

Letters

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Safe Use of Latex Rubber

To the Editor: Drs. Sussman and Beezhold (1) reviewed the increasing problems associated with natural rubber latex allergy and the roles played by latex gloves but did not address the option of simply shifting from natural rubber latex gloves to medically and economically acceptable nonlatex gloves.

Although extensive precautions are now available to patients known to be allergic to latex (1), a significant number of health care workers and persons in the general population have an unrecognized latex allergy (1).

Some powder-free latex gloves are designated "hypoallergenic," implying that the risk for anaphylaxis or other serious allergic reactions may be greatly reduced or eliminated. Recent studies (2, 3) indicate that use of powder-free latex gloves can significantly reduce airborne latex antigen levels. The cornstarch powder used in some gloves is known to increase the bioavailability of latex antigens. In vitro studies indicate that powder-free gloves release less latex antigen (4); however, no data indicate that substituting powder-free latex gloves is safe for routine use by or on latex-allergic health care workers or patients. Percutaneous, respiratory, or mucous membrane exposure to latex antigens can elicit allergic reactions, and each may represent a route of sensitization. Persons who already express IgE may sustain or increase their sensitivity with continued exposure to even powder-free latex gloves.

We have observed some latex-allergic health care workers who developed contact urticaria after donning powder-free latex gloves. As a consequence, we have begun to study the antigens elutable from "hypoallergenic" powder-free latex gloves. Aqueous extracts were made (1 g of glove fragments in 10 mL of water for 20 hours, 1:10 weight in volume) of four brands of such gloves. Duplicate percutaneous skin tests were done on four adult volunteers allergic to latex. Powder-free glove extracts elicited positive wheal and flare reactions (average wheal diameter, >3.5 mm) to all four extracts in one or more test participants. Controls showed no reaction. In confirmation of previously reported in vitro radioallergosorbent test inhibition data (4), our data indicate that clinically significant amounts of latex antigens can elute from "hypoallergenic," powder-free latex gloves.

Clearly, the latex gloves currently in widespread use pose an

immunologic hazard to an increasing number of patients and health care workers (1–4). The data indicate to us that little justification exists for the continued use of powdered latex gloves. Until data are available to assure the safety of modified latex gloves, serious consideration should be given to the routine use of nonlatex gloves.

Timothy J. Sullivan, MD
Barbara E. Magera, MD
Emory Clinic
Atlanta, GA 30322

References

1. Sussman G, Beezhold DH. Allergy to latex rubber. *Ann Intern Med*. 1995;122:43–6.
2. Tarlo SM, Sussman G, Contala A, Swanson MC. Control of airborne latex by use of powder-free latex gloves. *J Allergy Clin Immunol*. 1993; 93:985–9.
3. Swanson MC, Bubak ME, Hunt LW, Yunginger JW, Warner MA, Reed CE. Quantification of occupational latex aeroallergens in a medical center. *J Allergy Clin Immunol*. 1994;93:445–51.
4. Yunginger JW, Jones RT, Fransway AF, Kelso JM, Warner MA, Hunt LW. Extractable latex allergens and proteins in disposable medical gloves and other rubber products. *J Allergy Clin Immunol*. 1994;93:836–42.

To the Editor: In their recent review of latex allergy, Sussman and Beezhold (1) recommend that patients with a positive latex challenge use nonlatex gloves. This recommendation raises the question of the effectiveness of the substitutes—vinyl or synthetic latex (for example, neoprene). The Centers for Disease Control and Prevention and the Occupational Safety and Health Administration have stated that there are no significant differences in barrier protection between intact latex and vinyl gloves. During regular use, however, vinyl appears to tear more easily and is therefore substantially more permeable (2, 3). Are the authors aware of data on the effectiveness of nonvinyl synthetic gloves?

Latex gloves have been shown to differ 3000-fold in the amount of allergenic latex protein that can be extracted (with the highest levels in powdered gloves) (4). We have found that many latex-sensitive patients can tolerate a lower allergenic powder-free glove (for example, Safeskin). Assuming that latex offers a greater barrier protection than vinyl, low antigenic latex gloves should be tried before a substitute is considered.

The review also mentions that health care workers often present with allergic rhinoconjunctivitis and asthma. At the New York Hospital, at least one professional in each unit with high glove use (for example, the operating room, intensive care unit, or laboratory) has significant asthma from latex and requires daily medication to continue working. Respiratory symptoms develop from inhaling latex attached to glove powder, which becomes airborne as gloves are used. A recent report found that airborne latex allergen in a medical center ranged from 13 to 268 ng/m³ in areas of frequent powdered glove use compared with 0.3 to 1.8 ng/m³ in areas in which powdered gloves were seldom or never used. Absorption of the antigen onto mucosal surfaces may also enhance the development of sensitivity in exposed workers and patients.

In view of the above factors, an interim approach to this problem should be the widespread use of powder-free gloves. A future theoretical treatment may be specific immunotherapy, but the relevant antigen has not yet been clearly defined. Powder-free gloves are generally more expensive, but this factor should be weighed against the potential costs of disability compared with those of enabling persons already sensitized to continue to work.

Most importantly, further sensitization of both health care workers and patients should be prevented. *Primum non nocere*.

Gillian M. Shepherd, MD

The New York Hospital-Cornell Medical Center
New York, NY 10021

References

1. Sussman GL, Beezhold DH. Allergy to latex rubber. *Ann Intern Med*. 1995;122:43-6.
2. Korniewicz DM, Laughton BE, Cyr WH, et al. Leakage of virus through used vinyl and latex examination gloves. *J Clin Microbiol*. 1990;28:787-8.
3. DeGroot-Kosolcharoen J, Jones JM. Permeability of latex and vinyl gloves to water and blood. *Am J Infect Control*. 1989;17:196-201.
4. Yunginger JW, Jones RT, Fransway AF, Kelso JM, Warner MA, Hunt LW. Extractable latex allergens and proteins in disposable medical gloves and other rubber products. *J Allergy Clin Immunol*. 1994;93:836-42.
5. Swanson MC, Bubak ME, Hunt LE, Yunginger JW, Warner MA, Reed CE. Quantification of occupational latex aeroallergens in a medical center. *J Allergy Clin Immunol*. 1994;94:445-51.

In response: Latex allergy is a significant occupational hazard affecting 5% to 10% of health care workers. Latex-related illness causes severe morbidity and potentially life-threatening anaphylactic shock (1). A clear hospital policy is necessary to deal with this increasingly important problem.

Nonallergenic natural rubber latex is not currently available. Because latex-allergic patients have reported severe clinical allergy to low-protein latex gloves, we cannot recommend their use in persons with a positive history, skin test result, or radioallergen sorbent test result. Patients with clear histories of latex-induced contact urticaria, rhinitis, conjunctivitis, asthma, and anaphylaxis can safely use most nonlatex alternatives to prevent allergic consequences.

However, several issues are important in choosing an alternative. Studies have reported increased viral leakage through vinyl substitutes (2). We do not believe that vinyl be considered as an adequate alternative to latex in high-risk situations. Other non-latex substitutes are available and should be used by patients allergic to latex.

The use of powder-free latex will not prevent clinical allergy in sensitized persons but will decrease airborne latex and allow allergic patients to continue to work (3). Powder-free gloves would significantly decrease but not completely eliminate inhalation of latex, one very important route of sensitization. Powder-free gloves would also reduce other complications in surgery (4).

The cost of powder-free latex gloves is competitive with that of powdered examination and surgical gloves, but there may be limited availability. We recommend that low-allergen, powder-free latex gloves be used by all health care workers except patients with known latex allergies.

Government agencies must recognize latex allergy as a real and significant health hazard. The government must also regulate the safe use of latex. This includes adequate labeling of products so that the material of manufacture is clearly identified. The term hypoallergenic should be removed and replaced by meaningful values for latex protein, chemical additives, and glove powder. Manufacturers must voluntarily lower the allergenic content of their latex gloves to prevent sensitization and latex allergic illness.

Gordon L. Sussman, MD

Toronto, Ontario M4V 1R2
Canada

Donald H. Beezhold, PhD

Guthrie Foundation for Medical Research
Sayre, PA 18840

References

1. Ownby DR, Tonlanovich M, Sammons N, McCullough J. Anaphylaxis associated with latex allergy during barium enema examinations. *AJR Am J Roentgenol*. 1991;156:903-8.
2. Korniewicz DM, Laughton BE, Cyr WH, et al. Leakage of virus through used vinyl and latex examination gloves. *J Clin Microbiol*. 1990;28:787-8.

3. Tarlo SM, Sussman GL, Contala A, Swanson MC. Control of airborne latex by use of powder-free latex gloves. *J Allergy Clin Immunol*. 1994;93:985-9.
4. Beck WC, Beezhold DH. Starch powder should follow talc into limbo [Editorial]. *J Am Coll Surg*. 1994;178:185-6.

Thyroxine or Iodine Therapy for Thyroid Nodules

To the Editor: I read with interest the article by La Rosa and colleagues (1), which described the treatment of benign solitary solid cold nodules of the thyroid. I question the authors' rationale for treatment. Presuming that these nodules are completely asymptomatic and truly benign, this management strategy is preventive rather than therapeutic. According to the U.S. Preventive Task Force recommendations, performance of a preventive service is based on the quality of evidence that this service results in more good than harm (2).

After the thyroid nodule is determined to be benign by fine-needle aspiration—which has been proved to be safe, accurate, and cost-effective (3)—three possibilities exist for the future course of this nodule:

1. It can remain benign at the same, smaller, or larger size. (Untreated thyroid nodules disappear in 38% of cases, and only 13% of nodules increase in size [4].)
2. New satellite benign nodules can form.
3. Cancer can develop within the nodule or outside the nodule in another part of the thyroid gland.

Because no scientific evidence in La Rosa and colleagues' study or in other studies suggests that thyroid replacement prevents malignancy or improves health or longevity, we must turn to its potential harmful effects. Thyroid replacement dosage, if not carefully adjusted, can lead to osteoporosis or thyrotoxic heart disease. Additional harm includes the cost of the medication, follow-up laboratory testing, and the inconvenience to the patient resulting from lifelong medication use.

Mayo Clinic proceedings conclude that the role of levothyroxine therapy remains uncertain and is not recommended (5). I therefore conclude that, until further data accumulate, thyroid replacement is unjustified in the treatment of benign thyroid nodules.

Joseph Di Poala Sr., MD

University of Rochester Medical School
Rochester, NY 14623

References

1. La Rosa GL, Lupo L, Giuffrida D, Gullo D, Vigneri R, Belfiore A. Levothyroxine and potassium iodide are both effective in treating benign solitary cold nodules of the thyroid. *Ann Intern Med*. 1995;122:1-8.
2. Guide to Clinical Preventive Services: An Assessment of the Effectiveness of 169 Interventions. Report of the U.S. Preventive Services Task Force. Baltimore: Williams & Wilkins; 1989.
3. Gharib H, Goellner R. Fine needle aspiration biopsy of the thyroid: an appraisal. *Ann Intern Med*. 1993;118:282-9.
4. Kuma K, Matsuzuka F, Kobayashi A, Hirai K, Morita S, Miyauchi A, et al. Outcome of long standing solitary thyroid nodules. *World J Surg*. 1994;16:583-7.
5. Gharib H. Fine needle aspiration biopsy of thyroid nodules: advantages, limitations, and effect. *Mayo Clin Proc*. 1994;69:44-9.

In response: We strongly disagree with Dr. Di Poala's presumption that cold thyroid nodules are "totally asymptomatic and truly benign" and also with his misleading assertion that "untreated thyroid nodules disappear in 38% of cases, and only 13% of nodules increase in size."

Solitary benign cold nodules of the thyroid are not asymptomatic, and their presence may affect both quality and duration of life. Although these nodules rarely grow large enough to cause compression signs, patients feel uncomfortable because of aesthetic problems or fear of malignancy. The presence of malignancy cannot be completely ruled out by fine-needle aspiration biopsy, which, even in experienced hands, has a false-negative rate of 1% to 10% (1).

Further, most studies indicate that only a few solid nodules shrink by 50% or more, let alone disappear, without treatment (range, 0% to 20%) (2, 3). To support his thesis, Dr. Di Poala quotes the work of Kuma and colleagues (4). However, he fails to say that an invited commentary at the end of that report

underlines the possible selection bias of the study—only 140 (85 with solid nodules) of 2609 invited patients were actually examined. Should new nodules appear during follow-up, malignancy will become more difficult to exclude. For these reasons, many untreated patients eventually have prophylactic thyroidectomy and bear the costs, morbidity, and mortality associated with this procedure. Dr. Di Paola does not inform the reader that in the study he cites, 68% of examined patients developed multiple nodules and 36.3% of patients who responded had had surgery.

In our study (2), L-thyroxine administration not only prevented nodule growth and the appearance of new nodules but also induced a substantial shrinkage in 40% of solid solitary cold benign nodules. Small nodules are more sensitive to thyroid-stimulating hormone (TSH) suppression; however, L-thyroxine therapy may also be beneficial in large nodules because it may prevent further nodule growth. For this reason, growth of a nodule during L-thyroxine treatment is a strong indication for surgical removal of the nodule, regardless of the cytologic diagnosis. Thyroxine treatment therefore improves diagnostic accuracy and avoids long-term anxiety and unnecessary surgery. These favorable results can be obtained using a L-thyroxine dose that decreases but does not fully suppress serum TSH levels and therefore does not induce subclinical hyperthyroidism. Even if subclinical hyperthyroidism is temporarily present in some patients, this intermittent condition is not associated with harmful cardiac or bone effects (5).

Finally, follow-up laboratory testing does not add cost because repeated procedures (cytologic testing, ultrasonography) are also advisable for untreated nodules. The adjunctive cost of L-thyroxine medication, therefore, is very low and favorably balanced against the benefits.

Giacomo L. La Rosa, MD
Riccardo Vigneri, MD
Antonino Belfiore, MD
University of Catania
I-95123 Catania
Italy

References

1. Gharib H, Goellner R. Fine-needle aspiration biopsy of the thyroid: an appraisal. *Ann Intern Med.* 1993;118:282-9.
2. La Rosa GL, Lupo L, Giuffrida D, Gullo D, Vigneri R, Belfiore A. Levothyroxine and potassium iodide are both effective in treating benign solitary solid cold nodules of the thyroid. *Ann Intern Med.* 1995;122:1-8.
3. Mandel SJ, Brent GA, Larsen PR. Levothyroxine therapy in patients with thyroid disease. *Ann Intern Med.* 1993;119:492-502.
4. Kuma K, Matsuzuka F, Kobayashi A, Hirai K, Morita S, Miyauchi A, et al. Outcome of long standing solitary thyroid nodules. *World J Surg.* 1992;16:583-8.
5. Faber J, Galloe AM. Changes in bone mass during prolonged subclinical hyperthyroidism due to L-thyroxine treatment: a meta-analysis. *Eur J Endocrinol.* 1994;130:350-6.

Tamoxifen-Induced Steatohepatitis

To the Editor: Tamoxifen is one of the most commonly used oncologic therapeutic agents. Ongoing studies are evaluating the potential of tamoxifen as a chemopreventive agent for breast cancer; a reduction in the risk for development of cardiovascular disease and osteoporosis are being used as secondary end points in these studies. Although its overall safety record has been good, tamoxifen has been associated with endometrial cancer, retinopathy, and thromboembolic events. We report a case of tamoxifen-induced steatohepatitis.

A 55-year-old woman had bilateral mastectomies for breast cancer. She began receiving tamoxifen after surgery. Results of liver function tests done before treatment were normal. Two years later, the patient was noted to have an alanine aminotransferase level of 164 U/L (normal, 0 to 30 U/L) and an aspartate aminotransferase level of 224 U/L (normal, 0 to 35 U/L). She was symptom-free and had no signs of recurrent breast cancer. She rarely drank alcohol, and tamoxifen was the only drug started after surgery. Results of serologic tests for hepatitis, iron studies, and serum protein electrophoresis were either negative or normal. An ultrasound of the liver was consistent with fatty

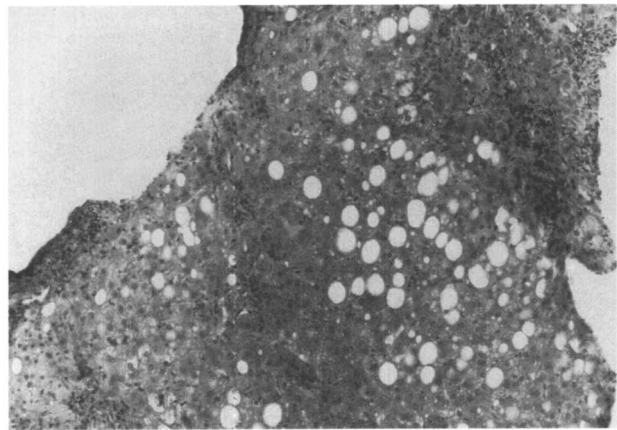


Figure 1. Percutaneous liver biopsy specimen showing macrovesicular fat infiltration, lobular inflammation, and portal inflammation with fibrosis. (Masson trichrome; original magnification, $\times 54$.)

infiltration. Liver biopsy was done after the aminotransferase levels had been elevated for 9 months; examination of the biopsy specimen showed diffuse macrovesicular fat, lobular inflammation, and a moderate amount of portal inflammation with fibrosis (Figure 1). Nonalcoholic steatohepatitis was diagnosed on the basis of these characteristic histologic findings and on the absence of alcohol use. Tamoxifen therapy was discontinued, and within 4 months, the aminotransferase levels were normal.

Liver damage secondary to tamoxifen use is rare. In the more than 20 years since the drug was introduced, no reports have associated it with nonalcoholic steatohepatitis. Predisposing factors for the disease include obesity, diabetes, hyperlipidemia, and female sex. The histologic findings are diagnostic and include steatosis, portal and lobular inflammation, Mallory bodies, and fibrosis (1-4). These findings are indistinguishable from those of alcohol-induced liver disease but occur in patients without a history of alcohol use. Several drugs have been associated with nonalcoholic steatohepatitis, including estrogens, but the mechanism of this drug-induced liver injury is unknown. Tamoxifen does have weak estrogenic effects (5) and therefore may have a similar mechanism.

The diagnosis of nonalcoholic steatohepatitis is easily missed because of the absence of clinical manifestations (2). This has serious clinical implications because it is now well established that the disease can progress to cirrhosis (2-4). Therefore, patients receiving tamoxifen should have liver function tests before initiation of therapy and regularly during treatment.

Daniel S. Pratt, MD
Tamsin A. Knox, MD
John Erban, MD
New England Medical Center
Boston, MA 02111

References

1. Ludwig J, Viggiano TR, McGill DB, Ott BJ. Nonalcoholic steatohepatitis. Mayo Clinic experiences with a hitherto unnamed disease. *Mayo Clin Proc.* 1980;55:434-8.
2. Diehl AM, Goodman Z, Ishak KG. Alcohol-like liver disease in nonalcoholics. *Gastroenterology.* 1988;95:1056-62.
3. Powell EE, Cooksley WG, Hanson R, Searle J, Halliday JW, Powell LW. The natural history of nonalcoholic steatohepatitis: a follow-up study of forty-two patients for up to 21 years. *Hepatology.* 1990;11:74-80.
4. Bacon BR, Farahvash MJ, Janney CG, Neuschwander-Tetri BA. Nonalcoholic steatohepatitis: an expanded clinical entity. *Gastroenterology.* 1994;107:1103-9.
5. Plowman PN. Tamoxifen as adjuvant therapy in breast cancer. *Drugs.* 1993;46:819-33.

Astemizole in the Treatment of Granulocyte Colony-Stimulating Factor-Induced Bone Pain

To the Editor: Granulocyte colony-stimulating factor (G-CSF) is commonly used to stimulate the production of granulocytes. A

major side effect of G-CSF is bone and generalized muscle pain, which can last for 10 or more days. The pain may be severe enough to require narcotic analgesics (1). It has been suggested that G-CSF may potentiate the inflammatory reaction by causing distinct cellular signaling and by increasing the histamine release (2). An increase in histamine levels has been shown to cause nociceptive c-fiber-mediated pain and neuropathic pain (3). Bennett (4) suggested that high levels of histamine can increase edema formation within bone; the increased pressure leads to pain. Investigators have observed that antihistamines such as terfenadine and astemizole have anti-inflammatory properties in addition to their potency as histamine-1 antagonists (5).

We report a case in which G-CSF-induced bone pain and generalized myalgia resolved with an oral antihistamine (astemizole).

A 59-year-old woman with bilateral breast cancer was treated every month with taxol, 390 mg, by intravenous infusion over 24 hours. Granulocyte colony-stimulating factor was administered for 10 days after taxol treatment. The patient reported generalized myalgia and bone pain that was not relieved by Tylenol (McNeil Consumer Products Company, Fort Washington, Pennsylvania) during her previous chemotherapy cycles. During her last cycle of chemotherapy, astemizole was given concurrently with G-CSF as follows: 30 mg once on day 1; 20 mg once on day 2, and 10 mg once a day on days 3 to 10. Pain completely resolved during this full chemotherapeutic cycle.

Taxol-induced bone and muscle pain, which usually lasts for 24 to 72 hours, has been reported to be relieved by terfenadine (5). Our patient had continuous pain that lasted for 10 days, suggesting that G-CSF was responsible. Oral antihistamine therapy appears to be effective in resolving G-CSF-induced pain.

Rajashree Gudi, MD
Muthuswamy Krishnamurthy, MD
Bruce R. Pachter, PhD
New York Methodist Hospital
Brooklyn, NY 11215

References

1. Weaver CH, Buckner CD, Longin K, Appelbaum FR, Rowley S, Lilleby K, et al. Syngeneic transplantation with peripheral blood mononuclear cells collected after the administration of recombinant human granulocyte colony-stimulating factor. *Blood*. 1993;82:1981-4.
2. König B, König W. Effect of growth factors on *Escherichia coli* alpha-hemolysin-induced mediator release from human inflammatory cells. Involvement of the signal transduction pathway. *Infect Immun*. 1994;62:2085-93.
3. Baron R, Sager M. Postherpetic neuralgia. Are c-nociceptors involved in signaling and maintenance of tactile allodynia? *Brain*. 1993;116:1477-96.
4. Bennett A. The role of biochemical mediators in peripheral nociception and bone pain. *Cancer Surv*. 1988;7:55-67.
5. Martoni A, Zamagni C, Ghika A, Pannuti F. Antihistamines in the treatment of taxol-induced paroxysmal pain syndrome. *J Natl Cancer Inst*. 1993;85:676.

Physician Assistants and Nurse Practitioners

To the Editor: We are writing in response to the American College of Physicians' recent position paper on the role of physician assistants and nurse practitioners (1). As registered nurses studying to become nurse practitioners, we represent a growing force of providers who will be prepared to provide primary care to many persons in all stages of life. It is important to clarify some misleading issues described in the College's position paper.

In the paper, the educational preparation of the nurse practitioner was compared with that of the physician assistant. It is noted that nurse practitioners spend 9 to 24 months learning the expanded role in which they can diagnose and treat commonly occurring acute and chronic illnesses. Physician assistants have 24 months of training in which to learn the same. What was not made clear in the College's statement is that nurses must have at least a Master's degree in nursing to be certified as a nurse practitioner by our professional organization. To be accepted into a Master's program, a nurse must have already completed a Bachelor of Science degree, which in the field of nursing requires an average of 4 years of undergraduate work to complete, and

must have practiced as a registered nurse for at least 1 year. Therefore, to be prepared for the role of nurse practitioner, a person must have between 6 and 7 years of educational and clinical preparation. Most of our classmates have many more years of clinical practice than that described here. In addition, State Boards of Nursing control the licensing requirements of nurse practitioners, and most now require that nurse practitioners be certified.

The College supports the role of practitioners only when the physician is responsible for the quality of care provided. Physicians must understand that nurse practitioners practice under their own licenses, not under that of a physician. Nurse practitioners must be accountable not only to physicians but also to the patient, the profession, and themselves.

We do agree with the College's position that the scope of practice should be evidence-based. We welcome the availability of research funding and interdisciplinary research done collaboratively between the nursing and medical professions. In addition, the College supports the development of collaborative communication systems. We do believe that collaboration is essential to safe and effective health care and support the search for more cost-effective and higher-quality ways to provide primary health care to all persons in the United States.

Jane Maffie-Lee, RN, MSN
Christine Cadegan, RN, BSN
Margerie Geronomo, RN, BSN
Quincy, MA 02169

Reference

1. American College of Physicians. Physician assistants and nurse practitioners. *Ann Intern Med*. 1994;121:714-6.

To the Editor: The American College of Physicians recently voiced its position on the role of nonphysician health care providers (1). The College recognizes the need for an expanded role of nonphysicians to meet future demands for primary health care. The debate on midlevel practitioners has previously focused on physician assistants and nurse practitioners. I suggest that a third group of practitioners—clinical pharmacists—also be considered.

Equipped with extensive didactic and clinical pharmacology training, PharmDs and other clinical pharmacists are often called on by physicians, physician assistants, and nurse practitioners for therapeutic consultations. (At our institution, 9 hours of pharmacology and 10 hours of applied therapeutics and pharmacology are required, in addition to other pharmacy-related courses such as biopharmaceutics and pharmacokinetics.) A logical extension of a clinical pharmacist's professional expertise would be to acknowledge and formalize this relationship by extending prescriptive authority under physician protocol. Seven states currently authorize prescriptive authority for pharmacists, and other states are considering similar legislation (2). In these models, only clinical pharmacists interested in this role apply to a state authority for credentialing for prescriptive authority under protocol or under the auspices of an attending physician or health care facility. For those physicians who have worked with PharmDs or other clinical pharmacists, the model would offer a welcome relief. Working with physician assistants and nurse practitioners who have diagnostic prowess, the pharmacy practitioners, if allowed to handle the treatment issues (for example, drug therapy selection, monitoring, and modifying and surveillance of adverse effects, drug therapy, and patient counseling), could allow more patients to be seen within a given period.

Any professional with prescribing authority should participate in a checks-and-balances system whereby the prescription is checked by another professional before it is dispensed. To date, this role has been filled by dispensing pharmacists. The College's sixth policy position statement advocates a system in which physician assistants and nurse practitioners dispense their own prescription drugs (1). It is interesting that an association representing physicians has ignored the daily telephone calls physicians receive from pharmacists correcting inaccurate and sometimes dangerous prescriptions that the physician assistants and nurse practitioners have written. To deny these professionals the value of this check system would be a disservice not only to these

midlevel practitioners but, more importantly, to the patients they serve. I strongly urge the College to reconsider their position on this matter.

Health care reform is upon us, whether legislated or not. An increased role for nonphysician health care providers is one of the few possible solutions to meet the need for primary care, especially in rural areas. Clinical pharmacists with prescriptive authority should be considered a part of the solution.

Lucinda G. Miller, PharmD

University of Nebraska Medical Center
Omaha, NE 68198-6045

References

1. American College of Physicians. Physician assistants and nurse practitioners. *Ann Intern Med.* 1994;121:714-6.
2. Feinberg JL. Summation: progress toward prescribing authority for pharmacists. *Consultant Pharmacist.* 1994;9:1121-4.

In response: Educational and certification requirements for registered nurses and nurse practitioners are not uniform. As our paper indicated, nurse practitioners are licensed registered nurses with advanced education ranging from 9 to 24 months of supervised clinical training, generally leading to a Master's degree. However, as Maffie-Lee and colleagues indicate, many nurses obtain advanced training to become nurse practitioners after already having completed educational and licensure requirements as registered nurses. The American Nurses Association has called for a minimum requirement of a Master's degree for certification of nurse practitioners by 1998.

Certification is available from several sources, is generally voluntary, but is not required for licensure in many states. According to survey data compiled for the Division of Nursing of the U.S. Public Health Service (1), as of December 1992, an estimated 37 963 nurses held national certification or state recognition as nurse practitioners or clinical nurse specialists. Of these, 27 746 (73%) were nurse practitioners only, 7998 (21%) were clinical nurse specialists, and 2219 (6%) held dual certification or recognition in both fields. The study cautioned that there is "considerable cross-over and overlap between and among nurse practitioners and clinical nurse specialists, with respect to educational preparation, certification/recognition, and practice." Of the 27 746 nurses certified or recognized only as nurse practitioners, most (51.8%) were prepared as nurse practitioners through a certificate program; the remaining 42.4% obtained their credentials through a Master's degree program. Only 2.8% were educated as nurse practitioners in a post-Master's degree certificate program. Almost all (99.5%) of the clinical nurse specialists obtained their education in Master's degree programs. Of the

nurses with dual certification, 64.1% were prepared as nurse practitioners and clinical nurse specialists at the Master's level in two different programs. The remaining nurses with dual certification received their nurse practitioner education in a certificate program and their clinical nurse specialist education in a Master's program.

In contrast, the training for physician assistants generally consists of at least 2 years at the Bachelor's level. Of the physician assistant's programs, 60% lead to a Bachelor's degree, and the remainder result in an Associate's degree or a certificate.

We agree that nurse practitioners must be accountable not only to physicians but also to patients, the profession, and themselves. We remain convinced, however, that until evidence suggests that advanced practice nurses can provide high-quality care in independent practice arrangements without accountability to physicians, they must continue to function within systems in which physicians bear ultimate responsibility for patient care.

Our paper also noted that nonphysician providers are a heterogeneous group with different educational paths. Dr. Miller reinforces this point in suggesting that we also consider the role of clinical pharmacists. The roles of these professionals and many others were beyond the scope of our paper but certainly should be considered in discussions of the primary health care work force. Dr. Miller also raises the important distinction between dispensing and prescribing authority. The sixth position of our paper was meant to address prescribing authority, not dispensing authority; it will be revised accordingly.

Harold C. Sox Jr., MD

Jack A. Ginsburg, MPE

H. Denman Scott, MD, MPH

American College of Physicians
Philadelphia, PA 19106

Reference

1. Washington Consulting Group. Final Report: Survey of Certified Nurse Practitioners and Clinical Nurse Specialists: December 1992. Washington, DC: Division of Nursing, Bureau of Health Professions. HRSA (240-91-0055); 1994.

Correction: Author's Name

To the Editor: In a recent book review, the name of the first author of *Ethics in Clinical Practice* was incorrectly given as J. C. Aronheim. The correct name is J. C. Ahronheim.

Reference

1. Burchell HB. Review of *Ethics in Clinical Practice*. *Ann Intern Med.* 1995;122:320.