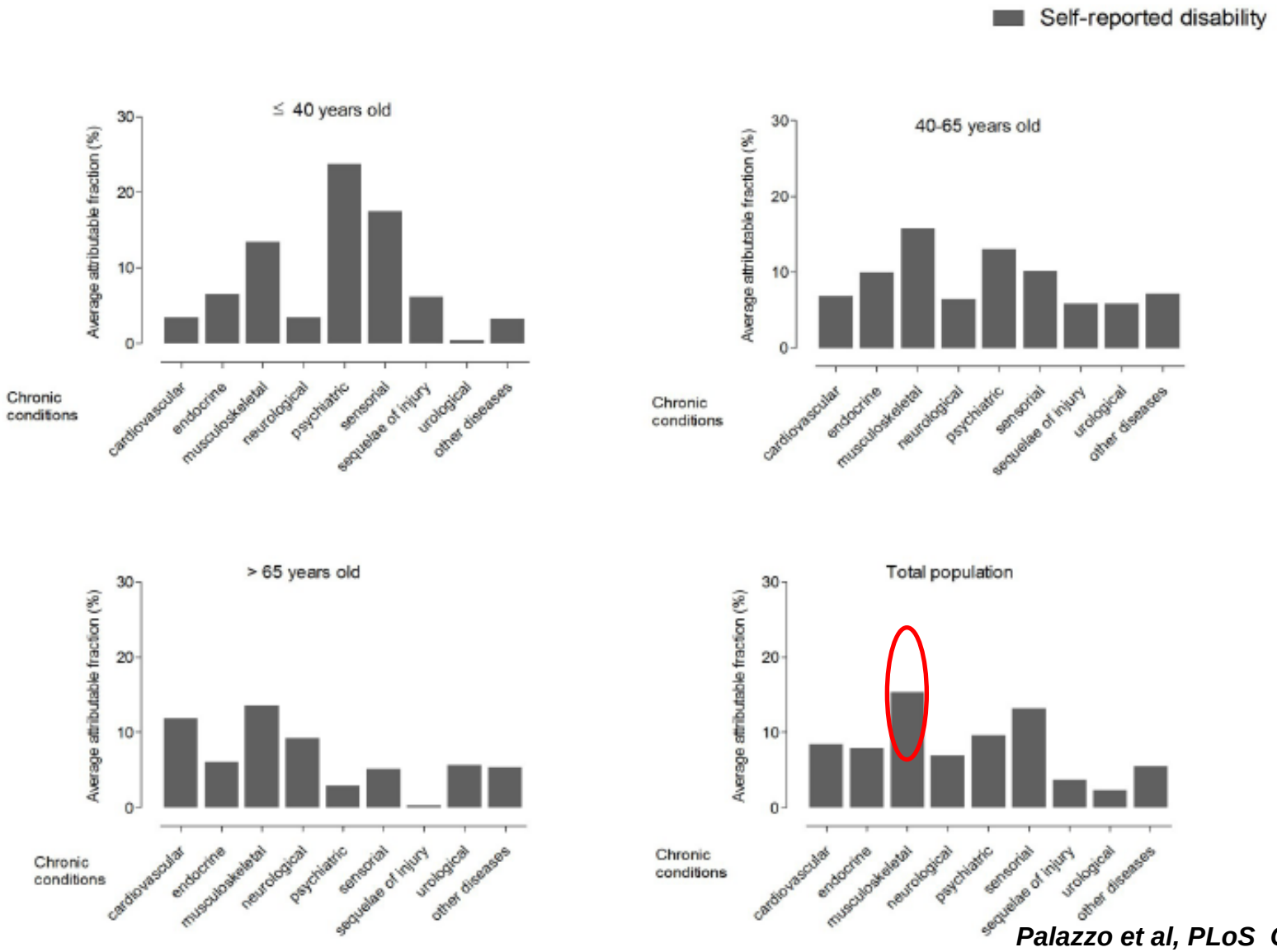
Guidelines for the Managment of Osteoarthritis

Francois Rannou, MD, PhD

Rehabilitation Unit, Rheumatology Department
Hopital Cochin, AP-HP
INSERM UMR-S 1124
Université Paris Descartes

Self reported disability in French population



Palazzo et al, PLoS ONE, 2012

The Burden of Musculoskeletal Conditions

Clémence Palazzo[1,2,3,4]*, Jean-François Ravaud[5,6,7], Agathe Papelard[4,5], Philippe Ravaud[1,2,3], Serge Poiraudeau[1,3,4,5]

1 U1153, Institut National de la Santé et de la Recherche Médicale, Paris, France, **2** Centre d'Épidémiologie Clinique, Hôpital Hôtel Dieu AP-HP, Paris, France, **3** Université Paris Descartes, PRES Sorbonne Paris Cité, Paris, France, **4** Service de rééducation et réadaptation de l'appareil locomoteur et des pathologies du rachis, Hôpital Cochin AP-HP, Paris, France, **5** Institut fédératif de recherche sur le handicap, Institut National de la Santé et de la Recherche Médicale, Paris, France, **6** U988, Institut National de la Santé et de la Recherche Médicale, Villejuif, France, **7** UMR 8211, Centre national de la recherche scientifique, Villejuif, France

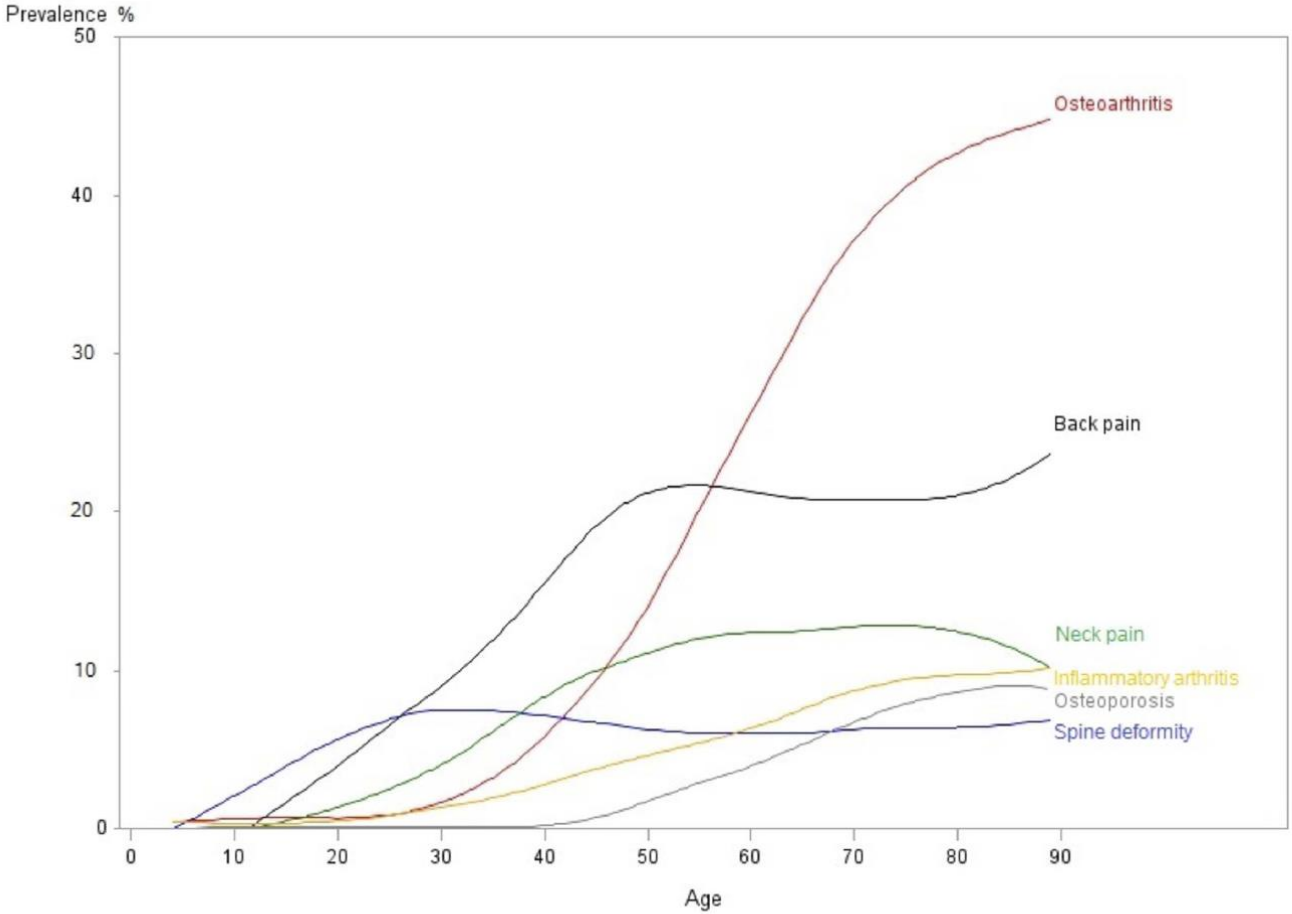
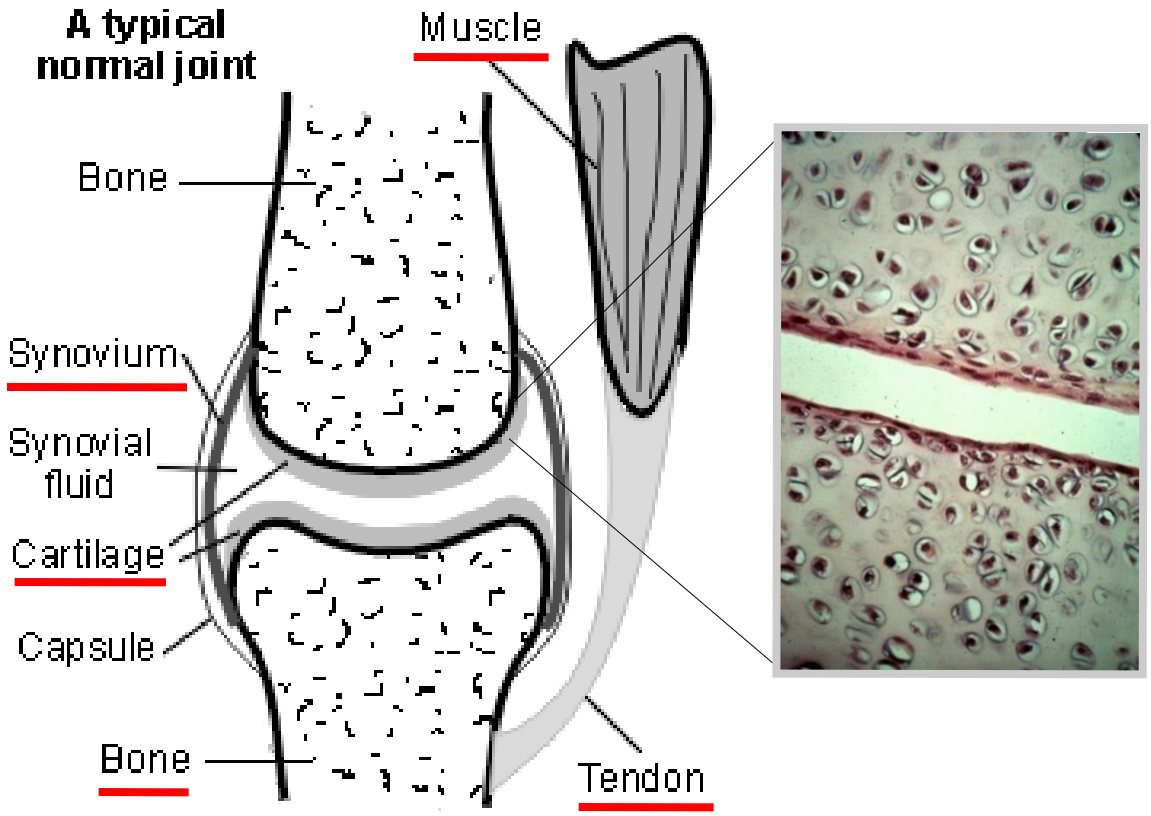


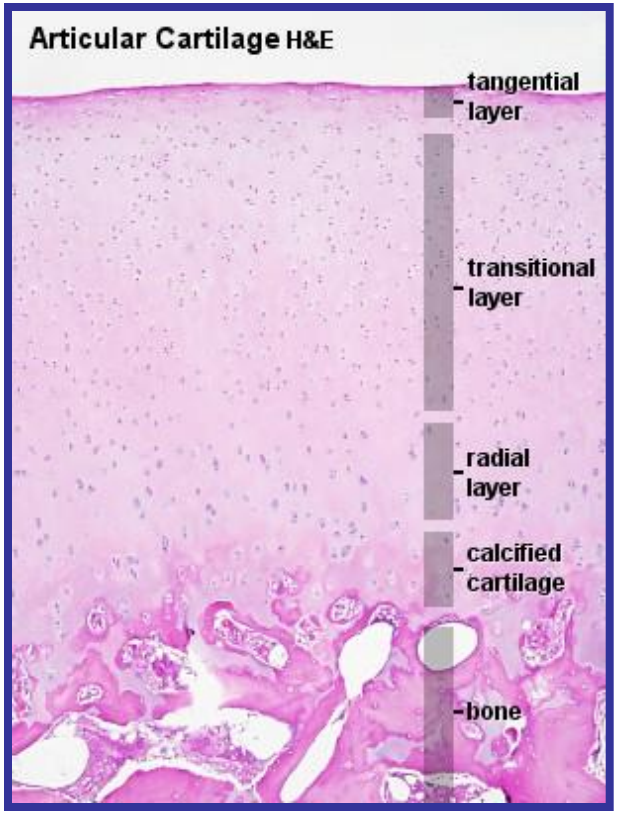
Figure 2. Prevalence of RMDs in France by age.
doi:10.1371/journal.pone.0090633.g002

OA physiopathology

XXth century	*XXIst century*
• a passive tissue disease	• a molecular active disease
• a degenerative disease	• an inflammatory, metabolic, genetic, and mechanical disease
• a cartilage disease	• a multiple tissue disease

OA is a whole joint disease





Treatment strategies in OA are based on modify factors involved in the pathophysiology of the disease

- Mechanical stress
- Inflammation, metabolism
- Obesity
- Aging
- Genetic

OARSI guidelines

Osteoarthritis and Cartilage 18 (2010) 476–499

Osteoarthritis and Cartilage

OARSI OSTEOARTHRITIS RESEARCH SOCIETY INTERNATIONAL

OARSI recommendations for the management of hip and knee osteoarthritis Part III: changes in evidence following systematic cumulative update of research published through January 2009

W. Zhang*, G. Nuki, R.W. Moskowitz, S. Abramson, R.D. Altman, N.K. Arden, S. Bierma-Zeinstra, K.D. Brandt, P. Croft, M. Doherty, M. Dougados, M. Hochberg, D.J. Hunter, K. Kwoh, L.S. Lohmander, P. Tugwell

Affiliations for Committee members' can be found in the following section: Members of the OARSI Treatment Guidelines Committee

OARSI guidelines

Table II
Comparison of ESs and LoE for pain relief with different modalities of therapy in 2006 and 2009

	31 January 2006 ES (95% CI), LoE	31 January 2009 ES (95% CI), LoE
Self-management	0.06 (0.02, 0.10), Ia	0.06 (0.02, 0.10), Ia
Education/information	0.06 (0.02, 0.10), Ia	0.06 (0.03, 0.10), Ia
Exercise for knee OA		
Strengthening	0.32 (0.23, 0.42), Ia	0.32 (0.23, 0.42), Ia
Aerobic	0.52 (0.34, 0.70), Ia	0.52 (0.34, 0.70), Ia
Exercise for hip OA	NA	0.38 (0.08, 0.68), Ia
Exercise in water for knee & hip OA	0.25 (0.02, 0.47), Ib	0.19 (0.04, 0.35), Ia
Weight reduction	0.13 (−0.12, 0.36), Ib	0.20 (0.00, 0.39), Ia
Acupuncture	0.51 (0.23, 0.79), Ib	0.35 (0.15, 0.55), Ia
Electromagnetic therapy	0.77 (0.36, 1.17), Ia	0.16 (−0.08, 0.39), Ia
Acetaminophen	0.21 (0.02, 0.41), Ia	0.14 (0.05, 0.22), Ia
NSAIDs	0.32 (0.24, 0.39), Ia	0.29 (0.22, 0.35), Ia
Topical NSAIDs	0.41 (0.22, 0.59), Ia	0.44 (0.27, 0.62), Ia
Opioids	NA	0.78 (0.59, 0.98), Ia
IA corticosteroid	0.72 (0.42, 1.02), Ia	0.58 (0.34, 0.75), Ia
IAHA	0.32 (0.17, 0.47), Ia	0.60 (0.37, 0.83), Ia
GS	0.61 (0.28, 0.95), Ia	0.58 (0.30, 0.87), Ia
GH	NA	−0.02 (−0.15, 0.11), Ib
CS	0.52 (0.37, 0.67), Ia	0.75 (0.50, 1.01), Ia
Diacerein	0.22 (0.01, 0.42), Ib	0.24 (0.08, 0.39), Ib
ASU	NA	0.38 (0.01, 0.76), Ia
Rosehip	NA	0.37 (0.13, 0.60), Ia
Lavage/debridement	0.09 (−0.27, 0.44), Ib	0.21 (−0.12, 0.54), Ib

NA: not available.

ES and high quality trials!

	All trials ES (95% CI)	High quality trials (Jaded = 5), ES (95% CI)
Acupuncture	0.35 (0.15, 0.55)	0.22 (0.01, 0.44)
Acetaminophen	0.14 (0.05, 0.23)	0.10 (−0.03, 0.23)
NSAIDs	0.29 (0.22, 0.35)	0.39 (0.24, 0.55)
Topical NSAIDs	0.44 (0.27, 0.62)	0.42 (0.19, 0.65)
IAHA	0.60 (0.37, 0.83)	0.22 (−0.11, 0.54)
GS	0.58 (0.30, 0.87)	0.29 (0.003, 0.57)
CS	0.75 (0.50, 1.01)	0.005 (−0.11, 0.12)
ASU	0.38 (0.01, 0.76)	0.22 (−0.06, 0.51)
Lavage/debridement	0.21 (−0.12, 0.54)	−0.11 (−0.30, 0.08)

The key messages of 2010 OARSI guidelines

1) ES of acetaminophen is very low
2) The ES of the pharmacological treatments decrease when the quality of the studies increase
3) Treatment must combinate non pharmacological and pharmacological modalities
4) NSAIDs need to be use at the lower dose and for the shorter duration

OARSI guidelines in knee OA

Osteoarthritis and Cartilage 22 (2014) 363–388

Osteoarthritis and Cartilage

OARSI OSTEOARTHRITIS RESEARCH SOCIETY INTERNATIONAL

OARSI guidelines for the non-surgical management of knee osteoarthritis

CrossMark

T.E. McAlindon †*, R.R. Bannuru †, M.C. Sullivan †, N.K. Arden ‡, F. Berenbaum §||, S.M. Bierma-Zeinstra ¶, G.A. Hawker #, Y. Henrotin ††‡‡, D.J. Hunter §§, H. Kawaguchi ||||, K. Kwoh ¶¶, S. Lohmander ##, F. Rannou †††, E.M. Roos ‡‡‡, M. Underwood §§§

Pharmacological treatments :

From effect size to side effects

- **acetaminophen** → **Level of evidence**: SR and meta-analysis of RCTs.
Quality of evidence: Good.

Estimated Effect Size for Pain (SMD): 0.18 (0.11–0.25)

- **NSAIDs** → **Level of evidence**: SR and meta-analysis of RCTs.
Quality of evidence: Good.

Estimated Effect Size for Pain (SMD): 0.37 (0.26–0.49)

OARSI 2014

BMJ

RESEARCH

Cardiovascular safety of non-steroidal anti-inflammatory drugs: network meta-analysis

Sven Trelle, senior research fellow,[1,2] Stephan Reichenbach, senior research fellow,[1,4] Simon Wandel, research fellow,[1] Pius Hildebrand, clinical reviewer,[3] Beatrice Tschannen, research fellow,[1] Peter M Villiger, head of department and professor of rheumatology,[4] Matthias Egger, head of department and professor of epidemiology and public health,[1] Peter Jüni, head of division and professor of clinical epidemiology[1,2]

Compared with placebo, rofecoxib was associated with the highest risk of myocardial infarction (rate ratio 2.12, 95% credibility interval 1.26 to 3.56), followed by lumiracoxib (2.00, 0.71 to 6.21). Ibuprofen was associated with the highest risk of stroke (3.36, 1.00 to 11.6), followed by diclofenac (2.86, 1.09 to 8.36). Etoricoxib (4.07, 1.23 to 15.7) and diclofenac (3.98, 1.48 to 12.7) were associated with the highest risk of cardiovascular death.

Pharmacological treatments :

side effects

- gastrointestinal perforation, bleeding with acetaminophen and NSAIDs
- renal failure with acetaminophen and NSAIDs
- myocardial infarction, cardiovascular events with coxibs and classical NSAIDs

→ **Balance ES/Side effects!**
Non systemic and non pharmacological treatments!

OARSI guidelines in knee OA

T.E. McAlindon et al. / Osteoarthritis and Cartilage 22 (2014) 363–388

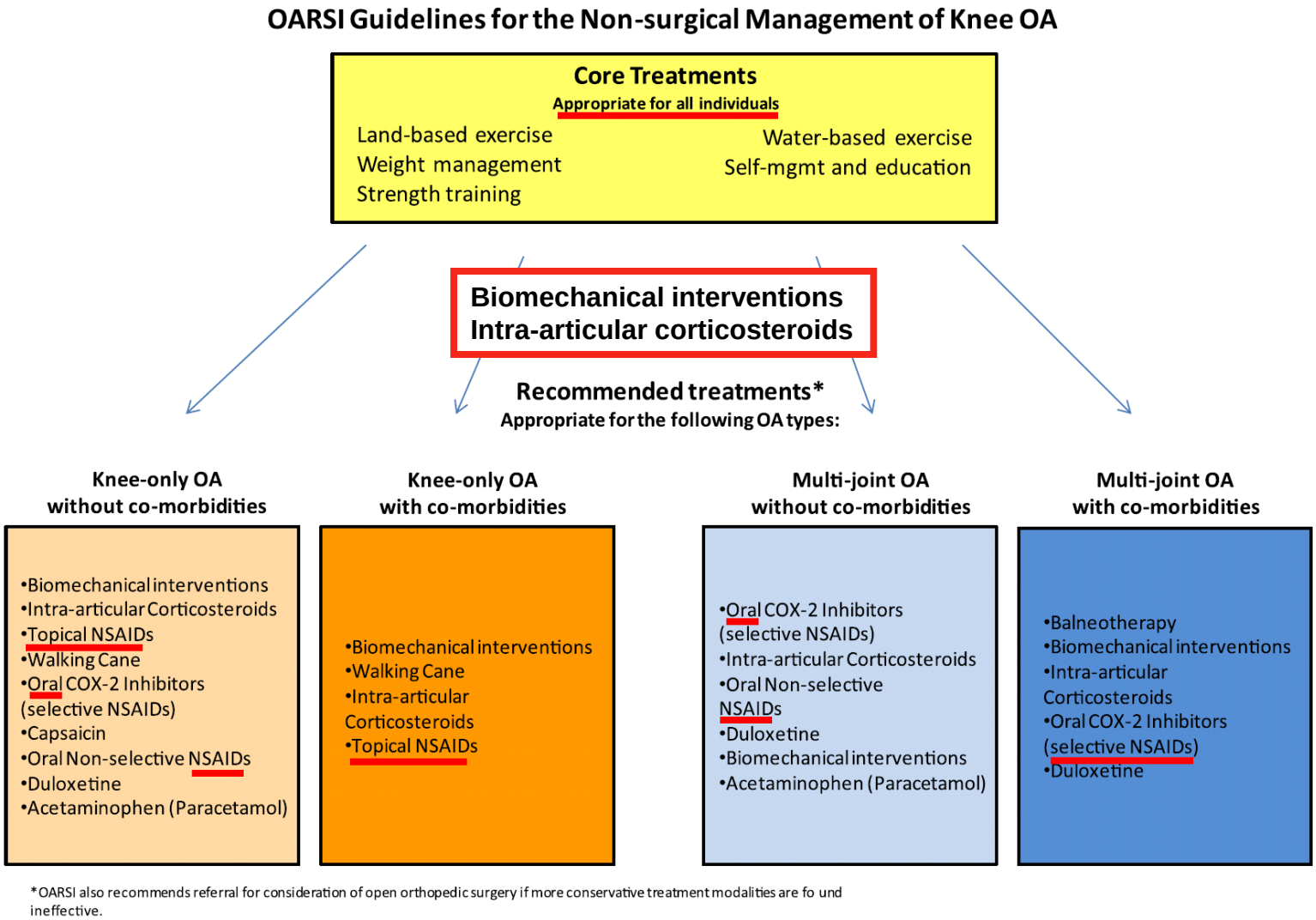


Fig. 1. Appropriate treatments summary.

Arthritis Care & Research
Vol. 64, No. 4, April 2012, pp 465–474
DOI 10.1002/acr.21596
© 2012, American College of Rheumatology

SPECIAL ARTICLE

American College of Rheumatology 2012 Recommendations for the Use of Nonpharmacologic and Pharmacologic Therapies in Osteoarthritis of the Hand, Hip, and Knee

MARC C. HOCHBERG,[1] ROY D. ALTMAN,[2] KARINE TOUPIN APRIL,[3] MARIA BENKHALTI,[3] GORDON GUYATT,[4] JESSIE McGOWAN,[3] TANVEER TOWHEED,[5] VIVIAN WELCH,[3] GEORGE WELLS,[3] AND PETER TUGWELL[3]

- *Hand OA*: Initial management of hand OA should include one
- or more of the following:
  - topical capsaicin
  - topical NSAIDs, including trolamine salicylate
  - oral NSAIDs, including COX-2 inhibitors
  - tramadol
- *Knee OA*: Initial management of knee OA should include one
- of the following:
  - acetaminophen
  - oral NSAIDs
  - topical NSAIDs
  - tramadol
  - intra-articular corticosteroid injections
- Topical rather than oral NSAIDs should be used in patients with hand or knee OA aged ≥75 years

Second line pharmacological treatements

1) OARSI : SYSADOA, HA injection

2) ACR : duloxetine, HA injection, tramadol

The key messages of 2014 OARSI and ACR guidelines

1) ES is important but SE (Side Effects) are very important to consider!
2) It is important to distinguish mono from poly joint OA
3) Comorbidities have to be detected, treated before any OA pharmacological prescription
4) The interest of topical NSAIDs

The keys of OA management

1) Acute phase treatment
2) Chronic phase treatment
3) Joint specific treatment
4) Mono or poly joint OA
5) Comorbidities

<u>Non pharmacological</u> and pharmacological treatments!!

Multidisciplinary approach

1) GPs, Rheumatologists, PMR, surgeons

2) Physiotherapists, occupationnal therapists, podologists, nurses

Best Practice & Research Clinical Rheumatology 24 (2010) 93–106

Contents lists available at ScienceDirect

Best Practice & Research Clinical Rheumatology

journal homepage: www.elsevierhealth.com/berh

9

Non-pharmacological approaches for the treatment of osteoarthritis

François Rannou, MD, PhD, Professor of Medicine [a,b,c,*], Serge Poiraudeau, MD, PhD, Professor of Medicine [a,b,c]

[a] *INSERM, U747, Laboratoire de Pharmacologie, Toxicologie et Signalisation Moléculaire, Paris F-75006, France*
[b] *Université Paris Descartes, Paris F-75006, France*
[c] *AP-HP, Groupe Hospitalier Cochin, Service de rééducation, Paris F-75014, France*

Chronic phase treatment whatever the number of joint affected

1) Pain killer (acetaminophen : 3 grammes a day)

2) SYSADOA (symptomatic slow acting drugs for OA), hyaluronic acid injection

3) NSAIDs: topics

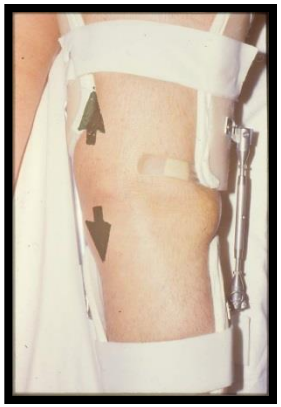
4) Specific non pharmacological treatment in order to modulate the load on the symptomatic joint including weight loss

5) Non specific non-pharmacological treatment in order to increase the aerobic conditions of the patient and general health

6) Weight managment

Chronic phase treatment and non pharmacological treatment

The non-pharmacological treatment in knee OA?



- Sticks, insole, knee bracing, and weight reduction

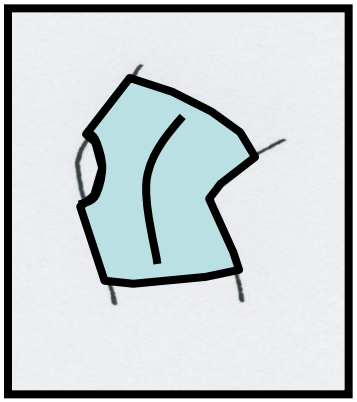
  + Physical therapy

- Involving :physical therapist, occupationnal therapist, podologist, orthesist, and dietician

The rational of the non pharmacological treatment is to modulate mechanical stress at the joint level !

Non adhesive bracing

Decreases pain and increases the quality of life



Dynamic bracing

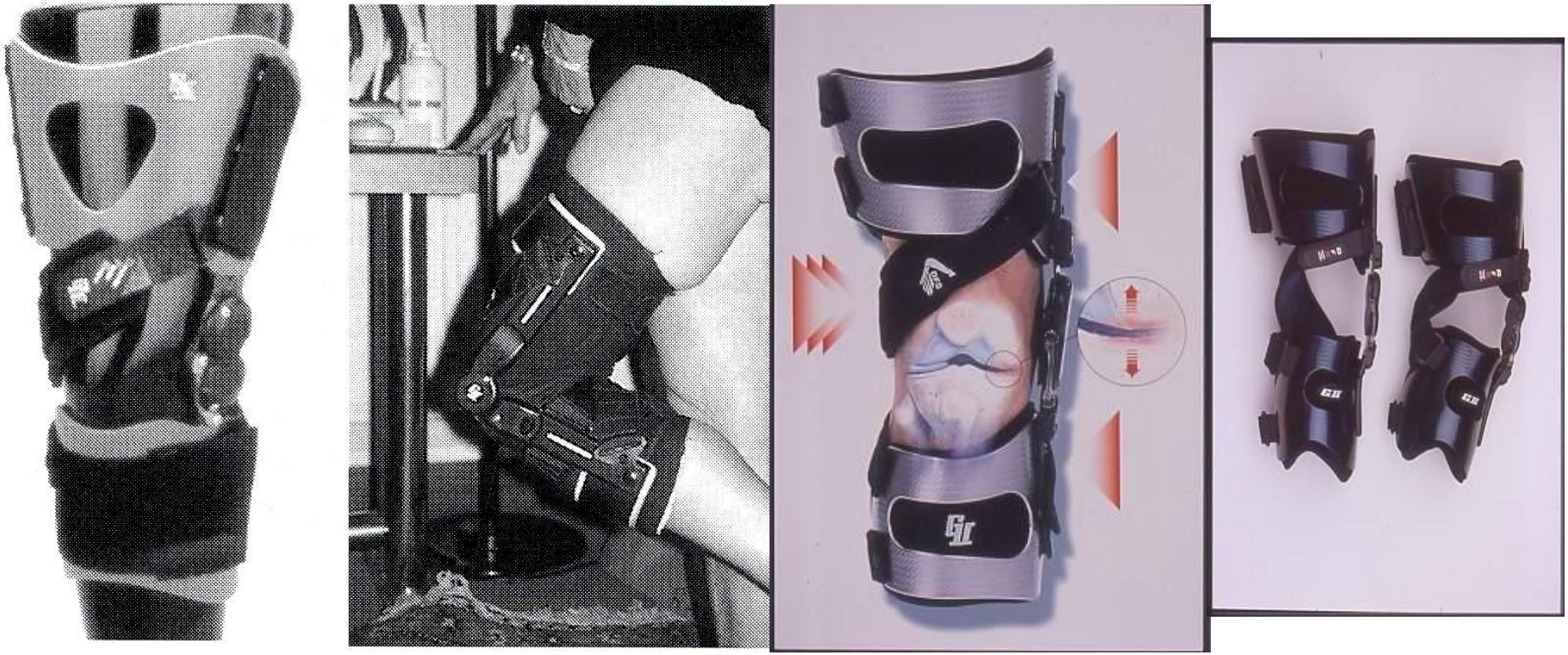


Figure 1. A. Orthèse articulée. B. Orthèse en flexion.

Decreases pain, disability and increase quality of life

Insoles in knee OA

Decrease NSAIDs used by patients

Practice points

- A lateral-wedged insole could reduce symptoms in medial knee OA.
- A strapped insole could have a good symptomatic effect.
- A neutral and cushioning insole could be of interest in knee OA, whatever the compartment affected.

Insoles in hip OA

Practice points

- Lateral-wedged insoles are not indicated for hip OA.
- Cushioning insoles could be proposed for hip OA (authors' recommendations).
- Footwear with shock absorbance could be proposed for hip OA (authors' recommendations).

Splint for base of thumb OA

Decreases pain and improves disability

Annals of Internal Medicine | ARTICLE

Splint for Base-of-Thumb Osteoarthritis

A Randomized Trial

François Rannou, MD, PhD; Jérôme Dimet, PharmD; Isabelle Boutron, MD, PhD; Gabriel Baron, PhD; Fouad Fayad, MD, MS; Yann Macé, MD; Johann Beaudreuil, MD, PhD; Pascal Richette, MD, PhD; Philippe Ravaud, MD, PhD; Michel Revel, MD; and Serge Poiraudeau, MD, PhD

Rannou et al, Ann Int Med 2009

Splint for base of thumb OA

Table 2. Estimates of Mean Change in Outcomes From Baseline to 1 or 12 Months and Estimates of Slope With Intervention and Control Treatment

Outcome	Intervention Group	Patients Available, *n*	Control Group	Patients Available, *n*	Difference (95% CI)*	*P* Value
Pain level (VAS score [range, 0–100 mm])						
Mean at baseline (SD)	45.5 (19.9)	57	47.7 (19.8)	54	–	–
Mean change from baseline to 1 mo (±SE)†	−10.1 ± 3.0	55	−10.7 ± 3.3	46	0.6 (−7.9 to 9.1)	0.89
Mean change from baseline to 12 mo (±SE)†	−22.2 ± 3.2	52	−7.9 ± 3.5	45	−14.3 (−23.4 to −5.2)	0.002
Estimate of slope at 12 mo (±SE)‡	−19.3 ± 3.1	–	−4.3 ± 3.3	–	−15.0 (−24.0 to −5.9)	0.001
CHFS score (range, 0–90)						
Mean at baseline (SD)	19.4 (12.2)	56	17.7 (12.9)	55	–	–
Mean change from baseline to 1 mo (±SE)†	1.3 ± 1.4	54	−0.3 ± 1.5	47	1.6 (−2.3 to 5.5)	0.42
Mean change from baseline to 12 mo (±SE)†	−1.9 ± 1.6	49	4.3 ± 1.7	46	−6.3 (−10.9 to −1.7)	0.008
Estimate of slope at 12 mo (±SE)‡	−2.3 ± 1.5	–	3.8 ± 1.6	–	−6.1 (−10.4 to −1.8)	0.006
Patient-perceived disability (VAS score [range, 0–100 mm])						
Mean at baseline (SD)	38.2 (25.2)	57	38.6 (21.5)	55	–	–
Mean change from baseline to 1 mo (±SE)†	0.2 ± 3.4	56	−0.7 ± 3.8	47	0.9 (−8.7 to 10.6)	0.85
Mean change from baseline to 12 mo (±SE)†	−11.6 ± 3.1	51	1.5 ± 3.4	46	−13.1 (−21.8 to −4.4)	0.003
Estimate of slope at 12 mo (±SE)‡	−13.6 ± 2.7	–	1.5 ± 2.8	–	−15.1 (−22.8 to −7.4)	0.001

Decreases pain and improves disability

Annals of Internal Medicine | ARTICLE

Splint for Base-of-Thumb Osteoarthritis

A Randomized Trial

François Rannou, MD, PhD; Jérôme Dimet, PharmD; Isabelle Boutron, MD, PhD; Gabriel Baron, PhD; Fouad Fayad, MD, MS; Yann Macé, MD; Johann Beaudreuil, MD, PhD; Pascal Richette, MD, PhD; Philippe Ravaud, MD, PhD; Michel Revel, MD; and Serge Poiraudeau, MD, PhD

Rannou et al, Ann Int Med 2009

Chronic phase treatment and non pharmacological treatment

<u>Exercises</u>

Exercises whatever the joint affected by OA

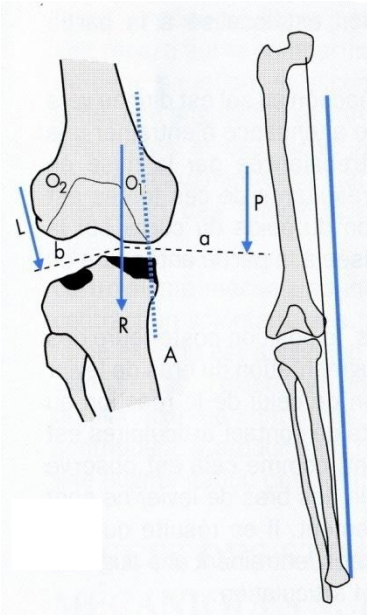
Practice points

- Aerobic, strengthening, range-of-motion and proprioceptive exercise is recommended to decrease pain and improve function and quality of life in knee OA.
- Inexpensive aerobic exercise can include sport, walking, swimming, cycling and any physical activity the patient particularly enjoys (authors' recommendations).

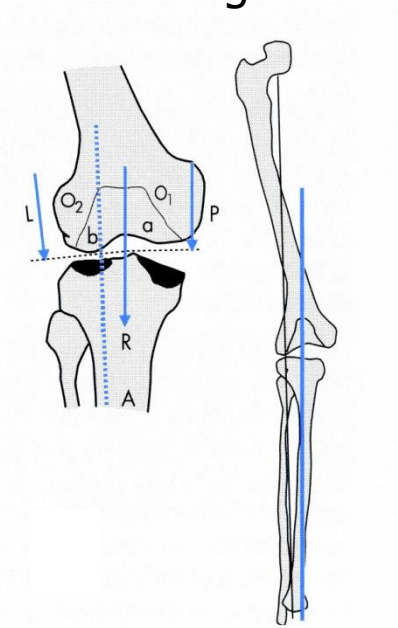
Exercises in knee OA

- Quadriceps and hamstring muscle strengthening may improve joint stability.
- For medial knee OA, strengthening the lateral muscle knee chain may decrease the load on the medial compartment (authors' recommendations).
- For lateral knee OA, strengthening the medial muscle knee chain may decrease the load on the medial compartment (authors' recommendations).
- Specific postural exercises in extension may guard against flessum (authors' recommendations).

Genu-varum



Genu-valgum



Exercises in hip OA

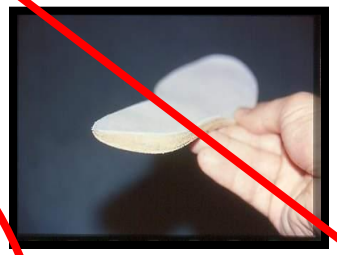
- Strengthening hip stabiliser muscles could improve joint stability (authors' recommendations).
- Strengthening pelvi-trochanterian muscles could decrease the load on the hip joint (authors' recommendations).
- Specific postural exercises in extension could guard against extension deficit and flessum (authors' recommendations).

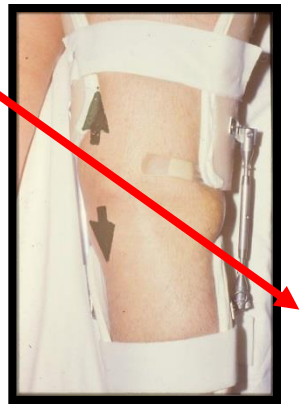
Exercises in hand OA

- Strengthening hand-joint stabiliser muscles could improve joint stability (authors' recommendations).
- Specific postural exercises to open the first web could be of interest (authors' recommendations).

Acute phase treatment and non pharmacological treatment

The non-pharmacological treatment in knee OA?





- Sticks, insole, knee bracing, and weight reduction

  \+ Exercise

- Involving :physical therapist, occupationnal therapist, podologist, orthesist, and dietician

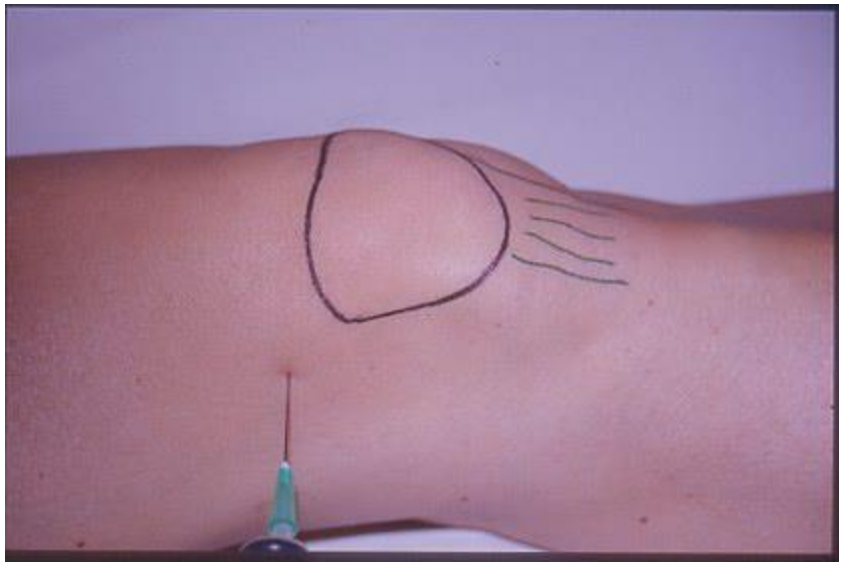
The rational of the non pharmacological treatment is to modulate mechanical stress at the joint level !

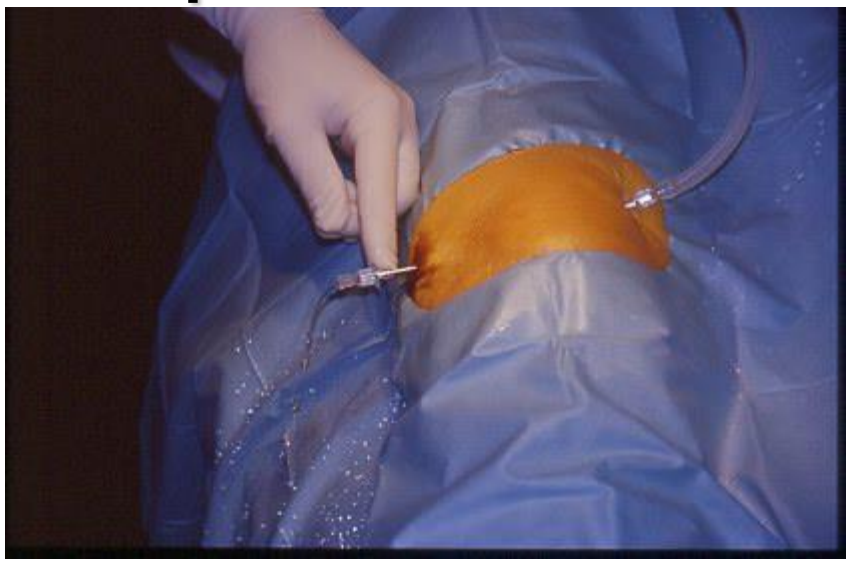
To summarize

Practice points

- The effect sizes of non-pharmacological treatments for OA are similar to those of pharmacological treatments, which suggest the importance of the use of non-pharmacological approaches in treating OA.
- Non-pharmacological approaches for OA include orthoses, insoles, exercise, diet and patient education.
- Some non-pharmacological modalities can be used whatever the joint affected (aerobic exercise, diet and patient education), whereas other modalities are specific to the joint affected (orthoses, insoles and specific exercise).
- The non-pharmacological approach must be adapted to the OA site and clearly explained to the patient.

Acute phase treatment and pharmacological treatment: Corticosteroid injections, NSAIDs: discontinued cures (lower dose and shorter duration) + topics





Courtesy of X Ayral, Cochin Hospital, Paris

CONCLUSION

Treatment of OA need to combine non pharmacological and pharmacological modalities

To date treatments are only symptomatic

Comorbidities need to be evaluated in order to adapt the pharmacological treatment

The treatment of the acute phase is different from the chronic phase treatment

Thank you for your attention