

# Knee Replacement Handbook

## Knee Replacement Handbook

- How to Get Back to a Pain Free Life After a Knee Replacement -

**Rick Kaselj**, MS

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## My Story

**Rick Kaselj**

- BSc – 1997
- MS – 2008 / RC
- *Work* – physical therapy clinic, studio, gym, rehab centre
- *Courses* – live, webinars, video presentations
- *Writing* – books, manuals
- Injury specialist
- Blog – ExercisesForInjuries.com

Rick Kaselj – ExercisesForInjuries.com



**Rick Hiking 4300 km / 5 months from Mexico to Canada**

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## Presentation Objectives



- **Part 1** – What You Need to Know About a Knee Replacement
- **Part 2** – What Will Make Your Knee Replacement Pain Better or Worse
- **Part 3** – 3-Stage Pain Relieving Exercise Program for Knee Replacement

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## **Part 1 – What You Need to Know About a Knee Replacement**

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## **Knee Replacement**

### **– What is a Knee Replacement?**

- A surgical procedure to replace the weight-bearing surfaces of the knee joint to relieve pain and disability



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## **Why Are Knee Replacements Performed?**



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## Goal of a Knee Replacement



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## Focusing on what you can do to get back to being pain-free.

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## Different Types of Knee Replacement

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- Partial Knee Replacement
  - 
  -
- Other Progress in KR:
  - 
  - 
  -



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## Different Types of Knee Replacement

– Total knee replacement hardware, including femoral head, tibial plate, patellar plate, and meniscus replacement plate.

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Uni-/bi-/three-compartmental osteoarthritis involvement, a new approach is resurfacing combination arthroplasty - Zanasani 2011

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## Different Types of Knee Replacement

– Orthopaedic surgeons are now able to offer patients knee replacement procedures that are associated with:

- (1) Minimal risks during and after surgery by avoiding fat embolism, reducing blood loss and minimizing soft tissue disruption;
- (2) Smaller incisions
- (3) Faster and less painful rehabilitation
- (4) Reduced hospital stay and faster return to normal activities of daily living
- (5) An improved range of motion
- (6) Less requirement for analgesics
- (7) A durable, well-aligned, highly functional knee

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## Different Types of Knee Replacement

- The anatomy of the knee is divided into three compartments:

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- 
- 

(kneecap) and the femur, the patellofemoral (PF) compartment.

~ Zanasi 2011

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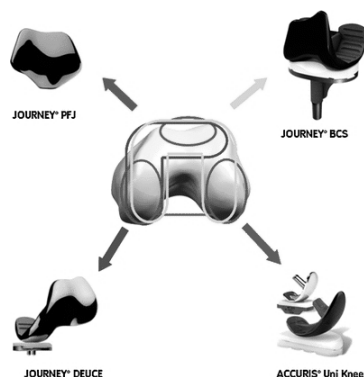
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Uni-/bi-/three-compartmental osteoarthritis involvement, a new approach is resurfacing combination arthroplasty - Zanasi 2011



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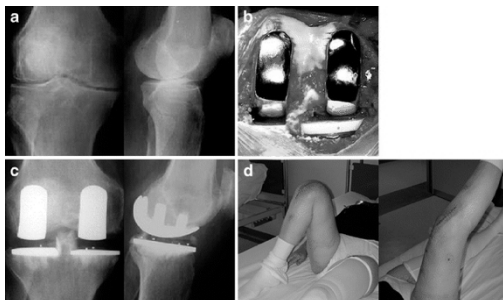
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Bi-unicompartmental knee replacement - Zanasi 2011

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## Different Types of Knee Replacement

### – Unicompartmental Knee Replacement/Resurfacing (UKR)

- More difficult procedure than TKR
- UKR is thought to allow preservation of the uninvolved soft tissue and bone
- Reduced operating time
- Better post-operative range of motion
- Less pain
- Better stair-climbing ability
- Improved gait due to proprioceptivity maintenance
- Increased patient satisfaction than TKR

~ Zanasi 2011

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## Different Types of Knee Replacement

### – With appropriate patient selection and careful surgical technique, UKR can provide the following advantages over TKR:

- (1)
  - (2)
  - (3)
  - (4)
  - (5)
  - (6)
  - (7)
- the medullary space
- (8) Easier revision surgery, if required, at a later date

~ Zanasi 2011

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## How Can A Pain Relieving Exercise Program for Knee Replacement Help You?

- Improves knee movement
- Makes your muscles strong
- Controls pain
- Reduce your body weight
- Improves sleep
- Reduces swelling
- Prevents blood clots
- Prevents constipation



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## How Big of a Problem are Knee Replacements?

- First knee replacement was performed in 1968
- Each year, almost 44,000 surgical procedures are done in Ontario for arthritis and related disorders - Health Quality Ontario 2005
- TKR surgeries rose by 61.6% between 1994 and 1995 and 2001 and 2002 in Ontario - Health Quality Ontario 2005
- In terms of age, 40% of TKR surgeries were performed in patients aged 65 to 74 years, 8% were performed in patients younger than 55 years, and 3% were for patients older than 85 years. - Health Quality Ontario 2005

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## How Big of a Problem are Knee Replacements?

- osteoarthritis (93%). Other diagnoses are inflammatory arthritis (5%), post-traumatic osteoarthritis (2%), and osteonecrosis (when bone dies due to blocked blood supply; 1%) - Health Quality Ontario 2005
- More women than men undergo knee replacement and most patients are between 55 and 84 years old - Health Quality Ontario 2005

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## How Big of a Problem are Knee Replacements?

- "Total hip and knee replacement are two of the most common and successful elective surgeries performed in the United States each year." - Ritterman 2013
- 450,000 TKA a year are performed in the USA - Meier 2008
- Expected to double by 2020 - Meier 2008
- "Osteoarthritis (OA) is the largest source of physical disability in the United States" - Mizner 2005
- "The joint most commonly affected by OA is the knee." - Mizner 2005

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## What are the Symptoms of Knee Replacement?



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- Progressive increase in pain
- Loss of function

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## Common Causes for a Knee Replacement

- 
- areas:
  - medial femorotibial
  - lateral femorotibial
  - patellofemoral compartments
- Rheumatoid Arthritis
- Injury



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## Common Causes for a Knee Replacement

- any more
- Knee replacement works on reconstructing the surface to a pain free joint
- In 2003/04 in Ontario, about 75% of THipR surgeries and 90% of TKR surgeries were to relieve pain and functional impairment due to OA - Health Quality Ontario 2005

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## Common Causes for a Knee Replacement

- OA affects about 10% of Canadian adults - Health Quality Ontario 2005
- In 2003, Statistics Canada reported that 16.8% of the Canadian population over the age of 12 has arthritis - Health Quality Ontario 2005
- About 6% of Canadians aged 35 years and older have osteoarthritis of the knee - Health Quality Ontario 2005

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## What Else Could it Be?



- Nothing

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## Other Names for Knee Replacement?



- Knee Replacement
- Total Knee Replacement (TKR)
- Knee Arthroplasty
- Total Knee Arthroplasty (TKA)

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## Key Structures Involved in Knee Replacement



- Overall Structure
  - Knee

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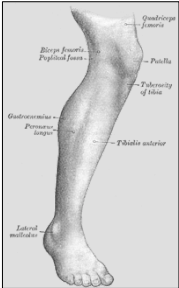
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## Key Structures Involved in Knee Replacement



- Key Area:
  - Knee joint
    - Largest joint in the body
    - Majority of the body weight is supported by the knee joint

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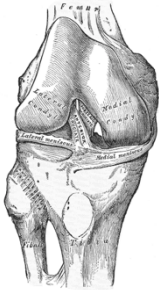
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## Key Structures Involved in Knee Replacement



- Key Area:
  - Medial femorotibial
  - Lateral femorotibial
  - Patellofemoral

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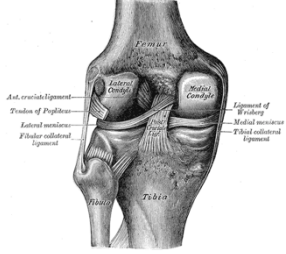
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## Key Structures Involved in Knee Replacement

- Key Bones in the Knee Joint
  - Femur
  - Tibia
  - Fibula
  - Patella



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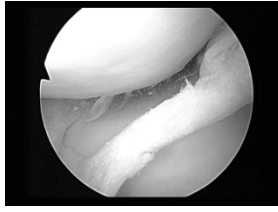
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## Key Structures Involved in Knee Replacement

- Covering Each of the Bones:
  - Cartilage



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## Key Structures Involved in Knee Replacement

- Key Muscles:
  - Quadriceps:
    - Rectus Femoris
    - Vastus Intermedius
    - Vastus Medialis
    - Vastus Lateralis



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## Key Structures Involved in Knee Replacement



- Key Muscles:
  - Hamstrings:
    - Semimembranosus
    - Semitendinosus
    - Biceps femoris

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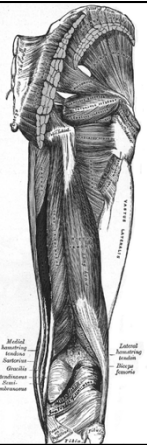
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## Key Structures Involved in Knee Replacement



- Key Muscles:
  - Hamstrings:
    - Semimembranosus
    - Semitendinosus
    - Biceps femoris

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## What Can You Do About It?

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- motion
- Play Wii Fit
- Exercise



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**Remember! (IMPORTANT)**

1.

2.


3.

4.

Any medical investigations

exercise program

Bring this exercise program to your doctor to see if it is right for you



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**Part 2 – What Will Make Your Knee Replacement Pain Better or Worse**

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**#1 - What Will Make Your Results Worse?**

"Physical deconditioning, tobacco use, obesity and medical co-morbidities can adversely affect outcomes and should be addressed before any elective procedure."



~ Coudeyre 2007

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## #2 - Pre-Operative Rehabilitation

"Rehabilitation before total hip and knee arthroplasty contributes to reduced hospital length of and modifying discharge conditions."

~ Ritterman 2013



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## #3 – Focus on the Quads Before Surgery

"Pre-operative quadriceps exercise at least three weeks prior total knee replacement result in short-term benefit such as decreased pain, improved quadriceps strength and improved quality of life after elective TKA."

~ Tungtrongjitt 2012

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## #4 - Core Stability

- Trunk Control



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## #5 - Balance Training

"Additional balance training exerted a significant beneficial effect on the function recovery and mobility outcome in patients with knee osteoarthritis after total knee replacement."

~ Liao 2013

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## #6 - Hip Strengthening

- Total Hip Machine
- Tubing in All 6 Directions of the Hip
- Sitting and Squeeze Ball between Knees



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## #7 - Ankle Strengthening

- Standing Toe Lifts
- Calf Raises

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## #8 - Functional Movement

- Walking
- Squatting
- Lunging
- Stepping

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## #9 - Stretching

- Flexibility because muscles tighten up with pain and lack of use

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## #10 - Walking and Gait

- It is affected before and after by pain
- Walking forwards, backwards, side-to-side

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## #11 - Sleeping

- 
- stress position
- One to two pillows between knees

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## #12 - Focus on Activities of Low Stress

- swimming,
- water walking
- water running
- water aerobics
- cycling
  - bicycle
  - upright
  - recumbent



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## #13 - Other

- 
- exercises
- Do not keep your knee in one position for too long
- Do not kneel until your knee is fully healed
- Be cautious of any pivoting of the knee
- Exercises on the floor you can do them on your bed

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## Essential Components of an Exercise Program For Knee Replacement



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- **Education cont.**
  - What is a Knee Replacement?
  - Why did I get it?
  - What makes it worse?
  - What to do about it?
  - How to do the exercise program and exercises properly?

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## Knee Replacement Assessment

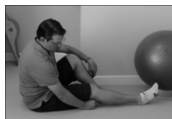
### - Knee to Wall (1284)

- Sitting with toe against wall, and move your knee towards the wall. Measure how far your knee is from the wall.



### - Knee to Floor (1283)

- Sitting and straighten you knee and measure how far your knee is off the ground.



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## Knee Replacement Exercise Program

### • **Goals of this Exercise Program:**

- Improve range of motion
- Muscle strength especially quadriceps
- Mobility of the joints
- Decrease pain

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## Keys to Remember

- Follow your therapist, doctor and surgeon advice.
- The program does not replace seeing a physical therapist.
- It is recommended that you see a physical therapist before and after your surgery.
- It is recommended that you see a physical therapist for the first 6 to 8 weeks after your surgery.

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## Keys to Remember

- Use walking aids as per medical guidance
- Rest your knee when needed
- Pace yourself
- Use pain medication as prescribed
- If you use a bag of peas, do not eat them after you have used them

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## **Part 3 – 3-Stage Pain Relieving Exercise Program for Knee Replacement**

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## 3-Stage Pain Relieving Exercise Program for Knee Replacement

	Stage 1	Stage 2	Stage 3
Step #1 - Cardiovascular	Stationary Bike	Rowing Machine	
Step #2 - Knee Extension	Tighten Quads on Back	Tighten Quads on Back with Heel on Towel Tighten Quads in Sitting	Tighten Quads in Standing
Step #3 - Ankle Mobility	Ankle Pumps on Back	Ankle Pumps in Sitting	Toe Raises in Sitting
Step #4 - Knee Flexion	Heel to Seat on Stomach	Heel to Seat on Back with Towel Heel to Seat in Sitting	Heel to Seat with Ball
Step #5 - Quad Strengthening	Leg Kicks on a Towel	Straight Leg Raises on Back Isometric Leg Extension in Sitting	Sitting Leg Kicks Sitting Towel Leg Press
Step #6 - Gluteus Maximus Strengthening	Seat Squeezes	Chair Lifts Bridging	Stair Step Up
Step #7 - Hamstring Strengthening	Heel Into Floor	Knee Bent Heel Into Floor Isometric Leg Curl in Sitting	Standing Heel to Seat

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## 3-Stage Pain Relieving Exercise Program for Knee Replacement

	Stage 1	Stage 2	Stage 3
Step #8 - Transfer	Forward Transfer	Backward Transfer	Single Leg Balance
Step #9 - Ice	- 10 to 20 minutes - 2 to 6 times a day	- 10 to 20 minutes - 2 to 6 times a day	- 10 to 20 minutes - 2 to 6 times a day

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## Exercise Rehabilitation Program

- **#1 – Cardiovascular**
  - Phase 1 - Stationary Bike
  - Phase 2 - Rowing Machine
- \_\_\_\_\_ minutes.



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**Exercise Rehabilitation Program**

- #2 – Knee Extension**
  - Phase 1 - Tighten Quads on Back (1246)
  - Phase 2 - Tighten Quads on Back with Heel on Towel (1247)

- 2 seconds

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**Exercise Rehabilitation Program**

- #2 – Knee Extension (cont.)**
  - Phase 2 - Tighten Quads in Sitting (1248)
  - Phase 3 - Tighten Quads in Standing (1249)

- 1 set of 5 repetitions with each held for 2 seconds

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**Exercise Rehabilitation Program**

- #3 – Ankle Mobility**
  - Phase 1 - Ankle Pumps on Back (1250)
  - Phase 2 - Ankle Pumps in Sitting (1251)
  - Phase 3 - Toe Raises in Sitting (1252)

- 1 set of 5 repetitions with each held for 2 seconds

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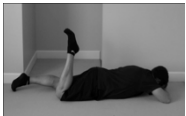
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# Knee Replacement Handbook

**Exercise Rehabilitation Program**

- #4 – Knee Flexion**
  - Phase 1 - Heel to Seat on Stomach (1253)
  - Phase 2 - Heel to Seat on Back with Towel (1254)
- 1 set of 5 repetitions



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**Exercise Rehabilitation Program**

- #4 – Knee Flexion (cont.)**
  - Phase 2 - Heel to Seat in Sitting (1255)
  - Phase 3 - Heel to Seat with Ball (1256)
- 1 set of 5 repetitions



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**Exercise Rehabilitation Program**

- #5 – Quad Strengthening**
  - Phase 1 - Leg Kicks on a Towel (1257)
  - Phase 2 - Straight Leg Raises on Back (1258)
  - Phase 2 - Isometric Leg Extension in Sitting (1259)
- 1 set of 5 repetitions with each held for 2 seconds



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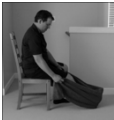

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# Knee Replacement Handbook

**Exercise Rehabilitation Program**

- #5 – Quad Strengthening (cont.)**
  - Phase 3 - Sitting Leg Kicks (1260)
  - Phase 3 - Sitting Towel Leg Press (1270)

1 set of 5 repetitions with each held for 2 seconds



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**Exercise Rehabilitation Program**

- #6 – Gluteus Maximus Strengthening**
  - Phase 1 - Seat Squeezes (1271)
  - Phase 2 - Chair Lifts (1272)

1 set of 5 repetitions with each held for 2 seconds

1 set of 5 repetitions



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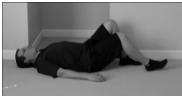
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**Exercise Rehabilitation Program**

- #6 – Gluteus Maximus Strengthening (cont.)**
  - Phase 2 - Bridging (1274)
  - Phase 3 - Stair Step Up (1273)

1 set of 5 repetitions



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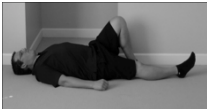
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# Knee Replacement Handbook

**Exercise Rehabilitation Program**

- #7 – Hamstring Strengthening**
  - Phase 1 - Heel Into Floor (1275)
  - Phase 2 - Knee Bent Heel Into Floor (1276)



- 1 set of 5 repetitions with each held for 2 seconds

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**Exercise Rehabilitation Program**

- #7 – Hamstring Strengthening (cont.)**
  - Phase 2 - Isometric Leg Curl in Sitting (1277)
  - Phase 3 - Standing Heel to Seat (1278)



- 1 set of 5 repetitions with each held for 2 seconds

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**Exercise Rehabilitation Program**

- #8 – Transfer**
  - Phase 1 - Forward Transfer (1279)
  - Phase 2 - Backward Transfer (1280)
  - Phase 2 - Side Transfer (1281)
  - Phase 3 - Single Leg Balance (1282)



- 1 set of 5 repetitions with each held for 2 seconds

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# Knee Replacement Handbook

## Exercise Rehabilitation Program

### • #9 – Ice

- 10 to 20 minutes
- 2 to 6 times a day



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## Other Injuries

- Iliotibial Band Syndrome (IT Band)
- Shin Splints
- Piriformis Syndrome
- Patellofemoral Pain Syndrome
- Meniscus Tear
- Sacroiliac Pain
- What to do When a Low Back Flare Up Hits



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## Other Injuries

- Plantar Fasciitis
- Lumbar Fusion
- Achilles Tendinitis
- Jumper's Knee
- Tennis Elbow
- Recovery Workouts
- Ankle Sprain



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# Knee Replacement Handbook

## Presentation Objectives



- **Part 1** – What You Need to Know About a Knee Replacement
- **Part 2** – What Will Make Your Knee Replacement Pain Better or Worse
- **Part 3** – 3-Stage Pain Relieving Exercise Program for Knee Replacement

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## Recommended Resource

- Hip Replacement Handbook

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## Recommended Resource

- Best Gluteus Maximus Exercises  
<http://BestGluteusMaximusExercises.com>

Your Gluteus Maximus Exercises:



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# Knee Replacement Handbook

## Recommended Resource

- Gluteus Medius Exercises

<http://GluteusMediusExercises.com/>

Your Gluteus Medius Exercise Program:



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## More FREE Information on Exercise & Injuries

- \$299 Fitness Education Gift

- Returning the Shoulder Back to Optimal Function Seminar
- Exercise Modification for the Sensitive Shoulder Seminar
- Visit [www.ExercisesForInjuries.com](http://www.ExercisesForInjuries.com)

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## Thank You

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- **Rick Kaselj**

- [support@ExercisesForInjuries.com](mailto:support@ExercisesForInjuries.com)
- [www.ExercisesForInjuries.com](http://www.ExercisesForInjuries.com)

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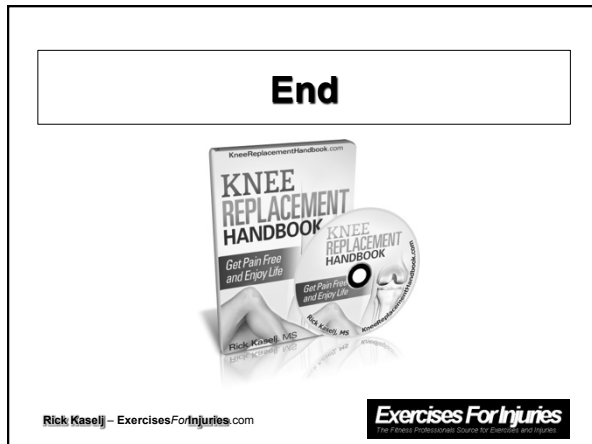
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## Knee Replacement Handbook



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