

Guidelines



British Society for Rheumatology and British Health Professionals in Rheumatology guideline for the management of rheumatoid arthritis (after the first 2 years)

Raashid Luqmani¹, Sheena Hennell², Cristina Estrach³, Damian Basher⁴, Fraser Birrell^{5,6,7}, Ailsa Bosworth⁸, Frank Burke⁹, Carole Callaghan¹⁰, Jaime Candal-Couto¹¹, Chris Fokke¹², Nicola Goodson³, Dawn Homer¹³, John Jackman¹⁴, Paula Jeffreson¹⁵, Susan Oliver¹⁶, Mike Reed¹¹, Luis Sanz¹⁷, Zoe Stableford¹⁸, Peter Taylor¹⁹, Nick Todd²⁰, Louise Warburton²¹, Chris Washbrook¹² and Mark Wilkinson²², on behalf of the British Society for Rheumatology and British Health Professionals in Rheumatology Standards, Guidelines and Audit Working Group

KEY WORDS: Rheumatoid arthritis, Guideline, Management, Disease-modifying anti-rheumatic therapy, Multidisciplinary care.

Scope and purpose

Background to disease

Approximately 1% of the adult population have RA. Managing established RA is different from managing early disease. RA is a chronic condition with a variable course requiring continuous support at different levels at different stages of the disease [1]. Those with established RA have increased rates of comorbidity, particularly cardiovascular disease and depression, associated with an increased mortality [2]. The main aim of management in early disease is to suppress disease activity,

prevent loss of function, control joint damage, maintain pain control and enhance self-management [3]; however, in established disease there is a need to address complications and associated comorbidity and evaluate the impact of the condition on the patient's quality of life [4].

Disability reduces social and economic participation and contributes to deprivation. As treatment and care improve, increasing numbers of people with established RA will need coordinated health and social services to support them at work, or require care at home during the variable course of their illness [5]. Local Performance Frameworks [6] and The NHS Operating Framework 2008–09 [7] provide mechanisms for organizations and partnerships to meet the health and social care needs of those with long-term conditions. Increasing patient involvement in care is also a part of longer term societal and policy goals [8, 9] to promote health and encourage individuals' personal involvement in their own health.

Effective care, treatment and support should be available for all patients with RA, particularly those with the greatest need. Equity in access to health and social care is one of the broader determinants of health and could be audited in order to ensure that health and social inequalities are not worsened by unequal access to services and support.

This guideline follows directly from the first guideline on the management of RA during the first 2 yrs [3]. The current guideline differs from the first, in that it deals with the long-term management of RA and includes reference to management of chronic diseases and the role of primary and secondary care teams in providing seamless long-term support for patients. In addition, it emphasizes the role for patients to take as they become more knowledgeable about their disease and can make informed choices about their treatment, based on their understanding of the benefits and limitations of such interventions.

¹Nuffield Orthopaedic Centre and University of Oxford, Oxford, ²Wirral Hospital NHS Trust, Wirral, ³Aintree University Hospital, Aintree, ⁴Wessex Public Health, Hampshire, ⁵Department of Rheumatology, Wansbeck General Hospital, Wansbeck, ⁶Department of Rheumatology, Freeman Hospital, ⁷Newcastle University, Newcastle, ⁸National Rheumatoid Arthritis Society, Maidenhead, ⁹Pulvertaft Hand Centre, Derby, ¹⁰Pharmacy Department, Western General Hospital, Edinburgh, ¹¹Wansbeck General Hospital, Wansbeck, ¹²Royal National Hospital for Rheumatic Diseases, Bath, ¹³Department of Rheumatology, University Hospital Birmingham NHS Foundation Trust, Birmingham, ¹⁴Langford Medical Practice, Bicester, ¹⁵Robert Jones and Agnes Hunt Orthopaedic and District Hospital NHS Trust, Oswestry, ¹⁶Royal College of Nursing Rheumatology Forum and Litchdon Health Centre, Barnstaple, ¹⁷Department of Orthopaedics, Macclesfield District General Hospital, Macclesfield, ¹⁸Department of Podiatry, Hope Hospital, Salford, ¹⁹Kennedy Institute of Rheumatology, London, ²⁰Newcastle General Hospital, Newcastle, ²¹Telford and Wrekin Primary Care Trust, Telford and ²²Stockport NHS Foundation Trust, Stockport, UK.

Submitted 19 June 2008; accepted 13 November 2008.

Correspondence to: R. Luqmani, Nuffield Orthopaedic Centre, Windmill Road, Oxford OX3 7LD, UK. E-mail: Raashid.luqmani@noc.anglo.nhs.uk

Disease activity and outcome measures for routine use in RA

The clinical course of RA is highly variable between individuals, and for any given individual, disease activity may vary over time. The symptoms and signs of rheumatoid include pain, stiffness, swelling and functional impairment, general malaise and profound fatigue. Progressive joint destruction is common, despite DMARD therapy, resulting in functional loss. Measures of disease activity and damage include severity of pain, global status scores, functional status and swelling or tender joint counts, and scoring of damage to joints, using erosion, narrowing or both. These evaluations provide robust and meaningful interpretation of the therapeutic benefit of new treatments in clinical trials. Tight disease control, with titration of pharmacological treatment against disease activity, can improve remission rates and reduce radiographic destruction [10]. This means titrating disease activity to a pre-defined target [e.g. 28-joint disease activity score (DAS28) <3.2]. Thus, it is objective assessment of disease activity at routine clinic attendance which enables comparison with the target and informs the need to change treatment. Similarly, an annual assessment of functional status is recommended.

Disease activity measures include the disease activity score (initially based on 44 swollen and 48 tender joint counts, and latterly 28 joint counts), simplified disease activity index (SDAI), Mallya–Mace and Stoke indices and ACR response criteria [11]. The most widely used and validated measure of function is the Stanford HAQ which patients complete themselves.

The DAS28 is derived from a formula based on four variables: the number of swollen and tender joints out of a set of 28 assessed joints, together with the acute-phase response with or without the patient's own assessment of global health status based on a 100-mm visual analogue scale. Formulae have been derived, depending on the numbers of joints assessed and whether ESR or CRP is used as the acute-phase reactant [12, 13] to provide a composite score of rheumatoid inflammation (readily calculated from www.das-score.nl/www.das-score.nl/DAS28calc.htm). BSR and National Institute for Health and Clinical Excellence (NICE) guidelines for anti-TNF biological agents [14] require the recording of a DAS28 of >5.1, calculated using all four variables on two consecutive occasions a month apart. The use of the DAS28 has become widespread, often without consideration of establishing reliability of scoring, or its validity in the setting used and the threshold values have been challenged [15]. DAS28 performs well with training, achieving good agreement between observers [16].

The DAS28 gives standard weighting to quite different features, so that very different patients can have the same score, or the score can actually mislead in certain circumstances. For example, a patient can have numerous swollen joints, particularly involving the feet, and yet meet DAS28 remission criteria (DAS28 ≤2.6). Conversely, a patient with many tender joints and fibromyalgic features may have a disproportionately high DAS28 score, without very active inflammatory disease [17]. Even so, the components of the DAS28 can be measured easily in routine clinical practice and the score itself can give a quantifiable measure of disease activity and has value in informing the need for treatment change and assessing response to therapy.

Progression of damage is strongly associated with persistent inflammation, modelled by time summated (or area under the curve of) CRP or ESR values [18]. These are readily available tests, which are quick and cheap to perform. In patients who have elevated inflammatory markers, they are a key component in the pursuit of remission. However, a minority of patients, particularly those with seronegative disease, may have normal inflammatory markers, but have definite, and in some cases quite florid, synovitis. Therefore, other measures of activity are needed. Additional areas not addressed in current assessments include

cardiovascular disease, vasculitis or continuing synovitis in joints that have been replaced.

High-resolution musculoskeletal ultrasound (MSUS) can detect synovitis in joints which do not have clinically evident inflammation, leading to a more accurate definition of remission [19] and diagnosis of polyarthritis, where clinical examination alone suggests mono- or oligoarticular disease [20]. MSUS is highly sensitive to both inflammation (visible as effusion, synovial thickness and increased power Doppler signal) and damage, where erosions are seen much earlier than with plain radiography. Although the sensitivity of MRI for early erosion is even greater [21], MRI is not feasible in routine UK clinical practice. In those centres where MSUS is available, it is used both for diagnosis of and remission from synovitis, but we are still not certain of the long-term value in routine clinical practice, especially its role in predicting future functional impairment or structural damage, compared with traditional measures (such as DAS or CRP). Whilst MSUS was of predictive value in determining future radiographic erosions in a series of 12 patients treated with MTX monotherapy [22], this was not the case for a group treated with additional infliximab. Naredo *et al.* [23] found no such association between baseline ultrasonographic (US) measures and 1 yr DAS28, HAQ or radiographic scores in early RA patients treated with DMARDs and steroids, though they did find a relation with time-integrated US measures (not single-point measures).

Given the profusion of methods for assessing activity and the financial and time pressures on clinicians, we recommend regular, documented assessment of disease activity, by clinical examination (this may include formal swollen and tender joint counts if time allows), inflammatory markers and, where available (and particularly where clinical or CRP assessment is indeterminate) MSUS. DAS28 assessments should probably be carried out in all patients with RA, but are obligatory when anti-TNF therapy is being considered; hence all secondary care departments should establish training programmes for specialist nurses and trainees that incorporate reliability assessments for joint counts and DAS28 calculation [24].

The concept of low or minimal disease activity as an alternative to clinical remission has been used in clinical trials as 'the next best thing' to actual remission. It represents a measurable state, which for many patients is acceptable, and the closest they may get to remission. The initial proposed definition of minimal disease activity was based on either having a DAS28 score of ≤2.85, or fulfilling five of the following seven criteria: (i) pain (0–10) ≤2; (ii) swollen joint count (0–28) ≤1; (iii) tender joint count (0–28) ≤1; (iv) HAQ (0–3) ≤0.5; (v) physician global assessment of disease activity (0–10) ≤1.5; (vi) patient global assessment of disease activity (0–10) ≤2; (vii) ESR ≤20 [25]. Subsequently, this was tested in a cohort of 200 patients, resulting in up to 48% of the patients being classified as having achieved MDA after 24 months treatment, compared with only up to 32% achieving remission after 24 months [26]. In a study of over 6000 patients with early RA [27], following 12 weeks of therapy, DAS remission was achieved in 38% compared with MDA, which was seen in 43–45%, suggesting that MDA definitions may be of only limited value at an early stage after therapy has been started.

Self-management

There is growing emphasis on developing patient self-management skills which include the ability to recognize clinical and functional remission, or alternatively the lack of remission. Patients require self-initiated access to appropriate health care providers in primary and secondary care teams to support their needs. Continuous education and collaboration between primary and secondary care providers should ensure prompt action in the event of flares or complications or drug toxicity [28, 29, 10].

Need for guideline

Need for guideline

This is a time of NHS changes, with new models of care, such as the ‘long-term conditions’ agenda [30] and the launching of the Musculoskeletal Services Framework [31] aiming to reshape services across the country. It may be a useful tool when planning pathways and delivery of care for the patients with established RA and aims to be an evidence-based guide for best practice with extensive multidisciplinary input. The Musculoskeletal Services Framework, recently launched, offers the vision of an integrated service for patients with musculoskeletal problems. It makes clear that some conditions, such as RA, will require the expertise of several disciplines to create relevant care pathways [31]. The Arthritis and Musculoskeletal Alliance (ARMA) standards of care [32] advocated for responsive services for ongoing treatment and support of patients with RA.

Rheumatology departments need to deal with the dual demands of delivering shorter waiting times for new patients and working with their primary care colleagues to serve the ongoing needs of patients with chronic inflammatory joint disease using approaches, such as Integrated Care Pathways. RA in its severe form is a considerable health burden [33]. We propose a model of care, based on the best existing evidence for patients with established disease discussing the ongoing use of DMARDs or the introduction of biologic agents where appropriate, with ongoing education and specialist management, but also with increasing emphasis on shared care between patients, primary care and secondary care providers, once the disease is stabilized [34]. Expert patient programmes and self-care educational packages should be considered.

Patients may have urgent problems that require prompt attention and should be regarded as medical emergencies. Such ‘red flag’ problems are listed in Table 1. We propose this concept for completeness because these features may form the main focus for urgent referral, usually to secondary care. In addition, patients identified by their general practitioner (GP) as suffering poor disease control, with increasing joint pain, swelling and or high inflammatory markers or low haemoglobin should also be referred rapidly to secondary care.

We have assessed and graded available evidence, in order to summarize best practice and provide recommendations. These recommendations have resource implications.

Objectives of guideline

The objectives of this guidance are as follows:

- (i) Control of synovitis: controlling synovitis is an essential part of the management of RA [3]. The concept of minimal disease activity has been defined in OMERACT 7 as a useful target of treatment. This may be more realistic than the achievement of remission [25] but requires validation. In practice, if patients are still symptomatic, with active disease, strategies for managing arthritis could include protocols to encourage prompt step up or change in medication [35], including biologic therapy where criteria are achieved according to BSR and NICE guidelines [14, 36]. Safety for patients on DMARD therapy or biologic therapy should be ensured by strict monitoring and adherence to appropriate Summary of Product Characteristics (SPC) and BSR guidelines [36] ideally within a framework of agreed regional or local shared care monitoring policies between primary and secondary care providers.
- (ii) Symptom control: patients with arthritis have symptoms that may be interdependent on inflammation, mechanical change to joints and surrounding structures, as well as psychosocial issues.

TABLE 1. Red flag problems in RA

1	Sepsis (see guideline point 10)
2	Drug toxicity (see guideline points 2 and 3)
3	Cervical spine instability (see guideline point 12)
4	Systemic rheumatoid vasculitis
5	Unexplained weight loss and lymphadenopathy as features of other systemic disease, e.g. lymphoma or amyloid
6	Exacerbations of respiratory or cardiac disease

- (iii) Self-management: this is an important part of the increasing empowerment for patients to learn more about their own disease and how to self-manage their symptoms and know when to access the services to support them at a time that is appropriate for them. Every interaction between patients and health care professional should be considered an educational opportunity.
- (iv) Physical functioning: the role of physiotherapy and occupational therapy in established disease is to maintain or improve physical functioning and especially mobility.
- (v) Psycho-social functioning: psychological and social support is an important aspect of management. Real and potential psychological distress should be addressed through the multidisciplinary team and appropriate agencies. When addressing some important but neglected issues, such as problems relating to sexual health and relationships, nurse specialists often feel out of their depth [37] and this area needs further work. Additional and important lay-led support should also be offered through liaison with patient-based organizations, such as the National Rheumatoid Arthritis Society (NRAS) and Arthritis Care.
- (vi) Monitoring: the use of DMARD therapy requires regular monitoring.
- (vii) Managing and screening for comorbidity: chronic comorbidity can serve as a major determinant of disease outcome in RA by influencing disability levels and mortality [38, 39]. Screening for potentially treatable comorbid conditions should occur on a regular basis and could form part of the annual review process (see section on annual review) RA-related chronic comorbidities include cardiovascular disease, osteoporosis and depression. Patients should be considered for orthopaedic referral for failing joints or where medical management has failed to control pain. Other medical complications include lung fibrosis, renal disease, vasculitis and amyloid. Comprehensive screening is impractical, but an awareness of these conditions is important in the management of all patients with RA. This is particularly true for patients who may present to other specialists for their medical problem. If patients are well informed, they should be able to tell medical staff of the possible link to their arthritis, in order to encourage referral to their rheumatology team.

Patients with RA have an increased risk of lymphoproliferative disease. In particular, the rates of Hodgkin’s disease and non-Hodgkin’s lymphoma are increased by 2- to 3-fold in patients with RA. It is difficult to determine whether the increased rate of lymphoproliferative disease in patients with RA is as a result of their underlying disease process or due to the effects of treatment [40]. Patients with higher levels of inflammation and extra-articular manifestations of RA have a higher risk of lymphoma than patients who do not have these features. These patients are more likely to receive immunosuppressive therapies. There is no convincing link between any specific DMARD and the development of lymphoma [41, 42].

Best practice points for general practitioners and health care commissioners

RA is a life-long multifactorial disease. The aim of this guideline is to optimize the care of patients with RA, by enhancing the

expertise and access to services in both primary and secondary care, for the benefit of patients with RA.

Patients have historically had initiation, supervision and monitoring of all DMARDs and biologic therapies in secondary care. Increasingly, some of these tasks, especially monitoring as well as screening for cardiovascular risk factors and depression and other comorbidities, are being managed very effectively in primary care.

Table 2 summarizes practice points for primary care physicians, and an example flow diagram for care is outlined in Figs 1 and 2; Table 3 provides a summary of key points for health care commissioners.

Target audience

The primary target audience of this guidance is health professionals in primary and secondary care, health care commissioners and patients with RA.

The areas the guideline does not cover

The guidance is limited to recommendations after the first 2 yrs of onset of RA in adults. It does not deal with the management of other forms of arthritis, such as PsA, or give detailed guidance on DMARDs or biologic therapy in RA. These areas are described in separate guidelines, and wherever appropriate, we

TABLE 2. Key interventions for primary care physicians in the management of RA

Proposed intervention	Reason for intervention
Early referral of patients with suspected inflammatory arthritis to secondary care	Optimal time for commencing DMARDs is within 12 weeks of disease onset
Refer patients with morning stiffness, joint pain and/or swelling in at least three areas	Better long-term outcome if this is achieved
Refer patients to secondary care where there is diagnostic difficulty	Specialist opinion is crucial in order to increase the likelihood of achieving the correct diagnosis
Monitor patients on DMARDs and biologic therapies according to BSR clinical guidelines on www.rheumatology.org.uk	Patients who present with less well-defined symptoms should be referred promptly to ensure that the window of opportunity to treat with a DMARD is not lost
Manage cardiovascular risk factors in patients with RA.	Avoid toxic side effects, such as marrow suppression and liver toxicity
Measure BP	Patients with rheumatoid have an increased risk of cardiovascular events; similar to patients with type II diabetes
Measure fasting lipids and glucose	Many deaths in rheumatoid are caused by cardiovascular events, driven by inflammatory components of their disease
Check weight and BMI	Commence statins and aspirin as recommended by cardiovascular risk tables
Waist measurement	
Encourage exercise	
Smoking cessation advice	
Remember that patients with high inflammatory markers carry an increased risk of cardiovascular disease	
Be aware of the potential risk of osteoporosis	Prevent fractures
RA is a separate risk factor for osteoporosis, as is use of steroids and lack of weight-bearing exercise	Maintain patients' mobility, fitness and independence
Refer for DXA scanning as appropriate	
Commence therapy as recommended by NICE and Royal College of Physicians guidelines on osteoporosis	
Be aware of the high incidence of depression in patients with rheumatoid	Depression often goes un-noticed and untreated. It is not just a consequence of having RA
Consider the use of screening questionnaires, such as PHQ9 or the Hospital Anxiety Depression Scale	Poor disease control, chronic pain and significant fatigue may all contribute to depression
Treat with medication and psychotherapy	Depression can impair the patient's coping strategies and recovery from the disease
Immunosuppressive treatments increase incidence and severity of infectious diseases	Be aware that response to inactive virus vaccines may be reduced in patients on immunosuppressive drugs
All patients should be offered immunization against	Avoid using live vaccines in patients taking immunosuppressive drugs
Influenza	
Pneumococcus	
In immunosuppressed patients not immune to measles or varicella consider using immunoglobulins after significant contact exposure	
Be aware of higher risk of infections in patients on DMARDs and immunosuppressive therapies	Prevent undetected sepsis and morbidity
Patients with RA require a lower threshold for treatment for a chest or urinary tract infection and may need more than the standard 3 day course of antibiotics, have a low threshold for admission if the patient is unwell	
Withhold DMARDs/biologics if necessary and contact secondary care team	
Minimize disease activity and aim for remission	Minimizing disease activity improves outcomes from the disease, through reducing disease progression
Be aware of disease flares	
Refer back to secondary care promptly if flares occur and cannot be managed in primary care	
Manage pain effectively	Effective therapy improves function and should aim for minimal side effects
Assess patients on an individual basis in relation to cardiac and gastric risk factors when considering NSAIDs or coxibs	Increases patient empowerment and return to normal activity levels
Use NSAIDs with gastro-protection for short- or medium-term control of joint symptoms	
Coxibs are effective in pain management in rheumatoid. They are safer in terms of gastric side effects than NSAIDs	
Both coxibs and NSAIDs produce a small increase in thrombotic events and hence an increase in cardiovascular risk and should be used in the short or medium term only and after counselling the patient about possible side effects	
Be aware of small increased risk of lymphoproliferative disorders in patients with rheumatoid	Have a low index of suspicion for malignancies and investigate or refer appropriately
Be aware of cervical cord compression	Prevent loss of mobility and paralysis
Sudden loss of function in lower limbs should be investigated promptly to exclude cervical cord myelopathy	

Principles of rheumatoid arthritis management after the first 2 yrs

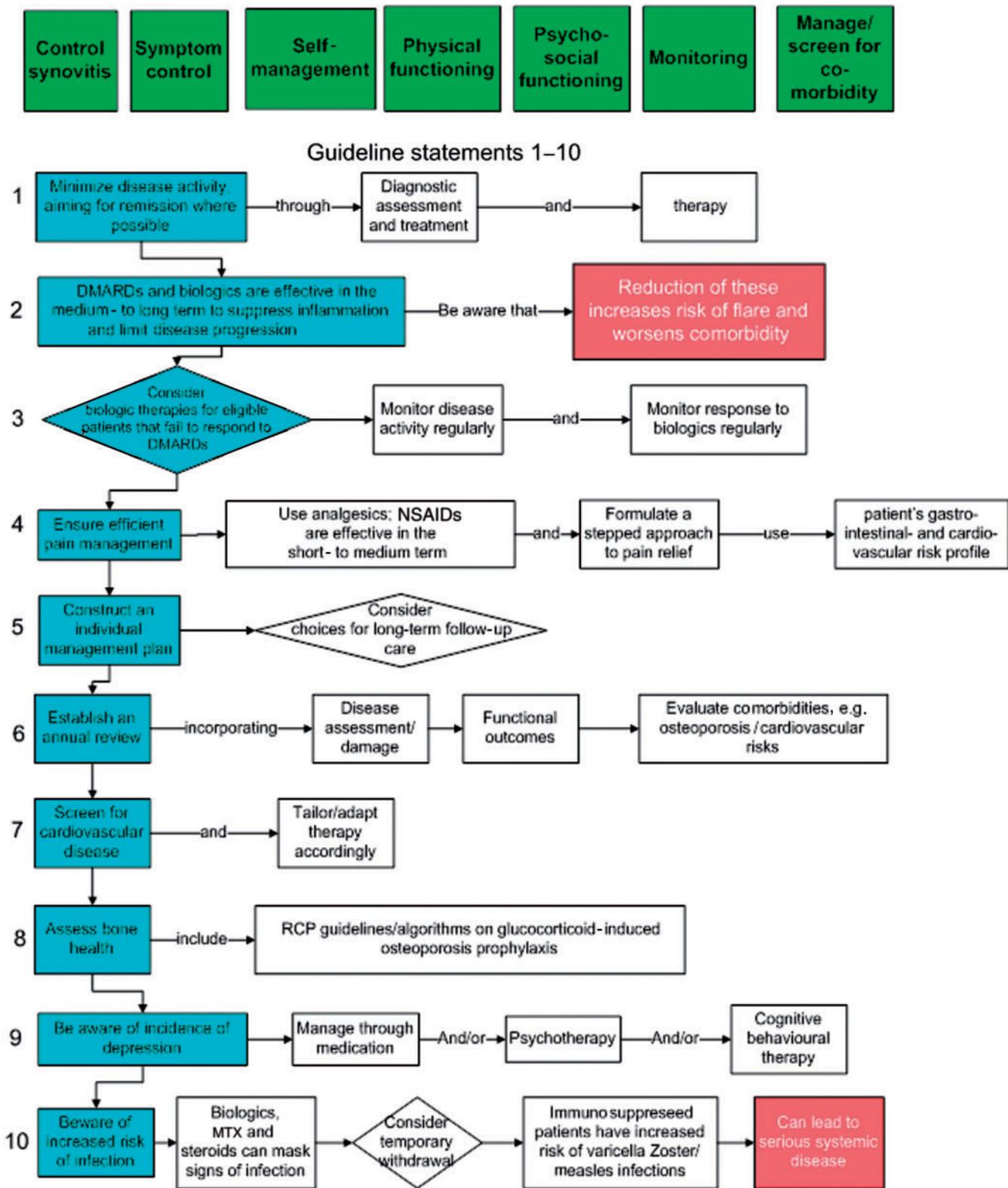


Fig. 1. Algorithm of guidelines for the management of established RA, based on statements 1–10 (to be read in conjunction with guidelines on management of early RA).

Principles of rheumatoid arthritis management after the first 2 years



Guideline statements 11-20

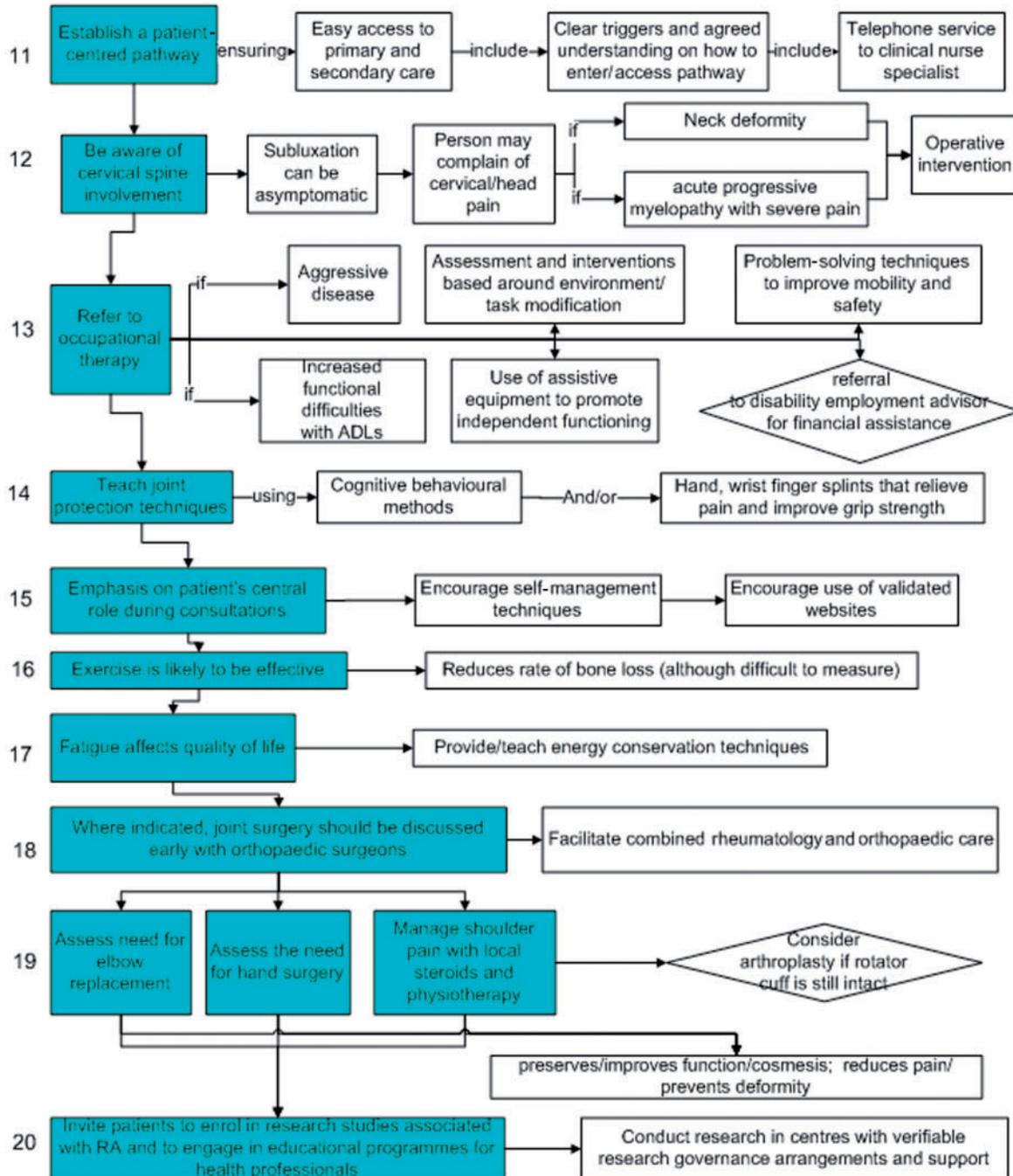


FIG. 2. Algorithm of guidelines for the management of established RA, based on statements 11–20 (to be read in conjunction with guidelines on management of early RA).

TABLE 3. Points to consider for commissioners of services for patients with RA

The main aims of the treating RA are to maintain functional ability and work, suppress disease activity, control joint damage, maintain pain control and enhance self-management

Access to early assessment of patients with possible inflammatory arthritis can result in early diagnosis and prompt initiation of treatment reducing the need for inpatient admissions

Patients with established RA may also have other existing conditions (comorbidities), which can be a major determinant of disease outcome due to increased levels of disability and mortality

Patients should have measurement of functional ability and assessment of joint damage to maintain independence and proactively manage to maintain social participation and assess outcomes

In the initial phase of the disease, patients need to be seen frequently following diagnosis so that prompt changes in medication can be made where appropriate and an annual review should be instituted for stable patients

Treatment of RA should be within a robust framework of shared, multidisciplinary care, and integrated care pathways across health and social care providers

have referenced these guidelines. A separate guideline on the management of RA during the first 2 yrs has been published by the BSR in 2006.

Stakeholder involvement

All are listed as authors.

Conflict of interest statements

F.B. holds departmental sponsorship for academic meetings; personal sponsorship for attendance at EULAR and ACR; honoraria for academic lectures; chair of Future Rheumatology Alliance for Training; national and regional advisory boards and commercial trial recruitment in osteoporosis/OA.

C.E. holds departmental sponsorship for academic meetings; personal sponsorships for courses and lectures. R.L. holds departmental sponsorship for academic meetings; personal sponsorship for attendance at EULAR 2004, 2006 and 2008, ACR San Francisco 2008, ACR Orlando 2003, ACR New Orleans 2002; honoraria for academic lectures; recruitment of patients for one commercial trial of NSAIDs in OA, one commercial trial of MAP kinase inhibitor in RA, one commercial trial of guselimumab in WG, one commercial trial of rituximab in vasculitis, consultancy for clinical trials in vasculitis.

S.M.O. has received honoraria for professional lectures and professional guidance/support in the development of educational programmes and chair to educational events, educational grants to attend academic meetings (ACR 2004, 2005 2006) and EULAR (2005/6). All other authors have declared no conflicts of interest.

Names and affiliations of users on the working party

All are listed as authors.

Involvement and affiliations of other people or organizations including user-representative organizations and pharmaceutical companies in the development of the guideline

All are listed as authors

Representatives from the NRAS were involved at every stage. They made a significant contribution to the guideline development, by attending guideline group meetings, and/or contributing to the email discussions and revisions of the guideline, and are therefore listed as authors. No representatives of pharmaceutical companies were involved in guideline development.

A draft version of the guideline was formally presented to members of the British Society for Rheumatology for comment, and these comments helped to formulate the final version.

Rigour of development

Statement of scope of literature search and strategy employed

A comprehensive literature search was undertaken prior to the development of this pathway and algorithm. Searches were conducted using MEDLINE, CINAHL, Cochrane, PUBMED, EMBASE, AMED and PsycINFO. MEDLINE is widely recognized as the premier source for bibliographic coverage of biomedical literature and CINAHL for nursing literature. A manual search from the references cited by generated articles was also used. Search terms used were relevant to each section of the guideline. Evidence was graded according to the strength of literature to support each statement, using the grading suggested by the Royal College of Physicians of London (<http://www.rcplondon.ac.uk/college/ceeu/conciseGuidelineDevelopmentNotes.pdf>) and the document was prepared in accordance with the principles outlined in the Appraisal of Guidelines Research and Evaluation (AGREE) guidelines (www.agreecollaboration.org).

Statement of when the guideline will be updated

In 3 yrs time or earlier if significant changes occur in the current management of RA.

Guideline itself

An algorithm for the guideline is shown in Figs 1 and 2.

1. The aim of therapy is to minimize disease activity (strength of evidence 1, grade of recommendation A).

Remission is a difficult target to achieve and the concept of achieving the minimum of disease activity is considered to be more realistic [43–47, 25]. The specific objectives outlined in the first guideline [3] are still valid for established disease: the aim is to achieve undetectable clinical synovitis and/or ultrasound evidence of synovitis and the maintenance of a CRP in the normal range. Clinical remission does not necessarily correlate with preventing radiological damage [47, 48] and new therapeutic strategies should address this paradigm. Measurement of functional ability and assessment of joint damage provide ways of determining outcome. If patients are not in remission, they still have active disease and this implies that there should be a change in management. Strategies for managing arthritis should include protocols that encourage the prompt step up or change in medication where appropriate [35]. These pathways should also include the introduction of biologic therapy according to NICE criteria and BSR guidelines [14, 36]. Safety for patients on DMARD therapy or biologic therapy should be ensured by strict monitoring and adherence to appropriate drug-monitoring BSR guidelines [36, 49] ideally within a robust framework of shared care between primary and secondary care providers.

2. DMARDs and biologic therapies are medium- to long-term treatments (strength of evidence 1, grade of recommendation A), whose withdrawal usually results in flare and disease progression (2, B).

The guidelines on the management of early RA have reviewed the evidence for introduction of DMARD regimens and biologic therapies [3]. Early use of DMARDs appears to confer long-lasting benefit at 5 yrs [50]. In a study of patients with disease duration from 20 months up to 5 yrs, tight control using conventional DMARD therapies with close monitoring and switch of DMARD treatment wherever appropriate resulted in significant improvements with substantial numbers of patients achieving ACR70 responses [10]. Low-dose oral corticosteroids may reduce the rate of erosions and improve remission rates in early disease, extending up to 4 yrs from disease onset, although the risk/benefit ratio for longer term use remains controversial [34, 51]. Although remission is an aspirational goal of therapy in the established

phase of RA, there is very little direct evidence for sustained long-term remission being achieved as a result of a short-term treatment intervention. Continuation of randomized controlled trials of aggressive regimens suggests that remission rates remain high and erosion rates remain low [52], with lower work disability [53] than comparative groups. However, this does not justify a reduction or withdrawal of DMARD therapy in the hope that cure has been achieved. Two randomized controlled trials of DMARD discontinuation have shown that stopping DMARDs doubles the risk of flare in the subsequent 12 months [54, 55]. The ‘window of opportunity’ for disease modification in RA may be a function of the treatment chosen—if using monotherapy then perhaps it is only a few months [56–58], whereas if combination DMARD or biologic therapy is used [58–60] then quite possibly it is substantially longer. Effective dosages of therapies (including combinations of traditional DMARDs or early use of biologic agents) commenced within the first 2 yrs may still have a significant impact on outcome at 5 yrs. However, in one study there was no obvious difference in outcome after 5 yrs of treatment whether patients were treated with early DMARDs or whether they were treated with a progressive pyramidal strategy of DMARDs which were initiated after the 1st yr of disease [61].

3. Biologic therapy is useful for patients who fail to respond to DMARDs, but an adequate response is a requirement for longer term continuation (1, A).

The use of biologic therapies, including anti-TNF therapies and rituximab, should be according to BSR and NICE guidelines. NICE guidance for infliximab, etanercept and adalimumab [14, 62] recommends them for use in patients with active arthritis who have failed conventional DMARD therapy. NICE guidance on rituximab [63] recommends its use in those who have failed multiple disease-modifying drugs, including at least one anti-TNF therapy. Final NICE guidance on abatacept is yet to be published. However, the Appraisal Consultation Document indicated that the use of abatacept will not be supported by NICE and the legal appeal released on 23 April 2008 indicates that this appeal was dismissed on all grounds [64]. The emerging role of other biologic agents will need to be evaluated and is beyond the scope of this current document. We would refer the reader to future BSR guidelines and NICE documentation.

4. Patients need a stepped approach to pain relief using analgesics, and in the short term, additional NSAIDs co-prescribed with a proton pump inhibitor (1, A).

Pain is the predominant impairment for individuals with RA [65]. Our understanding of the relative risks and benefits related to cardiovascular and gastrointestinal issues for both NSAIDs and coxibs continues to increase [66]. Our previous advice [3] on a comprehensive biopsychosocial assessment and stepped therapy for RA is still applicable. The main strategy is to use analgesics, intra-articular or intramuscular steroid injections and better use of DMARDs or biologic therapy to control synovitis, but some individuals who have residual pain and functional impairment will opt for NSAIDs despite the risks.

Current MHRA and EMEA guidance advises caution in the use of both NSAIDs and coxibs in those with cardiovascular risk and gastrointestinal risk factors and avoidance in those with established ischaemic heart disease. While the alternative use of analgesics, intra-articular or intramuscular steroid injections and better use of DMARDs or biologic therapy to control synovitis should be considered a preferable strategy to relying on long-term use of NSAIDs or coxibs, there may be individuals who have residual pain and functional impairment and who opt for anti-inflammatory drugs despite the risks. Documented discussion of these risks in copy correspondence is recommended to avoid any confusion. There is little controlled evidence that NSAIDs are preferable to paracetamol for the management of pain in RA,

although patient and physician preference for NSAIDs is clear in the older studies included in the Cochrane review [67].

Where aspirin is co-prescribed there is no evidence that using a coxib is preferable to an NSAID in terms of gastrointestinal risk, therefore a non-selective NSAID with a proton pump inhibitor would usually be used with aspirin, if required. The recent NICE clinical guideline for OA [68] included an update of the previous technology appraisal for NSAIDs and coxibs. CG59 included the issues of the withdrawal of lumiracoxib from the market for hepatotoxicity and release of a cheaper 30 mg etoricoxib formulation. This showed that NSAIDs and coxibs can be more effective than analgesia in some patients, but that given the potential toxicity, clinicians should continue to use the lowest possible dose for the shortest possible time. Where NSAIDs or coxibs are used, the addition of generic omeprazole is cost-effective in reducing adverse gastrointestinal events. These recommendations also apply to patients with RA.

5. Patients need an individualized management plan including choices for long-term follow-up care (3, C).

A plan of care is an important aspect in the long-term management of patients with RA providing educational opportunities for the patient and encouraging patients to take a central role in managing their disease [3].

6. An annual review is recommended, incorporating disease assessment, damage, functional outcomes, patient goals and evaluation of comorbidity (3, C).

RA is a chronic disease with a variable course over a long period of time [1]. Traditionally, patients have been cared for in a hospital setting; however, new health care initiatives are driving changes to reduce secondary care follow-up once the disease is stable and then use primary care support [69]. However, remission is advocated as the main goal in the management of RA and this implies the need for regular monitoring to determine disease status [70]. This activity can be shared between primary and secondary care. The ACR guidelines suggest a shared care approach but leave the responsibility of the care to the rheumatologist while also supporting the concept of patient choice [71]. The alternative system of patient-initiated review would offer greater empowerment for patients and maybe a more practical solution with sustained long-term benefit [69, 72]. Nevertheless, resources for a robust safety net may be a limiting factor in such systems. Structured telephone consultations could be an added tool of communication [73–75].

A compromise between patient self-management and secondary care-driven management would be a comprehensive annual review, as suggested in the ARMA standards of care [32], on the basis of having reached and sustained a sufficiently low level of disease activity. Despite the fact that annual review is not evidence based, it is widely discussed and practised in rheumatology clinics and seems to provide a useful service to many patients [76]. In its favour, annual review is successful in the management of diabetes for screening of complications [77]. The continuous evaluation and validation of an annual review system could be included in future research and audit proposals. Different models of annual review may be equally effective within a multidisciplinary framework. The annual review should include the following elements:

- Assess disease status (remission or active disease), damage and functional outcomes.
- Assess and screen for comorbidity including cardiovascular risk factors (standard 5).
- Review current medications, complications, educational needs, psychosocial issues and fatigue.
- Review patient goals.
- Evaluate need to refer to other services either within a multidisciplinary team or other related specialists.

An annual review is best undertaken using a multidisciplinary approach in the most appropriate local setting. In many cases, this will require good collaboration between primary and secondary care to ensure the optimal outcome for all patients with RA [32]. Local pathways could be developed and implemented following evidence-based guidelines for change in drug therapy and access to relevant specialties. Referral to other specialties should be considered if the clinical need arises, and specifically for orthopaedic surgery for problems with joint instability and/or tendon rupture [32, 78]. An annual review could be conducted in different health care settings, but in the UK hospital-based rheumatology departments are best placed to coordinate the process in a partnership between primary and secondary care. The core measurements and the overall responsibility for different aspects of care should be agreed with every patient so they can be empowered with that responsibility and obtain care through a seamless service. Annual reviews need to be supported by rapid access facilities so that patients or primary care teams can get appropriate help and advice directly from secondary care teams, in a timely manner [69, 32]. For example, it is often more appropriate and convenient for patients to have cardiovascular screening performed by their GP, whilst arthritis activity measures, such as DAS, are best performed by professionals with the relevant training. Annual reviews should be tested for their overall contribution to health for patients with RA.

There may be a concern amongst primary care providers that moderate levels of disease activity are not picked up by most GPs. The role of community nurses may become increasingly tailored to these patients, in close liaison with other relevant health care professions, such as the GP, consultant or clinical nurse specialist to prevent unnecessary hospital admissions due to early detection of deterioration in a patient's condition.

7. Patients should be screened and managed for cardiovascular disease (2, A).

It has been known for many years that the presence of RF is associated with an increased risk of cardiovascular mortality [79]. Current guidelines recommend targeted interventions to reduce coronary heart disease (CHD) risk in patients with known atherosclerotic CVD, people with diabetes and in apparently healthy individuals who have a calculated 10-yr risk of an event in excess of 20% based on the Joint British Societies CVD risk prediction charts found in the British National formulary [80] (www.bnf.org or www.bhsoc.org or www.nice.org.uk guidance on hypertension) (Table 2). Lifestyle interventions to reduce CVD risk are recommended for all patients and include smoking cessation, weight reduction where they are overweight and appropriate dietary modification. Patients should moderate their alcohol consumption and the importance of maintaining aerobic fitness should be emphasized.

Treatment to reduce CVD risk are summarized in Table 4.

The co-prescription of ibuprofen and aspirin should be avoided [81]. Gastroprotection should be provided if aspirin is co-prescribed with non-selective NSAIDs [82]. ACE inhibitors should be used in patients who have heart failure. Patients with atherosclerotic cerebrovascular accidents should be managed with ACE inhibitors and thiazide diuretics in order to

achieve tight blood pressure control. Systemic inflammation may promote atherosclerotic CVD in RA. It is important to treat RA to try to minimize disease activity and inflammatory disease burden [83].

Atherosclerotic events appear to be responsible for much of the excess cardiovascular disease in patients with RA. Most studies have reported 1.5- to 2-fold increase in events compared with the general population [84–86]. Unfortunately, RA patients are more likely to have silent ischaemia [87] and may present with atypical symptoms which may contribute to their excess CVD mortality [88].

Possible explanations for the link between RA and increased atherosclerotic cardiovascular disease include a shared risk factor profile for both conditions. Cigarette smoking and obesity are risk factors for both conditions [89, 79]. Cigarette smoking also increases the risk of cardiovascular disease and the severity of arthritis [90]. However, the cardiovascular risk in patients with RA cannot be entirely explained by an increased rate of traditional risk factors, suggesting that the disease itself or its treatment may be implicated [91–93]. Chronic inflammation in itself may promote atherosclerosis. There is increasing evidence that atherosclerosis is an inflammatory process [94]. Patients with elevated inflammatory markers have a higher rate of cardiovascular events [88] compared with patients who have normal inflammatory markers. Cardiovascular risk factors are modified by inflammatory disease activity.

DMARDs, which suppress inflammatory disease, may be associated with reduced cardiovascular events in RA [95–97]. The survival of patients with RA following myocardial infarction appears to have improved since the introduction of more aggressive use of immunosuppressive agents [98]. Glucocorticoids may worsen the CVD risk profile of patients by exacerbating hypertension, worsening dyslipidaemia and impairing glucose tolerance. However in contrast, use of glucocorticoids has been associated with paradoxical improvements in dyslipidaemia in RA [99]. TNF- α antagonists are capable of modulating endothelial function [100], but may exacerbate existing congested cardiac failure [101]. Current recommendations suggest avoiding selective COX-2 inhibitors in patients with high cardiovascular risk (see recommendation 4 on use of NSAIDs and analgesia). Lipid-lowering drugs (particularly statins) have been shown to reduce inflammation among patients with RA [102, 103]; however, this effect is at best modest.

Patients who have RA and who suffer a cardiovascular event are less likely to receive appropriate [104] secondary prophylaxis with anti-platelet drugs than their non-rheumatoid counterparts [105] and this may contribute to their higher case fatality rate after myocardial infarction [106].

Current assessment of primary CVD risk in RA utilizes the same risk prediction charts as the general population. Whilst it would seem sensible to comprehensively target risk factor reduction in RA patients at a lower CVD risk threshold, there is little evidence to support this step. However, recognition by health care providers that patients with RA are at high risk of cardiovascular disease is very important. Screening for CVD risk factors in RA patients, possibly as part of the annual review

TABLE 4. Medical interventions to reduce CVD

	Primary prevention of CVD if 10-yr CVD risk is <20% Initiate treatment if:	Primary prevention of CVD If 10-yr CVD risk is \geq 20% Initiate treatment if:	Secondary prevention of CVD known CVD or known diabetes Initiate treatment if:
Hypertension (mmHg)	\geq 160	\geq 140	aim for <130
Dyslipidaemia (mmol/l)	\geq 100 HDL : LDL cholesterol \geq 6	$>$ 90 Total cholesterol $>$ 5 LDL cholesterol $>$ 3	aim for <80 Total cholesterol (aim for <4) LDL cholesterol (aim for <2)
Anti-platelet therapy ^a		anti-platelet agent if aged \geq 50 yrs ^a	Use anti-platelet agent ^a

^aControl uncontrolled hypertension first, lifestyle interventions to promote health are recommended for all as well as treatment of diabetes mellitus if present.

process, will enable primary and secondary care interventions to reduce cardiovascular risk.

8. We recommend the Royal College of Physicians guidelines on idiopathic and glucocorticoid-induced osteoporosis (1, A).

Osteoporosis and bone fracture are a major cause of morbidity in patients with RA. Approximately one-third of the women report fractures within 5 yrs of the diagnosis of RA [107]. Osteoporotic fractures are a frequent cause of disability, mortality and major financial and social impact as well as leading to significant decline in quality of life. The causes of osteoporosis associated with RA are multi-factorial and include the effects of chronic inflammation, the effects of medication (in particular, the effects of glucocorticoids) and lifestyle factors. Pro-inflammatory cytokines mediate bone loss by directly stimulating osteoclast activity. Reduction of systemic inflammation by the use of low-dose glucocorticoids may have a beneficial effect on BMD [108]. However, high-dose, prolonged use of glucocorticoid results in bone loss by inhibiting calcium reabsorption, increasing renal calcium excretion and inhibiting new bone. RA is commonly associated with a reduction in physical ability and reduced weight-bearing activity that in turn promotes loss of bone [109].

Guidelines for primary prevention of osteoporotic fractures are currently being reviewed by NICE. Lifestyle factors, such as regular weight-bearing exercise and adequate dietary calcium and vitamin D intake, are recommended for all to help to prevent deterioration of BMD. Primary fracture prevention, using bisphosphonates (or strontium ranelate, if intolerant to bisphosphonates), is recommended for post-menopausal females who have reduced BMD (T -score < -2.5), measured using dual energy X-ray absorptiometry (DEXA). If patients are aged over 75 yrs and have three or more osteoporosis risk factors, they should be treated without the need for DEXA imaging. Risk factors are currently defined as a parental history of hip fracture, low BMI ($< 19 \text{ kg/m}^2$) and any medical conditions that are independently associated with bone loss, such as RA.

Steroids undoubtedly increase the risk of fragility fracture in patients with RA above the effect of lowering BMD [110]. General measures to limit bone loss should be applied to all patients and include lifestyle interventions and reduction of dose and duration of glucocorticoids to the minimum level necessary to control disease [111].

In addition, patients should be educated about the potential adverse effects of glucocorticoids on bone health. We would recommend following current RCP guidelines on osteoporosis prophylaxis for patients who are starting glucocorticoids [111].

9. Patients with depression benefit from anti-depressants and cognitive behavioural therapy (2, grade of recommendation B).

Hospital-based studies report severe depression in up to 40% of the patients with RA [112]. The level of depression is influenced by their functional disability, particularly during the early years of their disease [113]. However, there is also evidence that depression contributes to both the level of disability and work disability in patients with inflammatory joint disease [114]. Depression may influence rheumatoid disease severity; patients with a history of depression are more likely to experience higher levels of fatigue [115] and sleep disturbance [116]. Patients with RA who are depressed have higher levels of T-cell activation that may predispose them to more severe disease manifestations [116, 117]. These patients are also likely to have a reduced life expectancy [118]. Patients with RA and depression are also more likely to have comorbidity from cardiovascular disease [119].

Unfortunately, their response to anti-depressants is reduced compared with patients who do not have arthritis [120]. Although we recommend standard anti-depressant and cognitive behavioural therapy for such patients, there is limited evidence that this combined approach is effective in these patients [121]. NICE

has conducted a comprehensive review on management of depression [122].

10. Immunosuppressive therapy may exacerbate and mask infection, and temporary withdrawal should be considered during active infection (3, C).

Infection is a major cause of morbidity and mortality in RA. Patients are particularly prone to pulmonary infection, generalized sepsis, osteomyelitis, cellulitis and septic arthritis. Patients with RA are likely to require hospital admission for a number of these infections [123]. It is difficult to determine whether the increased risk of infection in RA is the result of disease or its treatment. Factors associated with disease severity are predictors of infection [124] and it is possible that the disturbed cellular immunity with impaired T-suppressor and natural killer cell function may predispose the patients to infection. Glucocorticoids, DMARDs and biologic therapies used to treat RA all have the potential to increase infection risk. MTX therapy influences cellular immunity by inhibiting the number and function of T-suppressor and T-cytotoxic cells as well as reducing granulocyte chemotaxis. These effects may increase the risk of opportunistic infection in patients treated with MTX [40, 125].

In addition, RA patients are prone to respiratory infections and the use of vaccination against influenza and pneumococcal capsular antigens is recommended. Patients are at risk of varicella zoster and measles infections, which can give rise to serious systemic disease. However, there have been some levels of concern about safety and efficacy of vaccinations in patients receiving DMARD therapy [126, 127], although a recent study suggests that whilst responses to vaccination are diminished in patients with RA, this is not influenced by use of DMARDs or anti-TNF therapy [128].

There is current concern over the safety of biologic therapies with regard to infection risk [129]. In particular, concerns exist over the increased risk of tuberculosis with biological therapies and this highlights the need to evaluate for and treat latent TB infections prior to starting these therapies [130].

11. Patients need rapid, self-initiated access to primary or secondary care (2–3 C) including telephone advice (3, C).

Patients with RA have traditionally been managed by the use of routine 3–6 monthly review in hospital-based rheumatology outpatient clinics. Patients benefit from continuing contact with rheumatologists, but they can experience difficulties accessing care between routine appointments [131].

Hewlett and colleagues [72] proposed that patients were not given routine follow-up appointments but could request review when they needed it, in specially designated clinics. A randomized controlled trial of patients with RA of 2 yrs or more duration showed that after 6 yrs, clinical and psychological outcomes were at least as good in patients managed in a demand-led way compared with conventional secondary care follow-up. The patients were more satisfied with this system than with conventional care and used less specialist and GP appointments. There were a number of safeguards in the system including 3-monthly telephone checks by a nurse specialist during the first 2 yrs and two yearly reviews following this. Correspondence following the publication of this trial suggests a selection bias towards younger patients with milder and more stable disease so that the results cannot be extrapolated to all patients with RA. This approach will need to be considered in the current context of Payment by Results.

Aggressive hospital outpatient management with relief of symptoms, control of the CRP and suppression of clinical synovitis was compared with control of joint pain and stiffness, largely by the GP using a protocol that dictated changes in DMARD therapy [28]. Outcomes were not significantly different

between the two groups, but one of the problems was that clinicians did not adhere to the protocols.

These studies demonstrate that it is possible to manage patients with stable RA outside the traditional pattern of outpatient review. The role of the rheumatology specialist nurse is well established [132, 133] and a key component of both trials was the use of specialist nurses to provide a safety net of care. Both trials also included an annual or biannual review.

Any system for managing established RA should be able to respond to patients who report flares or deterioration of their RA, because uncontrolled disease can lead to progression and disability [134]. Services of this type may be available in primary or secondary care, provided by GPSI's specialist nurses or consultants as appropriate. The availability of telephone help lines for provision of additional patient education and to support self-management strategies is valued by patients and health care professionals alike [74, 135, 136].

The Department of Health, in its publication *Supporting People with Long Term Conditions* [5], encourages the establishment of community-based teams with appropriate specialist support and protocols for the management of conditions such as RA.

Not all patients will benefit from these new models of care, but they would be a useful addition to the existing structure of care. The precise organization of systems is likely to vary between centres depending on local resources and the needs of the local population. For many patients this will require a reorganization of how they are managed, with a change from the traditional system of exclusive secondary care towards a sharing of appropriate responsibilities for long-term management of arthritis between the patient, the primary care team and the secondary care team.

12. Most patients with cervical spine involvement can be treated conservatively, but neck deformity, acute or progressive myelopathy and/or severe intractable pain are indications for surgery (2, B).

Cervical spine involvement is common in RA. Patients with disease duration of >8 yrs are most likely to experience some degree of cervical spine symptoms [137,138], although about 30% may be asymptomatic [139]. With increasing disease duration and disease severity, varying degrees of instability of the cervical spine can occur. Atlanto-axial subluxation is most common [138,140, 141] followed by vertical instability and subaxial subluxation. Commonly, patients complain of cervical pain and head pain and most can be treated conservatively. However, for those with progressive myelopathy or severe intractable pain, surgery is indicated [142]. The probability of progressive myelopathy increases exponentially once the atlanto-dens interval (the distance between the anterior body of C2 and the anterior arch of C1) is 9 mm [143]. However, the space available within the spinal canal for the spinal cord is probably the most important predictor of outcome. A posterior atlanto-dens interval (the distance from the posterior body of C2 to the posterior arch of C1) of <14mm predicts progressive myelopathy [144]. These measurements are best made on sagittal reformatted CT.

Conservative management of cervical spine problems may include analgesia, local nerve blocks for symptom relief (e.g. C2 nerve block), the use of heat, TENs machines and coping strategies such as relaxation. Pain can extend from the neck into the shoulders and head, as a result of spasm and weakness of the neck and shoulder muscles [145], which is common in patients who have cervical spine disease in RA. Patients often limit their range of movement to prevent moving into or out of the painful range [138, 146]. The maintenance and improvement of muscle strength can ease pain and reduce the stress on the neck [145].

A collar may prevent some or all spinal movement whilst the patient is mobile in order to maintain the cervical spine in an appropriate position. Patients with severe instability of the neck may require a collar constantly to support the head or reduce pain. With lesser degrees of instability, they may wear a collar when they are in vulnerable situations, such as in a car or during

prolonged activity when the neck could adopt extreme positions of flexion.

Soft collars are unlikely to be of use to patients with instability or subluxation as they do not limit the range of movement and offer very little support. They may act as a useful reminder to the patient to avoid certain positions and also provide some psychological support. The efficacy of firm collars to prevent all cervical movement is questionable. Studies which have used 'off the shelf' firm collars which do not have thoracic extensions or braces demonstrate that at best they only limit 85% of the movement in patients without deformity [147, 148]. There is a wide variation and contradiction in the effectiveness of individual collars. Many commercial collars require modification [145]. Custom-made collars can accommodate the deformities that occur with RA and fit more closely, and therefore limit movement and correct cervical spine subluxation in up to 50% of the patients with RA [145]. However, very few units have the facilities or in-house skills to undertake this type of work. With all collars there are problems of cosmetic acceptance, the possibility of pressure sore development, the difficulty of taking them on and off and possible wear of the collar through prolonged use [149]. Careful instruction and advice needs to be given to patients to prevent or limit complications.

Cervical spine deformity can be fixed with a variety of posterior surgical techniques. Previously wire and bone constructs were most commonly used. More recently, techniques using screw fixation have become more frequently used. For C2 root pain C1/2 stabilization will lead to relief of pain in over 90% of the cases [150].

Atlanto-axial subluxation may result in anterior compression of the spinal cord or brain stem as a result of periodontoid pannus or because of vertical translocation of the odontoid peg. These cases usually require trans-oral odontoidectomy, combined with posterior fixation/fusion to stabilize the spine [151]. Where atlanto-axial deformity or compression are combined with subaxial deformity (typically the staircase subaxial deformities) posterior fixation/fusion will need to be taken further down the cervical spine or in some cases into the thoracic spine.

The role of decompressive surgery in the non-ambulant myelopathic patient (Ranawat IIIB) [152] has been debated. There is no question that the morbidity, mortality and prospects of functional recovery are less in this group than in all other rheumatoid patients [153]. However, untreated patients have a poor prognosis with the majority dying within 6–12 months [154, 155]. In contrast, radical surgery on Ranawat IIIB patients can be associated with improvement in neurological function in two-thirds of the patients [156].

Posterior fixation will normally be associated with bone grafting. Autologous bone grafting is best, but can result in morbidity at the bone donor site; despite using autologous bone, the rates of bone fusion range from 90% to only 50% [157].

In RA, cervical spine surgery is a major undertaking in patients with severe neurological deficits who are immunosuppressed, with significant comorbidities, and who typically have osteoporosis. The mean peri-operative mortality is 6%, with a range of 0–18% [157]. The likelihood of recovery of neurological function depends directly on the degree of functional loss pre-operatively; the best patients are those with the least deficit pre-operatively, which emphasizes the importance of surgical treatment in these high-risk patients prior to the onset of severe deficit [157].

13. Occupational therapy promotes independent function (2–3, C) in patients with aggressive disease or if they experience difficulties in activities of daily living or employment (3, C). Interventions include environmental and home assessment, task modification, problem-solving exercises to improve mobility, functioning and safety (1, A) and use of assistive equipment (2–3, C).

During the course of RA, patients may experience increasing and more complex difficulties with mobility, function and

psychosocial problems. Pain, deformity, low energy and mood may also inhibit independent function. In later RA (>10 yrs) 89% have difficulty with leisure activities and 88% with household activities [158]. By 20 yrs after onset, 80% are moderately or severely disabled [1]. The main focus of rehabilitation is on maintaining function and life roles [159]. A structured approach towards rehabilitation management, including active participation of the patient, is advocated [160].

A reduced number of choices in leisure activities has a negative effect on self-esteem [161]. Loss of valued activities, at work and in leisure, is correlated with poorer psychological status [162]. People should therefore receive help to continue these activities or be encouraged to try alternative activities [159]. Leisure counselling may improve functional ability and psychological well-being [158]. About 50% of the patients own a walking aid and a third of them do not use them [163], but there are no controlled trials. Occupational therapists can undertake a home assessment and help with problem-solving to improve mobility, functioning and safety [164].

Many people with RA suffer from work disability or instability [165]. Patients who are working at the onset of disease have a one in three likelihood of becoming work disabled within 5 yrs, especially if they are involved in manual work and have a high baseline HAQ score at diagnosis [166]. Fatigue, lack of support, lack of autonomy and lack of participation in decision making also threaten work ability [167]. Regular screening of patients who are in employment helps to identify these risk factors so that support and advice could be offered.

Disability Employment Advisors are based at job centres and can provide financial and practical assistance for patients with RA. Occupational therapists and physiotherapists undertake work-based assessments, recommend modifications to the environment and assistive equipment, train in task modification, improved ergonomics and coping strategies and liaise with employers [158]. Employees with RA have suggested that involvement of health professionals from different disciplines and the implementation of organizational and technical interventions would help them [167].

Occupational therapists and physiotherapists trained in ergonomics and work rehabilitation can provide structured work rehabilitation programmes. Work rehabilitation programmes can achieve a successful return to work when a coordinated multi-agency team is involved [168]. Vocational rehabilitation improves levels of fatigue and mental health [169], but its impact on job retention remains uncertain [170–172].

14. Joint protection techniques should be taught or reinforced, using cognitive behavioural methods (1, A). Wrist splints relieve pain and improve grip strength during some activities (1, A). Finger splints may improve function (3, C).

The use of assistive devices increases with duration of disease and is related to more severe disease and pronounced disability [172]. Their use helps reduce difficulties in ADL, especially in the areas of eating, cooking and toileting. Pain may be reduced by using assistive devices when preparing food [173]. Their usage may be improved with careful selection and advice from an experienced occupational therapist [174] although this is not always the case [175].

The early RA guideline [3] outlines the evidence for patient education in joint protection and energy conservation, and for the use of working wrist splints and resting hand-based splints. A range of finger orthoses may be used to correct deformities, such as MCP joint ulnar drift, swan neck and boutonniere deformities, and to improve hand function. However, studies in this area are inconclusive and the NAROT guidelines advise the use of splints only when deformity is sufficiently reducible to improve hand function for the duration of an activity.

There is limited evidence to support the use of foot orthoses in the symptomatic management of pain in the foot related to RA.

There is no consensus with regard to choice of orthoses but reduction of pain and improved function of the foot are reported [176–178]. Semi-rigid orthotic supportive shoes can be effective for metatarsalgia [179]. A reduction in pain, disability and an improvement in activity as measured by the foot function index have been reported [180, 181].

15. Patients have a central role in their disease (3, C), supported by the use of key educational resources, patient organizations and self-management techniques (2, B).

Seeking health advice when vulnerable, at time of diagnosis or subsequently during flare-ups of their disease is a recognized coping strategy. An individualized management plan tailored to the patients' needs, outlining the available choices for long-term follow-up care and provision of shared care will help to encourage participation in effective self-management by a more informed patient. As part of on-going education and support, good examples of key recommended websites should be provided. Key website links and information are available through the ARC (www.arc.org.uk), which also produces a leaflet on searching the internet for information. During consultations, emphasis should be placed on the patient's central role. In order to achieve this, health care professionals need access to training in order that they can best utilize a self-management-based approach with goal-setting considered critical to facilitating behaviour change, and the use of appropriate self-management techniques by patients.

Self-management in chronic diseases empowers patients to learn more about their own disease, helps them to access timely and appropriate support and to exercise choice [3, 182]. Patient-led self-management programmes for chronic disease increase confidence, improve satisfaction with health care providers and are associated with improvements in physical and psychological well-being [183]. Patients are also more likely to use health resources appropriately, such as web-based information and access services at the right time. Self-management programmes, such as the 'expert patient' provide the patient with instruction and permission to manage their condition. The programme which is generic in format for a range of chronic long-term health conditions provides sustained and reproducible improvements in health behaviour and health status for up to 2 yrs [184–186]. A new comprehensive disease-specific RA self-management programme is being developed by NRAS in collaboration with the Expert Patient Programme Community Interest Company, which should be ready for piloting in autumn 2008. Educational programmes in rheumatology are constantly evolving and there is evidence to support this practice but it is likely that education is an ongoing requirement and needs to be delivered at various stages during the disease course [187, 188]. Time to adjust to a diagnosis, health beliefs, personal attitudes and behaviours all have an impact on the individual's ability to retain information. Education or self-management programmes that are not tailored to the individual's specific anxieties may affect learning and acquisition of self-management strategies. Enabling patients to talk to others with the disease who are positive and have come to terms with their disease, on a one to one basis, is a very helpful and empowering strategy for patients and volunteers from the NRAS have been trained to provide such peer to peer support. NRAS Volunteer Network extends to all areas of the UK and the calls made by volunteers are audited every 6 months and in September 2006; 83% of the calls were rated excellent or good by patients receiving the calls. Health professionals can refer any patient to NRAS to take advantage of this personal and tailored support service.

There may be barriers to accessing information in different languages and styles to suit the ethnic diversity of our population, and these need to be addressed [189]. Many minority ethnic populations experience inequitable health care in the UK due to cultural and language barriers and they also have a higher rate of morbidity and mortality across a spectrum of chronic health

conditions. Only one randomized controlled trial of a culturally adapted lay-led self-management programme has been conducted. Despite an incentive programme where participants were offered free taxi transportation and on completion of all six classes and provision of a shopping voucher, the course was poorly attended with less than half attending three or more classes. There were only marginal improvements in self-efficacy and health behaviour seen and long-term outcomes were not measured [190]. The Birmingham Arthritis resource centre has produced a range of literature and digital video on RA and OA in several ethnic dialects (www.barc.org.uk).

We recommend that self-management is embedded into health care provision so that patients become central to the clinical consultation [191, 192]. In order to achieve this we need to ensure that health professionals have access to training so that they can use the self-management approach in practice. The use of goal-setting will be an important factor in facilitating a change in behaviour and the use of the most appropriate self-management techniques by patients [185].

The World Wide Web is an increasingly popular source of providing information regarding medical conditions and treatments. There is no national guidance on minimum standards for medical information websites in the UK. However, the Commission of the European Communities in Brussels has identified quality criteria in the following domains: Transparency and honesty, Authority, Privacy and data protection, Updating of information, Accountability, Responsible partnering, Editorial policy, Accessibility, Researchability, Readability and Usability [193]. Patients with RA may be particularly vulnerable at the time of their diagnosis and during flares of their disease. It is common for patients to seek health advice as a coping strategy. The internet may be a useful source of this information although patients rarely use it [194]. The reasons for not using the internet may be lack of time or internet access skills, lack of motivation or dissatisfaction with the information available. The information may be unreliable or may be hard to find [195]. In view of this, patients with RA should be signposted to services that could help them to develop internet search skills and make sense of the information available to them. We recommend a number of authorized websites that provide balanced information on the disease and treatment, for example: Arthritis Care (www.arthritiscare.org.uk), Arthritis Research Campaign (www.arc.org.uk) and the NRAS (www.rheumatoid.org.uk). There is also a BMJ website [196] which provides a wealth of decision aids to help patients with different diagnoses and treatment options. A recent Cochrane review showed that there are now over 200 decision aids available for patients [197]. Appendix 3 contains a list of useful organizations and websites for patients.

16. Exercise is effective in improving function and reducing the rate of bone loss (2, B).

Exercise is likely to be effective in rheumatoid disease [198–202]. It reduces the rate of osteoporosis [110]. However, lack of and poor study design/methodology has made definition of which type of exercise and method of delivery is most effective and cost-effective (short- and long-term) difficult to compare and evaluate in rheumatoid disease. The use of moderate/high intensity exercise has been advocated to improve aerobic capacity, muscle strength, function and psychological well-being, but there have been few studies to evaluate its long-term impact on rheumatoid joints. However, a recent study has urged caution in the use of long-term high-intensity weight-bearing exercise by patients with significant radiological damage in large joints as it appears to accelerate joint damage [203–206]. Accurate patient assessment and individual prescription should enable beneficial tailor-made exercise programmes to be developed, which would not compromise long-term outcomes [207].

It is necessary to establish the factors that get and keep people exercising to see long-term benefit and effect in people's

lives: knowledge alone does not achieve this, but education linked to exercise with regular reinforcement by health professionals may be more effective. It is important that people's attitudes towards physical activity is known and addressed in order to implement a healthy lifestyle [208].

17. Fatigue may respond to energy conservation techniques (3, C).

Fatigue affects the quality of life of patients with RA and is an ongoing problem from the onset of disease [3]. When people decrease activity because of fatigue it has a negative effect on their psychological well-being. Physical fatigue may be positively influenced by exercise [209]. Energy conservation techniques, for example pacing and work simplification, can increase activity levels and advice and training should be offered. Reduction in activity and function over time is likely to be attributable to a variety of factors including muscle weakness, fatigue, attitude and motivation. Understanding these influences should help in planning long-term management.

18. Combined rheumatology and orthopaedic care is recommended, with replacement of failing joints progressing from lower to upper limb (4, D); in most cases, DMARDs or biologic therapy should not be stopped (2, B).

The order of procedures needs to be tailored to the individual patient. In principle, more successful operations are performed first, in order to build confidence with the patient. It is also considered advantageous to correct the lower limb abnormalities prior to upper limb problems. Use of the upper limb for weight-bearing, for example in the post-operative recovery period, may damage the more fragile upper limb reconstructions. Standard DMARD therapies can be safely continued throughout the period of surgery unless there is specific risk of infection [210–212], except for the effect of LEF on wound healing [213]. There is insufficient data applying to anti TNF- α therapy. Patients on long-term corticosteroids may need per-operative supplementation.

In those cases requiring intubation, clinical and radiographic assessment of cervical spine mobility and stability is paramount. Rheumatoid patients are prone to per-operative compression neuropathies of superficial nerves in the presence of deformities. Per-operative management of drug therapy should be individually tailored on a careful balance of risks and benefits.

A recommended order of reconstruction would therefore be the forefoot, followed by the hip, the knee and lastly the hind foot and ankle. However, recognition of the patient's most debilitating and/or deformed joints is required in order to optimally determine the surgical sequence. In patients with multiple end-stage joint involvement, physiotherapy and occupational therapy assessment in the pre-operative planning phase is helpful in determining surgical priority.

When medical management fails, forefoot reconstruction is considered to be a successful and well-tolerated procedure. Additionally, it reduces the risk of ulceration and infection of other total joint replacements [214]. The great toe metatarsophalangeal joint is generally fused or excised. The lesser toes are addressed either with a Fowler's type procedure that involves excision of the lesser toe metatarsal heads; or with the Stainsby procedure that consists of excision of the base of the proximal phalanx and relocation of the protective fat-pad underneath painful metatarsal heads [215, 216].

Cemented hip implants are generally recommended, but uncemented implants may be used if sufficient bone quality exists [217]. Only short-term data exist on resurfacing arthroplasty in the context of RA [218]. However, with the common concurrent use of corticosteroids, that is associated with secondary osteoporosis, the indications for resurfacing arthroplasty remain unclear.

With regards to the knee, cemented implants are considered the gold standard but, as with the hip, there is no strict

contraindication as long as sufficient bone quality allows [219]. The patello-femoral joint is often also resurfaced although this continues to be debated [220]. In the context of RA, uni-compartmental knee replacement is contraindicated, because of the tri-compartmental nature of the disease.

Subtalar and/or ankle arthrodesis are considered the gold standard for treatment of RA in the hind foot. Triple fusion, which is subtalar, calcaneocuboid and talonavicular fusion, is also occasionally required. The success rate of ankle fusion in the context of RA is lower than that of OA with fusion rates of around 80% being published. Ankle replacement in low-demand patients now shows very promising results, albeit with only short- to medium-term good outcome data to date.

19. Initial management of shoulder problems is with steroid injections and physiotherapy, but surgery should be considered if symptoms persist (2, B); arthroplasty is effective for pain relief but functional improvement depends on an intact rotator cuff (2, B); elbow replacement is very effective for pain relief and to restore function (2, B); hand surgery is most useful for preserving and improving function, for pain refractory to medical therapy, preventing deformity and aiding cosmesis (3, C).

Patients with RA may develop a painful shoulder, particularly on arm elevation. Acromioclavicular arthritis, synovitis, supraspinatus tendonitis, bursitis, cuff tears and long head of biceps degeneration are the usual pathologies that may require surgery. Rotator cuff tears in RA are usually the result of inflammation and repair may be difficult but provides lasting pain relief. Restoration of function cannot be expected in full-thickness tears [221]. Arthroscopic synovectomy can provide pain relief in selected cases with an intact rotator cuff and little radiographic change but there is no likely effect on improvement in function [222].

Painful degeneration of the glenohumeral joint is the main indication for prosthetic replacement. The outcomes of arthroplasty in rheumatoid patients are inferior to those of patients with OA [223]. The results are highly dependent on the integrity and preservation of rotator cuff function [224]. Unfortunately, many rheumatoid patients have a deficient rotator cuff and there may be marked erosion of the glenoid, which makes the procedure more difficult by the time they are considered for surgery. Arthroplasty should be considered as a pain-relieving procedure but little improvement in function should be expected unless the rotator cuff is intact.

Hemiarthroplasty of the humerus, where only the humeral side is replaced, usually employs a stemmed implant, but newer, resurfacing implants are becoming more popular as they are less likely to cause a periprosthetic fracture [225]. Both implants have been shown to significantly provide pain relief [224, 226–228]. Total shoulder replacement should be considered in severe cases, but the addition of a glenoid replacement to the humeral hemiarthroplasty is not possible in many rheumatoid patients because of poor bone quality to fix the glenoid component. The lack of a functional rotator cuff may lead to early loosening of the glenoid component, and unlike the situation in OA, a total shoulder replacement does not lead to better symptom relief [224]. Reverse polarity shoulder implants, used for elderly patients with cuff arthropathy, cannot be recommended in RA because of the problem of early loosening of the implant [229].

In patients with elbow involvement, arthroscopic synovectomy may be considered in resistant cases where there is little articular destruction [230]. Prosthetic elbow replacement will relieve pain and restore function in most rheumatoid patients leading to high patient satisfaction rates. Newer semi-constrained, linked implants are more versatile when dealing with severe bone loss and soft-tissue deficiencies [231]. Severe pain should still be the main indication for surgery. The limited longevity of the implant should be borne in mind prior to embarking on surgery. Interposition arthroplasty should be considered in very young

patients with painful joint disease in whom replacement arthroplasty is best avoided due to the high risk of loosening, but the results are less reliable [232].

The surgical management of the rheumatoid wrist is not standardized and should therefore be tailored to the individual needs as assessed by a multidisciplinary team of carers, doctors and physical and occupational therapists [233]. Surgery plays a role in improving hand function, relieving pain refractory to medical therapy, preventing deformity and aiding cosmesis [234]. Patient motivation and expectations from surgery need careful consideration [235].

In principle, surgery is considered after failure of optimized medical therapy and after multidisciplinary assessment of patient's needs, which often require multiple assessments. No surgery is contemplated during disease flares [234]. Surgery is often staged and several procedures may be required, some of which may not outlive the disease and would require revision [236].

Surgery should be timed to prevent irreversible damage of the musculoskeletal system by aiding ongoing treatment with chemical agents (synovectomy, soft tissue surgery). When such damage is present, reconstruction (arthroplasty) and salvage (arthrodesis) options should be considered [236]. Most authors recommend intervention in the proximal joints of the limb and to work distally as the function of the hand would be largely dependent on the ability of the shoulder to position it for its purpose [237]. Pre-operative anaesthetic assessment would determine the best anaesthetic mode but it is common for hand and wrist surgical procedures to be carried out under regional anaesthesia [238].

Rheumatoid hand surgery is best undertaken by a specialist hand surgeon [British Society for Surgery of the Hand (www.bssh.ac.uk)] with an interest in the disease (RA Surgical Society) in a setting that allows for adequate post-operative support. Hand rehabilitation is as important as is the surgical procedure itself. An objective assessment of functional deficits and patient expectations often requires the input of a hand therapist and the use of function and disability scores [239, 240]. Post-operative rehabilitation often requires significant patient input; therefore, the motivation and ability of the patient to comply should be determined beforehand [241]. Generically, the procedures to prevent and treat RA hand processes are: synovectomy, tenosynovectomy, tendon realignment, arthroplasty (excision, replacement) and arthrodesis (fusion).

Patients rate 'improvement in function' above 'relief of pain' in deciding to have hand surgery [235]. However, long-term results are disappointing with <40% retaining satisfactory hand function and <30% remaining pain free [242].

Inflammation and deformity can lead to compression neuropathy, most commonly of the medial nerve at the wrist, ulnar nerve at the elbow and posterior interosseous nerve in the proximal forearm. Surgical decompression is commonly successful. Initial treatment should be conservative but not delayed until severe sensory or motor changes are present since recovery after decompression would be incomplete [243]. Synovectomy should be considered when joint symptoms fail to respond to chemical therapy. Arthroscopic procedures offer the advantage of early recovery [244]. Dorsal wrist synovectomy is often the first procedure rheumatoid patients undertake [234] and plays an important role in tendon rupture prevention. It is often associated with an excision hemiarthroplasty of the head of the ulna, also termed Darrach's procedure; [245]. Flexor tenosynovectomy successfully prevents rupture at the expense of risking loss of range of movement due to adhesions. Tendon debulking and/or pulley release successfully manage triggering [246]. The tendons most at risk of rupture are the long extensors of the ulnar digits at the level of the distal radioulnar joint and flexor pollicis longus at the carpus. Direct repair is very rarely possible and due to the higher incidence of adhesions in tendon grafting, tendon transfer is preferred. [247]. Tendon transfers are individually tailored to

TABLE 5. Recommendations for management of RA including strength of evidence and grade of recommendation

	Recommendation	Strength of evidence	Grade of recommendation
1	The aim of therapy is to minimize disease activity	1	A
2	DMARDs and biologic therapies are medium- to long-term treatments whose withdrawal usually results in flare and disease progression	1–2	A–B
3	Biologic therapy is useful for patients who fail to respond to DMARDs, but an adequate response is a requirement for longer term continuation	1	A
4	Patients need a stepped approach to pain relief using analgesics, and in the short term, additional NSAIDs co-prescribed with a proton pump inhibitor	1	A
5	Patients need an individualized management plan including choices for long-term follow-up care	3	C
6	An annual review is recommended, incorporating disease assessment, damage, functional outcomes, patient goals and evaluation of comorbidity	3	C
7	Patients should be screened and managed for cardiovascular disease	2	A
8	We recommend the Royal College of Physicians guidelines on idiopathic and glucocorticoid-induced osteoporosis	1	A
9	Patients with depression benefit from anti-depressants and cognitive behavioural therapy	2	B
10	Immunosuppressive therapy may exacerbate and mask infection, and temporary withdrawal should be considered during active infection	3	C
11	Patients need rapid, self-initiated access to primary or secondary care including telephone advice	2–3	C
12	Most patients with cervical spine involvement can be treated conservatively, but neck deformity, acute or progressive myelopathy and/or severe intractable pain are indications for surgery	2	B
13	Occupational therapy promotes independent function in patients with aggressive disease or if they experience difficulties in activities of daily living or employment, interventions include environmental and home assessment, task modification, problem-solving exercises to improve mobility, functioning and safety and use of assistive equipment	1–3	A–C
14	Joint protection techniques should be taught or reinforced, using cognitive behavioural methods. Wrist splints relieve pain and improve grip strength during some activities. Finger splints may improve function	1–3	A–C
15	Patients have a central role in their disease supported by the use of key educational resources, patient organizations and self-management techniques	2–3	B–C
16	Exercise is effective in improving function and reducing the rate of bone loss	2	B
17	Fatigue may respond to energy conservation techniques	3	C
18	Combined rheumatology and orthopaedic care is recommended, with replacement of failing joints progressing from lower to upper limb; in most cases, DMARDs should not be stopped	2–4	B–D
19	Initial management of shoulder problems is with steroid injections and physiotherapy, but surgery should be considered if symptoms persist; arthroplasty is effective for pain relief but functional improvement depends on an intact rotator cuff; elbow replacement is very effective for pain relief and to restore function; hand surgery is most useful for preserving and improving function, for pain refractory to medical therapy, preventing deformity and aiding cosmesis	2–3	B–C
20	Patients should have an opportunity to enrol in research studies in centres with verifiable research governance arrangements and support, and to take part in specialist musculoskeletal training programmes for health professionals	2–4	B–D

the motor deficit and available donor units. The commonest transfer is the extensor indicis proprius to the long extensors of the ulnar digits or extensor pollicis longus. Transfer surgery often requires splinting for 6 weeks [248].

20. Patients should have an opportunity to enrol in research studies in centres with verifiable research governance arrangements and support (4, D), and to take part in specialist musculoskeletal training programmes for health professionals (2, B).

Research has contributed substantially to the understanding and management of musculoskeletal conditions, particularly RA [249]. Advances in management of RA have included the introduction of combination therapy [250], pragmatic aggressive treatment strategies to improve outcomes in RA [10], the use of anti-TNF therapies [251–253] and anti-B-cell therapies [254]. Future clinical trials face greater challenges as a result of the increased regulatory framework. The expectations of new therapies are remission rather than just a degree of improvement in disease activity. The continued involvement of patients in appropriate research programmes is highly desirable to ensure that therapeutic strategies continue to improve now that remission may be a realistic goal and to give experimental therapies to those who are failing to respond to, or are intolerant of, the existing armamentarium. Research protocols should be encouraged to include an aspect of patient-centred outcome measures, such as fatigue, which many patients find particularly distressing.

Patients can benefit from research in two main ways: either they derive benefit as individuals from a treatment that would not otherwise be available—such treatments would usually require more frequent visits to hospital for evaluation and administration of treatment; or they may benefit as a group from a scientific evidence base for introducing new treatment strategies or revising existing treatment strategies. The onus should be on clinicians to ensure that the needs of the individual and the needs of the group are balanced. This process is overseen by research ethics committees, local governance arrangements and for clinical trials of medicinal products, by the Medicines and Health Care Products Regulatory Agency [255] plus registration on both the European Clinical Trial database [255] and the International Standard Randomized Controlled Trial Number Register [256]. The current regulatory framework also includes the Human Rights Act 1998 [257], the Data Protection Act 1998 [258], the Medicines Act 1968 and subsequent amendments [259], the Medicines for Human Use (Clinical Trials) Regulations 2004 [260], the International Conference on Harmonization Guidelines on Good Clinical Practice [261], the World Medical Association Declaration of Helsinki entitled ‘Ethical Principles for Medical Research Involving Human Subjects’ [262] and the NHS Research Governance Framework for Health and Social Care 2005 [263].

Unresolved research questions in RA include not only the cause of disease, the relationship between the cellular components of

inflammation, particularly B cells and T cells, but also the growing understanding of other mechanisms involved in the disease including the cytokine cascade, the role of synovial cells and fibroblasts; it is uncertain whether vaccination or tolerogenic therapy early in disease can prevent the onset or progression. There is also a need to widen research recruitment to increase patients enrolled into studies. At the functional level there are huge gaps in our evidence base for the role of standard interventions, such as physiotherapy and occupational therapy so that all aspects of the multi-disciplinary care team should be addressed and subjected to evidence-based scrutiny. Where evidence is not available or unanswered intervention should be critically appraised and tested in hypothesis-driven clinical trials. Such trials are really only possible with collaboration between a number of centres in the UK and this has to be appropriately supported by government funding in order to ensure the best use of current limited resources. Trials should aim to include patients who are as representative as possible of realistic clinical situations so that the results from trials can be generalized to clinical practice [264]. We have made some further suggestions in our research agenda, relating specifically to the current guideline statements (see Appendix 2).

Patients are in a strong position to offer themselves as educators, taking an active role in undergraduate and postgraduate training programmes for all health professionals involved in the management of RA. [265–268].

Table 5 summarizes all the recommendations.

Applicability and utility

Potential organizational barriers to introduction

The provision of a seamless service between primary and secondary care may be hampered by a lack of IT capability. Annual review clinics are not widespread, mainly due to pressure on rheumatology services to provide care for new patients. Financial barriers exist, limiting the use of biologic agents, reducing the optimal provision of multidisciplinary teams, and provision of important equipment at home and in the workplace. A further barrier to introduction of the guideline is the lack of awareness by the multidisciplinary team of available resources to support patients (e.g. patient organisations).

Potential costs implications for introduction of the guideline

Service costs may be considerable if early arthritis clinics are to be provided. Our goal should be to achieve a fully functional multidisciplinary team in every community ensuring a specialist hospital service which is managing patients with arthritis.

Mechanism for audit of the guideline

A variety of clinical outcomes can be measured including laboratory tests, radiographic scores, formal joint counts, physical measures of functional status, global measures and patient self-report questionnaires [269]. Such measures may address disease activity, joint damage or long-term outcomes and can be incorporated into either local or national audit when using the guideline in clinical practice.

- Audit for the RA guideline could be single centre or, ideally, in many centres across the United Kingdom.

Patients with RA would have these outcomes measured before and after the guideline is implemented. An example of an audit of the guideline is described in Appendix 1.

Acknowledgements

The authors gratefully acknowledge the support from Mooka Siyomunji-Barker and Kate Jepson in the BSR office, and

secretarial support from Kathryn Cook and Michelle Cook, University of Oxford.

Disclosure statement: R.L. has received departmental sponsorship for academic meetings; personal sponsorship for attendance at EULAR 2004, 2006 and 2008 ACR San Francisco 2008, ACR Orlando 2003, ACR New Orleans 2002; honoraria for academic lectures; recruitment of patients for one commercial trial of NSAIDs in OA, one commercial trial of MAP kinase inhibitor in RA, one commercial trial of gusperimus in WG, one commercial trial of rituximab in vasculitis, consultancy for clinical trials in vasculitis from Schering Plough, Napp, Wyeth, Roche, UCB, EuroNippon Kayaku and GSK. S.M.O. has carried out consultancy work for Abbott, Roche, Sanofi-Aventis and UCB. They have received honorarium and carried out advisory work for Abbott, Roche, Schering-Plough and UCB. They have also received educational grant/sponsorship to attend an international meeting from Abbott, Roche and UCB. F.B. has received indirect support from industry (including Abbott, MSD, Pfizer, Schering-Plough and Wyeth) through research grants, honoraria and support for educational and research meetings. C.E. has received honoraria for participation in advisory boards and speaker fees from Abbott, Wyeth and Schering-Plough. She has been sponsored to attend international meetings and her department has received educational grants from Abbott and Wyeth. P.C.T. has received research grant support from Schering-Plough, Roche and GlaxoSmithKline. He has received advisory and speaker fees from a number of pharmaceutical companies including, but not restricted to, Abbott, Celgene, UCB, Roche and Wyeth. All other authors have declared no conflicts of interest.

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Appendix 1. Proposed audit proformas and suggested analysis

Audit

This audit aims to identify the improvement in self-managing behaviour, functional status, disease activity and pain levels in those with established RA using an evidence-based pathway of care.

The purpose is to assess the effectiveness of this evidence-based guideline and pathway of care for those patients with established RA.

Aims

- To test an evidence-based care pathway for RA patients, which incorporates an algorithm of care
- To evaluate the impact on patient knowledge and self-managing behaviour

Objectives

- To use a pathway of care which is evidence-based and utilizes current guidelines and standards for the management of RA
- To identify patients with inflammatory arthritis (RA) to commence on pathway and
- Commence active management protocol
- Commence/alter DMARD therapy
- Control symptoms
- Receive continuous appropriate education
- SOS and flare management support
- Ensure monitoring programme
- Management of comorbidity
- Multidisciplinary team action and support
- Orthopaedic consultation and action
- To evaluate pathway focusing on outcomes and processes

Proposed outcomes

- Control disease activity
- Disease remission—DAS28 < 2.6
- Knowledge assessment and retention
- Desirable behaviour (self-managing)
- Prevent loss of function
- Decrease pain
- Quality of life

Setting

Rheumatology services

Implement pathway and evaluate the outcome using the following validated measures: HAQ, SF-36 and DAS28. In parallel, we would propose recording of treatment and changes for both groups, patient diaries to record changes to physical functioning, mobility, pain, social functioning (work, hobbies), sleep, emotional status (life events) and exercise. Audit patient groups 3 months before implementing guidelines and repeat the audit 1 month after implementation, and collect data for a further 3 months.

Appendix 2. Research agenda

During the development of the guideline, the lack of good quality data in some areas has highlighted the need for further research. Unresolved research questions in RA include the following:

Statement 1. The aim of therapy is to minimize disease activity (strength of evidence 1, grade of recommendation A).

- There is a need for more reliable and readily available means to identify those patients in whom radiographic progression and

functional decline are progressive despite an apparently good response to current therapy as judged by clinical criteria and disease activity scores such as DAS28.

- If such patients can be identified, the hypothesis that they merit escalation of pharmacological intervention in order to prevent longer term decline needs to be tested.

Statement 2. DMARDs and biologic therapies are medium- to long-term treatments (1, A) whose withdrawal usually results in flare and disease progression (2, B).

and

Statement 5. Patients need an individualized management plan including choices for long-term follow-up care (3, C).

- A major unmet need in RA management is for robust methodologies for determining optimal therapeutic strategies on an individual patient basis in such a way as to maximize therapeutic efficacy and minimize toxicity.
- There is a need to gather long-term health economic data for different treatment strategies, with or without the use of biologic therapies, administered with a view to achieving tight disease control.

Statement 3. Biologic therapy is useful for patients who fail to respond to DMARDs, but an adequate response is a requirement for longer term continuation (1, A).

- There is a need to identify biomarkers that accurately predict response to a particular biologic intervention.

Statement 4. Patients need a stepped approach to pain relief using analgesics(1, A), and in the short term, additional NSAIDs co-prescribed with a proton pump inhibitor (1, A).

- There needs to be better understanding of the relationships between inflammatory and analgesic pathways in RA.
- An exploration of the effects of different methods of patient education on pain.
- In view of increasing evidence of the potential toxicities associated with NSAIDs and the limitations of non-NSAID analgesics, there is a need to formally test the comparative efficacy and safety of novel therapeutics directed at new molecular targets involved in pain pathways in RA.
- What is the benefit of education provided using a tailored individual on-going specialist expertise in relation to pain, self-efficacy and use of health care resources compared with expert patient disease-specific courses?

Statement 6. An annual review is recommended, incorporating disease assessment, damage, functional outcomes and evaluation of comorbidity (3, C).

- Annual reviews should be tested for their overall contribution to health for patients with RA.
- Research on long-term health economic data collected at the annual review would be expected to inform appropriate future resourcing of RA care within a musculoskeletal service framework.

Statement 7. Patients should be screened and managed for cardiovascular disease (2, A).

- Further research is required to better understand the relationships between inflammatory pathways and increased cardiovascular risk in RA.
- There is a need for further research on the effects of optimized suppression of synovitis on endothelial function and long-term cardiovascular health.

Statement 8. We recommend the Royal College of Physicians guidelines on idiopathic and glucocorticoid-induced osteoporosis (1, A).

- Further research is required into the relationships between corticosteroid action and mechanisms of osteoclast regulation in RA.
- The development of new biologic therapies inhibiting bone resorptive pathways, such as antibodies to RANKL, will allow testing of the hypothesis that pulsed use of such agents in combination with steroid will retard erosive disease in RA and inhibit osteoporotic effects of corticosteroids while exploiting their anti-inflammatory benefits.

Statement 9. Patients with depression benefit from anti-depressants and cognitive behavioural therapy (2, B).

and

Statement 17. Fatigue may respond to energy conservation techniques, (3, C).

- More research is required on the causes of fatigue and depression in RA and systematic evaluation of the roles of pharmacological intervention and non-pharmacological approaches in management and their effects on long-term outcomes.

Statement 10. Immunosuppressive therapy can exacerbate and mask infection, and temporary withdrawal should be considered where appropriate (3, C).

- There is a need to identify whether biomarkers can accurately predict the likelihood of infectious adverse events based on the magnitude of suppression of particular inflammatory pathways with a given therapeutic intervention, in particular, in response to biologic therapies.
- In the event that such biomarkers can be identified, there will be a need to test the hypothesis that findings can be used to adjust treatment dose to the optimum for the individual with consequent reduction in infectious complications.

Statement 11. Patients need rapid, self-initiated access to primary or secondary care (2–3, C) including telephone advice (3, C).

- Research is required to assess the impact of planned patient pathways on overall patient satisfaction, quality of life measures and to quantify the resource implications.
- Research to identify vulnerable adults who may not use this approach to care.

Statement 12. Most patients with cervical spine involvement can be treated conservatively, but neck deformity, acute or progressive myelopathy and/or severe intractable pain are indications for surgery (2, B).

- Is there a case for routine screening for cervical spine involvement, for example, at the annual review?

Statement 13. Occupational therapy promotes independent function (2–3, C) in patients with aggressive disease or if they experience difficulties in activities of daily living or employment (3, C). Interventions include environmental and home assessment, task modification, problem-solving exercises to improve mobility, functioning and safety (1, A) and use of assistive equipment (2–3, C).

- Is the benefit of using walking aids outweighed by the adverse effects on hand function/pain or altered gait?
- Carefully controlled trials are warranted to establish the value of leisure therapy and an appropriately sized walking aid in RA.

Statement 14. Joint protection techniques should be taught or reinforced, using cognitive behavioural methods (1, A). Wrist splints relieve pain and improve grip strength during some activities (1, A). Finger splints may improve function (3, C).

- Further research is required to establish the value of a range of orthoses with respect to prevention of progressive

deformity, preservation of joint function and long-term outcomes.

Statement 15. Patients have a central role in their disease (3, C), supported by the use of key educational resources, patient organizations and self-management techniques (2, B).

- Research is required to establish the value of different approaches to patient education, including web-based educational approaches, and to cost the resource implications of implementing a successful approach.

Statement 16. Exercise is effective in improving function and reducing the rate of bone loss (2, B).

- Well-designed studies are required to evaluate the benefits of different exercise therapies on short- and long-term outcome and the resource implications of these programmes.

Statement 18. Combined rheumatology and orthopaedic care is recommended, with replacement of failing joints progressing from lower to upper limb (4, D); in most cases, DMARDs or biologic therapy should not be stopped (2, B).

and

Statement 19. Initial management of shoulder problems is with steroid injections and physiotherapy, but surgery should be considered if symptoms persist (2, B); arthroplasty is effective for pain relief but functional improvement depends on an intact rotator cuff (2, B); elbow replacement is very effective for pain relief and to restore function (2, B); hand surgery is most useful for preserving and improving function, for pain refractory to medical therapy, preventing deformity and aiding cosmesis (3, C).

- There is a need for formal testing of comparative long-term outcomes between early surgical intervention approaches for a number of indications, for example, dorsal tenosynovitis, and delayed surgery.
- There is a need to further investigate the effects on surgical outcomes and complications of continuing scheduled biologic therapy, vs a temporary cessation in therapy, over the peri-operative period.

Statement 20. Patients should have an opportunity to enrol in research studies in centres with verifiable research governance arrangements and support (4, D), and to take part in musculoskeletal training programmes for health professionals (2, B).

- Further research is required on the impact and effectiveness of education programmes related to the need for patient participation in clinical studies.

Appendix 3. Useful websites for people with RA

BSR Evidence Base for RA >2 yrs

ARC—Arthritis Research Campaign

www.arc.org.uk

Arthritis Research Campaign, Copeman House, St Mary's Court, St Mary's Gate, Chesterfield, Derbyshire S41 7TD, UK. Tel: 0870 850 5000; Fax: 01246 558007; E-mail: info@arc.org.uk

The Arthritis Research Campaign, founded in 1936, raises funds to promote medical research into the cause, treatment and cure of arthritic conditions, to educate medical students, doctors and allied health care professionals about arthritis, and to provide information to people affected by arthritis and to the general public.

ARMA—Arthritis and Musculoskeletal Alliance

www.arma.uk.net

Bride House, 18-20 Bride Lane, London EC4Y 8EE, UK.

Tel: 020 7842 0910/11; Fax: 020 7842 0901; E-mail: arma@rheumatology.org.uk

ARMA is the UK umbrella association bringing together support groups, professional bodies and research organizations in the field of arthritis and other musculoskeletal conditions.

Arthritis Care

www.arthritiscare.org.uk

18 Stephenson Way, London NW1 2HD, UK.

Tel: 020 7380 6500 (general enquiries); Fax: 020 7380 6505.

Arthritis Care is the largest UK-wide voluntary organization working with and for all people with arthritis. It aims to promote independence and empower people with arthritis to live positive lives as well as raise awareness of the condition.

Best Treatments

www.besttreatments.co.uk

A very useful website with updated information on treatment of many different conditions.

National Rheumatoid Arthritis Society

www.rheumatoid.org.uk

Unit B4 Westacott Business Centre, Westacott Way, Littlewick Green, Maidenhead SL6 3RT, UK. General tel: 01628 823524; Helpline: 0845 458 3969; Fax: 0845 458 3971; E-mail: enquiries@rheumatoid.org.uk

NRAS is a patient-led national charity focusing entirely and specifically on RA. They provide information, support and advocacy to all people with RA, their families and carers. One-stop shop covering all aspects of disease, latest treatments, living with RA.