

Physical Therapy Practice Guidelines for Persons with Bleeding Disorders: Total Knee Replacement

The following practice guidelines were developed through the consensus of the therapists that work with patients with bleeding disorders and edited by the National Hemophilia Foundation’s Physical Therapy Working Group. The information contained in the practice guidelines is not intended in any way to be used as primary medical advice or to replace medical advice. They are intended to guide the physical therapist caring for individuals with bleeding disorders in the important factors and elements of quality care.

Definition

- Surgical removal of the abnormal cartilage, synovium fibrous scar tissue, granulation scar tissue and bone of the damaged knee joint followed by prosthetic knee replacement

Goal

- Reduce pain and regain maximum possible function

Indications for Referral for Orthopedic Surgical Considerations

- Pain that impacts life by restricting activity participation and everyday activities
- Joint restriction, flexion contracture or joint fusion due to recurrent bleeds and hemarthropathy
- Severe joint and soft tissue damage including crepitus, muscle atrophy, epiphyseal hypertrophy, synovial thickening, radiographic evidence of joint degeneration, compensatory movement and/or antalgic gait

Physical Therapy Intervention Guidelines

Pre-Operative conditioning: Goal is to prepare patient for surgery and optimize success

- Referral to a hematologist or hemophilia treatment center for pre-operative planning and medical management of the bleeding disorder
- Coordinate physical therapy treatment sessions in collaboration with orthopedic and hematology services
- Verify use and timing of coagulation factor concentrate with patient prior to each PT session
- PT recommended at least one month prior to surgery for pre surgical exercises to strengthen both the involved and uninvolved limb, post-op surgical exercises, transfer techniques, and ambulation with assistive device
- Exercises to include isometrics and proprioceptive training to optimize strength and condition
- Prepare home environment ahead of time to make recovery easier

Post-Operative Intervention: Acute Care (immediate post-op)

- Anticipate longer than normal hospital stay to ensure hematological stasis. Expected length of stay is 3-7 days or longer as determined by the medical team.
- Factor replacement per medical team
- Verify use and timing of coagulation factor concentrate with patient prior to each PT treatment session both inpatient and outpatient
- Out of bed within 24 hours of surgery with goal of walking that day or the next day with physical therapy, if medically stable
- Assistive device following weight bearing orders as outlined by the medical team.
- Functional mobility training
- Progression of home exercise from AA/AROM
- Continuous passive motion (CPM) if recommended by the medical team
- Use of cooling devices for pain relief and to manage swelling. Cryocuff, gel packs, bagged ice with towel for skin protection
- Full leg length compression stockings or bandages to manage swelling
- Education: edema management, home exercise program, pain management

Post-Operative Rehabilitation: Activity progression follows orthopedic recommendations

- Rehabilitation times vary by individual patient and extent of surgery. Anticipate longer than normal rehabilitation time of at least 3-5 months (refer to section **Long Term Expectations**).
- Recommend OPPT 3x weekly for 12 weeks minimum as a starting point. Rehab in a patient with hemophilia may take longer for best outcome.
- Setting to be determined by the medical team with possibilities to include: home with Home Health services, Outpatient Physical Therapy services, Assisted Living, Acute Rehab, or Skilled Nursing Facility
- Factor replacement per medical team orders. Recommend factor infusions prior to all outpatient PT treatment sessions for duration of rehab *no matter severity of hemophilia*. Verify use and timing of factor replacement prior to each PT treatment session.
- Pain medication and opioid management as determined per medical team. **Aspirin/NSAIDs are contraindicated** for post op pain management.
- Gait training within weight bearing restrictions. Progression to least restrictive assistive device as tolerated. Optimize gait pattern for symmetry of step length, stance time, push off and heel strike.
- Progressive therapeutic exercises: isometric, AROM, progressive resistive strengthening to include joints above and below surgical site
- Emphasis on gaining active knee extension and flexion
- Dynamic balance/proprioception-to include unilateral stance strengthening.
- ADL training
- Use of cooling devices for pain relief and to manage swelling: Cryocuff, gel packs, bagged ice with towel for skin protection.
- Full length compression socks to manage swelling
- Monitor for signs of an acute bleed

- Education on appropriate post-operative activity.

Exercise Guidelines

- Instruct in proper technique to avoid muscle substitution and injury.
- Do not continue with the specific exercise if proper form cannot be maintained due to pain or weakness
- Adapt the exercise if needed to achieve correct form
- Exercise frequency of 2-3 times per day
- Repetition goal of 3 sets of 10-15 repetitions as able to do with proper technique. Increase repetitions as correct form and tolerance indicate
- **Signs/symptoms of joint or muscle bleeding:** include increased swelling, increased pain, or loss of movement. Should these symptoms occur discontinue the exercise and contact the HTC for care of an acute bleed

Other Treatment Considerations

- Kinesiology tape
- Electrical stimulation
- NMES
- Myofascial release
- Patella joint mobilizations
- Relaxation techniques for muscle guarding
- Consider foot orthotic consult as indicated

Warning Signs of a Possible Knee Replacement Infection

- Persistent fever (higher than 100°F orally)
- Shaking, chills
- Increasing redness, tenderness, or swelling of the knee wound
- Drainage from the knee wound
- Increasing knee pain with both activity and rest

Stop physical therapy and notify the doctor immediately with the development of these symptoms.

Long Term Expectations

- Numbness may occur in the skin around the incision and may take months to improve.
- Knee motion is expected to improve but the amount is predicted by motion prior to surgery and often doesn't increase to the same level as persons who do not have hemophilia.

- In people with bleeding disorders, the amount of time required to obtain their individualized full motion is often increased.
- With a continued home exercise program, patients can expect to see continued improvement in ROM after a year or more from surgery. Patients should incorporate the home exercise program into a regular fitness routine to maintain new ROM and strength.
- **Activity expectations:** return to recreational walking, swimming, golf, driving, light to moderate hiking, light to moderate skiing, recreational biking, normal stair climbing
- **Not usually recommended:** Difficult hiking & skiing, tennis, repetitive lifting of greater than 50 pounds, repetitive aerobic stair-climbing
- **Not recommended:** Running, jogging, contact sports, high impact aerobics, jumping sports

References

1. https://elearning.wfh.org/resource/treatment-guidelines/?_ga=2.138954099.1727410586.1655216275-1258602413.1655216275&_gl=1*10t24nj*_ga*MTI1ODYwMjQxMy4xNjU1MjE2Mjc1*_ga_7974KH9LH5*MTY1NTIyNDgyMy4yLjEuMTY1NTIyNDg5Mi4w. This site links to the World Federation of Hemophilia website and the *WHF Guidelines for the Management of Hemophilia*.
2. Silva M, Luck JV. Long-term results of primary total knee replacement in patients with hemophilia. *J Bone Joint Surg Am* 2005; 87:85-91.
3. Powell DL, Whitener CJ, Dye CE et al. Knee and hip arthroplasty infection rates in persons with haemophilia: a 27 year single center experience during the HIV epidemic. *Haemophilia* 2005; 11; 233-9.
4. Norian JM, Ries MD, Karp S, Hambleton J. Total knee arthroplasty in hemophilia arthropathy. *J Bone Joint Surg Am* 2002;84; 1138-41.
5. Rodriguez-Merchan EC. Total knee replacement in haemophilic arthropathy. *J Bone and Joint Surg Br* 2007; 89-B: 2; 186-8.
6. Silva M, Luck JV. Long-term results of primary total knee replacement in patients with hemophilia. *J Bone Joint Surg Am* 2005;87; 85-91.
7. Goddard NJ, Rodriguez-Merchan EC, Wiedel JD. Total knee replacement in haemophilia. *Haemophilia* 2002;8; 382-386.
8. Mortazavi SJ, Bagheri N, Farhoud A, Hadi Kalantar S, Ghadimi E. Total Knee Arthroplasty in Patients with Hemophilia: What Do We Know? *Arch Bone Jt Surg*. 2020 Jul;8(4):470-478.
9. Wang SH, Chung CH, Chen YC, Cooper AM, Chien WC, Pan RY. Does Hemophilia Increase Risk of Adverse Outcomes Following Total Hip and Knee Arthroplasty? A Propensity Score-Matched Analysis of a Nationwide, Population-Based Study. *J Arthroplasty*. 2019 Oct;34(10):2329-2336.e1.