

## Getting in line

Finally, a research paper makes the case that sick people waiting in line die at a rate similar to or slightly lower than the death rate for other sick people.<sup>1</sup> Will government now be able to say that queuing isn't bad for you? Let's put everyone on a waiting list to reduce the death rates for all diseases.

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### Reference

1. Naylor CD, Szalai JP, Katic M. Benchmarking the vital risk of waiting for coronary artery bypass surgery in Ontario. *CMAJ* 2000;162(6):775-9.

### [One of the authors responds:]

I like Richard Gruneir's *reductio ad absurdum*. It is indeed frustrating that Canada's health care system has reached the point where we need to benchmark the toll of delayed care.<sup>1</sup> Ultimately, however, health professionals and administrators must get on with measuring and managing waiting lists, be it to contain the adverse consequences of poorly organized queues, or simply to provide better evidence to support arguments for additional resources.

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### Reference

1. Naylor CD, Szalai JP, Katic M. Benchmarking the vital risk of waiting for coronary artery bypass surgery in Ontario. *CMAJ* 2000;162(6):775-9.

## How long are TB patients infectious?

In their *CMAJ* paper on nosocomial tuberculosis, Kevin Schwartzman and Dick Menzies state that "if sputum or bronchial secretions are culture positive, then presumably they can still be

disseminated into the air and transmitted to others."<sup>1</sup> This seems logical, but there is ample clinical evidence to show that once treatment with effective chemotherapy is started, the infectiousness of the patient becomes minimal within 2 weeks.

Tuberculosis (TB) is spread by the coughing up of minute droplets smaller than 2 µm. Suspension of these droplets as droplet nuclei necessitates the evaporation of any moisture in less than a fraction of a second. This causes the droplet nucleus to shrink to less than a thousandth of its original size. The concentration of anti-TB drugs in the saliva and bronchial secretions is the same as it is in the blood. With the evaporation of the moisture the dried-out tubercle bacillus in the droplet nucleus is exposed to a thousand-fold increase in the concentration of the drugs.

Schwartzman and Menzies quoted several papers by Richard Riley and his colleagues, dealing mainly with the infectiousness of untreated TB and the use of ultraviolet light in the control of infection. They failed to quote other papers by Riley and colleagues relating to the infectiousness of patients with TB once effective treatment is started.<sup>2,3</sup> Riley and colleagues found that the infectiousness of untreated patients with drug-susceptible organisms was much greater than that of patients on chemotherapy.

About the same time, Wallace Fox and coworkers showed that the tuberculin conversion rates of the close contacts of patients with open cavitary TB being treated with standard chemotherapy were the same regardless of whether the patients were treated in hospital or at home.<sup>4-6</sup> The only contacts who developed a positive tuberculin test or TB per se demonstrated a positive test either at the time of, or within 1 month of, diagnosis of the case. This implies they had inhaled tubercle bacilli before starting treatment and before the tuberculin test had time to convert. These observations made it clear that anti-TB therapy rendered

patients virtually noninfectious within 2 weeks or so; it also persuaded most jurisdictions to eliminate compulsory segregation of subjects being treated for TB and removed the need for sanatoria.

Perhaps it will come as a shock to Schwartzman and Menzies to note the following statements in a highly regarded recent textbook: "for practical purposes patients can be regarded as being noninfectious two weeks after the start of treatment"<sup>7</sup> and "only untreated patients with sputum positive pulmonary TB are likely to be infectious."<sup>8</sup>

### D. Ahmad

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### References

1. Schwartzman K, Menzies D. Tuberculosis: 11. Nosocomial disease. *CMAJ* 1999;161(10):1271-7.
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3. Riley RL, Mills CC, O'Grady F, Sultan Lu, Wittstadt S, Shuvpuri DN. Infectiousness of air from a tuberculosis ward. *Am Rev Respir Dis* 1961;83:511-25.
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5. Fox W. The chemotherapy and epidemiology of tuberculosis. II. *Lancet* 1962;2:473-7.
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8. Davies PDO. The control of tuberculosis. In: Brewis A, Corrin B, Geddes DM, Gibson JG, editors. *Respiratory medicine*. Philadelphia: WB Saunders; 1995. p. 833.

### [The authors respond:]

We agree that the infectiousness of TB patients diminishes rapidly once effective treatment is initiated. However, there is considerable evidence against dogmatic claims that patients are no longer infectious after 2 weeks of treatment.

Among the sentinel contributions of Wells and Riley was the finding that a single viable TB bacillus, once inhaled, is sufficient to produce infection.<sup>1</sup> Viable mycobacteria can persist in sputum for weeks after the onset of therapy,<sup>2</sup> and isoniazid-susceptible TB bacilli in droplet nuclei containing isoniazid were demonstrated to remain viable after 12 hours airborne.<sup>3</sup> Of course, mycobacteria need not survive this long to produce secondary infection if circumstances favour rapid dissemination (e.g., close proximity, no mask use, poor ventilation). These are precisely the circumstances once respiratory isolation is discontinued.

Smear-negative patients can and do transmit TB. Such patients accounted for 17% of secondary transmission in San Francisco.<sup>4</sup> There is also evidence that some mycobacteria are much more infectious than others. This was first suggested by Riley's finding of highly variable infection risks related to patients with similar clinical characteristics.<sup>5</sup> Valway reported a community outbreak where extremely high tuberculin conversion rates followed trivial contacts and demonstrated accelerated growth of the relevant isolate in a mouse model.<sup>6</sup> At present it is impossible to prospectively identify or differentially isolate patients harbouring such organisms.

Community studies suggested that within stable households, transmission to identified contacts (with long-standing antecedent exposure) greatly diminished or ceased once effective treatment

was initiated. However, most of these studies had serious design flaws. The only randomized controlled trial of confinement versus outpatient treatment took place in India, where nearly all contacts evaluated were already infected.<sup>7</sup> It is inappropriate to extrapolate these data to the hospital setting. Hospitals now house sizeable numbers of patients infected with HIV, and other heavily immunosuppressed people. All of these individuals are at increased risk for infection and disease and most have never previously been exposed to TB.

The comments of D. Ahmad and W.K.C. Morgan also rest on the dangerous assumption that all infecting organisms are drug susceptible. Multidrug resistance is uncommon in Canada (1–2% of cases), but resistance to isoniazid was seen in 8.7% of Montreal cases.<sup>8</sup> In these patients, the response to standard therapy may be slower (or nonexistent, in multidrug resistance cases). The laboratory diagnosis of drug resistance cannot be established within 2 weeks. The release of smear-positive, drug-resistant patients onto general medical wards — after 2 weeks of “standard therapy” — has been documented to fuel nosocomial TB outbreaks in the United States, and the attendant risks cannot be overstated.<sup>9</sup>

Before hospitalized smear-positive patients move to general ward rooms, they must clearly respond to treatment. This entails a significant reduction in bacillary load, most reliably docu-

mented by conversion of the smear and supported by clinical parameters such as weight gain and resolution of fever. In some cases this may take 2 weeks or less; in others, much longer. Patients returning to stable households in which contacts have already been evaluated and treated (where appropriate) can indeed be discharged before smear conversion, provided there is clinical evidence of improvement and a suitable follow-up plan. As with other clinical decisions, we believe that a more reasoned approach is preferable to the indiscriminate application of a standard “recipe” — regardless of the (cook)books in which it has previously appeared.

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1. Wells WF. *Airborne contagion and air hygiene. An ecological study of droplet infection.* Cambridge (MA): Harvard University Press; 1955.
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5. Sultan L, Nyka W, Mills C, O'Grady F, Wells W, Riley RL. Tuberculosis disseminators: a study of the variability of aerial infectivity of tuberculosis patients. *Am Rev Respir Dis* 1960; 82:358-69.
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## Supplying PEI with doctors

While I have no major concerns about the details in a recent *CMAJ* article on physician supply in Prince Edward Island,<sup>1</sup> I was surprised and disappointed that only government officials were quoted; surely it would have been desirable to solicit comments from the PEI division of the Canadian Medical Association for the sake of balance.

In fact, there is no guarantee that 6 seats will be allotted to Islanders at Dalhousie University, although this is the average number of students admitted annually from PEI. Furthermore, the location grants differ in some ways from those offered by other provinces.

Since the article states that this plan was developed in consultation with the Medical Society of PEI, it would seem important that the writer also contact the Society for comment.

### Marilyn Lowther

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### Reference

1. Moulton D. PEI spending \$4.2 million to boost physician supply. *CMAJ* 2000;162(9):1340.

## The shoulder bone's connected to the ...

We read with interest the first instalment of the *CMAJ* series on the musculoskeletal system.<sup>1</sup> As musculoskeletal imagers, we agree wholeheartedly with Stephanie Ensworth's opinion of the importance of the musculoskeletal examination in diagnosing disorders that affect such a large segment of the population. Radiologists know the importance of understanding normal anatomy. Consequently we were dismayed to see Fig. 1, which has 4 major errors.

The subacromial-subdeltoid bursa is labelled as the subacromial bursa and is depicted much larger than it is in reality. The insertion of the supraspinatus

tendon, labelled generically as rotator cuff tendon, is incorrectly shown on the upper humeral shaft rather than on the greater tuberosity of the humerus. The insertion of the inferior joint capsule is too low on the humerus. Finally, the arm is in abduction and this figure demonstrates subacromial impingement.

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### Reference

1. Ensworth S. Rheumatology: 1. Is it arthritis? *CMAJ* 2000;162(7):1011-6.

### [The author responds:]

The figure<sup>1</sup> was intended to provide a simplified, quick reminder of the difference between a tendon, bursa, joint capsule and joint. It was not intended to be detailed, nor was it intended to represent a shoulder in any normal or special abduction. Clearly, a more detailed figure would have been more anatomically correct; however, there is the risk of losing the message in the detail.

It is worth noting that the subacromial-subdeltoid bursa is called either the subacromial bursa or the subdeltoid bursa in various rheumatology texts, and rheumatologists use either name to refer to the bursa. The size of the bursa does vary among patients.

I thank Barry Hobbs and Lisa Thain for their critical review of the figure. It serves to remind readers that the shoulder is more complex than the illustration used in this article and that my figure should not be used as an anatomically correct guide.

### Stephanie Ensworth

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### Reference

1. Ensworth S. Rheumatology: 1. Is it arthritis? *CMAJ* 2000;162(7):1011-6.

## Renal transplantation in Saskatchewan

Colin Geddes and Carl Cardella recently reported that the main problems in renal transplantation are the limited supply of donor organs and the failure to improve long-term graft survival rates.<sup>1</sup> The Saskatchewan Transplant Group reported recent evidence for a more optimistic view of these problems in 2 presentations at the 2000 annual meeting of the Canadian Society of Transplantation.

First, the group reported that in each of the past 3 years, the supply of organs has exceeded demand in Saskatchewan; as a result, the waiting list for renal transplantation has been reduced by 25% and the mean waiting time for a graft for recipients without a high plasma reactive antibody titer is now 4 months.<sup>2</sup> These results have been achieved by increasing the emphasis on donations from living donors and enhancing awareness of the need for organs in intensive care units.

Second, the group reported that while its 5-year graft survival rate did not change between 1984 and 1995, it has dramatically improved since 1995: with cadaveric donors the 5-year graft survival rate is now 84% and with living donors it is 94%, despite a marked increase in the number of zero-haplotype matches in the latter group.<sup>3</sup> This has come about because of an 80-90% decrease in the failure rate from chronic allograft nephropathy in postgraft years 1-5 to 1% per year. The reasons for this are not clear, but circumstantial evidence suggests that one factor might be the increased use of angiotensin-converting-enzyme inhibitors, which are known to favourably influence chronic nephropathy in other causes of renal disease such as diabetes.

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### Reference

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2. Baltzan MA, Shoker AS, Boechler B, Keindel I, Dyck RF. Renal transplantation in Saskatchewan: Does supply satisfy demand? [abstract]. *Abstracts of the annual scientific meeting of the Canadian Society of Transplantation*; 2000 Mar 1-4; Mont-Tremblant (Que.). Ottawa: The Society; 2000.
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## Vigilance is needed

The commentary by Peter Craighead on the situation in South Africa<sup>1</sup> is a good warning of the way in which members of the medical profession can be coerced into acting unethically on behalf of their government, and how professional organizations can be negligent in failing to oppose such unethical actions.

Unfortunately, the commentary did not mention the alleged unethical behaviour that occurred in Canada when physicians working with the Department of Immigration allegedly tranquilized deportees against their will to facilitate the removal process. When this situation became publicly known, no medical association in Canada publicly condemned this behaviour or protested to the Canadian government about its alleged unethical use of physicians. When pressured into responding, the Canadian Medical Association stated only that it "has gone on record on various occasions as categorically condemning the practice"<sup>2</sup> and that these actions "may have been [only] unacceptable acts by some of its members."<sup>2</sup>

No medical association made a complaint to any of the regulatory provincial colleges to demand that the doctors involved be investigated and appropriately disciplined if found guilty. When the Medical Network of Amnesty International made a complaint to the College of Physicians and Surgeons of Ontario, the College expressed concern and sought further information from the Minister of Employment and Im-

migration. However, the Minister refused to reveal to the College any details about the medical treatment or the names of the physicians involved during the period before the Department instituted new guidelines on June 18, 1990. As a result, the College was blocked from carrying out any independent investigation. The alleged victims of the involuntary treatment were no longer in Canada, were not in a situation to easily make a complaint on their own and were unlikely to remember the name of the physician who treated them. If these physicians were guilty, they had, in effect, being granted impunity for their unethical actions.

Craighead is right in pointing out that all physicians should have a good grounding in medical ethics. However, abuses continue even with this knowledge. We must have the political will to actively point out and condemn unethical medical behaviour that relates to governments before it becomes part of accepted government practice and before physicians are put under further pressure to conform to the government's increasing expectations of them.

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2. Kluge E-H. Tranquilizing deportees [letter]. *CMAJ* 1990;143(3):170.

## Addressing the anesthesiologist shortage

There is said to be a severe shortage of anesthesiologists in Canada. Wondering if this might be related to a lack of exposure to the subject at the undergraduate level, I queried the 16 Canadian medical schools about the amount of teaching in anesthesia they offer.

I received 13 replies, 1 of which bore no relation to my query but advised me on how to apply for an MSc in biomedical studies. Of the other 12 schools, 5 offered 2 weeks of teaching in anesthesia that included intensive care and anillaries, 3 had a 1-week course, 1 gave students the option of studying ears, nose and throat or anesthesia (but not both subjects), 1 provided an optional 4 weeks of teaching that included other subjects, and the other 3 schools gave 1 week of teaching. Not 1 of the schools provides its students with training that compares with the dedicated month of teaching in anesthesia I received half a century ago.

Aside from the issue of exposure to anesthesia at the undergraduate level, it seems to me that the shortage could be reduced immediately if anesthesiologists no longer ran intensive care and other units but instead acted only as consultants to such units.

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