Osteoarthritis of the hip : report / by the Industrial Injuries Advisory Council ... ; presented to Parliament by the Secretary of State for Work and Pensions by Command of Her Majesty, November 2003.

Department for Work and Pensions

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Social Security Administration Act 1992

Osteoarthritis of the hip

Report by the Industrial Injuries Advisory Council in accordance with Section 171 of the Social Security Administration Act 1992 on whether sufficient evidence exists to warrant adding osteoarthritis of the hip as a prescribed disease.

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INDUSTRIAL INJURIES ADVISORY COUNCIL

Secretary of State for Work and Pensions

Dear Secretary of State,

REVIEW OF OSTEOARTHRITIS OF THE HIP

Through its regular monitoring of the scientific evidence concerning occupational diseases, the Council decided that it should investigate osteoarthritis of the hip in more depth, to consider whether the evidence of occupational causation was strong enough to justify its inclusion in the list of prescribed diseases.

The first call for evidence was made in 1992. Initially the evidence was inconclusive, but the Council returned to the subject as further evidence was published, and, over the years, considered research from many sources and received oral evidence from experts in medicine and epidemiology.

The disease is common in the population at large, but it is now clear that in one occupational group – farmers – there is a raised incidence of the disease sufficiently high that a clear association can be made between the occupation and the condition, even though there is still some uncertainty about exactly what aspect of farming is responsible.

Although the Council has considered other occupations, particularly construction work, current evidence does not show with sufficient consistency that the incidence of osteoarthritis of the hip in these occupations is more than double the incidence in the general population. They do not, therefore, reach the threshold for prescription, although the Council considers it possible that certain individuals in these occupations may develop osteoarthritis of the hip as a result of their work.

I enclose our report which recommends that, in the light of our consideration of the evidence now available, osteoarthritis of the hip in farmers should be added to the list of prescribed diseases for benefit purposes.

Yours sincerely,
Professor A J Newman Taylor
Chairman

Date: 5th November 2003

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REPORT BY THE INDUSTRIAL INJURIES ADVISORY COUNCIL ON WHETHER SUFFICIENT EVIDENCE EXISTS TO WARRANT ADDING OSTEOARTHRITIS OF THE HIP AS A PRESCRIBED DISEASE

SUMMARY

1. Osteoarthritis of the hip is a degenerative condition of the hip joint characterised by radiographic changes, and pain and/or stiffness upon movement. This condition is common in the general population. In order to establish whether osteoarthritis of the hip could be prescribed for any occupational category, the Council sought to establish whether there was consistent and robust epidemiological evidence of doubling of risk for any group of workers.

2. The Council became aware that the latest scientific literature indicated the risk of osteoarthritis of the hip was more than doubled in farmers. A detailed review confirmed that this was so in farmers, but no strong evidence of a doubling of risk was discovered for other occupations. New research continues to emerge and the Council will continue to monitor the information on hip osteoarthritis in other occupations.

3. In the meantime, the Council recommends that osteoarthritis of the hip should be added to the scheduled list of prescribed diseases for Industrial Injuries Disablement Benefits (IIDB) for farmers.

4. The Council suggests that the definition of a farmer should follow the standard Office for National Statistics (ONS) classification for farmers (5111), farm workers (9111) and farm managers (1211).

5. The Council recommends that to qualify for the prescribed disease, a worker should have been a) engaged in employed work for at least 10 years in aggregate as a farmer, farm worker or farm manager and b) have been diagnosed with osteoarthritis of the hip or have had osteoarthritis of the hip prior to surgery on the hip. The Council would expect that this diagnosis would be supported by the clinical opinion of a registered medical practitioner and would normally be based on the combination of a painful hip with restricted movement and evidence of osteoarthritis on an image of the hip joint.

BACKGROUND TO THE INVESTIGATION

6. The first call for evidence was made in 1992 but initial evidence was inconclusive. In March 1997, IIAC issued a press release in which it announced that it would be undertaking an investigation of the condition and was seeking evidence about a broad range of jobs, to see whether osteoarthritis of the hip should be added to the list of prescribed diseases.

7. Through its regular monitoring of scientific evidence concerning occupational diseases the Council decided that it should examine this disease in more depth to consider whether it was appropriate for inclusion as a prescribed disease.

8. In particular, evidence had been examined that led the Council to believe that a case could be made for the prescription of this disease in regard to farm workers.

9. The Council was at the same time concerned that the investigation should take into account aspects of the current review of the schedule of diseases, and particularly the need to improve the speed and ease of processing claims for prescribed diseases and reduce the administrative cost of identifying those entitled to benefit, and of assessing and paying benefit.

10. Payment of Industrial Injuries Disablement Benefits (IIDB) is made in two circumstances: either when there has been an occupational accident or when a person has developed a prescribed disease – both from employment as an employed earner. Payments under the accident provisions account for much the larger proportion of the total (78% in 2000). They cover not only relatively immediate, short-term disabling effects of accidents, but also those that may not develop until many years after the original accident.

11. A person suffering from osteoarthritis of the hip could already receive benefit if the disabling effects of the disease could be attributed to an industrial accident. This investigation is concerned with the possible listing of osteoarthritis of the hip as a prescribed disease when it occurs in farmworkers (and perhaps other occupations) and cannot be attributed to an accident at work.

THE INDUSTRIAL INJURIES SCHEME

12. The Industrial Injuries Scheme provides a benefit that is non-contributory and 'no-fault'. It is paid in addition to other incapacity and disability benefits, and is taken into account for income-related benefits. It is tax-free and administered by The Department for Work and Pensions.

The Role of the Industrial Injuries Advisory Council

13. The Industrial Injuries Advisory Council (IIAC) is an independent statutory body set up in 1946 to advise the Secretary of State for Social Security on matters relating to the Industrial Injuries Scheme.

14. The major part of the Council's time is spent considering whether the list of prescribed diseases for which benefit may be paid should be enlarged or amended.

The legal requirements for prescription

15. The Social Security Contributions and Benefits Act 1992 states that the Secretary of State may prescribe a disease where he is satisfied that the disease:

a) ought to be treated, having regard to its causes and incidence and any other relevant considerations, as a risk of the occupation and not as a risk common to all persons; and

b) is such that, in the absence of special circumstances, the attribution of particular cases to the nature of the employment can be established or presumed with reasonable certainty.

16. In other words, a disease may only be prescribed if there is a recognised risk to workers in an occupation, and the link between disease and occupation can be established or reasonably presumed in individual cases.

17. In addressing this question in respect of any particular condition, the Council first looks for a workable definition of the disease. There should also exist a practical way to demonstrate in the individual case that the disease can be attributed to occupational exposure with reasonable confidence. For this purpose, reasonable confidence is interpreted as being based on the balance of probabilities. As already described, accidental exposure at work is specifically catered for within the IIDB scheme. However, if the condition might result from occupational exposure in the absence of an identifiable accident, the Council must consider whether it should be included in the list of diseases that are prescribed for benefit purposes. In these circumstances, attribution of the disease to a particular occupational exposure can be demonstrated in two ways.

Clinical features

18. For some diseases attribution to occupation may be possible from clinical features of the individual case. For example, the proof that an individual's dermatitis is caused by his occupation may lie in its improvement when he is on holiday, and relapse when he returns to work, and in the demonstration that he is allergic to a specific substance with which he comes into contact only at work. It may even be that the disease only occurs as a result of an occupational hazard (e.g. coal workers' pneumoconiosis).

Doubling of risk

19. Other diseases are not uniquely occupational, and when caused by occupation, are indistinguishable from the same disease occurring in someone who has not been exposed to a hazard at work. In these circumstances, attribution to occupation on the balance of probabilities depends on epidemiological evidence that work in the prescribed job, or with the prescribed occupational exposure, increases the risk of developing the disease by a factor of two or more. The requirement for, at least, a doubling of risk is not arbitrary. It follows from the fact that if a hazardous exposure doubles risk, for every 50 cases that would normally occur in an unexposed population, an additional 50 would be expected if the population were exposed to the hazard. Thus, out of every 100 cases that occurred in an exposed population, 50 would do so only as a consequence of their exposure while the other 50 would have been expected to develop the disease, even in the absence of the exposure. Therefore, for any individual case occurring in the exposed population, there would be a 50% chance that the disease resulted from exposure to the hazard, and a 50% chance that it would have occurred even without the exposure. Below the threshold of a doubling of risk only a minority of cases in an exposed population would be caused by the hazard, and individual cases therefore could not be attributed to exposure on the balance of probabilities.

20. The epidemiological evidence required should ideally be drawn from several independent studies, and be sufficiently robust that further research at a later date would be unlikely to overturn it.

ISSUES ADDRESSED IN THE INVESTIGATION

21. As described above, in establishing whether a disease should be prescribed within the benefit scheme, the Council must examine whether the terms in which it is prescribed are such that:

- the disease is capable of being precisely defined;
- the current scientific evidence supports attribution of the disease to occupation in the prescribed circumstances on the basis either of clinical features of the disease itself; or of epidemiological evidence that work in the prescribed job or with the prescribed occupational exposure increases the risk of developing the disease by a factor of two or more; and
- the nature of the relevant exposure (including, if appropriate, its level and duration) is clearly definable and readily ascertainable, and can occur in circumstances other than an accident.

METHOD OF INVESTIGATION

22. The Council asked for evidence to be submitted by 20 June 1997. Several experts gave oral and written evidence to the Council. A list of experts who provided evidence, either written or oral, is given in the Appendix. The Council also considered written evidence from individuals and organisations in response to a Press Release. In addition, the Council's research librarian undertook reviews of the relevant scientific literature. Members of the Council's Research Working Group then examined all the information obtained.

ANATOMY OF THE HIP

23. The hip joint is a ball and socket joint – so called because the bones that comprise it are the ball-shaped head of the femur (thigh bone) and the socket-shaped acetabulum – a cup-like depression on the surface of the ilium (pelvic bone).

24. The bony articular surfaces of the hip joint are covered by cartilage and separated from one another by a cavity containing a viscous lubricant called synovial fluid. This lubricant is produced by a thin synovial membrane which lines the inner joint surface. The anatomy of a normal hip joint is illustrated in Figure 1.

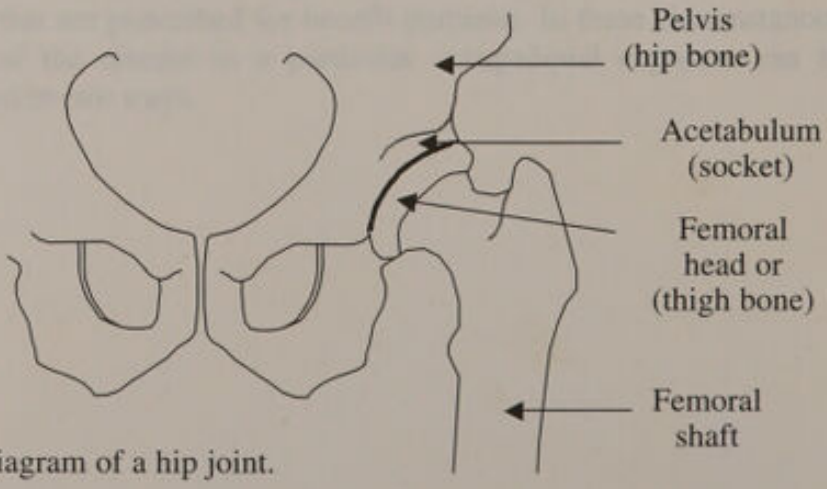

Figure 1. Diagram of a hip joint.

OSTEOARTHRITIS OF THE HIP

Clinical and radiological features

25. Normally the synovial membrane of the hip joint is intact, its joint cartilages are smooth, and the femoral head and acetabulum are well-separated. But in osteoarthritis there is degenerative wear and tear: the surface of the cartilage softens, roughens and flakes; fissures appear in it, exposing the underlying (subchondral) bone; and reactive bone changes occur, including sclerosis (thickening), cyst formation, and outgrowth of new protuberances at the edges of the joint surface (osteophytes). The joint space (measured as the distance between the femoral head and the acetabular roof) narrows. Changes tend to be most marked in the area where maximum joint loading occurs. As the disease progresses, wear and tear may extend to the femoral head or acetabulum, and joint deformity may arise.

26. The typical symptoms of hip osteoarthritis are pain and stiffness. Pain is usually felt in the groin, but it may radiate to the knee, buttock, or inner thigh. It is mainly felt on weight-bearing and aggravated by movement. Stiffness is most noticeable following a period of inactivity. Slowly over time, an effective shortening of the affected limb arises as contractures develop in the muscles around the hip joint. The affected individual finds it difficult to reach down to tie shoe laces, or put on socks, stockings and shoes. Medical examination indicates that movements of the hip are restricted and painful. Loss of functional ability may progress from stiffness to difficulties in rising from a chair, walking, negotiating stairs, and dressing; a characteristic limp may develop, or a gait that is waddling. A walking stick is often needed for support. In severe disease, pain can also occur at night and can disturb sleep.

27. Characteristic features of osteoarthritis – reduced joint space, subchondral sclerosis, development of bone cysts and osteophytes, irregularity of the joint surfaces, and deformity – may be apparent on hip radiographs. Such changes are common at older ages. It has been estimated, for example that, in the general population of the Netherlands, 10-13% of men and 10-17% of women aged 65 years and over have some radiographic evidence of hip osteoarthritis.

28. It seems possible that some of the X-ray appearances in hip osteoarthritis represent adaptive changes that help to arrest or slow disease progression. In keeping with this view, the degree of pain experienced does not correlate consistently with the radiological appearance. For example, some individuals with severe radiological changes have remarkably little pain whereas others, with more limited radiological change, have a great deal of pain.

29. Similarly, the natural history of the disease varies, with a spectrum of severity. Most patients have mild, slowly progressive disease and cope without the need for surgery; but some individuals incur rapidly progressive joint damage and severe disablement, and total hip replacement is one of the most frequently undertaken surgical procedures in orthopaedic practice (approximately 50,000 operations per year in the United Kingdom).

Diagnosis

30. In research, because the concordance between pain and radiological changes is only moderately good, a standardised approach to diagnosis has been adopted, based on the X-ray appearance – and particularly on the degree of narrowing of the joint space, which can be measured reliably and has been shown to correlate best with the clinical and other radiographic features of the disease. In many epidemiological surveys, moderate to severe osteoarthritis of the hip has been defined as a joint space at the narrowest point of 1.5 mm or less on a standardized radiograph of the pelvis.

31. Although clinical and radiological features may not coincide, when all are present together the likelihood of disablement and the need for surgical management is greater. Thus, in clinical practice a diagnosis of osteoarthritis of the hip is normally based upon the combination of typical symptoms, restricted hip movement on examination, and changes typical of osteoarthritis on a radiograph. Similarly, in assessing the need for surgical intervention, most account is taken of the extent of pain and disability, but radiographic evidence of structural damage is routinely sought before recommending total hip replacement.

Risk factors for osteoarthritis of the hip

32. Various genetic and acquired factors may contribute to the occurrence of hip osteoarthritis. Disorders which distort the normal anatomy and integrity of the joint, such as congenital dislocation of the hip, Perthes disease, acetabular dysplasia, and slipped femoral epiphysis may lead to an earlier and faster progression of osteoarthritis. Similarly, fractures which disrupt the joint surfaces or cause misalignment of the articulating bones predispose to arthritic change. Alternatively, the hip may be affected as part of a more generalised inflammatory disease of joints, as happens sometimes in rheumatoid arthritis and several other arthropathies. These are rather uncommon causes of hip osteoarthritis in the general population.

33. More commonly, the hip joint wears insidiously during ageing – in isolation, or sometimes as part of a more widespread pattern of osteoarthritis that involves multiple joints.

34. Obesity is also associated with osteoarthritis of the hip, although how far it predisposes to joint damage and how far it is consequent of reduced mobility once disease has developed is not clear.

35. Several of the known risk factors for osteoarthritis of the hip suggest that the mechanical integrity of the joint is important to its protection. Conversely, activities which increase the mechanical load on the joint and produce large compression forces (e.g. heavy regular lifting) may increase the risk that osteoarthritis will develop. This has been demonstrated in animal experiments and in a growing body of human epidemiological research, and similar research evidence has accrued in respect of osteoarthritis of the knee.

Consideration of the evidence on farmers

36. Osteoarthritis of the hip is common in the general population. According to the evidence received there are no distinctive clinical or radiographic features of the disease that help to distinguish between work-associated and non-occupational patterns of disease. Thus, in assessing whether occupational attribution was possible in affected farmers, the Council focussed on the epidemiological evidence that the risk of hip osteoarthritis is at least doubled for this occupation as compared to the general population.

37. A substantial amount of research has been published which is relevant to this question. Studies were identified with a variety of designs (cross-sectional, case-control, and cohort) from different countries (Britain, Finland, Sweden, France and the United States). In addition, experts from the field of rheumatology provided oral and written evidence. The principal findings are summarized in the paragraphs that follow.

38. Initial case-control studies from Finland, Sweden and France suggested that farmers had a two to three-fold higher rate of total hip replacement than other occupational groups. In a large Swedish cohort study, which included 250,000 people who held the same blue-collar occupations in successive censuses, the risk of hospital admission for hip osteoarthritis among farmers was increased nearly four-fold relative to occupations with low physical workloads. Also in Sweden, where a disability pension is available for hip osteoarthritis, a particularly high rate of award was found in farmers relative to physically less demanding occupations (increased around fourteen-fold).

39. This pattern might arise from greater difficulty in coping with hip osteoarthritis, rather than a higher incidence of the disease. For example, farmers with hip disease might seek joint replacement or a disability pension more readily than other workers if their job was more physically arduous, or the options for alternative employment were more limited.

40. To overcome this problem of interpretation, later research focused on groups who were not selected because they had sought help for hip pain, and compared the occupations of subjects according to the appearance on their hip radiograph. Surveys were conducted in the general population and in subjects whose osteoarthritis was found coincidentally on X-ray examination for other purposes.

41. These investigations have also shown a consistent excess risk of hip osteoarthritis among farmers. For example, a survey of the radiographs of Swedish farmers who had undergone X-ray examinations of the urinary tract or bowel found a prevalence of hip osteoarthritis 10 times higher than in control films from the general population. A similar study in Britain identified cases from intravenous urograms (X-rays of the kidney and urinary tract), and found a doubled risk of severe hip osteoarthritis in men who had farmed for more than 10 years when compared with controls. In an update of an earlier Swedish case-control study, joint space narrowing was two to three times more common in agricultural workers, and more than six-

times more prevalent among men who had worked as farm labourers for more than 30 years compared to randomly selected controls from the same region matched for age and sex. In another survey, British men aged 60-76 years were sampled from the registers of five rural general practices: moderate to severe radiographic hip osteoarthritis (a joint space of 1.5 mm or less, or joint replacement) was about eight times more common in men who had farmed for longer than a year than in a control group (mainly office workers), and nine times more common in men who had farmed for at least 10 years. Comparable risk estimates have been found in several other surveys.

42. In those studies that collected information about other possible contributory factors such as obesity, farming remained an important risk factor for osteoarthritis of the hip after allowance for these variables.

43. One British study estimated that as many as one in five male farmers might eventually require hip replacement.

44. The findings are compelling in several respects: (1) a substantial weight of evidence now exists that the risk of hip osteoarthritis is at least doubled in farm workers; (2) research investigations from several countries, including Britain, have shown a high degree of consistency in their findings; and (3) a greater than doubling of risk has been found in surveys with a range of different study designs. This last observation makes it unlikely that the association is explained simply by chance or an artifact of study methodology.

45. The experts who were consulted by the Council also agreed that a doubling of risk for hip osteoarthritis has been demonstrated in farm workers.

46. The evidence identified relates substantially to male farm workers. By contrast, female farm workers have been little studied, although the experts considered that similar risks were likely to apply, in so far as they carried out the same sort of work as male farmers.

47. The exact reasons for the excess risk of hip osteoarthritis in farm workers have not been firmly established. But evidence exists that, more generally, repeated heavy loading of the hip joint predisposes to arthritic change (paragraph 35). This suggests a possible mechanism for hip disease in farmers and adds biological plausibility to the association uncovered by epidemiological research. Farm work often involves heavy lifting and other activities that may stress the hip joint mechanically (e.g. walking over rough ground). Heavy lifting has been shown to be a risk factor for osteoarthritis of the hip in other occupations, such as construction workers, albeit at a lesser level than for farmers. This evidence lends credence to the link between heavy lifting and osteoarthritis of the hip.

Occupational definition of a farmer

48. In general the research investigations described were based upon self-reported occupation without further inquiry as to duties, and so do not provide a precise definition of the occupational group 'farmer' or 'farm

worker'. They have covered populations undertaking a variety of farming activities, and the large increases in risk described have been averaged across all farmers and farm workers.

49. Some investigations looked in further detail at the types of farming activity, but no indication emerged that risks differed substantially between subsets undertaking different kinds of farming, and so the Council cannot confidently ascribe the higher risk to any one type of agriculture or to any single farming activity.

50. The Council considers that there is a strong case for prescription and that it would be most appropriate to prescribe for farmers whose work can be classified according to the Office of National Statistics Standard Occupational Classification 2000, '5111 farmers', '9111 farm workers' or '1211 farm managers', and who have been employed as employed earners in this capacity for ten years or longer in aggregate (self-employed work is not covered under the Industrial Injuries Scheme). This definition is more restrictive than those used in the supporting field research, but the Council believes that it provides a workable definition of a level exposure for which the epidemiological evidence of a doubling (or greater) of risk is robust.

Osteoarthritis in other occupations

51. As mentioned previously, heavy lifting in other occupations has been shown to increase the risk for osteoarthritis of the hip. Whilst some evidence suggested that there was an increased risk for osteoarthritis of the hip in construction workers and professional footballers, there was no consistent evidence of a doubling of risk in any occupations other than farming. However, the Council will continue to monitor new research.

PREVENTION

52. The risk of musculoskeletal injury from excessive lifting can be minimised by good working practices and the introduction of control measures to reduce the exposure to musculoskeletal risks. Employers have a legal responsibility under the Manual Handling Operations Regulations 1992 to reduce unacceptable risks of injury from manual handling activities.

53. The most reliable way of eliminating the risk of injury from excessive lifting is, in the first instance, to remove the need for employees to carry out manual handling. This can be achieved by reviewing work procedures. If the handling of loads cannot be eliminated it may be possible to mechanise the process e.g. by using mechanical lifting devices.

54. Where it is not possible to mechanise the process, consideration should be given to reducing the weight of the load and frequency of lift, so far as is reasonably practicable. This can be achieved for example by purchasing/producing loads of a smaller magnitude. Reviewing employees' work patterns will assist in establishing the frequency of lifting tasks. It may be possible to allocate the lifting tasks among the workers to reduce an individual's exposure to the risk.

55. It is good practice for employers to have systems in place which allow for early reporting of any incidents of manual handling injury.

56. The Health and Safety Executive has produced general guidance on the prevention of injury due to manual handling "Manual Handling Operation Regulations 1992 – Guidance on Regulations" ISBN 0-7176-2415-3 and "Getting to grips with Manual Handling" INDG 143. It has also published specific guidance for the agriculture industry "Manual handling solutions for farms" AS23 (rev2).

RECOMMENDATIONS

57. The Council has concluded that the available scientific evidence is such that it should recommend that osteoarthritis of the hip be added to the list of prescribed diseases set out in schedule 1 to the SS (II) (PD) Regs 1985, but only in respect of farming.

58. We recommend that osteoarthritis of the hip should be prescribed in relation to farmers, farm workers and farm managers, as classified to the ONS Standard Occupational Classification for 2000, categories 5111, 9111 and 1211.

59. The Council concludes that people engaged in such occupations should receive benefit if they meet the following criteria:

a) they have engaged in employed work for at least 10 years in aggregate as a farmer, farm worker or farm manager; and

b) have been diagnosed with osteoarthritis of the hip, or have had osteoarthritis of the hip prior to surgery on the hip.

60. The Council would expect a diagnosis of hip osteoarthritis to be supported by the clinical opinion of a registered medical practitioner, and normally to be based on the combination of (a) a painful hip with restricted movement and (b) evidence of osteoarthritis on an image of the hip joint.

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APPENDIX

The following experts were invited to contribute to the proceedings of the Council:

Oral presentations:

1. Professor Peter Croft, Professor of Primary Care Epidemiology, Primary Care Sciences Research Centre, University of Keele, Keele
2. Professor Paul Dieppe, MRC Professor of Health Services Research, Department of Social Medicine, University of Bristol, Bristol
3. Professor Alan Silman, Professor of Rheumatic Disease Epidemiology, School of Epidemiology and Health Sciences, University of Manchester, Manchester
4. Professor Michael Doherty, Head of Academic Rheumology, School of Medical and Surgical Sciences, University of Nottingham, Nottingham

Written submissions:

1. Professor T Felson, Professor of Medicine and Public Health, Boston University School of Medicine, Boston
2. Dr Eva Vingard, Karolinska Institutet, Stockholm

The Council also considered evidence from various individuals and organisations who had submitted information.

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