

ADVANCED REHAB FOR TOTAL KNEE REPLACEMENT

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OBJECTIVES

- 1) Learn quick functional tests to assess balance, mobility and strength.
- 2) Selective use of manual therapy along the lower kinetic chain to ease pain without medication, and increase joint mobility.
- 3) Go beyond the mat program and learn more sophisticated exercise prescriptions.

WHAT IS "ADVANCED"?

An expert does the basics well

"Secret ingredient" = clinical decision-making

Consider:

- Ways to adapt techniques & reinforce with your HEP
- How you screen regions above and below
- How you prioritize impairments
- How you blend with exercise and education
- "Active Constructive" Communication (enthusiastic support)

Simple is not always so simple.

ASSUMPTION



A LQ screening exam & other key tests/measures should have already been included as indicated:

History & Pain Assessment (description, where, NPRS scores)

- Observation, Postural Exam
- Functional Tests (Gait, Squat, Step Up/Down, Cross legs, Jump, Hop, Walk, Run, Etc)
- Neuromotor Screen & Vascular Screen to LEs
- Lumbar Clearing Exam (flexion, extension, quadrants, + overpressures, accessory glides from T/L junction down)
- Screening of hip, knee, ankle/foot ROM with overpressures
- Neurodynamics assessment



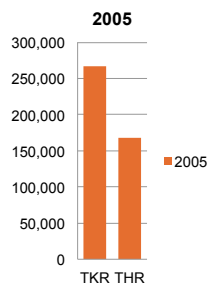
STUFF YOU SHOULD KNOW

Osteoarthritis is the single most common cause of disability in older adults.

As the population ages the rate of surgery increases.



STUFF YOU SHOULD KNOW



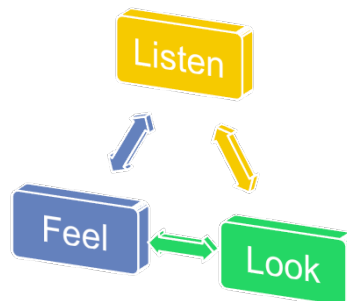
15-30% P/O TKR No Change in Pain and Function



COMPLICATIONS (JONES 2011)

- ♦ 81–89% overall patient satisfaction following total knee replacement
- ♦ 1 in 8 patients experience unexplained postoperative pain
- ♦ Obesity, increasing age, and medical comorbidities increase the risk of postoperative complications
- ♦ Prosthetic infection rate at 1 year is 1–2%
- ♦ Preoperative range of movement often determines postoperative range
- ♦ Low risk of acute vascular event and neurological and ligamentous injury
- ♦ Duration and method of venous thromboprophylaxis remains controversial

3 STEPS FOR MORE ADVANCED ORTHOPEDIC EXAMINATION



LISTEN

BODY MAP

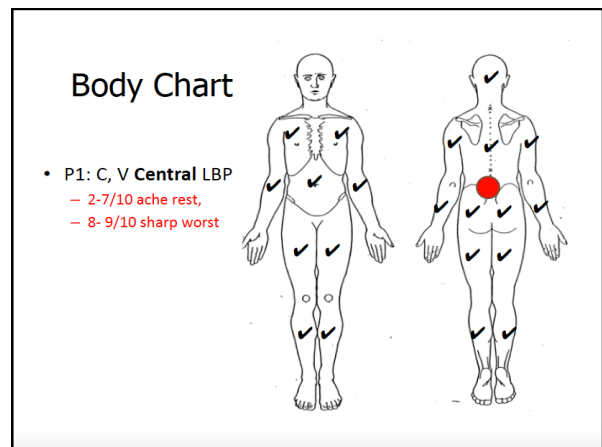
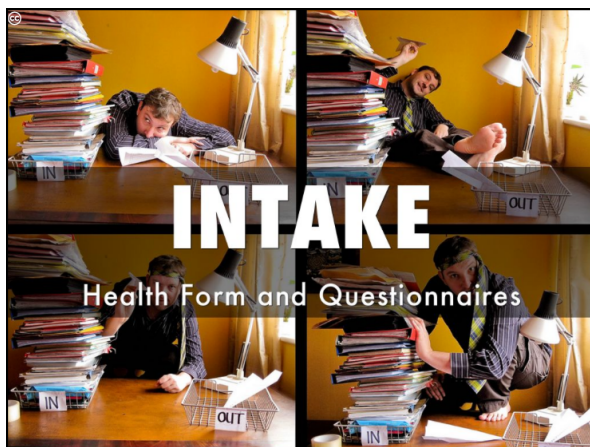
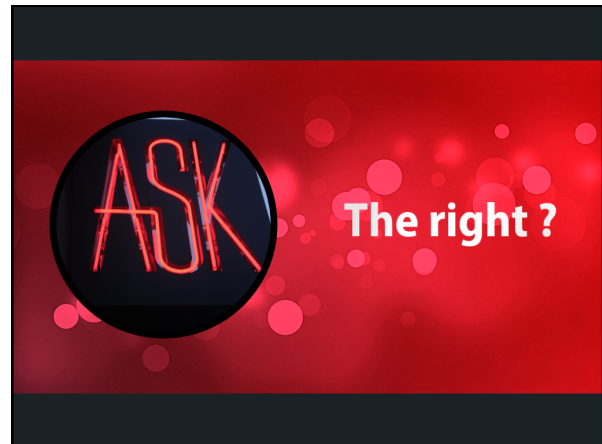
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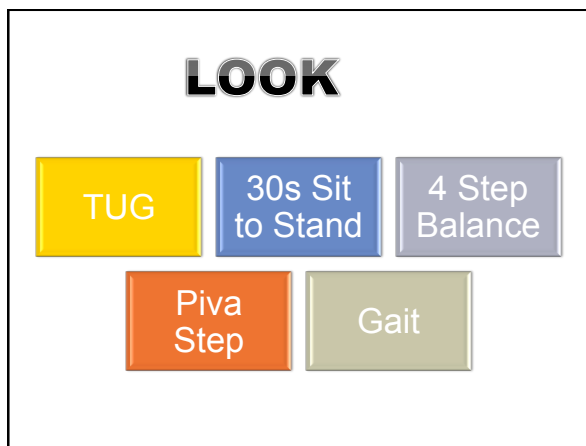
SELF REPORT OUTCOMES

- 1
- 2

YELLOW FLAGS

- 1
- 2





TIMED UP AND GO

SIT TO STAND

10 FEET & RETURN

“READY SET GO”

3 FUNCTIONAL TESTS

Timed Up & Go Test (10 ft)

30 second Chair Stand Test

4-Stage Balance Test



Instructions to the patient:

1. Stand with your feet side by side. Time: _____ seconds
2. Place the instep of one foot so it is touching the big toe of the other foot. Time: _____ seconds
3. Place one foot in front of the other, heel touching toe. Time: _____ seconds
4. Stand on one foot. Time: _____ seconds

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30 SECOND CHAIR STAND NORMS

Chair Stand—Below Average Scores

Age	Men	Women
60-64	< 14	< 12
65-69	< 12	< 11
70-74	< 12	< 10
75-79	< 11	< 10
80-84	< 10	< 9
85-89	< 8	< 8
90-94	< 7	< 4

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©

5 x Sit to Stand

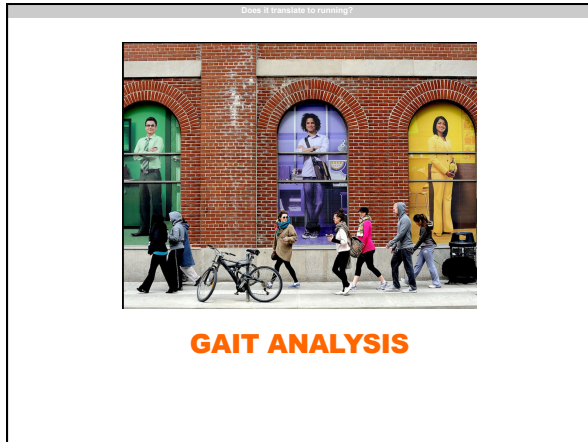
Reps: Time: Symptoms

Quality of Movement during Lateral Step Down Test (Piva et al 2006)

- 20 cm step
- Neutral LE alignment/ hands on waist
- 5 criteria grading scale
 - 0-1= good
 - 2-3= medium
 - = or > 4 =poor
- Repeat 5 times
- Reliability= (ICC) .94 (Loudan 2002)

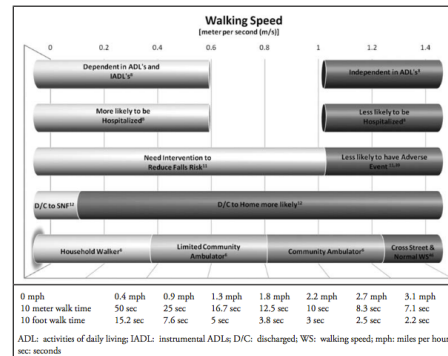


**Agreement with Boglia et al 2008 and Earl et al in 2005

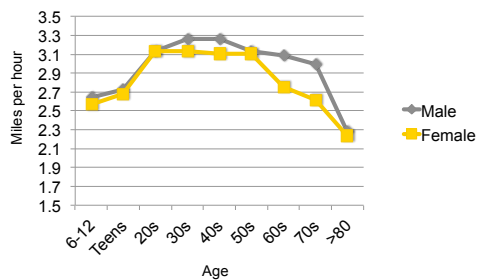


WALKING SPEED: THE SIXTH VITAL SIGN

Fritz 2009. J Geri Phys Ther

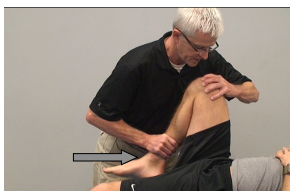


WALKING SPEED BY GENDER AND AGE



Feel

- Observation & Palpation
- Range of Motion Screen
- Resisted Muscle Tests
- Joint Mobility Assessment
- Mobilization & Manipulation

KNEE FLEXION

Flex the knee
Note end-feel, range,
pain and resistance
Apply mobilizing
force
Retest impairments

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KNEE FLEXION**(GR III IR & ER)**

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**KNEE FLEXION
+ POPLITEAL WEDGE**

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KNEE EXTENSION + ADDUCTION: GR IV

Stabilize the limb at the ankle so there is
a lower leg adduction moment

Place the heel of your mobilizing hand
medial to the tib tuberosity as shown

Apply an extension mobilization with
your mobilizing hand into tibiofemoral
adduction

Note end-feel, range, pain and
resistance

Retest impairments

Note: This technique is named for the
distal segment adduction moment

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KNEE EXTENSION + ABDUCTION: GR IV



Stabilize the limb at the ankle so there is a lower leg abduction moment

Place the heel of your mobilizing hand lateral to the tib tuberosity as shown

Apply an extension mobilization with your mobilizing hand into tibiofemoral abduction

Note end-feel, range, pain and resistance

Retest impairments

Note: This technique is named for the distal segment abduction moment

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KNEE EXTENSION: GR IV

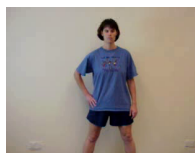


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Selected Exercises for Lower Extremity Conditions

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SELF MOBILIZATION



Videos



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MEDIAL AND LATERAL HAMSTRINGS



•While keeping the patient's knee extended, passively flex the hip with abduction or adduction for medial or lateral hamstring stretching, respectively

•If symptoms are felt behind or distal to the knee, this may be due to adverse neural dynamics. If so, this may respond best to on / off stretching instead of static stretching

•MANUAL CONTACTS- Try active stretching using manual contacts on the H/S and active contraction of the patients quadriceps

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PIRIFORMIS MUSCLE ABOVE 90 DEGREES IN SUPINE



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PIRIFORMIS MUSCLE BELOW 90 DEGREES IN SUPINE

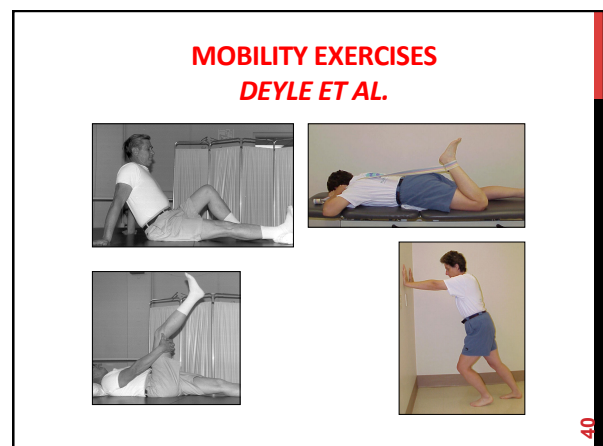
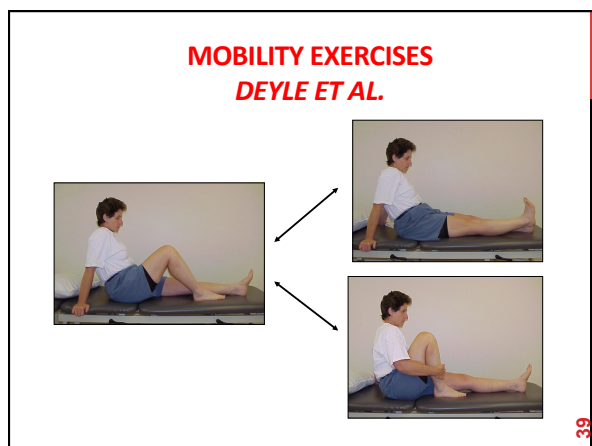
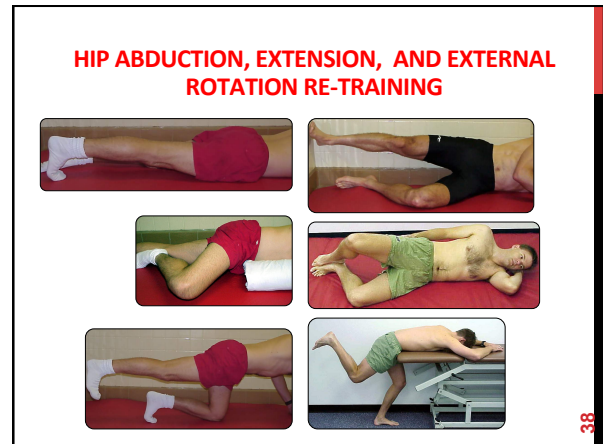
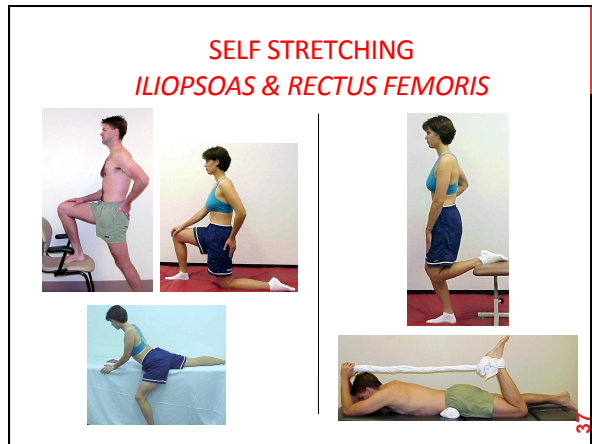


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SUPINE ILIOPSOAS, RECTUS FEMORIS, TFL



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STRENGTH EXERCISES DEYLE ET AL.

Terminal knee extensions (TKE)

Functional strengthening progression

- Seated Leg Press
- Weight Lessened Dips
 - Double Leg
 - Single Leg
- Step-ups

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QUADRICEPS FACILITATION

Discuss options for facilitating quadriceps

- Static quad set
- Quad set with movement
- Addition of facilitation
- Student ideas/discussion



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STRENGTH EXERCISES DEYLE ET AL.



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STRENGTH EXERCISES DEYLE ET AL.



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DOSING OF EXERCISES

DEYLE ET AL.

Daily

- Isometric SQS: 6-10 seconds x 10
- AROM with end range challenges to flex and ext: 2 bouts of 30 seconds
- Muscle stretches 3x30 seconds
- Walk at own pace and progressive distance

Three times weekly

- Terminal knee extension & closed chain progression - 1 30 second bout each exercise

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CLINICAL EXPERIENCE

DEYLE ET AL.

OA knee patients benefit from a good differential examination

Symptoms from many sources but all may be ascribed to the knee pathology

Not very tolerant to increased symptoms

Address impairments to movement

Extension loss can be treated more aggressively than flexion loss

Target treatment to the identified impairments

Use functional markers to measure treatment effect

Extensive overlap of manually applied PROM effects and ROM/stretching exercise is effective

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SELF-MOBILIZATION DORSIFLEXION & EVERSION

- The patient stabilizes the leg with the upper extremity / elbow as demonstrated. The therapist's stabilizing hand should wrap around the distal tibia and fibula
- The mobilizing hand grasps the calcaneus and provides either a medial to lateral or eversion oscillatory mobilization force to the rearfoot



- To mobilize the left ankle, the patient should stand as demonstrated
- The patient should ensure that the foot is pointed straight forward
- As the patient brings the knee forward, she should "drive" the heel downward and backwards and maintain contact between the heel and the floor at all times
- The patient should feel a stretch deep in the posterior ankle region. If the patient feels a "pinch" in front of the ankle, the exercise should be adjusted (increase/decrease arch of foot, point toes outwards slightly, etc) until the "pinch" resolves and the stretch is felt posteriorly



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