

performance. Reports of severe and fatal adverse events associated with use of ephedra-containing products led to an evidence-based review of the data surrounding them, and in 2004, the FDA banned their sale in the United States.

Another major current concern with dietary supplements is adulteration with pharmacologic active compounds. Multi-ingredient products marketed for weight loss, body building, “sexual health,” and athletic performance are of particular concern. Recent FDA recalls have involved contamination with steroids, diuretics, stimulants, and phosphodiesterase type 5 inhibitors.

**Herb-Drug Interactions** A number of herbal products have potential impact on the metabolism of drugs. This effect was illustrated most compellingly with the demonstration in 2000 that consumption of St. John’s wort interferes with the bioavailability of the HIV protease inhibitor indinavir. Later studies showed its similar interference with metabolism of topoisomerase inhibitors such as irinotecan, with cyclosporine, and with many other drugs. The breadth of interference stems from the ability of hyperforin in St. John’s wort to upregulate expression of the pregnane X receptor, a promiscuous nuclear regulatory factor that promotes the expression of many hepatic oxidative, conjugative, and efflux enzymes involved in drug and food metabolism.

Because of the large number of compounds that alter drug metabolism and the large number of agents some patients are taking, identification of all potential interactions can be a daunting task. Several useful Web resources are available as information sources (Table 14e-2). Clearly, attention to this problem is particularly important with drugs with a narrow therapeutic index, such as anticoagulants, antiseizure medications, antibiotics, immunosuppressants, and cancer chemotherapeutic agents.

#### PATIENT AND PROVIDER RESOURCES

Physicians regularly face difficult challenges in providing patients with advice and education about complementary practices. Of particular concern to all physicians are practices of uncertain safety and practices that raise inappropriate hopes. Cancer therapies, antiaging regimens, weight-loss programs, sexual function, and athletic performance are frequently targeted for excessive claims and irresponsible marketing. A number of Internet resources provide critical tools for patient education (Table 14e-3). Because many complementary health products and practices are used as self-care and because many patients research these approaches extensively on the Internet, directing patients to responsible websites can often be very helpful.

**TABLE 14e-2 RESOURCES FOR DIETARY SUPPLEMENT–DRUG INTERACTIONS**

##### Medscape

<http://www.medscape.com/druginfo/druginterchecker?cid=med>

This website is maintained by WebMD and includes a free drug interaction checker tool that provides information on interactions between two or more drugs, herbals, and/or dietary supplements.

##### Natural Medicines Comprehensive Database

<http://naturaldatabase.therapeuticresearch.com>

This website provides an interactive natural product–drug interaction checker tool that identifies interactions between drugs and natural products, including herbals and dietary supplements. This service is available by subscription. A PDA version is available.

##### Natural Standard

<http://www.naturalstandard.com/tools/>

This website provides an interactive tool for checking drug and herb/supplement interactions. This service is available by subscription. A PDA version is available.

**Abbreviation:** PDA, personal digital assistant.

**TABLE 14e-3 INTERNET RESOURCES ON COMPLEMENTARY HEALTH APPROACHES**

##### The Cochrane Collaboration Complementary Medicine Reviews

This website offers rigorous systematic reviews of mainstream and complementary health interventions using standardized methods. It includes more than 300 reviews of complementary health practices. Complete reviews require institutional or individual subscription, but summaries are available to the public.

<http://www.cochrane.org/cochrane-reviews>

##### MedlinePlus All Herbs and Supplements, A–Z List

##### MedlinePlus Complementary and Alternative Medicine

##### NLM FAQ: Dietary Supplements, Complementary or Alternative Medicines

These National Library of Medicine (NLM) Web pages provide an A–Z database of science-based information on herbal and dietary supplements; basic facts about complementary health practices; and federal government sources on information about using natural products, dietary supplements, medicinal plants, and other complementary health modalities.

[http://www.nlm.nih.gov/medlineplus/druginfo/herb\\_All.html](http://www.nlm.nih.gov/medlineplus/druginfo/herb_All.html)

<http://www.cochrane.org/cochrane-reviews>

<http://www.nlm.nih.gov/medlineplus/dietarysupplements.html>

##### National Institutes of Health National Center for Complementary and Alternative Medicine (NCCAM)

This National Institutes of Health NCCAM website contains information for consumers and health care providers on many aspects of complementary health products and practices. Downloadable information sheets include short summaries of complementary health approaches, uses and risks of herbal therapies, and advice on wise use of dietary supplements.

<http://www.nccam.nih.gov>

Resources for Health Care Providers: <http://www.nccam.nih.gov/health/providers>

NCCAM Clinical Digest e-Newsletter: <http://www.nccam.nih.gov/health/providers/digest>

Continuing medical education lectures: <http://www.nccam.nih.gov/training/videolectures>

The scientific evidence regarding complementary therapies is fragmentary and incomplete. Nonetheless, in some areas, particularly pain management, it is increasingly possible to perform the kind of rigorous systematic reviews of complementary health approaches that are the cornerstone of evidence-based medicine. A particularly valuable resource in this respect is the Cochrane Collaboration, which has performed more than 300 systematic reviews of complementary health practices. Practitioners will find this a valuable source to answer patient questions. Practice guidelines, particularly for pain management, are also available from several professional organizations. Links to these resources are provided in Table 14e-3.

#### SUMMARY

The use of complementary and alternative health practices reflects an active interest in improved health. An array of unproven modalities will always be used by our patients. While some of these choices need to be actively discouraged, many are in fact innocuous and can be accommodated. Some may be genuinely helpful, particularly in the management of troublesome symptoms. The dialogue with patients about complementary health practices is an opportunity to understand patients’ beliefs and expectations and use those insights to help guide health-seeking practices in a constructive way.

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