EXTENDED REPORT

Use of complementary medicines for osteoarthritis—a prospective study

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Background: Patients with osteoarthritis commonly use complementary and alternative medicines (CAM), either as an adjunct to or in place of conventional analgesics.
Objectives: To undertake a prospective investigation of the prevalence of CAM use for osteoarthritis and the direct costs incurred.
Methods: The subjects were 341 patients with osteoarthritis of the knee or hip drawn from central and northern Sydney, Australia, and comprising 83 community based patients and 258 awaiting joint replacement. Information on CAM use was obtained from prospective three monthly diaries. Variables of interest included health related quality of life scores. Prospective out of pocket costs were recorded over a 12 month follow up period.
Results: The prevalence of CAM use was 40%, which falls within the range of previous studies. Average annual expenditure on CAM was A$32.25 (range 0 to 603.30). CAM users were more likely to be female (odds ratio (OR) 1.8 (95% confidence interval, 1.1 to 3.0)), reported a higher level of bodily pain (OR 0.97 (0.95 to 0.99)), and were less likely to purchase conventional analgesics (OR 3.3 (1.6 to 7.0)), either prescribed or over the counter. Vitamin supplementation was the most common CAM reported, followed by celery extract, fish oils, and garlic extracts.
Conclusions: There are no good quality clinical trials to support the use of most preparations purchased by patients with osteoarthritis. There is a need for patient education on the risks and benefits of complementary medicine in osteoarthritis.

Osteoarthritis is a common chronic disabling disease, with an estimated 21 million sufferers reported in the USA,[1 2] which corresponds to approximately 12.1% of the population over the age of 25 years—similar to that in Australia and other developed countries.[3 4] Prevalence increases with age,[5] and so this number can only increase as our population ages and treatments for life threatening conditions improve. The cost to the health system is substantial, measured in Australia at A$624 million in 1994,[6] with 48% of these costs incurred in hospitals and 9% for pharmaceuticals.

This comparatively small percentage for pharmaceuticals is not surprising, as there is no preventive or curative drug treatment available for osteoarthritis, and medical practitioners are left simply with various analgesic options for the pharmaceutical management of the disease. Despite a recently described decrease in the use of paracetamol and non-steroidal anti-inflammatory drugs (NSAID) in osteoarthritis,[7] paracetamol, ibuprofen, and aspirin remain the three most commonly used ''over the counter'' drugs for any indication.[8]

In the absence of definitive treatments, do osteoarthritis patients resort to using unproven alternative medicines as a part of their disease management? For the purposes of this study, ''complementary and alternative medicines'' (CAM) have been defined as those medicinal preparations, either oral or topical, which can be purchased over the counter without medical prescription, do not have general medical acceptance for their use, and do not include the analgesics paracetamol, aspirin, or ibuprofen. Australia has a publicly funded health care reimbursement system which does not subsidise CAM, and there is no such reimbursement planned in the future. Forty per cent of the population has additional private health insurance, but this also does not provide for most types of alternative medication.

Published reports to date are based on retrospective cross sectional studies of CAM in osteoarthritis. To our knowledge, there have been no prospective studies. In the present study we undertook a prospective assessment of the patterns of complementary and alternative medicine use and the associated out of pocket costs in a population of osteoarthritis sufferers in Sydney, and of independent predictive factors for CAM use.

METHODS

Subjects

Two cohorts of osteoarthritis sufferers were recruited between 1994 and 1999. Community dwelling subjects with self reported osteoarthritis were drawn from electoral rolls in the Northern Sydney health services area. Questionnaires were sent to a random sample of individuals from these rolls, and those who reported having osteoarthritis were approached to participate. The diagnosis of osteoarthritis was confirmed by interview and physical examination by a rheumatologist (described elsewhere[9]). We recruited 115 individuals with osteoarthritis. In addition, nine orthopaedic surgeons provided waiting lists for total primary hip or knee replacements for four hospitals in Sydney (St Vincent's Public and Private Hospitals, the Centre for Bone and Joint Disease, and Mater Misericordiae). Patients from these lists with a diagnosis of osteoarthritis were approached to participate in the study, and 399 were

Abbreviations: CAM, complementary and alternative medicines; MOS SF-36, medical outcomes study short form 36 item health survey; WOMAC, Western Ontario and McMaster Universities osteoarthritis index

recruited. This study forms part of a larger ongoing NHMRC funded study of the costs associated with arthritis, the COST study.

Thirty two non-surgical patients and 141 surgical candidates did not complete sufficient prospective diaries to allow analysis (111 no longer wished to participate, 23 were excused, 24 died, and 15 were unable to be contacted on follow up).

Assessments

Baseline demographic information was collected, including sex, age, employment status, highest level of education achieved, comorbidities, duration of osteoarthritis, and financial status determined by receipt of a pension. Participants were asked to complete a retrospective three month questionnaire detailing all expenses relating to their arthritis, including prescription and non-prescription drug costs. Quality of life at baseline was assessed by interview using the Western Ontario and McMaster Universities osteoarthritis index (WOMAC)[10] and the medical outcomes study short form 36 itme health survey (MOS SF-36)[11]. Lower WOMAC scores reflect better performance; MOS SF-36 scores are the reverse, with higher scores reflecting better performance.

Patients were required to complete prospective cost diaries every three months, recording medications purchased and the amount spent on each preparation. Diaries were completed by mail, and two reminder telephone calls made if required. Diaries were checked for missing answers, and clarifications made by telephone if required. It was specified that only those preparations purchased for management of osteoarthritis were to be recorded, both over the counter treatments and prescription drugs. WOMAC and MOS SF-36 questionnaires were completed every three months for one year by the surgical group; the non-surgical completed WOMAC every three months, and MOS SF-36 at baseline and 12 months.

Missing data

If a cost diary was not returned, the last record was carried forward. There was no significant difference between the four diaries (data not shown). This method was not appropriate for postoperative diaries. In instances when participants failed to return the amount spent on an item within a diary, the missing cost of that individual item was recorded as the mean expenditure for that item incurred by that individual from the remaining diaries. Missing data within the WOMAC and MOS SF-36 was dealt with using guidelines specified by their authors. Where one entire questionnaire was missing within the non-surgical group, the result from the next returned questionnaire was substituted.

Statistical methods

Data were analysed using the SPSS for Windows, version 11.0 program. Mean demographic differences between the surgical and non-surgical groups were examined using χ^2 tests for dichotomous variables, and independent Student *t* tests for continuous data. Paired sample *t* tests were used for comparing results from different diaries. Univariate analyses were carried out by Student's *t* tests for continuous data, and Mantel–Haenszel odds ratios were calculated for categorical data. Backwards stepwise logistic regression was carried out for multivariate analysis to identify independent predictors of CAM use. In order to compare out of pocket expenditure over time, all costs were adjusted to AU$1999 using the consumer price index.

Table 1 Demographics of surgical and non-surgical osteoarthritis participants

Variable	Non-surgical (n = 115)	Surgical (n = 399)	p Value
Age (years) (mean (SD))	65.0 (8.80)	68.5 (9.80)	0.001
% Female	67.0%	53.4%	0.032
Duration of disease (years) (mean (SD))	15.3 (12.1)	15.2 (11.8)	NS
% On pension	45.2%	56.4%	0.034
% employed	29.6%	16.8%	0.002
% HSC or higher	46.8%	60.9%	0.008
% Comorbidities	67.8%	63.4%	NS
% On non-prescription medications	49.6%	46.4%	NS

RESULTS

Demographics

The surgical group of osteoarthritis patients was older, more likely to be on a pension or unemployed, but more highly educated than the non-surgical group (table 1). There was no significant difference between groups for duration of osteoarthritis or the presence of other medical conditions. Not surprisingly, the surgical group also performed more poorly on most aspects of quality of life when compared with the non-surgical group (table 2).

Once dropouts were excluded from the study, there were 83 non-surgical osteoarthritis participants and 258 surgical patients enrolled. Dropouts were not significantly different from those remaining in the study for any of the demographic factors. With respect to quality of life factors, non-surgical dropouts were not different from the non-surgical participants remaining in the study, with the exception of the MOS SF-36 domain of bodily pain which was more severe in the dropout group (mean score 41.0 in dropouts *v* 50.7 in non-dropouts; $t = -2.39$, $p = 0.02$). In the surgical group, dropouts had significantly worse mean WOMAC pain scores (11.1 *v* 10.2; $t = 2.39$, $p = 0.02$) and function scores (40.4 *v* 36.8; $t = 2.73$, $p = 0.007$), and poorer mean MOS SF-36 domain scores for physical function (dropouts 20.8 *v* 25.8 for non-dropouts, $t = -2.45$, $p = 0.02$), general health (64.2 *v* 70.1; $t = -2.40$, $p = 0.02$), and social function (53.4 *v* 60.4; $t = 2.13$, $p = 0.03$).

Table 2 Baseline quality of life scores in surgical and non-surgical osteoarthritis participants

Mean score	Non-surgical (n = 83)	Surgical (n = 258)	p Value
WOMAC pain	7.19 (3.7)	10.2 (3.9)	<0.0001
WOMAC stiffness	3.2 (1.6)	4.7 (1.7)	<0.0001
WOMAC function	23.5 (13.2)	36.8 (12.8)	<0.0001
MOS SF-36 domains			
Physical function	50.1 (25.3)	26.0 (18.6)	<0.0001
Role physical	42.4 (42.6)	16.0 (29.5)	<0.0001
Bodily pain	50.8 (24.2)	33.3 (19.8)	<0.0001
General health	65.68 (21.2)	70.1 (19.6)	0.143
Vitality	55.0 (18.5)	47.2 (26.3)	0.035
Social function	76.6 (25.0)	60.5 (28.0)	<0.0001
Role emotional	70.2 (40.5)	58.8 (44.6)	0.079
Mental health	77.8 (15.1)	72.7 (19.6)	0.067
MOS SF-36 physical summary	35.7 (11.5)	28.7 (6.4)	p<0.0001
MOS SF-36 mental summary	53.6 (10.4)	48.8 (6.2)	p<0.0001

Values are mean (SD).
MOS SF-36, medical outcomes study SF-36 health survey; WOMAC, Western Ontario and McMaster Universities osteoarthritis index.

There were no significant differences between WOMAC scores at baseline and at three, six, nine, or 12 months within the non-surgical group, with the exception of mean stiffness, which deteriorated between the first two diaries (3.2 at baseline compared with 3.5 at three months; $t = -2.15$, $p = 0.03$). This was not considered to be a clinically important difference. There were no significant differences between mean MOS SF-36 scores over the 12 month period, with the exception of the ''role physical'' score which improved (35.8 at baseline *v* 50.4 at 12 months; $t = -4.27$, $p<0.0001$). Comparisons of these variables between other diaries did not reach statistical significance. There was significant improvement in all the variables after surgery, reported elsewhere.[12–14]

Complementary and alternative medicines

Forty per cent of the combined surgical and non-surgical cohort of osteoarthritis patients (136 of 341) purchased at least one complementary medicine over the first 12 month period of the study. These included 36 of the 83 non-surgical participants (43%)—significantly different to the 53% reporting CAM use retrospectively in the three month period leading up to the study ($\chi^2 = 19.41$, $p<0.0001$). The non-surgical group also reportedly spent more on CAM in the retrospective period, with the average expenditure reported as A$20.71 for the three months leading up to the start of the study, compared with A$10.73 measured prospectively for the first three months ($t = 3.64$, $p<0.0001$). Eighty one surgical participants completed a prospective three month diary preoperatively; of these, 17 (21%) recorded at least one CAM purchase. This was a lower proportion than the 35 participants (43%) who retrospectively reported CAM purchases in the three months before enrolling in the study ($\chi^2 = 6.60$, $p = 0.01$). In the first postoperative year, 94 of the 258 surgical participants (36%) purchased CAM.

There was no significant difference in overall CAM use between the non-surgical group and those surgical participants who completed a three month diary before undergoing joint replacement surgery ($\chi^2 = 2.27$, $p = 0.13$), although when different types of CAM are examined, the non-surgical group was more likely to use oral herbal medicines than the presurgical group ($\chi^2 = 8.51$, $p = 0.004$).

The most common complementary medicines and preparations purchased by the study group over the first 12 months of the study are shown in table 3.

There was no significant difference in expenditure between any diaries in the non-surgical group ($p>0.2$) (data not shown). Glucosamine sulphate and chondroitin sulphate preparations were excluded from further analysis as they are no longer considered to be CAM; their exclusion did not change the results significantly, as they were infrequently used in these cohorts. Annual mean costs were not different between surgical and non-surgical participants (A$28.88 *v* A$42.69; $p = 0.2$). The groups were therefore combined in all further analyses. Mean (SD) annual expenditure on CAM for the whole osteoarthritis cohort was A$32.25 (81.10), ranging from no outlay to A$603.30. An average of A$80.85 (A$84.84 by men and A$78.75 by women) was spent by those individuals who report spending on CAM. This makes up approximately 33% of the total out of pocket non-surgical costs of osteoarthritis in men, and 15% in women[15] over the same period of study.

Table 3 Number of participants who purchased the more commonly reported complementary preparations for osteoarthritis, and the average amount spent per person

CAM	Non-surgical (n = 83)	Surgical (n = 258)	Total (n = 341)
Vitamin supplements	10	38	48 (14%)
Fish oils	8	8	16 (5%)
Mussel extracts	4	5	9 (3%)
Celery extract	14	10	24 (7%)
Garlic	5	13	18 (5%)
Evening primrose oil	9	11	20 (6%)
Cod liver oil	4	13	17 (5%)
Goanna oil	5	11	16 (5%)
Average cost of CAM (per person who purchased CAM)	A$42.69	A$28.88	A$32.25

CAM, complementary and alternative medicines.

Univariate associations with CAM use

The entire osteoarthritis cohort (n = 341) was classified as ''purchased CAM in the study year'' or ''did not purchase CAM in the study year.'' Univariate associations with CAM use (tables 4 and 5) included the three mean WOMAC measures of disease impact over the study period, the mean physical domains of the MOS SF-36, sex, and the use of conventional analgesic drugs. Women were twice as likely to use CAM as men, and individuals purchasing analgesics (either over the counter or prescription) were 80% less likely to purchase CAM products than those not using analgesics. Those individuals purchasing CAM had more pain and stiffness and poorer function on the WOMAC scale than those who did not, both at baseline and on follow up. Similar results were seen using the MOS SF-36 instrument, with physical indices being worse in individuals using CAM. The mental and emotional indices were generally not different, except for the mental health scale which showed a significantly worse score among the CAM purchasers, though the difference was small. Educational level, socioeconomic status, and age were not associated with CAM use.

Logistic regression model

The significant univariate independent variables for CAM use were entered into a stepwise backwards logistic regression analysis. The only factors found to be independent predictors of CAM use were female sex, non-use of conventional analgesics, and poorer score on the MOS SF-36 measure of bodily pain (table 6). WOMAC function remained in the model for stability, but did not reach statistical significance.

DISCUSSION

The prevalence of complementary medicine use in Australian osteoarthritis sufferers (40%) is comparable to that seen in the general community in Australia,[16] despite the fact that they are older and approximately 50% receive a pension. Previous studies have reported a considerable range in this estimation between populations, from 8% in older osteoarthritis patients in the USA[17] to 54% of general rheumatology patients in Canada[18] and 70% among fibromyalgia sufferers.[19] The reasons behind these differences are not clear, but are likely to reflect cultural acceptance of alternative therapies, availability and affordability of alternative choices, and the adequacy of conventional medicine in caring for chronic, painful, and often disabling diseases. The use of complementary medicines does not preclude traditional medical care; Rao showed that 83% of CAM users also consult their medical practitioner about their condition, although 72% of these do not disclose their CAM use to that practitioner.[20]

Study participants uniformly overestimated the amount they spend on CAM when giving information on a recall basis. A higher proportion of participants reported purchasing CAM in the preceding three months than in the ensuing 12 months, suggesting bias in the retrospective data collection. The discrepancy between retrospective and prospective diaries infers a certain unreliability of conclusions about CAM use based on self report alone; for this reason,

Table 4 Univariate associations of continuous variables with the purchase of complementary medicines in the entire osteoarthritis cohort

Continuous variables	Bought complementary medicines	Did not buy complementary medicines	*t* Value	p Value
Age (years)	66.4 (9.2)	67.4 (9.1)	1.008	0.31
Disease duration (years)	14.4 (11.7)	16.0 (11.4)	1.261	0.21
WOMAC pain	5.7 (3.3)	4.6 (3.6)	−2.986	0.003*
WOMAC stiffness	3.2 (1.5)	2.7 (1.6)	−2.801	0.005*
WOMAC function	21.8 (12.2)	18.7 (13.3)	−2.206	0.028*
SF-36 mental component summary	46.1 (5.3)	45.8 (5.0)	−0.520	0.60
SF-36 physical component summary	36.8 (9.3)	39.6 (9.0)	2.427	0.016*
SF-36 scale scores				
Mental health 0–100	73.3 (14.5)	76.8 (15.5)	2.099	0.037*
Role emotional	66.8 (34.2)	71.4 (33.7)	1.203	0.23
General health	65.6 (16.7)	67.5 (18.0)	0.987	0.33
Vitality	56.3 (14.6)	60.0 (18.7)	1.936	0.054
Social function	68.8 (34.2)	71.4 (33.7)	1.717	0.087
Physical function	47.7 (20.5)	53.5 (24.7)	2.251	0.025*
Role physical	39.3 (50.1)	50.3 (37.9)	2.294	0.022*
Bodily pain	52.5 (20.0)	63.3 (22.5)	4.496	0.001*
Cost of concomitant arthritis medicines (annual, both prescription and non-prescription)	$98.27 ($113.35)	$64.00 ($142.33)	−2.458	0.014*

Values are mean (SD).
*p<0.05.
SF-36, short form 36 item health questionnaire; WOMAC, Western Ontario and McMaster Universities osteoarthritis index.

further analysis was not done on the retrospective data collected. This is an interesting finding in that most other studies into the use of complementary medicines and alternative health providers are based on patient recall and estimation of usage and expenditure. The use of prospective diary collection is a strength of this study, and has not previously been carried out in studies of CAM in osteoarthritis. One could postulate that such bias is caused by participants reporting all expenses they could remember instead of limiting them to the specified three month period. There may also have been a direct effect of the study on the participants—being required to record all expenditures may have forced patients to consider the cost of such preparations before purchasing them. It is possible that participants forgot to record purchases in the diaries, leading to the lower reported rate compared with retrospective reporting; however, other reported variables such as prescription drugs and visits to practitioners did not change in this patient population[15] so this is less likely.

Our study has shown that osteoarthritis sufferers in Australia purchase a wide variety of herbal preparations as treatment for joint disease; however, there is little good quality evidence to support their use. There is no level 1 (meta-analysis of randomised controlled trials) or level 2 (well designed randomised controlled trial) evidence to support the efficacy of any of the eight most popular complementary medicines in our cohort (table 3). Contributing to the lack of evidence is the poor quality of even the randomised clinical trials of CAM[21] and the substantial publication bias surrounding the subject.[22]

The most popular patient initiated treatment for osteoarthritis was ''vitamin supplementation.'' Antioxidant vitamins have been linked to improved osteoarthritis outcomes[23]—particularly vitamin C, β carotene, and vitamin E—but there is no association between osteoarthritis measures and non-oxidative vitamin supplements. Ginger,[24 25] topical capsaicin,[26] and Devil's claw[27–29] have also been shown to give symptomatic improvement in osteoarthritis.

Of all the available complementary medicines for osteoarthritis, glucosamine sulphate and chondroitin sulphate are the two which are breaching the gap between ''alternative'' and ''conventional'' therapy. Originally considered a natural therapy for osteoarthritis, the evidence of symptom improvement with glucosamine[30 31] is building to the point where practitioners are accepting glucosamine preparations as a routine step in the long term management of osteoarthritis. Recent studies suggest not merely symptom modification but also cartilage structural modification with glucosamine sulphate.[32–34]

Chondroitin sulphate is effective in reducing pain in osteoarthritis by at least half (measured by visual analogue scale), as was shown in a meta-analysis of seven trials

Table 5 Univariate associations of categorical variables with the purchase of complementary medicines in the entire osteoarthritis study group

Categorical variables	β statistic	SE	p value	Odds ratio	95% CI
Analgesic use	−1.524	0.350	<0.001	0.22	0.11 to 0.43
Sex (female)	0.746	0.228	0.001	2.11	1.35 to 3.30*
Education (higher)	0.213	0.223	0.38	1.24	0.80 to 1.92
Comorbidities	−0.38	0.237	0.10	0.74	0.46 to 1.17
Pension	0.249	0.223	0.27	1.28	0.83 to 1.99
Employment	−0.468	0.302	0.12	0.63	0.35 to 1.14
Planned surgery for osteoarthritis (worse disease)	0.637	−0.451	0.080	0.64	0.39 to 1.05

*p<0.05.
CI, confidence interval.

Table 6 Final regression model variables for determinants of annual purchase of complementary or alternative medicines for osteoarthritis

	β coefficient	Odds ratio	95% CI	Significance
Sex (female)	0.714	2.04	1.17 to 3.55	0.011
Did not purchase conventional analgesics	0.882	2.4	1.05 to 5.54	0.037
MOS SF-36 bodily pain	0.028	1.03	1.01 to 1.05	0.006
WOMAC function	0.033	1.03	1.00 to 1.07	0.051*

CI, confidence interval; MOS SF-36, medical outcomes study SF-36 health survey; WOMAC, Western Ontario and McMaster Universities osteoarthritis index.

measuring similar outcomes.[35] There is a suggestion that chondroitin may also play a role in disease modification, retarding the progression of osteoarthritis in the knee[36 37] or hand[38]; to date, these results have only been published in abstract form and it remains to be seen whether the quality of the studies stands up to critical analysis.

This study of costs incurred by patients with osteoarthritis was conducted between 1995 and 1999, in a period when the benefits of glucosamine and chondroitin were only just becoming known, and the preparations were not readily available to patients in Australia. This is reflected in the dearth of glucosamine and chondroitin use in our cohort; one patient reported using ''shark's cartilage'' in the retrospective three month period, one prospectively reported purchasing deer antler (containing various glycosaminoglycans including glucosamine) in one three month period only, and one postsurgical patient was maintained on glucosamine therapy throughout the 12 month follow up period.

The vast majority of preparations purchased by our cohort are not supported by evidence based medicine for use in osteoarthritis. Similarly, most CAM preparations that are supported by appropriate clinical trials[39–42] are not represented in our cohort. Despite a general lack of understanding of complementary medicines in the osteoarthritis community, we see that up to 33% of all patient out of pocket costs (excluding surgical expenses) are attributable to alternative medicines.

This study has shown the use of complementary and alternative medicines for osteoarthritis is associated with female sex, non-use of conventional analgesics for osteoarthritis, and poorer physical health. The relation of CAM use[43] to visits to complementary medicine practitioners[43 44] and to female sex has been reported previously in studies of rheumatoid arthritis, and also in surveys of the general population.[16 45] Surveys of the patients of rheumatologists have been more divided with respect to other demographics, with only a few revealing any relation between CAM use and higher education,[20 46] employment,[16] and age.[43] Some association has been found previously between general health and CAM use; one study of older patients with arthritis showed that CAM users more commonly self reported a poorer health state,[47] and another showed that those patients consulting a complementary health practitioner had ''worse health'' than those who did not seek such intervention.[48]

Our non-surgical group was found to improve by a clinically meaningful amount in their SF-36 measure of ''role physical'' over the 12 month study. This is likely to be a Bonferroni error; if the change is a real one, it might be explained by the patient's desire to do well, or be a result of the ''intervention'' of the study itself. It would be unusual, however, for this to affect only one quality of life measure. The improvement is not related to CAM use.

Complementary and alternative medicine use in this study was associated with both higher pain levels and the use of less conventional analgesics. It is not possible to infer causation here owing to the cross sectional study design, but one might hypothesise that quality of life with regard to pain could be improved by substituting simple analgesics in this group, in addition to saving money.

Limitations of this study are those common to all cross sectional studies.

It is only possible to describe associations between groups, not look at the effect of CAM as an intervention in osteoarthritis. It is therefore not possible to draw conclusions regarding the efficacy of CAM. One can hypothesise that CAM, as used by patients with less severe osteoarthritis in northern Sydney, are not effective in symptom control, as this prevalence paper has shown no evidence of improved health status measures over a 12 month period in those taking CAM. There was a high percentage of patients lost from the initial cohort. These were shown to have more severe osteoarthritis as reflected in health related quality of life measures than the study group. This would suggest that the true prevalence of CAM use in patients with osteoarthritis may have been underestimated, given that CAM use has been shown to be related to poorer pain and function outcomes.

Our study confirms that there is a significant proportion of osteoarthritis sufferers in Australia who are using complementary or alternative medicines as an adjunct to their conventional medical care, but the preparations they are using have little or no scientific evidence of efficacy. Further work is needed to define the efficacy and safety of CAM preparations. The challenge is to demystify these treatments and to improve the education of patients and medical practitioners alike as to what can benefit osteoarthritis, what is safe to use in arthritis, what can interact with other conventional medicines, and what can be dangerous. Patients with osteoarthritis are already using CAM; it is up to the medical profession to be aware of what they are taking, and to play an active role in patient education regarding the available evidence base.

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