

The new American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiac care: presented by the Emergency Cardiac Care Subcommittee of the Heart and Stroke Foundation of Canada

James M. Christenson, MD; Alfonso J. Solimano, MD; Jane Williams, BN, MEd; Brian Connolly, MD; Lynda Monik, MBA; Heather Erb-Campbell, RN, NP; Lyle McGonigle, MD

Résumé : Les auteurs décrivent les modifications les plus importantes que l'American Heart Association a apportées récemment aux directives sur la réanimation cardiorespiratoire et sur les soins cardiaques d'urgence (SCU). Ces modifications ont été avalisées par le sous-comité SCU de la Fondation des maladies du cœur du Canada. La fondation a joué un rôle important dans l'élaboration des nouvelles directives. Les auteurs décrivent les répercussions des modifications sur les programmes de formation en soins immédiats et avancés en réanimation au Canada. Ces directives sont importantes pour les profanes et les professionnels de la santé confrontés à un cas d'arrêt cardiaque.

The American Heart Association (AHA) recently published its guidelines for cardiopulmonary resuscitation (CPR) and emergency cardiac care (ECC).¹ The document summarized the history and science of ECC, outlined the proposed changes to the educational programs for basic life support (BLS) and

advanced life support (ALS) and recommended comprehensive community coordination of resources to treat cardiovascular and pediatric emergencies.

In this article we point out the important changes to the guidelines that have been endorsed by the ECC Subcommittee of the Heart and Stroke Foundation of Canada (HSFC).

The problem

Sudden cardiac death is a significant public health issue. Each year approximately 50 000 Canadians die from coronary artery disease;² 20 000 of these deaths are sudden and unexpected,³ and 12 000 of the cardiac arrests are witnessed.⁴⁻⁶ Even in large centres with sophisticated prehospital systems the survival rates to hospital discharge are low. With an optimal system of emergency medical response we could save many of these victims and help them return to active, relatively healthy lifestyles. Lay responders must recognize the important symptoms of cardiac emergencies and take appropriate action to shorten the time to treatment. Appropriate response will reduce the time to thrombolytic therapy for

Dr. Christenson is a clinical associate professor, Department of Surgery, and an emergency physician, St. Paul's Hospital, University of British Columbia, Vancouver, BC, and chairman, Emergency Cardiac Care (ECC) Subcommittee, Heart and Stroke Foundation of Canada (HSFC); Dr. Solimano is clinical associate professor of pediatrics, University of British Columbia, and chairman, Canadian National Neonatal Resuscitation Program Committee; Ms. Williams is chairperson, Basic Life Support Subcommittee, HSFC; Dr. Connolly is associate professor of family medicine, McGill University, Montreal, Que., and vice-chairman, ECC Subcommittee; Ms. Monik is national coordinator for emergency cardiac care, HSFC. Ms. Erb-Campbell is director of programs and public issues, Heart and Stroke Foundation of New Brunswick; and Dr. McGonigle is associate professor of pediatrics, University of Alberta, Edmonton, Alta., and chairman, Advanced Life Support Subcommittee, HSFC.

Reprint request to: Ms. Lynda Monik, National coordinator, Heart and Stroke Foundation of Canada, 200-160 George St., Ottawa, ON K1N 9M2

myocardial infarction as well as response times in cardiac arrest. Of course, reducing the risk factors for cardiovascular disease may ultimately be the main determinant in reducing cardiovascular mortality.

These issues are important for newborns and children as well. Life support is required by 6% of all newborns. The need for resuscitation rises dramatically with infants weighing less than 1500 g. The prompt application of appropriate ALS techniques in such cases can reduce the rate of unnecessary death and disability.

Reducing pediatric mortality and morbidity requires educating the public about trauma prevention and basic pediatric life support, as well as health care professionals about the appropriate response to a critically ill or injured child.

Development of BLS and ALS courses in Canada

The HSFC is the only national volunteer organization devoted to furthering the study, prevention and reduction of death and disability from cardiovascular disease. The foundation's BLS and ALS programs have expanded over the past 15 years and now reach all corners of the country. The ECC Subcommittee of the HSFC strives to ensure that the courses provide quality educational experiences with consistent information.

The BLS courses are mainly delivered by a network that includes the provincial arms of the HSFC and four national training agencies (the Canadian Red Cross Society, St. John Ambulance, the Canadian Ski Patrol System and the Royal Life Saving Society of Canada). Other local agencies and health care institutions provide courses using HSFC teaching materials. The four national training agencies have representation at the national and provincial BLS committee levels of the HSFC. This tight communication network ensures that the public receives a consistent message, a critical aspect of the national initiatives for public education in CPR. If the courses differed substantially the message would be confusing, and lay people would not respond to the best of their abilities.

1992 CPR guidelines conference

In developing their new CPR guidelines the AHA solicited advice from many experts. At a meeting in September 1991 the group reached a preliminary consensus on many contentious issues. This provided a framework for subsequent formal discussions.

The fifth US National Conference on CPR and ECC, hosted by the AHA, convened in Dallas in February 1992, with more than 500 invited delegates. Cosponsors included the HSFC, the European Resuscitation Council, the American Academy of Pediatrics, the American College of Cardiology, the US National Heart,

Lung and Blood Institute and the American Red Cross. The objectives were to review and revise past recommendations, to provide recommendations for prevention, to recommend changes in methods of education and evaluation, to provide guidelines for evaluating CPR and ECC programs and to provide ethical guidelines.

A key strategy in the discussions was the use of the classification of therapeutic interventions developed by the AHA and the American College of Cardiology.¹ Many past decisions and current AHA recommendations are based on less-than-rigorous science but are necessary to give appropriate guidance. Some of these "best guesses" are often viewed as dogma and mistakenly thought to be scientifically "proven." The use of this classification scheme helped clarify the strength of the science accompanying an individual recommendation. A class I intervention is definitely helpful, a class IIa probably helpful and a class IIb possibly helpful. A class III intervention is not indicated and may be harmful.

Canadian input

The AHA and the HSFC have a close working relationship: each organization sends liaison members to sit on the other's ECC committee. Guideline changes recommended by the AHA are reviewed by the HSFC and incorporated into training programs unless there is reason to do otherwise. The AHA educational guidelines for BLS have been accepted, and those for ALS have been accepted with few exceptions: the use of adenosine is one.

"Chain of survival"

The chain of survival^{7,8} is an appropriate metaphor for the components necessary to successfully respond to an out-of-hospital cardiac arrest. The links are early access, early CPR, early defibrillation and early advanced care. One weak link will result in a low survival rate even if all of the other links are exceptionally strong. This helps explain the variation in survival statistics among cities.

The "chain" emphasizes that the best outcomes can occur only if there is a coordinated and cooperative effort by the public and by prehospital and hospital health care professionals. This reality has forced us to look beyond professional emergency medical response and training in traditional CPR (chest compression and ventilation). We must redesign strategies to ensure that the patient or a bystander can recognize the symptoms of myocardial ischemia or arrhythmia and rapidly call for an ambulance. This challenge complements BLS and ALS programs. Adding this step to a rapid, well-organized prehospital response is essential.

The ECC Coalition of Canada will be a strong advocate for this chain of survival. The coalition's 30 national organizations, which all have a stake in ECC, first

met in March 1992 to promote the development of ECC systems using its collective energy and resources.

Changes in educational programs

While the AHA reviewed the new guidelines volunteer members of the HSFC (members of the ECC, the ALS and the BLS committees) evaluated them from a Canadian perspective. The following changes are important and are endorsed by the ECC Subcommittee.

BLS

The most significant change in the recommendations for basic CPR is that emergency medical services must be contacted immediately after the rescuer recognizes that an adult is unresponsive. Previously, lone rescuers applied 1 minute of CPR before calling for professional help. Ventricular fibrillation is the most common cause of cardiac arrest in adults. It is also the rhythm most amenable to treatment. Many prehospital systems can provide lifesaving defibrillation, but the success of this treatment depends on the speed of delivery. In addition, many ambulance dispatchers can give detailed advice to lay rescuers over the telephone. It is logical, therefore, for rescuers to telephone for emergency medical services immediately after determining unresponsiveness and then to apply CPR.

This change in procedure is not appropriate for infants or children. The cause of cardiac arrest in children is most commonly respiratory failure. Since this is a potentially reversible condition a properly trained lay rescuer should attempt ventilation before calling for professional help. The time spent searching for a telephone and making the call could reduce the chances of survival. Clearing an obstructed airway or providing oxygen to a hypoxic child may save a life or prevent brain injury.

Many lay people are unable to assess pulselessness adequately in an infant or child. Therefore, less emphasis is placed on this part of the assessment.

The technique of ventilation was discussed at length. The use of slower breaths with lower peak pressures is now recommended to reduce the chance of overcoming esophageal opening pressures. Adults, before intubation, should have an inspiration time of 1.5 to 2.0 s (instead of 1.0 to 1.5 s); this change should result in better alveolar ventilation and less risk of gastric insufflation. In pediatric cases the emphasis is on watching for adequate chest movement and using slow breaths (inspiration time of 1.0 to 1.5 s).

The traditional three-quarter prone recovery position is recommended for patients who are unconscious (from a nontraumatic cause) but who are breathing spontaneously. This now conforms to standard medical practice.

A change in the protocol for obstructed airways in

infants should help learners remember the sequence, which is now 5 back blows and then 5 chest thrusts. The number 5 is more consistent with the typical 5:1 compression:ventilation sequence.

In children over 1 year of age trauma is the leading cause of death. A new section on injury prevention in the guidelines is a welcome addition to the BLS information for this age group. Focusing on the science of injury control and the epidemiology of childhood trauma is a major step toward the prevention of these needless deaths.

Much more time is spent in dealing with the transmission of infectious diseases during CPR courses and actual cardiac arrest. There are no reports of the transmission of bacteria, viruses or fungi (including human immunodeficiency and hepatitis B viruses) during CPR training. Because of theoretic risks, the guidelines outline specific protocols for hygienic practices during BLS courses. Instructors are encouraged to teach mouth-to-barrier-device ventilation.

The BLS courses will now offer information about the psychologic impact of rescue attempts on rescuers. This addition should help prepare students for the emotional trauma of a real cardiac arrest.

ALS

The ALS programs include the courses on advanced cardiac life support (ACLS) and pediatric ALS (PedALS), and the Neonatal Resuscitation Program (NRP).

Airway adjuncts: In adults endotracheal intubation is the gold standard for definitive airway control. Other devices, such as esophageal obturator airways, pharyngotracheal lumen airways and combination esophageal-tracheal tubes, are not proven but may be helpful. Mastering good technique in the use of bag-valve-mask systems is essential in all age groups.

In pediatric cases endotracheal intubation is the most effective and safest treatment. Neonatal ventilation bags may be inadequate for infants and children. The bags should have a minimum size of 450 mL. Monitoring gas exchange with the use of pulse oximetry and end-tidal carbon dioxide can provide useful information.

Airway management in neonates generated considerable debate. Birth is a physiologic process, and most infants are healthy at birth. Not all babies need to be positioned and suctioned at delivery, but all need to be closely assessed and, if necessary, promptly stabilized with the use of the decision-making and management process outlined in the NRP. All infants needing resuscitation must receive 100% oxygen. Ventilation bags should have a maximum size of 750 mL. The recommended endotracheal tube size for newborns weighing more than 3 kg was revised to include the 3.5-mm size in addition to the 4.0-mm size; this is more consistent with current Canadian practice.

The compression:ventilation ratio in the newborn was revised to 3:1, with one breath interposed during a pause after each group of three chest compressions (i.e., 90 compressions and 30 breaths per minute). However, compression is seldom necessary, since an appropriate cardiac response usually follows adequate oxygenation and ventilation. There is little scientific information about chest compressions in the newborn, and the HSFC strongly encourages research into this area.

Vascular access: Interosseous vascular access is an appropriate and easily learned procedure. It is extremely useful in children under 6 years of age. In neonates the preferred route of access remains the umbilical vein.

Since glucose solutions may worsen cerebral anoxic damage, normal saline solutions are recommended for maintaining intravenous access in cardiac arrest. Glucose-containing solutions are acceptable in adults but unacceptable in children without hypoglycemia. Neonates, however, are prone to hypoglycemia, and a solution of 10% dextrose, administered intravenously, is still recommended after resuscitation.

Infants, children and adults can be given lidocaine, epinephrine and atropine through the endotracheal tube if vascular access is delayed. Adults are given 2 to 2.5 times the intravenous dose diluted in 10 mL of normal saline or distilled water. In children the drug is diluted in 1 to 2 mL. In neonates epinephrine and naloxone should be used in standard intravenous doses when administered endotracheally. The endotracheal administration of lidocaine and atropine is not recommended in neonates.

Medications: The use of high doses of epinephrine during cardiac arrest has sparked a great deal of interest. Three large, randomized controlled trials involving 2000 adults showed no significant difference in survival between the standard-dose and the high-dose epinephrine groups.⁹⁻¹¹ The recommended dose in adults has not really changed but has been simplified: 1.0 mg should be given at first and repeated every 3 to 5 minutes during the arrest. One clinical study demonstrated improved outcome with high doses of epinephrine in children.¹² Therefore, the recommendation for children is an initial dose of 0.01 mg/kg and then 0.1 mg/kg every 3 to 5 minutes. The pediatric dose given by the endotracheal tube is 0.1 mg/kg. Because of the concern of intracerebral hemorrhage in neonates the recommended dose remains 0.01 to 0.03 mg/kg.

Lidocaine is not appropriate for routine prophylaxis against ventricular tachyarrhythmias after myocardial infarction. This change is now more consistent with standard Canadian practice. The recommended dose for ventricular fibrillation or ventricular tachycardia with an undetectable pulse is now 1.5 mg/kg intravenously. This dose may be repeated once before a second-line antiarrhythmic is tried.

Bicarbonate use was extensively reviewed, and although policies were not changed, this intervention was classified according to the situation in which it would be

used. Bicarbonate use is a class I (definitely helpful) intervention for pre-existing hyperkalemia; class IIa (probably helpful) for pre-existing bicarbonate-responsive metabolic acidosis and tricyclic antidepressant overdose or to alkalinize the urine in some cases of overdose; class IIb (possibly helpful) for an intubated patient with a continued, long arrest or upon return of spontaneous circulation after a long arrest interval; and class III (not indicated, may be harmful) for hypoxic lactic acidosis.

In the AHA guidelines adenosine is recommended for supraventricular tachycardia in all age groups. The ECC Subcommittee of the HSFC considers that in adults and in children over the age of 1 year either verapamil or adenosine is acceptable for stable, narrow, complex supraventricular tachycardia if there is no accessory atrioventricular pathway. Adenosine is clearly indicated for supraventricular tachycardia in children under 1 year.¹³ The HSFC agrees that adenosine should be used in cases of stable, wide, complex tachycardia if lidocaine fails to stop the arrhythmia.

The recommended maximum dose of atropine in adults has been increased. The full vagolytic dose is 3 mg (0.04 mg/kg) and should be used if necessary in asystolic arrest. Atropine is given in boluses of 1.0 mg for asystole and 0.5 to 1.0 mg for symptomatic bradycardia. The boluses should be given every 3 to 5 minutes, as necessary. Atropine should be used with caution in type II, second-degree atrioventricular block.¹⁴ The drug increases the sinus rate, and since this may further fatigue the block site, a higher grade of block may result. However, this is extremely unlikely to cause clinical deterioration. Failure to pace and inability to temporize with atropine may require dopamine or epinephrine infusion for extremely unstable bradycardia. The use of isoproterenol in such cases is now discouraged.

Thrombolytic agents are routinely used in acute myocardial infarction. To increase their effectiveness there is a need to reduce delays due to patient denial and delays after arrival in the emergency department. Public education and the establishment of hospital protocols are important in shortening the time from symptom onset to the administration of the thrombolytic agent.

Naloxone is important for the resuscitation of a newborn whose mother received narcotics less than 4 hours before delivery. The recommended dose is now 0.1 mg/kg, intravenously, endotracheally, intramuscularly or subcutaneously.

Defibrillation: The AHA guidelines and the HSFC strongly support the AHA statement on defibrillation,¹⁵ which recommends that all personnel required to perform basic CPR be trained to operate and permitted to use a defibrillator, particularly the automated external ones. The time from collapse to defibrillation is the most critical determinant of survival. Only through bold new approaches will we be able to bring defibrillation quickly to most arrest victims. The technology that allows minimally trained people to successfully defibril-

late is available; however, the HSFC stresses that such programs must have strong medical control.

Emergency pacing: Early transcutaneous pacing is encouraged in patients with symptomatic bradycardia who await the insertion of a transvenous pacemaker. It is the initial pacing method of choice because it can be applied quickly and is noninvasive.

Algorithms: The algorithms for treating various conditions have been expanded and provide much more useful detail. A helpful addition to the guidelines is the description of treatments according to their strength of scientific evidence.

Educational philosophy

The educational philosophy of the CPR and ECC courses is evolving. The following concepts are important and are supported by the HSFC.

- **Flexibility:** The use of new formats such as mass CPR training, public service announcements and video tapes is encouraged. Programs must be individualized to meet the needs of the student more directly. Targeting appropriate groups such as families of high-risk patients will disseminate the information more effectively.

- **Simplification:** The sequence of CPR steps has been revised so that it is remembered more easily.

- **Refocusing evaluation:** The ECC Subcommittee will further emphasize that the courses are educational and not for "certification" or "licensing." Student evaluations should facilitate the educational process through their determination of what the student has learned, identification of weak areas and assessment of the success of the course. Traditional pass/fail criteria often focus undue attention on an artificial end point rather than on learning. This puts unnecessary stress on the student who fears failure. The best way to rephrase the assessment of the student's performance to reflect the changing philosophy is with the dichotomy "passed" versus "not yet passed." The BLS courses will move toward an open-book examination to reduce student anxiety and to use valuable time to consolidate learning.

Implementation of course changes in Canada

The BLS courses will be taught according to the previous guidelines until new materials are available, perhaps in the fall of 1993. The HSFC and the four national training agencies have agreed to begin teaching the new material then.

All ALS courses will be taught according to the new information and philosophies. Teaching materials will be available, perhaps in the fall of 1993. The new ACLS and PedALS text will be distributed by the AHA. The Canadian ALS instructor's manual will be developed by the HSFC. The new textbook of neonatal resuscitation will be produced jointly by the AHA and the American Academy of Pediatrics. The Canadian Neo-

natal Resuscitation Program Committee is revising the Canadian National Guidelines for Neonatal Resuscitation.

The changes to the AHA guidelines improve the current resuscitation guidelines and information but do not represent radical change or imply that existing practices are "wrong" or "dangerous." We believe that the changes should be implemented in an orderly and thoughtful manner.

Summary

CPR courses (both basic and advanced) continue to evolve. The recent CPR and ECC guidelines by the AHA consolidate the research and vast experience in one document. These guidelines are helpful to lay people and health care professionals who intervene in cases of cardiac arrest. They are also excellent resources for those involved in coordinating ECC systems in the community.

We thank the people, especially the Canadians, who helped formulate the AHA guidelines and all the members of the ECC Subcommittee and the BLS and ALS subcommittees of the HSFC for help in preparing this article.

References

1. Emergency Cardiac Care Committee and Subcommittees, American Heart Association: Guidelines for cardiopulmonary resuscitation and emergency cardiac care. *JAMA* 1992; 268: 2171-2302
2. Bisch L, Lee K, Mark E: Major causes of death, Canada 1989. *Chronic Dis Can* 1989; 10: 22-24
3. Kannel W, Gagnon D, Cupples L: Epidemiology of sudden cardiac death: population at risk. *Can J Cardiol* 1990; 6: 439-444
4. Spaite D, Hanlon T, Criss E et al: Prehospital cardiac arrest: the impact of witnessed collapse and bystander CPR in a metropolitan EMS system with short response times. *Ann Emerg Med* 1990; 19: 1264-1269
5. Valenzuela TD, Spaite DW, Meislin HW et al: Case and survival definitions in out-of-hospital cardiac arrest: effect on survival rate calculation. *JAMA* 1992; 267: 272-274
6. Brison RJ, Davidson JR, Dreyer JF et al: Cardiac arrest in Ontario: circumstances, community response, role of prehospital defibrillation and predictors of survival. *Can Med Assoc J* 1992; 147: 191-199
7. Cummins RO, Ornato JP, Thies WH et al: Improving survival from sudden cardiac arrest: the "chain of survival" concept. A statement for health professionals from the Advanced Cardiac Life Support Subcommittee and the Emergency Cardiac Care Committee, American Heart Association. *Circulation* 1991; 83: 1832-1847
8. Newman M: The chain of survival: converting a nation. *J Emerg Med Serv* 1989; 14: 11-13
9. Stiell I, Hebert P, Weitzman B et al: High-dose epinephrine in adult cardiac arrest. *N Engl J Med* 1992; 327: 1045-1050
10. Barton C, Callahan M: High-dose epinephrine significantly im-

proves resuscitation rates in human victims of cardiac arrest [abstr]. *Ann Emerg Med* 1990; 19: 490-491

11. Brown C, Martin D, Pepe P et al: A comparison of standard-dose and high-dose epinephrine in cardiac arrest outside the hospital. *N Engl J Med* 1992; 327: 1051-1055
12. Goetting MG, Paradis NA: High-dose epinephrine improves outcome from pediatric cardiac arrest. *Ann Emerg Med* 1991; 20: 22-26
13. Epstein M, Kiel E, Victorica B: Cardiac decompensation follow-

ing verapamil therapy in infants with supraventricular tachycardia. *Pediatrics* 1985; 75: 737-740

14. American College of Cardiology/American Heart Association Task Force on the Assessment of Diagnostic and Cardiovascular Procedures: Guidelines for the early management of patients with acute myocardial infarction. *J Am Coll Cardiol* 1990; 16: 249-292
15. Kerber R: Statement on early defibrillation from the Emergency Cardiac Care Committee, American Heart Association. *Circulation* 1991; 83: 2233

Conferences

continued from page 570

Oct. 28-31, 1993: What is Aging? — Canadian Association on Gerontology Annual Conference
Montreal

Canadian Association on Gerontology, 500-1306 Wellington St., Ottawa, ON K1Y 3B2; tel (613) 728-9347

Oct. 29-31, 1993: International Symposium on Advances in Laparoscopic Colectomy
Indianapolis

Dr. Rama M. Jager, Colon and Rectal Care, Inc., 200-7430 N Shadeland Ave., Indianapolis, IN 46250; tel (317) 841-8090, fax (317) 577-7538

Nov. 1-3, 1993: Medical and Scientific Writing Dynamics
Toronto

McLuhan and Davies Communications, Inc., 167 Carlton St., Toronto, ON M5A 2K3; tel (416) 967-7481, fax (416) 967-0646

Nov. 2, 1993: The Challenge of Multiple Births — How Should Professionals Respond? (sponsored jointly by the Royal Postgraduate Medical School [RPMS] Institute of Obstetrics and Gynaecology and the Multiple Births Foundation)

London, England

Study credits available.

Symposium Secretary, RPMS Institute of Obstetrics and Gynaecology, Queen Charlotte's and Chelsea Hospital, Goldhawk Road, London, England W6 0XG; tel 011-44-81-740-3904, fax 011-44-81-741-1838

Nov. 3, 1993: Applications of Advancing Technology in Contemporary Hepatology — 4th Annual Rush Symposium on Transplantation

Chicago

Patricia Michaels, physician relations coordinator, Rush Transplant Programs, Rush-Presbyterian-St. Luke's Medical Center, Rush University, Rm. 201 Jones, 1653 W Congress Parkway, Chicago, IL 60612-3833; tel (312) 942-6242, fax (312) 942-3114

Nov. 4-7, 1993: Philosophic Foundations of Bioethics — International Perspectives
Washington

Dr. Eric M. Meslin, Centre for Bioethics, University of Toronto, Tanz Neuroscience Bldg., 6 Queen's Park Cres. W, Toronto, ON M8V 1X4; tel (416) 978-2709, fax (416) 978-1911

Nov. 5, 1993: Social Work Clinic Day
North York, Ont.

Sybil Gilinsky, Continuing Education Department, Baycrest Centre for Geriatric Care, 3560 Bathurst St., North York, ON M6A 2E1; tel (416) 789-5131, ext. 2365

Nov. 7-9, 1993: 1st International Course on Neuro-Interventional Procedures (sponsored by the Riyadh Armed Forces Hospital)

Riyadh, Saudi Arabia

Dr. M. A. Sofi, assistant director, Department of Postgraduate and Academic Affairs, Riyadh Armed Forces Hospital, PO Box 7897, Riyadh 11159, Saudi Arabia; tel 011-966-1-477-7714, fax 011-966-1-478-4057

Nov. 7-12, 1993: 3rd International Conference on Pediatric Otorhinolaryngology of the European Working Group on Pediatric Otorhinolaryngology

Jerusalem, Israel

Gil-Kenes, 946-1617 J.F.K. Blvd., Philadelphia, PA 19103, tel (800) 223-3855, fax (215) 568-0696; or Secretariat, 3rd International Conference on Pediatric Otorhinolaryngology, PO Box 50006, Tel Aviv 61500, Israel, tel 011-972-3-517-4571, fax 011-972-3-660-325

Nov. 8-10, 1993: Chicken Soup for the Soul — a Special Conference for the Physician and Spouse
Sedona, Ariz.

Peak Performance Institute, 392 John St., Burlington, ON L7R 2K4; tel (416) 681-1711; fax (416) 681-1946

Nov. 14-19, 1993: 7th European Conference on Clinical Oncology and Cancer Nursing

Jerusalem, Israel

Secretariat, Federation of European Cancer Societies, Department of Radiotherapy, University Hospital St. Rafael, Capucijnenvoer 33, 3000 Leuven, Belgium; tel 011-32-16-212225, fax 011-32-16-212241

continued on page 602