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6. One person should be identified as responsible for vaccine management. Another person should also be trained for when the first is absent.
7. All vaccine storage refrigerators should have a maximum-minimum thermometer or, if large quantities of vaccines are stored, a continuous temperature recording device. All monitoring devices should be certified or calibrated routinely.
8. Two daily temperature readings for the vaccine refrigerator should be taken and recorded – one first thing in the morning and one at the end of the day – to ensure temperatures remain between 2°C and 8°C. A chart-recording thermometer should also be checked for temperature fluctuations, which can occur between readings. The designated staff person should record and sign off readings in a logbook daily. This person also should ensure that all staff handling vaccine know how to read and interpret maximum-minimum thermometers.
9. All staff handling vaccines should be taught the importance of good vaccine storage and transportation techniques.
10. Vaccines should never be stored on refrigerator door shelves because temperatures are warmer there than on the shelves of the refrigerator.
11. Space should be left between the products in the refrigerator to allow air to circulate. For freeze-dried products, for which diluent is provided in separate packages, the diluent should be stored at room temperature to conserve refrigerator space (unless the vaccine direction insert specifies that the diluent must be refrigerated).
12. Keep all adsorbed vaccines that should not be frozen away from the freezing element and away from direct contact with ice.
13. Store water bottles at the bottom, at the top, and in the door spaces of the vaccine refrigerator, and keep ice packs in the freezer compartment to maintain a more constant temperature if the power supply fails.
14. Keep a sign near the electric plug outlet for the vaccine refrigerator and the power-breaker box indicating that the power cannot be turned off. Refrigerator plugs should be in a protected area where they cannot be knocked out accidentally. Vaccine refrigerators should have a designated plug outlet that is not required for other appliances.
15. Make sure that the refrigerator door is closed when not in use.
16. Procedures in the event of vaccine refrigerator failure should be posted on or near all such refrigerators.
17. If the power supply fails, the person responsible for vaccine storage or the delegate should put all vaccines into a thermal cold box or a container with ice packs and a thermometer until the vaccines can be transferred to another refrigerator. If a short power outage is anticipated (less than 1 hour), the storage unit should not be opened. If a longer power outage is anticipated, plans for transfer are warranted.
18. Educational material on the cold chain should be available in all centres storing vaccines.
19. If products are known to have been exposed to temperatures outside of the recommended range, the exposed products should be put in a box marked “DO NOT USE” and placed in a functioning refrigerator. The types of products exposed should be recorded, as well as the duration and temperature of exposure, and advice on whether these products can be used or returned should be sought immediately.
20. Regular maintenance of refrigerators (cleaning coils, replacing door seals, etc) should be performed and records kept.

Recommendations for transportation

1. If evidence of freezing is present when vaccines sensitive to freezing are received (eg, results of temperature measurements), the vaccine must not be used.
2. Oral polio vaccine should preferably arrive with some dry ice still present. If this vaccine arrives with no remaining ice but still cold, it may still be used; however, if the vaccine is warm, it should not be used. ■

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Preventing hepatitis A infections

National Advisory Committee on Immunization statement

LABORATORY CENTRE FOR DISEASE CONTROL

The following summarizes the statement on the prevention of hepatitis A infections, focusing on aspects that are most relevant to family practitioners. A copy of the complete statement can be obtained through the FaxLink service by dialing (613) 941-3900 from any fax machine and requesting Vol 20, issue 16 of the Canada Communicable Disease Report, when asked.

Between 1000 and 3000 cases of hepatitis A (HAV) infection are reported annually in Canada. Since

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1987 the reported incidence rates per 100 000 population have varied from 4.4 to 11.2.

Hepatitis A virus (HAV) is spread via the fecal-oral route, through direct contact with infected persons or indirectly through ingesting contaminated water or foods, especially uncooked shellfish.¹ Toddlers are apt to infect their playmates or family members.

Life-long immunity usually follows HAV infection because only a single serotype of HAV exists.² Passive immunization with immunoglobulin can be used for short-term prophylaxis or given shortly after exposure to prevent HAV infection.³ Immunoglobulin preparations contain adequate anti-HAV levels because a proportion of blood donors are seropositive. Active immunization with hepatitis A vaccine is also available for those who would benefit from long-term protection (see review page 1199).⁴

Vaccine for active immunization

One hepatitis A vaccine is licensed in Canada. This inactivated, whole-virus vaccine is supplied as a liquid, of slightly milky appearance. A single dose of 1.0 mL contains not less than 720 enzyme-linked immunosorbent assay units of viral antigen. The vaccine should be stored at 2°C to 8°C and should not be frozen.

The vaccine is highly immunogenic,^{5,6} eliciting virus-neutralizing antibody.⁵ More than 90% of healthy vaccinees develop anti-HAV levels thought to be protective (≥ 20 mIU/mL) within 4 weeks of receiving the second dose. By this time HAV antibody levels substantially exceed those in recent recipients of Ig,⁵ an alternative means of protection (see below). Anti-HAV antibody levels decline slowly after the second dose. A third dose given 6 to 12 months after series initiation

provides a strong booster effect.⁵ Both young and old adults in good health respond satisfactorily.^{5,7} The duration of protection is unknown but extends at least 3 years, based upon available data.⁸ Projections based on antibody decay rates suggest that protection following the three-dose series might last 10 years or more.⁹

Hepatitis A vaccine can be given at the same time as hepatitis B and certain other vaccines, provided that separate injection sites are used.¹⁰ Responses to hepatitis A vaccine are not impaired when it is given at the same time as diphtheria and tetanus toxoids, rabies, poliomyelitis, yellow fever, or typhoid vaccines. Concurrent administration with Ig (at separate injection sites) does not substantially impair responses to hepatitis A vaccine.^{11,12}

Recommended use. Hepatitis A vaccine should be injected intramuscularly. The deltoid area is preferred for adults. The recommended series consists of three doses (1.0 mL each) given at 0 and 1 month and at any time between 6 months and 12 months after the initial dose.^{5,6} For more rapid protection, the first two doses can be given 2 weeks apart.

Hepatitis A vaccine is currently recommended only for pre-exposure prophylaxis and for individuals at increased risk of infection for an extended period. It is a preferred alternative to repeated or large-volume doses of Ig, previously used for short-term passive immunization against HAV.

Hepatitis A vaccine is currently licensed for use for adults. No specific pediatric formulation is available, but for children likely to be exposed to HAV, half of the adult dose (ie, 360 ELISA units) according to the recommended adult schedule may be considered.

High priority for vaccination.

The list of persons considered to be at increased risk of HAV infection and, therefore, potential candidates for vaccine includes:

- residents of communities with high endemic rates or recurrent outbreaks of hepatitis A. Effective community-based programs would require inclusion of children and adults;
- persons planning to live for prolonged periods in developing countries, such as missionaries,¹³ diplomats, and engineers;
- members of the armed forces, emergency relief organization workers, and others likely to be posted abroad at short notice to areas with high rates of HAV infections;
- travelers to countries where hepatitis A is endemic, especially when travel involves rural or primitive conditions. Vaccination is particularly suitable for frequent travel abroad and extended stays, as an alternative to repeated or large volume injections of Ig. For travelers with limited time before departure, the two initial doses can be separated by as little as 2 weeks.¹⁴ A protective response might take 4 weeks to develop following completion of an accelerated schedule. If insufficient time is available, Ig can be given concurrently with hepatitis A vaccine using a separate injection site^{11,12};
- residents and staff of institutions for the developmentally challenged;
- patients with hemophilia A or B receiving plasma-derived replacement clotting factors. The solvent-detergent method, used to prepare all present plasma-derived factor VIII and some factor IX concentrates, does not reliably inactivate HAV, a nonenveloped virus. Some groups of

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Table 1. Immunoglobulin dosages for pre-exposure prophylaxis

LENGTH OF STAY	BODY WEIGHT (KG)	DOSE (ML)*
< 3 months	< 23 [†]	0.5
	23-45	1.0
	> 45	2.0
> 3 months	< 23 [†]	1.0
	23-45	2.5
	> 45	5.0

* Dosage can vary among Ig products. Consult the product monograph for dosage details.
[†] For small infants, the dosage equivalent is 0.02 mL/kg for stays shorter than 3 months and 0.06 mL/kg for stays longer than 3 months.

hemophiliacs have a higher-than-expected prevalence of anti-HAV,¹⁵ implicating clotting factor preparations as a possible source;

- zoo-keepers, veterinarians, and researchers who handle non-human primates¹⁶; and
- certain workers involved in research on HAV or production of hepatitis A vaccine.

Moderate priority for vaccination. The following are at moderately increased risk of developing infection:

- inmates of correctional facilities where an ongoing problem with HAV infections is not responsive to other control measures; and
- persons with lifestyle-determined risks of infection, including those engaged in oral or intravenous illicit drug use in unsanitary conditions and male homosexuals with multiple sexual partners.

Booster doses of vaccine. The need for and timing of booster doses of hepatitis A vaccine is not yet known.

Adverse reactions and contraindications. Side effects reported among vaccine recipients to date (numbering more than 1 million worldwide) have usually been mild and transient and

generally limited to soreness and redness at the injection site.⁶ Local reactions do not increase in severity with successive doses or with pre-existing natural immunity. Rare instances of anaphylaxis have been reported. The vaccination series should be stopped when individuals have signs of anaphylaxis following a dose. The hepatitis A vaccine does not cause serum aminotransferase levels to rise.⁶

The hepatitis A vaccine is contraindicated for persons allergic to any of its constituents, which include bovine albumin and aluminum.

Pregnancy is a relative contraindication because the safety of hepatitis A vaccination has not been studied in pregnancy. However, there is no reason to expect untoward effects on the fetus from an inactivated vaccine should a pregnant woman be considered for vaccination because of increased risk of HAV exposure. Hepatitis A infection can be more serious during pregnancy. Immunoglobulin is an alternative means of protection for short-term exposure.

Because it is an inactivated preparation, hepatitis A vaccine is safe to use for immunocompromised persons, but the immune response could be sub-optimal depending upon the specific immunologic impairment.

Limitations of knowledge.

New vaccines inevitably are accompanied by some unanswered questions. Extensive experience to date with hepatitis A vaccine in other countries minimizes safety concerns for Canadians. However, physicians should report to provincial health authorities and the manufacturer any serious adverse experiences potentially attributable to this vaccine.

Immunoglobulin for passive immunization

Human immunoglobulin provides protection against HAV when administered intramuscularly before exposure or during the early incubation period.³ Its relative effectiveness depends upon both the time of administration and the dose given. Hepatitis A vaccine is now the preferred alternative for pre-exposure prophylaxis for persons at continuing or repeated risk of exposure to HAV.

Pre-exposure prophylaxis. Prophylaxis is recommended for certain travelers to areas of high prevalence, especially rural areas or where the hygienic quality of the food and water supply is likely to be poor and hepatitis A is endemic. Immunoglobulin should be given shortly before departure and in the doses indicated in *Table 1*. Hepatitis A vaccine is preferred for people who anticipate additional future travel and is an alternative for others. If there is insufficient time for immunity to develop after vaccination, Ig can be given concurrently with hepatitis A vaccine using a separate injection site.^{11,12} Immunoglobulin is not needed by travelers who completed the recommended three-dose hepatitis A vaccination series within 3 years.

Persons planning to live for prolonged periods in developing

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countries should be offered hepatitis A vaccine; those who elect not to receive vaccine should be given Ig every 4 to 6 months in the doses shown in *Table 1*. Immunoglobulin produced in developing countries might not meet the standards for purity used in most developed countries. Persons needing repeat doses overseas should receive products that meet Canadian licence requirements and be injected using a sterile disposable syringe and needle.

Postexposure prophylaxis.

Immunoglobulin should be given as soon as possible after a known exposure, preferably within 72 hours. Evidence suggests minimal benefit from Ig given more than 1 week after exposure and no benefit with delays of 2 weeks or more. The recommended dose is the same as for short-term pre-exposure prophylaxis shown in *Table 1*. The following groups should be considered for postexposure prophylaxis:

- all household or similar contacts of people with acute hepatitis A;
- certain contacts in day-care centre outbreaks. Outbreaks of hepatitis A in day-care centres enrolling children younger than 2 years of age are characterized by clusters of clinical hepatitis among staff and parents of centre children, with little clinical illness among the children themselves, who nonetheless are the reservoir of infection and transmit it to staff and parents. In centres that accept diapered children, Ig should be given to all children and employees at the centre if one case occurs in a child or staff member, or if cases occur in at least two children's families. Family members of children younger than 4 years attending such a day-care centre

should also be considered for prophylaxis if the outbreak is recognized more than 3 weeks after onset or if cases have occurred in three or more children's families. If cases occur in a centre not caring for diapered children, Ig need be administered only to close contacts of the index case; and

- residents and staff of institutions for the developmentally challenged and inmates and staff of correctional facilities in which there is an outbreak.

Other preventive measures

Neither active nor passive immunization can be expected to be 100% effective. Therefore, food and water handling precautions remain critically important for avoiding HAV infection. ■

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Available

Patient Education Program

New brochures, available from the College of Family Physicians of Canada, can help to reinforce information you offer your patients during their appointments. They can take these pamphlets home to read when they are better able to absorb the message. Brochures now available are:

- Insomnia: How to get a good night's sleep;
- Urinary Tract Infections: A common problem for some women;
- Irritable Bowel Syndrome: Tips on controlling your symptoms;
- Low Back Pain: Tips on pain relief and prevention;
- Stress: How to cope better with life's challenges;
- Weight Control: Losing weight and keeping it off;
- Colic: Learning how to deal with your baby's crying;
- Migraine Headaches: Ways to deal with the pain;
- Sore Throat: Easing the pain of a sore throat; and
- Grieving: Facing illness, death and other losses.

To request copies, call 1-800-387-6197 or write to the College of Family Physicians of Canada, 2630 Skymark Ave, Mississauga, ON L4W 5A4. Other titles will be released soon:

- Ulcers: What you can do to heal your ulcer;
- Constipation: Keeping your bowels moving smoothly;
- Diaper Rash: Tips on prevention and treatment;
- High Blood Pressure: Things you can do to help lower yours;
- Vomiting and Diarrhea: Helping your child through sickness;
- Anxiety and Panic: Gaining control over how you're feeling;
- Exercise: A healthy habit to start and keep;
- Hemorrhoids: Reducing the pain and discomfort;
- STDs: Common STDs and tips on prevention;
- Vaginal Discharge: Changes that may be signs of a problem;
- Acne in Teens: Ways to control it;
- Cholesterol: What you can do to lower your level;
- Fever in Children: When your child has a fever;
- Osteoporosis in Women: Keeping your bones healthy and strong;
- Smoking: Steps to help you break the habit;
- Alcohol: What to do if it's a problem for you;
- Breast Cancer: Steps to finding breast lumps early;
- Child Safety: How to keep your home safe for your baby;
- Memory Loss with Aging: What's normal, what's not; and
- Skin Cancer: Saving your skin from sun damage.

Primary prevention of cancer

The Ontario Task Force on the Primary Prevention of Cancer recently released its report, *Recommendations for the Primary Prevention of Cancer*. "The report builds on our government's *Tobacco Control Act*, *Environmental Bill of Rights*, and Ontario's first cancer strategy, *Life to Gain*," says Ruth Grier, Ontario's Minister of Health. In a 1994 report, Ontario's Chief Medical Officer of Health estimated that 25% of cancer deaths are tobacco-related and 20% are diet-related. Occupation, family history, and alcohol use each account for 5% of cancer deaths. Because lifestyle changes can prevent cancer and save lives, the task force was asked to prepare an action plan for cancer prevention and to establish targets for the reduction of specific types of cancer. Its 81 recommendations cover tobacco, diet, alcohol, physical activity, occupational and environmental carcinogens, sunlight, reproductive factors, medications, and socioeconomic factors. Copies of the report are available by calling the Ministry of Health INFOLine at 1-800-269-1154 or (416) 314-5518 in Toronto.

L'hypertrophie bénigne de la prostate

D'après une récente enquête pancanadienne, la moitié des hommes de plus de 50 ans n'ont jamais entendu parler de l'hypertrophie bénigne de la prostate (HBP), affection qui touche éventuellement la plupart des hommes âgés. Cette enquête a lancé une campagne de sensibilisation aux signes et aux symptômes de l'HBP, qui incluent le besoin fréquent et impérieux d'uriner, surtout la nuit; l'hésitation ou le retard de la miction; les fuites post-mictionnelles; l'affaiblissement ou l'interruption du jet mictionnel et la sensation de vidage incomplète de la vessie après la miction. Pour plus de renseignements, veuillez communiquer avec Stéphane Beaulieu ou Danielle Jasmin, Jasmin et Associés, au (514) 938-5354.

New HIV guidelines

Guidelines intended to improve HIV testing and counseling are now available from the Canadian Medical Association. The new *HIV Testing: Counselling Guidelines* suggests ways to use HIV testing with pretest and posttest counseling to help patients improve their health while stopping the spread of HIV infection. The full text of the guidelines is available through CMA Online, the association's World Wide Web site on Internet; the address is <http://hpb1.hwc.ca:8400/infobase/hiv/contents.htm>.