

#### **Introduction to Graft-versus-Host Disease**

Celebrating a Second Chance at Life Survivorship Symposium

April 30 - May 6, 2022



Amin Alousi MD
The University of Texas
MD Anderson Cancer Center



#### **Graft-vs.-Host Disease (GVHD)**

Multisystem Disorder that occurs when Immune Cells transplanted from a non-identical donor (the graft) recognize the recipient (host) as foreign resulting an immunologic process resulting in tissue injury.

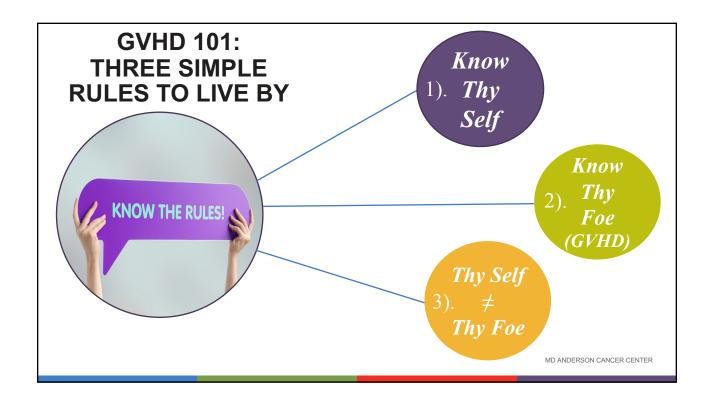
MD ANDERSON CANCER CENTER

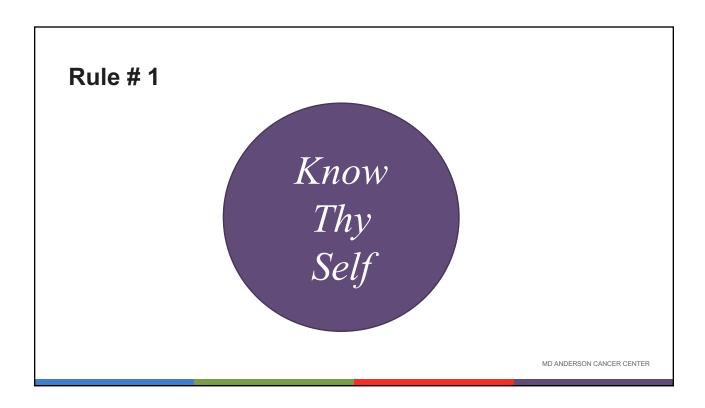
#### **Graft-vs.-Host Disease (GVHD)**



WHAT SHOULD I KNOW ???

MD ANDERSON CANCER CENTER





## **Know Thy Self**

- Examine your body weekly
  - -Mouth, Skin, Joints & Genitals
- Pay attention to new symptoms
  - —Symptoms generally begin as subtle changes
- Report new symptoms:
  - -Don't be afraid to ask
  - —Don't assume

MD ANDERSON CANCER CENTER

#### Rule #2



MD ANDERSON CANCER CENTER

## **Know Thy Foe (GVHD)**

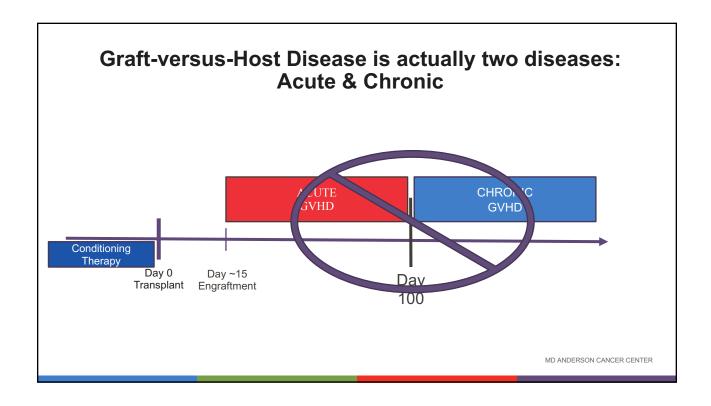
- Graft-versus-Host Disease is actually two diseases
  - o acute GVHD
  - o chronic GVHD
- Acute GVHD mainly affects three organs
  - o Skin:
  - · macular-papular rash
  - Gastrointestinal (GI) Tract:
  - upper GI symptoms: nausea, vomiting, poor appetite (failure-to-thrive)
  - lower GI: secretory diarrhea
  - Liver:
  - o abnormal liver labs (typically total bilirubin)

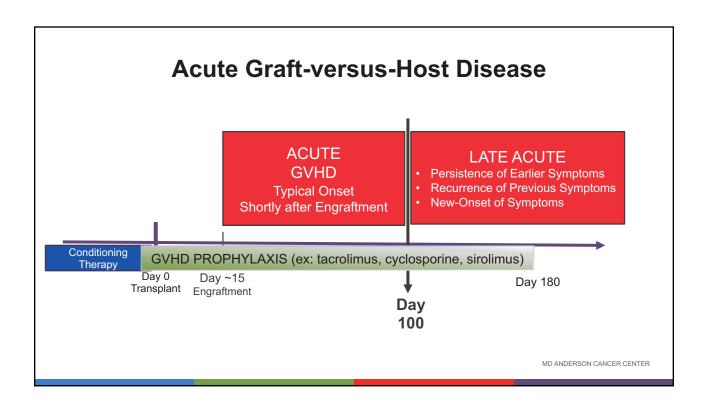
MD ANDERSON CANCER CENTER

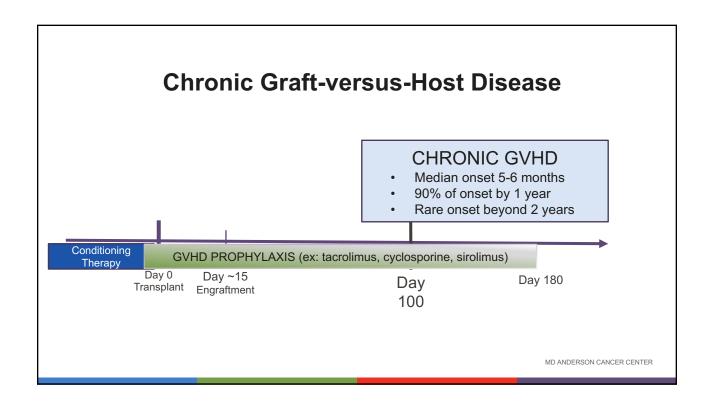
## **Know Thy Foe (GVHD)**

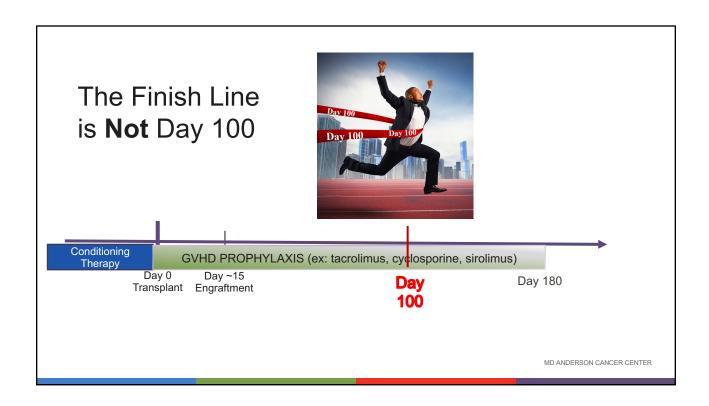
- Chronic GVHD can affect many different organs
- Most common organs affected:
  - Eyes
  - Mouth
  - Skin
  - Joint/ Fascia
  - Gastrointestinal tract
  - Liver
  - Lungs
  - Genitals (vulva/vagina or penis/ foreskin)

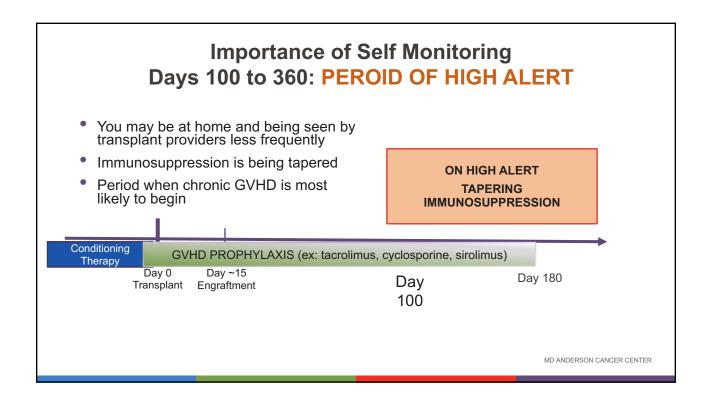
MD ANDERSON CANCER CENTER

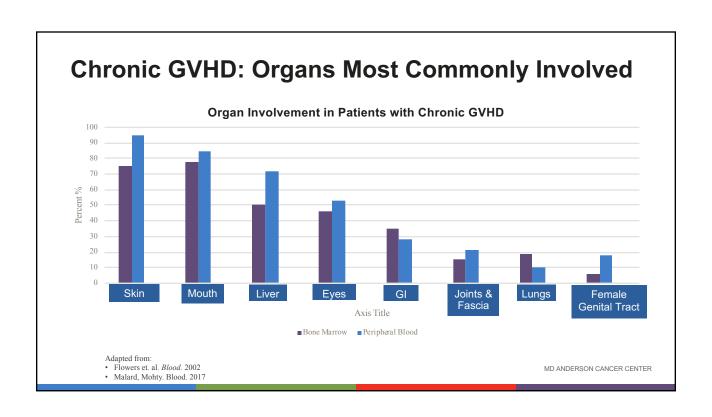








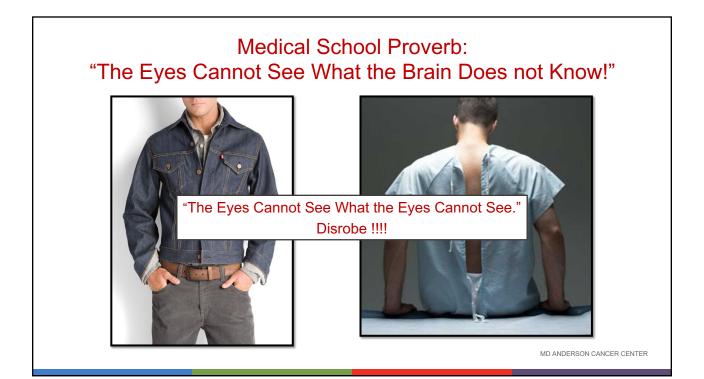




## Rule #1: Know Thy Skin

- Your skin is one of the most common organs involved by GVHD
- Your skin is also a common site for secondary cancers (skin cancers).
- Inspect of your skin weekly
- Have a total skin exam by a transplant professional and/or dermatologist at least once yearly

MD ANDERSON CANCER CENTER

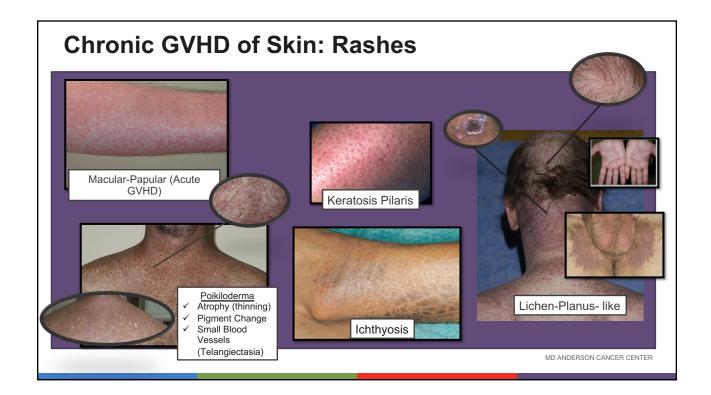


### Chronic GVHD of Skin: What am I looking For?

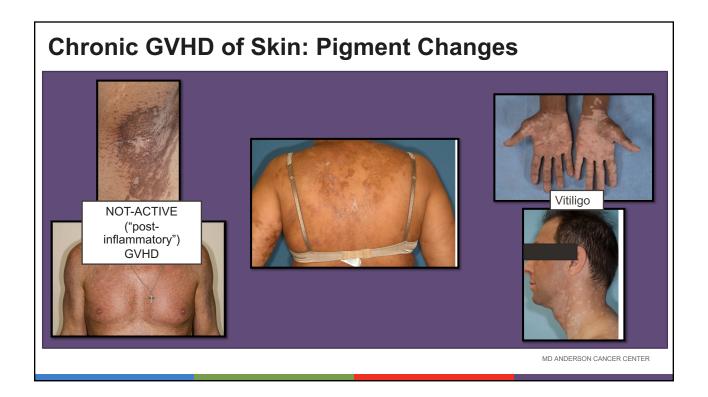
- ✓ Rashes
- ✓ Skin Texture
  - Scarring
  - New "cellulite-like" changes
  - Swelling
- Limited mobility (skin feeling tight)
- ✓ Pigment Changes:
- Darkening of skin (hyperpigmentation)
- Lightening of skin (hypopigmentation)
- ✓ Hair & nail changes
- ✓ Moles



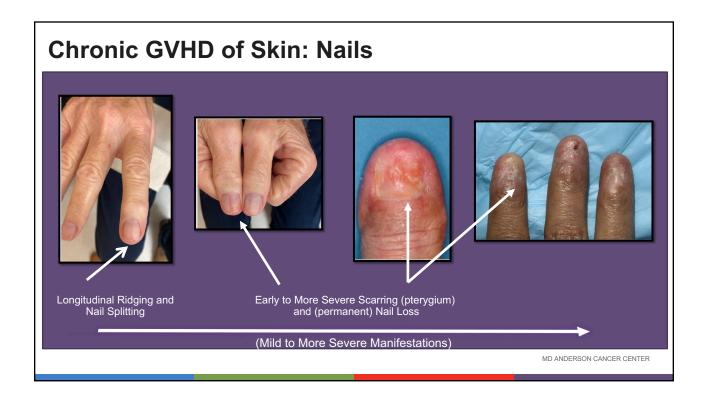
MD ANDERSON CANCER CENTER

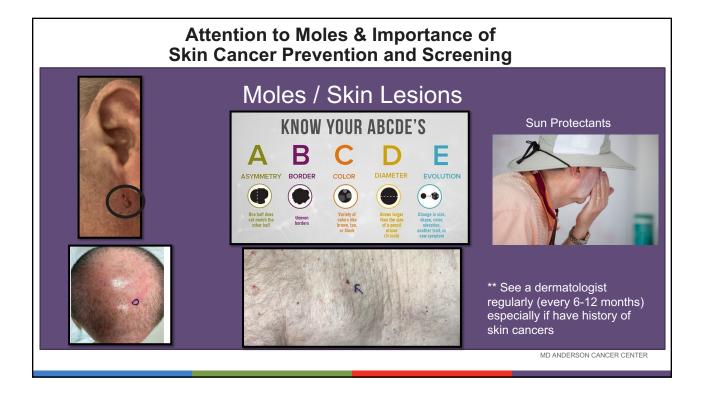












#### For More Information on Skin GVHD

- BMT InfoNet Survivorship Symposium Workshop: Sharon Hymes, MD Skin GVHD (Tuesday, May 3, 2:45 pm Central)
   Video at bmtinfonet.org/video/2022-GVHD-skin
- BE THE MATCH®: Screening Skin for Chronic GVHD bethematchclinical.org/post-transplant-care/chronic-gvhd/skin
- BE THE MATCH®: Fast Facts- Chronic GVHD of the Skin bethematchclinical.org/resources-and-education/materials-catalog/fast-facts---chronic-gvhd-of-the-skin



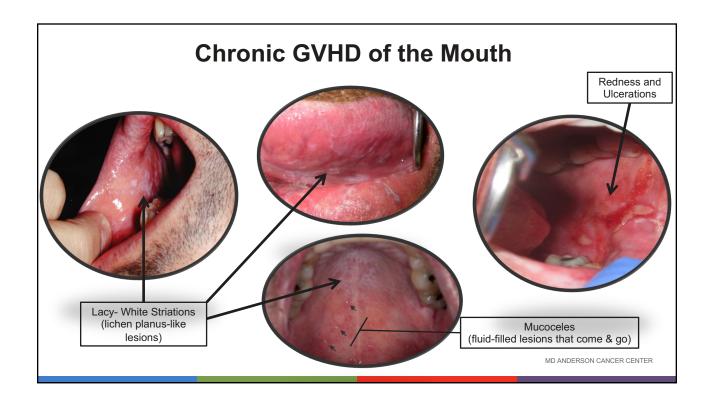
MD ANDERSON CANCER CENTER

## Chronic GVHD of the Mouth: What am I looking for?

- ✓ Dry mouth
- ✓ Rough sensation (scalded mouth sensation)
- ✓ Painless small fluid-filled lesions that come and go throughout the day
- Sensitivity to spicy or acidic foods, toothpaste, carbonated beverages
- Swelling, redness, pain or bleeding gums
- ✓ Ulcers, pain



MD ANDERSON CANCER CENTER



### Chronic GVHD of the Eyes: What am I looking for?

- ✓ Excessive tearing (early symptom)
- ✓ Decreased tearing
- ✓ Dry, burning, gritty eyes
- ✓ Itching
- ✓ Difficulty opening eyes in morning (eye discharge)
- ✓ Sensitivity to light and wind
- ✓ Diminished visual acuity / blurred vision



MD ANDERSON CANCER CENTER

#### Chronic GVHD of the GI Tract: What am I looking For?

- ✓ Anorexia (no desire to eat)
- ✓ Nausea, vomiting
- ✓ Abdominal pain, bloating, cramping
- ✓ Diarrhea
- ✓ Greasy stools, undigested food in stool
- ✓ Painful swallowing
- ✓ Difficulty swallowing dry foods, pills including esophageal strictures (narrowing of the esophagus)
- ✓ Weight loss



MD ANDERSON CANCER CENTER

# Chronic GVHD of Joints, Fascia, Muscles: What am I Looking For?

- ✓ Joint stiffness
- ✓ Reduced range of motion
- ✓ Tightened muscles, tendons
- ✓ Muscle cramps / spasms
- Contractures (joints in a fixed, flexed position)
- ✓ Edema (swelling)
- √ Joint Pain / Swelling (rare)

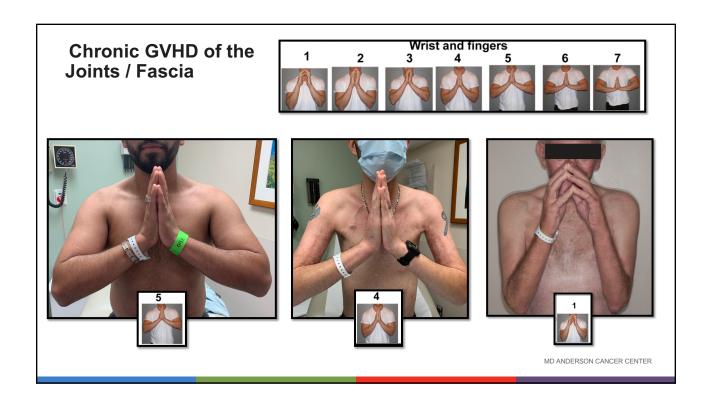


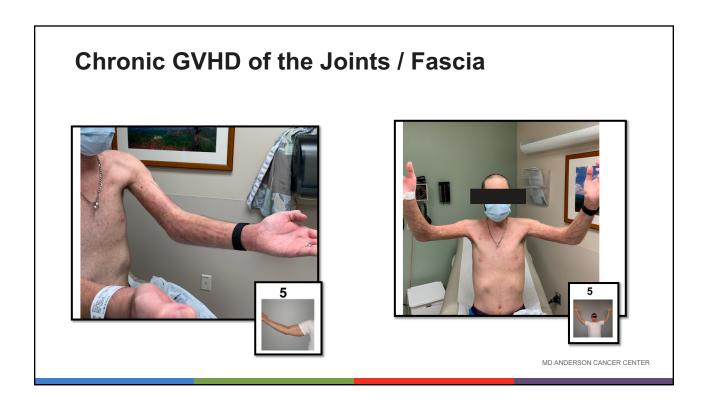
MD ANDERSON CANCER CENTER

#### **Chronic GVHD of the Joints and Fascia**



MD ANDERSON CANCER CENTER





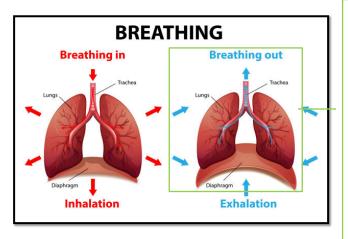
#### Chronic GVHD of the Lungs: What am I Looking For?

- ✓ Dry cough
- ✓ Wheezing
- Cough that persists after a cold (lasting longer than 2-4 weeks)
- ✓ Shortness of breath
- Feeling like you can't take a deep breath
- Asymptomatic (no symptoms; importance of screening)



MD ANDERSON CANCER CENTER

#### **Chronic GVHD of the Lungs**



- Hallmark of lung GVHD is impaired exhalation.
- ✓ Air gets trapped in lungs.
- ✓ One of the most serious forms of chronic GVHD.
- ✓ Patients with chronic GVHD involving other organs (skin, eyes, etc.) are at highest risk for developing lung involvement.
- Can be triggered by common community respiratory viruses like RSV and Parainfluenza.

MD ANDERSON CANCER CENTER

## Importance of Screening for Lung GVHD



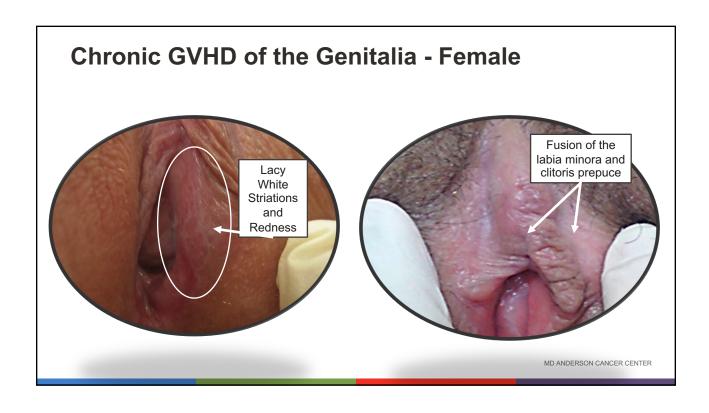
- Patients with early Lung GVHD may have few or no symptoms.
- Catching it early is felt to be important.
- Routine (screening) PFT's should be done for the first 2-3 years (or longer).
- Screening pulmonary function tests (PFT) especially important in those with active GVHD outside of the lung
- The role of at-home monitoring is being studied (handheld PFT).

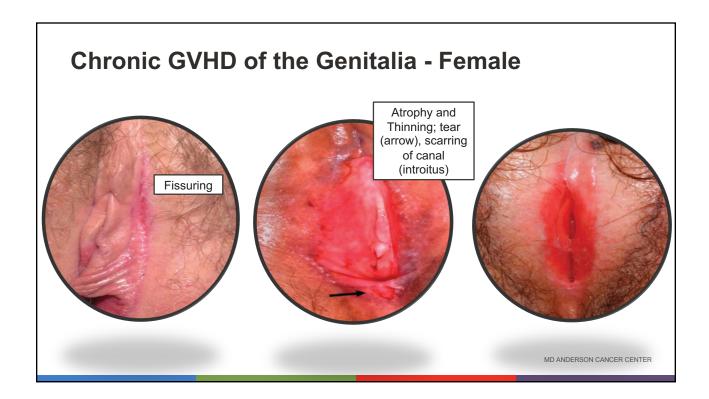
MD ANDERSON CANCER CENTER

## Rule # 1: Know Thy Genitals - Females

- √ Examine (external) vulva
  - Note areas of redness, focal areas of white plaques or thinning
- ✓ Examine (internal) vaginal mucosa (use a hand mirror).
  - Is the tissue uniform in color?
  - Note areas of redness, white striations, scarring, adhesions, loss of elasticity, narrowing of the vaginal canal
- ✓ Note symptoms:
  - Itching
  - Burning
  - Dryness
  - Painful Intercourse
  - Pain with urination
  - Bleeding

MD ANDERSON CANCER CENTER

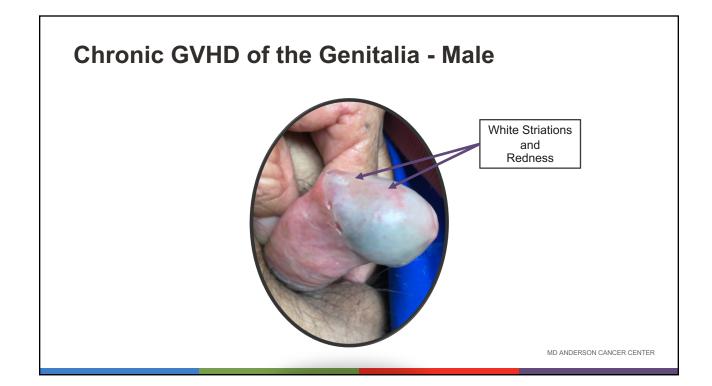




#### Rule # 1: Know Thy Genitals - Males

- √ Examine the glans (the head of the penis)
  - Is it uniform in color?
  - Note areas of redness or white striations, burning or pain
- ✓ Retract the foreskin
  - It should retract easily and without pain
  - Note scar tissue / adhesions
- ✓ Note Symptoms
  - Pain and burning on the head of penis (glans)
  - (Rare) scarring of the meatus (where the urine comes out)
  - (Rare) abnormal/new bending of the penis when erect

MD ANDERSON CANCER CENTER



#### **Chronic GVHD Laboratory Monitoring**

- ✓ Labs are an important part of monitoring for Chronic GVHD.
- ✓ Particularly important when tapering immunosuppression.
- Routine labs should be obtained at least monthly between days 100 to 365 (and sometimes more frequently).
- ✓ Liver test results including: ALT/AST, Alkaline Phosphatase, Total Bilirubin.
- ✓ Other markers of chronic GVHD may include:
  - Elevated eosinophil count (an increase in the absolute number of these white blood cells)
  - New fall in blood counts (neutrophils, platelets)



MD ANDERSON CANCER CENTER

#### Rule #3



MD ANDERSON CANCER CENTER

#### Rule #3: Thy Self Must NEVER Be Thy Foe

- ✓ Takes thy meds
- ✓ Monitor and report
- ✓ When feasible, travel to see transplant provider and sub-specialists who best know and can treat GVHD
- ✓ Don't resist starting and taking therapy:
  - Steroids
  - Other GVHD Therapy
  - Physical / Occupational Therapy

MD ANDERSON CANCER CENTER

## **Chronic GVHD Treatment: Supportive Care**

- It's more than just taking a drug
- Organ specific therapies (therapies to improve symptoms and/or organ function) e.g.
  - Ocular GVHD: topical agents, punctal plugs/ cautery, scleral lenses
  - Lung GVHD: Inhaled steroids, Montelukast (Singulair)
  - Genital GVHD: topical agents
  - Skin: topical therapies and emollients
- Drugs to prevent infections
- Occupational, physical and pelvic floor therapy
- Nutritional support

MD ANDERSON CANCER CENTER

## **Chronic GVHD Treatment: Systemic Therapy**

- Steroids (prednisone or methylprednisolone) are the first line treatment for acute and chronic GVHD
- Patients who fail to get better or have GVHD recur with lowering or stopping the steroids will require additional therapy (Steroid-Refractory or Dependent GVHD)

MD ANDERSON CANCER CENTER

## **Steroid-Refractory Acute GVHD**

- Ruxolitinib (Jakafi/Jakavi) is the only FDA-approved therapy
- New therapies are being studied
- Importance of clinical trials

MD ANDERSON CANCER CENTER

#### Steroid-Refractory Chronic GVHD

- Three FDA-approved therapies
  - o Ibrutinib (*Imbruvica*)
  - Belumosudil (Rezurock)
  - Ruxolitinib (Jakafi/Jakavi)
- A number of agents are used for Non-FDA approved indications
  - Sirolimus
  - Extracorporeal phototherapy (ECP)
  - Rituximab
  - o IL-2
  - Methotrexate
  - Abetacept
- A number of new, exciting drugs are being studied
- Importance of clinical trials

MD ANDERSON CANCER CENTER

## Ibrutinib (*Imbruvica*™)

- First FDA-approved Therapy for Patients with Steroid-Refractory Chronic
  - o Inhibits the immune cells that drives chronic GVHD
  - Studied in patients ≥18 years who failed steroids and had red rash or oral GVHD
  - 67% of patients had a GVHD response and roughly 25% had meaningful improvement in symptoms.
- Side Effects
  - Infections requiring hospitalization (36%)
  - Fatigue (roughly half of patients reported)
  - Diarrhea (roughly 1/3<sup>rd</sup> of patients reported)
- Commonly patients need a lower dose due to side effects

MD ANDERSON CANCER CENTER

## Belumosudil (Rezurock™)

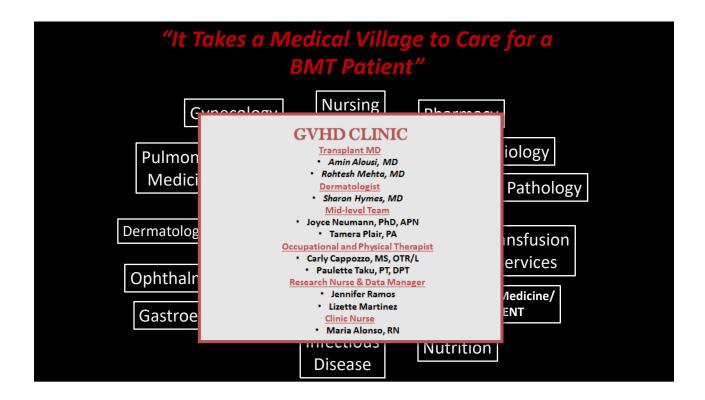
- FDA approved in 2021 for patients failing more than 2 prior therapies
  - o First of its kind drug inhibits the ROCK2 protein
  - Believed to restore immune balance as well as inhibit fibrosis (scarring)
  - Studied in patients ≥12 years with very advanced / severe chronic GVHD
  - 74% of patients had a GVHD response and roughly 60% had meaningful improvement in symptoms.
- Side Effects
  - Pneumonia requiring hospitalization (roughly 10%)
  - Elevated liver tests (roughly 20%)
  - Fatigue (roughly half of patients reported)
  - Nausea/ Diarrhea (roughly 1/3<sup>rd</sup> of patients reported)

MD ANDERSON CANCER CENTER

#### Ruxolitinib (*Jakafi*™)

- FDA approved in 2021 for patients failing one or more prior therapies
  - o Previously FDA approved for Steroid-Refractory Acute GVHD
  - Only FDA-approved, Chronic GVHD drug tested in a randomized trial against other ("best-available") therapies
  - Studied in patients >12 years with moderate to severe chronic GVHD
  - ~ 50% of patients had a GVHD response compared to ~25% for patients who received other therapies (control-arm).
  - ~ 25% had meaningful improvement in symptoms vs. 11% for controlarm.
- Side Effects
  - Pneumonia requiring hospitalization (8.5%)
  - Anemia (29%), lowering of platelets (21%) or neutrophils (11%)

MD ANDERSON CANCER CENTER





## **GVHD RESOURCES**

MD ANDERSON CANCER CENTER

## **More GVHD Information and Resources**

Topic	See Slide #
General GVHD	56
Skin GVHD	57
Oral (Mouth) GVHD	58
Ocular (Eyes) GVHD	59
GI Tract and Liver GVHD	60
Joints & Fascia GVHD	61
Lung GVHD	62
Genital GVHD	63

MD ANDERSON CANCER CENTER

#### Graft-versus-Host Disease: What to Know, What to Do

Free booklet from BMT infonet.org

bmtinfonet.org/GVHD-Patient-Handbook



Available in English and Spanish

MD ANDERSON CANCER CENTER

#### For More Information on Skin GVHD

- BMT InfoNet Survivorship Symposium Workshop: Sharon Hymes, MD Skin GVHD (Tuesday, May 3, 2:45 pm Central)
   Video after symposium at bmtinfonet.org/video/2022-GVHD-skin
- BE THE MATCH®: Screening Skin for Chronic GVHD bethematchclinical.org/post-transplant-care/chronic-gvhd/skin
- BE THE MATCH®: Fast Facts- Chronic GVHD of the Skin bethematchclinical.org/resources-and-education/materialscatalog/fast-facts---chronic-gvhd-of-the-skin



MD ANDERSON CANCER CENTER

#### For More Information on Oral GVHD

- BMT InfoNet Symposium Workshop: Nadarajah Vigneswaran, BDS, DMD, Dr.Med.Dent Your Mouth and GVHD (Wednesday, May 4, 11:00 am Central)
   Video after symposium at bmtinfonet.org/video/2022-GVHD-mouth
- BE THE MATCH®: Screening Mouth for Chronic GVHD bethematchclinical.org/post-transplant-care/chronic-gvhd/mouth
- BE THE MATCH®: Fast Facts- Chronic GVHD of the Mouth bethematchclinical.org/resources-and-education/materialscatalog/fast-facts---chronic-gvhd-of-the-mouth



MD ANDERSON CANCER CENTER

#### For More Information on Ocular GVHD

- BMT InfoNet Survivorship Symposium Workshop: Zhonghui Katie Luo MD, PhD Your Eyes and GVHD (Saturday, April 30, 2:45 pm)
   Video after symposium at bmtinfonet.org/video/2022GVHD-Eyes
- BE THE MATCH®: Screening Eyes for Chronic GVHD bethematchclinical.org/post-transplant-care/chronic-gvhd/eyes
- BE THE MATCH®: Fast Facts- Chronic GVHD of the Eye bethematch.org/materials-catalog/items/fast-facts---chronic-gvhdof-the-eye?pid=12884



MD ANDERSON CANCER CENTER

#### For More Information on GVHD of the GI Tract and Liver

- BMT InfoNet Survivorship Symposium Workshop: Paul Shaughnessy MD GVHD of GI Tract and Liver (Sunday, May 1, 2022 11 AM Central)
   Video after symposium at bmtinfonet.org/video/2022-GVHD-gastrointestinal-liver
- BE THE MATCH<sup>®</sup>: Screening Skin for Chronic GVHD bethematchclinical.org/post-transplant-care/chronic-gvhd/gi-tract
- BE THE MATCH®: Fast Facts- Chronic GVHD of the Skin

bethematch.org/materials-catalog/items/fast-facts---ghvd-of-the-stomach-and-intestines/?pid=15558



MD ANDERSON CANCER CENTER

## For More Information on Chronic GVHD of Joints and Fascia

BMT InfoNet Survivorship Symposium Workshops:
 Megan Nelson MD & Ekta Gupta MD

How Rehabilitation Medicine Helps GVHD Patients (Friday, May 6, 11:00 am)

Video after symposium at bmtinfonet.org/video/2022-GVHD-rehabiltation-medicine

Carly Cappozzo MSOT, OTR/L, Rachel Petrie MS, OTR/L, MSCS, and Paulette Taku, PT, DPT

Rehabilitation Therapies to Manage Side Effects of GVHD (Friday, May 6, 12:15 pm) Video after symposiu at bmtinfonet.org/video/2022-GVHD-rehab-exercises-and-devices

 BE THE MATCH®: Screening Muscles, Fascia, Joints for Chronic GVHD bethematchclinical.org/post-transplant-care/chronic-gvhd/muscles,-fascia,-joints

MD ANDERSON CANCER CENTER

#### For More Information on Chronic GVHD of the Lungs

 BMT InfoNet Survivorship Symposium Workshop: Ajay Sheshadri MD, MSCI Pulmonary GVHD (Monday, May 2, 1:30 pm)
 Video after symposium at bmtinfonet.org/video/2022-lung-breathing-problems

 BE THE MATCH®: Screening Lungs for Chronic GVHD bethematchclinical.org/post-transplant-care/chronic-gvhd/lungs

• BE THE MATCH®: Fast Facts- Chronic GVHD of the Lungs
bethematch.org/materials-catalog/items/fast-facts---gvhd-of-the-lungs?pid=13627

MD ANDERSON CANCER CENTER

#### For More Information on Chronic GVHD of the Genitals

- BMT InfoNet Survivorship Workshop: Nikki Samms, PT, DPT
   Pelvic Floor Exercises for Vulvar GVHD (Tuesday, May 3, 11 am)
   Video after at bmtinfonet.org/video/2022-GVHD-pelvic-floor-exercise
- BE THE MATCH®: Screening Genitalia for Chronic GVHD bethematchclinical.org/post-transplant-care/chronic-gvhd/genitalia



MD ANDERSON CANCER CENTER



## **Questions?**



Amin Alousi MD

Celebrating a Second Chance at Life Survivorship Symposium 2022

bmtinfonet.org ★ help@bmtinfonet.org ★ 847-433-3313



#### Let Us Know How BMT InfoNet Can Help YOU!



Visit our website: bmtinfonet.org

Email us: help@bmtinfonet.org

Give us call: 888-597-7674

xxxxx

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