
Eight physicians elected to Commons

There's one more doctor in the House following the Nov. 27 federal election. The latest addition is Dr. Jeannot Castonguay, a Liberal who captured the New Brunswick riding of Madawaska-Restigouche from the Tories. Castonguay, a general surgeon, resigned as chair of the New Brunswick Medical Society to run for Parliament.

Seven other physician incumbents were re-elected. Returning for the Liberals are Drs. Bernard Patry and Gilbert Normand from Quebec, Carolyn Bennett from Ontario, Rey Pagtakhan from Manitoba and Hedy Fry from British Columbia. Re-elected for the Canadian Alliance were Drs. Grant Hill of Alberta and Keith Martin of British Columbia. The longest-serving member is Pagtakhan, a Winnipeg pediatrician. Patry enjoyed the biggest victory, winning by more than 33 000 votes and capturing 73% of votes cast. He was followed by Hill, who captured 70% of the vote and won by almost 25 000 votes.

Twelve physicians sought election in the Nov. 27 vote. The unsuccessful candidates were Dr. Amir Khadir (Bloc Québécois) and Ontario physicians Gordon Guyatt (NDP), Kenneth Ranney (NDP) and Elahi Mahmood (Canadian Alliance).

This is the largest number of physicians elected to Parliament at one time.

— *Patrick Sullivan, CMAJ*

WHO compares tobacco to land-mine threat, seeks international rules

As tobacco manufacturers turn their considerable marketing expertise toward the developing world, the World Health Organization is turning its attention to the first-ever international health convention on tobacco.

WHO's Framework Convention on Tobacco Control, due to be in place by May 2003, is an international attempt to

regulate tobacco use. Negotiations are just beginning on the convention, which will set standards that countries can adopt to control advertising, prevent tobacco smuggling and promote smoking-cessation programs. "Like the convention to ban land mines, the tobacco convention also seeks to stop a killer," said Dr. Gro Harlem Brundtland, WHO's director general.

But what the convention will include and how it will work are the daunting questions facing WHO's 191 member states. A draft of the framework will be presented at the second session of negotiations this April.

WHO estimates that 4 million people will die of tobacco-related illness this year, and in 20 years that figure will leap to 10 million, with 70% of these deaths occurring in developing countries. "The framework is a global complement to national action," Geneva-based Douglas Bettcher, WHO's coordinator for the Framework, told *CMAJ*. "You don't do one without the other."

Since 1995, new cigarette factories have been springing up in countries such as Tanzania, Poland and Cambodia; the

companies' Madison Avenue marketing campaigns have followed. Many ads target women, who are traditionally non-smokers in most developing countries.

"We need a global effort to control tobacco," says Linda Waverley Brigden, executive director of Research for International Tobacco Control, who warns that "a piecemeal approach opens gaps for the tobacco industry."

WHO's current emphasis is on reducing demand, says Bettcher.

The framework was launched in May 1999, when WHO member countries unanimously backed a resolution calling for an antismoking initiative. A record-breaking 50 nations pledged financial and political support. "We hope all 191 [WHO members] sign it," says Waverley Brigden. — *Barbara Sibbald, CMAJ*



Tobacco manufacturers set sights on developing world

Nutritional supplement to treat bipolar disorder?

The time-tested veterinary practice of treating a nervous condition in pigs with nutritional supplements may have paved the way toward a new therapy for helping people with bipolar disorder.

In a case-series study presented during the recent annual meeting of the Canadian Psychiatric Association, 10 men with manic depression showed considerable improvement in symptoms and were able to reduce significantly their dosages of psychotropic medications after taking a broad-based dietary supplement for between 6 and 24 weeks. Similar supplements are used to treat a swine disorder called ear-and-tail-biting syndrome.

The new supplement was brought to the attention of University of Calgary researchers Bonnie Kaplan and Steve Simpson by an Alberta man. His son and daughter, both of whom have bipolar disorder, improved dramatically after taking pills containing trace minerals, vitamins and amino acids.

"I was totally shocked," said Kaplan, a professor in the U of C's Faculty of Medicine. "It seemed ridiculous to think that vitamins and minerals could affect mental functioning. But then, on the other hand, it's not magic either."

A randomized, placebo-controlled trial of the new supplement, launched in late July and involving 100 patients, was made possible by a \$500 000 grant from the Alberta Science and Research Authority. — *Greg Basky, Saskatoon*

U of A refuses tobacco-sponsored scholarship donation

The University of Alberta has turned down a donation of nearly \$500 000 from an undisclosed tobacco manufacturer while it debates the ethics of accepting such gifts. In a closed session, the university's Board of Governors voted not to accept the donation, which was to be used for scholarships.

Action on Smoking and Health (ASH), Western Canada's largest antitobacco lobby group, wants the university to adopt a policy refusing all tobacco company sponsorship, as the University of British Columbia has already done. "Universities should serve as healthy role models to the community," said ASH Executive Director Les Hagen. "It's a slippery slope to [tobacco industry] funding of research."

The University of Toronto, McGill and the University of Calgary have all accepted funding from Imasco Ltd., which owns Imperial Tobacco, says Hagen. Calgary used Imasco money to help fund a Faculty of Nursing learning centre. "The tobacco industry is very adept at getting in," says Hagen. "We have to be forever vigilant." — *Barbara Sibbald, CMAJ*

Will Canada follow US lead on RU 486?

After 17 years of debate, mifepristone (RU 486), the controversial pill that induces early abortion, is for sale in the US. The drug's Canadian proponents hope this country will soon follow suit.

"It's amazing that they got it through," says Bonnie Johnson, executive director of the Planned Parenthood Federation of Canada (www.ppfc.ca/). "It means women now have a choice. The big thing for us is it takes [abortion] off the streets — it becomes a private thing between a woman and her doctor."

Health Canada has agreed to fast-track approval of the drug, but "[Canada's] problem isn't approval," says Johnson, "it's getting a manufacturer, someone who is willing to take the risk of marketing and promoting it. They'll have to wear armour."

Dr. André Lalonde, executive vice-president of the Society of Obstetricians and Gynaecologists of Canada (SOGC), agrees. "We're never going to get a company to bring it forward for approval," he says. The program currently considers only those drugs presented by manufacturers. Lalonde says the key is to get the program to change and accept an application from another group as a "public health measure."

That's exactly what happened in the US. The Population Council holds the US patent for mifepristone, while the manufacturer is Danco Laboratories.

Mifepristone, a progesterone blocker, can be used safely to induce abortion in women who are up to 8 weeks' pregnant. After confirming pregnancy and determining dates, mifepristone is prescribed. Two days later the woman takes misoprostol (unless the physician confirms that the pregnancy has terminated); this drug causes uterine contractions. In the US, the bill for the drugs, physicians' charges, counselling and other fees totals about \$270. The main advantages of RU 486 is that it allows earlier, nonsurgical abortions.

Mifepristone, which was first approved for use in France in 1988, has been used by 620 000 women in Europe. The death rate among women using the pill is 1 per 200 000, almost the same as the rate for surgical abortions.

Canadian women may try to buy the

drug in the US, says Dr. Ken Milne of the SOGC. He says some of his patients have bought combination birth control pills in the US. However, he warns that if Canadian women manage to get RU 486 across the border it is "essential that they confide in their physicians. To withhold may well jeopardize their well-being."

In the US, 87% of counties don't have an abortion provider and studies indicate that the number of doctors providing abortions decreased by 14% between 1992 and 1996. US approval of RU 486 came with some restrictions: the drug must be administered by or under the control of a physician. This means that other health professionals, such as nurse practitioners, can administer the drug. The professional has to know how to date conception, rule out a tubal pregnancy and be able to perform or to arrange a surgical abortion if one is needed. Instead of being sold in pharmacies, the drug will be ordered directly from the manufacturer by physicians.

Detailed patient information is available and a patient agreement, which stipulates that the woman must return for a follow-up appointment, has to be signed before the drug can be administered. Physicians must also sign a form indicating that they understand the method.

The SOGC passed a resolution in 1992 supporting the "legal availability" of antiprogesterone steroids such as mifepristone in order to give "Canadian women access to treatment of proven efficacy." Lalonde says withholding approval is an "insult to women — they're being treated like babies, being refused access to this and that when it comes to their health."

Not everyone is as enthusiastic. Mary Ellen Douglas, national organizer for Canada's Campaign Life Coalition (www.lifesite.net), told *CMAJ*: "The result of taking this pill is a dead baby, and that's certainly not a drug we need here." — *Barbara Sibbald, CMAJ*

Gene mutation may explain multiple-birth pregnancies

The recent discovery (*Lancet* 2000;356:914) of a gene mutation thought to be responsible for multiple-birth pregnancies could mark the first step in developing a test to identify women at increased risk of having twins and triplets.

By using DNA tests on blood samples from a woman who has given birth to 2 sets of twins and has a family history of multiple pregnancies over 2 generations, Dr. Valter Feyles and colleagues from McMaster University identified a pair of gene defects that appear to increase the sensitivity of the receptor site where follicle-stimulating hormone (FSH) binds with the ovaries. This heightened sensitivity may cause the ovaries to release more than 1 egg during ovulation, causing a multiple pregnancy. The mutation was not found in blood samples taken from the 34 women in the control group, all of whom had just 1 baby per pregnancy and no family history of twinning.

If borne out in larger-scale studies, say researchers, the finding could lead to more effective treatment. "Early identification of women carrying the gene defect would allow doctors to adjust fertility medication to reduce risk of multiple-birth pregnancies," said Feyles. — *Greg Basky, Saskatoon*



ON THE NET

Going green? Go online

Concerned about hospital or office waste? Worried about dioxin emissions? Looking for alternatives to PVC IV bags? Internet resources can provide information on all these issues, and much more.

Begin your search by visiting Health Care Without Harm (www.noharm.org/), a collaborative campaign involving more than 270 member organizations, including 41 US hospitals. The HCWH search engine leads to well-researched review articles with topics ranging from the dangers posed by mercury thermometers and PVCs to the environmental implications of the health care sector itself.

Physicians interested in the Canadian perspective on the greening of health care should click on the site of the Canadian Association of Physicians for the Environment site (www.cape.ca) or the Toronto Environmental Alliance (www.torontoenvironment.org/), which is the Canadian coordinator for HCWH.

The alliance also lists Canadian distributors of medical devices made without PVC or mercury, but the bible for alter-

native products is the Sustainable Hospital Project (www.uml.edu/centers/LCSP/hospitals/), which provides sources for green products ranging from nonmercury sphygmomanometers to non-PVC patient ID bracelets. The site also has fact sheets on environmentally preferable purchasing and other topics, reputable basic references and a wealth of links to other scientific studies.

And just because you run an office practice, don't think you're off the environmental hook. A green guide to running your office is posted on the US National Association of Physicians for the Environment site (www.napenet.org/), along with additional information.

If you're looking to save on energy costs, check out the Energy Innovators Project (www.cchse.org), sponsored by the Canadian College of Health Service Executives and Natural Resources Canada. Ninety-three Canadian health care institutions are now part of the project and are reporting savings of up to \$1.6 million annually.

For general scientific information on

health and environment, it's hard to beat the Centre for Health and the Global Environment at the Harvard School of Public Health (www.med.harvard.edu/chge/). And to gain an interna-



tional perspective see the International Society of Doctors for the Environment (www.gn.apc.org/noharm/isde/index.htm) or the WHO Health-promoting Hospitals Network (www.univie.ac.at/hph/). So far, hospitals in 50 countries have joined the network, resulting in models of best practices, cost savings and more. — *Barbara Sibbald, CMAJ*

Greening of health care goal of new coalition

A dozen health and environmental groups have joined forces in an attempt to make the greening of health care facilities a national issue. Members of a coalition, formed at the first-ever meeting of the Canadian Association of Physicians for the Environment (CAPE, www.cape.ca) national workshop in October, agreed that a national effort and meaningful monitoring are essential. One suggestion was to include environmental markers in the health services accreditation process. (*CMAJ* will publish a review article on sustainable health care in its Jan. 23 issue. — Ed.)

The coalition, which is comprised of groups like the Canadian Nurses Association and Pollution Probe, wants to boost awareness of health care's environmental issues among health care workers, suppliers, service providers and the public. Ultimately, the aim is to ensure that every action in health facilities is environmentally sensitive.

"We've got to get away from the notion that healing people one at a time is the only valid thing we do," said Dr. Warren Bell, the CAPE president. "We've got to adopt the notion of healing the community."

Hospitals, which account for 3.3% of Canada's gross domestic product, are significant polluters. They consume resources and generate a wide range of emissions. The US Environmental Protection Agency found that medical waste incineration is the third largest source of dioxin and accounts for 10% of mercury emissions.

"Hospitals should be exemplars of how to be environmentally healthy places," says Rich Whate of the Toronto Environmental Alliance. "Yet hospitals actually contribute to disease in the community." — *Barbara Sibbald, CMAJ*

More medical students for Dalhousie

The wave of medical school expansions that spread from British Columbia to Quebec over the last 2 years has finally washed up in Nova Scotia. The Nova Scotia Department of Health has asked the Dalhousie University medical school to increase enrolment by 8 students in each of the next 3 years, a move that would increase first-year enrolment to 106 students in 2003. The medical school held "town hall meetings" in November and December in an attempt to gauge the impact of the enrolment increase on the school, and it posted an online questionnaire at its Web site (www.medicine.dal.ca) seeking input on the new resources it will need. The province has also asked the school to provide 15 to 20 additional residency positions by July 2001.

Number of medical school applicants drops on both sides of border

The number of applicants to US medical schools has dropped by 18% since 1996, while the number applying to Canada's 16 schools declined by 8% in the same period.

The American Medical Association (www.ama-assn.org/) reports that the number of applicants to US schools stood at 38 529 in 1999, a 6% decrease from 1998 and an 18% decline since 1996. Actual first-year enrolment remained relatively constant over this period, at around 17 000 students.

Data from the Association of Canadian Medical Colleges (www.acmc.ca) indicate that the number of applicants to Canadian faculties of medicine stood at 7575 in 1999, 8% fewer than in 1996.

Barbara Barzansky, secretary of the AMA's Council on Medical Education, attributes the steady decline in applications to a buoyant economy that offers more career options. She also cites difficulties in finding favourable medical employment, as well as fear of the perceived difficulties posed by managed care. "There is a lot of dissatisfaction among the established medical community that is getting passed on," she says.

Potential medical students may also be declining to assume the huge debts now associated with medical education. On graduating, the average US medical student now owes about US\$93 000. With interest, that could easily grow to US\$200 000, Barzansky notes.

Recent projections about medical school debt are also troubling for Canadian students. The CMA issued a position paper (www.cma.ca/advocacy/tuition/index.htm) expressing concern over increases that have moved tuition fees "into the 5 figures" at several Canadian medical schools. — *Milan Korcok*, Florida

Stressed parents at "loggerheads" with children, report says

A new report has issued a warning about the mental health of Canadian children. The research, published in *The Health of Canada's Children* (www.cich.ca/resource.htm), indicates that 20% of Canadian children are experiencing emotional problems requiring treatment.

Parents are at "loggerheads with their kids," says Dr. Graham Chance, chair of the Canadian Institute of Child Health (CICH) committee that compiled the report. Surveys of how parents view their children aged 4 to 11 years revealed that 70% of children "argue a lot" and 50% are "stubborn, sullen or irritable." In addition, the parents thought 51% of the boys and 35% of the girls had concentration problems, while 51% of the boys and 37% of the girls were considered restless or hyperactive. Another study is under way to see how teachers view these same children.

Chance, a retired pediatrician, says the parental view is an "alarming surprise" that "raises the question of whether society expects too much of a child." He added that "it also reflects the intolerable tensions on the family." Other research shows that 66% of parents are experiencing severe or high degrees of family tension because they have to juggle work with family commitments and child care.

"Children's mental health now requires the same level of public focus that was used to cut the number of SIDS cases in half between 1988 and 1996," says Dawn Walker, the CICH executive director. Chance says physicians, with their unique knowledge of health and the family's specific situation, play an essential role in counselling families about many of these mental health issues. Unfortunately, he said, "they're also damned hard pressed for time." — *Barbara Sibbald*, CMAJ

PULSE

Does Canada really rank 30th in world in terms of health care?

The World Health Organization's (WHO) World Health Report 2000 (www.who.int/whr/2000/en/report.htm) ranked Canada 30th among 191 member states in terms of overall health-system performance. But what does the number mean and how was it derived?

The performance ranking links overall health system achievement to health system expenditure. Canada ranked 7th in overall health-system achievement and 10th in terms of health spending, but fell to 30th when these 2 measures were combined because the methodology considers what could be achieved in a country given the level of resources available.

The WHO assessment of overall health-system achievement was based on the overall level of population health, health inequalities within the population, responsiveness of the system based on patient satisfaction and how well the system performs, how well people of varying economic status feel they are served by the system and the distribution of the health system's costs.

The average level of health — where Canada ranked 12th — is based on disability-adjusted life expectancy or the expectation of life lived in equivalent full health. Distribution of health is measured in terms of child-survival rates across countries. Canada ranked 18th in this area.

Responsiveness of the health system was estimated based on individual surveys that evaluated performance concerning respect of persons (dignity, autonomy, confidentiality) and client orientation (prompt attention, choice of provider, etc). Distribution of responsiveness reflected a country's ability to treat disadvantaged groups such as the elderly and poor. Canada ranked 8th in terms of level of responsiveness and among the top 38 countries (36 countries tied) for distribution.

In terms of financial fairness, Canada tied with 2 other countries for 19th position. — *Lynda Buske*, buskel@cma.ca

Military's environmental medicine research pushes limits of human endurance

There's only one place in Canada where you can climb 100 000 feet by stepping through one door and drop to a depth of 5000 feet by stepping through another. Toronto's Defence and Civil Institute of Environmental Medicine (DCIEM, www.dciem.dnd.ca), a little-known human-factors research facility, pits men and women against the environment by simulating high altitudes, great depths, powerful acceleration forces and temperatures ranging from -60°C with 50 km/h winds to 45°C with 95% humidity. "We're one of the few places in the world where all the disciplines come together," says Colonel David Salisbury, the physician who serves as deputy director general at DCIEM. "We're small by world standards, but we're complete."

Dr. Manny Radomski, the director general, is more effusive: "We're probably one of the top international, elite research institutions in the world." Better, he says, than its US counterparts, where cutbacks have led to contracting out. "We have the only altitude research facilities and the only [acceleration] research facilities in North America. Some say we're Canada's best kept secret."

DCIEM was founded in 1939 by Nobel Prize winner Sir Frederick Banting and moved to CFB Downsview in north Toronto in the mid-1950s. These days, the mammoth brick buildings house 130 civilian and 60 military personnel, many with PhDs. There are also 6 physicians, including 4 who practise aerospace medicine, an internist who specializes in travel and tropical medicine, and another who specializes in post-traumatic stress.

They work on both military and civilian projects. The facility has already garnered 97 patents for its innovative products, ranging from antigravity suits to artificial blood. Currently, it helps the Canadian Standards Association set values for noise protection and life jackets, and it has contracts with the US Navy and Boeing Aerospace. The largest ongoing contract involves testing children's car seats on its pneumatic crash track — the only one of its type in Canada.

DCIEM, 1 of 5 military research centres in Canada, also collaborates with other military forces. It is currently con-

ducting research on African sleeping sickness for the French army. And it is closely aligned with 8 universities and 5 Toronto hospitals. In one project, the University of Toronto is supplying ophthalmology expertise while DCIEM provides experts in hypobaric physiology to assess the effect of altitude on patients who have undergone laser surgery for retinal detachment.

But the institute's primary function is to support the Canadian Forces. In the air-tight thermal unit, researchers are trying to determine if modafinil, a drug used to treat narcolepsy, is affected by high temperatures. In an adjacent room, researchers are testing clothing in the world's largest freezer, which can produce temperatures of -100°C (with wind chill). Outside sits a peculiar inflated stretcher — a forced-air warming system for hypothermia patients (see photo).

But how well will new equipment work in the field? "We're always looking at human-factors input," says Radomski. Even simple things like helmets must be assessed, and tracked vehicles for use in the Arctic must be able to accommodate drivers in full winter gear, including mukluks.

Salisbury led the way to the world's deepest diving facility — capable of pressurizing to a simulated depth of 5000 feet, and ideal for testing equipment and personnel. In fact, DCIEM's decompression tables are in universal use for sports diving. The 3-part chamber, which resembles 3 giant drug capsules, features a wet, transfer and living chamber, since decompression from a depth of 700 feet can take up to a week.

In its altitude chambers, meanwhile, the institute conducts research with NASA and the Canadian Space Agency. They are trying to reduce the amount of time astronauts have to pre-breathe oxygen before going on a space walk in order to avoid decompression sickness. So far, researchers have been able to reduce pre-breathing time from 12 to 2 hours.



A portable forced-air warming system that suspends hypothermia patients on a bed of air is used on search and rescue missions.

"Whatever it takes to increase performance or protection of aircrew, we're willing to do it," says Commander Bill Bateman, the physician who heads the Aerospace Life Support Section. It studies gravity protection, spatial disorientation, life-support equipment and human-factors accident investigation.

Not only did DCIEM develop the first antigravity suit, but the institute has also produced what Radomski says may be the world's best protective equipment for aircrew flying high-performance jets. The STING (Sustained Tolerance to INcreased G), now being manufactured, increases tolerance to 9 Gs. Previous equipment has provided a combined natural and suit tolerance of about 6 Gs. DCIEM is now combining the STING suit with a pressure breathing device that increases pressure in the lungs, thus increasing blood pressure.

There is also intense research into spatial disorientation, which involves the erroneous perception of an aircraft's position relative to other planes and the ground. It is a major cause of aircraft losses; from 1982 to 1992, 20% of losses were caused by spatial disorientation.

Meanwhile, DCIEM's new, standardized, universal escape system for helicopters is being installed in US Coast Guard aircraft. (To help pilots who have to ditch in water, the insulating properties of new immersion suits developed by DCIEM make them comfortable at 30°C in the aircraft or 4°C in the water.)

A number of nonmilitary spinoffs may result from DCIEM's research. For example, G-suit and altitude research

may contribute to noninvasive cardiovascular monitoring to treat respiratory failure. "As an MD I can see all sorts of clinical applications," says Bateman.

One of DCIEM's major projects involves an artificial blood, Hemolink, which will soon be sent to the US Federal Drug Administration for approval. The new "blood" will provide unlimited quantities of a non-type-specific product.



DCIEM's new immersion suits, worn by military pilots, have special insulating properties that make them comfortable at 30°C in the aircraft or 4°C in the water.

Dr. Pang Shek, head of the Biomedical Sciences Section, says most of the institute's medical R & D work involves military trauma such as explosive-related injuries and postoperative challenges such as sepsis and shock. It is also developing artificial skin for use in wound management. Though promising, Shek says the product is still 5 years away from its first trials.

On the second floor at DCIEM, 6 young men mill about a table, nervously awaiting their next test in their quest to become a military pilot. DCIEM is a world leader in assessing aircrew for the military and civilian airlines, with about 400 candidates passing through its doors annually.

Candidates for the Canadian Space Agency and Canadian Forces pilot training program endure a battery of physical and psychological tests for more than 2 days. Under the watchful eye of flight surgeon Gary Gray, these half-dozen men undergo ECG, pulmonary function testing, echocardiography, cardiovascular stress testing, arrhythmia detection and more.

So far, data have been gathered on 15 000 personnel, which gives the Canadian Forces Medical Service a unique medical database that helps answer epidemiologic questions. Baseline and subsequent blood testing provide information on serial changes over a career. As

well, a 13-country, 1500-subject study looked at the effects of high gravity on the hearts of fighter pilots by comparing their test results with those of transport pilots. "There are no long-term changes," notes Gray.

Meanwhile, DCIEM's School of Operational Medicine trains physicians to be flight surgeons and diving medical officers. "Medicine teaches us to treat people with abnormal physiology in normal environments," says Commander Cyd Courchesne, the physician who heads the Medical Assessment and Training Section. "We treat normal people in abnormal environments."

Certainly the medical issues handled by flight surgeons, such as decreased oxygen, increased gravitational pressure and chronically fatigued transport aircrew, can be serious. Each year about 20 students, including military physicians from other countries and civilians, take the 6-week course. Salisbury, who is doing his second tour at DCIEM, says the institute is a "dream job" for medical researchers, simply because "there are so many interesting projects on the go." — *Barbara Sibbald, CMAJ*

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CONFERENCE REPORT

What role do genes play in abnormal HDL levels?

How do genetic abnormalities modulate the metabolism of high-density lipoprotein (HDL)? Medical geneticist Michael Hayden of the University of British Columbia asked and answered that question during a symposium at the Canadian Cardiovascular Society Congress, held in Vancouver Oct. 29. He began by highlighting the importance of HDL and noting that lowered HDL levels are responsible for at least 40% of premature heart disease. The higher the HDL, said Hayden, the lower the risk, even in the presence of elevated low-density lipoprotein (LDL) levels. He reviewed the hypothesis that HDL protects at the cellular level through its role in reverse cholesterol transport. In this process, cholesterol is

mobilized from peripheral sites and shuttled back to the liver for catabolism.

The consequences of defective reverse cholesterol transport are epitomized in patients with Tangier disease, a striking and severe expression of HDL deficiency. In addition to depressed HDL, patients with this disease have abnormal tissue deposition of cholesterol within the reticulo-endothelial system (giving rise to orange tonsils) and appear to be at high risk for atherosclerosis end points.

Hayden's group and others genetically mapped Tangier disease to chromosome 9q and then used fine-mapping techniques to isolate the causative gene. It turned out that the same gene defect that causes Tangier disease is also pre-

sent in a small but substantial proportion of patients with low HDL levels but without abnormal cholesterol deposits.

People who are heterozygous for this genetic defect have been found to develop vascular aging about 25 years faster than normal. An exciting implication of Hayden's work is the potential for novel drug development directed at raising HDL levels and thereby protecting against the development of atherosclerosis. — **This article was written by Dr. Paul Armstrong, an Edmonton cardiologist, and Dr. Robert Hegele, a symposium cochair. Physicians interested in submitting similar reports should contact John Hoey, 800 663-7336 x2118; hoeyj@cma.ca.**

CLINICAL UPDATE

HRT and venous thromboembolism: more evidence of a link

Grady D, Wenger NK, Herrington D, Khan S, Furberg C, Hunninghake D, et al. Postmenopausal hormone therapy increases risk for venous thromboembolic disease. The Heart and Estrogen/progestin Replacement Study. *Ann Intern Med* 2000; 132:689-96.

Background: Recent observational studies^{1,2} suggest that there is an increased risk of venous thromboembolism (VTE) with postmenopausal hormone replacement therapy (HRT), but this risk has not been confirmed in clinical trials.

Question: Does HRT increase the risk of VTE among postmenopausal women?

Design: The Heart and Estrogen/progestin Replacement Study [HERS]³ was a randomized, double-blind, placebo-controlled trial conducted at 20 centres. Postmenopausal women less than 80 years of age who had not undergone hysterectomy were enrolled. All had coronary artery disease, because the original goal of the trial was to examine the secondary prevention of coronary events. No subject had a history of VTE, and none had used HRT within 3 months of randomization.

The women were randomly assigned to receive conjugated equine estrogen (0.625 mg/d) and medroxyprogesterone acetate (2.5 mg/d), or placebo. Clinical follow-up occurred every 4 months. During each visit subjects were asked if a blood clot had been diagnosed in the legs or lungs, or if they had been admitted to hospital. Medical records were then reviewed to determine whether VTE had occurred. To prevent unblinding of clinical centre staff, subjects reported gynecologic symptoms to gynecology staff, who were at a separate location.

Results: A total of 1380 women were assigned to receive HRT and 1383 placebo. The mean age was 68 years at baseline. During the follow-up period of

4.1 years on average, 34 women in the HRT group experienced VTE events (6.2 per 1000 woman-years), as compared with 13 in the placebo group (2.3 per 1000 woman-years), for a relative hazard of 2.7 (95% confidence interval [CI] 1.4-5.0, $p = 0.003$). The excess risk was 3.9 events per 1000 woman-years (95% CI 1.4-6.4), yielding a "number needed to treat for harm" (the number of subjects treated for 1 year with HRT, as opposed to placebo, per VTE event) of 256 (95% CI 157-692). The findings were similar when deep vein thrombosis and pulmonary embolism were analyzed separately. Two women died of pulmonary embolism; both had received HRT.

Multivariate analysis showed excess risk in subjects with lower extremity fracture (relative hazard 18.1, 95% CI 5.4-60.4), cancer (relative hazard 3.9, 95% CI 1.6-9.4), inpatient surgery within 90 days (relative hazard 4.9, 95% CI 2.4-9.8) and hospital admission for nonsurgical reason within 90 days (relative hazard 5.7, 95% CI 3.0-10.8). The risk of VTE was lower among women taking ASA (relative hazard 0.5, 95% CI 0.2-0.8) or statins (relative hazard 0.5, 95% CI 0.2-0.9).

Commentary: HERS is the largest randomized controlled clinical trial to date examining the health outcomes of postmenopausal HRT. Its finding of a 3-fold increase in risk of VTE is consistent with findings of previously published observational studies. Non-randomized observational studies, however, may have been subject to selection bias, had women taking HRT been more likely to undergo more exhaustive diagnostic evaluation for symptoms



suggestive of VTE. The key strength of HERS is that its randomized, double-blind design guarded against such bias.

Practice implications: Postmenopausal women should be cautioned that HRT is independently associated with a small excess risk of VTE events, most of which are nonfatal, and that this risk should be weighed against the beneficial effects of HRT. HRT should be avoided in women whose risk of VTE is increased by cancer, lower extremity fracture or recent (within 90 days) hospital admission for medical or surgical treatment. — *Benjamin H. Chen*

The Clinical Update section is edited by Dr. Donald Farquhar, head of the Division of Internal Medicine, Queen's University, Kingston, Ont. The updates are written by members of the division.

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PUBLIC HEALTH

Snowboarding injuries: hitting the slopes

Epidemiology: The popularity of snowboarding has grown tremendously since the sport was introduced commercially 20 years ago. This winter, 20% to 30% of all visitors to North American ski resorts will be snowboarders.¹ In the 1980s, the typical snowboarder was a 19-year-old male attracted to the sport by its relatively low cost, baggy pants, goofy hats and the thrill of “catching air” during aerial manoeuvres. Today the sport is enjoyed by children as young as 4 and seniors in their 60s, and about 25% of snowboarders are female.^{2,3} As the demographic profile of snowboarders evolves, so will the patterns of their injuries.

axis of their boards, with both feet affixed by nonreleasable binders to a single board. They most often face rightward, using the left leg and hand to lead the ride downhill and placing the bulk of the body’s weight on the right rear leg.¹ As with surfers and skateboarders, arms and hands remain free and are used for balance. Most recreational snowboarders wear soft boots, which allow for maximum comfort and manoeuvrability. Hard boots provide greater ankle support and increased control and are worn primarily by racers. Hybrid boots, which combine a hard shell with a soft upper component, provide a balance between manoeuvrability and stability and are becoming increasingly popular. Since each boot style places the body under different stresses, it is important to enquire about the type of boot worn when injuries are being evaluated.⁶

Because of the fixed position of the lower limbs, snowboarders tend to use the outstretched arm to break a fall. Wrist injuries due to falls onto a hyperextended wrist account for almost half of all snowboarding-related injuries.^{3,7} Most of these (50%–65%) are fractures,² so evaluation of a wrist with point tenderness should include radiology studies. Wrist guards appear to decrease the risk of wrist injury but may place the areas proximate to the device, such as the fingers, radial shaft and shoulder, under greater stress.⁴

Ankles are involved in 12%–17% of snowboarding-related injuries.^{6,7} Physicians need to be alert to the possibility of a fracture to the lateral process of the talus, known as “snowboarder’s ankle,” because it accounts for as many as one-third of ankle fractures in this population.⁶ The mechanism is a forcing of the ankle into dorsiflexion and inversion during a landing from an aerial manoeuvre, especially when the landing has been over-rotated. This fracture is difficult to see on a standard ankle x-ray series and requires CT scanning for definitive diagnosis. Surgical repair is required, with excision of fracture fragments or internal fixation of the fractures.⁷

Because snowboarders often fall

backward, blows to the back of the head account for about 12% of injuries. Fortunately, force load on the head is usually mild, with most of the force being absorbed by the buttocks, back and upper extremities. However, this may result in vertebral column fracture, a diagnosis reported in 11% of the snowboarding-related injuries evaluated in a recent case series.⁵

Prevention: A survey of 355 injured snowboarders revealed that only 6% wore wrist guards, 14% used kneepads and 3% used elbow pads.⁴ Only 1% of children treated and released from an emergency department for snow-related recreational injuries reported wearing a helmet.⁸ According to cross-sectional data, failure to wear a wrist guard increases the risk of wrist injury 2.78 times.³ However, the effectiveness of snowboarding safety devices has not been well evaluated, and further research and development of safety equipment is needed. Current recommendations to lessen the risk of injury, particularly among novices, include formal training in proper snowboarding techniques, using soft-shell boots with a stiff inner boot for ankle support and wearing helmets, padding and wrist guards.⁵ A recent article provides a thorough survey of the issue.⁹ — *Erica Weir, CMAJ*

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Canapress

Estimates of the risk of snowboarding-related injuries, based on the number of injured patients presenting to local hospitals in relation to the number of lift tickets sold, range between 1.7 and 16 injuries per 1000 days of snowboarding.³ According to several reported case series, 80% of injured snowboarders are male, with a median age of 20 years.^{4,5} Novices are at greatest risk, with almost 25% of injuries occurring during a person’s first experience and almost 50% occurring during the first season.^{1,4} Most injuries are caused by direct impact during falls or while attempting jumps,⁵ with torsion and collision playing less of a role than in skiing injuries.

Clinical management: Knowing the type of equipment used and the rider’s position on the board is important in evaluating injuries. Unlike skiers, snowboarders stand perpendicular to the long