SISTEMA SANITARIO REGIONALE
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U.O.C. MEDICINA INTERNA E GERIATRIA
AMBULATORIO DI REUMATOLOGIA

EFFETTI BENEFICI DELLO SPORT NELLE PATOLOGIE AUTOIMMUNI

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scegli
uno STILE
di vita
SANO

“Un’epidemia silenziosa si diffonde nella popolazione occidentale che invecchia: la regressione delle capacità motorie”

- In Italia il 30% degli adulti tra 18 e 69 anni svolge, nella vita quotidiana, meno attività fisica di quanto è raccomandato e può essere definito sedentario. In particolare, il rischio di sedentarietà aumenta con il progredire dell'età.
- Secondo i dati ISTAT, nel 2010 in Italiail 38% delle persone adulte ha dichiarato di non praticare, nella vita quotidiana, né sport né altre forme di attività fisica.

- L'organismo umano non è nato per l'inattività: il movimento gli è connaturato e una regolare attività fisica, anche di intensità moderata, contribuisce a migliorare tutti gli aspetti della qualità della vita. Al contrario, la scarsa attività fisica è implicata nell'insorgenza di alcuni tra i disturbi e le malattie oggi più frequenti: diabete di tipo 2, malattie cardiocircolatorie (infarto, miocardico, ictus, insufficienza cardiaca), tumori.

La postura è associata al movimento poichè rappresenta il punto di partenza del movimento

I benefici dell'attività fisica

- Muoversi quotidianamente produce effetti positivi sulla salute fisica e psichica della persona. Gli studi scientifici che ne confermano gli effetti benefici sono ormai innumerevoli e mettono in luce che l'attività fisica:

- Migliora la tolleranza al glucosio e riduce il rischio di ammalarsi di diabete di tipo 2
- Previene l'ipercolesterolemia e l'ipertensione e riduce i livelli della pressione arteriosa e del colesterolo
- Diminuisce il rischio di sviluppo di malattie cardiache e di diversi tumori, come quelli del colon e del seno
- Riduce il rischio di morte prematura, in particolare quella causata da infarto e altre malattie cardiache
- Previene e riduce l'osteoporosi e il rischio di fratture, ma anche i disturbi muscolo-scheletrici (per esempio il mal di schiena)

Osteoporosi ed attività fisica

- L'esercizio fisico regolare è un cardine dei programmi d'intervento nella gestione dell'osteoporosi:
- Aumenta la massa ossea sia in soggetti con densità ossea normale che osteopenica e osteoporotica - E' efficace nel ridurre il consumo di analgesici - Migliora la qualità della vita - Aumenta l'abilità funzionale nelle attività della vita quotidiana
- L'attività fisica è in grado di agire positivamente sui principali fattori di rischio dell'osteoporosi, diminuendo significativamente il rischio di fratture

- Riduce i sintomi di ansia, stress e depressione
- Previene, specialmente tra i bambini e i giovani, i comportamenti a rischio come l'uso di tabacco, alcol, diete non sane e atteggiamenti violenti e favorisce il benessere psicologico attraverso lo sviluppo dell'autostima, dell'autonomia e facilità la gestione dell'ansia e delle situazioni stressanti
- Produce dispendio energetico e la diminuzione del rischio di obesità

- Secondo i dati di alcuni sistemi di monitoraggio **Soltanto 1 bambino su 10 fa attività fisica in modo adeguato per la sua età e circa 1 bambino su 4 (26%), al momento della rilevazione, dichiarava di non aver svolto alcuna attività fisica il giorno precedente l'indagine.**
- Come in altri paesi europei, l'attività motoria della popolazione in Italia è diminuita di pari passo con i grandi cambiamenti del lavoro e dell'organizzazione delle città. Da una parte lo sviluppo dell'automazione, anche nel lavoro domestico, e il deprezzamento sociale del lavoro manuale, dall'altra la dominanza del trasporto motorizzato e la riduzione di spazi e sicurezza per pedoni e ciclisti.

- A vederlo sembrerebbe un panorama idilliaco, in cui tutto è facile e lineare, ma non lo è.
- Infatti, se praticata con i dovuti modi, e magari sotto la guida di un professionista del movimento, l'attività fisica può essere considerata un investimento sul presente e sul futuro, a prescindere dall'età. È ovvio che prima si comincia, meglio è.
- Allo stesso tempo, se praticata in maniera discontinua, disordinata o in eccesso, potrebbe essere fonte di infortuni.

- C'è da dire anche che l'allenamento fatto con tutti i criteri e sotto la supervisione di un allenatore personale non ci mette al riparo dagli infortuni, ma sicuramente ci espone in maniera più limitata a tali evenienze, tanto che se dovessimo porre su una bilancia benefici e rischi dell'attività fisica, l'ago penderebbe in maniera netta dalla parte dei primi.

- I pazienti affetti da malattie infiammatorie croniche (ad es. **A.R**.) hanno un rischio maggiore di patologie cardiovascolari
- Questa è la ragione per cui un regolare ed intensivo esercizio fisico potrebbe ridurre questi fattori di rischio
- Il timore è che pazienti con AR potrebbero avere un peggioramento dello stato flogistico e del danno articolare

Is a Long-Term High-Intensity Exercise Program Effective and Safe in Patients With Rheumatoid Arthritis?

ARTHRITIS & RHEUMATISM
Vol. 48, No. 9, September 2003, pp 2415–2424
DOI 10.1002/art.11216

Objective. **There are insufficient data on the effects of long-term intensive exercise in patients with rheumatoid arthritis (RA). We undertook this randomized, controlled, multicenter trial to compare the effectiveness and safety of a 2-year intensive exercise program (Rheumatoid Arthritis Patients In Training [RAPIT]) with those of physical therapy (termed usual care [UC]).**

Methods. **Three hundred nine RA patients were assigned to either the RAPIT program or UC. The primary end points were functional ability (assessed by the McMaster Toronto Arthritis [MACTAR] Patient Preference Disability Questionnaire and the Health Assessment Questionnaire [HAQ]) and the effects on radiographic progression in large joints. Secondary end points concerned emotional status and disease activity.**

Eligibility criteria for inclusion in the study

Age 20–70 years
RA according to ACR 1987 revised criteria (22)
ACR functional classes I–III (23)
Stable DMARD regimen in past 3 months
Able to cycle
Willing to exercise biweekly on fixed schedule
Living within a predefined adherence region of training and/or assessment center
No prosthesis of a weight-bearing joint
No cardiopulmonary disease excluding intensive exercise
No comorbidity causing a short life expectancy
No serious psychiatric disease
Able to complete a questionnaire

Baseline demographic and clinical characteristics of the 300 RA Patient

RA patients who were randomized and for whom data were provided*
Uc group (n 150)
RAPIT group (n 150)
Age, median (IQR) years 53.5 (18) 54.0 (16)
Female 118 (79) 119 (79)
Duration of RA, median (IQR) years 7.5 (10.8) 5.0 (7)†
RF positive 106 (71) 107 (71)
Radiographic damage of hands and feet, median (IQR)‡ 38.5 (54.5) 25.0 (53.8)†
Past number of DMARDs, mean SD 2.0 1.2 1.8 1.5
Current treatment
NSAIDs 110 (73) 102 (68)
DMARDs 134 (89) 117 (78)†
Oral corticosteroids 15 (10) 12 (8)
Intraarticular corticosteroids 7 (5) 17 (11)
Bisphosphonates 4 (3) 3 (2)
Calcium supplement 11 (7) 11 (7)
Vitamin D 3 (2) 2 (1)

* Except where indicated otherwise, values are the number (%) of patients. Interquartile ranges (IQRs) are expressed as the net result of 75th percentile 25th percentile. UC usual care; RAPIT Rheumatoid Arthritis Patients In Training; RF rheumatoid factor; NSAIDs nonsteroidal antiinflammatory drugs (see Table 1 for other definitions).
† *P* 0.05 versus UC group by Mann-Whitney U test or chi-square test, as appropriate.
‡ Larsen score of the small joints (24).

Primary end points of effectiveness

UC group RAPIT
UC group,
mean difference (95% CI)†
Functional ability by MACTAR
Questionnaire score (n)
First year
Baseline (298) 53.0 (5.0) 54.0 (4.8)
6 months (283) 0.3 9.3 1.7 10.5 1.3 (1.2, 3.7)
12 months (275) 0.9 9.8 2.1 11.2 2.6 (0.1, 5.2)
P for trend‡ 0.034
Second year
Baseline 12 months (273) 54.0 (6.0) 54.0 (6.0)
18 months (273) 0.3 8.4 2.0 8.4 2.4 (0.3, 4.4)
24 months (273) 0.7 9.4 3.6 9.8 3.1 (0.7, 5.5)
P for trend‡ 0.017
Functional ability by HAQ score (n)
First and second years
Baseline (299) 0.63 (0.78) 0.69 (0.88)
6 months (288) 0.00 0.4 0.03 0.3 0.01 (0.08, 0.08)
12 months (284) 0.10 0.4 0.06 0.4 0.04 (0.13, 0.05)
18 months (271) 0.08 0.3 0.02 0.4 0.07 (0.16, 0.03)
24 months (276) 0.07 0.3 0.00 0.4 0.09 (0.18, 0.01)
P for trend‡ 0.421

* Functional ability was measured by the McMaster Toronto Arthritis (MACTAR) Patient Preference Disability Questionnaire and by the Health Assessment Questionnaire (HAQ). Baseline values are given as the median (interquartile range [expressed as the net result of 75th percentile 25th percentile]). Followup values are given as the mean SD change from baseline values. See Table 2 for other definitions.
† Mean difference (95% confidence interval [95% CI]) between change in the UC group and change in the RAPIT group. Differences are corrected for the baseline differences between the UC and RAPIT groups in duration of rheumatoid arthritis, current use of disease-modifying antirheumatic drugs, and radiographic damage of hands and feet (Larsen score).
‡ By mixed-effects analysis of variance.

Primary endpoint of safety

UC group RAPIT
UC group, mean difference (95% CI)†
Radiographic damage of the large joints by LLJ score (n)
Baseline (293) 2.0 (5.0) 1.5 (4.5)
12 months (283) 0.0 0.0 0.0 0.5 0.2 (0.0, 0.4)
24 months (274) 0.0 1.0 0.0 1.0 0.3 (0.0, 0.7)
P for trend‡ 0.134

* Radiographic damage of the large joints was measured by the Larsen score of the large joints (LLJ score). Baseline values are given as the median (interquartile range [expressed as the net result of 75th percentile 25th percentile]). Followup values are given as the mean SD change from baseline values. See Table 2 for other definitions.
† Mean difference (95% confidence interval [95% CI]) between change in the UC group and change in the RAPIT group. Differences are corrected for the baseline differences between the UC and RAPIT groups in duration of rheumatoid arthritis, current use of diseasemodifying antirheumatic drugs, and radiographic damage of hands and feet (Larsen score).
‡ By mixed-effects analysis of variance.

Secondary end points of effectiveness and safety

UC group RAPIT group
RAPIT group UC group, mean difference (95% CI)†
Effectiveness (emotional status)
by HADS score (n)
Baseline (296) 11.0 (8.0) 11.0 (8.2)
6 months (284) 0.1 3.9 0.6 4.0 0.5 (1.5, 0.5)
12 months (283) 0.5 3.5 0.8 4.2 1.2 (2.1, 0.3)
18 months (267) 0.1 4.1 1.0 4.4 0.8 (1.9, 0.3)
24 months (275) 0.1 4.0 1.2 4.1 1.3 (2.2, 0.3)
P for trend‡ 0.007
Safety by DAS4 (n)
Baseline (299) 3.4 (1.9) 3.3 (1.4)
6 months (283) 0.4 0.9 0.3 1.0 0.19 (0.0, 0.4)
12 months (286) 0.4 1.0 0.5 1.1 0.01 (0.3, 0.2)
18 months (270) 0.7 1.1 0.6 1.0 0.07 (0.2, 0.3)
24 months (277) 0.7 1.1 0.9 1.2 0.10 (0.4, 0.2)
P for trend‡ 0.851

* Effectiveness (emotional status) was measured by the Hospital Anxiety and Depression Scale (HADS). Safety was measured by the Disease Activity Score with 4 variables (DAS4). Baseline values are given as the median (interquartile range [expressed as the net result of 75th percentile 25th percentile]). Followup values are given as the mean SD change from baseline values. See Table 2 for other definitions.
† Mean difference (95% confidence interval [95% CI]) between change in the UC group and change in the RAPIT group. Differences are corrected for the baseline differences between the UC and RAPIT groups in duration of rheumatoid arthritis, current use of disease-modifying antirheumatic drugs, and radiographic damage of hands and feet (Larsen score).
‡ By mixed-effects analysis of variance.

This is the first study to document extensively the effect of high-intensity joint loading exercise on radiographic damage of the large joints of RA patients. Program was well tolerated in the long term. Our findings support the view that long-term, high-intensity, weight-bearing exercises improve the functional ability, physical capacity, and emotional status of RA patients.

- The RA patients were able to perform these exercises without detrimental effects on disease activity, and the exercises were safe for the weight-bearing large joints, probably with the exclusion of patients with considerable baseline damage

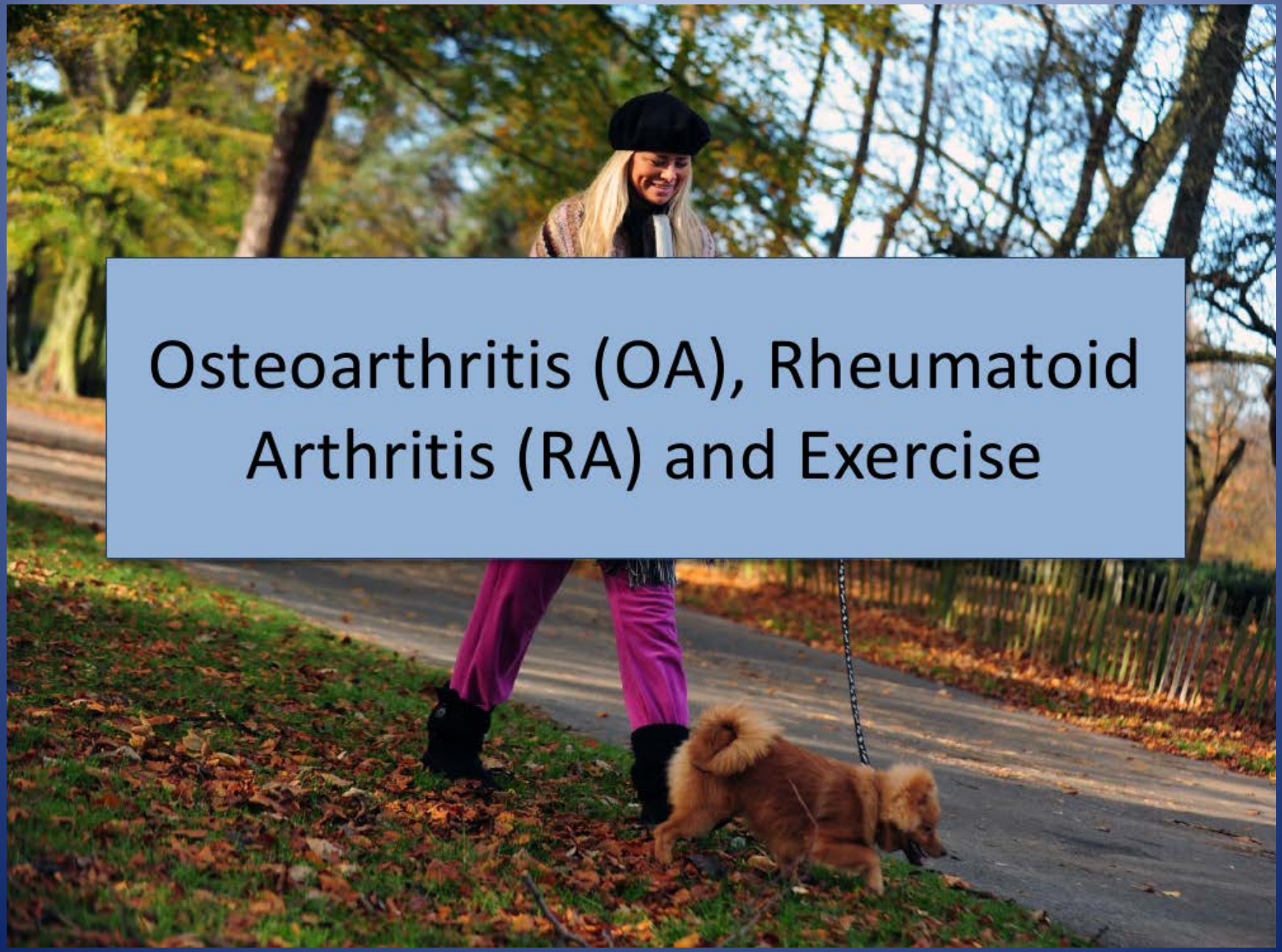
- Questo studio dimostra che la partecipazione a gruppi di esercizio moderato- intenso a lungo termine determina una riduzione del livello di stress psicologico nei pazienti affetti da A.R.
- Il danno radiografico mediano delle articolazioni maggiori non è aumentato in nessuno dei gruppi
- Inoltre non è stato evidenziato nessun incremento dell'attività di malattia

- Evidence is accumulating that intensive “weigh bearing exercise” improve aerobic fitness and muscle strength of RA patients without any increse in disease activity
- Improvement in funcional ability with exercise has been demonstrated by the use of funcional test

CONCLUSION

A long-term high-intensity exercise program is more effective than UC in improving functional ability of RA patients. Intensive exercise does not increase radiographic damage of the large joints, except possibly in patients with considerable baseline damage of the large joints.

- Pertanto in attesa di ulteriori ricerche sembra saggio prescrivere esercizi personalizzati che risparmino le articolazioni maggiori con danni considerevoli
- Un buon bilanciamento dell' intensità e della frequenza del carico è essenziale per mantenere le articolazioni sane



Osteoarthritis (OA), Rheumatoid Arthritis (RA) and Exercise

Benefits of exercise in OA & RA

- Exercise is widely used by health professionals and patients to reduce pain Messier 2013 , Juhl, 2014
- Improves function Fransen 2015, Uthman 2013, Bartels 007, Juhl, 2014,
- Improves aerobic capacity Bartels 2007
- Tai chi may be effective for pain control Lauche, R. e(2013).

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Benefits of exercise in OA & RA

- Improving general mobility, function, well-being and self-efficacy
- Maintaining a healthy weight
- Improving gait Roddy 2005
- Reducing risk of immobility, disability, #NCDs and death Badley, 2014
- Potentially reducing other risks of associated conditions such as cardiovascular disease (Metsios, 2008)

#NCDs = noncommunicable diseases

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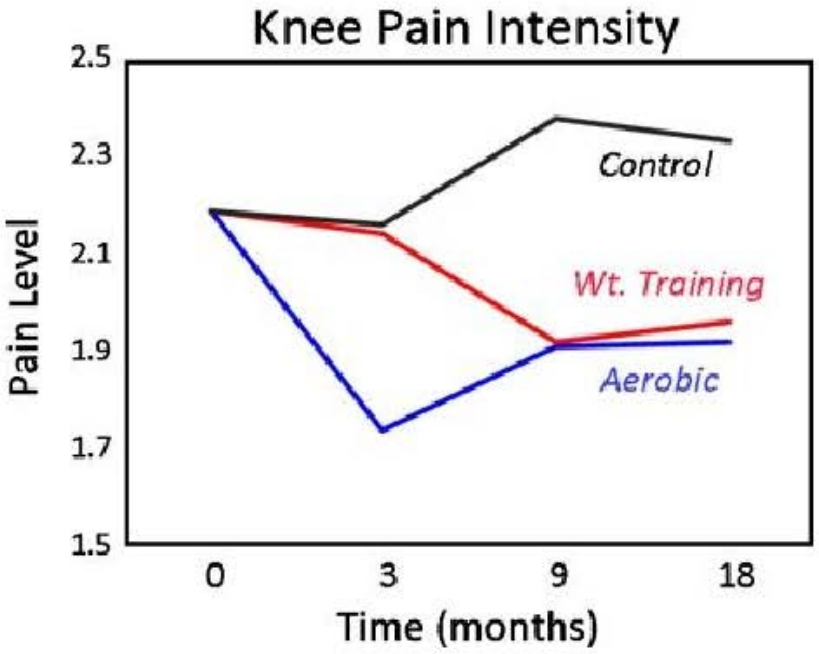
Pain levels, exercise & patient care in OA



Pain level decreases both with weight training and with aerobic exercise. Adapted with permission from Messier et al.

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Contraindications and precautions to exercise in OA & RA

1. New or uncontrolled arrhythmias
2. Resting or uncontrolled tachycardia
3. Uncontrolled hypertension
4. Symptomatic hypotension
5. Unstable angina
6. Unstable or acute heart failure
7. Unstable diabetes
8. Febrile illness

During RA flare-up, exercise should be limited to range of movement activities

Systemic effects of RA must be considered, particularly where these could affect exercise capacity e.g. pleural effusion, intra-pleural nodules or pericarditis

http://www.nchpad.org/112/866/Rheumatoid~Arthritis
FYSS (2014)

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Exercise considerations in OA & RA: For clinicians

- Prescribe patient centred, individualised programmes, based on assessment findings
- Moderate loading is recommended Sutton, 2001
- In RA, introduce and progress exercise slowly
- Physical activity programmes should include a range of exercise types:
  - Stretching
  - Resistance exercise
  - Aerobic conditioning

Arthritis Research UK (2014)
Metsios et al (2008), Bennell et al (2014)
Hurkmans et al (2009)
NICE CG179, NICE CG79) , NICE QS87)

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Exercise recommendations in OA & RA
Aerobic Training

- 150 minutes/week of heart healthy exercise
  - Cycling, Swimming/Aqua-aerobics, Dance, Brisk Walking
  - Indoor cycles can be modified to accommodate the needs of most patients
- Mix of moderate and high intensity exercise
- May be broken into 3 or 4 bouts of 10 minutes/day

Iversen et al (2012), Bennell et al (2014), WHO (2015)
ACSM (2011), NICE CG179, NICE CG79
Metsios et al (2008), Arthritis Research UK (2014) FYSS (2014)

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- Interface Focus. 2014 Oct 6;4(5):20140040. doi: 10.1098/rsfs.2014.0040.

- **Biological mechanisms underlying the role of physical fitness in health and resilience.**

- Silverman MN[1], Deuster PA[1].
- **Author information**
- [1]Consortium for Health and Military Performance, Department of Military and Emergency Medicine , Uniformed Services University of the Health Sciences , Bethesda, MD 20814 , USA.

- I meccanismi biologici sottesi sono diversi e complessi ed ancora non completamenti noti

- L’ attività motoria regolare ed aerobica determina un effetto positivo sia a livello fisico che psichico

- Riduzione del tessuto adiposo
- Riduzione dei sintomi depressivi
- Meccanismi antiifiammatori derivanti dalla contrazione muscolare
- Vari meccanismi neurormonali mediati dal sistema ipotalamo-ipofisario e sistema simpatico

- These findings are relevant to understanding the effects of both exercise maintenance and short-term exercise withdrawal. Overall, the findings suggest that the relationship between physical fitness and mood may be mediated in part by the status of stress responsive systems

- In addition, **higher aerobic fitness** among older women has been shown to attenuate age-related increases in HPA axis reactivity, as indicated by a blunted cortisol response to psychological stress [124]. High-fit individuals also exhibit reduced cortisol responses to a combined challenge of physical (cycling) and mental stress [119].

- Interestingly, we demonstrated that when someone who exercises regularly is forced to abstain for two weeks, negative mood increases significantly and this increase is related to a decrease in fitness [89,92]. In addition, reduced baseline **parasympathetic** nervous system activity, as measured by heart rate variability (HRV), predicted the development of negative mood after deprivation of exercise [92].

- J Physiol Biochem. 2016 Jun;72(2):361-9. doi: 10.1007/s13105-016-0478-4. Epub 2016 Mar 15.
- **The "bioregulatory effect of exercise" on the innate/inflammatory responses.**
- Ortega E[1].
- **Author information**
- [1]Department of Physiology (Group of Immunophysiology), Faculty of Sciences, University of Extremadura, Avda. de Elvas s/n 06071, Badajoz, Spain. orincon@unex.es.

- Le citochine proinfiammatorie sono inibite dall'acetilcolina e dal tono del parasimpasimpatico
- Le citochine proinfiammatorie sono sotto il controllo inibitorio del vago
- L'esercizio fisico aumenta il tono del parasimpatico ed aumenta l'HRV (Thayer 2008, J.Int. medicine)

- **Abstract**
- The effects of exercise on the innate response are primarily mediated by the SNS (sympathetic nervous system) and/or the HPA (hypothalamic-pituitary-adrenal) axis and by stress proteins such as Hsp72. Regular exercise can induce immuno-neuroendocrine stabilization in persons with deregulated inflammatory and stress feedback by reducing the presence of stress hormones and inflammatory cytokines. Anti-inflammatory and "anti-stress" responses seem also to be induced after sessions of exercise, being a promising strategy for treating certain inflammatory pathologies.

The anti-inflammatory effects of exercise: mechanisms and implications for the prevention and treatment of disease

Michael Gleeson, Nicolette C. Bishop, David J. Stensel, Martin R. Lindley, Sarabjit S. Mastana and Myra A. Nimmo

Abstract | Regular exercise reduces the risk of chronic metabolic and cardiorespiratory diseases, in part because exercise exerts anti-inflammatory effects. However, these effects are also likely to be responsible for the suppressed immunity that makes elite athletes more susceptible to infections. The anti-inflammatory effects of regular exercise may be mediated via both a reduction in visceral fat mass (with a subsequent decreased release of adipokines) and the induction of an anti-inflammatory environment with each bout of exercise. In this Review, we focus on the known mechanisms by which exercise — both acute and chronic — exerts its anti-inflammatory effects, and we discuss the implications of these effects for the prevention and treatment of disease.

If you don’t want to just do heavy exercise you got that sweet

THANKS
FOR
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