

Seaweed, vitamin K, and warfarin

Many drugs and foods affect the response to oral anticoagulants.¹ New sources of dietary vitamin K are still being discovered.² We describe a change in the International Normalized Ratio (INR) in a patient taking warfarin who consumed a large quantity of sushi that contained *asakusa-nori*, a type of seaweed.

A 33-year-old woman was admitted to our institution for a tissue mitral valve replacement. Warfarin sodium therapy was started postoperatively, and about 2 mg/day kept the INR within or near the desired range of 2–3 after hospital discharge. Although the patient reported adhering to the warfarin regimen, the INR was lower than expected on days 23 and 26 of warfarin therapy. The patient revealed that she had consumed 12 pieces of sushi on day 22 and an unknown quantity on day 25 (table).

Sushi is gaining popularity in North

America.³ The rice in sushi is often wrapped in or mixed with *asakusa-nori*, a marine alga that is processed into thin sheets. We used a previously described assay⁴ to measure the vitamin K₁ (phytonadione) content of the prepackaged brand of sushi consumed by the patient and of another brand from another city. The phytonadione content averaged 18.8 µg per 100 g of the brand of sushi consumed by the patient and 11.4 µg/100 g in the other. We estimate that our patient consumed only about 45 µg of phytonadione on day 22 of warfarin therapy. Because of her prolonged postoperative course and antimicrobial therapy during hospitalization, however, her vitamin K stores may have been low, and the amount consumed in the sushi may have accounted for a large percentage of her vitamin K intake or stores at the time.

Sushi and other foods containing

asakusa-nori should be included on the list of vitamin K-containing foods that may interfere (usually transiently) with maintenance of the desired INR. Intermittent changes in vitamin K intake should not necessitate permanent changes in the warfarin dosage.

1. Wells PS, Holbrook AM, Crowther NR et al. Interactions of warfarin with drugs and food. *Ann Intern Med.* 1994; 121:676-83.
2. Bartle WR, Ferland G. Fiddleheads and the International Normalized Ratio. *N Engl J Med.* 1998; 338:1550. Letter.
3. Sushi on a roll. *Toronto Globe Mail.* 1999; Apr 12:A20.
4. Ferland G, Sadowski JA. Vitamin K₁ (phylloquinone) content of green vegetables; effects of plant maturation and geographical growth location. *J Agric Food Chem.* 1992; 40:1874-7.

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Association of International Normalized Ratio (INR) with Sushi Consumption

Day of Warfarin Therapy	INR	Warfarin Sodium Dosage (mg/Day)
21	3.17	2
22	2.34	2 (sushi consumed)
23	1.64	3
24	2.27	2.5
25	2.32	2.5 (sushi consumed)
26	1.77	3
27	2.15	3

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The Letters column is a forum for rapid exchange of ideas among readers of AJHP. Liberal criteria are applied in the review of submissions to encourage contributions to this column.

The Letters column includes the following types of contributions: (1) comments, addenda, and minor updates on previously published work, (2) alerts on potential problems in practice, (3) observations or comments on trends in drug use, (4) opinions on apparent trends or controversies in drug therapy or clinical research, (5) opinions on public health issues of interest to pharmacists in health systems, (6) comments on ASHP activities, and (7) human interest items about life as a pharmacist. Reports of adverse drug reactions must present a reasonably clear description of causality.

Short papers on practice innovations and other original work are

included in the Notes section rather than in Letters.

Letters need not be submitted with AJHP's manuscript checklist. The following conditions, however, must be adhered to: (1) the body of the letter must be no longer than two typewritten pages, (2) the use of references and tables should be minimized, (3) the number of authors should be no more than three, (4) the authors' names, affiliations, and mailing addresses must be typed at the end of the letter in the format used by AJHP, and (5) the entire letter (including references, tables, and authors' names) must be typed double-spaced. After acceptance of a letter, the authors are required to sign an exclusive publication statement and a copyright transferal form. All letters are subject to revision by the editors. Authors do not receive proofs of edited letters.

Letters may be sent via the Internet to ajhp@ashp.org.

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Meeting of oncology residency program directors

The First Annual Meeting of Oncology Residency Directors was held December 3, 2000, during the ASHP Mid-year Clinical Meeting (MCM) to address issues pertinent to specialized oncology residency training. Twenty representatives from 14 institutions attended. The session began with a presentation of the results of an oncology specialty residency survey completed earlier in the year by residency program directors. Survey responses regarding requirements for acceptance, staffing, specific rotations, and teaching requirements, as well as satisfaction with the interviewing process for oncology pharmacy residency programs, were reviewed.

One discussion addressed specialty residency program recruitment and interviewing. The group concluded that it was not in the best interest of oncology specialty residency programs to be involved in an ASHP-coordinated matching program. This was due mainly to the large number of oncology programs not currently accredited by ASHP, the relatively small number of oncology programs in general, and the small pool of applicants in recent years. A date was established before which offers could not be made to applicants for an oncology residency position. This removes the need for candidates to accept or reject such offers made before concluding interviews with other programs. February 15, 2001, was selected, and a letter encouraging all programs to comply with this date was sent to oncology residency program directors. Initial feedback suggested that the date was feasible and effective in eliminating early offers. The group will decide at the next meeting

whether this date should be used in the future.

The need for a comprehensive residency directory was addressed. Although the directories provided by ASHP and the American College of Clinical Pharmacy are useful, they do not provide detailed descriptions of program content, and neither directory includes all the oncology specialty residency programs. A comprehensive directory would be a valuable tool for those interested in oncology residency training. A Web-based directory with links to individual program Web sites was considered ideal by most residency programs. The programs that do not currently have a Web site agreed to work toward developing one.

A decline in the number of oncology specialty residency applicants over the past few years was recognized. After the meeting, a survey was conducted to collect baseline information for the 2001–2002 residency applicant pool. Nineteen oncology residency programs participated in the survey. There were a median of 3 (range, 1–9) applicants per program. Eighty-two percent of the applicants had pharmacy practice residency experience. Of those applicants who were interviewed onsite, 92% had completed a pharmacy practice residency. Of a total of 21 residency positions available, 11 were filled. The number of unfilled positions is alarming and threatens continued availability of highly trained oncology pharmacy specialists. Development of an informational program for oncology residency directors, preceptors, and residents and students interested in oncology may increase interest in and awareness of specialty training in oncology

pharmacy. A steering committee to develop such a meeting is being organized; this meeting may be held during the 2001 MCM.

The group unanimously decided that an annual meeting of all oncology residency program directors would benefit the future of training in this field. The group of directors will meet again during the 2001 MCM. All directors of oncology residency training programs are invited. Issues discussed at the prior meeting will be revisited to evaluate progress. Other topics to be discussed include developing formalized resident-exchange programs, rotation requirements, and resident staffing. To our knowledge, this is the first meeting of specialty residency directors to formally meet to discuss training issues. The group could serve as the voice of oncology pharmacy residency directors when making statements and recommendations to other groups and organizations. As the number of oncology residency training programs increases and the field evolves, it becomes more important for the specialty of oncology pharmacotherapy to organize and determine where specialized oncology residency training should be directed in the future.

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An essential perspective

The Reflections article in the July 1, 2001, issue of *AJHP*, "What I Learned When I Thought I Was Teaching," should be required reading in every undergraduate and graduate program in pharmacy education.¹ This article is so insightful, and the perspective so important, that I cannot overemphasize its value in pharmacy education, pharmacy practice, and managed care pharmacy. The article reminded me of writings by Angaran.^{2,3} Thank you, Jane Kerzee, for sharing this experience.

1. Kerzee J. What I learned when I thought I was teaching. *Am J Health-Syst Pharm*. 2001; 58:1250-1.
2. Angaran DM. My magic pill. *Am J Hosp Pharm*. 1982; 39:1548.
3. Angaran DM. I will never sing for my father. *Am J Hosp Pharm*. 1984; 41:772.

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Editor's note: The author of the Reflections article has informed us that Kurt, the patient she described, died on June 25, 2001. The editors encourage readers to submit manuscripts dealing with the nontechnical aspects of a pharmacist's life for possible publication in the Reflections section.

money for the health system as a whole and should be maintained.

With regard to the copayment debate, I would add that many of our patients come to us because they are unable to afford the copayments required of them by our local health system. Larger institutions must consider the effect that copayments will have on the smaller and resource-deficient "safety-net" providers in their area. While copayments may increase revenues at a larger institution, they force some patients from this organized system into local free clinics that are already busting at the seams.

Dr. Wilson's Mercedes-versus-Chevrolet metaphor is not applicable to the care of indigent patients. While the statement was well-meant, to me ownership of an automobile is primarily a luxury, while access to basic health care and pharmaceuticals is a necessity. Many of our patients are not choosing among luxuries but are choosing which necessities to do without. Do they buy food and diapers, or do they seek health care?

Abuse of the indigent care system occurs, of course. Our response should not be to design restrictions that deny care to the truly needy, but to detect the abusers and remove them from the system.

Pharmacists see all too many patients who choose not to receive the benefit of needed drug therapy because of the cost. These patients include the unemployed, underemployed, uninsured, and underinsured (including many of our nation's seniors who only have Medicare). Our profession needs to be a part of the solution for these patients. This discussion is a step in that direction.

1. Hatwig CA, Miller DE, McAllister JC et al. Providing pharmaceutical care for indigent patients: a roundtable discussion. *Am J Health-Syst Pharm*. 2001; 58:867-78.

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Pharmaceutical services for indigent patients

As a pharmacy educator and clinical pharmacist working with indigent patients daily, I commend ASHP and the panelists for the recent roundtable discussion of indigent care.¹

An important element in the care of indigent patients was overlooked: the contributions that nonprofit organizations make to the care of such patients. Nonprofits, whether free health clinics or church-based groups, carry much of the burden for indigent care. I practice at the Kansas City Free Health Clinic (KCFHC), which provides free medical care to people in the greater Kansas City, Missouri, area.

In 2000 alone, KCFHC provided 12,877 health care visits to the medically and pharmaceutically indigent. The care is primarily given by volunteer physicians, one staff nurse practitioner, one staff registered nurse, one staff medical assistant, and volunteer nurses and assistants, with support from two University of Missouri–Kansas City School of Pharmacy faculty members and many pharmacy students.

Escalating drug costs are an issue across all areas of health care, and the

problem is particularly acute in the indigent care setting. Our clinic has only \$1400 per month dedicated to the purchase of pharmaceuticals for these patients through a grant from another local nonprofit group. Any other funds for drug purchases come directly from the general medicine budget; this interferes with the clinic's ability to hire other staff to help care for this population. Because of the limited funds, we must rely on manufacturer samples and assistance programs to augment our inadequate formulary. While these programs are tenuous—as was well described in the roundtable discussion—they may be the only means by which our patients can obtain their medications.

I would like to encourage decision-makers not to look to mail-order as an answer to the high cost of providing pharmaceuticals. In addition to the many valid reasons given in the discussion, mail-order removes yet one more interaction with the pharmacist. Bypassing this interaction denies the patient the potential benefit of the clinical services the pharmacist provides at the point of dispensing. This interaction can save