The intent of this protocol is to provide guidelines for progression of rehabilitation. It is not intended to serve as a substitute for clinical decision making. Progression through each phase of rehabilitation is based on clinical criteria and time frames as appropriate. These guidelines should be administered under the supervision of a physical therapist.

Terms and Definitions:

**ROM** – *Range of Motion*
This defines the amount of mobility in your knee

**PROM** – *Passive Range of Motion*
Mobility exercises remain completely passive without the use of muscles to move your knee

**AAROM** – *Active Assisted (or partner assisted) ROM*
Range of motion with the assistance of a partner or your other leg and minimal use of the muscles of the surgical leg.

**AROM** - *Active Range of Motion*
Range of motion using the muscles of the surgical leg

**POD** – *Post-Operative Day*

**NWB** – *Non Weight Bearing*
This means that you should keep all weight off of your leg.

**TTWB** – *Toe Touch Weight Bearing*
This means that you may place a small amount of weight on your leg for balance purposes.

**PWB** – *Partial Weight Bearing*
This means that you may place some weight on your leg. The amount may be defined by your doctor

**WBAT** – *Weight Bearing as Tolerated*
This means that you may place weight on your leg, but to your tolerance. If your leg cannot accept your full weight, crutches are advised.

**DVT** – *Deep Vein Thrombosis*
This is a blood clot that can form in a deep vein.

**Proprioception**
This is a term to describe joint sense or your ability to feel how bent or extended your knee is without looking at it.

**Neuromuscular re-education**
This is the term used to train your muscles to fire in patterns that mimic function, such as balancing while standing.

**Open Chain**
This describes a position in which your leg can be moved about you, such as kicking. Your foot is not on the ground or a platform for these types of exercises

**Closed Chain**
A position in which your foot is on the ground or a platform, such as a squat or leg press.
Prehab (Presurgical Phase)

Goals:
- Prepare patient for surgery
- Achieve optimal ROM for easier recovery
- Achieve optimal conditioning for improved healing potential

Interventions:
- Patient education on post-operative protocol, ADL, hip precautions and ambulation with walker or crutches.
- ROM, stretching and manual therapy to address ROM limitations
- General conditioning (i.e. stationary bike) and light strengthening regimen

Phase 1 - Inpatient Protection Phase (POD 1 - hospital discharge)

Goals:
- Thorough assessment of living situation, availability of caregiver, need for home care and functional and cognitive status
- Patient and caregiver understanding of post-operative parameters, hip precautions, weight bearing precautions and post-operative protocol
- Achieve independent ambulation with assistive device
- Independent transfers (bed to stand, bathroom)
- Independent with ADL with assistance of caregiver or assistive devices (hip kit)
- Assist in reducing pain to tolerable levels
- DVT prevention and monitoring

Hip Precautions - maintain these precautions for ~ 3 months

Posterior Dislocation Precautions – for posterior and lateral approaches
- Avoid isolated and combined movements of adduction, internal rotation and flexion.
- Limit flexion to 90° - this includes flexing the torso! (eg. Sitting and leaning forward to reach for an object)
- Limit hip extension to neutral

Pain and Swelling
- PRICE – Protection, Rest, Ice, Compression, Elevation
- Use these items together to reduce pain and swelling
- At minimum, 5-6 times per day for 20-30 minute sessions
- There is no maximum!
- Modalities as indicated - Ultrasound, Electric Stimulation, Iontophoreses

This protocol was provided by Proaxis Therapy (303) 295-1403
www.proaxistherapy.com
• Ankle Pumps, quad sets, glute sets, regular ambulation – for swelling and DVT prevention

Range of Motion
• Passive Range of Motion
  o Partner assisted ROM to be taught to patient and caregiver
  o Self ROM exercises with strap (PROM and AAROM)
  o Knee PROM and AROM
• Active Assist Range of Motion
  o Stationary Bike without resistance
• Manual therapy as indicated

Gait (walking) and ADL
• WBAT unless otherwise noted
• ADL
  o Supine to sit and sit to stand transfers to be instructed while maintaining hip precautions
  o Positioning to maintain hip precautions
  o Instruct toilet, car, bath and shower transfers and address living situation needs for functional mobility at home
  o Instruction of use of assistive devices necessary for discharge to home (eg. hip kit)

Strength
• Isometrics
  o Abduction
  o Adduction – may be limited with osteotomy
  o Flexion
  o Extension
  o Quadriceps
  o Hamstrings
  o Calf Muscles

Proprioception and Neuromuscular Re-education
• Begin open chain proprioception exercises
• Light co-contraction exercises
• Light closed chain stability balance exercises (if weight bearing status permits)
Phase 2 – Outpatient Protection Phase - (hospital discharge - post-operative week 7)

Criteria to advancement to Phase 2
• Independent ambulation with assistive device to distance required for discharge to home
• Independent with hip precautions
• Independent with post-operative protocol and HEP supplied
• Caregiver and/or patient independence with ADL and transfers while maintaining hip precautions
• Needs for functional mobility in living situation met
• Other goals established by therapists met

Goals:
• Reduce swelling and pain
• Restore mobility within set limitations
• Promote return of strength in lower extremity musculature while maintaining hip precautions
• Hip flexors, abductors, adductors, extensors
• Knee extensors and flexors
• Continue DVT prevention and monitoring
• Restore normal gait within limits set by surgeon
• Promote normal proprioceptive and neuromuscular control

Pain and Swelling
• PRICE – Protection, Rest, Ice, Compression, Elevation
  • Use these items together to reduce pain and swelling
  • At minimum, 5-6 times per day for 20-30 minute sessions
  • There is no maximum!
• Modalities as indicated - Ultrasound, Electric Stimulation, Iontophoreses
• Ankle Pumps, quad sets, glute sets, regular ambulation – for swelling and DVT prevention

Range of Motion
• Passive Range of Motion
  • Partner assisted ROM to be taught to patient and caregiver
  • Self ROM exercises with strap (PROM and AAROM)
  • Knee PROM and AROM
• Active Assist Range of Motion
  • Stationary Bike without resistance
• Advance to active ROM while maintaining hip precautions
• Manual therapy as indicated
• Hydrotherapy
  • ROM exercises are permitted when incisions have healed (~2weeks)
Gait (walking) and ADL

- Continue to maintain weight bearing precautions. Ambulation distances may be increased for cardio-vascular benefit. If WBAT, weaning from assistive device progression may begin as tolerated.
- Weaning from crutches or walker
  - Begin with weight shifting exercises
  - Begin walking with more weight on leg using crutches
  - Single crutch or cane walking
    - This will reduce weight on your surgical leg by 25%
    - Be sure to place the crutch under the opposite arm
  - Walk small distances in home without crutches and take crutches with you for longer distances
- Hydrotherapy – water walking (*may begin when incisions are healed*)
  - Walk in water at shoulder level
  - Advance to walking at waist level

Strength

- Isometric with progression to standing, open-chain exercises
  - Abduction
  - Adduction – may be limited with osteotomy
  - Flexion
  - Extension
  - Quadriceps
  - Hamstrings
  - Calf Muscles

Proprioception and Neuromuscular Re-education

- Begin open chain proprioception exercises
- Light co-contraction exercises
- Light closed chain stability balance exercises (if weight bearing status permits)

**Phase 3 – Initial Strength (post-operative weeks 7-15)**

Criteria for advancement to phase 3

- PROM and AROM within limitations
- Minimal pain
- -4/5 strength assessed in hip flexors, abductors (unless osteotomy precautions are being maintained), adductors, quads and hamstrings

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Goals

• Eliminate Swelling
• Pain free active and passive ROM within set limitations
• Restore normal gait without deviations to distance of at least 300ft. without assistive device
• Increase leg strength to allow for:
  o Ambulation without assistive device
  o 1/3 knee bend without compensations
  o Single leg stance without Trendelenburg

Swelling

• Continue PRICE’ing with residual swelling
• Modalities as indicated - Ultrasound, Electric Stimulation, Iontophoreses

Range of Motion

☐ Continued PROM, AAROM and AROM – advance to full motion when cleared
☐ Quad and Hamstring stretching as indicated
☐ Advance to Low Load Prolonged Stretches as indicated
☐ Manual therapy as indicated for joint, capsular and soft tissue limitations.

Gait (walking) and ADL

• Patient is encouraged to continue weaning from assistive device if this progression has already been started
• Continued use of assistive device may be necessary with gait deviations, such as antalgic gait and Trendelenburg pattern
• Weaning from crutches or walker
  o Begin with weight shifting exercises
  o Begin walking with more weight on leg using crutches
  o Single crutch or cane walking
    ▪ This will reduce weight on your surgical leg by 25%
    ▪ Be sure to place the crutch under the opposite arm
  o Walk small distanced in home without crutches and take crutches with you for longer distances
• Hydrotherapy – water walking (may begin when incisions are healed)
  o Walk in water at shoulder level
  o Advance to walking at waist level
• Advance to ascending and descending stairs as tolerated

Strength

• Hip exercises
  o Sidelying open chain exercises in all directions
  o Theraband Around the world exercise
  o Side Steps with thera-band

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Single leg stance, Glute Medius exercise

- Closed Chain Strength progression (Glutes and Quads)
  - Leg press with light weight and high repetitions beginning with double leg and advancing to single leg
  - Mini Squats, 1/3 knee bends
  - Double knee bends to 90°

- Hamstring Specific Exercises
  - Carpet Drags
  - Hamstring Curls
  - Physio-ball bridging with knee bends

- Calf Muscles
  - Heel-toe raising
  - Calf raises

- Cardio
  - Begin stationary bike with resistance
  - Eliptical trainer if tolerated

**Proprioception, Balance and Neuromuscular Re-education**

- Begin double leg stability exercises on balance board
- Single leg balance on stable/semi unstable (foam) surface
- Single leg balance on balance board
- Variations of balance exercises with perturbation training
- Variations of balance exercises during alternate activity (i.e. ball tossing)

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**Phase 4 – Advanced Strengthening (Post-Operative weeks 15- outpatient discharge)**

**Criteria for advancement to Phase 4**

- No residual swelling present
- Full Active and Passive ROM
- Ascending and Descending stairs with involved leg without pain or compensation
- At least 1 minute of double knee bends without compensations
- Single knee bends to 70° flexion without compensations

**Goals:**

- Restore multi-directional strength
- Restore ability to absorb impact on leg (plyometric strength)

**Strength, Agility, Balance and Stability Training**

- Increase time on double knee bends with resistance
- Increase time on single knee bends. Add resistance as tolerated

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• Forward backward jog exercises with sport cord with minimal impact
• Lateral Agility exercise with minimal impact
• Advanced perturbation, balance and stability exercises
• Continue with cardio training
  o Add treadmill walking with incline, swimming and outdoor biking as tolerated
• Begin following sports at specified times or according to the discretion of surgeon and/or physical therapist
  o Mountain biking 4-5-6 months
  o Golf – 5 months
  o Sports involving running, cutting, and high-impact should be discussed with surgeon and physical therapist

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