

ciple of medical confidentiality is one of the most venerable moral obligations of medical ethics."¹ And years ago, Siegler was "astonished to learn that at least 25 and possibly as many 100 health professionals at our university hospital had access to the patient's record."² Will not the adoption of electronic medical records further increase the number of people with access to those charts?

Ivan D. Miziara, M.D., Ph.D.

ABC School of Medicine
05411-000 Santo André, Brazil
miz@uol.com.br

1. Gillon R. Confidentiality. *Br Med J (Clin Res Ed)* 1985;291:1634-6.
2. Siegler M. Confidentiality in medicine — a decrepit concept. *N Engl J Med* 1982;307:1518-21.

THE AUTHORS REPLY: We agree with Lipschutz that most physicians, once they overcome the challenges of adoption, are happy with the use of electronic health records. Furthermore, the system that the VHA uses is an excellent tool. It is clinically intuitive and has all the features necessary to allow clinicians to deliver high-quality care. Whether it is the right solution for every physician and hospital in the United States is less clear. However, given that the system is free and familiar to many clinicians, many providers may see this as an attractive solution.

With respect to the issue raised by Mueller and

Trentman about anesthesia information systems: we agree that such systems are likely to be helpful for managing the care of high-risk patients. There are other such "specialized" solutions, including information systems in cardiac suites and operating rooms, which are also likely to be valuable for hospitals. Unfortunately, the scope of our survey limited our ability to examine these areas.

Finally, Miziara expresses concern about privacy, which is on the minds of many clinicians and patients as we transition to the widespread use of electronic health records. In contrast to paper-based records, which are highly insecure, enormous focus has been placed on establishing privacy and security standards for electronic records under the privacy rule of the Health Insurance Portability and Accountability Act (HIPAA). Indeed, as recently as February 2009, Congress further strengthened HIPAA to ensure the privacy of health information.

Ashish K. Jha, M.D., M.P.H.

Boston Veterans Affairs Hospital
Boston, MA 02130
ajha@hsph.harvard.edu

Catherine DesRoches, Dr.P.H.

Massachusetts General Hospital
Boston, MA 02114

Sara Rosenbaum, J.D.

George Washington University
Washington, DC 20052

Myocarditis

TO THE EDITOR: Supportive care is the mainstay of therapy for acute myocarditis. In his review article on this topic, Cooper (April 9 issue)¹ notes that studies of immunosuppressive therapy have not shown a clear beneficial role, as compared with usual care. Thus, the beneficial effect of immunosuppressive therapy remains controversial. Treatment that is based on the presence of human leukocyte antigen may be associated with improved outcomes.¹ However, are there other ways to predict who is likely to benefit from immunosuppressive therapy? In one trial, prednisolone that was administered to patients who did not have a response to other treatment or whose clinical condition worsened with virus-negative inflammation had the best clinical and echocardiographic outcomes.² In another study of patients with myocarditis in whom conventional

supportive therapy failed, the overwhelming majority of those who did not have a response to immunosuppressive therapy were found to have viral genomes in biopsy specimens and no cardiac autoantibodies.³ The authors of that study concluded that patients "with circulating cardiac autoantibodies and no viral genome in the myocardium are the most likely to benefit from immunosuppression."³ Thus, physicians should be aware of studies suggesting that patients with virus-negative myocarditis may benefit from immunosuppressive therapy.

John R. Kapoor, M.D., Ph.D.

Stanford University
Stanford, CA 94305

1. Cooper LT Jr. Myocarditis. *N Engl J Med* 2009;360:1526-38.
2. Zimmermann O, Kochs M, Zwaka TP, et al. Myocardial biopsy based classification and treatment in patients with dilated cardiomyopathy. *Int J Cardiol* 2005;104:92-100.

3. Frustaci A, Chimenti C, Calabrese F, Pieroni M, Thiene G, Maseri A. Immunosuppressive therapy for active lymphocytic myocarditis: virological and immunologic profile of responders versus nonresponders. *Circulation* 2003;107:857-63.

TO THE EDITOR: Cooper describes several causes of myocarditis that include a number of viruses, *Borrelia burgdorferi*, *Trypanosoma cruzi*, and other infectious agents. There are additional causes of myocarditis that are not discussed. For example, *Corynebacterium diphtheriae* also can cause myocarditis.¹ Infection with *Campylobacter jejuni*, the most common cause of human bacterial enteritis in developed countries, can be associated with myocarditis, as can salmonella infection.² Anti-cancer drugs can cause cardiac side effects, ranging from arrhythmias to alterations in coronary vasomotion, leading to myocardial ischemia and myocarditis with potentially fatal outcomes. Anthracyclines are potent chemotherapeutic agents associated with various forms of cardiomyopathy. Acute cardiomyopathy is seen within 3 months after drug exposure and may take the form of either a reversible myocarditis and pericarditis or chronic cardiomyopathy with either an early or a late onset.³ These aspects should have been mentioned in the article. Besides the medical treatments for myocarditis that Cooper describes, levosimendan, a positive inotropic drug, has been shown to have beneficial effects on clinical and hemodynamic results in patients with acute decompensated heart failure from myocarditis.⁴

Sebastian Szabo, M.D.

Kardiologische Gemeinschaftspraxis
40764 Langenfeld, Germany
krisztinaszb@aol.com

Thomas Oikonomopoulos, M.D.

Hans Martin Hoffmeister, M.D., Ph.D.
Städtisches Klinikum Solingen
42653 Solingen, Germany

1. Havaladar PV, Sankpal MN, Doddannavar RP. Diphtheritic myocarditis: clinical and laboratory parameters of prognosis and fatal outcome. *Ann Trop Paediatr* 2000;20:209-15.
2. Hannu T, Mattila L, Rautelin H, Siitonen A, Leirisalo-Repo M. Three cases of cardiac complications associated with *Campylobacter jejuni* infection and review of the literature. *Eur J Clin Microbiol Infect Dis* 2005;24:619-22.
3. Simmons A, Vacek JL, Meyers D. Anthracycline-induced cardiomyopathy. *Postgrad Med* 2008;120:67-72.
4. de March Ronsoni R, Feijó RV Jr, Melo LH, et al. The use of levosimendan for myocardial pathy due to acute Chagas' disease. *Int J Cardiol* 2008 July 26 (Epub ahead of print).

TO THE EDITOR: In his comprehensive review, Cooper does not mention acute rheumatic fever as one of the causes of myocarditis. This disease

is an important cause of death and complications from cardiac causes. Acute rheumatic fever is diagnosed in about half a million patients worldwide every year; of these patients, rheumatic heart disease develops in approximately 300,000. This disease is associated with some 233,000 deaths annually.¹ The estimated annual incidence of acute rheumatic fever varies from 374 per 100,000 in the indigenous population of Australia and New Zealand to less than 1 per 100,000 in high-income countries.²

There have been several outbreaks of acute rheumatic fever in middle-class populations in the Salt Lake City region since the mid-1980s.² The disease has not been eradicated yet in the world, and its diagnosis remains a clinical challenge.

Hussam Ammar, M.D.

Erie County Medical Center
Buffalo, NY 14215

Ragai Fouda, M.D.

Bassetlaw Hospital
Worksop S81 0BD, United Kingdom

1. Carapetis JR, McDonald M, Wilson NJ. Acute rheumatic fever. *Lancet* 2005;366:155-68.
2. Cilliers AM. Rheumatic fever and its management. *BMJ* 2006;333:1153-6.

THE AUTHOR REPLIES: Kapoor writes about immunosuppressive therapy for myocarditis. Deciding which patients with myocarditis may respond to immunosuppressive therapy first requires knowledge of the patient's clinical situation. Most patients improve with usual care in the common scenario of acute, mild-to-moderate dilated cardiomyopathy without high-degree heart block or hemodynamically significant ventricular arrhythmias. A cardiac biopsy is seldom needed in this clinical scenario, because histologic results rarely have a meaningful effect on the patient's prognosis or treatment.¹ In contrast, two small, randomized trials suggested that patients with symptomatic, subacute-to-chronic dilated cardiomyopathy whose condition did not improve despite optimal medical management may benefit from a short course of immunosuppression if additional features of altered immunity are present.^{2,3} Investigators have used circulating antimyocardial antibodies, HLA expression on cardiomyocytes, and inflammatory cell-specific immunocytochemical stains to identify responsive populations with subacute-to-chronic dilated cardiomyopathy.⁴ It is not known whether

the presence of viral genomes in the heart can identify a population with dilated cardiomyopathy that would not improve with immunosuppression. Patients with viral genomes that were detected on cardiac biopsy were excluded from the recently reported Tailored Immunosuppression in Inflammatory Cardiomyopathy (TIMIC) trial.³ Multicenter, randomized trials are still needed to assess the effect of immunosuppression on clinically meaningful end points, such as the rate of death and heart transplantation in patients with chronic, persistently symptomatic dilated cardiomyopathy.

I strongly agree with Szabo et al. that specific infections and toxins contribute substantially to the burden of myocarditis, particularly in the developing world. Since many of these specific causes have been addressed in other recent review articles, I chose to use the limited space in my article to focus primarily on viral and select noninfectious, autoimmune cardiac conditions. The authors cite a letter to the Editor concerning two patients with Chagas' cardiomyopathy who responded to levosimendan. At this time, the use of levosimendan for myocarditis is not established.

I agree with Ammar and Fouda that carditis

from post-streptococcal rheumatic fever is a major cause of cardiomyopathy, particularly in the developing world. Frequently the long-term effects of post-streptococcal endocarditis, including atrial fibrillation and stroke, garner more attention than the long-term effects of myocarditis in this disorder. The Gates Foundation is sponsoring an ongoing project on the Global Burden of Disease that should help to separate the long-term morbidity of rheumatic carditis on the basis of major sequelae, including dilated cardiomyopathy.

Leslie T. Cooper, Jr., M.D.

Mayo Clinic
Rochester, MN 55905
cooper.leslie@mayo.edu

1. Cooper LT, Baughman KL, Feldman AM, et al. The role of endomyocardial biopsy in the management of cardiovascular disease: a scientific statement from the American Heart Association, the American College of Cardiology, and the European Society of Cardiology. *Circulation* 2007;116:2216-33.
2. Wojnicz R, Nowalany-Kozielska E, Wojciechowska C, et al. Randomized, placebo-controlled study for the treatment of inflammatory dilated cardiomyopathy: two-year follow-up results. *Circulation* 2001;104:39-45.
3. Frustaci A, Russo MA, Chimenti C. Randomized study on the efficacy of immunosuppressive therapy in patients with virus-negative inflammatory cardiomyopathy: the TIMIC study. *Eur Heart J* (in press).
4. Cooper L. The heat is off: immunosuppression for myocarditis revisited. *Eur Heart J* (in press).

Calculation of Number Needed to Treat

TO THE EDITOR: The number of patients who would need to be treated to prevent a given adverse outcome in one patient, called the number needed to treat, is often used in randomized trials and observational studies to provide a simple measure of the effect of a treatment. The computation of the number needed to treat can, however, be inaccurate and its interpretation misleading in trials with varying follow-up times. In this case, the cumulative incidence of an outcome cannot simply be calculated as a proportion of subjects but must instead be estimated over time by means of the Kaplan–Meier approach that accounts for varying follow-up times.

Trials that based the computation of the number needed to treat on the simple proportion of patients with the outcome, rather than the Kaplan–Meier estimates, may have distorted values of the number needed to treat.¹⁻³ Other trials have ac-

counted for varying follow-up times by using, instead, the incidence rate computed as the number of patients with the outcome divided by the total amount of person-time.^{4,5} However, the corresponding number needed to treat, although based on the incidence rates, was interpreted as the number needed to treat to prevent one occurrence of the outcome among patients treated for a given period, which may be incorrect.

For example, in the recent trial of 3845 elderly patients who had hypertension, with follow-up times varying from 0 to 6.5 years, the incidence rate of stroke was 12.4 per 1000 patient-years for active treatment compared with 17.7 per 1000 patient-years for placebo.⁵ These rates were converted to 2-year rates and the number needed to treat was computed as $1 \div (0.0354 - 0.0248) = 94.3$, interpreted as “1 stroke being prevented because 94 patients were treated for 2 years.”⁵ This inter-