

Total Knee Arthroplasty

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- TKA - Indications
- Osteoarthritis
  - Rheumatoid Arthritis
  - Post – Traumatic Arthritis
  - Osteonecrosis
  - Tumor

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- Technical Goals - TKA
- Prosthesis parallel to Floor/Stance
  - Mechanical Axis/Center of Joint
  - Correct Rotation
  - Centralize Quadriceps Tendon

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## Mechanisms of Failure

- Aseptic Loosening
- Infection
- Instability
- Stiffness
- Fracture
- Patella Femoral Problems

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## Total Knee Arthroplasty

### TKA – Goals

- Restore mechanical axis
- Restore joint line
- Painless ROM for ADL

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## TKA - Rehabilitation

### Acute Phase

- CPM 0° - 30° - Progress as tolerated
- Isometric Sub-max Hamstrings and Quadriceps
- Ambulation training
- Closed kinetic chain exercises – standing terminal extension – heel to toe loading mini squats
- Mobility – patella and assisted R.O.M.
- Standing (SLR) leg control exercises

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## TKA - Rehabilitation

### Sub-acute Phase

- CPM/R.O.M. as tolerated
- Exercises for early return of proprioception
- Core Stabilization: Swiss-plyo-ball exercises
- Closed Kinetic chain progression:
  - Wall squats (mini), standing terminal extension with resistance, leg press and balance activities
- Open chain exercises: Terminal Extension, Co-contraction Hamstrings/Quads, short arc exercises
- Mobility Activity as needed: Hamstrings and heel cord stretching

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## Proprioception Stimulation

### Calcaneal Control

“Heel to big toe concept”

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## TKA - Rehabilitation

### Early Proprioception – Return to function phase

- Balance activity – progress to single leg ( if possible)
- Continue core strengthening as needed
- Closed Kinetic Chain: Leg Press. Step lunges and balance vector training
- Independent Ambulation – treadmill/retro stepper for endurance
- Manual mobility as needed

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### Single leg balancing with multidirectional vectors

T.T. 5-5-3 = 5 Seconds  
5 Reps  
3 Planes

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### Single Plane Protocol

- 5 Seconds
- 5 Reps
- 3 Sets

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### TKA – Functional Summary

Stage I:

1. Core Stabilization
    - Swiss Ball Exercise
    - Seated Balance with quad sets
  2. Double Leg Wall Slides  
Ball Squats
  3. Leg Press – Closed Kinetic Chain Strengthening  
Total Gym – Sub max. based on body weight
  4. Heel to Toe Loading – mini squats
  5. STE – Standing Terminal Extension
  6. Step Lunges
- \* Exercise progression in based on assessment

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## TKA – Functional Summary

Stage II:

1. Single Leg Balance – eyes open
2. Single Leg Mini Squat
3. Balance Vector Program  
TT 553 – Tri-plane Stabilization
4. Eye open/ Eyes Closed balance testing

\* Based on work of C. Lewis, PT, PhD.

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## Total Shoulder Arthroplasty

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## Protective Protocol Concepts - TSR

- Subscapularis Protection
  - Delayed Strengthening
- Limits on External Rotation
  - Scapular Plane
    - 45° – Acute Phase
    - 60° – Sub-acute Phase
    - >60° – Return to Function Phase

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## Protective Protocol Concepts - TSR

- Limits on Elevation
  - 90° – Acute Phase
  - 140° – Sub-acute Phase to Functional Phase

*Reference: Wilcox R, Arslanian L, Millett P: Rehabilitation Following Total Shoulder Arthroplasty. J. Orthop Sports Phys Ther 2005; 35: 821-836.*

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## Total Shoulder Arthroplasty

### Acute Phase

- Immobilization device
- Assisted glenohumeral motion – scapula mobility
- Protection external rotation – slow stretch to the subscapularis
- Active elbow and hand exercises
- Manual exercises – elevation in scaption
- Light Isometric without internal rotation

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## Total Shoulder Arthroplasty

### Sub-acute Phase

- Mobility activities as instructed (wand exercises)
- Manual mobility – scapula – Glenohumeral
- Low level closed kinetic chain exercises
  - Ball on the table to ball on the wall
  - Wall push-ups
- Scapula retraction sets – strengthening
- Isometrics to light resistance exercises
- Manual exercises – rhythmic stabilization

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## Total Shoulder Arthroplasty

- Return to Function Phase
- Active rotator cuff strengthening
- Active elevation – scaption with resistance
  - Go slow with subscapularis
- Manual exercises
- Advanced scapula retraction – protraction control
- Continue closed kinetic chain exercises
  - Wall push-ups single arm in different planes

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## TSR Summary

- Mobility
- Strengthening
- Stabilization

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