

Healthy lifestyle interventions in general practice

Part 11: Lifestyle and arthritic conditions

– rheumatoid arthritis

^a Schwellnus MP, MBBCh, MSc(Med) Sports Science, MD(Sport and Exercise Medicine), FACSM, FFIMS ^b Patel DN, MBBCh, MMed(Paed)

^b Nossel C, MBBCh, MBA ^b Dreyer M, BSc(Hons Sports Science), BSc(Hons Dietetics) ^c Whitesman S, MBChB

^a Derman EW, MBChB, PhD(Sport and Exercise Medicine), FACSM, FFIMS

^aUCT/MRC Research Unit for Exercise Science and Sports Medicine, Department of Human Biology, University of Cape Town, International Olympic Committee (IOC) Research Centre ^bVitality Wellness ^cInstitute for Mindfulness, South Africa

Correspondence to: Prof Martin Schwellnus, e-mail: martin.schwellnus@uct.ac.za

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Abstract

Rheumatoid arthritis (RA) is a chronic, systemic, inflammatory autoimmune disorder that causes symmetrical polyarthritis of large and small joints. RA affects about 0.5–1% of the population and is more common in females than males. In recent years, it has been increasingly recognised that early diagnosis and management of RA is important to prevent joint destruction, which has been shown to occur early on in the disease process. The primary effects of the disease on joints and muscles, together with physical inactivity, usually result in diminished joint range of motion, muscle weakness, decreased endurance performance, depression, poor cardiovascular health and osteoporosis. The principles of management of RA should include non-pharmacological and pharmacological management. Non-pharmacological modalities (including lifestyle interventions) are well recognised as important components of the treatment of early arthritis, including RA. The main lifestyle interventions for RA are physical exercise, dietary intervention, psychological intervention and education. The guidelines for these lifestyle interventions in patients with RA are reviewed.

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Introduction

Chronic musculoskeletal diseases, in particular osteoarthritis (OA), rheumatoid arthritis (RA) and low back pain (LBP) are the most important causes of disability-adjusted-life years in both developed and developing countries.¹ In the previous article in this series (Part 10)² lifestyle intervention for the most common of these three conditions, osteoarthritis (OA), was reviewed.³ However, one of the other significant arthritic conditions contributing to musculoskeletal disability is RA. In both developing and developed countries, OA and RA account for the largest burden of musculoskeletal diseases.¹ Apart from the effect of these conditions on patient morbidity, the significant economic impact of these arthritic conditions has already been briefly reviewed in Part 10 of this series.²

As in most chronic diseases, lifestyle interventions play a very important role in the aetiology and management of chronic musculoskeletal disease. The focus of this article, the eleventh in the series, is therefore on the role of lifestyle interventions in the management of RA.

RA can be defined as a chronic, systemic, inflammatory autoimmune disorder causing symmetrical polyarthritis of large and small joints.⁴ It occurs in about 0.5–1% of

the population and females are affected approximately 2–5 times more often than males.^{5–8} The disease typically presents between 30 and 50 years of age, and is the most common inflammatory arthritis.⁴ In recent years, it has been increasingly recognised that early diagnosis and management of RA is important to prevent joint destruction, which has been shown to occur early on in the disease process.⁹ In particular, patients presenting with arthritis of more than one joint should be investigated (preferably by a rheumatologist) ideally within six weeks of the onset of symptoms.¹⁰ Patients should be assessed clinically and by appropriate investigations (serological, radiological) to exclude diseases other than RA.¹⁰

The diagnostic criteria for RA have recently been reviewed.⁴ The diagnosis of RA is primarily clinical⁴ (symptoms and physical signs) but serological tests as well as radiological findings are used to confirm the diagnosis.⁸ The classical criteria that have been used for the diagnosis of RA (American College of Rheumatology 1987 criteria)¹¹ are listed in Table I. In recent years, several modifications of these criteria have been suggested,^{12,13} primarily because these classical criteria are not sensitive and specific for the detection of early disease.⁸ For example, in recent years the use of anticyclic citrullinated peptide antibody (anti-CCP

autoantibodies) as a more sensitive and specific serological test for the diagnosis of RA has become available.^{14,15} A detailed discussion of the merits of these diagnostic criteria is beyond the scope of this article, but it has been suggested that a revision and validation of the classical criteria is required.⁸

Table 1: Classification criteria for RA – based on American College of Rheumatology criteria (1987)¹¹ (at least four criteria must be fulfilled)

Criteria	Definition
Morning stiffness	Morning stiffness in and around the joints, lasting at least one hour
Arthritis of ≥ 3 joint areas	Soft-tissue swelling or fluid in at least three of the following areas: the left or right PIP, MCP, wrist, elbow, knee, ankle or MTP joints
Arthritis of the hand joints	Swelling of the wrist, MCP, or PIP joints
Symmetric arthritis	Simultaneous involvement of the same joint areas (as above) on both sides of the body (at least 50% of the affected joint areas affected symmetrically)
Rheumatoid nodules	Subcutaneous nodules present
Rheumatoid factor	Detected by a method that yields positive findings in < 5% of normal controls
Radiographic changes	Erosions or unequivocal bony decalcification localised to the joints of the hand and wrists

Furthermore, it is important to note that as part of the initial clinical assessment, factors that predict persistent and erosive joint disease should be measured. These include the number of swollen and tender joints, ESR or CRP, levels of rheumatoid factor and anti-CCP antibodies as well as radiographic evidence of joint erosions.¹⁰

The precise cause of RA remains unknown but it appears that it is a manifestation of the response to an infectious agent in a genetically susceptible host. It is characterised by periods of acute exacerbation and remission. The primary effects of the disease on joints and muscles together with physical inactivity usually result in diminished joint range of motion, muscle weakness, decreased endurance performance, depression, poor cardiovascular health¹⁶ and osteoporosis.⁷ RA not only affects joints, but also a variety of organ systems including the cardiovascular and respiratory systems. It is well established that RA is associated with an increased cardiovascular disease (CVD) morbidity and mortality,^{17,18} and much attention has been paid to the potential role of the high-grade systemic inflammation in RA as a contributing factor to atherosclerosis.¹⁷ However, the classical risk factors for CVD are also prevalent in these patients and should not be ignored.

General management of RA

As mentioned, RA is not a benign disease and early recognition and aggressive management before the onset of joint damage, is very important.¹⁰ Evidence-based guidelines for the management of early RA have been published and are available.^{9,10,19} There is consensus that a comprehensive approach to the management of RA should be followed that would include non-pharmacological^{10,20,21} and pharmacological management.⁴ Pharmacological intervention has received considerable attention in recent years and the earlier use of non-biologic as well as biologic disease-modifying anti-rheumatic drugs (DMARDs) has changed the modern management of RA. The recommendations for the use of non-biologic as well as biologic DMARDs in RA have recently been reviewed,^{10,19} and therefore a detailed discussion of the use of these agents is beyond the scope of this article. The remainder of this article will focus on the non-pharmacological management of RA, in particular the role of lifestyle changes.

Non-pharmacological modalities are well recognised as important components of the treatment of early arthritis, including RA.^{10,20,21} Clinical practice guidelines for the use of non-pharmacologic treatment, including lifestyle changes, in RA have recently been published.²²

Lifestyle interventions in the management of RA

The main lifestyle interventions for RA are physical exercise, dietary intervention, psychological intervention and education.²² Other therapeutic interventions include smoking cessation,¹⁸ the use of electro-physical modalities,^{20,22} massage,²⁰ passive hydrotherapy,²⁰ and the use of splints or orthoses.²⁰

Physical exercise as a lifestyle intervention for RA

In all the recent published recommendations on the non-pharmacological management of RA, physical exercise is consistently recommended as an important lifestyle intervention.^{10,20,21} In the past, regular exercise was not encouraged in patients with RA. The reasons for this were related to concerns by health professionals and fear among patients with RA that exercise may harm joints. However, it is now well established that exercise training is beneficial for patients with RA, and can safely be implemented without inducing harmful effects on disease activity and joint damage.^{5,17}

Broadly, the potential benefits of an exercise programme for patients with RA are as follows: to improve joint range of motion (ROM), to improve muscle strength, to improve endurance capacity to perform normal daily activity

including vocational activity, reduction of cardiovascular disease mortality, reversal of reduced muscle mass (rheumatoid cachexia), enhancement of self-esteem and to improve mood.¹⁶⁻¹⁸

There is now a significant body of evidence from well conducted clinical trials that regular exercise is both beneficial and safe for patients with RA. The details of these studies have been reviewed extensively over the last few years,^{5,17} including a recent Cochrane review.²³ The main findings of these studies, and the strength of evidence supporting these findings, are summarised in Table II.

Table II: Summary of evidence that regular exercise is beneficial and safe for patients with RA

Main findings	Level of evidence
Habitual physical activity is reduced in patients with RA ⁵	Some evidence
Regular physical activity improves physical fitness and muscle strength in patients with RA ^{5-7,23,24}	Strong evidence
Resistance training can increase fat-free mass in patients with RA provided a sufficient training dose is present ⁵	Some evidence
In RA patients, regular exercise may improve emotional status, alleviate fatigue and improve quality of life ^{6,7}	Some evidence
Regular physical activity has a moderate beneficial effect on disease activity and pain in patients with RA ⁵	Good evidence
Regular exercise training, even high-intensity exercise training, is safe in patients with RA and does not cause accelerated joint damage ^{5,7,25}	Good evidence

On the strength of the evidence summarised in Table II, physical exercise is now recommended for all patients with RA.^{10,20,22,25}

As with all chronic diseases where exercise is recommended,²⁶ patients with RA should also undergo a comprehensive medical examination and functional evaluation (a comprehensive cardiovascular and pulmonary evaluation including a stress electrocardiogram) before embarking on an exercise programme.^{17,18} In patients with RA, this evaluation should also include documentation of the activity and staging of the disease, and functional assessment of joint range of motion, muscle strength and endurance capacity. Particular attention should be given to the degree of any damage or active inflammation of the joints.¹⁷

Based on this assessment, an individualised exercise programme can then be prescribed for the patient with RA. There are no specific guidelines to indicate if exercise training for patients with RA should be medically supervised or not, or if the exercise programme should be individual

or group-based. In the absence of specific guidelines the following can be suggested:

- Medically supervised exercise is indicated where co-morbidities are identified (such as underlying cardiovascular disease) that require a medical supervised setting²⁷
- Medically directed exercise, in an individual or a group setting, is indicated for all patients who commence exercise training and for those with active disease

Table III: Guidelines for exercise prescription for patients with stable RA (during periods of remission)

Exercise goal	Practical implementation of the exercise goal
General considerations	<ul style="list-style-type: none"> • Perform an active warm-up and cool down before and after an exercise session • Allow for variation in the exercise programme to increase compliance • Permit the use of splints and other joint protection devices
Improving the joint range of movement (ROM) of affected joints	<ul style="list-style-type: none"> • Active ROM exercise can be performed (after a hot bath or shower) • Start with 2-3 repetitions and gradually increase to 10 repetitions daily • All the muscle groups around affected joints should undergo flexibility training
Increasing the strength and endurance of peri-articular muscles	<ul style="list-style-type: none"> • Isometric muscle strength exercises in 3-4 different ranges of motion should initially be performed in all muscles around the affected joints • Initially 1-2 contractions lasting 6-10 seconds should be performed daily • The number of contractions can gradually be increased to 6-8 per day • Isotonic exercise using low resistance and few repetitions may be started once sufficient muscle strength has been gained • Isotonic exercises should not result in undue pain or excessive fatigue • The prescription of isotonic exercise should take into account the stage of the disease, age of the patient, and the interests of the patient
Increasing endurance capacity	<ul style="list-style-type: none"> • Activities that improve endurance capacity should be introduced as soon as possible into the exercise programme • Activities such as swimming (particularly useful in rheumatoid arthritis), cycling and even low impact aerobics can be introduced • During a training session, the aim is to increase the exercise heart rate to 60-80% of the age predicted maximum heart rate (calculated as 200 minus age in years) • The average duration of the endurance training session should gradually increase from 10 min to 30 minutes or even longer • Endurance training should ideally be performed 3-5 times per week or even more frequently
Special considerations	<ul style="list-style-type: none"> • Attention should be given to equipment, such as footwear, and surfaces

An exercise programme for patients with RA will vary and the guidelines for exercise prescription will depend on whether the condition is stable or if there is a degree of active inflammation (flare-up) in the affected joints.²² The guidelines for exercise prescription in patients with stable RA are summarised in Table III.

The effect of exercise training on RA during periods of joint flare has been an active area of research in recent years. In the past, a number of modifications to the exercise programme were recommended in cases where patients had an acute exacerbation of the condition (acutely swollen, painful and stiff joints). These included the following: avoiding active range of motion exercises, isometric or isotonic resistance training, avoiding endurance-training sessions or decreasing their duration and frequency, recommending rest therapy by immobilisation of the joint, and introducing only passive range of motion exercises.

However, in recent years, a number of scientific studies have been published where more intense exercise was prescribed to patients who were admitted for a disease flare.²⁵ The results of these studies showed that there is no detrimental effect of more intense exercise training on disease activity, and in some cases, a moderate benefit was shown in those groups performing more intense exercise.

In these studies, it was documented that exercise training can in fact have a positive effect on disease activity by reducing systemic inflammation.²⁸ The precise mechanisms for this positive benefit on disease activity are not known but include reduction in the expression of genes involved in inflammation and fibrosis,²⁸ suppression of pro-inflammatory cytokines,²⁸ alteration in the concentrations of circulating neuropeptides, the process of autotransformation or perhaps just more aggressive treatment of rheumatoid arthritis itself.²⁵ These mechanisms are in the process of being investigated further.

The guidelines for exercise prescription in patients with active RA are summarised in Table IV.

Nutritional lifestyle intervention for RA

Beyond meeting daily nutritional requirements, the potential beneficial role that nutrition can play in certain disease states is becoming increasingly recognised by the scientific community.²⁹ More specifically, symptoms related to arthritic conditions can be improved by nutrition.²⁹ It remains to be seen, however, whether nutrition is implicated in prevention and disease progression. This review deals with the most important dietary considerations in the management of RA. The main nutritional considerations in patients with RA are summarised in Table V.

In summary, patients suffering from RA often turn to alternative and complementary medicines when modern

Table IV: Guidelines for exercise prescription for patients with RA during periods of active RA (inflammatory flare-up)²²

Exercise goal	Practical implementation of the exercise goal
General considerations	<ul style="list-style-type: none"> The main goal of exercise treatment is to prevent joint deformity and loss of muscle strength Heat treatment has been suggested
Improving the joint range of movement (ROM) of affected joints	<ul style="list-style-type: none"> Physiotherapy assisted active or passive joint mobilisation is recommended
Increasing the strength and endurance of peri-articular muscles	<ul style="list-style-type: none"> Isometric muscle strength exercises can be continued Strengthening exercise can be performed against manual resistance Strengthening exercises must be performed with caution on inflamed joints and should be below the pain threshold Strength training (isokinetic or isotonic) can be performed 2–3 times per week for 30 to 45 minutes Water based exercise programmes can be encouraged
Increasing endurance capacity	<ul style="list-style-type: none"> Endurance training can be continued, but activities with low impact on the joints are recommended
Special considerations	<ul style="list-style-type: none"> In this phase, attention should be given to the use of equipment such as rest splints and orthoses

medicine fails to provide permanent symptom relief or promise of a cure. Together with this, controversial remedies and treatments, claiming their effects and benefits, are gaining increased exposure due to growing access to the Internet – often with unsupported scientific evidence. To this extent, registered dietitians play a key role in informing patients of the safety and effectiveness of such therapies, in addition to assisting with optimal dietary planning, as medical nutrition therapy plays a key role in the treatment (alleviation of symptoms and management of pain) in patients with arthritic conditions. Further, it is important to consider co-morbidities, such as cardiovascular disease, obesity and diabetes, all of which need dietary intervention, and to balance the goal of symptom relief and health promotion both in the short and long-term. For all patients with arthritic conditions, a diet rich in vegetables and fruit, whole grains and omega-3 fatty acids, can be safely recommended.

Psychological lifestyle intervention for RA

Psychological distress is common in patients with arthritis and often exacerbates the experience of physical discomfort.³⁸ This is generally true for chronic pain conditions, irrespective of aetiology, and as such, it is useful

Table V: Nutritional guidelines for patients with RA

Nutritional consideration	Guidelines and implementation
Impact of RA on overall nutritional status	The nutritional status of individuals suffering from RA could potentially be affected in several ways by the articular and extra-articular manifestations of RA, including the ability to perform nutrition related ADLs (shopping, preparing and chewing and swallowing of food) as well as an increased metabolic rate and changes in the gastrointestinal mucosa due to the inflammatory process These should all be taken into consideration during the comprehensive nutritional assessment and counselling
The omegas and the inflammatory process	Omega-6 and omega-3 (including EPA, DHA and ALA) polyunsaturated fatty acids are metabolised competitively Increasing the amount of omega-3 fatty acids (found in fatty fish, flaxseed, walnuts, soy and canola) whilst reducing the intake of omega-6 fatty acids will result in the modulation of the inflammatory response, including an increase in the production of mediators with anti-inflammatory properties Research over the past two decades, has clearly illustrated beneficial responses in the metabolism of cytokines and eicosanoids with fish oil supplementation ^{30,31} Despite the fact that most studies demonstrate this modulation of the inflammatory process with increased intake of omega-3 fatty acids and a reduced intake of omega-6 fatty acids, and a subsequent improvement in arthritic conditions, this strategy should be used in conjunction with improved eating habits and should not replace conventional drug therapy The recommendation for RA patients is to eat oily fish once or twice a week, and/or take an omega-3 dietary supplement providing the daily dose of EPA (50 mg/kg/day) and DHA (30 mg/kg/day) ³² It is prudent to advise patients that all dietary supplements are not without potential side effects, and should be obtained from a reputable source
Vitamins, minerals and antioxidants	The dietary intake of calcium, folic acid, vitamin E, zinc, vitamin B and selenium is often below their respective DRIs ^{33,34} In RA patients, bone demineralisation and eventually osteoporosis or osteomalacia can result from prolonged use of glucocorticoids, vitamin D and calcium malabsorption and advanced stage disease Calcium and vitamin D supplementation could assist in the prevention and reduction in the severity of these conditions ³⁵ Increasing evidence supports supplementation, independent of drug-nutrient interactions, beyond minimum levels for certain nutrients, and that this may complement drug therapy, particularly for vitamin E, ³¹ folic acid ³⁶ and vitamin D ³⁷

to consider the psychological dimensions of arthritides in the general context of chronic pain syndrome.

The pathophysiology of chronic pain is characterised by dysregulation of nociceptive pathways in the spinal cord, subcortical and cortical regions of the neuraxis.^{39,40} The consequence of this 'centralisation' of pain is the complex syndrome observed clinically, which includes physical (noxious stimuli), mental (e.g. beliefs and thoughts such as 'I cannot live with the pain', or "my life is over") and emotional (e.g. fear, anger sadness, loss, depression) components, with a consequential effect on behaviour (e.g. withdrawal, passivity, avoidance) and on relatedness (aversion and withdrawal).

The two most common causes of arthritis-related chronic pain – OA and RA – will have distinctive clinical and therapeutic elements from pharmacological to lifestyle modification, and intervention will depend on the stage at presentation and the severity of functional impairment. That said, working with patients who inhabit a world in which pain is more or less a constant presence, albeit with varying intensity, it is most helpful to appreciate the pathophysiology of chronic pain and its physical and psychosocial interplay,

and always consider management in a multi-disciplinary context. It is easy to overlook the value of individual or group psychotherapy and stress management programmes and focus only on the physical dimensions such as medication and physiotherapy. Simply put, chronic pain conditions require a wide therapeutic net.

There are some interesting emerging data with respect to specific therapeutic interventions, especially with RA which are worthy of brief mention. (For a review of psychological interventions and lifestyle modifications in arthritis see Keefe et al 2008).⁴¹ Research has demonstrated that writing about emotionally traumatic experiences (usually for 20 minutes a day for four days) has a surprisingly beneficial effect on symptoms and immune parameters. In a randomised, controlled trial, individuals with RA (and asthma) were compared to controls (who wrote about emotionally neutral topics) with respect to symptom reduction.⁴² Of evaluable patients four months after treatment, patients with RA had a 28% reduction ($p = 0.001$) in overall disease activity as assessed by independent rheumatologists, while controls showed no change.

Mindfulness-based stress reduction (MBSR), an eight week, out-patient programme teaching patients mindfulness practices to enhance self-regulation, has been used effectively for symptom reduction in chronic pain conditions, with 3-year follow up showing maintenance of gains.⁴³ MBSR utilised with patients with RA showed an improvement in psychological distress and strengthening of well-being at four months post-intervention, but no changes in either depressive symptoms or disease activity.⁴⁴ In comparing MBSR to a group CBT intervention in RA, patients in the CBT group showed the greatest improvement in self-reported pain and reductions in the pro-inflammatory cytokine IL6, while those with a history of recurrent depression benefited most from the mindfulness intervention with respect to both emotional regulation and physician rating of joint tenderness. Controls showed no improvements on either physiological or psychological parameters.⁴⁵

These data suggests that a variety of factors should be considered carefully when choosing which interventions are best suited for patients, and that no single intervention works for everyone, even within a homogeneous patient population. Further, it gives credence to the importance of doing more integrative and comparative research so that clinicians are better informed about nuanced differences in approach which will enhance our patients' well-being.

Educational lifestyle intervention for RA

The provision of therapeutic education should be an integral part of management of any disease, including RA.^{10,22} Educational intervention is often combined with the exercise intervention.²⁰ Data from three randomised clinical trials show that written information increases knowledge about the disease,¹⁰ while the results from two trials show that a self management education programme resulted in improved short-term clinical outcomes in RA.¹⁰ There is only weak evidence that group education is better than individual education.¹⁰

The main components of a therapeutic education programme should include the following²²:

- Knowing and understanding the disease and its treatment (pharmacological and non-pharmacological)
- Familiarisation with the movements to protect the joints
- Educational intervention focused on all the lifestyle interventions
- Learning to cope with the disease and the problems it causes
- Involvement of relatives in disease management, treatment and any repercussions

Other lifestyle interventions for RA

Electro-physical modalities for RA include thermotherapy, electrotherapy, low-level laser therapy and passive hydrotherapy (balneotherapy).²⁰ However, because of limited studies and poor methodological quality of studies, no firm conclusions on the effectiveness of these interventions in RA patients can be drawn.²⁰

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