Canadians suing over cigarette-related fires

Fire-safe cigarettes were invented more than a century ago, but 100 Canadians still die every year in cigarette-related fires. Now, the parents of 3 children who died in such a fire hope to force the government and tobacco manufacturers into action. In January they launched a class-action suit alleging that cigarettes sold by in Canada by Imperial Tobacco Ltd., Rothmans, Benson & Hedges Inc., and JTI–MacDonald Inc. are defective because they fail to provide reasonable protection against house fires.

Jasmine Ragoonanan, 3, Philip Ragoonanan, 16, and Ranuka Baboolal, 15, died in a cigarette-related fire at the Ragoonanan home in Brampton, Ont., Jan. 18, 1998. The parents' lawyer, Douglas Lennox, says they aren't making a "money grab. We know [the tobacco companies] have a gazillion lawyers and could tie this up forever and kids will continue to die. Rather than argue about money, we want a safe product."

They also want the tobacco companies to donate money to the burn centre at Toronto's Sunnybrook Hospital.

Cigarette-related fires are the leading cause of fire deaths in Canada, accounting for 25% of the total. In addition to the 100 annual deaths, another 300 people are injured.

Lennox has invited Canadians to join the class-action suit if a family member has died in a smoking-related fire since Oct. 1, 1987, the date research made it blatantly obvious that fire-safety features were available for cigarettes.

The federal government has had the authority to issue fire-safe-tobacco regulations since the 1997 Tobacco Act was passed. Health Minister Allan Rock told the Canada Safety Council in 1997 that safe-tobacco regulations would be "a priority activity . . . over the next few years."

"The government hasn't done its job," says Lennox, "so the last remedy is private litigation."

The Canadian lawsuit was launched Jan. 11, 2000, the same day that Philip Morris, the largest US cigarette manufacturer, admitted that it knew how to make a safer cigarette and was going to test market the product in Buffalo. New York State recently approved legislation that requires cigarettes to pass a fire-safety code.

Fire-safe cigarettes either go out quickly when set down or don't generate enough energy to cause a fire. Either way, the safer cigarettes cost the same to manufacture, are no more toxic than other cigarettes and, according to focus group testing, taste the same as conventional cigarettes.

The cigarettes can be manufactured with one or more of the following features: they are thinner, more loosely packed or have less porous paper. Cigarettes are considered fire safe if they will not cause cotton and foam to ignite in more than 90% of tests. The first patent for a fire-safe cigarette was filed in 1889; the US Federal Bureau of Standards developed a fire-safe cigarette in 1929.

Lennox says present-day manufacturers are reluctant to produce fire-safe cigarettes because this could implicate them legally because of previous fires, and because the fire-safe product may remind consumers that smoking also kills in other ways. A 1986 letter from the CEO of British-American Tobacco to the CEO of its Canadian subsidiary, Imasco, which owns Imperial Tobacco Ltd., justified the hesitation this way: "In attempting to develop a 'safe' cigarette you are, by implication, in danger of being interpreted as accepting that the current product is 'unsafe' and this is not a position I think we should take." — *Barbara Sibbald*, CMAJ

Number of health professionals not keeping pace

Although there were 48 000 more health professionals in Canada in 1997 than in 1988, an increasing population means that the number of workers per 10 000 people actually declined by 1.7% over the period, from 185 to 182. The Canadian Institute for Health Information reports that only a handful of professions experienced a decrease, but they were the largest ones. The number of doctors per 10 000 Canadians declined by 0.3%, while the number of registered nurses dropped by 5.2%. The biggest decrease was among medical laboratory technologists, where the overall number fell by 10.8% and the number per population declined by 20%. Among the areas experiencing large increases were chiropractic, which rose by 40.3%, to 4472 practitioners. — CMAJ

Alberta allows midwives to practise in hospitals if patients pay

With new provincial regulations in place, Alberta is set to become the third province, after Ontario and British Columbia, to allow midwives to deliver babies in hospitals. Unlike their eastern and western counterparts, however, Alberta's mothers-to-be will still have to pay for midwifery services out of their own pockets.

In December, Alberta passed legislation that allowed nonphysician practitioners such as midwives to admit patients to hospital and use diagnostic services such as x-rays and ultrasound. Since then, 5 of the province's 17 regional health authorities have been busy drawing up plans for incorporating midwives into their hospitals.

Dr. June Bergman, regional clinical department head for the Department of Family Medicine of the Calgary Regional Health Authority, says such implementation has not always been easy. "Because it's a top-down directive and because the cultures of the groups [physicians and midwives] are so different, the ability to forge an alliance of health care providers who can work in collaboration has been made more difficult," she said.

Despite any logistical difficulties the regional health boards have experienced, there should be little concern over the ability of the midwives to deliver safe medical care, says Sylvia Gillespie, chair of the committee responsible for implementing midwifery regulations in the province and a board member with the Red Deer based David Thompson Health Region. She said Alberta's midwives must pass a rigorous, standardized examination before becoming eligible for registration. Standards of care for the profession are dictated by the Midwifery Act, which currently falls under the Health Disciplines Act.

Gillespie said midwives provide continuity of care throughout a pregnancy, during labour and delivery, and for 7 weeks following the birth. Calgary midwives typically charge $2500 for these services; physicians can bill $295 for the delivery alone. By law, midwives are permitted to handle only low-risk pregnancies.

Permitting midwives to practise in hospitals had been a contentious issue because obstetricians and other specialists they consulted did not receive a consultation fee; such fees were paid only when a family physician asked for the consultation. Thanks to money set aside by Alberta Health's Innovation Fund, however, these physicians will now receive their full consultation rate.

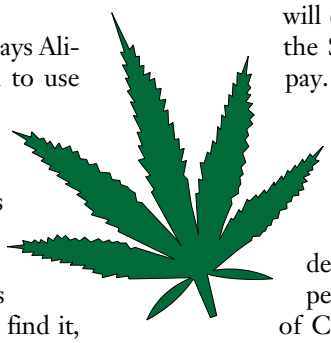
The addition of midwives to the hospital environment should benefit patients, said Bergman, as long as proper guidelines are in place. "I think as long as they are clear on what their scope of practice is, it shouldn't be a problem. We know that doulas [nonprofessional birthing attendants] … reduce the rate of intervention by something like 30% or 40%. So there are obviously things we can do to elevate or change the comfort level of the mothers [to alter] outcomes. Will bringing a midwife in do that? We don't know, but there's nothing to say that it will do bad things." — *Mike Vlessides*, Canmore, Alta.

Ottawa seeks source of medical marijuana

The federal government's recent decision to establish a Canadian source of quality and affordable research-grade marijuana is particularly good news for the 37 Canadians who have exemptions that allow them to smoke the drug because of illness.

"This is definitely a step in the right direction," says Alison Myrden of Burlington, Ont., who is allowed to use marijuana because she has multiple sclerosis. "I hope life will be a bit less complicated because I would no longer have to go to the streets."

Myrden is among the handful of MS patients who develop tic douloureux (trigeminal neuralgia), which causes "excruciating" facial pain. Although marijuana helps control her pain, she has had a hard time finding the drug. When she could find it, the cost was $400 a month. She now receives free marijuana from the Compassion Club Society of British Columbia (see *CMAJ* 1999;161[8]:1024), but she says the strength and the amount have not been adequate to control her pain. Under the Health Canada plan, a grower would establish a processing operation, provide quality control and distribute the marijuana to "authorized recipients." Myrden says the greatest need is for an "appropriate, consistent and affordable source for our medication." The marijuana produced for the government will also be used in clinical trials.



Myrden is unsure what the government marijuana will cost, but hopes it will be cheaper than the $300 to $400 per month she used to pay. "I hope the government will take into consideration the fact that most exemptees are either dying or on full disability, and affordability is a key factor," she says.

As for concerns about possible detrimental effects from exempting some people from the provisions of section 56 of Canada's Controlled Drugs and Substances Act, Myrden responds: "Those of us who use this drug medicinally are not potheads or drug addicts. We are sick and dying people." — *Patrick Sullivan*, CMAJ

Combating car accidents by examining the causes

Edmonton police have stepped up enforcement of seat-belt and antijaywalking laws in response to recommendations from University of Alberta researchers, whose unique pilot project aims to prevent motor vehicle injuries by focusing on their root causes.

"All injuries are predictable and preventable, but we can't really say why people are getting injured [in motor vehicle accidents]," says Mohammed Naseem Hoque, a graduate student in the Department of Public Health Sciences.

Hoque and Dr. Louis Francescutti, an emergency physician at the Royal Alexandra Hospital, are working with the Edmonton police at the scenes of serious car crashes, where they document the causes of injuries. They then follow patients to the trauma centres at the Royal Alexandra and University of Alberta hospitals, where they document the injuries and further analyse the causes.

In the era before crash test dummies, physicians sometimes went to crash sites, explains Francescutti. "Crash test dummies have provided a lot of information, but they have taken us away from the real world. Forming this relationship with police officers allows us the opportunity to give them back preventive strategies that they can apply almost immediately."

Since last fall, the researchers have collected data on 31 injuries from 23 accidents; they wrapped up their work last month.

Eventually, they would like to have a permanent injury prevention team in place in Edmonton, perhaps one that includes a retired police traffic accident reconstructionist. "If you drive by a fire, you'll see a truck that says Fire Investigation, or if you drive by a crime scene, you'll see a truck that sees Crime Scene Investigation," says Francescutti. "We would want emergency medical services to have Injury Investigation as part of the way they do business."

University of Alberta

Researchers Mohammed Naseem Hoque (front) and Dr. Louis Francescutti are collaborating with Edmonton police officers such as Constable Tedd Benesch to reduce the number of car accidents.

Edmonton's emergency physicians appear interested in the project. "As we show up in the trauma rooms, we are able to convey to them a better sense of what the accident scene looked like, and it helps them look for injuries that they may not have suspected," says Francescutti. Soon, he and Hoque hope to begin sending digital images of accident scenes to emergency rooms before patients arrive. Francescutti hopes this kind of information will hasten the decision-making process.

"If the medical community focused on this aspect of medicine, we could save a lot of money and a lot of lives," says Hoque. — *Heather Kent*, Vancouver

NB launches ambitious Organ Donation Network

Although it's only a few months old, the New Brunswick Organ Donation Network has already set itself the monumental challenge of increasing the province's donor rate from 14 per million to 25 per million within the next 5 years. Its goal is to become Atlantic Canada's leader in organ and tissue donation.

"There are very significant waiting lists for various transplants," says Dr. Bill Goodine, president of the New Brunswick Medical Society, one of several partners in the new venture. "Anything we can do to shorten those lists would be worth while."

More than 80 New Brunswick residents are currently waiting for a transplant. Last year there were only 66 donors in the province. "When we compare ourselves to other countries, we can see we've fallen behind," says Goodine. "It stands out that we are at 14.4 [donors] per million. We're really trying to find a New Brunswick solution, and this is the first step."

That first step includes finding ways to garner greater public support for organ donation. Overall, Canada's organ donor rate stands at 13.7 donors per million population. The world leader in organ donation is Spain, with 32 donors per million population. — *Donalee Moulton*, Halifax

On the Net

Sleep-deprived patients turning to Web for help

Many Canadians are affected by sleep disorders. Afflictions range from the occasional bout of insomnia to more serious problems such as narcolepsy and sleep apnea.

For those with too much waking time on their hands, the Web offers a wealth of information. Most sites are geared toward the patient, but a few target health care professionals.

Sleep/Wake Disorders Canada (**www.geocities.com/HotSprings/1837/**) is a national volunteer group that helps these patients by providing information, research and lobbying action. The site lists sleep research clinics across Canada and around the world. It also features a self-help forum where participants can pose questions, and includes stories of people's personal struggles with insomnia and other sleeping disorders.

The Royal Ottawa Health Care Group's Sleep Disorder Centre (**www.rohcg.on.ca/sleep.html**) is an excellent resource. It publishes a monthly newsletter covering various aspects of sleep, provides a checklist of good sleep habits and lets visitors pose questions to its professional staff. The centre's sleep laboratory is also featured in an 8-minute online video, which requires RealPlayer (**www.real.com/player/**).

The Canadian Sleep Society (**www.css.to**) is a professional association of clinicians, scientists and technologists. Its site includes sections for patients and professionals. On the patient side there is an online questionnaire to help people self-assess the quality of their sleep. The society has also arranged for several professionals to accept queries by email. For physicians there are links to current research. The site also lists sleep-related headlines from both the popular and scientific literature.

Moving south of the border, the Sleep Medicine Home-Page (**www.users.cloud9.net/~thorpy/**) and the Sleep Home Pages (**bisleep.medsch.ucla.edu**) provide hundreds of links to sleep resources. The latter a solid research section, and even a monthly book list for people facing long sleepless nights.

Finally, there are a few email-based discussion groups dedicated to sleep disorders. SLEEP-L is a moderated group for sleep specialists (email, **southmay@qucdn.queensu.ca**), while PEDSLEEP is dedicated to pediatric sleep problems and is open to all medical and education professionals involved in child care (email, **sadeh@ccsg.tau.ac.il**). — *Michael OReilly*, mike@oreilly.net

Quebec's GPs get a raise

Quebec's budget for general practitioners' will increase by 9% over 4 years (retroactive to 1998), with annual increases similar to those given the province's public servants. Dr. Renald Dutil, president of the Fédération des médecins omnipraticiens du Québec (FMOQ), says the agreement-in-principle, announced in May, provides higher fees for the most difficult activities performed by family doctors.

Budget increases for 1999 and 2000 will go to physicians practising in what the FMOQ has identified as priority areas: emergency room care, care of hospitalized patients, obstetrical care, services in various long-term-care facilities, geriatric care and mental health services provided in private offices and clinics. Next year's increase will be earmarked for medical practices run out of private offices, which account for 65% of earnings by Quebec GPs. The province's 6500 general practitioners currently earn an average of $150 000 annually, with net earnings of about $99 000.

Significantly, the agreement eliminates $150 million in overpayments that the government had wanted physicians to repay. The government agreed that these overruns were due to inadequate funding.

In addition, the agreement sets aside $8 million to entice general practitioners to stay in remote and isolated areas for more than 3 years, $3 million for continuing medical education allowances and $12.3 million to adjust pay scales for doctors working on fixed salaries.

The province also reached a 4-year agreement-in-principle with the province's specialists. Key parts of this agreement are aimed at attracting and retaining specialists in remote and isolated areas, and making provisions for new specialties, such as medical genetics and emergency medicine. A Ministry of Health spokesperson said the overall budget for specialists is being increased by $105 million (9%) over 4 years. — *Janice Hamilton*, Montreal

Pulse

Natural health products get own directorate at Health Canada

During a recent shake-up at Health Canada (see page 80), the federal department's Office of Natural Health Products was upgraded to a full directorate within the newly minted Health Products and Food Branch. Although the office is small change in the greater scheme of things — its $10-million budget is a tiny fraction of the more than $2 billion the department spends every year — its enhanced status reflects Canadians' increasing demand for accurate information about herbal remedies and dietary supplements. The new office was announced by Health Minister Allan Rock in March 1999 (see *CMAJ* 160[9];1999:1355-7).

The bad news is that it will be a while before the office gets rolling. Dr. Norman Viner, the acting director of research, said the office's biggest challenge will be to define health products. "So far, we have only defined them as not including foods, pharmaceuticals and bulk herbs. We haven't been able to settle what they are. And we know that whatever we come up with will be challenged by the Department of Justice."

At the moment, there are no clear categories. Orange juice that has added calcium is considered both a food and a drug by Health Canada. Likewise, vitamin E can be categorized as a food, a drug or a health product, depending on how it is marketed.

Manufacturers are keen to pursue the licensing of their manufacturing facilities, said Viner, because they could use this as a marketing tool, but "they are not so keen" on the use of product licences.

Consistent application of standards will also cause problems. At the moment, for example, there are 4 St. John's wort products on the market that have Drug Identification Numbers and 8 more that do not.

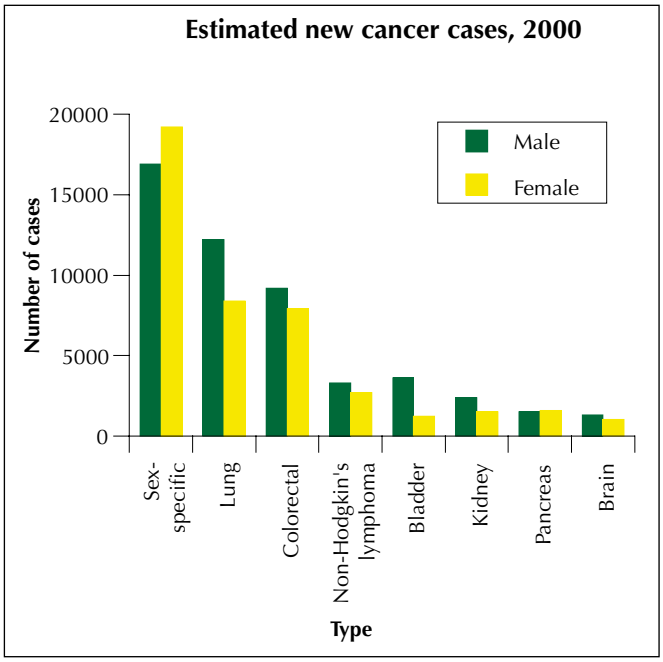
Good research will be key, says Viner. He admitted that the field has become so vast so quickly that, at least at the start, the office "will rely on policing by complaint."

Canada is the first country to launch a systematic evaluation of all natural health products, and other countries are already watching with interest how far a government can go in trying to apply rigorous science to an undisciplined marketplace. "A lot of science needs to be unravelled as we deal with these products," comments Viner. "We're going to need a lot of people to help us — and Health Canada is in a hiring mode."

The executive director of the new office is Phillip Waddington, a 1996 graduate of the Canadian College of Naturopathic Medicine. — *Charlotte Gray*, Ottawa

Aging population means more cancer cases

The Canadian Cancer Society has used *Canadian Cancer Statistics 2000*, a report prepared in conjunction with Health Canada and the National Cancer Institute of Canada, to estimate that there will be 132 000 new cases of cancer and 65 000 cancer-related deaths in Canada this year.



Males will account for 51.4% of new cases of cancer in 2000 and for 53.2% of cancer-related deaths. Among men, prostate cancer is responsible for 24.9% of new cancer cases and 6.5% of deaths; among women, breast cancer accounts for 29.9% of new cases and 18.1% of cancer-related deaths. Lung cancer is the second most frequently occurring cancer for both men (18%) and women (13.1%). New cases of colorectal cancer will strike men and women almost equally (13.5% versus 12.3%). Age-standardized rates for new cancer cases have remained relatively stable for the past 30 years, but the number of new cases has grown steadily (from 51 000 in 1971) because of aging of the population.

Cancer was the leading cause of potential years of life lost (PYLL) in 1997, representing 29.3% of PYLL from all causes. Lung cancer accounts for 26.1% of cancer-related PYLL, breast cancer for 10.6%, and colorectal cancer for 9.4%. Although prostate cancer is the most frequently occurring cancer in males, it accounts for only 3.7% of all cancer-related PYLL. All data from the 2000 report are available at **www.cancer.ca/stats2000/maine.htm**. — *Shelley Martin*, martins@cma.ca

Health Canada undergoes a shakeup


Hugh Malcolm

Health Canada is a leviathan. It has more employees — 6000 — than the New Brunswick public service, and it fills more than 25 pages in the federal telephone directory.

In terms of bureaucrats based in Ottawa, only 2 departments are larger: Public Works, which deals with the federal government's vast inventory of property and real estate, and Human Resources Development Canada, which the recent wave of grant scandals has suggested is beyond anybody's control. However, neither department has as much direct impact on Canadians' everyday lives as Health Canada.

The *Canada Food Guide*, hepatitis, Inuit health care, occupational safety, contaminated shellfish, parasitic infections, health standards on cruise ships, flu epidemics, Viagra, blood safety, tobacco products, HIV/AIDS, cosmetic safety, bacterial vaccines — the range of departmental responsibilities is staggering. Although the provinces deliver health care to most Canadians, Ottawa's oversight, health-promotion and regulatory roles directly affect most of the decisions made in doctors' offices. The federal government not only sets and enforces standards on a range of fronts, but it also plays a lead role in focusing research and public education on issues such as smoking. And it provides health care directly to Aboriginals living on reserves.

Without the department, health care in Canada would be an incoherent jumble of different regulations, rules and policies. Yet few physicians, or even provincial health officials, have found it easy to understand how this federal department functions. Up to now, it has been a mass of acronyms, scattered responsibilities and confusing lines of accountability.

But all this is supposed to start changing on July 1, when this vast bureaucratic machine will embark on a total transformation. Preparation for the change began in April with a volley of announcements and the publication of a glossy booklet, *Realigning Health Canada to Better Serve Canadians*. Dann Michols, 1 of 4 "champions for change" appointed by Deputy Minister David Dodge to drive the realignment, says the transformation is much more than a shakeup of the departmental org chart.

"This is about a change in mindset. We want to make our regulatory processes more transparent and we want to build a new relationship between Ottawa and the regions. It is not going to be 'business as usual' for anybody in the department."

The most important aspect of the shakeup is that the 2 largest branches in the department, Health Protection and Health Promotion and Programs, are being reorganized into 3 branches: Population and Public Health, Health Products and Food, and Environmental and Product Safety.

In large part, the change is recognition that the Health Protection Branch (HPB) has been growing like Topsy and had become unmanageable. The branch functioned under 12 different pieces of legislation, and there was little coordination for its activities. In theory, it dealt with regulation within the health field, but various other programs were thrown into the basket. Scientific capacity was fragmented across departments: infrastructure was duplicated and it was impossible to focus resources on health priorities.

In the US, the functions performed by the HPB are managed by at least 4 separate agencies, the names of which clearly define their mandate — the Centers for Disease Control and Prevention, the Food and Drug Administration, the Environmental Protection Agency and the National Institutes of Health. Canada's HPB, meanwhile, had become a grab bag of competing programs. "It was too unwieldy for good management," explains Michols.

The smaller Health Promotion & Programs branch included most of the programs that related to health education, whether it was about healthy eating, disease prevention or incidence of particular diseases. But the split between "Protection" and "Promotion" led to duplication on issues. While the environmental health program resided in the HPB, for example, programs dealing with safe physical environments and workplace health were dealt with not only in a different branch (Health Promotion and Programs) but also in a different building. In bureaucratic terms, they were light years apart.

With the unprecedented advances in scientific knowledge and technology in recent years, and with growing public demand for good information and accountability, the department could not afford to make artificial divisions between programs or spread itself too thin. "We're bunching pro-

grams," Michols explains, "so that regulation and promotion on particular issues are now aligned, and people can see more clearly what each branch does."

The 3 new branches will each be run by an assistant deputy minister. The new **Population and Public Health Branch** combines elements of the old Health Promotion and Programs Branch with the Laboratory Centre for Disease Control. Its responsibilities include epidemiologic studies, healthy family programs and prevention of chronic and communicable diseases.

The new **Health Products and Food Branch** will focus on the health determinants and risks associated with products that enter the body — drugs, food, blood products and natural health products.

The new **Environmental and Product Safety Branch** will promote safe living, working and recreational environments, and will regulate consumer products, including tobacco. It will also assume responsibility for occupational health and safety.

The shakeup is only one aspect of Dodge's promised "transformation" — the second is more cooperation and collaboration with regions. Up to now, Health Canada divided the country into 4 regions when implementing its policies: Atlantic, Quebec, Central and Western. These days, however, every federal department is trying to connect more closely with provincial partners and with organizations in the field. The centralized decision-making of the past has reinforced a perception that the health department is remote and out of touch when it comes to local needs. In the future, the department will push more decision-making down to senior officials in 6 regions: Atlantic, Quebec, Ontario and Nunavut, Manitoba and Saskatchewan, Alberta and NWT, and BC and the Yukon. "You're going to see national programs delivered locally," says Michols.

Will this ambitious transformation actually happen? Turning around a huge government department is a major undertaking, especially when the department in question has been badly managed for years and has experienced disastrous morale problems. Diana Gorman, another "champion for change" who is in charge of the Health Products and Food Branch, admits that the real work of re-engineering the department will only start after July 1, when the cultural integration within the 3 new branches and the horizontal links between them, must begin.

The first fear of many employees is that they will lose their jobs. When the glossy booklet first appeared, middle-ranking bureaucrats were anxiously trying to read between the lines to see which divisions would disappear from the department. Their cynicism was reinforced by the opacity of the jargon-heavy booklet. A typical sentence reads: "We must be aligned to bring a more cohesive, integrative culture and the required skill sets to quickly make effective and coordinated decisions."

Michols insists that the department will be hiring rather than firing. "We have new money with which to hire an additional 600 to 700 people. But we are facing a significant human resources challenge: 25% of departmental employees will reach retirement age over the next few years."

With a renewed workforce and a new framework, senior officials are confident that they will achieve the revitalization of their department. Canadians can only hope that they succeed. — *Charlotte Gray*, Ottawa

Cancer researcher fired after false data uncovered

A researcher from one of South Africa's most prestigious medical schools has been fired after admitting that he falsified cancer research data. Dr. Werner Bezwoda of Witwatersrand University had reported to the American Society of Clinical Oncology last year on the success of the controversial technique of using high-dose chemotherapy followed by a bone-marrow transplant to treat cancer.

He had conducted clinical trials involving 154 South African women with "high-risk" breast cancer and reported an increased survival rate and lower relapse rate among women who received higher doses of chemotherapy. "The drugs Bezwoda gave women in the control group — who were supposed to be on standard dose treatment — were not the same as he cited in his report," the *South African Medical Journal* reports (2000;90[4]:333-4). "He tested the high-dose patients against a group he claimed was on the conventional regimen, but were in fact on an entirely different experimental group of drugs."

The *SAMJ* reports that his presentation at the American conference "literally turned accepted wisdom on its head and contradicted the findings of all other research presenters." This marked the first time the society has had to retract a paper in its 35-year history.

Bezwoda, who was fired from his job as head of the university's departments of hematology and clinical oncology, apologized for his "serious breach of scientific honesty and integrity." He said he was motivated by a "foolish desire to make the presentation more acceptable." Since his dishonesty was discovered, says the *SAMJ*, Aetna/US Healthcare, the largest insurer in the US, has announced that it will no longer pay for combined high-dose chemotherapy and bone-marrow transplant treatments. — *Patrick Sullivan*, CMAJ

Clinical Update

Treating obsessive–compulsive and tic disorders

Perlmutter SJ, Leitman SF, Garvey MA, Hamburger S, Feldman E, Leonard HL, Swedo SE. Therapeutic plasma exchange and intravenous immunoglobulin for obsessive–compulsive disorder and tic disorders in childhood. *Lancet* 1999; 354:1153-8.

Background

Obsessive–compulsive disorder (OCD) and tic disorders are common in childhood, affecting 1% to 2% of school-aged children and adolescents. Treatment with serotonin-reuptake inhibitors, behaviour therapy, or both, helps more than 75% of these patients, but most show only partial response and relapse when medication is discontinued. The cause of OCD and tic disorders is unknown. Poststreptococcal autoimmunity has been postulated as a possible environmental trigger, raising the possibility that some children might respond to immunomodulatory therapy.

Question

Is plasma exchange or intravenous immunoglobulin (IVIG) better than placebo in decreasing neuropsychiatric symptoms in children with exacerbations of OCD or tics triggered by streptococcal infection?

Design

The study was a randomized, placebo-controlled trial with follow-up at 1 month and 1 year. Children between the ages of 5 and 14 years, with an existing severe exacerbation of OCD or tic disorder and a history of exacerbations associated with streptococcal infection, were randomly assigned to treatment with plasma exchange (5 single-unit exchanges over 2 weeks), IVIG (1g/kg on 2 consecutive days) or placebo (intravenous saline). Symptom severity was rated on standard scales at baseline, 1 month and 12 months (active treatment groups only) after treatment. Neuropsychiatric medications were maintained at constant doses over the first month and were then adjusted as needed.

Results

Thirty children participated in the study; 10 received plasma exchange (2 subjects were lost to follow-up at 12 months), 10 received IVIG (1 subject withdrew within a month) and 10 received placebo. At baseline patient characteristics and symptom severity were similar, with the exception that tics were more severe among children in the plasma-exchange group. Mild-to-moderate adverse reactions were experienced by 12 of the 19 subjects in the active treatment groups (e.g., nausea, vomiting and headache) and by 2 in the placebo group (e.g., stomach ache and headache). At 1 month the IVIG and plasma-exchange groups showed a mean improvement from baseline of 45% (OC scale score reduction of 12) and 58% (OC scale score reduction of 13) respectively, while children in the control group improved a mean of 3% (OC score reduction of 0.9); overall function scores were 2.9 (33% improvement), 2.8 (35% improvement) and 0 (no change) for the respective groups. Symptom improvement usually occurred by 1 week in the plasma-exchange group and by 3 weeks in the IVIG group. Tic symptoms improved significantly in the plasma-exchange group only. At 12 months 14 of the 17 children who had received active treatment were much or very much improved.

Commentary

Postinfectious autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS) are believed to be mediated by antibodies formed after group A β-hemolytic streptococcal infection that cross-react with neuronal tissue.[1] Sydenham's chorea, the neurological manifestation of rheumatic fever, has been proposed as a potential model of pathophysiology.[2] The original hypothesis of the study was that either IVIG or plasma exchange would reduce symptom severity by blocking (IVIG) or removing (plasma exchange) the antibodies that are cross-reacting. Despite limitations, such as the lack of blinding to treatment assignment,[3] the study demonstrated that both interventions effectively reduced symptoms in a select population of children with a history of streptococcal-induced symptom exacerbation. According to this hypothesis, however, the rate of symptom improvement should be directly proportional to the rate of antibody removal. Most of the children receiving plasma exchange did not show immediate improvement, suggesting that the mechanism of immunomodulation is not well understood.

Clinical implications

This study does not support the routine use of immunomodulatory agents to treat OCD and tic disorders but does prompt intriguing questions for further study and review.[4] — *Erica Weir*, CMAJ

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Clinical Update

Detecting *Helicobacter pylori* infection

Braden B, Yeuber G, Dietrich C, Caspary W, Lembcke B. Comparison of new faecal antigen test with ^{13}C-urea breath test for detecting *Helicobacter pylori* infection and monitoring eradication treatment: prospective clinical evaluation. *BMJ* 2000;320:148.

Background

The ^{13}C-urea breath test is currently the best noninvasive method for detecting *Helicobacter pylori* infection. Serological methods are less appropriate, especially for monitoring efficacy of treatment, because antibodies are present for months after the bacteria has been eradicated.

Question

What is the clinical validity of a newly developed immunoassay for detecting *H. pylori* antigens in fecal specimens?

Design

This prospective study compared the results of the new antigen test for *H. pylori* in feces with results of the ^{13}C-urea breath test for detecting infection and monitoring treatment efficacy. Ninety subjects with dyspepsia (46 men and 44 women, age range 18–82) were screened with both tests. In addition, 115 participants (62 men and 53 women, age range 18–78) with positive breath test results were treated with triple therapy, and at least 4 weeks after treatment ended were retested with both tests.

Results

Of the 51 dyspeptic patients with positive breath test results, 47 had positive fecal antigen tests (sensitivity 92.2%, 95% confidence interval [CI] 81.1–97.8); 38 of the 39 participants with negative breath test results were also negative on the *H. pylori* antigen test (specificity 97.4%, 95% CI 86.5–99.9). Of the 115 *H. pylori* positive patients treated with triple therapy, 92 subsequently had negative breath test results; there were 5 false-positive and 2 false-negative antigen tests, resulting in a sensitivity of 91.3% and specificity of 94.6%. The results for the 205 participants showed that the overall sensitivity and specificity of the antigen fecal test with reference to the breath tests were 91.9% and 95.4% respectively.

Commentary

These results suggest that the new immunoassay has good sensitivity and specificity when compared with the urea breath test, although it was not clear how the 2 false-negative immunoassay tests were detected among the patients with negative breath test results. The recognized gold standard for the detection of *H. pylori* is histology from endoscopic biopsy, and the sensitivity (97.9%) and specificity (98.0%) of the urea breath test is very good when compared with histology.[1] Given the ease of use and the validity of the urea breath test, as well as patient reluctance to collect fecal samples, the utility of this fecal test is not apparent, although it does appear to offer economic benefits. The authors report the new test is cheaper than the urea breath test, but its cost-effectiveness was not evaluated.

Clinical Implications

Compliance and cost-effectiveness need to be studied before the clinical utility of this new test can be determined. — *Erica Weir*, CMAJ

Reference

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New hope in stroke rehabilitation

For the first time, research has shown that stroke victims who undergo intense rehabilitation not only recover some movement but also alter how their brain works in the long term (*Stroke* 2000;31:1210). Researchers at the University of Alabama at Birmingham claim they are on the brink of a revolution in rehabilitation.

Researchers found that 13 chronic stroke patients who had lost the use of an arm regained some movement after 12 days of intense therapy. For 6 hours daily, the subjects' good arm was tied down and therapists helped them perform arm movements, such as picking up objects or spooning food, with their weakened arm. Subjects reported that a "switch [eventually] flipped" and they were able to perform tasks that were previously impossible.

Scans of the subjects revealed that before rehabilitation, the area of the cortex that controls hand movement was much smaller on the brain's stroke-damaged side. After treatment, the area almost doubled in size. Six months later, motor performance remained high and the size of the cortical area in both hemispheres was nearly identical.

Not only does this offer hope for stroke patients, but it is also further proof that the brain adapts better after injury than scientists once thought. — *Barbara Sibbald*, CMAJ

Public Health

Making our water safe to drink

Canada's drinking water has become a subject of concern since the May outbreak of *Escherichia coli* O157:H7 infection in Walkerton, Ont. Because patients might have questions about water quality, physicians should understand how our drinking water is disinfected. Most of the information in this article has been adapted from the chapter on drinking water by Nigel Bunce.[1]

The 2 main sources of drinking water are groundwater and surface water. Groundwater is recovered from underground aquifers at depths ranging from a few to hundreds of metres. This water is typically replaced very slowly and may be depleted if used too rapidly. Surface water, drawn from lakes and rivers, almost always has more suspended materials and requires more extensive processing. Groundwater tends to be less contaminated because soil bacteria has had time to decompose organic matter in the water, and the soil itself filters particulate matter.

There are 4 steps in a typical treatment program. During **primary settling**, water is contained in a large holding basin where particulate matter settles. **Aeration** then agitates the water to promote the oxidation of substances that would consume chlorine added later in the process. With **filtration**, sand or other filtering agents are used to remove the finest particles. Finally, any remaining microorganisms are killed during the **disinfecting** stage. Chlorine is the most popular disinfecting agent because its residual activity protects against contamination throughout the distribution system. Dissolved chlorine dissociates into hypochlorous acid and the hypochlorite ion. Hypochlorous acid is the stronger disinfectant because, being neutral, it penetrates the cell membrane of microorganisms.[2]

Chlorine treatment has several drawbacks, however. Taste and odour are concerns in industrialized areas, where water may be contaminated with phenols. Chlorinated phenols have a penetrating odour that, even at parts per million, can make water unusable for cooking or drinking. There is also growing concern about possible health risks associated with ingesting chlorination by-products (e.g., chloroform). Results of studies suggesting an increased risk of bladder and colon cancers, as well as adverse reproductive and developmental effects,[3–5] led an expert working group to conclude that it is "possible to probable" that chlorination by-products pose a significant cancer risk.[6,7] Health Canada is working with provincial ministries to assess the need to reduce the levels of these by-products in drinking water and the options for doing this.[8]

Alternatives to chlorination include ozonization and ultraviolet radiation. During ozonization, which is used in several Quebec communities, including Montreal, ozone is prepared by passing a high voltage electric discharge through very dry air and then absorbing the ozone in water. The process appears to inactivate organisms by causing physicochemical damage to DNA.[2] Ozone is slightly more effective than chlorine and produces no chlorine derivatives, but it must be made on site (it cannot be stored or transported), and the process is expensive. In addition, because ozone decomposes rapidly in water and leaves no residual posttreatment, chlorination is still required.

Ultraviolet radiation at wavelengths below 300 nm damages DNA.[2] The radiation must penetrate the water to be successful, so particulate matter, coloured material and dissolved organic compounds (which compete for ultraviolet radiation) should be minimal.

Organic compounds such as herbicides, insecticides and industrial compounds in drinking water are a growing concern. More than 360 chemical compounds have been identified in the Great Lakes, many of which are persistent toxins (e.g., benzopyrene and dichlorodiphenyl trichloroethane [DDT]). Expensive processes such as activated carbon filters and packed-tower aeration of volatile organic compounds may effectively remove some of these compounds. However, the specific hazards posed by ingesting trace amounts of these compounds have not yet been established.

Nitrate contamination of water from livestock and human excrement, other organic waste, or chemical fertilizers is a concern because of its toxicity.[9] Nitrite ions can combine with hemoglobin to produce methemoglobin, and severe cases of methemoglobinemia can deprive the brain of hemoglobin and oxygen delivery and cause mental retardation in infants.

For further information the interested reader may consult the Centre for Science in the Public Interest, National Action, Nutrition Action Healthletter, June, 2000, at **www.cspinet.org**

— *Erica Weir*, CMAJ

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