHD



# Treatment for GVHD

- First line treatment:
  - Corticosteroids (1-2 mg/kg/daily) – Standard
    - Prednisone, Methylprednisone, Solu-Medrol
  - Calcineurin Inhibitors (Tacrolimus, Cyclosporine) – Immunosuppression
- Second Line Treatment for Steroid Refractory GVHD
  - Photopheresis
  - Rituxan

# Steroids

- Corticosteroids play an important role in managing GVHD by:
  - suppressing the immune system
  - reducing inflammation
  - symptom management.
- Corticosteroids also play a critical role in attempting to prevent the progression of the severity of GVHD and further complications.

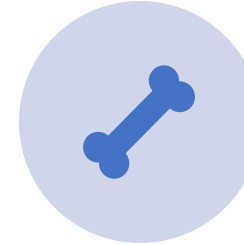


# Steroid Side Effects

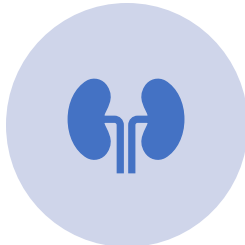


## **Muscle Weakness:**

Corticosteroids can cause muscle weakness and atrophy, especially in the proximal muscles (hips and shoulders).



**Bone Health:** Long term corticosteroid use can lead to osteoporosis, increasing the risk of fractures.



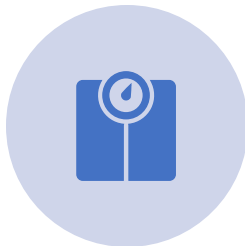
## **Skin Changes:**

Corticosteroids can cause thinning of the skin, leading to easier bruising.



## **Blood sugar changes:**

Corticosteroid use can cause steroid induced hyperglycemia, which can progress to steroid induced diabetes mellitus (SIDM).



**Weight Gain:** Corticosteroid use can cause increased appetite and weight gain.



**Infection Risk:** Higher susceptibility to infection due to immunosuppression.



# Steroid Myopathy

- **Definition:**

- Muscle weakness due to prolonged corticosteroid use

- **Incidence:**

- Can occur in up to **60%** of patients on chronic steroids
  - Risk increases with higher doses ( $\geq 10$  mg/day of prednisone for >3 months)

- **Clinical Features:**

- Proximal muscle weakness (hips, quads, & shoulders)
  - Difficulty with sit-to-stand, stair climbing
  - Increased fall risk, balance deficits

# Exercise Considerations

- **Medical Clearance:**

- Screen for active GVHD, infections, and organ involvement
- Make sure your rehab provider is aware of active treatment for your GVHD

- **Fatigue & Energy Conservation:**

- Adjust intensity based on patient symptoms
- Make a daily schedule
- Build rest breaks into your day
- Space out your activity



# Exercise Considerations, cont'd

- **Fall Risk:**

- Assess gait, balance, and neuropathy before progressing mobility
- Ask your rehab provider if you might benefit from a cane or a walker

- **Bone Health:**

- Decreased bone density risk due to steroids
- Let your doctors know if you have hip, groin, or back pain if you have been on steroids for a prolonged period of time



# Exercise Precautions for GVHD

- **Gastrointestinal (GI):**

- Hydration & electrolyte balance critical with diarrhea/malabsorption

- **Lungs:**

- Monitor oxygen (O<sub>2</sub>) saturation; avoid high-intensity exercise

- **Skin:**

- Avoid excessive friction, tight clothing

- **Musculoskeletal:**

- Prevent joint contractures with stretching, range of motion (ROM) exercises



# What should you be doing for exercise?



Aerobic Exercise



Resistive Exercise



Flexibility & Balance  
Training



# Aerobic Exercise

- **Goal:** Improve endurance, reduce fatigue
- **Guidelines:**
  - **Intensity:** Moderate (Rate of Perceived Exertion (RPE) 4-6 on Modified Borg Scale)
  - **Duration:** 20-30 minutes per session
  - **Frequency:** 3-5 days per week
  - **Mode:** Low-impact, joint-friendly activities (walking, stationary bike, swimming)

# Rate of Perceived Exertion (RPE) Scale

| Rating | Description     |
|--------|-----------------|
| 0      | Rest            |
| 1      | Very, Very Easy |
| 2      | Very Easy       |
| 3      | Moderate        |
| 4      | Somewhat Hard   |
| 5      | Hard            |
| 6      |                 |
| 7      | Very Hard       |
| 8      |                 |
| 9      | Very, Very Hard |
| 10     | Maximal Effort  |



# Resistive Exercise

- **Goal:**

- Counteract steroid-induced muscle atrophy

- **Guidelines:**

- **Frequency:** 2-3x/week, non-consecutive days
  - **Intensity:** Low to moderate resistance (30-50% 1-rep max\*, 10-15 reps)
    - \*you should be able to do 8-12 reps without form breakdown
  - **Focus: Large muscle groups (hips, quads, shoulders)** due to steroid-induced weakness

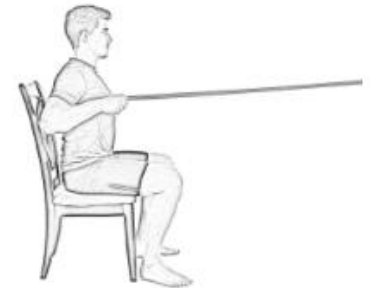
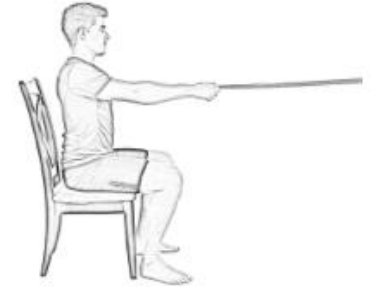


# Resistive Exercise Examples

| Muscle Group                                 | Exercises                                                                    | Considerations                                                      |
|----------------------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Hip & Thigh (gluteus, quadriceps)            | Sit-to-stand from chair (progress to squats), step-ups, seated leg press     | Start with bodyweight, add resistance bands or weights as tolerated |
| Shoulder & Arm (deltoids, biceps, triceps)   | Seated shoulder press (light dumbbells), resistance band rows, wall push-ups | Avoid excessive overhead lifting if shoulder GVHD is present        |
| Core & Trunk Stability                       | Seated core activation (marching), bridges, bird-dogs                        | Focus on <b>core control</b> to reduce fall risk                    |
| Ankle & Foot (dorsiflexors, plantar flexors) | Seated heel raises, ankle dorsiflexion with band, tandem stance              | Important for <b>fall prevention</b> and <b>gait stability</b>      |



# Resistive Exercise Examples



# Flexibility

- **Goal:**

- Maintain **joint mobility**, prevent **soft tissue contractures**, and **reduce fall risk** due to steroid myopathy and GVHD-related musculoskeletal restrictions.

| Target Area      | Stretching Exercise                                 | Considerations                                                 |
|------------------|-----------------------------------------------------|----------------------------------------------------------------|
| Shoulders & Arms | Doorway pec stretch, overhead reach with dowel      | Avoid aggressive stretching if skin GVHD present               |
| Hips & Legs      | Seated hamstring stretch, supine hip flexor stretch | Maintain <b>neutral spine</b> to avoid excessive lumbar stress |
| Feet & Ankles    | Standing calf stretch, ankle circles                | Essential for <b>gait mechanics</b>                            |



# Flexibility Exercise Examples



# Balance Training

| Exercise                             | Purpose                             | Considerations                                          |
|--------------------------------------|-------------------------------------|---------------------------------------------------------|
| Tandem stance (heel-to-toe hold)     | Improves static balance             | Use a stable surface for support if needed              |
| Single-leg stance (hold 10 sec/side) | Enhances dynamic stability          | Start with hand support and progress to no support      |
| Weight shifting side-to-side         | Improves lateral stability for gait | Cue <b>slow, controlled movement</b> to prevent falls   |
| Seated reaching tasks                | Improves sitting balance for ADLs   | Use resistance bands to <b>increase core activation</b> |



# Balance Training Examples



# Key Takeaways and Recommendations

- GVHD and steroid myopathy significantly impact **mobility and strength**
- Safe exercise prescription should be **individualized** and **evidence-based**
- Multidisciplinary approach (PT, OT, MD, Nutrition) is **essential**
- Physical therapy interventions can **improve function, Quality of Life, and long-term outcomes**



# References

- Jagasia M, et al. *National Institutes of Health Consensus Development Project on Criteria for Clinical Trials in Chronic Graft-versus-Host Disease: I. Diagnosis and Staging Working Group Report*. Biol Blood Marrow Transplant. 2015;21(3):389-401.
- Martin PJ, et al. *Chronic Graft-Versus-Host Disease: A Review*. N Engl J Med. 2022;387(23):2135-2146.
- Stubblefield MD, et al. *Skeletal Muscle Dysfunction in Patients with Chronic GVHD: A Review*. Bone Marrow Transplant. 2017;52(5):617-626.
- Wang T, et al. *Long-Term Outcomes of Steroid Myopathy in Allogeneic Stem Cell Transplant Recipients*. J Clin Oncol. 2020;38(9):1112-1121.



# Questions?



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# Let Us Know How We Can Help You

**Visit our website:** [bmtinfonet.org](http://bmtinfonet.org)

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