

Editors: **Associate Professor Michael Woodward**, Director, Aged and Residential Care Services, **Dr Margaret Bird**, Consultant Geriatrician, **Mr Rohan Elliott**, Clinical Pharmacist, Austin Health, Victoria; **Ms Helen Lourens**, Director of Pharmacy, Coffs Harbour Hospital, New South Wales; **Mrs Robyn Saunders**, Consultant Pharmacist, Victoria.

Complementary and Alternative Medicine Use in the Elderly

Geraldine Moses

ABSTRACT

Recent surveys suggest that the elderly are more frequent users of complementary and alternative medicines (CAMs) than the general population—up to 80% have reported using at least one CAM on a regular basis in the past year. Although many reasons are cited for their interest in CAMs, the elderly commonly state that CAMs are not used as ‘alternatives’, but rather as ‘supplements’ to compensate for aspects perceived to be lacking in conventional care. Although high-level evidence supports the use of some CAMs in specific conditions, their use in the elderly presents significant challenges as this population is burdened by polypharmacy, decreased functional reserve and chronic disease. Preventing adverse reactions and drug interactions associated with CAM use is complicated by the fact that fewer than 50% of older patients disclose CAM use to their doctor or pharmacist. This article is a guide for health professionals who wish to advise the elderly consumer on the rational use of CAMs.

J Pharm Pract Res 2005; 35: 63-8.

INTRODUCTION

The elderly are often thought of as unlikely consumers of complementary and alternative medicines (CAMs).^{1,2} However, recent surveys¹⁻¹³ suggest that they are more frequent users of CAMs than younger people. Compared with about 50% in the general population, 60 to 80% of elderly consumers have declared the use of at least one herbal or nutritional medicine on a regular basis.^{14,15} In addition, the number of remedies taken by the elderly is not insignificant, ranging from four to seven per day.⁹

There are a myriad of reasons why the elderly are attracted to using CAMs, the commonest being that these remedies are perceived as accessible, safe and effective.¹⁶ Such perceptions bypass the fact that CAMs are capable of causing adverse reactions and drug interactions, and more so in an older population burdened by polypharmacy, decreased functional reserve and chronic disease. Consumers look to health professionals for information and advice on the risks and benefits of pursuing CAMs for their health needs. Therefore, it behoves health professionals to develop an appreciation of these medicines and know what constitutes rational use of CAMs in the elderly.

DEFINITIONS

There is no internationally accepted collective term to describe the group of products regulated in Australia as CAMs.¹⁶⁻¹⁹ In general, CAMs refer to a wide range of

health-related interventions, including diagnostics, therapies and medicines. Essentially, CAMs are therapeutic remedies, such as herbal, homoeopathic, traditional or nutritional medicines, which are usually available without prescription, and often supported by limited evidence of efficacy. The term ‘complementary medicines’ implies that the remedies complement the patient’s health needs, or is used together with conventional treatments. In contrast, the term ‘alternative medicines’ refers to remedies used in substitution for conventional treatments.¹⁶⁻¹⁸ Another term for CAMs gaining popularity is ‘natural health products’, which avoids reference to concomitant use (or not) of conventional treatment yet denotes the source, purpose and commercial nature of the medicine.^{16,20,21}

PREDICTORS OF USE

Predictors of CAM use in the elderly are similar to those found in younger populations, particularly the female gender, higher education and higher income.¹⁻⁹ In a multicultural society like Australia, it is worthwhile recognising the influence that ethnicity has on CAM use in the elderly.^{4,12,22-27} Flaherty et al. found that elderly Japanese were more frequent users of CAMs than elderly white Americans, who were in turn more likely to use CAMs than elderly African-Americans.²² Najm et al. found that elderly Hispanic Americans were high users of dietary supplements (56%), home remedies (25%), and traditional healers (8%), whereas elderly non-Hispanic Americans were higher users of chiropractic (42%), massage (20%), vitamins (20%), and dietary (17%) modalities.¹³

The burden of chronic disease has also been associated with more frequent use of CAMs in the elderly. In a study of older persons with arthritis, those who reported more severe disease or poorer health were more likely to use CAM.³ In a study comparing the use of CAMs in individuals with and without diabetes, those aged over 65 years with diabetes were 1.6 times more likely to be using CAMs than those without diabetes.²⁸ In surveys of cancer patients, over 80% declared the use of CAMs in their treatment.²⁹

REASONS FOR USE

There are numerous reasons why older consumers access CAMs for their health needs.^{16,20,21,29-34} These include:

- disillusionment with conventional medicine when that offers no firm answers;
- dissatisfaction with conventional practitioners who may exhibit poor communication, lack of empathy, and have limited time;
- desire for simplicity as CAMs are perceived to be ‘simple’ without complex directions, warnings and labels;
- perception that natural medicines are more ‘compatible with health’ and promote ‘optimum health’;

Geraldine Moses, BPharm, PostGradDipClinPharm, DCLinPharm candidate, Senior Pharmacist, Education and Information Unit, Mater Health Services, South Brisbane, Queensland

Address for correspondence: Geraldine Moses, Education and Information Unit, Mater Health Services, South Brisbane Qld 4101, Australia
E-mail: Geraldine.Moses@mater.org.au

- ready access via Internet, health food shops, freecall hot-lines, mail-order, free home-delivery, party-plan and multi-level marketing;
- enticing advertising that encourages a trial of CAMs.
- peer pressure—fashion, alternative lifestyles and ‘keep fighting the disease’;
- postpone age-related deterioration and mortality; and
- desire for autonomy over healthcare decisions.

No single reason accounts for an individual’s decision to use CAMs—any or all of the above reasons may apply. Barnes has claimed in her review that CAM use is based on the concept of health pluralism, a term she says ‘refers to the fact that when people become ill, they will take advantage of the many sources of health advice and treatment available, which may include family, friends, pharmacists, doctors, homoeopaths, naturopaths and other health professionals’.³³

The majority of elderly consumers do not use CAMs as an alternative to conventional treatments, but as a supplement or to compensate for aspects conventional treatment is perceived to lack. In a qualitative analysis of self-care decision-making, Thorne et al. concluded ‘CAM use can be understood not as a rejection of conventional medicine or an unrealistic search for a cure, but as a critical component of self-care management. It represents personal responsibility for health, reframing the measures by which therapeutics are evaluated and how consumers adopt a pragmatic approach to living as well as possible in the context of a chronic condition’.³⁵

Cancer and palliative care patients frequently express the view that they feel it is inadequate to rely solely on conventional treatment and that CAMs provide an opportunity ‘to ensure that everything that can be done is being done’.^{29,31,35} This then raises the most contentious issue of CAM use—can CAMs live up to their claims. Under current regulations, the majority of CAMs are ‘listed’ medicines, which are required by the Therapeutic Goods Administration to provide evidence of safety and quality before they can be legally marketed in Australia, but they do not have to prove their efficacy.¹⁸

DISCLOSURE

Most consumers believe that CAMs are safe^{1-5,30,37} and express satisfaction with them, often higher than with their conventional treatments.^{1,4,9,19,36} These attitudes are contributory to the reluctance of the elderly to declare CAM use to their healthcare providers. Studies have shown that 55 to 62% of older adults do not disclose CAM use to their doctor^{2,4-6,9,13,23} and they have cited a perception that doctors lack knowledge about CAMs, are prejudiced against their use, will attempt to discourage them, and that ‘it is none of the doctor’s business’ as to why they keep CAM use to themselves.^{16,19-21,31,33,34} Indeed, a study of elderly consumers in rural USA, showed that 83% of those using CAMs did not tell their physician and only 2% asked their physicians questions about CAMs. But it works both ways, as physicians in this study only asked their patients about CAMs in 3.4% of encounters.²⁴

Several studies have shown that pharmacists, doctors and nurses are unfamiliar with CAMs and therefore reluctant to confront their use.^{16,31} It is important to overcome the breakdown of communication in this area and, realising that consumers are unlikely to volunteer details, systematically and non-judgementally ask them about their CAM use, and to take it into account when providing pharmaceutical care.

USE IN THE ELDERLY

The widespread and increasing use of CAMs in the elderly presents challenges for health professionals interested in the quality use of medicines (QUM). Australia has an established and well-accepted national policy on the QUM,³⁸ which can readily be applied to CAM use as it is built upon the following principles of medicine use:

- **Judicious**—whether prescribed, recommended and/or self-selected, medicines should only be used when appropriate and non-medicinal alternatives considered as needed.
- **Appropriate**—the most appropriate medicine should be chosen, taking into account factors such as the condition being treated, the potential risks and benefits of treatment, dosage, length of treatment, and cost.
- **Safe**—adverse events and medicine misuse, including overuse and under-use, should be minimised.
- **Efficacious**—the medicine must achieve the goals of therapy by delivering beneficial changes in actual health outcomes.

Performing a comprehensive medication review, can promote the QUM of CAMs in the elderly (Table 1). The main difference between a conventional medication review and one involving CAMs is that the products may be unfamiliar and they generally contain multiple ingredients.

Table 1. Performing a medication review of complementary and alternative medicines

Inspect product(s)	Where was it made? Is it registered for use in Australia? Formulation? Administration technique required?
Identify all remedies being used	All the brand names. All ingredients. Dose and duration of treatment
Quantify benefit	What is the therapeutic purpose? Is it real? Outcome-based benefit. Level of supportive evidence? If the therapeutic purpose is meaningless or unrealistic, consider ensuring the patient is aware.
Quantify risks	Adverse reactions: What potential for intrinsic and extrinsic adverse effects? Interactions: Adding in new drug(s) increases the risk of interactions. Expense: Is the outlay in terms of money and time affordable to the patient? Disappointment: Sometimes a failed response can have devastating effects on the patient's level of hope for future treatment success. Assess whether the disappointment from failure is too great a chance to take. Delay in effective treatment and disease progression: Some disease states are more amenable to treatment at specific stages of progression. Avoid wasting precious time if the most efficacious treatments can only be used at this point in time.
Risk versus benefit	Compare potential benefit of the remedy with potential harm, and decide with the patient, whether using the product should proceed.

Information on most CAMs are now described in readily available, up-to-date, peer-reviewed textbooks and web sites (Table 2) and a wealth of primary research is available. The ingredients of most CAMs should be identifiable, as Australian regulations mandate that all therapeutic goods, including CAMs, be registered or listed before marketing in Australia. Part of this process requires all ingredients to be declared on packaging as

Table 2. Useful resources on complementary and alternative medicines

Web sites	Comments
The Natural Medicines Comprehensive Database <www.naturaldatabase.com>	Subscription required
The Natural Pharmacist <community.health.gate.com/>	Free access
The Longwood Herbal Taskforce <www.mcp.edu/herbal/>	Free access
Association of Natural Medicine Pharmacists <www.anmp.org/monographs.htm>	Free access
eCAM <ecam.oupjournals.org>	Free access
National Centre for Complementary and Alternative Medicine <www.herbmed.org>	Some free access
American Botanical Council <www.herbalgram.org>	Free access
Bandolier Complementary and Alternative Therapies <www.jr2.ox.ac.uk/bandolier/booth/booths/altmed.html>	Free access
Memorial Sloan-Kettering Cancer Centre <www.mskcc.org/mskcc/html/11570.cfm>	Free access
WHO monographs <www.who.int/medicines/library/trm/medicinaplants/monograph_volume_two.shtml>	Free access
Botanical Pathways (online or hard copy) <www.botanicalpathways.com>	Free access
Textbooks	Comments
Ernst E, editor. The desktop guide to complementary and alternative medicine-an evidence-based approach. Edinburgh: Mosby; 2002.	Review of evidence
Barnes J, Andersen LA, Phillipson JD. Herbal medicines. 2nd ed. London: Pharmaceutical Press; 2002.	British
Fugh-Berman A. The 5-minute herb and dietary supplement consult. Philadelphia: Lippincott Williams & Wilkins; 2003.	US
Fetrow CW, Avila JR. Professional's handbook of complementary and alternative medicines. 4th ed. Philadelphia: Lippincott, Williams & Wilkins; 2003.	Convenient handbook size
Blumenthal M, editor. The ABC clinical guide to herbs. Austin: American Botanical Council; 2003.	Herbals only
Cherniak P, Cherniak N. Alternative medicine for the elderly. New York: Springer; 2003.	Geriatric focus
Braun L, Cohen M. Herbs and natural supplements - an evidence based guide. Sydney: Elsevier; 2005.	Australian
DerMarderosian A, Beutler JA. The review of natural products. Facts and comparisons. St Louis: Wolters Kluwer Health Inc; 2005.	Updated monthly

well as in their formal submission to the Therapeutic Goods Administration. It is recognised, however, that CAMs such as traditional remedies, extemporaneous herbals and imported products may be less overt about their ingredients, in which case pharmacists can seek information direct from the manufacturer/practitioner, consult a drug information centre or ensure that the consumer takes full responsibility for the consequences of using a remedy with unquantifiable benefits and risks.

EFFICACY

There is a growing body of evidence including randomised, controlled trials and systematic reviews to support the efficacy of certain CAMs for specific conditions.^{16,36,40} It is beyond the scope of this paper to summarise all the evidence, however, a summary of indications for which high levels of evidence support specific herbal treatments is presented in Table 3. A few points should be made regarding interpreting efficacy data in the area of complementary medicine.

Table 3. Indications for which high level evidence supports the efficacy of complementary and alternative medicines^{39,40,50}

Indications	Plant	No. RCTs
Benign prostatic hypertrophy	<i>Serenoa repens</i> (saw palmetto) <i>Pygenum africanum</i> (African plum)	21 18
Anxiety	<i>Piper methysticum</i> (kava kava)	7
Chronic venous insufficiency	<i>Aesculus hippocantum</i> (horse chestnut)	13
Rheumatoid arthritis	Herbal remedies	11
Osteoarthritis	Herbal remedies	5
Migraine prevention	<i>Tanacetum parthenium</i> (feverfew)	4
Hypercholesterolaemia	<i>Cynara scolylus</i> (artichoke)	2
Depression	<i>Hypericum perforatum</i> (St John's wort)	27

Firstly, the rigorous principles of evidence-based medicine are not always applied in CAM literature. Published reviews and marketing materials can frequently be found to focus on positive studies and omit negative findings. Secondly, the application of clinical trial data to elderly subjects should be conservative as clinical trials of CAMs are rarely conducted in the elderly, doses usually do not account for renal impairment, and comorbidities such as heart disease or diabetes (common in the elderly) may have been excluded.

As with prescription medicines, the findings of clinical trials can only be attributed to the product actually tested. Hence, when consulting efficacy data of herbal remedies it is important to note the type of extract used, its strength and formulation.³⁶ For example, three species of echinacea are used clinically (*E. angustifolia*, *E. purpurea*, *E. pallida*), however, most of the data supporting treatment of the common cold is based on extracts of *E. purpurea*. Therefore, only *E. purpurea* extracts can be considered effective. Moreover, most research focuses on single ingredients, rather than the combination products that are commonly available.

PROBLEMS IN THE ELDERLY

Although most CAMs have a relatively low potential for toxicity when used at recommended doses, a broad range of intrinsic and extrinsic adverse events are increasingly being associated with their use.³⁷ Intrinsic adverse events are those that occur as a consequence of the pharmacology of the substance, whether predictable (type A) or idiosyncratic (type B). For example, ginkgo biloba has been associated with various forms of haemorrhage (type A),³⁹ and kava kava has been linked with hepatitis (type B).³⁶ Extrinsic adverse events are not related to the

herb itself, but to problems in commercial manufacture or compounding, including adulteration and contamination. For example, the association between l-tryptophan and eosinophilic myalgia syndrome was most likely caused by a contaminant from the manufacturing process.³⁹

To make a rational assessment of CAM safety, it is best to consult high-quality resources for up-to-date information on possible toxicity issues (Table 1). Clearly, the patient's age, genetic constitution, nutritional state, concomitant diseases and concurrent medication need to also be taken into account. Adverse events associated with CAMs are not well documented, as consumers and health professionals have generally been unaware of their responsibility to participate in CAM pharmacovigilance. However, this may be changing.

In May 2004, the World Health Organization (WHO) alerted health professionals of an alarming rise in adverse reaction reports to CAM therapies in the preceding two years.⁴¹ As a result they issued new guidelines on safe and appropriate use of CAMs in an attempt to temper over-enthusiastic uptake, especially in developing countries. WHO has also advocated the creation of reporting systems for consumers in order to better capture adverse events associated with self-medication. The Adverse Medicine Event Line was established in Australia in October 2003 and a substantial percentage of consumer reports have been associated with CAMs.⁴²

The eight Hepler and Strand drug-related problem types⁴³ are a useful tool for classifying CAM-related problems in the elderly. In addition, there is a range of indirect harms that can ensue from CAMs, which should be explained to consumers. These include their cost in terms of money and time, withdrawal or delay of more effective treatment, and disappointment/loss of hope if the CAM is ineffective.⁴⁴

POLYPHARMACY

A critical issue in the elderly is that CAM use exacerbates polypharmacy, which is a risk factor for drug interactions, medication errors and hospitalisation.⁹ This is especially relevant as most CAMs contain multiple medicines and older consumers tend to take multiple products. This was demonstrated by Canter and Ernst in a survey of 271 British seniors, who admitted to regularly using a mean of 5.91 (range 4-7) herbal and nutritional supplements and the group used a mean of 2.26 prescription drugs.⁹ Interestingly, they found no statistically significant correlation between the number of CAMs and the number of prescription drugs taken. In a Canadian survey of 193 older adults with cognitive impairment, 15% used one herbal remedy, 13.8% used two and 44.8% used three or more.¹⁶

DRUG INTERACTIONS

As the number of medicines increases, so too the risk of drug interactions. A Canadian study of older adults attending a memory clinic found that almost one-third of patients were at risk of a herb-drug interaction⁴⁵ and Smith et al. found that 19.2% of patients on warfarin were taking at least one CAM that may interact with it.⁴⁶ In geriatric patients, CAMs with anticoagulant properties such as ginkgo biloba, garlic and fish oils should be closely monitored given the likelihood of co-administration with drugs such as warfarin, aspirin, clopidogrel or heparin. In the hospital setting, an important concern is the interaction between CAMs and perioperative medicines such as muscle relaxants, narcotic analgesics and anaesthetics.^{48,49}

The identification of CAM-drug interactions in the elderly are grossly under-recognised.⁴⁹ However, many interactions with CAMs can be predicted and avoided with knowledge of how CAMs influence the cytochrome P450 and P-glycoprotein systems (Table 4).

Table 4. Selected complementary and alternative medicines and their cytochrome P450/P-glycoprotein (PGP) influences^{49,51}

	Substrates of	Inhibitors of	Inducers of
Caffeine (e.g. in guarana)	1A2, 3A4	1A2	-
Cranberry juice	-	2C9*	-
Echinacea (purpurea root)	-	1A2, 2C9, 3A4	Intestinal 3A
Ethanol	2E1	-	-
Fish oils	-	3A4 (<i>in vitro</i>)	-
Garlic	2E1	2C9,* 2C19,* PGP*	-
Ginkgo biloba	-	2E1	1A2,* 3A*
Ginseng	-	3A*	-
Goldenseal	-	3A4 (<i>in vitro</i>)	-
Grapefruit	-	3A4,5,7, PGP	-
Liquorice	-	2B6, 2C9, 3A	-
Marijuana	-	-	1A2
Oestradiol	1A2, 3A4	1A2	-
Progesterone	2C19, 3A4	PGP	-
Quercetin	-	2C8	-
Smoking/tobacco	-	-	1A2
St John's wort	-	PGP (acute use)	1A2, 2C9, 2C19, 3A, PGP (chronic use)
Testosterone	3A4,5,7	PGP	-
Valerian	-	3A4 (<i>in vitro</i>)	-
Watercress	-	2E1	-

*Preliminary data

Table 5. Therapeutic monitoring guidelines for some complementary and alternative medicines (CAMs)²

CAM	Full blood count	Liver function tests	Urea and electrolytes	Coagulation	Blood glucose
Alfalfa	-	-	-	X	X
Aloe vera	-	-	X	-	-
Angelica	-	-	-	X	-
Bee pollen	-	-	-	-	X
Borage	-	X	-	-	-
Cascara	-	X	-	-	-
Cat's claw	-	-	-	X	-
Celandine	-	X	-	-	-
Chaparral	-	X	-	-	-
Chondroitin	X	-	-	X	-
Comfrey	-	X	-	-	-
Damiana	-	X	-	-	-
Dandelion	-	-	-	-	X
Fenugreek	-	-	-	X	X
Fish oils	-	-	-	X	-
Garlic	X	-	-	X*	-
Ginger	-	-	-	X	-
Ginkgo biloba	-	-	-	X	-
Ginseng	-	-	-	-	X
Glucomannan	-	-	-	-	X
Goldenseal	X	-	-	-	-
Gotu kola	-	-	-	-	X
Guggul	-	-	-	X	-
Hesperidin	-	-	-	X	-
Horse chestnut	-	X	-	X	-
Irish moss	-	-	-	X	-
Kava kava	-	X	-	-	-
Kelp	-	-	-	X	-
Liquorice	-	-	X	-	-
Meadowsweet	-	-	-	X	-
Milk thistle	-	X	-	-	-
Mistletoe	-	-	X	-	-
Olive leaf	-	-	-	-	X
Pau d'Arco	-	-	-	X	-
Red clover	-	-	-	X	-
Royal jelly	-	-	-	-	X
Schisandra	-	X	-	-	-
Shark cartilage	-	X	-	-	-
Skullcap	-	X	-	-	-
Turmeric	-	-	-	X	-
Valerian	-	X	-	-	-
Walnut	-	X	-	-	-
Willowbark	-	X	X	X	-
Wormwood	-	-	X	-	-
Yerba mate	-	X	X	-	-
Yew	-	X	-	-	-
Yohimbe	-	-	X	-	-

*Only high dose garlic > 4 g/day.

DOSAGE ADJUSTMENT AND MONITORING

Alteration of dosage to account for age-related decline in renal function can rarely be pursued in CAM, as the relevant pharmacokinetic properties of most remedies are unidentified. However, Fetrow and Avila have provided therapeutic monitoring guidelines with some commonly used CAMs (Table 5).⁵² This is an area that is largely unexplored, so careful patient monitoring, together with a good knowledge of pharmacology and pharmacokinetics, will alert the clinician where dosage alteration is required.

CONCLUSION

The extensive use of CAMs in the elderly makes it imperative for health professionals to have knowledge of the relevant issues associated with their use. CAM use exacerbates the risks of polypharmacy such as interactions and adverse reactions, but given that some remedies are efficacious, the decision to trial an unproven remedy is an exercise in assessing the risks and benefits.

Competing interests: None declared

References

1. McKenzie J, Keller HH. Vitamin-mineral supplementation and use of herbal preparations among community-living older adults. *Can J Public Health* 2001; 92: 286-90.
2. Foster DF, Phillips RS, Hamel MB, Eisenberg DM. Alternative medicine use in older Americans. *J Am Geriatr Soc* 2000; 48: 1560-5.
3. Kaboli PJ, Doebbeling BN, Saag KG, Rosenthal GE. Use of complementary and alternative medicine by older patients with arthritis: a population based study. *Arthritis Rheum* 2001; 45: 398-403.
4. Flaherty JH, Takahashi R. The use of complementary and alternative medical therapies among older persons around the world. *Clin Geriatr Med* 2004; 20: 179-200.
5. Cohen RJ, Kirsten Ek, Pan CX. Complementary and alternative medicine (CAM) use by older adults: a comparison of self-report and physician chart documentation. *J Gerontol A Biol Sci Med Sci* 2002; 57: M223-7.
6. Astin JA, Pelletier KR, Marie A, Haskell WL. Complementary and alternative medicine use among elderly persons: a one year analysis of a Blue Shield Medicare supplement. *J Gerontol A Biol Sci Med* 2000; 55: M4-9.
7. Cherniak EP, Senzel RS, Pan CX. Correlates of use of alternative medicine by elderly in an urban population. *J Altern Complement Med* 2001; 7: 277-80.
8. Weng YI, Raab C, Georgiou C, Dunton N. Herbal and vitamin/mineral supplement use by retirement community residents: preliminary findings. *J Nutr Elder* 2004; 23: 1-13.
9. Canter PH, Ernst E. Herbal supplement use by persons aged over 50 in Britain: frequently used herbs, concomitant use of herbs, nutritional supplements and prescription drugs, rate of informing doctors and potential for negative interactions. *Drugs Aging* 2004; 21: 597-605.
10. Gozum S, Unsal A. Use of herbal therapies by older, community-dwelling women. *J Adv Nurs* 2004; 46: 171-8.
11. Della Buono M, Urciuoli O, Marietta P, Padoani W, De Leo D. Alternative medicine in a sample of 655 community-dwelling elderly. *J Psychosom Res* 2001; 50: 147-54.
12. Zeilmann CA, Dole EJ, Skipper BJ, McCabe M, Rhyne RL. Use of herbal medicine by elderly Hispanic and non-Hispanic white patients. *Pharmacotherapy* 2003; 23: 526-32.
13. Najm W, Reinsch S, Hochler F, Tobis J. Use of complementary and alternative medicine among the ethnic elderly. *Altern Ther Health Med* 2003; 9: 50-7.
14. Therapeutic Goods Administration. Complementary medicines information sheets: who uses them. Available from <www.tga.gov.au/docs/html>. Accessed 12/01/05.
15. MacLennan AH, Wilson DH, Taylor AW. The escalating cost and prevalence of alternative medicine. *Prev Med* 2002; 35: 166-73.
16. Cherniak P, Cherniak N. *Alternative medicine for the elderly*. Berlin: Springer; 2003.
17. National Center for Complementary and Alternative Medicine. What is complementary and alternative medicine (CAM)? Available from <nccam.nih.gov>. Accessed 12/01/05.
18. Therapeutic Goods Administration. Medicines definitions-complementary medicines. Available from <www.tga.gov.au/docs/html>. Accessed 12/01/05.
19. Coulter ID, Willis EM. The rise and rise of complementary and alternative medicine: a sociological perspective. *Med J Aust* 2004; 180: 587-9.
20. Spencer JW, Jacobs JJ. *Complementary and alternative medicine. An evidence based approach*. 2nd edition. St Louis Missouri. Mosby 2003.
21. Johns Cupp M, Tract TS. *Dietary supplements: toxicology and clinical pharmacology*. New Jersey: Humana Press; 2003.
22. Flaherty JH, Takahashi R, Teoh J, Jeung-Im K, Habib S, Ito M, et al. Use of alternative therapies in older outpatients in the United States and Japan: prevalence, reporting patterns, and perceived effectiveness. *J Gerontol A Biol Sci Med Sci* 2001; 56: M650-6.
23. Sleath B, Rubin RH, Campbell W, Gwyther L, Clark T. Ethnicity and physician-older patient communication about alternative therapies. *J Altern Complement Med* 2001; 7: 329-35.
24. Cuellar N, Aycock T, Cahill B, Ford J. Complementary and alternative medicine (CAM) use by African American (AA) and caucasian American (CA) older adults in a rural setting: a descriptive, comparative study. *Complement Altern Med* 2003; 3: 8-15.
25. Mackenzie ER, Taylor L, Bloom BS, Hufford DJ, Johnson JC. Ethnic minority use of complementary and alternative medicine (CAM): a national probability survey of CAM utilizers. *Altern Ther Health Med* 2003; 9: 50-56.
26. Jones J. Ethnicity may affect alternative, complementary therapy choices. *J Nat Cancer Inst* 2001; 93: 1522-3.
27. Cappuccio FP, Duneclift SM, Atkinson RW, Cook DG. Use of alternative medicines in a multi-ethnic population. *Ethn Dis* 2001; 11: 11-18.
28. Egede LE, Ye X, Zheng D, Silverstein MD. The prevalence and pattern of complementary and alternative medicine use in individuals with diabetes. *Diabetes Care* 2002; 25: 324-9.
29. Cassileth BR, Deng G. Complementary and alternative therapies for cancer. *Oncologist* 2004; 9: 80-9.
30. Eisenberg DM, Kessler RC, Van Rompay MI, Kaptchuk TJ, Wilkey SA, Appel S, et al. Complementary therapies relative to conventional therapies among adults who use both: results from a national survey. *Ann Intern Med* 2001; 135: 344-51.
31. Tasaki K, Maskarinec G, Shumay DM, Tatsumura Y, Kakai H. Communication between physicians and cancer patients about complementary and alternative medicine: exploring patients' perspectives. *Psychooncology* 2002; 11: 212-20.
32. Kelner M, Wellman B. Health care and consumer choice: Medical and alternate therapies. *Soc Sci Med* 1997; 45: 203-12.
33. Barnes J. Quality, efficacy and safety of complementary medicines: fashions, facts and the future. Part I. Regulation and quality. *Br J Clin Pharmacol* 2003; 55: 226-33.
34. Thorne S, Paterson B, Russell C, Schultz A. Complementary/alternative medicine in chronic illness as informed self-care decision-making. *Int J Nurs Stud* 2002; 39: 671-83.
35. Vickers AJ, Cassileth BR. Unconventional therapies for cancer and cancer-related symptoms. *Lancet Oncol* 2001; 2: 226-32.
36. Barnes J. Quality, efficacy and safety of complementary medicines: fashions, facts and the future. Part II. Efficacy and safety. *Br J Clin Pharmacol* 2003; 55: 331-40.
37. Drew AK, Myers SP. Safety issues in herbal medicine: implications for the health professions. *Med J Aust* 1997; 166: 538-41.
38. Department of Health and Ageing. National Medicines Policy: Quality Use of Medicines. Available from <www.health.gov.au/internet/wcms/publishing.nsf/Content/nmp-quality.htm>. Accessed 12/01/05.
39. Jellin J. *Natural medicines comprehensive database*. 3rd ed. Stockton: Therapeutic Research Faculty; 2000.
40. Barnes J, Andersen LA, Phillipson JD. *Herbal medicines. A guide for healthcare professionals*. 2nd ed. London: Pharmaceutical Press; 2002.
41. World Health Organization. New WHO guidelines to promote proper use of alternative medicines. Available from <www.who.int/mediacentre/news/releases/2004/en>. Accessed 12/01/05.
42. McGuire TM, Moses GM. Adverse medicine events line-progress report. The first 1470 calls. Canberra: Australian Council for Safety and Quality in Health Care; 2004.
43. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm* 1990; 47: 533-43.
44. MacLennan AH. The four harms of harmless therapies. *Climacteric* 1999; 2: 73-4.
45. Lee MSW, Dergal J, Gold J, et al. Use of herbals and potential interactions between herbals and conventional drug therapy in older adults attending a memory clinic. *Pharmacoepidemiol Drug Saf* 2001; 10: S145.
46. Smith L, Ernst E, Ewings P, Myers P, Smith C. Co-ingestion of herbal medicines and warfarin. *Br J Gen Pract* 2004; 54: 439-41.
47. Grymonpre RE, McKechnie M, Briggs C. Community pharmacists' identification of natural health product/drug interactions in older persons. *Int J Pharm Pract* 2003; 11: 217-23.
48. Haynes LC, Martin JH, Endres D. Use of non-traditional therapies-implications for older adults. *AORN J* 2003; 77: 913-22.
49. Ang-Lee MK, Moss J, Yuan CS. Herbal medicines and perioperative care. *JAMA* 2001; 286: 208-16.
50. Ernst E. Complementary medicine pharmacist? *Pharm J* 2004; 273: 197-8.
51. Osterheld J, Osser DN, Sandson NB. Mental health connections CYP450, UGT and PGP drug interactions program. Lexington: Mental Health Connections Inc; 2005. Available from <www.mhc.com>. Accessed 12/01/05.
52. Fetrow CW, Avila JR. *Professional's handbook of complementary and alternative medicines*. 4th ed. Philadelphia: Lippincott, Williams and Wilkins; 2003.

Submitted: January 2005

Accepted after external peer review: March 2005

