

weight-loss aquafit taichi bicycling swimming
endurance
strength health
relaxation aerobics intensity nEMEX nordicwalking
exercise
walking elliptical resistance
agility range gentle gradual yoga speed
fitness medicine snowshoeing
low-impact warm-up
stability weight-training
treadmill resilience

Benefits of exercise on health and chronic disease



- ✓ Hypertension
- ✓ Heart Disease
- ✓ Diabetes
- ✓ Obesity
- ✓ Bone density
- ✓ Depression
- ✓ Anxiety
- ✓ Dementia
- ✓ Cancer
- ✓ Arthritis

Health benefits of physical activity: the evidence; Warburton, D; CMAJ March 14, 2006

Benefits of exercise and arthritis



- ✓ Less pain
- ✓ Improved function
- ✓ Increased quality of life
- ✓ Improved sleep
- ✓ More energy
- ✓ Weight-loss
- ✓ Improved mood
- ✓ Improved stress management
- ? Improved cartilage health
- ? Anti-inflammatory effects

Exercise for osteoarthritis of the knee. Cochrane Database Syst Review 2015

Effect of cardiorespiratory & strength exercises on disease activity in patients with IA: Syst review & meta-analysis 2016



2018 EULAR Recommendations for Physical Activity in People with Inflammatory arthritis & Osteoarthritis

Based on evidence for effectiveness, feasibility & safety:

- ✓ Physical Activity (PA) should be an integral part of standard care
- ✓ All Health Care Providers have a responsibility for PA promotion
- ✓ Individual adaptations to PA based on individualized assessment



Agenda

What is **Neuromuscular Exercise (NEMEX)**?

What have we learned from **GLA:D™**?

Examples of **NEMEX** exercises

Move it...



What is **Neuromuscular Exercise (NEMEX)**?

Individualized Exercise with focus on:

- Correct posture
- Correct alignment
- Controlled movement
- Quality not quantity
- Balance while maintaining alignment

NEMEX

Correct knee over toe position



Incorrect knee medial to foot





What is **Neuromuscular Exercise (NEMEX)** ?

- Muscle strength
- Coordination
- Functional
- Loading and un-loading
- Closed-kinetic chain



GLA:D™

What have we learned from GLA:D™?



- 9,825 participants with hip and knee OA
- education & NEMEX
- 8 wk program: 12 ex sessions (2x/wk)
- Small groups (max 6 participants)
- 2 education sessions
- 27% reduction in pain intensity
- 32% increase in self-reported activity levels
- 37% - 45% reduction in use of pain medications

S. Skou and E. Roos; Good Life with osteoArthritis in Denmark (GLA:D™); BMC Musculoskeletal Disorders, Feb 2017



What have we learned from GLA:D™?

- Improved quality of life
- Fewer patients on sick leave
- Results sustained at 1 year
- 93% satisfied
- Results have been repeated in Canada
- Locations: <https://gladcanada.ca/>

www.glaiddk/english.html: *English Summary of GLA:D® Annual Report*



GLA:D™ Canada Results (Dec 2017)

- 428 out of 607 participants provided data
- 178 completed 3 month follow-up data
- 28% reduction in pain intensity
- Hip OA participants: 10% improvement QOL
- Knee OA participants: 25% improvement QOL
- 35% reported more physically active
- 90% were satisfied with program

<https://gladcanada.ca/>



What have we learned from GLA:D™?

- OA knee & hip pain can be improved with exercise
- Repetition (10 – 20 reps)
- Recovery (2-3 sets)
- Progression (number or difficulty)
- Supervised twice per week
- 8 weeks



What else have we learned from GLA:D™?

- OK to feel some pain with exercise
- Hurt does not mean harm
- Some pain during exercise is **not** dangerous
- Pain should return to **usual** within 24 hours





What else have we learned from GLA:D™?

Value of Outcome measures

- ✓ Quantify change / improvement
- ✓ Evaluate effectiveness of intervention
- ✓ Foundation for evidence-based clinical practice

30-Second Sit to Stand Test



Outcome measure:

- ✓ Sit-to-stand ability, lower body strength & balance
- ✓ Validity: good, correlates with the 50 ft. walk test in patients awaiting THR & TKR
- ✓ Reliability: Excellent inter-rater and test-retest reliability in patients with hip/knee OA or awaiting TJA
- ✓ Simple and practical

30-Second Sit to Stand Test

Instructions to the patient:

1. Sit in the middle of the chair.
2. Place your hands on the opposite shoulder crossed at the wrists.
3. Keep your feet flat on the floor.
4. Keep your back straight and keep your arms against your chest.
5. On "**Go,**" rise to a full standing position and then sit back down again.
6. Repeat this for 30 seconds.





30-Second Sit to Stand Test

- ✓ Demonstrate the task both slowly and quickly.
 - ✓ Have the patient practice a repetition or 2 before completing the test.
 - ✓ Count the number of times
-
- ✓ Ready... set... GO....

30-Second Sit to Stand Test



- ✓ If a patient must use their arms to complete the test they are scored 0.
- ✓ **Document if you modify.**
- ✓ The participant can stop and rest if they become tired (but the time keeps going).
- ✓ Monitor and encourage the participant's performance to ensure proper form
- ✓ The **tester silently counts** the completion of each correct stand

Moderately Active Older Adults:

Normative data published in Rikli and Jones 1999b

(Rikli and Jones, 2013; $n = 2140$ moderately active older adults)

Criterion fitness standards to maintain physical independence

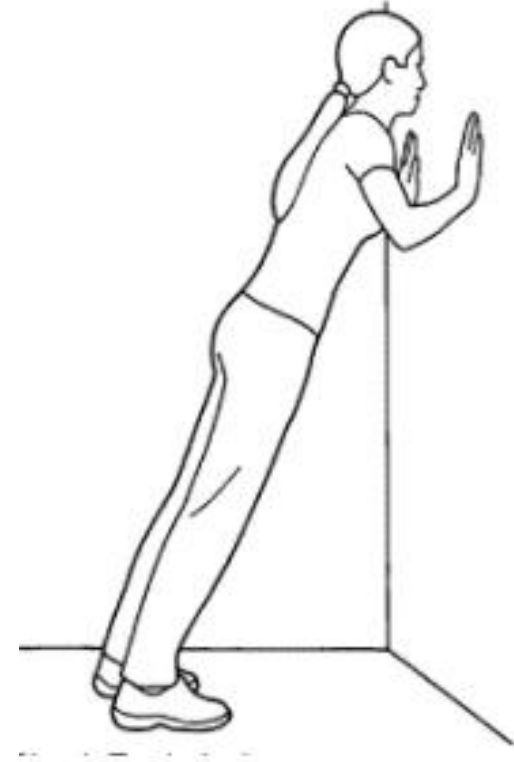
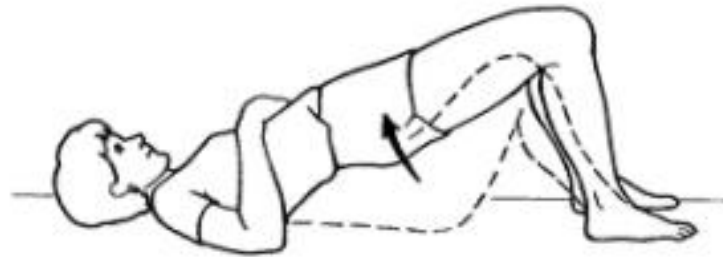
Age	60-64	65-69	70-74	75-79	80-84
Women	15	15	14	13	12
Men	17	16	15	14	13

Below average scores associated with an increased risk of falling

NEMEX

Core strength

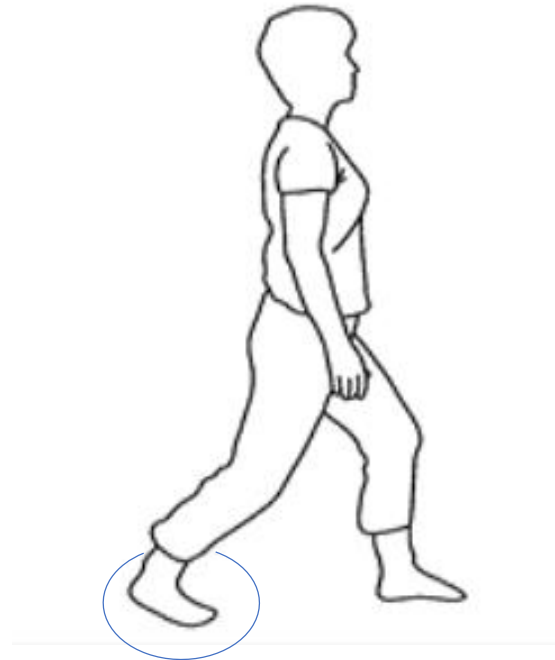
- Bridge
- Wall-plank



NEMEX

Postural Orientation

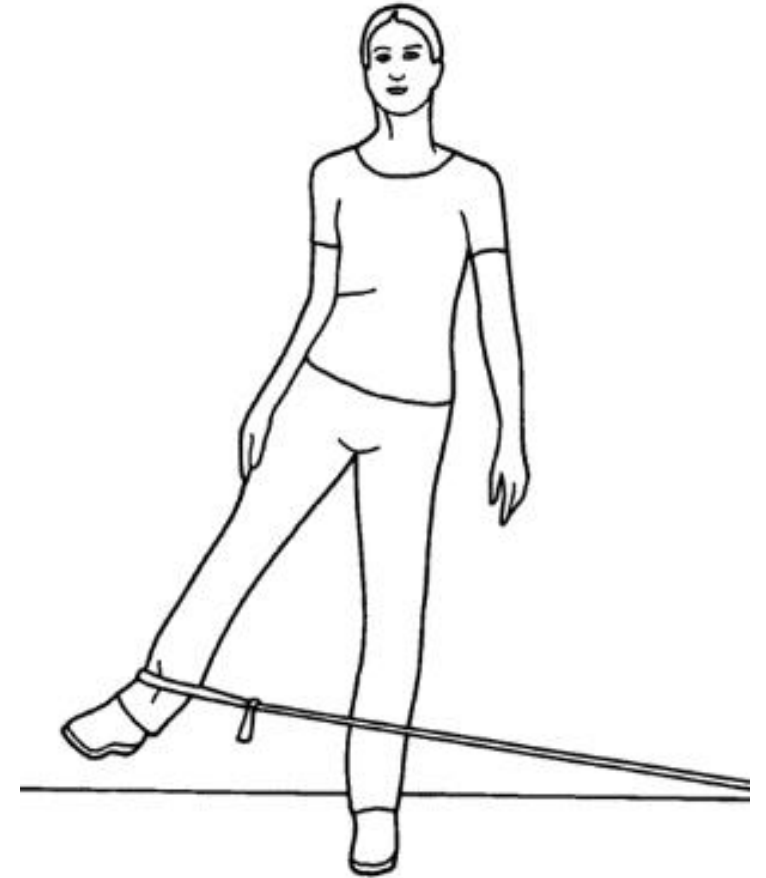
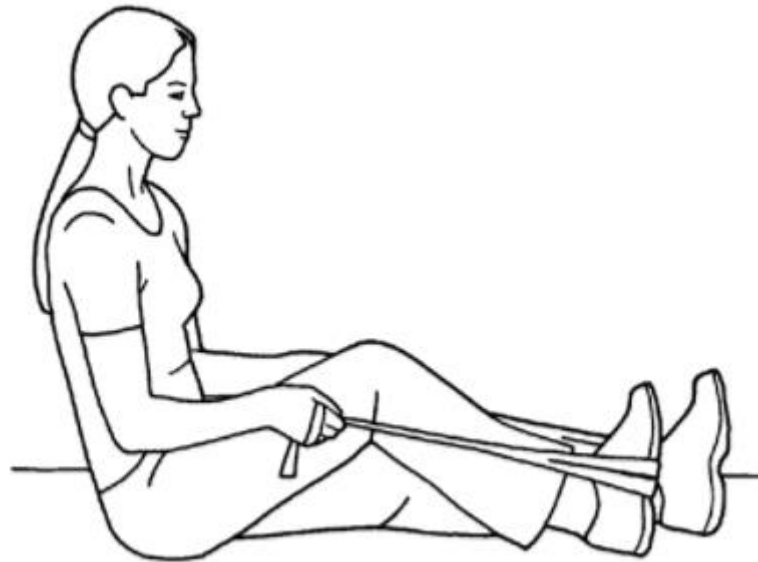
- Backward / forward slides & lunges
- Sideways slides & lunges



NEMEX

Lower Extremity Strength

- Theraband resistance and standing strengthening



NEMEX

Functional Exercises

- Chair stands
- Stairs





Move it!

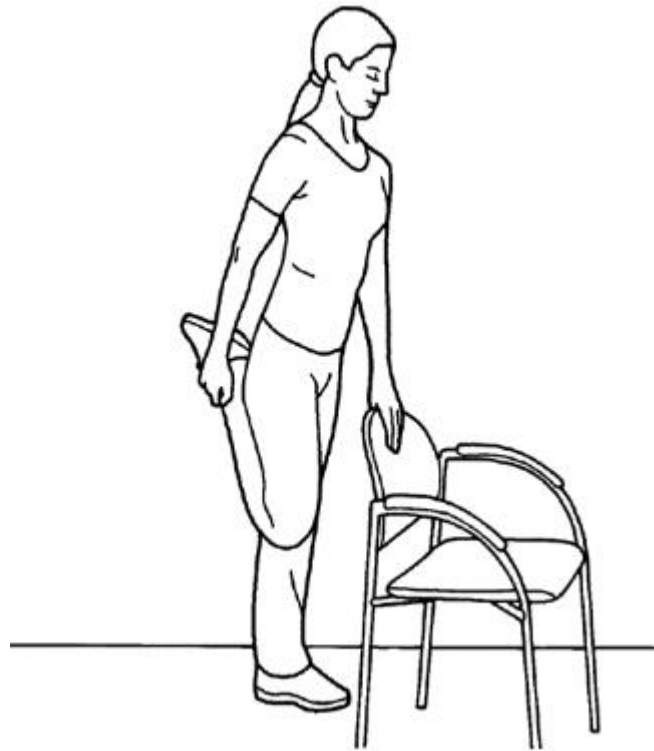
DreamWorks Madagascar

Gastrocs stretch



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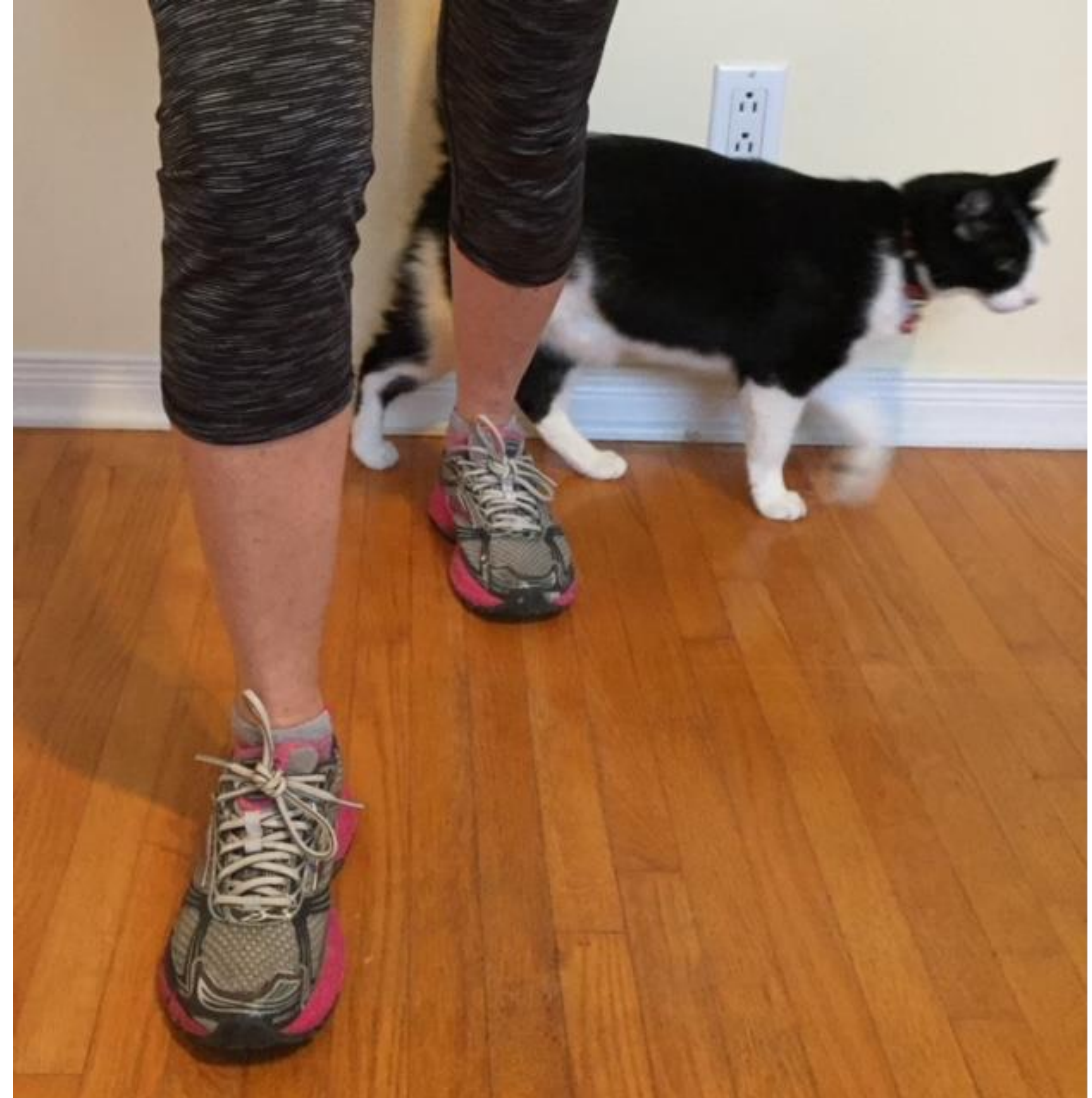
Quadriceps



Hamstring



Questions?



References and references

- Health benefits of physical activity: the evidence; Warburton, D; CMAJ March 14, 2006 174 (6) 801-809; DOI: <https://doi.org/10.1503/cmaj.051351>
- Exercise for osteoarthritis of the knee. Fransen M, Cochrane Database Syst Rev 2015;1:CD004376.
- Effect of cardiorespiratory and strength exercises on disease activity in patients with inflammatory rheumatic diseases: a systematic review and meta-analysis Silje Halvorsen Sveaas; <http://dx.doi.org/10.1136/bjsports-2016-097149>
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- <https://physicaltherapy.med.ubc.ca/physical-therapy-knowledge-broker/total-joint-arthroplasty-and-outcome-measures-tjaom-toolkit/>
- <https://oarsi.org/sites/default/files/docs/2013/manual.pdf>
- Functional Fitness Normative Scores for Community-Residing Older Adults, Ages 60-94; Rikli, Jones, <https://doi.org/10.1123/japa.7.2.162>

How does GLA:D work?

- Initial individual assessment
- Small groups of 4- 6 patients
- 6-8 exercise sessions:
 - 10 minutes warm-up: walking or stationary bike
 - 4 exercise stations
- Re-evaluation of outcome measures