

- iii. Assistance at home

e. Postoperative Management begins soon after surgery and depending on the procedure can last weeks to months. Due to the stresses often placed on joints and/or muscles during physical therapy following surgery, it is imperative that the patient's clotting factor is being managed by the hematologist, and that prior to any post-operative physical therapy, the patient is at low risk of bleeding. The physical therapist needs a keen awareness of postoperative bleeding and infection.^[22]

- i. Examples of postoperative management:

1. Functional mobility including using specific assistive devices (i.e., crutches, knee scooters, etc.)
2. Progressive Muscle lengthening
 - a. Flexibility
 - b. Passive ROM
3. Progressive Therapeutic exercise
 - a. Active ROM
 - b. Progressive strengthening
 - c. Resistive work
4. Gait training
5. Neuromuscular Reeducation
 - a. Balance
 - b. Proprioception
 - c. Fall Prevention

6. See **Physical Therapy for Rehabilitation #7** for other treatment recommendations.

f. Types of non-surgical and surgical procedures often required by PWBD

- i. Non-Surgical:

1. Aspiration puncture
2. Intra-articular Corticotherapy
3. Hyaluronic acid injections
4. Non-Surgical synovectomy

- ii. Surgical:

1. Surgical Synovectomy
 - a. See **Appendix G** for Physical Therapy Practice Guidelines for Persons with Bleeding Disorders: Surgical Synovectomy
2. Arthrotomy and reactionary osteotomy
3. Arthrodesis
4. Endoprosthetic Arthroplasty (i.e., Total Knee Arthroplasty)
 - a. See **Appendix H** for Physical Therapy Practice Guidelines for Persons with Bleeding Disorders: Total Knee Replacement

- iii. Post surgical DVT

1. Although the incidence of symptomatic DVT appears to be slightly lower than the estimated incidence in the general population without thromboprophylaxis following TKA or THA, physical therapists need to be aware of the signs and symptoms of post-surgical DVTs to communicate to the healthcare team for management.^[23]
2. The most common symptoms are redness, warmth, and swelling. Also, excessive pain and tenderness, beyond expected rehab pain, or a sudden change in how the leg feels.

7. Physical Therapy for Rehabilitation

- a. Physical therapy management of PWBD has been informed largely by the literature pertaining to other populations, such as sports injuries. In PWBD, attention must be paid to ensuring the bleeding has stopped, and to preventing new bleeding during the rehabilitation period.
- b. During the acute phase, exercise programs should be conducted in limited range, at low velocity and submaximal load, and within patient tolerance, while closely monitoring for signs of new bleeding.^[24]
- c. Progression beyond the acute phase, control of hemorrhage and restoration of range of motion, is an often-ignored component of the rehabilitation process. Functional rehabilitation and return to sport/work levels are vital elements often overlooked in physical therapy treatment programs.
- d. The physical therapist must be familiar with contraindications and safety precautions applicable to treating PWBD.
- e. Therapy Programs may include any of the following treatment modalities based on reason for physical therapy, diagnosis, and current functional status:
 - i. Exercises that have been studied in PWBD, particularly Hemophilia A and Hemophilia B, include exercise in water, active, isometric, and resisted exercise, aerobic exercise, functional (closed chain) exercise, treadmill walking, Tai Chi, Nordic walking, and home exercise programs.^[25]
 - ii. Progressive Muscle lengthening
 1. Flexibility
 2. Passive ROM
 - iii. Progressive Therapeutic exercise
 1. Active ROM
 2. Progressive strengthening
 3. Resistive work