# Letters to the Editor

## To the Editor

### Autonomic Dysfunction in Recovered Severe Acute Respiratory Syndrome Patients

The worldwide outbreak of the severe acute respiratory syndrome (SARS) has been associated with a novel coronavirus.[1] With global eradication of transmission of SARS, research efforts have focused on vaccine development and prevention of future outbreaks. However, little attention has been paid to the morbidity of recovered SARS patients, and effects of the disease on the nervous system. A common complaint is prolonged fatigue and malaise. Based on previous experiences of similar complaints after viral infections, we hypothesized that the symptomatology may be related to peripheral and autonomic nervous system dysfunction.

With ethics committee approval, we studied 14 probable SARS patients (two men, age range 20 to 48 years) who were previously healthy six months after onset of illness, with their consent. They were infected by a SARS patient during a local hospital outbreak but subsequently recovered and returned to work. The diagnoses were based on contact history, clinical features, chest radiological changes and antibody testing. Each patient had a detailed history taken and underwent physical examination, including a complete neurological examination. They underwent nerve conduction (median sensory and motor, ulnar sensory and motor, posterior tibial motor, superficial peroneal sensory, peroneal motor, sural, 'F' waves) and autonomic studies (sympathetic skin responses in four limbs, heart rate measurement over one minute during normal, deep breathing and 30:15 s heart rate ratio to standing up). To ensure validity, each heart rate study was repeated six times and was considered abnormal if more than three showed results exceeding that of controls. For a more robust criterion, only absence of sympathetic skin response in a particular limb was regarded as pathological. Studies were performed using a Medtronic Keypoint (Medtronic, Skovlunde, Denmark) machine with automated analysis.

Each patient then completed a questionnaire based on four questions relating to fatigue symptoms. These comprised subjective severity of fatigue, its relation to time of day, additional rest needed and whether fatigue affected daily activities. Each question was scored from 1 to 7, defined as depicting no change from before illness to maximum severity of symptoms. Hence, the fatigue score ranged from 4 to 28.

The results were compared with those from 30 age-matched (range: 18 to 50 years) normal controls who underwent similar study protocols.

All 14 patients experienced fatigue and malaise. The controls and patients had mean fatigue scores (standard deviation (SD)) of 2.2 (1.5) and 4.7 (0.9) respectively, with statistically significant differences (unpaired t-test, $p<0.005$). None had evidence of postural hypotension (> 20 mm Hg postural drop in blood pressure) or abnormal neurological examination.

Nerve conduction studies were unremarkable, consistent with absence of large fiber system affectation. The stand-up test was significantly abnormal for patients (mean: 1.14, SD: 0.15) compared with controls (mean: 1.28, SD: 0.16) (Mann-Whitney U test, $p<0.05$). Comparison with normal controls of each age group showed four patients had abnormal individual stand-up test ratios, of which three experienced persistent dizziness. Two others with headache and sleep disturbances had normal and deep breathing test abnormalities, respectively. One patient had absent bilateral lower limb sympathetic skin responses.

The findings in this study, which show the presence of dysautonomia in recovered SARS patients, are of interest in several areas. While younger patients suffer less mortality, significant morbidity, particularly chronic fatigue, may be present months after recovery from acute illness.[2] This was supported by statistically significant differences in fatigue scores of patients and controls. The autonomic dysfunction (parasympathetic and sympathetic) documented in 50% of recovered SARS patients in our study appeared to be of higher incidence than postviral idiopathic autonomic neuropathy.[3] While the relationship between our findings and the chronic fatigue syndrome,[4] which share common features, is unclear, abnormal stand-up test results may partially account for subclinical orthostatic hemodynamic disturbances, which contribute to fatigue symptoms and dizziness. More sensitive additional autonomic testing may be useful in this respect. To this end, our study leads to better understanding of clinical problems faced by convalescing SARS, and will be of value in devising future therapeutic regimens.

This study is dedicated to the patients who overcame SARS and continue to live life courageously.

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## To the Editor

**An American-Canadian Neurologist Returns to Canada.** Harvey B. Sarnat. *Can. J. Neurol. Sci. 2004; 31: 436-437.*

Like Dr. Sarnat, we have also recently returned to Canada after twelve years of practice in neurology and neurosurgery in the Midwest of the USA. Before then we had practiced in Canada for fifteen years as an academic neurologist (SJP) and a neurosurgeon in a nonuniversity hospital (GBP). One of us has recently returned to a nonacademic practice in British Columbia. Dr. Sarnat's



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editorial may give comfort to the politicians and academics in Canada, but we believe it does not reflect the reality of patient care in Canada or the United States.

In our experience, the American system generally provides more expedient and better quality health care to the majority of its citizens than most Canadians receive. We worked in an area in the mid west where the market was not dominated by the large employers health maintenance organizations, and we were not in the immediate referral area to a large academic center. About one third of the patients in the practice had coverage from the federal medicare system which insures all patients over the age of 65 as well as those who have qualified for social security disability. Medicare patients do have a copay, up to the limits of a yearly deductible and are not covered for medications. Most of the rest of the patients were covered by insurance they either bought themselves, or obtained through employers, or were covered by the state program for the poor, called Medicaid. About five percent were private pay, meaning they had no insurance, but the city had a clinic funded by the United Way where these patients could get care. The hospitals provided emergency care and necessary inpatient care and the patients negotiated with them afterward regarding the bill if their insurance would not pay it all.

Patients with acute ischemic neurological events did not spend days on an emergency room stretcher waiting for a bed, or wait days in hospital for appropriate imaging (if available at all) like they often do in Canada. Evaluation and urgent treatment with agents such as tPA for stroke is denied to most Canadians because of overcrowded emergency rooms and distant geography, but is the standard of care for cardiac and appropriate neurology cases in most US emergency rooms. Patients with progressive nerve root deficits from lumbar or cervical discs could be quickly imaged and expediently treated, while in Canada we see them wait weeks or months for appropriate imaging and then again for the appropriate surgery. Patients and physicians in Canada have had so little experience with this type of expedient care that they don't expect it, and have come to accept, or not even recognize, the neurologic deficits that result from these delays in treatment.

Dr. Sarnat has conveniently ignored the American federal regulations that deal with some of the abuses he implies. The Stark laws impose harsh penalties on self referral and largely protect the patients from physician financial self interest. The Emergency Medical Treatment and Active Labour Act (EMTALA) ensures that adequate emergency care is provided to everyone regardless of ability to pay. Not-for-profit hospitals are allowed a tax free status in return for indigent care and each state has Medicaid to provide for its most disadvantaged citizens. Dr. Sarnat is correct in noting that health insurance is tied in with employment, so that people are not as free to take part time jobs as they are in Canada for fear of losing coverage, but many state governments are implementing group insurance for the self employed and their families. However, such plans vary a great deal from state to state. The US system is far from ideal, but in the twelve years we practiced there we never saw patients denied essential care and almost always it was provided more expediently than happens in much of Canada.

Before accepting Dr. Sarnat's statement that the Canadian system of universality is fixable, perhaps we should question the idea that equal health care for everyone is a right. What about food and shelter? These are not provided for everyone at an equal level by government monopolies. Human behavior seeks the best for one's self and family. Most western countries, including Australia, New Zealand, Britain and Western Europe, that had monopolistic healthcare have moved to a mixed system. Only Cuba remains in this ideologically legislated state. No country can afford to provide all possible care to all citizens all of the time. Technology has surpassed governments' ability to pay. How we distribute the best care for the most people is our challenge. Dr. Sarnat's satisfaction with Canada's single tier and very bureaucratic system may mislead your readers. Extolling the virtues of a system because it is "essentially fair" is supporting more fairytale than reality in a system that delivers something as personal as health care. By publishing Dr. Sarnat's letter as an editorial rather than an opinion piece, the CJNS comes dangerously close to endorsing one individual's very personal views. This is not the way to encourage critical reading or true debate.

Our experience of both the US and Canadian health care systems is very different from that of Dr. Sarnat. We hope that our views will encourage a more thoughtful debate on the challenges in the neurosciences in providing high quality and comprehensive care for patients with neurological conditions in Canada.

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## To the Editor

**An American-Canadian Neurologist Returns to Canada.** *Harvey B. Sarnat. Can. J. Neurol. Sci. 2004; 31: 436-437.*

In a recent editorial, Harvey Sarnat shared with us his painful and lingering distemper towards health care in the United States.[1] We are accustomed to extend to cheerless men the effects of our understanding. Given the current political climate, and the readership of the Canadian Journal of Neurological Sciences, it is difficult to imagine a more likely recipient. We must remind ourselves, however, that it is not usually in the language of a polemic that we can discern the true character of a flawed system.

I have spent close to five years immersed in the medical culture of the United States. While professionalism in U.S. medicine may appear to have been overtaken by brash mercantilism, or at least undermined by lack of social/ governmental constraint, it has been my experience that most physicians' primary interest rests in the pure and humble challenge of helping their fellow man. Some have degraded their professional dignity, by condescending, for the pursuit of material gain, to join the ranks of the commercial class. But they are in the minority. And a large segment remains intensely devoted to the pursuit of knowledge.

Poverty and access to primary care for the poor are, of course, the great public health challenges in the United States today. And the inflexible, and, if we may use the expression, intolerant free market zeal of the government in power suggests that a solution is not around the corner. But the less restrained laissez faire approach does allow for some advantages.

Because health care spending has not been as limited by government policy as it has been elsewhere, there is more money in the medical economy of the United States. And as a direct result