LETTERS TO THE EDITOR

Symptoms of Hypothyroidism

To the Editor:—The data set collected during the study by Canaris and colleagues¹ on hypothyroidism may contain other useful information not yet reported. It seems that a family history of hypothyroidism and being a woman may also be independent predictors of hypothyroidism (thyroid-stimulating hormone [TSH] >20 μ U/mL and low thyroxine level). In Table 1 of their report, 42.6% of case patients but only 16.8% of control patients had a positive family history of hypothyroidism. The difference was statistically significant at $p = .0001$. This p value compares quite favorably with those of most of the current symptoms and many of the changed symptoms. Similarly, 70% of the case patients were women. Although statistical power may be lacking, it might be useful to compare individual current and changed symptoms and combinations of symptoms for both women and men. I wonder whether the likelihood ratio positives (LR+) for women would be higher and the likelihood ratio negatives (LR-) for men would be lower. Conceivably the likelihood ratio negative for a combination of symptoms in men would be low enough to be used in screening and thereby obviate the need for obtaining a TSH level.—**DAVID A. NARDONE, MD**, Veterans Health Affairs Medical Center, Portland, Ore.

REFERENCE

1. Canaris GJ, Steiner JF, Ridgway C. Do traditional symptoms of hypothyroidism correlate with biochemical disease? *J Gen Intern Med*. 1997;12:544–50.

In reply:—Dr. Nardone has brought up an interesting question. The aim of our study was to determine the relation between symptoms and biochemically defined hypothyroidism. Symptoms in newly diagnosed hypothyroid subjects and controls (matched by age and gender) were assessed by self-administered questionnaire. The likelihood of hypothyroidism increased as the number of symptoms reported increased. Because our focus was on the relation of symptoms to likelihood of disease, we did not include family history in the analysis. In response to Dr. Nardone's question, we have extended the analysis.

When we included family history in the conditional logistic regression, it was a statistically significant predictor of hypothyroidism. In fact, family history displaced the current symptom of muscle cramps from the model. The current symptom of hoarse

voice and the changed symptoms of puffer eyes and more constipation remained in the model. The logistic model that included family history was slightly stronger ($\chi^2 = 39.038$ vs 37.066), but this difference was not statistically significant ($p > .10$).

A similar analysis with gender, however, was constrained by study design. Because it is reported in the literature that prevalence rates of hypothyroidism are generally greater for women than men, we had matched subjects with and without hypothyroidism on gender. Thus, we did not include gender in the analysis. When it was included as an independent variable in the model, it did not provide any additional explanatory power.

Dr. Nardone's comments concerning subgroup analysis are correct. Unfortunately, we lacked statistical power to do separate multivariate analyses for each gender.—**GAY CANARIS, MD, MSPH**, with **JOHN STEINER, MD, MPH**, and **E. C. RIDGWAY, MD**, Department of Internal Medicine, University of Nebraska Medical Center, Omaha.

Physicians' Use of Lumbar Spine Imaging Tests

To the Editor:—One of the successes of the outcomes movement during its first decade has been to highlight variations in utilization of medical procedures and services.^{1,2} This variation has raised what I believe should be called the "Goldilocks" issue: Is the variation too much, too little, or just right? Although we hope the movement's second decade will continue to address this issue with effectiveness studies and guideline development, ultimate improvement in care will occur only if the information is effectively disseminated and incorporated into practice. As the study by Freeborn and colleagues shows, however, this will not be straightforward.³ Their study used three of the six previously described methods to change physicians' practices.⁴ Education, feedback, and participation by physicians in the change effort were used; administrative interventions and financial incentives and penalties were not. The study failed, however, to show a decrease in the rate or the variation in rate of lumbar spine imaging.

For the outcomes movement to realize its potential for improving the effectiveness and appropriateness of care, it is not sufficient for studies solely to identify areas of practice variation. They also will need to identify critical influences on the clinical decision underlying that variation. Possible influences include variation in provider knowledge, structural barriers, financial incentives, and the availability of specialists and procedures. Also, as the authors suggest, nonclinical factors such as patient expectations may affect decisions. Only after these influences have been identified can translation be accomplished efficiently.—**DANIEL B. STRYER, MD**, Center for Outcomes and Effectiveness Research, Agency for Health Care Policy and Research, Rockville, Md.

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The opinions expressed in this letter are those of the author and do not represent those of the Agency for Health Care Policy and Research or the Department of Health and Human Services.

REFERENCES

1. Wennberg JE, Freeman JL, Shelto RM, Bubolz TA. Hospital use and mortality among Medicare beneficiaries in Boston and New Haven. *N Engl J Med*. 1989;321:1168-73.
2. Cherkin DC, Deyo RA, Wheeler K, Ciol MA. Physician variation in diagnostic testing for low back pain. Who you see is what you get. *Arthritis Rheum*. 1994;37:15-22.
3. Freeborn DK, Shye D, Mullooly JP, Eraker S, Romeo J. Primary care physicians' use of lumbar spine imaging tests: effect of guidelines and practice pattern feedback. *J Gen Intern Med*. 1997;12:619-25.
4. Greco PJ, Eisenberg JM. Changing physicians' practices. *N Engl J Med*. 1993;329:1271-4.

In reply:—We agree completely with Dr. Stryer's observation that studies should go beyond identifying areas of practice varia-

tion and seek to understand the reasons underlying this variation before carrying out an intervention. Interventions to change physician behavior change are all too often implemented without much thought being given to structural and other barriers that make it difficult for change to take place. We address this point in a forthcoming follow-up paper to be published in *The International Journal for Quality in Health Care* (Vol. 10, No. 2, 1998). The paper draws on data we collected in focus groups with primary care physicians in which we explored their views about the key factors that influence their clinical decisions about use of imaging tests for patients with low-back pain. We conclude that focus groups can be useful in providing the kind of information that can aid in the design of more successful intervention strategies.—**DONALD K. FREEBORN, PhD**, and **DIANA SHYE, PhD**, Center for Health Research, Kaiser Permanente, N.W. Division, Portland, Ore.

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