OARSI Year in Review
Rehabilitation and Outcomes

Kim Bennell, Michelle Hall, Rana Hinman

Centre for Health, Exercise and Sports Medicine
Department of Physiotherapy
University of Melbourne
Australia

Disclosures

- Royalties from ASICS Oceania Pty Ltd
- Consultant for Physitrack

Search strategy

- **All non-drug, non-surgical modalities**
- **April 1st 2014 to March 31st 2015**
- **Pubmed and Cochrane databases**
- **Included systematic reviews and RCTs**

Type of study design and topic	No. of articles
Systematic reviews	24
Exercise/physical activity for knee OA	7
Aquatic exercise/balneotherapy for lower limb/hand OA	3
Orthoses and/or bracing for knee OA	3
Rehabilitation interventions for thumb OA	2
Exercise for hip and knee OA	2
Whole body vibration for knee OA	2
Weight loss for hip and knee OA	1
Exercise and depression for OA at unspecified joint	1
Exercise for hip OA	1
Compression gloves for hand OA	1
Acupuncture for OA at unspecified joint	1

Randomised controlled trials	46
Exercise/physical activity	21
Electrotherapy (eg laser, electrical stimulation)	7
Spa therapy/balneotherapy/mud bath	4
Acupuncture	3
Bracing	3
Lateral wedge insoles	3
Taping	2
Manual therapy	2
Physical therapy	2
Joint protection	1
Multidisciplinary strategy	1
Yoga	1
Gait training	1

Selected studies

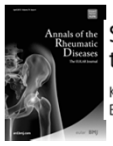
- Treatment at less studied joints
  - Hand
  - Hip
- New insights in to exercise for knee OA
- Biomechanical interventions
- Acupuncture

Hand osteoarthritis

Exercise **Joint protection**

Limited effects of exercises in people with hand osteoarthritis: results from a randomized controlled trial

N. Østerås † *, K.B. Hagen † ‡, M. Grotle † §, A.-L. Sand-Svartrud †, P. Mowinckel †, I. Kjeken † ‡



Self-management approaches for osteoarthritis in the hand: a 2×2 factorial randomised trial

Krysia Dziedzic,[1] Elaine Nicholls,[1] Susan Hill,[1] Alison Hammond,[2] June Handy,[1] Elaine Thomas,[1] Elaine Hay[1]

Osteras et al 2014 N=130

- **At 3 mths - no effect on Functional Index Hand OA**
- **Greater improvement on patient-specific functional scale (mean diff 0.9 points, 95% CI 0.1, 1.7)**
- **No effects at 6 months**

Osteras et al 2014 N=130

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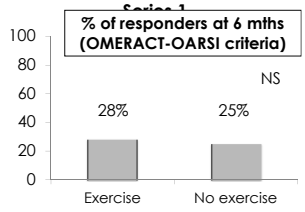

Dziedzic et al 2015 N=257

Osteras et al 2014 N=130

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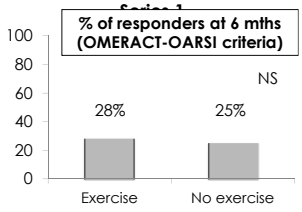

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Joint protection

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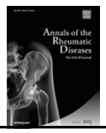
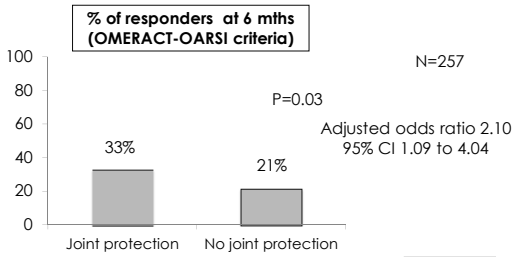


Joint protection



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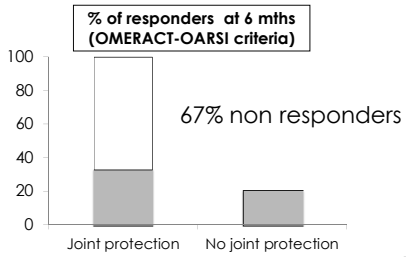

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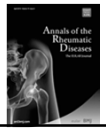

Hip osteoarthritis

Exercise for osteoarthritis of the hip (Review)

Fransen M, McConnell S, Hernandez-Molina G, Reichenbach S

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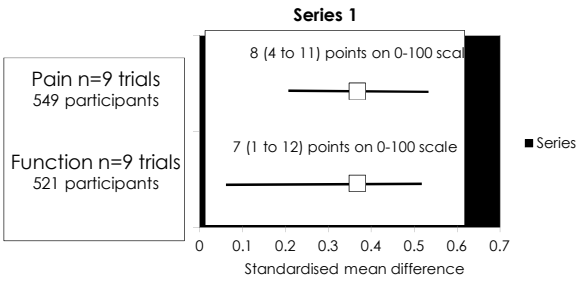

Immediate Efficacy of Neuromuscular Exercise in Patients with Severe Osteoarthritis of the Hip or Knee: A Secondary Analysis from a Randomized Controlled Trial

J Rheumatol 2014

Allan Villadsen, Søren Overgaard, Anders Holsgaard-Larsen, Robin Christensen, and Ewa M. Roos

- 165 patients with end-stage hip or knee OA
- 8 week physiotherapist supervised neuromuscular exercise program

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Significant difference in mean change in HOOS/KOOS ADL subscale between groups in favour of exercise

Mean diff -7.2 points, 95% CI -10.9 to -3.5, p=0.0002

HIP OA

✓

Mean diff -10.9 points, 95% CI -15.9 to -5.8, p<0.0001

NNT = 4 for ≥15% improvement in KOOS/HOOS

KNEE OA

××

Mean diff -3.5 points, 95% CI –8.8 to 1.8, p=0.192

NNT = 23 for ≥15% improvement in KOOS/HOOS

EXTENDED REPORT

Exercise therapy may postpone total hip replacement surgery in patients with hip osteoarthritis: a long-term follow-up of a randomised trial

Ann Rheum Dis 2015

Ida Svege,[1] Lars Nordsletten,[2,3] Linda Fernandes,[1,4] May Arna Risberg[1]

- 12 week program – strengthening, flexibility, functional exercises 2-3 times per week

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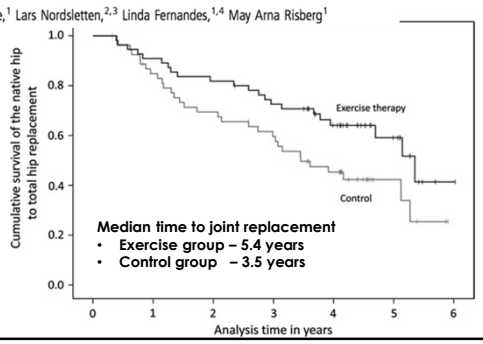


Median time to joint replacement
- **Exercise group – 5.4 years**
- **Control group – 3.5 years**

Physical therapy for hip OA (n=102)

Education **Manual therapy**

Exercise **Gait aids**

VS

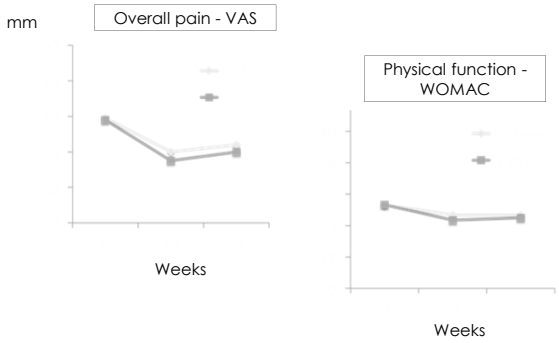
SHAM

Inert cream

Inactive ultrasound

Bennell et al *JAMA* 2014

Mean scores over time



New insights in to exercise for knee OA

Moderate benefits of exercise

One size fits all?

J Rehabil Med 2014; 46: 703–707

SHORT COMMUNICATION

KNEE JOINT STABILIZATION THERAPY IN PATIENTS WITH OSTEOARTHRITIS OF THE KNEE AND KNEE INSTABILITY: SUBGROUP ANALYSES IN A RANDOMIZED, CONTROLLED TRIAL

Jesper Knoop, MSc, PT[1], Marike van der Leeden, PT, PhD[1,2], Leo D. Roorda, PhD, MD, PT[1], Carina A. Thorstensson, PT, PhD[3], Martin van der Esch, PT, PhD[1], Wilfred F. Peter, PT[1], Mariette de Rooij, PT[1], Willem F. Lems, PhD, MD[4,5], Joost Dekker, PhD[2,6] and Martijn P. M. Steultjens, PhD[7]

Experimental exercise program

Stabilisation exercises	Strength exercises	Performance of daily activities

Control exercise program

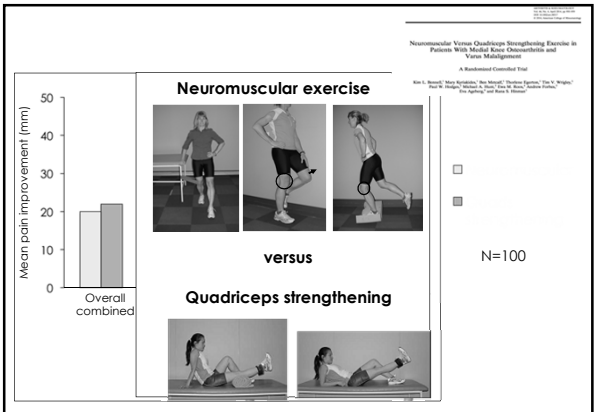
Strength exercises	Performance of daily activities

12 weeks
N=159

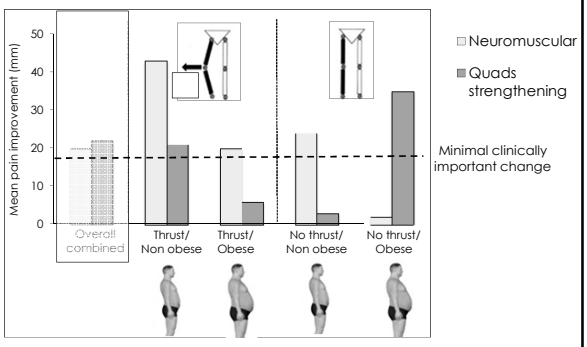
Effect modification by muscle strength

- **Patients with greater muscle strength benefitted more from experimental program**
- **Patients with lower muscle strength benefitted more from control program**

Knoop et al *J Rehabil Med 2014*



Bennell et al *Arth Rheum* 2014



Bennell et al *Arth Care Res* 2015

Maximising exercise adherence

Maximising exercise adherence

Arthritis Care & Research
Vol. 66, No. 11, November 2014, pp 1680–1687
DOI 10.1002/acr.22350
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ORIGINAL ARTICLE

Effects of Two Physiotherapy Booster Sessions on Outcomes With Home Exercise in People With Knee Osteoarthritis: A Randomized Controlled Trial

KIM L. BENNELL,[1] MARY KYRIAKIDES,[1] PAUL W. HODGES,[2] AND RANA S. HINMAN[1]

Group-mediated Physical Activity Promotion and Mobility in Sedentary Patients with Knee Osteoarthritis: Results from the IMPACT-Pilot Trial

Brian C. Focht, Matthew J. Garver, Steven T. Devor, Justin Dials, Alexander R. Lucas, Charles F. Emery, Kevin V. Hackshaw, and W. Jack Rejeski

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The Journal of Rheumatology

- **Development of motivation**
- **Activity self regulatory skills**
- **Group dynamics**

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Traditional centre-based exercise

3 month supervised exercise program 3 x per week (36 sessions)

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Group-mediated cognitive behavioural exercise intervention

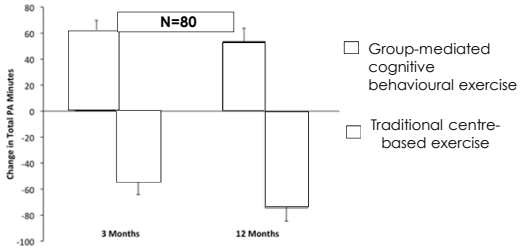
36 supervised sessions over 9 months

- **Development of motivation**
- **Activity self regulatory skills**
- **Group dynamics**

Traditional centre-based exercise

3 month supervised exercise program 3 x per week (36 sessions)

Mean change in total physical activity from baseline



Focht et al *J Rheumatol* 2014

What are the structural effects of exercise?

Effect of Exercise on Patellar Cartilage in Women with Mild Knee Osteoarthritis

Jarmo Koli[1], Juhani Multanen[1,2], Urho M. Kujala[1], Arja Häkkinen[1,2], Miika T. Nieminen[3,4,5], Hannu Kautiainen[6,7], Eveliina Lammentausta[3,4], Timo Jämsä[3,4,8], Riikka Ahola[4,8], Harri Selänne[9], Ilkka Kiviranta[10], and Ari Heinonen[1]

Medicine & Science IN Sports & Exercise

- 80 post menopausal women with mild patellofemoral OA
- Progressive impact exercise program 3 times weekly for 12 months vs no intervention control
- MRI – T2 relaxation time mapping

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Medicine & Science IN Sports & Exercise

- 80 post menopausal women with mild patellofemoral OA
- Progressive impact exercise program 3 times weekly for 12 months vs no intervention control
- MRI – T2 relaxation time mapping
- Change in patellofemoral T2 values was 7% greater in exercise group (p=0.018)

Duivenvoorden et al *Clin Orthop Rel Res 2015*
Campos et al Sao Paulo Med J 2014

Lateral wedge insoles

Footwear

Biomechanical treatments for knee OA

Bracing

Gait retaining

Segal et al *Am J Phys Med Rehab 2015*

Osteoarthritis and Cartilage

Biomechanical effects of valgus knee bracing: a systematic review and meta-analysis

Arthritis Care & Research

Valgus Bracing for Knee Osteoarthritis: A Meta-Analysis of Randomized Trials

REBECCA F. MOYER, TREVOR B. BIRMINGHAM, DIANNE M. BRYANT, J. ROBERT GIFFIN, KENDAL A. MARRIOTT, AND KRISTYN M. LEITCH

Braces and orthoses for treating osteoarthritis of the knee (Review)

Duivenvoorden T, Brouwer RW, van Raaij TM, Verhagen AP, Verhaar JAN, Bierma-Zeinstra SMA

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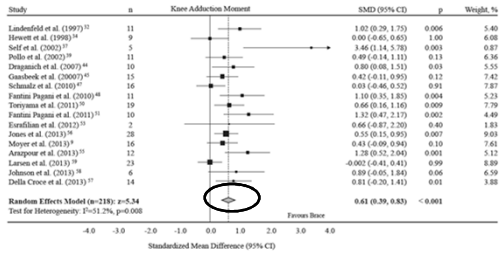
Effect of bracing on pain and function

- Studies deemed to be of low methodological quality
- Small pain benefit of marginal clinical importance
- No effect on physical function
- Adherence rates low

Moyer et al *Arth Care Res* 2015;
Duivenvoorden et al *Cochrane review* 2015

Effect of valgus bracing on knee adduction moment



Moyer et al *Osteoarth Cart* 2015

EXTENDED REPORT

A randomised trial of a brace for patellofemoral osteoarthritis targeting knee pain and bone marrow lesions

Ann Rheum Dis 2015

Michael J Callaghan,[1,2] Matthew J Parkes,[1,2] Charles E Hutchinson,[3,4] Andrew D Gait,[3] Laura M Forsythe,[1,2] Elizabeth J Marjanovic,[3] Mark Lunt,[1,2] David T Felson[1,2,5,6]

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- N=126
- PF Brace vs No brace
- 75% had PF BMLs at baseline
- Wore brace for mean 7.4 hr/day for 6 weeks

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- N=126
- P
- 7
- W eks

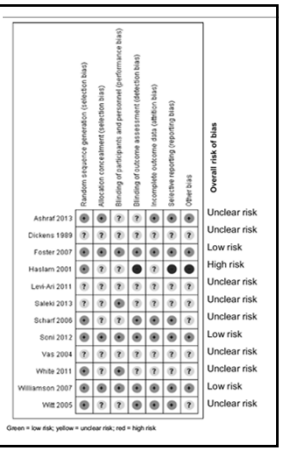
18% greater reduction in BML volume at patella with bracing (p=0.03)

Acupuncture

Conflicting guideline recommendations

Systematic review and meta-analysis

- 12 trials (1763 participants) up to May 2014
- Most trials were of high or unclear risk of bias (75%)

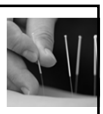


Manyaga et al *BMC Comp Alt Med* 2014

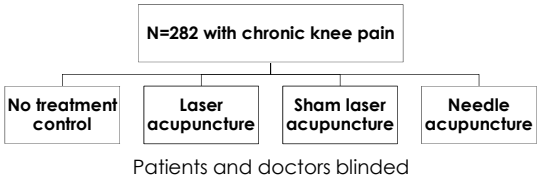
Research

Original Investigation

Acupuncture for Chronic Knee Pain
A Randomized Clinical Trial



Zelen-design RCT



Patients and doctors blinded

Hinman et al *JAMA* 2014

Research

Original Investigation

Acupuncture for Chronic Knee Pain
A Randomized Clinical Trial

- No effect of needle or laser acupuncture compared to sham
- Modest improvements in pain at 12 weeks but not 1 year with needle or laser compared to no treatment

Findings do not support acupuncture for patients aged >50 years with chronic knee pain

Hinman et al *JAMA* 2014

Future research directions

- Identify effective rehabilitation for hand OA
- No more trials of exercise versus no exercise
- Investigation of:
  - patient subgroups
  - adherence to exercise
  - structural effects

OARSI OSTEOARTHRITIS RESEARCH SOCIETY INTERNATIONAL

Thank you

Australian Government
National Health and Medical Research Council
N H M R C

Australian Government
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