# How to Motivate Patients with Rheumatoid Arthritis to Quit Smoking

Helen E. Harris, Fiona Tweedie, Marie White, and Kay Samson

*ABSTRACT.* ***Objective.*** Seropositive rheumatoid arthritis (RA) is strongly linked to cigarette smoking, and smoking cessation is an essential step in RA management. Our objectives were to develop RA and smoking awareness materials and to evaluate the influence of the materials on awareness about the links between RA and smoking and on motivation to quit smoking.

***Methods.*** A group of patients with seropositive RA in Fife, Scotland, were telephoned before the campaign, and the results of the pre-campaign questionnaire were used to develop the image for the campaign. After the campaign a second group of patients were questioned to ascertain the effect of the campaign.

***Results.*** The 320 patient responses to the pre-campaign questionnaire revealed that many ex-smokers with RA had quit when they developed a known smoking-related disease such as emphysema. This concept was used to develop an image illustrating that RA is a smoking-related disease. The campaign was launched in Fife in 2011. The post-campaign questionnaire involving 380 patients revealed that there was 21% higher awareness of a link between RA and smoking and 45% higher awareness that smoking could interfere with treatment of RA. In total, 13/75 smokers who had cut down since the campaign had been influenced by the new information.

***Conclusion.*** The new materials have successfully increased patients' knowledge of the link between RA and smoking and the effect of smoking on RA therapy. RA smokers' attitudes to smoking may have been affected by the campaign. (First Release February 15 2016; J Rheumatol 2016;43:691–8; doi:10.3899/jrheum.141368)

*Key Indexing Terms:*
RHEUMATOID ARTHRITIS SMOKING PSYCHOLOGY CARDIOVASCULAR DISEASES

Smoking cessation is a European League Against Rheumatism recommendation for cardiovascular risk management in patients with inflammatory arthritis[1]. A survey of the smoking cessation practices of those participating in the multinational Quantitative Standard Monitoring of Patients with Rheumatoid Arthritis (QUEST-RA) group showed many deficiencies in provision of smoking cessation advice to patients[2]. Almost a third of rheumatologists and more than two-thirds of nurses in the QUEST-RA group reported that they did not give smoking cessation advice to most of their patients. That study highlighted the need for written advice about smoking cessation and called for a smoking cessation protocol to be put in place in rheumatology units[2]. Raising awareness is recognized as the first step in managing tobacco dependence and addiction[3,4]. Visual materials about smoking cessation have not to date been customized for patients with RA. The 2 objectives of our study were first, the development of novel RA and smoking awareness materials, and second, evaluation of the influence of the new materials on awareness of patients with RA about the links between RA and smoking and on motivation to quit smoking.

*From the Fife Rheumatic Diseases Unit, Whyteman's Brae Hospital, UK National Health Service (NHS) Fife; and Smoking Cessation Department, Haig House, Cameron Hospital, NHS Fife.*

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*H.E. Harris, MD, Consultant Rheumatologist, Rheumatic Diseases Unit, Whyteman's Brae Hospital; F. Tweedie, Occupational Therapist, Rheumatic Diseases Unit, Whyteman's Brae Hospital; M.J. White, RGN, Specialist Rheumatology Nurse, Rheumatic Diseases Unit, Whyteman's Brae Hospital; K. Samson, Tobacco Issues Co-ordinator, Smoking Cessation Department, Haig House, Cameron Hospital.*

*Address correspondence to Dr. H.E. Harris, Fife Rheumatic Diseases Unit, Whyteman's Brae Hospital, Kirkcaldy, Fife KY1 2ND, UK.*
*E-mail: helenharris@nhs.net*

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## MATERIALS AND METHODS

*Objective 1.* All patients in Fife, Scotland, are enrolled on a rheumatology database at the time of their first clinic visit. The database is used primarily to generate correspondence for general practitioners and rheumatology team members. A letter was sent to all 1000 patients with seropositive RA enrolled on the UK National Health Service Fife Rheumatology database at the time the study was initiated, informing them of the study and explaining that a member of the study team may contact them to enquire if they wished to take part. Five hundred fifty patients with RA were randomly selected for the precampaign questionnaire and 450 for the postcampaign questionnaire (Figure 1).

Questionnaires were designed to elicit both qualitative and quantitative information from patients about their smoking status, beliefs, and knowledge about smoking and RA. Both unprompted and prompted questions about RA and smoking were asked in the postcampaign questionnaire (Supplementary material, available from the authors on request). A rheumatology occupational therapist, a nurse, and a medical student undertook the telephone questionnaires (Figure 1; the student was unavailable to undertake postcampaign questionnaires). Patients were telephoned between 9 AM and 8:30 PM

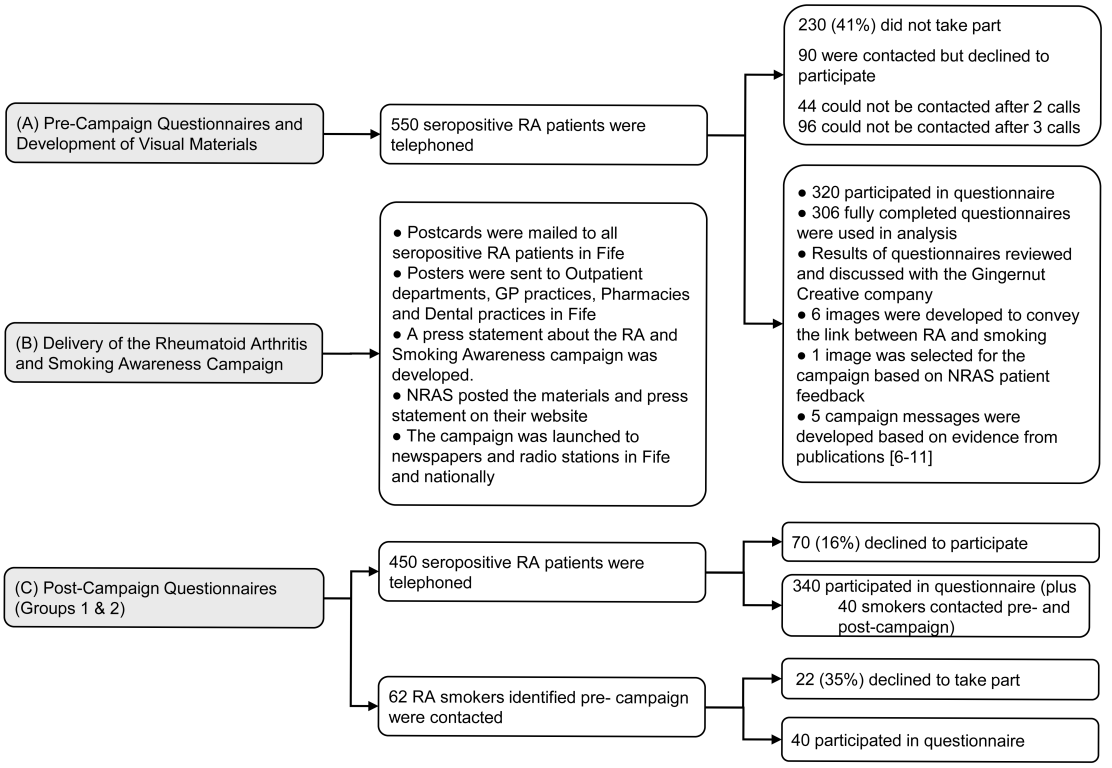


*Figure 1*. Methods used for precampaign questionnaires and development of visual materials, delivery of the rheumatoid arthritis and smoking awareness campaign, and precampaign questionnaires. RA: rheumatoid arthritis; GP: general practitioner; NRAS: National Rheumatoid Arthritis Society.

on up to 3 occasions and if contacted were invited to give verbal consent to participate in the precampaign questionnaire. The questionnaire results were analyzed and reported to the authors.

The key finding was that many RA ex-smokers were motivated to quit when they experienced known smoking-related diseases. The authors worked with a media company (Gingernut Creative) to develop images that conveyed in different ways that RA is a smoking-related disease. Patients' views were then sought to help in selecting which of the 6 images produced was the most suitable and acceptable. The 9 patients who took part in this exercise were smokers and members of the National Rheumatoid Arthritis Society (NRAS); their feedback was reviewed and the most popular image was selected for the campaign.

Messages for the campaign posters and postcards were selected from peer-reviewed publications with the consent of the authors. The front of the postcard carried the statements "Smoking and Rheumatoid Arthritis: a joint problem. Rheumatoid Arthritis (RA) can dramatically affect quality of life. It is therefore important that people with RA are aware of the impact that smoking can have on the development and management of their condition." The 5 messages selected for display on the campaign materials were as follows: 1. Smoking can increase your risk of developing RA[5,6]. 2. Heavy smoking increases the risk of RA by 100%[6]. 3. Smoking can lessen the effect of your treatment[7,8,9]. 4. RA may be more severe in smokers than nonsmokers[9]. 5. Quitting is one of the best things you could do for your RA. The campaign postcards were mailed to all patients with RA and on the same day in September 2011 a press release about the campaign was sent to Fife and national newspapers and radio stations. Campaign posters were sent to all outpatient departments, general practices, community pharmacies, and dental practices.

*Objective 2*. After the campaign, patients that had not previously been telephoned were contacted and invited to take part in the postcampaign questionnaire. The 62 smokers identified in the precampaign group were also telephoned again after the campaign and invited to take part in the postcampaign questionnaire (Figure 1). Approval for the study was given by the National Health Service (NHS) Fife Caldicott Guardians. Analysis of data was undertaken by JSL Consulting and Associates Ltd.

## RESULTS

The characteristics of the 2 groups of patients with RA who took part in the questionnaires precampaign and postcampaign are shown in Table 1. In the precampaign group, 32% of patients had never smoked, but 55% of these had a mean of 22.3 years' passive exposure to cigarette smoke due to a smoking partner. In total, 85% of patients with seropositive RA in Fife had significant cigarette smoke exposure due to current, past, or passive smoking. There were 146 ex-smokers in the precampaign group; when asked "What motivated you to give up?" 40% mentioned that they had experienced a known smoking-related disease such as a heart or lung condition and 15% cited fear of cancer; 23% were self-motivated and 12% motivated by cost. Of the precampaign RA smokers, 22/62 had at least 1 quit attempt in the previous 12 months; patients had a mean of 3 quit attempts (range 1–6). Of those attempting to quit, 15/22 had received support. The types of support were from the general practitioner in 5/15 (33%), a pharmacist in 2/15 (13%), and a smoking cessation team in 3/15 (20%), and 5/15 (33%) used pharmacotherapy to support their quit attempt. Almost half (47%) of RA smokers cited pleasure or relaxation as the main reasons

*Table 1A*. Results of the questionnaires from all patients with rheumatoid arthritis (RA), before and after the RA and smoking awareness campaign.

| Characteristic | Precampaign, n = 306 | Postcampaign, n = 340 | Smokers Identified Pre- and Revisited Post-campaign, n = 40/62 |
|---|---|---|---|
| Females, % | 73 | 70 | 73 |
| Age, yrs, mean | 64 (range 25–91) | 61 (range 39–76) | 57 (range 43–78) |
| Duration RA diagnosis, yrs | 14 (range 1–54) | Not asked | 11 (3–29) |
| Mean time to complete questionnaire, min | 7 | 12 | 12 |
| Never smoker, n (%) | 98 (32) | 114 (34) | — |
| Ex-smoker, n (%) | 146 (48) | 151 (44) | — |
| Current smoker, n (%) | 62 (20) | 75 (22) | 62 (100) |
| Questions | Responses to questions, n (%) | | |
| Are you aware of any new information regarding RA? | Not asked | 34 (10) aware<br>92 (27) unsure<br>214 (63) not aware | 4 (10) aware<br>3 (7) unsure<br>33 (83) not aware |
| Are you aware that there is a link between RA and smoking? | 15/291 (5) aware | 88 (26) aware<br>66 (19) unsure<br>186 (55) not aware | 17 (43) aware<br>9 (22) unsure<br>14 (35) not aware |
| Can cigarette smoking increase the risk of developing RA? | Not asked | 112 (33) yes<br>178 (52) unsure<br>50 (15) no | 13 (33) yes<br>22 (54) unsure<br>5 (13) no |
| Does heavy smoking increase the risk of RA by 100%? | Not asked | 62 (18) yes<br>220 (65) unsure<br>58 (17) no | 6 (15) yes<br>25 (62) unsure<br>9 (23) no |
| Can smoking lessen the effect of your treatment? | 12/289 (4%) yes | 165 (49) yes<br>132 (39) unsure<br>43 (13) no | 22 (55) yes<br>11 (17) unsure<br>7 (17) no |
| Is RA more severe in smokers than nonsmokers? | Not asked | 89 (26) yes<br>219 (64) unsure<br>32 (10) no | 11 (28) yes<br>23 (58) unsure<br>6 (14) no |
| Did you learn about the RA and smoking campaign from any of these sources? (listed to patient) | Not asked | 123 (32) recalled the postcard<br>6 (2) saw it on NRAS Website<br>20 (5) read about it in a newspaper<br>8 (2) other<br>157 (46) in total recalled the campaign | 20 (50) recalled the postcard<br>37 (93) volunteered they recalled the initial questionnaire |

NRAS: National Rheumatoid Arthritis Society.

they were not planning to quit, while 20% said they smoked because they believed smoking helped to relieve their pain.

Using the information that many RA ex-smokers were motivated to quit when they suffered a known smoking-related disease, images were designed to convey that RA is a smoking-related disease; some of these are shown in Figures 2, 3, 4, and 5. Comments were given by the NRAS volunteers as shown in the figure legends. The image in Figure 2 was given the most positive feedback and was chosen for the RA and smoking awareness campaign. The campaign was reported by 2 Fife newspapers, and 1 author (H.E. Harris) was interviewed about the campaign by 2 local radio stations. These media provided a potential audience of 289,660 that may have been reached about the campaign, based on reader and listener audience data.

When contacted in the 3–12 months following the campaign, patients with RA who had not previously been telephoned had a 21% higher awareness of the links between RA and smoking than patients who had been contacted before the campaign (chi-square statistic 49.3, $p = 0.00001$). When patients were asked a prompted question about the campaign, awareness appeared to be higher than when an open unprompted question about any "new information" was asked (26% vs 10%, respectively), as shown in Table 1. Smokers who had taken part in both the precampaign and postcampaign questionnaires had the highest awareness about the campaign (43%). The highest awareness was about smoking having an effect on RA treatment, where there was a 45% higher awareness (chi-square statistic 90.6, $p < 0.00001$; Table 1). When prompted, both postcampaign groups remem-

*Table 1B*. Results of the questionnaires from patients with rheumatoid arthritis (RA) who were smokers, before and after the RA and smoking awareness campaign.

| Questions for Smokers | Answers | Precampaign, n = 62 (%) | Postcampaign, n = 75 (%) | Smokers Identified Pre- and Revisited Post- campaign, n = 40/62 (%) |
|---|---|---|---|---|
| No. cigarettes smoked per day | < 5 | 5 (7) | 10 (14) | 4 (10) |
| | 5–10 | 22 (36) | 22 (29) | 13 (32) |
| | 11–20 | 24 (40) | 37 (50) | 20 (50) |
| | > 20 | 11 (17) | 6 (7) | 3 (8) |
| How do you feel about your smoking? | Planning to stop | 5 (7) | 10 (13) | 1 (2) |
| | Concerned* | 29 (47) | 41 (55) | 26 (65) |
| | Contented** | 28 (46) | 24 (32) | 13 (33) |
| Did finding out about the effects of smoking on RA help you to think about quitting? | Yes | Not asked | 24 (32) | 15 (38) |
| | No | | 9 (12) | 8 (19) |
| | Not aware of link | | 42 (56) | 17 (43) |
| If smoking less than in 2011 were you influenced by finding out link between RA and smoking? | Yes | Not asked | 7/49 (14) | 6/26 (23) |
| | No | | 12/49 (25) | 8/26 (31) |
| | Not aware of link | | 30/49 (61) | 12/26 (46) |
| Do you think that the new information about RA and smoking will increase the chances that you will quit in the future? | Yes | Not asked | 26 (35) | 18 (46) |
| | No | | 23 (30) | 11 (27) |
| | Not sure | | 42 (32) | 11 (27) |
| | No answer | | 2 (3) | |

*Concerned: thinking about stopping. **Contented: not thinking about stopping.

bered receiving the postcard (32% and 50%) and 5% recalled reading a newspaper article about the campaign. Compared to smokers contacted before the campaign, 6% more smokers in the postcampaign group were planning to quit and 8% more were concerned and thinking about stopping following the campaign. Smokers who were smoking less since the awareness campaign were influenced by the awareness campaign in 17% of cases (7/49 + 6/26; Table 1).

## DISCUSSION

We have developed the first visual materials conveying that seropositive RA is a smoking-related disease. These materials were used in the Fife smoking and RA awareness campaign to successfully raise patients' knowledge of the link between RA and smoking. The RA-specific smoking cessation materials developed in our study also had an effect on smokers' behavior and motivating quit attempts.

The authors were unable to find any evidence that visual materials conveying that RA is a smoking-related disease had previously been created. While raising awareness was the main focus of the study, a modest change in smokers' behavior also occurred after the campaign. There are 6 stages of behavioral change describing smokers and former smokers: pre-contemplation, contemplation, preparation, action, maintenance, and termination[10]. In the pre-contemplation stage, the individual does not recognize smoking as a problem. Raising awareness is recognized as the first step in managing addiction[4]. RA smokers in the pre-contemplation stage who are not ready to quit should be given the RA and smoking awareness materials together with a brief intervention about smoking cessation and be referred for counseling to increase the chance of a future quit attempt[11]. To further increase the chance of a successful quit attempt, pharmacotherapy should also be offered to RA smokers[12]. The importance of pharmacotherapy in supporting quit attempts was highlighted by our finding that more than two-thirds of ex-smokers with RA in our study had used pharmacotherapy to quit.

A study of a smoking cessation protocol aimed at patients with arthritis was quite successful but did not include raising awareness as its first step[13]. The use of our new visual materials to raise awareness and motivate quit attempts in combination with a smoking cessation protocol is likely to deliver a higher number of quit attempts than the use of either intervention separately. The visual materials may be even more effective if used at the time of RA diagnosis, when there is a "teachable moment" for patients to learn that seropositive RA is a smoking-related disease[14].

There is compelling evidence that cigarette smoking is a major risk factor for the development of seropositive but not seronegative RA[5,6]. This is strongly supported by our finding that 85% of patients with seropositive RA had significant exposure to cigarette smoke. In our study, 1 in 5 smokers with RA believed that smoking relieved pain. Smokers with RA who experience persistent pain may be motivated to quit by learning that ex-smokers experience lower levels of pain than current smokers[15]. Once motivated, patients may be more successful in quitting. A mean of 3 attempts were required before quitting by RA ex-smokers in the pre-campaign group. In contrast, a mean of 7 attempts was required by ex-smokers in Fife before they succeeded in quitting, suggesting that smokers with RA may be more motivated to quit than the general population (NHS Fife data).

While the campaign brought about a 5-fold increase in

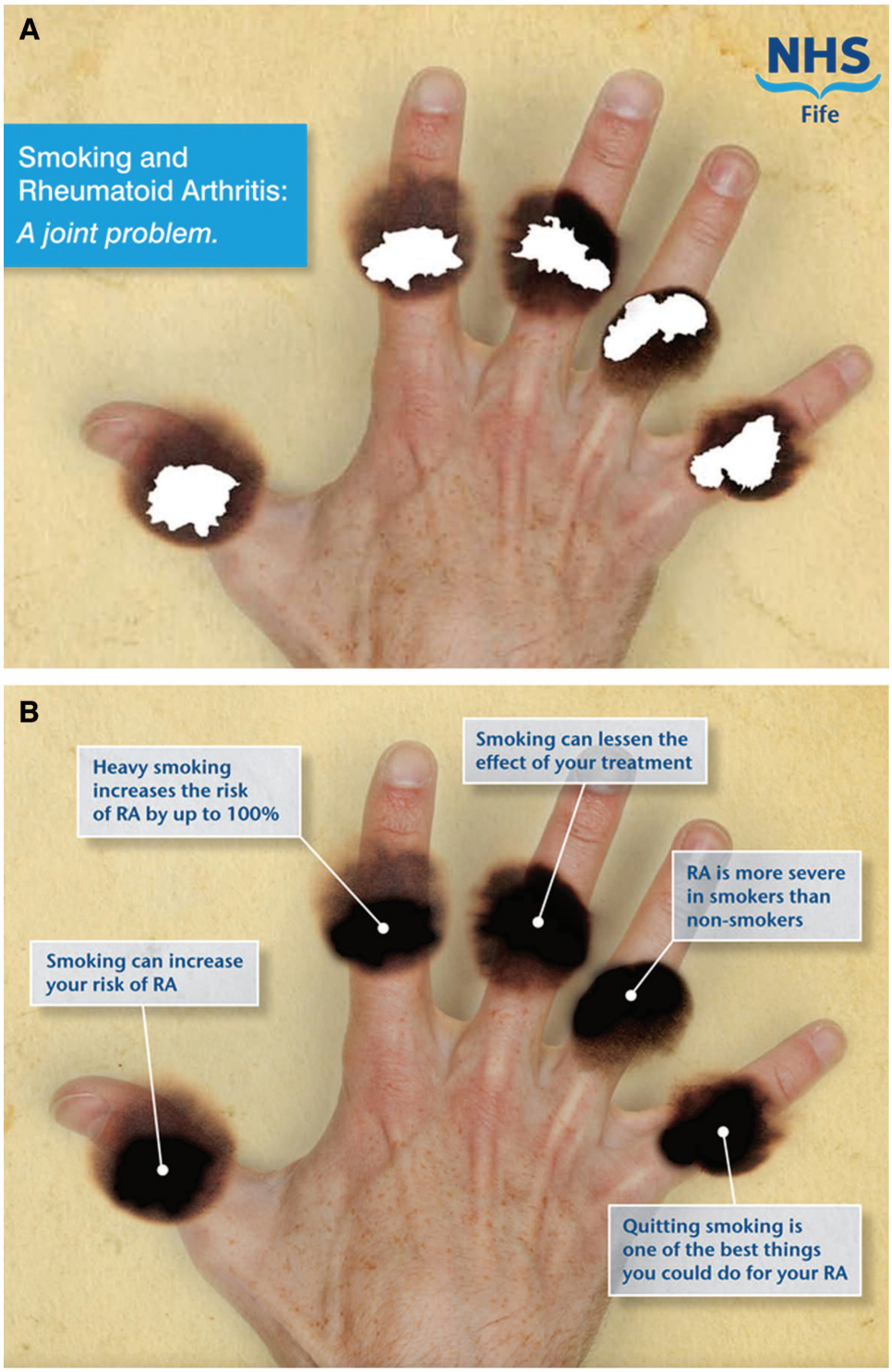


*Figure 2*. A. Image chosen for the RA and smoking awareness campaign. Patient feedback: "Attention grabbing, immediately conveys message, interesting." B. Image chosen for the RA and smoking awareness campaign. The 5 campaign messages were displayed on the reverse side of the card. RA: rheumatoid arthritis; NHS: UK National Health Service.

awareness of the link between RA and smoking, a large proportion of patients with RA were unaware of the link despite having been sent the awareness materials. More work will be required to raise awareness by displaying the materials at clinics and repeatedly giving out the postcards to patients with RA who smoke. In general, the effects of the


*Figure 3*. Suggested image for RA and smoking awareness campaign. Patient feedback: "Hard-hitting, visually impactful, too negative." RA: rheumatoid arthritis; NHS: UK National Health Service.


*Figure 4*. Suggested image for RA and smoking awareness campaign. Patient feedback: "Strong imagery, offers 'a way out' for smokers, conveys pain message." RA: rheumatoid arthritis; NHS: UK National Health Service.

campaign were most pronounced in the group of smokers contacted both before and after the campaign (Table 1). This demonstrates that repeatedly raising awareness may be increasingly effective. The campaign influenced smokers to cut down the amount they were smoking. Over a third of these smokers thought it also increased the chance that they would quit in the future. Most smokers with RA will require longterm or repeated episodes of care to achieve the ultimate goal of sustained abstinence from smoking and recovery of their health. Organizations involved in raising public awareness about arthritis should disseminate the RA and smoking cessation materials to the general public at a national level.

The levels of awareness about links between RA and smoking appeared to vary depending on the type of question asked, and may also have varied depending on how early in the questionnaire each question was asked. When the most open style of question was asked without prompting, awareness appeared to be lower than when questions containing prompts were asked, as shown in Table 1.

To become more successful in helping patients quit smoking, rheumatology teams need to adopt new policies and

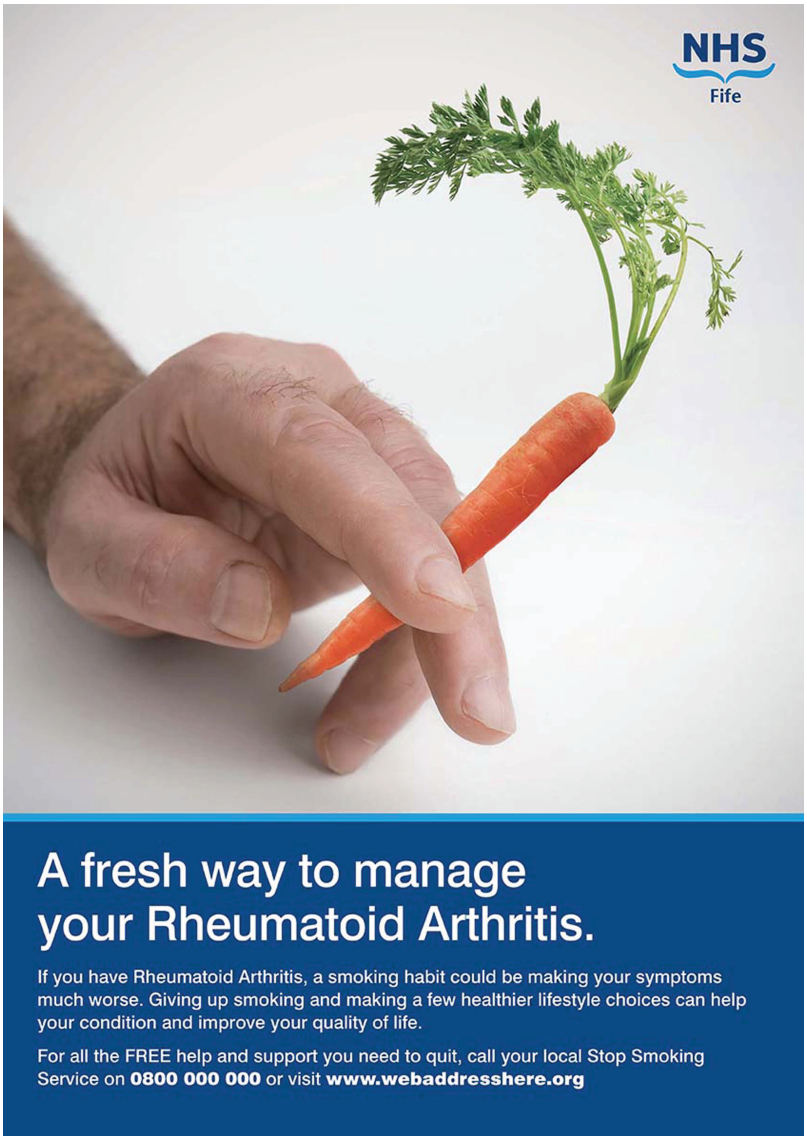


*Figure 5*. Suggested image for RA and smoking awareness campaign. Patient feedback: "Universally liked, bright, fresh look, positive, could be used for healthy eating campaign, clever." RA: rheumatoid arthritis; NHS: UK National Health Service.

practices. Smoking status should be documented each time a patient contacts the rheumatology team. Awareness of the links between RA and smoking should be repeatedly raised and brief smoking cessation advice given to all RA smokers. Brief advice can be delivered in as little as 30 s by any member of the rheumatology team and is highly cost-effective[16]. Brief advice can simply consist of asking smokers questions such as "Have you thought about quitting?" or "Would you like help to stop smoking?" When 80 patients are given solely brief advice on smoking, 1 premature death is prevented[17]. This compares favorably with 127 patients prescribed a statin to prevent 1 premature death over 5 years[17].

The RA and smoking awareness materials developed in this study should be used by all members of the rheumatology team. They may be useful as the first step in a smoking cessation protocol and could be used repeatedly when delivering brief advice about smoking cessation to all smokers with RA. The feedback given by NRAS smokers with RA on the images we developed illustrated that negative images of smoking can be unappealing for smokers (Figures 3 and 4). The image chosen for the campaign was seen by patients to be less "hard hitting" and "more positive" (Figure 2). The materials developed in this study are the first to illustrate the links between seropositive RA and smoking; they are available at www.nras.org.uk.

The effectiveness of these materials in other rheumatology conditions has not been studied. Smoking is also known to

be a risk factor for the development of psoriatic arthritis and can worsen cutaneous manifestations of systemic lupus erythematosus[18,19]. Smoking can exacerbate ankylosing spondylitis, is associated with higher levels of chronic pain, and increases the risk of cardiorespiratory and other diseases in rheumatology patients[15,20]. These are just some of the compelling reasons for promoting smoking cessation in rheumatology patients who smoke. The RA and smoking awareness postcards could be given to smokers with other rheumatology conditions in the absence of disease-specific materials. It is more desirable that disease-specific materials are developed in the future for all relevant rheumatology conditions.

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