

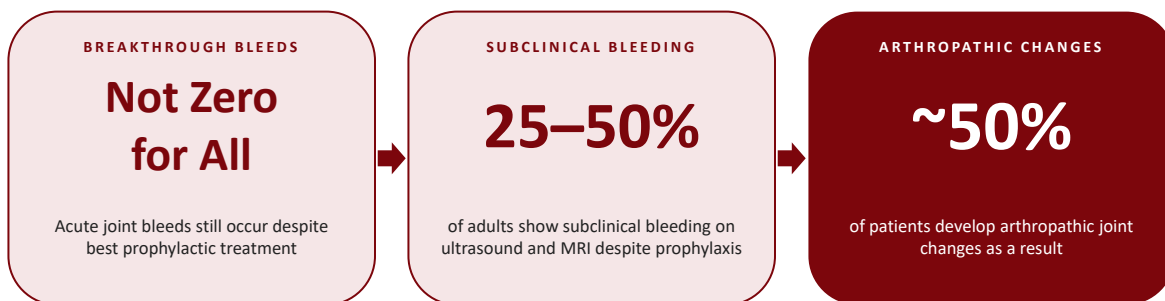
# Segment 1: Optimizing Joint Health

Annette von Drygalski, MD, PharmD, RMSK



## Clinical Outcomes in the Era of Prophylaxis

Real-World Data

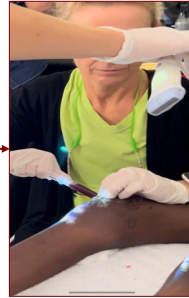


1. Mannucci P, et al. *Haemophilia*. 2023;29(4):954-962. 2. Brands MR, et al. *Res Pract Thromb Haemost*. 2025;9(2):102717. 3. De la Corte-Rodriguez H, et al. *BMJ Open*. 2024;14(9):e082204. 4. Khudair AM, et al. *Med J Babylon*. 2025;22(4):1495.

# Joint and Muscle Bleeding Are Frequent Manifestations of Severe Hemophilia



WFH, Dakar, 2019



WFH, Nairobi, 2024

Resulting in arthropathy and musculoskeletal problems



Joint Deformities



Acute and Chronic Pain

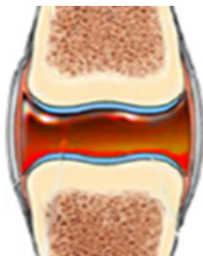


Reduced Quality of Life & Productivity

Knobe K, et al. *J Comorb.* 2011;1:51-59.

## Evolution of Bleed Sites

**Intracavitary**



Repeated  
→  
Target Joint

Synovial  
Hypertrophy  
→  
Vascular  
Remodeling

**Soft Tissue**

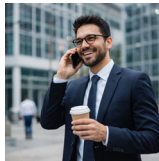


Osteoarthritic  
Cysts

**Bone  
(Subchondral Cysts)**



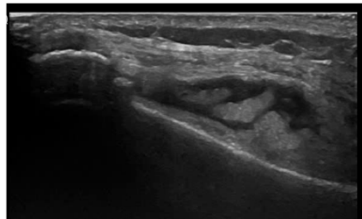
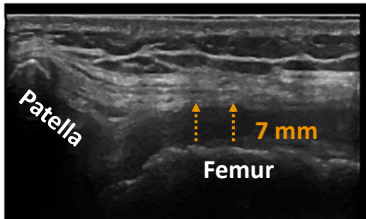
→



Images generated using Image Generator, ChatGPT, 2026.

# Joint Bleed: Identifying Fluid by Sonopalpation

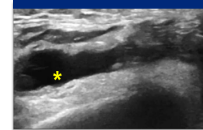
- Fluid is compressible – Synovium is not



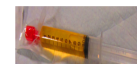
## Synovial expansion

- Fluid thickness can be measured directly (JADE protocol)
- Bloody fluid is speckled

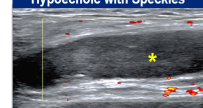
### Simple Effusion: Anechoic



Anechoic



### Acute Complex Effusion: Hypoechoic with Speckles



Echogenic

(speckled, reflectors)



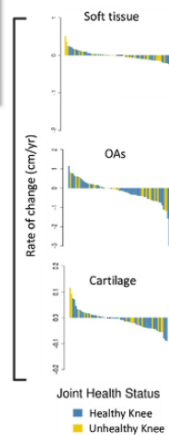
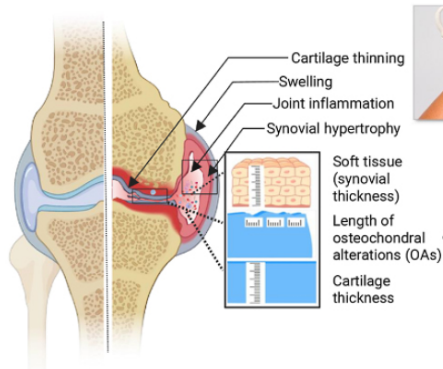
1. Sheth P, et al. *Res Pract Thromb Haemost.* 2025;10(1):103290. 2. Volland LM, et al. *J Ultrasound Med.* 2019;38(6):1569-1581. 3. Mesleh Shayeb A, et al. *Haemophilia.* 2021;27(5):866-875. 4. Nguyen S, et al. *Thromb Haemost.* 2018;16(3):490-499. 5. von Drygalski A, et al. *J Ultrasound Med.* 2018;37(8):1945-1956. Image Courtesy UCSD Center for Bleeding and Clotting Disorders.

# The Evaluation of Hemophilic Joints

Healthy Joint

Hemophilic Joint

MSKUS



## JADE protocol

Prospective evaluation of tissue change rates using the JADE ultrasound protocol

## Capacity for repair

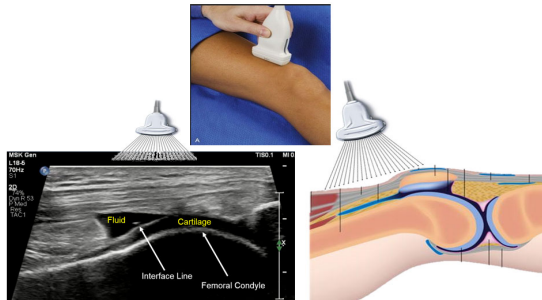
Longitudinal measurements suggest hemophilic joints have an unexpected capacity for repair

Sheth P, et al. *Res Pract Thromb Haemost.* 2025;10(1):103290.

# Musculoskeletal Health Monitoring

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## Ultrasound of the knee



Handheld devices work at the bedside

### Bleed vs pain

distinguishes joint bleeding from inflammation at the point of care

**97%**

of structures correctly identified on handheld images

**$\kappa = 0.93$**

agreement vs stationary ultrasound (95% CI, 0.86–0.99)

Zhou JY, et al. *Haemophilia*. 2018;24(2):e77-e80.