

(755 nm, 100 nsec) for tattoo pigment removal in an animal model. *J Am Acad Dermatol* 1993; 28:745-750

7. Kilmer SL, Anderson RR: Clinical use of the Q-switched ruby and the Q-switched Nd:YAG (1064 nm and 532 nm) lasers for treatment of tattoos. *J Dermatol Surg Oncol* 1993; 19:330-338

* * *

Dr Stevenson Responds

TO THE EDITOR: The letter from Drs Fitzpatrick and Goldman in response to my epitome is appreciated.¹ My brief article was not written as a comprehensive review of laser therapy. My intent was to emphasize the fact that lasers are useful in treating skin lesions and tattoos. The results are often excellent, although not free of complications. I did omit a discussion of pulsed-dye lasers and the Q-switched pulsed ruby laser, both excellent tools. I thank the authors for a more complete review of the newest treatment techniques.

THOMAS R. STEVENSON, MD
Division of Plastic Surgery
University of California, Davis,
School of Medicine
Sacramento, CA 95817

REFERENCE

1. Stevenson TR: Laser treatment of skin lesions, *In* Epitomes—Important Advances in Clinical Medicine—Plastic Surgery. *West J Med* 1993; 158:404

Audible Third Heart Sound

TO THE EDITOR: I read with interest the article by Patel and colleagues regarding the audible third heart sound.¹ The authors selected an important clinical examination topic for review. They are to be commended for focusing on findings by “generalists” as opposed to “subspecialists” and for calculating test measures (true-positive and false-positive rates) at different cutoff points (ejection fractions < 50% and < 30%).

Their study has several methodologic problems that deserve to be mentioned, however. Interobserver variability was not reported. The authors state that the “cardiologist” examined a patient for a third heart sound when there was disagreement between the two “generalists.” Interobserver variability could have easily been calculated.² This study also suffers from spectrum bias. Patients were selected for clinical examination after a decision had been made that the patient needed radionuclide ventriculography. No doubt the presence of heart failure and a third heart sound is more prevalent in this group than among general internists’ patients. Such bias leads to an overestimation of true-positive rates and perhaps an underestimation of false-positive rates. As a result, the usefulness of the test is overestimated. Although an ideal study is difficult to carry out, its value should have been discussed by the authors. Patients in a general medicine setting should have been assessed at the bedside for jugular venous distension, hepatojugular reflux, rales, fourth heart sound, third heart sound, and peripheral edema. These patients should have had a posteroanterior x-ray film taken of the chest in addition to the gold standard test—radionuclide ventriculography. Test measures (true-positive and false-positive rates) could have been calculated to determine which individual bedside test or com-

bination of tests is best for confirming or excluding cardiac dysfunction at different cutoff points.

I take issue with the authors’ statement that, at an ejection fraction cutoff of less than 30%, the absence of an audible third heart sound excludes, with good confidence, severe cardiac dysfunction. The likelihood ratio negative (LR⁻) for a false-negative rate (0.22) and a true-negative rate (0.88) at an ejection fraction cutoff of less than 30% is 0.25. For pretest probabilities of 0.90, 0.70, 0.50, 0.30, and 0.10, the corresponding posttest probabilities with an LR⁻ of 0.22 are 0.66, 0.34, 0.18, 0.09, and 0.02, respectively. It is doubtful that clinicians or patients would be reassured by a negative finding for a third heart sound unless the pretest probability was low. Thus, traditional thinking that an absence of an audible third heart sound does not rule out cardiac dysfunction is not challenged by the results of this study.

DAVID A. NARDONE, MD
PO Box 1034
Veterans Health Administration
Medical Center, 11cp
Portland, OR 97207

REFERENCES

1. Patel R, Bushnell DL, Sobotka PA: Implications of an audible third heart sound in evaluating cardiac function. *West J Med* 1993; 158: 606-609
2. Ishmail AA, Wing S, Ferguson J, Hutchinson TA, Magder S, Flegel KM: Interobserver agreement by auscultation in the presence of a third heart sound in patients with congestive heart failure. *Chest* 1987; 91:870-873

* * *

Drs Sobotka and Bushnell Respond

TO THE EDITOR: We appreciate the thoughtful comments of Dr Nardone in response to our article.¹ The number of cases in which the initial two examiners disagreed regarding the presence of the third heart sound was approximately five. There is indeed an inherent spectrum bias introduced by selecting for correlation only those patients referred for nuclear ventriculography. This bias increases the population prevalence for severe heart failure and thus would tend to overestimate true-positive rates and underestimate false-positive rates. This “bias” is most appropriate, however, as the correlation would have less clinical meaning if applied to patients in whom the question of ventricular function was not relevant. The decision to refer patients to Nuclear Medicine in our hospital was routinely made by house staff in training to become general internists who care for patients admitted to general medicine services, and thus it reflects a patient sampling and physician interest for which the question is relevant.

Nardone appropriately suggests broadening the scope of our investigation to include the panorama of physical examination observations that historically are thought to document ventricular performance. This list includes, but is not exhausted by, jugular venous distension, hepatojugular reflux, rales, third heart sound, edema, hepatic size and pulsations, indirect definitive precordial percussion, apical pulsation location and size, Valsalva maneuver induction of pressure changes, and post-extrasystolic beat potentiation potential. The Evidence-Based Medicine Working Group has proposed that physical diagnostic maneuvers must meet criteria of accuracy and repro-