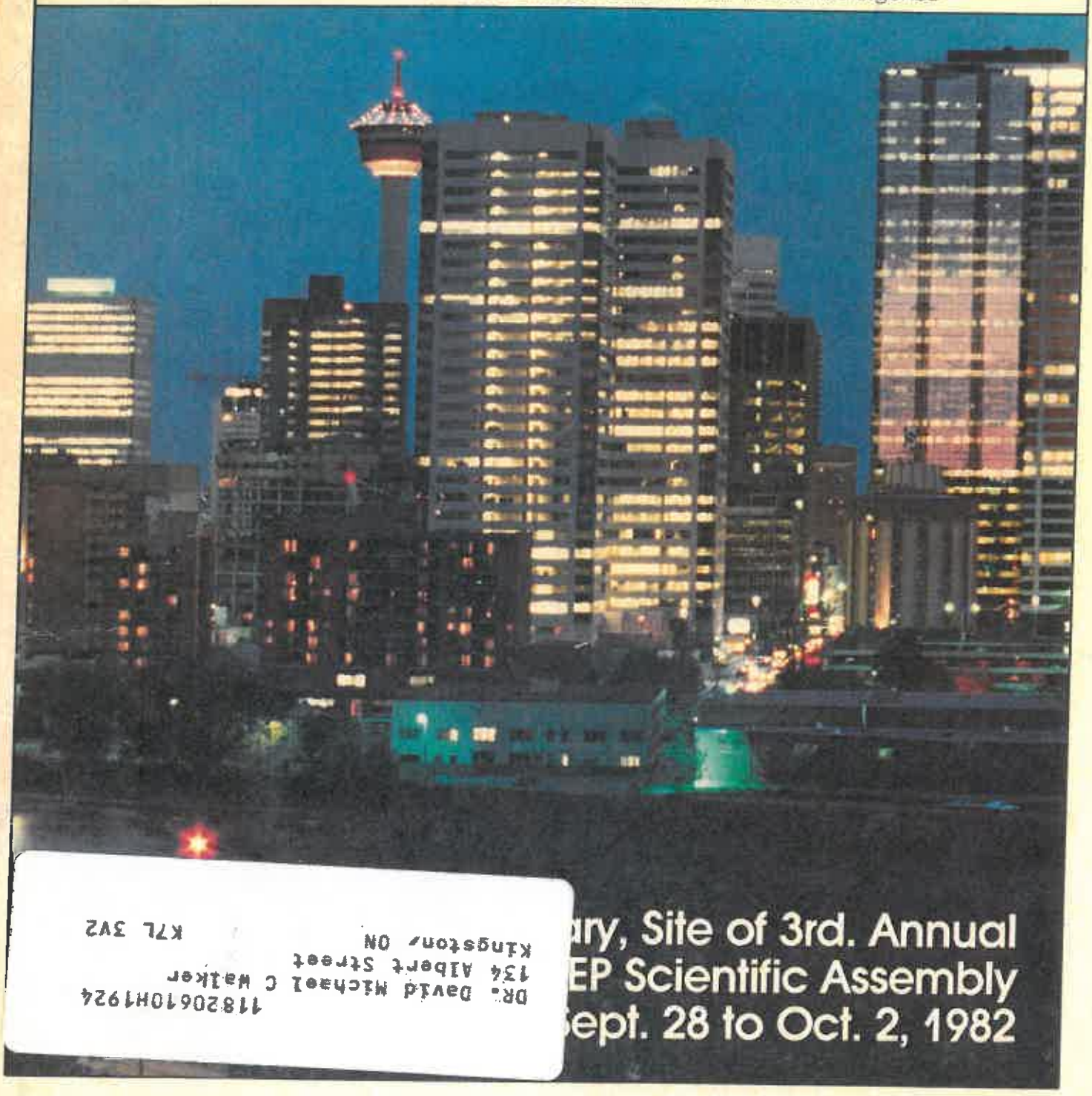
Vol. 3, No. 3, July 1982

CAEP REVIEW

The Official Publication of the Canadian Association of Emergency Physicians
La publication officielle de l'Association Canadienne des Médecins d'Urgence



...ary, Site of 3rd. Annual
...EP Scientific Assembly
...Sept. 28 to Oct. 2, 1982

CAEP REVIEW

Vol. 3, No. 3, July 1982

ISSN 0228-8559

Editor:
Peter L. Lane, M.D.

Scientific Editor:
Lynne Fulton, M.D.

Contributing Editors:
Charles Ramesar, M.D.
Michel Tétreault, M.D.

Editorial Board:
Donald Doell, M.D.
Robert Fortier, M.D.
Nigel Merchant, M.D.
Angela Pitchford, M.D.
Albert Scholtz, M.D.
Terry Sosnowski, M.D.
David Walker, M.D.

Advertising Manager:
Tom Hanson,
190 Main St.,
Unionville, Ont., L3R 2G9.
(416) 297-2030

Art Director:
Norm Melchior

Production Supervisor:
Dave Bell
Southam Murray Printing

The CAEP Review is published quarterly by the Canadian Association of Emergency Physicians. Opinions expressed are those of the authors and do not necessarily reflect those of the Association.

Subscription is free to CAEP members, $20.00 per yr. to libraries and non-members. All correspondence including unsolicited manuscripts should be forwarded to:

THE EDITOR
CAEP REVIEW
c/o Dept. Emergency Services,
Sunnybrook Medical Centre,
2075 Bayview Ave.,
Toronto, Ontario.
M4N 3M5

Cover Photo:
Calgary Skyline at dusk. Courtesy of Dr. Brian Stewart

Second Class Mail Registration Number 5640

Contents

News & Views

Scientific Section

Information

President's Notebook

The last major administrative hurdle is behind us. Certification is now a reality and the processes for examination have been finalized. It is time for us to feel a sense of accomplishment and to thank the many people who have been involved in Emergency Medicine through this long process. It is important to remember that contribution of those who never became nor will become emergency physicians but have supported our cause, chaired our committees and contributed to better emergency care for the Canadian population. The Canadian Association has recognized some of these individuals in the past by asking them to become honorary members of our association and there will be more in the future. For those of us who are staying involved and become the emergency physicians of the future the examinations and the development of service, teaching and research within our own specialty are squarely before us.

The certification process and all the lobbying and committees are water under the bridge and CAEP must look to the future. To this end, we have planned for a long-range strategic planning session to occur in the month of June in London, Ontario. We hope this will outline our goals for the immediate future and provide a framework in which we may wisely allocate our resources. We will try to provide the results of this planning session in the next issue of the Review.

There are a number of interesting issues which I would like to write about briefly.

1. As an emergency physician you are a hospital-based individual. This is a far different role than the itinerant physician who visits a patient once during the day, leaves a set of orders and does not revisit that patient for 24 hours unless circumstances mitigate further responsibilities. As a hospital-based physician you must assume institutional responsibilities above and beyond those of physicians who have been involved in the past. It is most important that the planning, research development and overall patient care provided at the institution has major input from all the hospital-based physicians. This includes a more major role in the support services and in nursing function than has been the involvement of our predecessors.

2. An appropriate title for a conversation which often comes up in the emergency physician's life is 'turf'. It is interesting but usually unproductive to engage in discussions about which kind of physicians should do what. As you are all aware, in emergency medicine we must do what is necessary to save the patient's life or limb regardless of the designated responsibility of any individual. I urge you to engage in the turf related discussions of our profession and our medial community by providing exemplary patient care and managing your geographic area well. This will be a more forceful argument than words can ever provide.

3. The annual meeting, as you can see from many other parts of this issue, will be held in Calgary at the end of September. We have tried to definitively move in the direction of an academic format which will provide concrete information useful in the preparation for the examination process. We also hope to provide some workshops in which we will actually review the depth of knowledge and examination techniques useful in overcoming this rather major challenge. It is my sincere hope that as many of you as possible will attend this meeting and provide your input in this regard.

4. The American College of Emergency Physicians has been most supportive and helpful in providing information to our growing organization. We have followed in their footsteps in many ways and learned from some of their mistakes in others. Our continued close relationship is part of our future plans and we have had fairly frequent contact with their president, Dr. Ken Gray. We are continuing our negotiations regarding the international membership and benefits that may accompany that situation.

In conclusion, I would like to thank the membership of the Canadian Association of Emergency Physicians for the opportunity to serve as president of the organization and the executive for their support over the past year. It has been a rewarding time to be involved with this organization and I look forward to continued participation in the future.

G. Powell, M.D.
President

Resident's Corner

The Image of Emergency Medicine – Do Residents Have a Responsibility?

The need for emergency physicians is not disputed. The role of emergency physicians as specialists remains to be proven. I wonder how many of us as emergency residents reflect on whether we can or even should influence the image of emergency medicine.

As with any new kid on the block, emergency specialists will have to prove themselves. It is disconcerting to hear derogatory comments from physicians practising in other fields of medicine. Emergency physicians are often regarded as being "superficial", "the 10-minute doctors", "glorified triage officers", "the act-now-think-later (maybe) types". Some of this attitude is, in part, a defense reaction against a perceived threat to territoriality. Some of this attitude may, unfortunately, be based on fact.

Unlike specialists in other areas, emergency physicians cannot control the volume of patients seen in the "office". Added to this are the pressures applied by nurses, colleagues, administrators, etc. to keep the flow of patients moving. The problem then turns into a tug of war between speed and quality. It may become more expedient to function mainly as a triage officer. Thus rapid decisions are made without complete evaluation of the patient. Frequently, especially in a tertiary care centre, the rapid decision reached is "Yes, the patient is sick – get the specialty resident to assess". The implication is "I don't have the time to sort it out." Needless to say this attitude does not win peer respect for our claim as specialists. This is something that is perhaps not often appreciated by Emergency residents since, by and large, one has the luxury of spending extra time with a difficult or interesting or critically ill patient.

Another aspect of the sometimes negative image may be an expression of envy of the hours and the lifestyle that emergency medicine offers. Strangely enough, in medicine, a strong feeling still prevails that working long hours is equated to dedication. A thirty-six hour week, while envied, falls short of the expected ideal level of "dedication".

Like it or not, how emergency specialists will be regarded by their peers in other fields will partly depend on the style and quality of practice of those who are now in training for specialty certification. I am not suggesting that as residents we need to shoulder the burden of being personally responsible for the image of emergency specialists. However, it may be worthwhile to occasionally consider that, in many ways, we will be setting examples. We will need to respond to the challenge accordingly.

Ingrid Vicas, M.D.
Chairperson, Resident Committee

From the Editor

Shocking as it may be for some readers, the *Review* may arrive this time before the end of the month. Previously, we have been relegated to 3rd class postage. This has been both expensive, and *very* slow – sometimes requiring six weeks to reach some readers. We wondered at times if marathon bicyclists and cross-country skiers were being pressed into service by the post office. However, we have now been granted a second class permit. This is both cheaper and, I'm told faster. Let's hope so!

There continues to be a reasonable number of good quality articles submitted for publication. To date, very few of them have been from emergency physicians in what might be considered the more academic departments. Hopefully this will improve.

The *Review* is now a fully refereed journal. All scientific articles submitted are first screened by the editorial staff and board. They are then submitted to a number of "experts" across the country, for review. To date, approximately 40-50% of the articles submitted eventually become published after revision. This process has, I feel, significantly improved the quality of our Scientific Section.

Big News!! Both Colleges are well down the road towards their first examination, and both have included announcements in this issue. In addition, the Royal College of Physicians and Surgeons has finalized both accreditation requirements for training programmes in Emergency Medicine, and eligibility criteria to write the examination. The specialty committee has been busy!

Both of these documents are reproduced for reader's information, and Dr. John Duff, Chairman of the Specialty Committee has produced a report of the committee's activities.

This is an exciting time for us all in Emergency Medicine. Many of the goals that we have worked toward for so many years are being achieved. The *CAEP REVIEW* has been and will continue to be an important part of the coming of age of the specialty of Emergency Medicine in Canada.

Peter Lane, M.D.

Letters to the Editor

Dear Sir,

Dr. Vertesi's comments regarding the so-called territorial battle between emergency nurses and ambulance attendants is the most blatant example of ostrich in the sand syndrome that I have seen to date. Anyone who knows anything at all about how the Advanced Life Support Programme is developing would have to plead total absence of thought not to be concerned about the short and long term effects that it will have on the present roles of emergency nurses and physicians.

If any one group has all the solutions, or better still, if emergency physicians in Ontario have all the solutions, they had better be quick on the draw because, by the time the politicians kick this thing around, we will be fortunate to have influenced patient care at all.

Nurses could assume their traditional posture which closely resembles a doormat, but in this particular case, the nurses you are referring to are emergency nurses and occupational health nurses, and we find the cards too unpredictable to wait patiently and hope for the best.

Regardless of what anyone in Ontario says, we are not systematically prepared for a paramedic programme.

There are a number of committed, far seeing emergency-oriented physicians but they are a small percentage of the total group who will be interrelating with the paramedic worker. Or will it be the emergency Physician? That, Dr. Vertesi is exactly the problem.

There really isn't a lot of fuss going on: in fact, it was my impression that in general terms, communications between emergency nurses and ambulance attendants were improving. In fact, the E.N.A.O. and the Association of Casualty Care Personnel executive members met recently to discuss the paramedic programme and our positions. Worse than ruffling a few feathers would be to say nothing, think nothing, and do nothing. If you are upset or concerned about our interest, I might suggest that you look closely at your own experience in B.C. and the relationship that emergency nurses have to the programme. They are not outsiders and do have, as I saw first hand, a very major impact on the quality of paramedic who provides pre hospital care for the patient that you feel we have forgotten. Everyone who may be affected by this new worker has the right to have input. There is no place for sanctimony. No purpose in separating the good guy and the bad guys. Physicians certainly appear in this article as the good guys — with white hats, but can you meet the challenge that this programme promises to impose on you.

If history is any reference for the future, emergency nurses should be cautious of allowing any one group to dictate policy or procedure only to find out that it can all be delegated when the responsibility becomes inconvenient.

Dr. Vertesi's remarks regarding E.N.A.O. support of the College of Nurses are not accurate and, if he reviews our position paper carefully, he will see that it strongly supports an A.L.S. "system", with an independent professional identity and career mobility for nurses and ambulance attendants.

The Advanced Life Support Provider will become a recognized health care worker and I hope that this comes about with the aspired for effect on patient care, but only with the collective input of the disciplines who already have a significant investment in emergency health care.

Sincerely,
Sandra Easton, R.N.
Past President, ENAO
and
Patient Care Co-ordinator,
Emergency,
McMaster Medical Centre,
Hamilton, Ontario.

Authors reply

Dear Sir,

I must admit that I am at a loss as to how to answer Ms. Easton's letter. Whatever else one can say, there is certainly no lack of passion about this subject in Ontario!

I feel that the E.N.A.O. has been the most constructive and reasonable of the nursing organizations involved, and I had thought this was evident from my article. Certainly I applaud any movement that will resolve the conflict and get Ontario's prehospital care system up on its feet.

Precisely how this is to be done is Ontario's problem, but it might be helpful for those involved to remember that there are some problems that cannot be solved with passion.

Sincerely,
L. Vertesi, M.D.
Medical Director ALS Programs
Province of B.C.
Chairman, CAEP Prehospital Care Committee

Guest Editorial

Post-Graduate Emergency Nurses program

Within the context of the development of Emergency Medical Services (E.M.S.), the role of the Emergency Nurse has been slow to be identified at the Post-Graduate level.

The Pre-hospital worker, Emergency Medical Assistant, Paramedic, or whatever, has been brought into the health education system in several provinces. Throughout the Canadian Medical Association, an Ad Hoc Committee under the Allied Medical Education Branch, is attempting to set standards nationally and develop an accreditation system.

There have been Emergency Medicine programs in Canada for 10 years and the Royal College of Physicians and Surgeons are busy setting the first fellowship exams. As well the Canadian College of Family Practice are developing addendums to their residencies in order that their graduates from Family Practice residencies will feel comfortable and competent fulfilling an obvious need in the smaller and outlying community hospitals.

The education of the Emergency Nurses has been left behind. Except for In-Service training at individual hospitals, and the stringing together of mini-courses, until now there has been no formal post-graduate education program for Emergency Nurses.

In September of this year, Douglas College in British Columbia accepted 12 candidates for its first Post-Basic Emergency Nursing course. The course is 7 months in length and the first certificates will be issued in April, 1982. This outline capsulizes the description and sequence of the courses.

Basic Concepts for Advanced Nursing Practice

An independent study course to provide students with knowledge of anatomy and physiology, growth and development to prepare the nurse to apply this knowledge in advanced practice.

Emergency Nursing I – Introduction

Introductory course designed to provide students with an overview of Emergency Nursing, the Philosophy, and the role of the nurse in Emergency, Basic Legal safety considerations.

Therapeutic Relationships

Interpersonal skills in an Emergency care setting, communications and management of individuals in crisis will be emphasized. Principles and skills of health teaching.

Emergency Nursing II – assessment

This course introduces the knowledge and skills necessary for an emergency nurse to perform a focused subjective and objective assessment of the biological and psychosocial systems for an adult and child.

Emergency Nursing III A

This theory course presents a detailed overview of the commonly occurring and/or major emergency health problems relating to the biological and psychosocial systems. Content will be presented through the framework of the nursing processes. Developmental aspects and community resources will be considered.

Emergency Nursing III B

Clinical experience within an emergency setting can provide students with an opportunity to apply knowledge and skills learned in the classroom and laboratory.

Emergency Pharmacology

The student will learn specified drugs for emergency and non-emergency use as well as Toxicology, over the counter medication, drug abuse and misuse.

Legal Aspects of Emergency Nursing

The student is introduced to general areas of law which define the parameters of the nurse's role within the emergency health care system. Accountability within the system, and potential areas of conflict between the patient, family and interdisciplinary team are discussed. Reportable conditions and situations are reviewed, as well as community resources.

Emergency Nursing V — Seminars

Stress management, prehospital care, leadership, emergency nursing in small hospital setting, disaster planning and management, professional concepts, triage, transport.

Emergency Nursing IV Practicum

An 8 week practicum course with major clinical emphasis in a large emergency setting, other experiences include critical care, small hospital emergency and ambulance.

Not only will the patient in the large emergency care setting benefit from these programs but also in the smaller emergency care settings, the nurse will be able to provide definitive care through arms-length operation, either by protocol or phone contact.

These programs will only be developed through the Post-Graduate Education facility in each province under the direction and pressure of the local Emergency Nurse nursing group through their provincial registered nurses association. It is essential that the provincial emergency physician's groups give support and guidance to these efforts.

Gina Dingwell, R.N.
Herb Parkin, M.D.

Accreditation: A New Look for Ambulance Training in Canada

by Les Vertesi*, M.D.

The lack of uniform standards for prehospital care in Canada is one of its most readily apparent, and depressing features. From one community to another, standards range over the full spectrum, from virtually non-existent in many areas of central Canada and the East, to sophisticated advanced life support systems in the West. Despite almost universally available advances in the conventional medical care, for victims of sudden illness or accident, chance is still a major factor in early survival. But just when things seem hopeless, into the chaos comes Accreditation, promising to have the biggest impact of any single event in the history of prehospital care in Canada.

For those not familiar with accreditation, this is a voluntary process whereby schools and training institutions agree to meet common standards and submit to regular inspections to verify that those standards are actually being met. In this case, the certifying agency will be the Canadian Medical Association, the schools will be the major centres for ambulance training across Canada, and the standards will be those recently drawn up by the CMA's Committee for Accreditation of Ambulance Training Programs (CAATP).

Don't confuse accreditation with certification. The latter applies only to individuals and is a mandatory process usually on a local or regional level, often requiring individuals to pass a licensing examination. Accreditation on the other hand, does not apply to individuals directly; instead it tries to establish a common standard among the schools. The process is well established for universities; medical schools for example must all meet standards imposed by an international accrediting body.

But why should the CMA be involved? Many people do not realize that the CMA has been accrediting allied health disciplines for many years. Training programs for Xray and Lab technicians are accredited through conjoint committees of the CMA, involving physicians, professional educators, and personnel from the specific discipline involved. The CAATP is simply the newest addition to the CMA's accreditation functions.

The first task of the CAATP was to define exactly what the national standards should be. This took more than two years and involved people from all over the country with expertise in the field. It was decided that 3 separate levels of training should be recognized and accredited. Very briefly these are:

Level I (Basic): (approx. 160 hours)

Core Subjects: basic bandaging and splinting, basic pathophysiology, patient assessment, basic CPR, airway positioning and maintenance.

Level II (Intermediate): (approx. 600 hours)

Core Subject: indepth pathophysiology, patient assessment and priority setting, airway manipulation including McGill forceps, management of shock with IV fluids, antishock garments, and Entonox.

Rotations: classroom and in-hospital clinical, on-car experience.

Level III (Advanced): (approx. 1200 hours)

Core Subjects: cardiac monitoring and arrhythmia suppression, defibrillation, ET intubation, ACLS management of cardiac arrest, IV drug therapy.

Rotations: classroom, ICU, CCU, OR and Emerg. in-hospital experience, on-car experience.

The Level I program is intended as a minimum for any person working in the emergency care field. Level II may be an intermediate step on the way to higher training, or it may serve as an end in itself in some communities. Level III prepares for full Advanced Life Support capability, intended for larger urban communities. Each of the three levels forms a "floor" or minimum standard which the applying school must meet or exceed in order to receive accreditation.

Since this is only a voluntary process, you may be wondering how this will help you in your own community. Most ambulance services are either run by government agencies of one form or another, or depend heavily on government for funding. Improving standards then, means convincing governments to spend more money. Arguments to improve training such as "because it would result in better care" may make sense to physicians but are rejected by governments because they offer no endpoint, and often lead to unrestrained expenses. A much more effective argument is one such as "... because we are below the National Standard and our neighbors are not!" In politics it is very helpful to know what the Jones' are doing, it is also helpful if the standard is clearly defined both technically and financially, and backed by a credible organization, such as the CMA. In other words we must accept that there is no way to legislate compulsory standards on a national basis, but accreditation depends on a "bandwagon effect" to which governments are relatively sensitive.

The process of accreditation itself is expected to begin sometime this fall. Applications for any of the 3 levels will be open to any Canadian institution involved in training ambulance and emergency care personnel. Level I accreditation will be available on written verification of compliance with requirements, with on-site surveys to be arranged at some time during a 5 year period. Levels II and III will require on-site surveys prior to accreditation to confirm that all minimum requirements are being met.

Anyone who would like more details about either the process, or about the core content of approved programs is invited to write to:

Brian Henderson
Accreditation of Ambulance & Emergency Care
c/o Canadian Medical Association
Box 8650
Ottawa, Ontario K1G 0G8

*Chairman, CMA's CAATP
Chairman, CAEP Prehospital Care Committee
Medical Director ALS Programs, province of B.C.

Royal College of Physicians and Surgeons of Canada:

Specialty Training Requirements in Emergency Medicine

Emergency Medicine comprises the medical knowledge and skills essential to the initial diagnosis, treatment, and disposition of patients with acute illness or injury.

General Objectives

During the course of training the candidate must acquire satisfactory knowledge and skills in the following areas:

1. The primary care of patient-declared emergencies including the recognition, evaluation, and initial management of acute illness or injury.
2. Triage of patients with major illness or injury.
3. The natural history of illnesses or injuries commonly presenting as emergencies and the principles of the long-term care and follow-up essential for these conditions.
4. Supervisory and administrative aspects of emergency medical services, pre-hospital care of emergency conditions, paramedical emergency services, ambulance services, communication systems and disaster planning.
5. Research areas of emergency medicine.
6. Social and family implications of serious illness or injury.

Training Requirements

1. Internship

All trainees must complete an **approved** internship of at least one year's duration in addition to the three years of specialty training described below. Acceptable internships are rotating internships, mixed internships (in medicine and surgery) or straight internships in medicine, pediatrics, surgery, or family medicine.

Internships differing from those mentioned above may be considered on an individual basis. However, the internship is viewed as an important component of the training program of the emergency physician, and if the internship completed by a trainee is judged by the Credentials Committee and the Specialty Committee in Emergency Medicine to be inappropriate to emergency medicine the trainee may be required to undertake additional acceptable training beyond the requirements listed in Section 2 ("Specialty Training Requirements").

2. Specialty Training Requirements

Training should incorporate the principle of graded, increasing responsibility. The term "approved" throughout this section means approved by the candidate's program director and the Credentials Committee.

The program of specialty training must be of three year's duration. Although flexibility in accredited programs is important, each program must include 24 months of clinical training in a core curriculum, and 12 months of elective assignments.

Experience in the Emergency Department should be of not less than nine months' duration, and each trainee must spend at least three months of this requirement as a senior resident in the Emergency Department. While the order in which the elements of the core curriculum and the elective assignments are undertaken is to be arranged by the program director, it is strongly recommended that the trainee's experience as senior resident take place in the final year of resident training.

Senior residency is defined as experience in which the trainee is regularly entrusted with the responsibility for the diagnosis, resuscitation, stabilization, evaluation, and disposition of acutely ill or injured patients. No other resident shall intervene between the senior resident and the attending staff emergency physician.

Except for the above comments on Emergency Department experience, these regulations do not prescribe minimum periods of time to be spent in the various components of the core curriculum (Section 2a). Individual assignments in the elective group (Section 2b) can be for any duration up to 12 months. Arrangement of these details is left to the discretion of the program director.

a) Core Curriculum (24 months):

- Critical care including experience in the Emergency Department, surgical intensive care unit, and coronary care unit.
- Anesthesia
- General Surgery
- Internal Medicine
- Musculo-skeletal trauma
- Neurology — Neurosurgery
- Obstetrics and Gynecology
- Pediatrics including neonatology
- Psychiatry

b) Elective Assignments (12 months):

- All core curriculum subjects (as in 2a)
- Dermatology
- Diagnostic Radiology
- Disaster planning
- Hospital administration
- Otolaryngology and Ophthalmology
- Plastic Surgery
- Research

Note: For the first three years of the examinations, consideration will be given to training, experience and current responsibilities in lieu of the training requirements outlined in Section 2 of this document. This provision does not apply to current trainees.

The New Royal College Certification in Emergency Medicine

by J. H. Duff, M.D., F.R.C.S(C), Chairman, Royal College Committee on Emergency Medical Care

In the Royal College, the concept of Emergency Medicine as a separate specialty evolved slowly during the 1970's. Early on there was considerable doubt that the body of knowledge for emergency medicine was sufficiently well defined to justify the creation of a new specialty. Further, many believed that emergency medicine would not be a lifetime career but rather a transient interest and then a stepping stone to family practice or a specialty. These opinions prevailed in 1975 when the Royal College Committee on Emergency Medical Care rejected emergency medicine as a separate specialty. However, enthusiasm for emergency medicine as a specialty was gaining momentum, and there was increasing pressure for a certification mechanism in Canada. Showing sensitivity to this issue, in June of 1977, the Royal College granted a mandate to a Conjoint Committee of the Royal College and the College of Family Physicians to establish education requirements, approve training programmes and grant appropriate recognition to qualified emergency care physicians. Prior certification in either College was to be a requirement. The Conjoint Committee did a considerable amount of work toward the establishment of such a qualification. But, doubts arose from those in the field of emergency medicine as to the practicality of such an arrangement. They expressed these concerns at a meeting at the College on October 1, 1979. Attending were members of the Conjoint Committee (both Colleges), representatives of medical schools, Canadian interns and residents and the Canadian Association of Emergency Physicians. On the following day, the Conjoint Committee met to discuss these concerns. There was a turn-around. The Conjoint Committee now rejected the requirement that a certification in Emergency Medicine must be based on prior certification by the Royal College or the College of Family Physicians. They approved a motion to remove this requirement, but feeling that this change might not be acceptable to either College, they listed eight alternatives. The first two were that the Royal College and the College of Family Physicians establish a primary specialty in Emergency Medicine. The Conjoint Committee had listened to those active in the field of emergency medicine and, despite the work they had already done, now rejected the mandate given them by both Colleges.

In November, 1979, the Executive of the Royal College considered the new position of the Conjoint Committee. They directed the Royal College Committee on Emergency Medical Care to study the new recommendations. Reconsideration of the matter was timely, as pressure for a certification mechanism had increased sharply. The American Board of Emergency Medicine had been created and it was now clear that Emergency Medicine would not be a transient interest of young physicians or surgeons. Indeed, as subsequent events were to show, many had changed their thinking about Emergency Medicine as a specialty. The Committee on Emergency Medical Care met on January 11, 1980 and with surprising lack of disagreement, passed unanimously five motions related to Emergency Medicine. The pertinent ones were, (1) that the Royal College recognize Emergency Medicine as a primary specialty; (2) that the specialty of Emergency Medicine consider in its training curriculum not less than three nor more than four years of training following graduation from medical school; and (3) that an observer from the College of Family Physicians be invited to participate in the Specialty Committee in Emergency Medicine. A few months later, the Council of the Royal College approved all five resolutions by a majority vote.

Over the next year and a half, the Committee put forth recommendations for specialty training requirements, accreditation standards, examination structure and assessment of eligibility for examination of those already established in the specialty.

Finally, on April 20, 1982, the training requirements for the new qualification in Emergency Medicine were sent to all Canadian medical schools, emergency medicine training programmes and the Canadian Association of Emergency Physicians.

The first examinations will be offered in 1983. There will be a written and an oral examination. The written exam will most likely be of the multiple choice type. The oral will consist of three one-hour exams by three teams of two examiners. One member of each team will be an emergency physician, the other a specialist of a relevant discipline.

Who will be eligible to sit the examination? As with other new specialties of the College, for the first three years, consideration is given to training, experience and current responsibilities in lieu of training requirements. Currently, the Committee is reviewing its recommendations for practice, eligible candidates, candidates with Royal College certification in other specialties, non-certified candidates with some formal training, candidates who have completed training in the United States, and candidates who have unusual backgrounds in such areas as administration, teaching and research in Emergency Medicine.

Eventually, the College will grant official accreditation to Training Programmes of Canadian medical schools. The Committee has already agreed on the specific requirements and guidelines for accreditation. Several programmes of excellent quality exist now. In the near future, it is likely that most Canadian schools will have accredited training programmes in Emergency Medicine.

La Nouvelle Certification du Collège Royal en Medécine d'Urgence

par J.H. Duff, M.D., F.R.C.S. (C), président du Comité d'étude des soins médicaux d'urgence du Collège Royal

Au Collège Royal, le concept de la médecine d'urgence en tant que spécialité distincte a vu le jour au cours des années 70. Au début, on doutait que le contenu scientifique spécifique à la médecine d'urgence soit assez bien défini pour justifier la création d'une nouvelle spécialité. De plus, de nombreuses personnes croyaient que la médecine d'urgence, au lieu d'être une carrière à long terme, serait plutôt un intérêt passager, puis une voie d'accès à la médecine de famille ou à une spécialité. C'est cette attitude qui prévalait en 1975 lorsque le Comité d'étude des soins médicaux d'urgence du Collège Royal rejeta la médecine d'urgence comme spécialité distincte. Cependant, l'enthousiasme manifesté face à cette discipline en tant que spécialité grandissait, et on fit des pressions croissantes pour que soit établi un mécanisme de certification au Canada. Sensibilisé à la question, le Collège Royal accorda en juin 1977 un mandat à un Comité conjoint du Collège Royal et du Collège des médecins de famille our établir des prérequis académiques, approuver des programmes de formation et accorder la reconnaissance appropriée aux médecins d'urgence qualifiés, avec la condition préalable d'une certification par l'un des deux Collèges. Le Comité conjoint consacra de longues heures de travail afin d'établir les normes de qualification. Mais les médecins d'urgence soulevèrent des doutes quant à l'aspect pratique d'un tel arrangement. Ils exprimèrent ces inquiétudes lors d'une réunion au Collège tenue le 1er octobre 1979. Etaient présents les membres du Comité conjoint (des deux Collèges), les représentants des facultés de médecine, des internes et des résidents canadiens et un comité de l'Association canadienne des médecins d'urgence! Le jour suivant, le Comité conjoint se réunit afin de discuter de ces questions. Il y eut un volte-face. Le Comité rejetait maintenant l'exigence voulant qu'une certification en médecine d'urgence soit basée sur une certification antérieure par le Collège Royal ou le Collège des médecins de famille. Ils adoptèrent une motion pour l'élimination de cette exigence, mais jugeant que ce changement ne serait peut-être pas acceptable pour les deux Collèges, ils établirent huit solutions de rechange. Les deux premières proposaient que le Collège Royal et le Collège des médecins de famille créent une spécialité primaire en médecine d'urgence. Le Comité conjoint avait entendu les personnes actives dans le domaine de la médecine d'urgence et, malgré le travail déjà accompli, rejetait maintenant le mandat que lui avait confié les deux Collèges.

En novembre 1979, le Comité Exécutif du Collège Royal étudia la nouvelle position du Comité conjoint. Il demanda au Comité d'étude des soins médicaux d'urgence du Collège Royal d'étudier les nouvelles recommandations. Une reconsidération de la question venait à propos car les pressions pour un mécanisme de certification s'étaient nettement accrues. L'American Board of Emergency Medicine avait été créé et il était maintenant clair que la médecine d'urgence ne demeurerait pas un intérêt passager pour les jeunes médecins ou chirurgiens. En effet, comme les événements l'ont prouvé par la suite, beaucoup de personnes avait modifié leur façon de voir sur la médecine d'urgence en tant que spécialité. Le Comité des soins médicaux d'urgence se réunit le 11 janvier 1980 et dans un accord commun surprenant, adopta à l'unanimité cinq motions relatives à la médecine d'urgence. Les motions les plus importantes furent: 1) que le Collège Royal reconnaisse la médecine d'urgence comme une spécialité primaire; 2) que la spécialité de médecine d'urgence considère dans son programme une formation qui ne dure pas moins de trois ans ni plus de quatre ans suite à la graduation de la faculté de médecine, et 3) qu'un observateur du Collège des médecins de famille soit invité à participer au Comité de spécialité en médecine d'urgence. Quelques mois plus tard, le Conseil du Collège Royal approuvait les cinq résolutions par la majorité des voix.

Au cours des dix-huit mois qui suivirent, le Comité mit de l'avant des recommandations concernant les exigences de formation, les normes d'accréditation, la structure des examens et l'évaluation de l'éligibilité à l'examen des médecins travaillant déjà dans la spécialité.

Finalement, le 20 avril 1982, les exigences de formation pour la nouvelle spécialité de médecine d'urgence furent envoyées à toutes les facultés de médecine canadiennes, aux responsables des programmes de formation en médecine d'urgence et à l'Association canadienne des médecins d'urgence.

Les premiers examens auront lieu en 1983. Ils comprendront un examen écrit et un examen oral. L'examen écrit sera probablement du genre à choix multiples. L'oral consistera en trois examens d'une heure donnés par trois équipes de deux examinateurs. Un membre de chaque équipe sera médecin d'urgence, l'autre membre, spécialiste d'une discipline connexe.

Qui sera éligible à l'examen? Au cours des trois premières années, commes pour les autres nouvelles disciplines du Collège, on prendra en considération la formation, l'expérience et les responsabilités actuelles du médecine, plutôt que les exigences de formation. Le Comité révise présentement ses recommandations pour les candidats éligibles par la voie de la pratique, ceux détenant une certification du Collège Royal dans d'autres spécialités, ceux qui sont non-certifiés mais possèdent une certaine formation dans le domaine, ceux qui ont été formés aux Etats-Unis, et ceux qui possèdent des antécédents spéciaux dans des domaines comme l'administration, l'enseignement et la recherche en médecine d'urgence.

Le Collège accordera une accréditation officielle aux programmes de formation des facultés de médecine canadiennes. Le Comité s'est déjà entendu sur les exigences spécifiques et les lignes de conduite pour l'accréditation. Plusieurs programmes d'excellente qualité existent présentement. Dans un avenir rapproché, il est probable que la plupart des facultés canadiennes auront des programmes de formation accrédités en médecine d'urgence.

Scientific Section

Cephalic and Generalized Tetanus

Case Report and Literature Review by Francine Vogler, M.D.*

An unusual case of cephalic and generalized tetanus is presented. A recent review of the literature is summarized with emphasis on the emergency management and adequate prophylaxis of tetanus.

Case Report

A 54-year old garage mechanic, previously in good health, fell backwards down a flight of stairs, struck his occipital area, and sustained loss of consciousness for an undetermined period of time. He was admitted to a local hospital overnight for observation, and his scalp laceration was sutured there. The patient vomited frequently throughout his hospital stay and remained confused for approximately 10-12 hours.

After discharge from the hospital, the patient felt well for several days, but then developed headaches, vomiting, anorexia, malaise, and tightness of the musculature of the neck. The patient was again seen by a physician who ordered skull x-rays which were normal, and sent him home with analgesics.

The following day, five days after his original fall, he developed jaw pain, abdominal pain, difficulty swallowing, inability to open his mouth and visual disturbances. On the sixth post-accident day, the patient was admitted to another hospital, where additional history revealed that the patient was not immunized against tetanus, and had not received adequate tetanus prophylaxis during his previous admission. A clinical diagnosis of tetanus was considered, and the patient was transferred for evaluation and treatment.

On admission, the patient was alert and oriented to place, but not to time nor date. Vital signs were BP 130/90; pulse 62; temp. 36° (axillary). Examination showed an infected sub-occipital wound, risus sardonicus and spasms of the musculature of the neck and abdomen. The remainder of the physical examination was within normal limits. Routine labwork was drawn and an intravenous line was commenced. The patient was immediately treated with 3,000 units of tetanus immune globulin I.M. and given 5 mg of diazepam I.V. to control muscular spasms and mild respiratory distress. His wound was debrided and packed with Dakins solution (1:16). Penicillin G, 1,000,000 units I.V. was given. The patient required a second dose of diazepam 5mg to help control reflex muscular spasms, presumed secondary to the debridement.

The patient was transferred to the intensive care unit, and intubation was accomplished after sedation with 10mg diazepam, and transtracheal and superior laryngeal nerve block. Because of secondary extension posturing of the spine, the patient was then paralyzed with pancuronium and sodium luminol, and placed on a MA-1 respirator with 5 cm of PEEP. He was given an additional 3,000 units of human immune globulin; tetanus toxoid; cimentidine 300 mg qid; heparin 5,000 units SQ qd; penicillin G 2 million units q6h, and his occipital wound was debrided and packed with Dakin's solution every shift. Paralysis was maintained with d-tubocurare, and sedation with morphine.

On the fifth hospital day, (twelve days after his injury), the patient began to develop reflex tachycardias and hypertension (to 230 systolic) precipitated by external stimuli, such as suctioning or turning the patient. These episodes were treated successfully with small doses of propanalol and phentolamine. Eventually, because of the increasing difficulty in controlling these episodes, he was started on prophylactic Inderal (40 mg per NG qid). Additionally, he began requiring increasing doses of curare and morphine to remain totally paralyzed and sedated. Because of high metabolic requirements, total parenteral nutrition and nasogastric feedings were instituted.

On the tenth hospital day, the patient became hyperthermic, spiking fevers to 39.4°. No focal source of infection was found, and in spite of numerous antibiotic regimens, the patient remained febrile for the ensuing ten days.

Paralytic agents were gradually tapered, and by the nineteenth hospital day, curare was entirely discontinued. The patient remained comatose. Bilateral hemotympanum was discovered, and a lumbar puncture revealed xanthochromic fluid with 500 rbc's, 30 lymphs, elevated CSF protein (162), and decreased CSF glucose (86 with serum glucose 151). An electroencephalogram showed sluggish waves. A CT scan was negative. Diagnostic impression was a possible partially treated meningitis, and he was placed on chloramphenicol to cover for Gram (—) organisms. On the twenty-third hospital day, the patient began to respond to verbal stimuli by weak hand grips, and eye movements. On the twenty-seventh hospital day, it was noted that the patient's eyes were divergent at rest, consistent with bilateral sixth nerve palsies, and he was noted to have generalized rigidity. Intermittent muscular spasms continued. Muscle paralysis was reinstituted, nalbuphine (nubain) was started, and dantrolene, for muscular spasticity was begun. Dantrolene allowed a gradual decline in amount of d-tubocurare used, without the reflex muscular spasms previously exhibited, and, by the thirty-fourth hospital day, the paralytic agent was entirely discontinued. The patient was placed on a T-piece, and extubated forty days after admission. At this time, he appeared to be alert and oriented, with contractures the only apparent sequelae from his illness. He was finally afebrile. He was transferred to a chronic care facility for physiotherapy.

*Royal Victoria Hospital
McGill University

Discussion

Tetanus is an extremely uncommon disease in North America. The majority of cases occur in the third world, in underdeveloped countries, where these illnesses are not reportable. Tetanus carries an overall mortality rate of 45%, and 400,000 people die annually from the disease. An overall global incidence approaches one million cases of tetanus per annum.

The etiologic agent, clostridium tetani, exists in two forms. It is found primarily as a spore in the soil and in animal and human feces. It is also found in operating rooms, house dust and contaminated heroin. It is an obligate anaerobe, and under conditions of low tissue oxygen tension, the spore form may convert into the vegetative form, a gram positive bacillus.

Innoculation generally occurs in a contaminated wound as the spore form. Tissue trauma and low tissue oxygen tension favor the development of the toxin-producing vegetative form.

The vegetative form produces two toxins; tetanospasmin and tetanolysin, of which the later is insignificant. Tetanospasmin, second only to botulinum toxin, is one of the most powerful neurotoxins known to man.

Tetanospasmin acts by inhibiting the release of acetylcholine from nerve terminals in certain muscles. This causes unopposed contraction of certain muscles with loss of antagonistic muscle function. Seizures are thought to be caused by binding of the neurotoxin to cerebral gangliosides. The neurotoxin essentially acts at four sites: 1) skeletal muscle motor end-plate, 2) brain, 3) sympathetic nervous system, and 4) spinal cord. All of the clinical signs of tetanus are caused not by the organism, but by the elaboration of the neurotoxin.

The incubation period of tetanus averages 3 to 21 days, but may vary. The severity of the disease is related to the rapidity of onset of clinical symptoms, and inversely related to the distance between the innoculation site and the central nervous system.

The majority of cases follow some form of trauma; although, no history of trauma, nor detectable portal of entry was found in 20% of patients.

Forms of the Disease:

There are three main forms of tetanus: local, generalized and cephalic. The generalized form can be further subdivided by grading according to the severity of the disease.

a) Local Tetanus. This is the benign form of tetanus and carries the lowest mortality rate (1%). Symptoms consist of persistent rigidity of the muscles near the innoculation site. It may linger for weeks to months, and may spontaneously resolve, or it may progress to the generalized form.

b) Generalized Tetanus. Generalized tetanus is the most common form of the disease. The overall mortality of this form is 45-55%. Over 50% of cases present with trismus alone. Dentists will frequently see these patients first. Seventy-five percent present with trismus, or local muscular spasm, or both. Other presenting complaints include lethargy, irritability, nuchal rigidity, dysphagia, abdominal or lumbar muscle spasm, glottal or laryngeal spasm and opisthotonus. The muscle rigidity starts with jaw and facial musculature resulting in a peculiar facial expression, the sardonic smile or "risus sardonicus". As the disease progresses, rigidity arises in other muscle groups of the body, until opisthotonus results. The typical tetanic seizure is characterized by flexion of the arms, clenching the fists on the chest, extension of the lower extremities and spasm of spinal musculature, resulting in opisthotonic posturing.

These episodes are extremely painful, and the patients remain conscious during the seizure. Frequently, they become hyperthermic and remain so throughout the course of their disease. Laryngeal spasm can occur at any time, and may be precipitated by only a mild amount of stress. Hence, early prophylactic protection of the airway is indicated. Laryngeal spasm may be broken with succinylcholine but the patient must then be artificially ventilated.

c) Cephalic Tetanus: A very unusual form of the disease. It has a very short incubation period of 1-2 days, and follows injuries to the face and head, or a bout of otitis media. It may also occur in heroin addicts or in newborns, and, recently, a case was reported in a child who had stuck a foreign body (a pencil) in her nose. The hallmark of the disease is cranial nerve dysfunction, involving most commonly the seventh cranial nerve, and less commonly III, IV, IX, X, and XII. The prognosis of this form is extremely poor.

Severity of the Disease

The local form of the disease is the mildest form, while the cephalic form is the most severe. The generalized form can be further subdivided into the mild, moderate and severe form. A mild case of generalized tetanus may present only with a change of facial expression, or with discomfort of the back secondary to stiffness of the spinal musculature. Patients with mild generalized tetanus may appear to have only local tetanus at the innoculation site.

The moderate form of generalized tetanus presents with increasing rigidity and increasing trismus. Patients in this classification exhibit the classic "risus sardonicus". Frequent "reflex spasms" secondary to external stimuli are observed. Opisthotonus may be present, or the patient may simply "lie at attention" in bed. The hallmark and most serious consequence is the presence of dysphagia which may then progress to glottal and laryngeal muscle spasm.

The severe generalized form, first described in 1968, presents with increasing intensity and increasing

frequency of reflex spasms. There is spasm of the laryngeal muscles, diaphragm, and intercostal muscles leading to poor ventilation and cyanosis. Opisthotonus becomes so severe that fractures of the lumbar vertebrae may result. The hallmark of this form is the presence of sympathetic nervous system overactivity, or intense autonomic discharge. After maintenance of the airway, autonomic discharge is the most serious complication of the disease. It is usually seen one to two weeks after the development of active, generalized, severe tetanus. Patients develop a "sympathetic crisis" from intense autonomic discharge, and exhibit tachycardias and severe hypertension. The patient also becomes severely diaphoretic, hyperpyrexic, and peripherally vasoconstricted with paresthesias in a stocking-glove distribution.

Cardiac output rises secondary to a high basal metabolic rate. Elevated systemic vascular resistance is a late change, and bradycardia and hypotension are ominous signs. The etiology is still uncertain, but is felt to be secondary to elevated serum cortisol, and increasing circulating catecholamines, (causing increasing sodium and water retention).

Treatment is not prophylactic, but is initiated with signs of cardiovascular instability. Beta-blockers such as propanalol (in small doses 0.2mg/min increments to a maximum of 2 mg IV or 10 mg p.o.) are recommended to control the tachyarrhythmias. Alpha-blockers such as phentolamine or guanethidine are used to control the hypertensive episodes.

Diagnosis

The diagnosis of tetanus is clinical, and based upon the history. Laboratory tests are non-specific, although the white blood count and the CPK may be elevated. Differential diagnosis includes: tetany of other causes (eg. hypocalcemia); strychnine poisoning; meningitis; phenothiazine toxicity; and local diseases of the mandible.

Therapeutic Management

The goals of treatment are threefold: (1) elimination of the vegetative organisms producing toxin at the wound site, (2) neutralization of circulating endotoxin, and (3) supportive treatment, including protection of the airway, control of seizures and "reflex spasms", and avoidance of excessive external stimuli. The patient is ideally treated in an intensive care unit environment.

(a) Airway – Of primary importance is protection of the airway. Patients with tetanus may develop laryngeal and glottal spasm at any time. Intubation should probably be performed in all cases of generalized and cephalic tetanus. If the patient is having reflex muscular spasms, then paralytic agents should be used prior to the intubation attempt. Tracheostomy should be performed if the patient is to be intubated for a period of time longer than ten days, or if the patient has had glottal seizures. Certain authorities recommend routine tracheostomy in all heroin addicts with tetanus because of the protracted course of the disease. Heroin addicts with the disease have a high incidence of cardiac arrhythmias, respiratory arrest, and hyperthermia.

(b) Antitoxin – Human tetanus immune globulin is given in a dosage of 3,000 to 6,000 unit intramuscularly to neutralize circulating antitoxin. If this is not available, 50,000 units of horse serum antitoxin is given intramuscularly, followed by an additional 50,000 units in a slow, intravenous drip. Appropriate testing for hypersensitivity to horse serum should be done first. The two regimens have equal efficacies, although the human immune globulin has a lower incidence of allergenic reactions.

(c) Debridement of the Wound – This should be delayed for several hours to allow for adequate concentration of the antitoxin in the serum. Surgical excision will remove the organisms that are actively producing toxin; however, too early a debridement will cause more tetanospasmin to be liberated into the circulation. The patient should be cultured initially, and at the time of the debridement.

(d) Antibiotics – Penicillin is the drug of choice to kill any vegetative forms of the Clostridium tetani remaining after the debridement. The dosage is 1.2 million units of procaine penicillin daily or 1 million units of penicillin G intravenously every six hours for ten days. If the patient is allergic to penicillin, then tetracycline two grams daily, or erythromycin or chloramphenicol should be used.

(e) Sedation – The patient should be placed in a quiet, unobtrusive environment. Even mild stimuli may precipitate generalized seizures or reflex spasms. Patients may be alert and conscious, and therefore should be well-sedated before all necessary manipulations are done. Ideally, reflex convulsions and muscle spasms should be controlled, the patient's pain and anxiety should be diminished, and an amnesic response is desirable. Diazepam (2-20 mg every 1-8 hours) or short-acting barbiturates (seconal or nembutal 100-150 mg every 1-4 hours), in combination with neuromuscular blockade offer the best pharmacological combinations. Other sedative drugs used are chlorpromazine, meprobamate, chloral hydrate, paraldehyde or mephanisin. Adjunctive use of neuromuscular blockade is recommended in cases of tetanus involving reflex spasms, or in cases of respiratory failure. D-tubocurarine is the drug of choice. The dose is titrable via an intravenous solution so as to maintain maximal muscular relaxation.

(f) Sympathetic Nervous System Overactivity – As mentioned previously, this is one of the most serious complications of the disease. The syndrome must be recognized early. The

episodes can be controlled with low dose propanalol (0.2mg/min intravenously to a total of 2mg, or 10 mg p.o.), or other beta-blockers for the tachyarrhythmias that result. Alpha-blockers (such as phentolamine) are used to control the reflex hypertension.

(g) Immunization – All patients must be immunized as they do not have detectable antibody in their serum three months after resolution of the disease. Recurrences of tetanus are rare.

(h) General Supportive Measures – Nutrition, avoidance of decubitus ulcers or contractures, adequate suctioning, humidified oxygen, and low dose heparin prophylaxis is given, as these patients are at high risk for the development of deep vein thrombosis or pulmonary emboli. Cimetidine or antacids are given to prevent the development of stress ulcers.

Prophylaxis

Tetanus is a completely preventable disease with adequate immunization. When a patient is seen in the emergency room with any wound, abrasion, or burn, inquiry into their immunization history is mandatory. The wound must be cleansed, irrigated and debrided. Any foreign bodies should be removed as completely as possible. Determine if the patient has been adequately immunized.

In a child, four DPT (diphtheria, pertussis, and tetanus toxoid) vaccines at 2, 4, 6 and 18 months of age are considered adequate. Any adult who has not been immunized as a child, may be actively immunized by giving three DT (diphtheria and tetanus toxoid) injections at four week intervals followed by a booster one year after the last dose.

In the emergency room, determine first if the wound is clean or contaminated, then determine the patient's immunization status. If the patient has a clean wound, and has had a complete tetanus series including a tetanus toxoid booster within the last ten years, then no treatment is indicated. If the patient has had a complete series, but no tetanus booster in the preceding ten years, give ½cc tetanus toxoid booster. If the patient has not had a complete series, then give him (or her) a tetanus toxoid booster, and schedule the patient to complete the series (two more tetanus toxoid boosters at four week intervals and another booster injection one year later).

If the wound is contaminated (obviously dirty, crush injury, old laceration), and the patient has had a complete series; he must have had a tetanus toxoid booster within the last *five* years to avoid an injection. If his booster was more than five years ago, and his immunization series is complete, give only a tetanus toxoid booster. If the immunization series is incomplete, or if the history is unclear, give human tetanus antitoxin 250 units IM (125 units in children aged 5-10, or 75 units in children age 5 or less) *and* tetanus toxoid intramuscularly in the opposite arm. Additionally, the patient should be scheduled to complete the series. (See figure 1)

While adverse reactions to the booster have been reported (angioneurotic edema, anaphylaxis, urticaria, and serum sickness), it would seem prudent to administer the booster when adequate information regarding the patient's immunization history is not available. Overimmunization with the tetanus toxoid booster has been shown to produce antibody levels as high as 2,500 times the minimal dose necessary for adequate protection.

References

1. Kozbor, D. and Roder, C. Requirements for the establishment of High-Titered Human Monoclonal Antibodies Against Tetanus Toxoid Using the Epstein-Barr Virus Technique, J. Immunol. 127, No. 4, p. 1275-1280, 1981.

2. Sarniak, A. Cephalic Tetanus as a Complication of Nasal Foreign Body, Am. J. Dis. Child, 135, p. 571-572, 1981.

3. Dastur, F. et al. Response to a Single Dose of Tetanus Vaccine in Subjects with Naturally Acquired Tetanus Antitoxin, Lancet, p. 219-221, August 1, 1981.

4. Trujillo, et al. Tetanus in the Adult; Intensive Care and Management Experience with 233 Cases, Crit. Care Med., July (7), p. 419-423, 1980.

5. Alfrey, DD, Rauskher, LA. Tetanus: A Review, Crit. Care Med. 1979, 176-180.

6. Rothstein, R. & Baker, F.; Tetanus Prevention and Treatment, JAMA 240, p. 675-676, 1978.

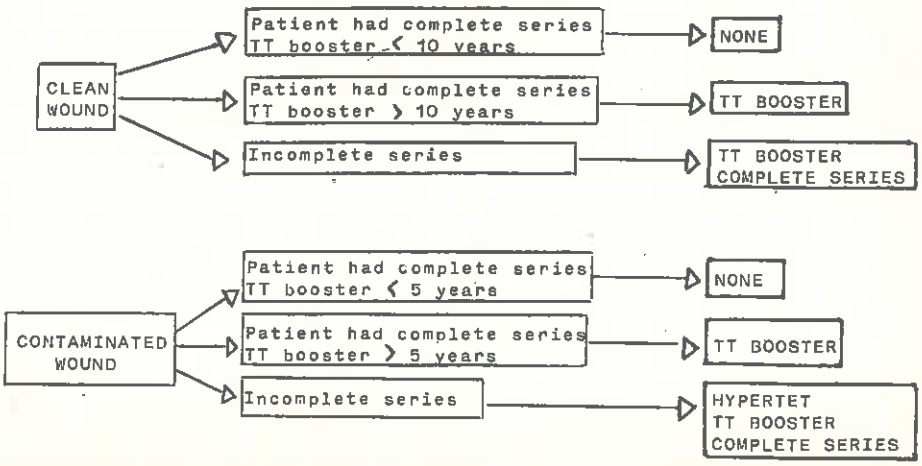
7. Weinstein, L. Current Concepts: Tetanus, NEJM 289, p. 1293-1296, 1973.

8. Eckmann, L. Active and Passive Tetanus Immunization, NEJM, 271, No. 21, p. 1087-1090, 1964.

9. Duffy, T.J., and Pentlow, B.D. Tetanus in Phlegmasia Caerulea Dolens, Br. Surg., Vol 68, (1981), p. 304-305.

10. Prys-Roberts, C, Kerr, J.H. Corbett, J.L. et al. Treatment of Sympathetic Overactivity in Tetanus, Lancet, 1969, 1:542.

figure 1

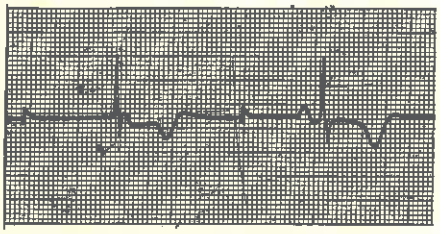


ECG Rounds

by Lynne Fulton, M.D.

Case 1

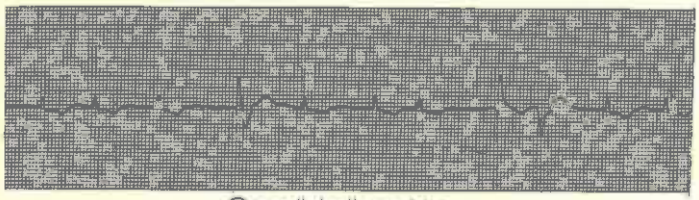
A 75-year-old gentleman, who had a pacemaker inserted 6 months ago, presents to the Emergency Department after having collapsed at home. Questioning reveals that he has been troubled with lightheadedness and generally feeling tired for the past few days.



Case I rhythm strip

Case 2

A 67-year-old female has noted that her pulse has been more irregular recently, and wishes to see if her pacemaker is working properly. She is asymptomatic.



Case II rhythm strip

See page 103 for interpretation of results

Special Report

The Royal College of Physicians and Surgeons of Canada

Examinations in Emergency Medicine

Eligibility Guidelines for applicants not meeting the regular training requirements

1. Wholly "practice eligible" applicants. The applicant must have had a total of at least five years of full-time practice of Emergency Medicine, be currently in the full-time practice of Emergency Medicine, and have been in such practice for the two immediately preceding years. The application must be supported by letters from colleagues or chiefs-of-service attesting to adequate performance in the field.

2. Applicants with Royal College certification. Applicants certificated by the Royal College in relevant specialties may receive up to two years credit towards the five-year practice requirement. As in No. 1, the applicant must be currently in the full-time practice of Emergency Medicine, have been in such practice for the two immediately preceding years, and have appropriate supporting letters.

3. Non-certitificated applicants with some formal training. Applicants who have undertaken some accredited training in a relevant specialty but who are not certificated may receive up to two years of credit on the basis of one year of credit for two years of training. As in No. 1, the applicant must be currently in the full-time practice of Emergency Medicine, have been in such practice for the two immediately preceding years, and have appropriate supporting letters.

4. Applicants with training in Emergency Medicine. Applicants who have completed satisfactorily two years of training in accredited Emergency Medicine programs, and who are currently in the full-time practice of Emergency Medicine, may receive four years "practice" credit on the basis of one year of training being equated to two years of practice, and would require one further year of full-time practice of Emergency Medicine or alternatively, one year of additional resident training in Emergency Medicine.

5. Applicants with unusual backgrounds. Up to one year of credit can be granted for relevant non-clinical activity in Emergency Medicine such as administration, teaching, research, etc., and in addition, special consideration can be given to applicants with unusual qualifications not covered by the previous guidelines.

Adopted by the Specialty Committee in Emergency Medicine June 4, 1982

Please note the specialty training requirements for Emergency Medicine

Emergency Medicine and Emergency Nursing 1982

Introduction

The Canadian Association of Emergency Physicians is extending their warm invitation to you for their Third Annual Scientific Assembly to be held in Calgary, Alberta, September 28th through October 2nd, 1982.

The initial three days of our five-day assembly offers to all participants a series of stimulating lectures, a series of specialized "mini courses" designed to meet the specific needs of physicians and nurses, and an inspiring presentation of the most recent scientific endeavors in our field.

The last two days offers to physicians a programme of Emergency Medicine Laboratories aimed at refining physical skills in related subspecialty areas of ophthalmology, neurosurgery, orthopedics and plastic surgery and an A.T.L.S. Course. For both our nursing and medical participants, we are also offering an A.C.L.S. recertification course during this time.

Our list of reputed guest specialists has been chosen to give both the Emergency Specialists of medicine and nursing an in-depth view of topics integral to our stimulating world of Emergency care.

Included in our plans are several social events — a welcoming reception, a Western Barbecue on Alberta's famous Elkana Ranch located in our gorgeous foothills country, and, of course, our Annual Banquet. Added to Calgary's endless offerings for entertainment and recreation, we are sure this conference will entirely fulfill your education and recreational expectations.

Location

Our conference will be centred in the Calgary Convention Centre in the heart of downtown Calgary, Alberta. This centre has been especially chosen to enable our participants to enjoy a conference in exciting surroundings with the best service.

The Four Seasons Hotel, one of Calgary's finest hotels, is connected to the Convention Centre and will be providing our accommodations.

Our location is within the cultural, entertainment, shopping and business heart of Calgary.

Registration

Our total registration must be limited in order to maximize the teaching potentials of each of our courses. Our registration form is provided in this brochure.

Each of our physician registrants will be guaranteed placement in three mini-courses, and each of our nursing registrants will be guaranteed placement in two of the nursing tracts and two of the special interest programmes. We urge you to register early to ensure your placement in the programmes of your choice.

Cancellation

Cancellations prior to September 1st, 1982 shall be refunded minus 15% for a necessary service fee. Requests for cancellations received after September 1st will receive no refund.

Accreditation

The Canadian Association of Emergency Physicians has granted 18 hours of Category I Credits for continuing education for the mini course and plenary sessions. Each lab course has been granted three hours of Category I Credits. Application has been made for accreditation by both the American College of Emergency Physicians and the Canadian College of Family Practice. Applications for C.M.E. credits for the A.C.L.S. and A.T.L.S. course have also been made.

Accommodation

A registration form is included in the brochure for the Four Seasons Hotel. This registration form should be mailed directly to the Four Seasons Hotel. Our block of room reservations will be held until prior to the conference.

Social Functions

As well as providing an excellent educational programme, our Programme Committee is endeavoring to make your stay in Calgary a very enjoyable one.

On the evening of September 27th, we welcome you to a no-host bar reception on the Garden Terrace of the Calgary Convention Centre. This will be your opportunity to reacquaint yourself with friends from across Canada and the U.S.A.

On Tuesday evening, September 28th, we will be presenting a taste of Calgary's Western fare. A Western Night at the Elkana Ranch, 20 miles west of Calgary, will feature an outdoor barbecue and dance among other Western activities and entertainment. Transportation will be provided to and from the Calgary Convention Centre for all who care to enjoy this evening.

On Wednesday, September 29th, we invite you to attend the Canadian Association of Emergency Physicians Annual Banquet. Cocktails will be served prior to the Banquet.

On your arrival at the Registration Desk, we will provide you with a package of information about the City of Calgary and its various attractions for your individual attention.

Programme Chairman

Dr. Robert Abernathy
Foothills Hospital
Calgary, Alberta

Nursing Programme Chairman

Marsha McCall
Calgary General Hospital
Calgary, Alberta

Physician Courses

Mini Courses

A. Hand Injuries — Dr. Peter Carter
B. Respiratory Emergencies — Dr. Arnold Aberman
C. Controversies in Trauma Care — Dr. Norman E. McSwain, Jr.
D. Orthopedic Emergencies — Dr. Robert Pickering
E. Pediatric Emergencies — Dr. Gus Cooper

F. Controversies in Emergency Medicine Esoterica — Dr. Ron Stewart

Emergency Medicine Laboratories

1. Plastics Laboratory — Dr. G. Waslen and Dr. E. Magi
2. Orthopedics Techniques — Dr. D. Dinwoodie and Dr. J. Harder
3. Neurosurgical Techniques — Dr. Doug Cochrane and Dr. T. Myles
4. Ophthalmological Techniques — Dr. M. Kirker and Dr. R. Lang

Nursing Courses

Tract Programme

Tract I:
Nursing Assessment and Management of the Multi-Injured Patient — Jody Ross, R.N., B.Sc., M.S.

Tract II:
Nursing Assessment and Management of the Pediatric Patient — Anne-Marie Ecclestone, R.N.

Tract III:
Nursing Assessment and Management of the Neurological Patient — Ferelith A. Taylor, R.N.

Tract IV:
Nursing Assessment and Management of the Cardiac Patient — Nancy Holloway, R.N., M.S.

Tract V.
Contemporary Issues
Session I — Emergency Nursing in Canada — Theresa Conliffe, R.N.
Session II — Utilization of Emergency Nurses in the Emergency Department — June Thompson, B.S.N., M.S.

Special Interest Programme

A. Nursing Assessment and Management of the Patient with Gynecological Problems — Johanna Mouseau, R.N., B.Sc.
B. Nursing Assessment and Management of Dislocations — Betty Gourlay, R.N., B.N., M.A.
C. Nursing Assessment and Management of the Respiratory Patient — Theresa Conliffe, R.N.
D. Assessment of Shock Syndrome — Dean Sandham, M.D.
E. Stress Management — Robert McMahon, B.Sw.
F. Organizational Planning and Administration of an Emergency Department — Linda Traquair, R.N., B.Sc.N., MSc.N.

A.T.L.S. Course

Limit: 16 Physicians
Chairman: Dr. Bill Dunlop

A.C.L.S. Recertification Course

Limit: 50 participations
Director: Dr. Fred Argument

Registration Form

Name

City

Telephone — Bus. Home

Address

Prov./State

Postal/Zip Code

Fees:	
CAEP Member	$250
Non-Member	$325
Resident[1]	$200
Nurse	$175
Paramedics	$175
ACLS	$125
Laboratories	$50/lab
ATLS	$350
Extra Banquet Tickets	$ 25
Western Night	$20/ticket
Total Submitted	$

Physicians' Course Choice*

Physician Mini-Courses (Max. 3)
- Pediatric Emergencies ____
- Hand Injuries ____
- Orthopedic Emergencies ____
- Controversies in Trauma ____
- Respiratory Emergencies ____
- Controversies in Emergency Medicine Esoterica ____

Laboratories (Max. 2)
- Plastics ____
- Orthopedics ____
- Neurosurgery ____
- Ophthalmology ____

Nurses' Course Choice*

Nursing Tracts (Max. 2)
- Multi-Injured Patient ____
- Pediatric Patient ____
- Neurologic Patient ____
- Cardiac Patient ____
- Contemporary Issues ____

Special Interest Programme (Max. 2)
- Gynecological Problems ____
- Dislocation Injuries ____
- Respiratory Emergencies ____
- Shock Syndrome ____
- Stress Management ____
- E.R. Organization ____

Return completed REGISTRATION FORM to:
THIRD ANNUAL CANADIAN ASSOCIATION OF EMERGENCY PHYSICIANS SCIENTIFIC ASSEMBLY
c/o Madeleine Aldridge
Faculty of Continuing Education
The University of Calgary
2500 University Drive N.W.
Calgary, Alberta. T2N 1N4
Telephone (403) 284-5051

Cheques or Money Order to be payable in Canadian funds to The University of Calgary

[1]must provide letter from residency director

*Indicate choice in order of preference

Conference Outline

September 27th

13.00 to 20:00 Registration
19:00 Reception

September 28th

Plenary Session
8:30 Introduction — Dr. G. Powell
8:45 EMS System in Canada — Dr. L. Vertesi
Coffee-Break
10:45 Recent Trends in Emergency Department Management — J. Thompson, B.S.N., M.S.
Lunch
13:30 Physician Mini-Courses — A thru E.
Nursing Tracts — Session I, Session II
18:00 Western Barbecue, Elkana Ranch (dress — Western)

September 29th

8:30 Physician Mini-Courses — B thru F
Nursing Tracts — Session I, Session II
Lunch
13:00 CAEP Workshops on Certification
Nurses' Special Interest Program — A Thru F
14:00 Scientific Paper Presentation
Chairman — Dr. M. Hodsman
Continuation of Nurses' Special Interest program
16:30 CAEP General Meeting
19:00 CAEP Annual Banquet
19:00 Cocktails
20:00 Dinner

September 30th

8:30 Physician Mini courses — B thru F
Nursing Tracts — Session I, Session II
Lunch
Plenary Session
13:00 The Belligerent Patient — Dr. R. Stewart
14:00 Mountain Rescue — P. Furman
Coffee-Break
15:30 Disaster Planning — Dr. G. Powell & Dr. R. Gerace
19:00 ACLS Recertification Course begins

October 1st

8:30 Emergency Medicine Laboratories — Neurosurgery, Orthopedics, Plastic Surgery
ACLS Course
ATLS Course
Lunch
13:30 Emergency Medicine Laboratories — Neurosurgery, Orthopedics, Plastic Surgery, Ophthalmology
ACLS Course
ATLS Course

October 2nd

8:30 ATLS Course

Case Conference

Acute Atrial Fibrillation

Two cases are presented which demonstrate some important factors to consider in the initial management of acute atrial fibrillation. General principles will be discussed, as well as the approach to therapy in the specific settings of chest pain and enhanced atrioventricular conduction.

Case 1

A 78 year old male presented to the Emergency department soon after the sudden onset of palpitations and dizziness while he was watching a parade. There had been no associated chest pain or dyspnea. This was his third bout of palpitations in six weeks – both previous episodes were sudden in onset, associated with dizziness, and were prolonged, but terminated spontaneously. He had been hypertensive for ten years and gave a history of poor compliance but no other past history of cardiac, pulmonary or thyroid disease.

On examination he was pale, but alert. Vital signs showed a pulse of 160/minute, the rate being irregularly irregular, blood pressure 180/100 mm Hg, and respirations 28/minute. JVP was normal. Head and neck exam revealed copper wiring of fundi. Chest was clear to auscultation. Cardiovascular exam showed normal S_1 and S_2 with no other sounds heard. He had bilateral pedal edema. The remainder of the exam was normal. An E.C.G. done in the E.D. (Figure 1) showed atrial fibrillation at a rate of 140-160/minute with periods of rapid AV-conduction up to 300/minute (Figure 1, arrows).

Initial treatment included propranolol 1 mg I.V. bolus with no significant effect, then digoxin 0.5 mg I.V. with no effect initially. He was admitted to hospital with a diagnosis of hypertension and paroxysmal atrial fibrillation of unknown etiology, possibly related to a pre-excitation syndrome with an AV-bypass tract. Just before transfer from the E.R., the patient converted to normal sinus rhythm. A repeat E.C.G. showed no evidence of WPW syndrome. A lung scan was negative and thyroid function was normal. He was digitalized fully and remained in sinus rhythm until discharge.

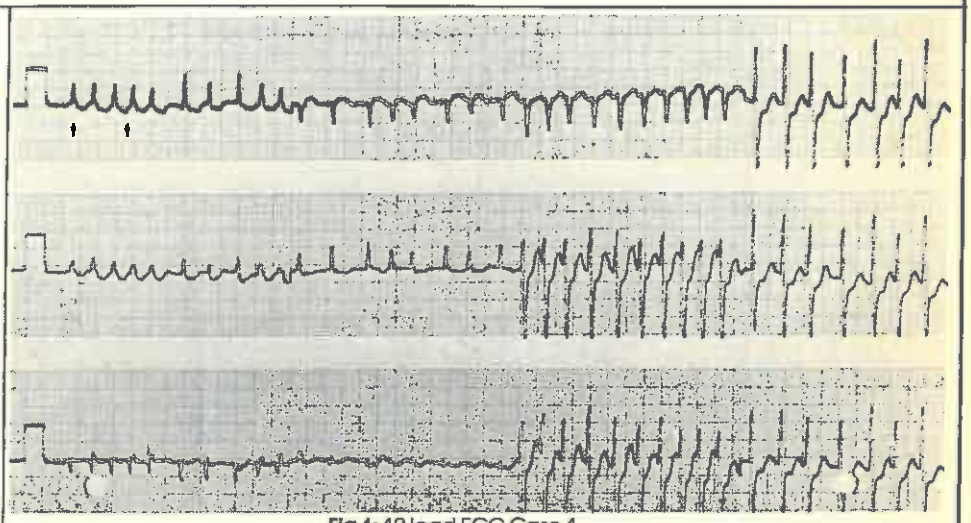


Fig 1: 12 lead ECG Case 1

Case 2

A 69 year old male developed sudden onset of palpitations and dizziness while sitting at home. This was followed by a pressure sensation across his chest and numbness in the left arm, associated with dyspnea and marked diaphoresis. He also noted a rapid heart beat. The chest pain was not relieved by sublingual nitroglycerine and, after twenty minutes, he decided to come to the E.D.. His past history included exertional chest pain for five years, hiatus hernia, adenocarcinoma of the prostate operated on five years previously, and hypertension for thirty years complicated by chronic renal failure. His medications were nitroglycerine and a diuretic.

On examination he was in distress with chest pain. Heart rate was irregularly irregular at 150/minute and blood pressure 120-70 mm Hg. JVP was normal. Chest was clear. S_1 was decreased, S_2 was normal. It was difficult to assess for murmurs due to the fast rate. The rest of the examination was normal.

E.C.G. showed atrial fibrillation with a rate of 170/minute and diffuse ST-segment depression (Figure 2). Oxygen was started and he was given sublingual nitroglycerine. Propranolol, 1 mg I.V. bolus, was repeated twice with no significant change in heart rate. Digoxin was then given, 0.5 mg I.V. over fifteen minutes. Chest pain subsided gradually only after I.V. morphine, and more sublingual nitroglycerine and the patient was admitted to the coronary care unit with a diagnosis of rapid atrial fibrillation and possible acute myocardial infarction.

The treatment plan on admission was to slow his heart rate with digoxin. If chest pain recurred with a rapid heart rate, cardioversion would be employed; otherwise, quinidine would be used to convert him to sinus rhythm. By the following day he had converted to sinus rhythm at 80/ minute, and his E.C.G. and cardiac enzymes had not changed. Thyroid function was normal, and no murmurs were heard at his slower rate. Recurrent chest pain was controlled with nitrates, and he was discharged on digoxin 0.125 mg on alternate days (due to diminished renal function), as well as on nitrates, and a beta-blocker to control angina.

Discussant: Gary Bloomberg, M.B., B.Ch.
Senior Cardiology Resident, Toronto General Hospital
Editor: Charles Ramesar, M.D.
Emergency Staff Physician, Toronto General Hospital

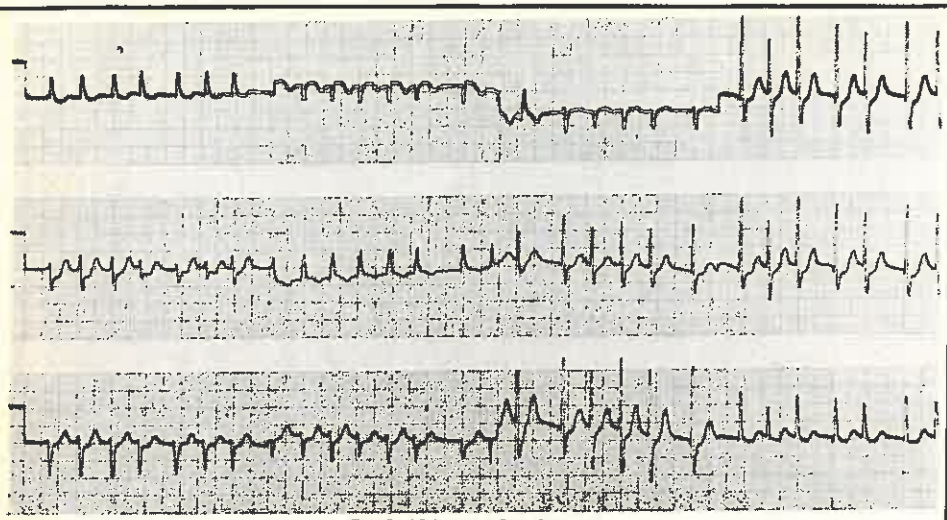


Fig 2: 12 lead ECG Case 2

Discussion

Dr. G. Bloomberg.

These two cases raise some important considerations in choosing initial therapy for acute atrial fibrillation with rapid rate. In Case 1, where bouts of very rapid conduction suggested a pre-excitation syndrome, the use of digoxin may have been inappropriate in view of its potential to enhance the bypass tract. The etiology of the arrhythmia here is still unclear – he is likely to be a "lone fibrillator" (i.e. pathologically normal heart) in view of his age, and poorly controlled hypertension. Case 2 is a patient with poorly controlled ischaemic heart disease associated with a rapid rate, and electrical cardioversion may have been appropriate here. There is a role for the use of digoxin in this setting, and this will be discussed, along with some of the other points mentioned.

Atrial fibrillation is, by far, the most common arrhythmia with serious clinical implications[1], ten times more frequent than P.A.T.[2], and with a peak age incidence of between 50 and 70 years. When faced with a patient in atrial fibrillation, it is important to consider the possible predisposing conditions. Hypertensive, ischaemic, and chronic rheumatic heart disease are commonly associated with atrial fibrillation, but many patients are "lone fibrillators", usually older males with normal hearts. Strong vagal stimulation may predispose to atrial fibrillation, as well as some pharmacologic agents. About 10% of patients with acute myocardial infarction develop atrial fibrillation. Other predisposing conditions include mitral valve prolapse, pericarditis, cardiomyopathies, congenital heart disease, recent cardiac surgery, and pre-excitation syndromes, particularly Wolff-Parkinson-White. Less common causes include pulmonary embolism, thyroid disease, alcohol excess, electrolyte imbalance, hypothermia, and smoking. In patients with premature atrial contractions (a common initiating factor), a useful predictor for the development of atrial fibrillation is the coupling interval – the distance between the normal QRS complex and the atrial ectopic beat. If this distance is less than 50% of the normal R-R interval, there is a high probability of developing fibrillation.[5]

Clinically, patients may be aware of palpitations, but often they present due to the secondary effects of the arrhythmia, such as chest discomfort or lightheadedness. At this point three important parameters to assess are: cardiac reserve, the occurrence of emboli, and the presence of palpitations. On examination, the peripheral pulse is irregularly irregular with a rate of between 120 and 170, reflecting the limits of AV nodal conduction. It is rare for the ventricles to receive impulses above the rate of 170/minute through the normal AV nodal tissue, and, if the apical or ECG rate is over 180 to 200/minute, conduction to the ventricles must be by an accessory pathway. Rapid rates are seen in the pre-excitation syndromes, and, sometimes, in thyroid disease.

If the ventricular rate in atrial fibrillation is slow, less than 120, and the patient is not on medications, such as digoxin, then the AV node is not conducting normally. Any patient who presents with atrial fibrillation at a rate of 75/minute, who is not on digoxin, must have AV nodal disease.

The 12 lead ECG confirms the clinical impression, and is characterized by absent p waves, a distortion of the baseline caused by atrial deflections or "f" waves of variable amplitude, and an irregular distribution of ventricular complexes. The most important aspect of the ECG is signs of associated heart disease.

Management is generally conservative. The question to ask in the E.D. is "how stable is the patient?" If the patient is stable, there is no urgency in treating the atrial fibrillation. If the setting is acute myocardial infaction, then urgent treatment is needed to prevent the detrimental effects of rapid atrial fibrillation on myocardial oxygen consumption. The treatment of choice for rapid atrial fibrillation (rate over 150), if the patient is hypotensive, having ongoing myocardial ischaemia with poorly controlled chest pain, or in life threatening acute pulmonary oedema, is electrical cardioversion. Atrial fibrillation is the most difficult arrhythmia to cardiovert, and, in these life threatening situations, large voltages (150-200 Joules) must often be used. Problems with cardioversion include emboli, pulmonary oedema, skin irritations, and dysrhythmias, so the benefits of this procedure should be weighed against the risks. This is particularly true in the digitalized patient who is not anticoagulated, as this patient is more prone to complications. It may be more difficult to cardiovert those patients with prolonged arrhythmias, advanced age, large left ventricles, previous cardioversion with recurrence, and digitalis toxicity.

The use of digitalis in the acute phase of myocardial infarction was originally controversial because of the major effects of the drug. If digitalis is given rapidly through the intravenous route, it increases peripheral vascular resistance leading to increased afterload and strain on the ischaemic heart. By administering the drug slowly, over 10 to 15 minutes, this effect can be avoided. The second potentially dangerous effect of digitalis in this setting is its ability to increse myocardial contractility. It has been postulated that this would lead to the bulging of the ischaemic or infarcted cardiac segment, contributing to aneurysmal formation, and dissipating the inotropic effect on the non-ischaemic areas. This probably does not occur, however, and

the beneficial effects on contractility of digoxin outweigh the deleterious ones.

The goal in atrial fibrillation is slowing of the heart rate, and it is to achieve this effect, by blocking AV nodal conduction, that digitalis is used. Although conversion to sinus rhythm is not the therapeutic goal with digitalization, some patients (25-50%) will do so. This is a coincidental occurrence probably due to the break in the arrhythmia following slowing of the heart rate.

The best way to use digoxin for rapid atrial fibrillation is to administer it by slow intravenous infusion at a dose of 0.5 mg over 15 minutes. Since the peak effect of the drug is in 2 to 4 hours, doses should be repeated in about 6 hours. For patients with ongoing ischaemic pain and a persistent rapid rate, the drug can be given more frequently, i.e. after the initial 0.5 mg intravenously, 0.25 mg can be given every 4 hours, or even every 2 hours, by either the intravenous or oral route, until a maximum dose of 1.5 mg over 24 hours is reached, or the desired effect is achieved. As the digitalis is being administered to slow the heart rate, it is this that determines the total dose.

If the patient is presenting with digitalis toxicity, or is already digitalized, large doses of the drug must be avoided. Early signs of digitalis toxicity may resemble atrial fibrillation – as the dose of digoxin is increased, there is progressive AV nodal entrance block until, with complete block, the lower conducting tissue takes over at a rate of 45-50/minute. Atrial fibrillation may thus slow, and then become a regular rhythm at a low rate with heart block secondary to the drug. At this point the AV node may become irritable and take over as the pacemaker, leading to an accelerated idioventricular rhythm at a rate of 150 to 160. The absent p waves, and the rapid rate may lead to the conclusion that more digoxin is needed, when, in fact, this is a manifestation of digoxin in excess.

Beta-blockers may be useful when used in combination with digoxin to treat atrial fibrillation, by allowing the use of lower doses of digoxin. If used alone, beta-blockers can have deleterious effects, since they raise left ventricular end diastolic pressure by their negative inotropic effect, resulting in increased left atrial pressure, and exacerbation of the arrhythmia. These drugs may be of some value in pre-excitation syndromes, although there are superior drugs for use in this setting, such as procainamide which slows the accessory pathway.

Calcium antagonists, such as verapamil, have been shown to be useful in slowing the ventricular rate, but few patients convert to sinus rhythm. Some newer drugs are available to treat paroxysmal atrial fibrillation, such as amiodarone, which has both atrial and ventricular antiarrhythmic effects, and is valuable for long term control.

In summary, acute atrial fibrillation is a common and sometimes life threatening arrhythmia. The physician managing these patients in the Emergency Department should be aware of the variety of predisposing factors and carefully select, from the different therapies available, the one appropriate to the clinical setting. Initial management is aimed at controlling the heart rate – in the unstable patient this will be with electrical cardioversion, the stable patient can be converted to sinus rhythm electively, either medically or electrically.

Question

Is there any advantage to verapamil over digoxin in the patient who is not unstable enough to require electrical cardioversion but whose rate should be controlled quickly?

Comment

It is true that I.V. digoxin has a delay in effect of about 30-40 minutes, and this should be considered in selecting it. Verapamil may be preferable to digoxin when rapid control is desired, since it begins to slow the rate effectively within minutes; however, its effects disappear within a half hour, so treatment might be initiated with verapamil and the effect maintained by digitilizing the patient[5]. Verapamil should not be used in patients with WPW syndrome, heart block, hypotension or who have received I.V. beta-blockers.

References

1. Selzer, A. Editorial – Atrial fibrillation revisited. N.Eng.J Med April 29, 1982
2. Hurst, J W., Morris, D : Current Problems in Cardiology Year Book Medical Publishers Inc., 1976.
3. Killip, T., Gault, J.: Mode of Onset of Atrial Fibrillation in Man. Am.Heart J. 70:172, 1965.
4. Mason, D., Awar, N.: Recent Advance in Digitalis Research Am J. Cardiol. Vol. 43, May 1979.
5. Waxman, H., Myerburg, R et al. Verapamil for Control of Ventricular Rate in Paroxysmal Supraventricular Tachycardia and Atrial Fibrillation or Flutter Ann.Int.Med. 94:1-6, Jan. 1981.

CME Calendar

Emergency Medicine and Emergency Nursing
CAEP, Annual Scientific Assembly
Sept. 28, Oct. 2, 1982
Calgary, Four Seasons Hotel
Dr. Robert Abernathy, Foothills Hospital, Calgary

6th Annual Course on Emergency Management
Department of Family and Community Medicine
University of Toronto
Skyline Hotel, Toronto
April 30-May 1-2, 1982
Dr. Calvin Gutkin, Toronto Western Hospital, 18 hrs.

Scientific Meeting, Section of Emergency Medicine
Ontario Medical Association
Dr. Nizar Mussani, St-Josephs Hospital Centre, Toronto
June 2-3, 1982, 8 hrs.

Current Concepts Seminar
September 28-29, 1982
Royal Victoria Hospital
Barrie, Ontario
Dr. B. Morris, Royal Victoria Hospital; 6 hrs.

Fourth Annual Orangeville Day
May 1, 1982
Nottawasaga Inn, Alliston, Ontario
Dr. Don Stewart, Dufferin Are Hospital, Orangeville, Ont., 6 hrs.

Emergency Medicine and the Law
June 14-16
Empress Hotel, Victoria, B.C.
Dr. J.C. Maccagno, Parkside Emergency Physicians
928 Pandora Drive, Victoria; 18 hrs.

Continued on page 99

Scientific Section

Interpretation of X-Rays by Emergency Physicians

by Kent D.L. McKinnon*, M.D. and Leon A. Baskerville*, M.D.

Abstract

An audit was undertaken to assess the accuracy of the initial emergency physician interpretation of radiographic studies ordered at the time of first patient contact in the Emergency Department. There was a 97.3% concordance between the initial emergency physician reading and the final radiological reading. The system of precautionary safeguards for x-ray interpretation utilized at our centre is identified, and the significance of the non-concordance in the management of individual cases is discussed in the paper.

From this data, it is concluded that the initial assessment of Emergency Department x-rays by experienced emergency physicians is adequate, and that patient risk in such a system can be considered minimal.

Résumé

On a procédé à une vérification afin d'évaluer l'exactitude de l'interprétation initiale des clichés radiographiques par le médecin d'urgence au moment du premier contact avec le malade dans la salle d'urgence. On a constaté une concordance à 97,3% entre la première interprétation par le médecin d'urgence et l'interprétation radiologique finale. Cet article explique le système de mesures de précaution pour l'interprétation des radiographies utilisé dans cet hôpital et l'importance de la non-concordance des interprétations dans le traitement de cas particuliers.

A partir de ces données, on conclut que l'évaluation initiale des radiographies par des médecins d'urgence qualifiés est adéquate et que les risques pour le malade dans un tel système peuvent être considérés comme minimes.

The choice of Emergency Medicine as a career carries with it the responsibility for acquiring skills which are both technical and interpretive in nature. In the Emergency Department the treatment and disposition of patients frequently involves on-site interpretation of radiologic investigations by the emergency physician alone. For this reason it is of utmost importance to emergency physicians, other medical specialists, and the public, that such interpretation demonstrates a high degree of diagnostic accuracy, and lead to a minimum of patient risk.

The evaluation and documentation of emergency physicians' skills in x-ray interpretation should be a goal of major emergency medical centres. To this end a study was undertaken in Kitchener-Waterloo to assess the accuracy of x-ray interpretation by the emergency physicians at the time of initial patient contact. The objectives of this study were to: (1) determine the concordance of emergency physician interpretations as compared to the final radiologic reports; (2) assess the relationship of positive radiographic findings to the overall number of patients x-rayed; (3) determine the positive yield for different anatomical areas x-rayed, and (4) identify areas of confusion in x-ray interpretation so that emergency physicians might improve their skills.

The Emergency Departments of the two Kitchener-Waterloo hospitals are staffed by thirteen career emergency physicians who treat 85,000 patients per year at both hospitals. Each physician is required to have ACLS certification and maintain CAEP C.M.E. criteria as a condition of employment. Annual emergency radiology inservices are held so that interpretive skills may be upgraded.

There is no house staff in the Kitchener-Waterloo hospitals and thus x-ray interpretations were, of necessity, made solely by the emergency physicians. It can be argued that at teaching centres, with specialty residents, family practice residents, interns, and medical students all present at various times in the ER, it might be difficult to extract a true sampling of the interpretive skills of the emergency physicians themselves.

The majority of ER x-rays at our hospitals are performed in the evenings, nights, and on weekends, when there is no in-hospital specialty staff. A radiologist is always available at these times, but one is called in less than 10 times per year. On weekdays the emergency physicians are able to consult with a radiologist, but this occurs less than 2% of the time.

Methods

During a four week period charts of 3216 patients seen by emergency physicians at both hospitals were randomly selected and categorized as to the presence or absence of x-ray investigations. Chart selections were made retrospectively and neither emergency physicians nor radiologists had prior knowledge of the audit's time frame. Random chart selection was discontinued when x-rayed patients numbered 590 at St. Mary's General Hospital and 500 at K-W Hospital. The first 500 at St. Mary's General Hospital plus all 500 at K-W Hospital were ultimately used for the study.

* Emergency Physicians, Kitchener-Waterloo Hospital and St. Mary's General Hospital, Kitchener, Ontario, and members of courtesy staff, Cambridge Memorial Hospital, Cambridge, Ontario

Emergency physicians are required to write their x-ray diagnosis both on the patient's chart and on the x-ray envelope. Thus, for purposes of the audit, these interpretations were readily available from either of two sources.

Further safeguards are provided by the following features within the hospitals: i) since the emergency physician must indicate a diagnosis on the x-ray folder, the radiologists are always aware of his assessment, ii) if a radiologist subsequently discovers what he considers a significant misinterpretation he notifies the emergency physician or the emergency department of this discrepancy and the patient or his family physician is immediately notified; and iii) emergency physicians get follow-up copies of all x-ray reports and they can, if necessary, alter instructions to patients if misinterpretations are discovered. These reports also act as excellent educational aids. The above measures have been standard procedures in this centre for several years.

Interpretive accuracy was evaluated by means of concordance figures. Concordance refers to the agreement in the radiographic interpretation between the emergency physician and the radiologist. Non-concordance, of course, refers to a difference in interpretation. The specialist's assessment was generally held to be the correct one. However, all non-concordance films were reviewed by the authors and in those cases where a reasonable doubt existed, the x-ray was given to an arbitrator (another radiologist) for the final ruling.

Results

Of the 3216 emergency department patients seen by emergency physicians during the study period, 1090 (33.9%) were x-rayed. Of the 1000 x-rayed patients used for the audit, 26.6% had positive findings (Table I).

Concordance for x-ray interpretation was 97.3% (1139/1171 x-ray studies – Table II). Non-concordance was therefore 2.7% (32 x-ray studies). Of this group with non-cordance 3 patients out of 1000 (.3%) were considered to have significant non-concordance, i.e. not only were the x-rays misinterpreted but, as well, the misinterpretation may have led to an inadequate or inappropriate treatment. These three cases included: i) a subtle fracture of the radius in a 20 year old who was treated without a splint or cast, ii) a tibial plateau fracture in a 54 year old who was treated with a tensor and crutches, and iii) a skull fracture in a 19 month old who was discharged with a head injury card.

Other cases of non-concordance (29/32) were assessed to have been adequately treated despite x-ray misinterpretation. Examples of these included: missed fractures of phalanges which were treated with splints, 'overcalled' fractures (clavicle, scaphoid), missed undisplaced fractures of nasal bones, and several missed subtle pulmonary infiltrates that were treated with antibiotics.

Non-concordance by anatomical regions is shown in Table III.

The myriad of various x-ray studies that can be ordered were coalesced into the following 5 categories so that the presentation of data could be simplified:

HEAD = skull, facial bones, mandible, nasal bones, soft tissues neck

CHEST = chest, ribs, clavicle, scapula, sternum

ABDOMEN = 3 views, KUB

EXTREMITIES = arms, shoulders, AC joints, hips, legs

SPINE = cervical, thoracic, lumbosacral, spine, coccyx, pelvis

Results of the positive yield per category, as well as the overall percentage of films ordered by category, are shown in Table IV.

TABLE I

General Data

a) charts reviewed with X-rays	1,000
b) total X-ray series ordered	1,171
c) number of positive X-rays	266
d) percent positive per total taken	22.7%
e) percent positive per patients x-rayed	26.6%

TABLE II

Concordance

	Number	Percent
Concordance of emergency physician interpretation with radiologist report	1139	97.3
Non-concordance	32	2.7
	1171	100.0
Significant non-concordance*	3	.3

* difference in interpretation may have led to inappropriate therapy for the patient

TABLE III

Non-Concordance

– non-cordance cases include:

a) extremity	14
b) CXR	11
c) nasal bones	3
d) skull	2
e) spine	1
f) facial bones	1
	32

TABLE IV

X-Rays Ordered by Category and Positive Yield per Category

Category	Total per category		Positive	
	No.	*%*	*No.*	*%*
Head	169	14.4*	17	10**
Chest	244	20.8	53	22
Abdomen	37	3.2	14	38
Extremities	633	54.1	168	27
Spine	88	7.5	14	16

*i.e. 14.4% of all ordered x-rays were of HEAD

**i.e. of all HEAD x-rays 10% are positive

Discussion

Of all patients who were x-rayed, 26.6% had positive films. This compares favourably to a study at Stanford University in which 20% of 2179 trauma patients x-rayed had positive findings.[1]

In this audit the most commonly ordered x-rays involved EXTREMITY and CHEST films, (54.1% and 20.8% respectively). Considering the frequency with which these views are ordered, the positive yields of 27% and 22% were considered quite acceptable.

ABDOMEN films gave the highest positive yield (38%) but this category represents only 37 out of 1171 ordered x-ray series (3.2%). No attempt was made to identify those positive ABDOMEN findings which may have been unrelated to the clinical problem, as was done in a study by McCook et al[2] in which a positive abdominal x-ray yield of 23% was broken down into 15% positives which were clinically relevant and 8% which were clinically unrelated. This high positive ABDOMEN x-ray yield (38%), as compared to McCook's series (23%), reflects to some degree the

selectivity with which these films are ordered.

The lowest yield was with HEAD films (10%) of which the majority were skull films. High yield criteria for ordering skull x-rays[3] were not used. The low positive yield on HEAD and SPINE radiographs (10% and 16%) points out the need for a reassessment of the perceived necessity for these investigations in many cases.

The radiologic examination that resulted in the greatest interpretive variation was the chest x-ray, especially with regard to infective processes. This is borne out by the non-concordance figures showing that 11 of 32 misinterpretations involved chest x-rays (34%), whereas only 20.8% of all films ordered were CHEST films. This feature was especially evident in infants and small children, and appears to be a problem that is not confined to this centre.[4]

The overall non-concordance rate (2.7%) and the low significant non-concordance rate (0.3%) would seem to indicate that minimal patient risk has been introduced into this system of ER x-ray evaluation.

Conclusions

Of all ER patients who were x-rayed in this study, almost 27% had positive findings. EXTREMITY, CHEST, and ABDOMEN films yielded the most useful information. HEAD and SPINE x-rays were probably overutilized.

Emergency physicians accurately interpreted ER x-rays in over 97% of cases. Non-concordant interpretations which were significant in terms of treatment outcome were extremely rare. It can be concluded that acceptable and safe patient care can be rendered under a system whereby ER x-rays are utilized and interpreted by experienced emergency physicians.

References

1 Eliasiam M et al. Utilization of diagnostic radiologic examinations in the emergency department of a teaching hospital. J Trauma 20: 61-65, 1980.

2 McCook T.A, Ravin, C E, Rice R P. Abdominal radiography in the emergency department: A prospective analysis. Ann Emerg Med 11: 7-8, January 1982.

3 Cordon I W. Skull roentgenography for patients with head trauma: the use of high-yield criteria. Can Med Assoc J 1981; 124: 584-589

4 Quick G, Podgorny G. An emergency department radiology audit procedure. JACEP 6: 247-250, 1977

CME continued from page 96

Fractures and dislocations of the upper limbs

New Brunswick Association of Emergency Physicians
April 3, 1982
Sir Georges Dumont Hospital, Moncton, N.B.
Dr. Derek Jones, St. Johns Regional Hospital; 4 hrs.

The Medicine of Sport Scuba Diving

Bonaire, Netherland Antilles
February 6-13, 1982
Jefferson C. Davis, Hyperbaric Medicine P.A.

Treatment of the Seriously Injured or Ill in the Emergency Room

June 2-4, 1982, The Montreal General Hospital
Postgraduate Board, Montreal General Hospital;

Les Urgences

Fedceration des Medecins Omnipraticiens du Québec
May 6, 7, 8, 1982. Dr. Pierre Fréchette
Québec, Québec; 28 hrs

Noticeboard

The Royal College of Physicians and Surgeons of Canada
Examinations: Emergency Medicine

The first examinations in the specialty of Emergency Medicine will be held in September 1983. Prospective candidates should note the following:

1. Every candidate for admission to the examinations must submit an application for assessment of training.

2. Candidates who wish to take the examinations in 1983 should apply for a preliminary assessment of training as soon as possible, and in any case, not later than September 1, 1982. Only candidates whose assessment of credentials is complete will be accepted to sit for the examinations.

3. Candidates who desire to take the examinations in Emergency Medicine, having complied with the above requirement of preliminary assessment of training, must notify the College in writing of their intent before February 1, 1983. Upon receipt of this notice of intent, the evaluation of the candidate's performance during training will be added to the previously completed assessment of credentials. Each candidate will then receive notification as to eligibility together with an application form for admission to the examinations, which must be completed and returned.

4. The following documents may be obtained from the College office:

(a) Application forms for assessment of training.

(b) General information booklet of regulations relating to the examinations.

(c) Specific requirements for training and regulations relating to the examinations in Emergency Medicine.

5. Address all inquiries to

Office of Training and Evaluation,
Royal College of Physicians and Surgeons of Canada,
74 Stanley,
Ottawa, Canada, K1M 1P4

Emergency Physicians: Ontario

Mount Sinai Hospital, a fully accredited University of Toronto teaching hospital, is accepting applications for two full-time Emergency positions, commencing July 1 st, 1982 or August 1st, 1982. Responsibilities will include primary patient care, teaching of housestaff and research in emergency related areas. Preference will be given to career-oriented applicants with previous emergency experience or post-graduate training in Emergency Medicine. Apply with curriculum vitae to Dr. C.E. Murphy, Director of Emergency Services, Mount Sinai Hospital, 600 University Avenue, Toronto, Ont. M5G 1X5, telephone (416) 596-4242

Emergency Medicine Physicians

sought to staff several emergency departments throughout the Midwest, U.S.A. Excellent guaranteed income plus paid malpractice insurance; flexible scheduling; reimbursement of state licensure and CME tuition; moving allowance, etc. Annual patient volume ranges from 5,000 to 20,000. For complete details send credentials in confidence to

David Schnitzer, Spectrum Emergency Care, Inc.,
999 Executive Parkway, St. Louis, MO 63141;
or call collect (314) 878-2280.

Emergency Room Director – Academic

The Department of Family Medicine of the University of Manitoba and the St. Boniface General Hospital invites applications for the position of Head, Section of Emergency Medicine, Department of Family Practice, St. Boniface General Hospital.

Applicants should have extensive experience in emergency medicine and in teaching in the emergency room setting. Administrative experience or ability is essential. Major responsibilities will include the provision and coordination of patient care and undergraduate and postgraduate teaching. St. Boniface General Hospital is one of two major teaching hospitals in the Province of Manitoba, and has earned a reputation for excellence by practising innovation and through the continual improvement of service.

Application accompanied by a curriculum vitae and names of three referees should be submitted by *September 1, 1982* to:

Dr. Gary Beazley, Head,
Department of Family Medicine
409 Tache Avenue
WINNIPEG, Manitoba
R2H 2A6

Meetings to note

Ontario Assembly of Emergency Care

The Fifth Annual Ontario Assembly of Emergency Care will take place in Toronto on October 3-4-5-6, 1982. Nationally acclaimed speakers, through presentations and workshops, will address the continuing education needs and desires of Emergency Department Physicians, pre-hospital care personnel and Emergency Department nurses.

Sponsored by the Association of Casualty Care Personnel, Emergency Nurses Association of Ontario and Ontario Medical Association — Section of Emergency Medicine.

For further information, please contact:

Ontario Assembly of Emergency Care
P.O. Box 550, Vineland, Ontario, Canada L0R 2C0
Telephone: 416-957-7123

September 17-19

Disaster: No Safe Place, Le Chateau de l'Aéroport Hotel, Montreal's International Airport, Mirabel, Québec, Canada — Lectures will include discussions of past disasters. Workshop will include: Exercise in initial assessment of patients at an MCI, disasters and the media, disaster scene management, etc. For more information contact:

Hélène Lamontagne, M.D., 1110 Pine Ave. West,
Montreal, Quebec, Canada H3A 1A3
(514) 844-7192

Maui 1982

Third Annual "Current Concept in Emergency Care", December 5-11, 1982, Maui Surf Resort. Sponsored by the Institute for Emergency Medical Education and Washington Chapter American College of Emergency Physicians.

Contact Steven Anton, Paradise Tours,
5710 Hannum Ave., Culver City,
Calif. 90230.
800-421-2912, (Cal) 800-262-1218,
or collect 213-645-8400

ECG Rounds

ECG Rounds – Interpretations

Case 1

Rate	32
Rhythm:	regular
P waves:	wide, not correlated with the QRS
QRS:	.12
ST segments:	isoelectric
T waves:	inverted
Additional:	pacemaker spikes, not correlated with the QRS

Interpretation: Pacemaker dysfunction. Slow pacemaker firing with no capture. Underlying rhythm appears nodal at a rate of 32.

Case 2

Rate:	irregular, averages 80
Rhythm:	irregular, no P waves seen – atrial fibrillation with paced beats
P waves:	absent
QRS:	.08 in spontaneous beats
ST:	down 2 mm
T waves:	inverted

Interpretation: Demand pacemaker, firing at rate of 68, functioning normally. Atrial fibrillation with a slow ventricular response.

Causes of pacemaker spike with intermittent capture or no capture can be divided into those occurring early or late. Early sources of trouble most frequently relate to the lead, while late failures (more than 30 days post insertion) can be due to either lead or battery problems.

On the initial insertion of the electrode, the shape of the tip and pressure from the stiff electrode hold it in position until it is secured by fibrosis. Lead displacement is most common within the first 30 days, before the fibrotic process has anchored it. A large right ventricle, bipolar system, high initial pacing threshold, poor lead placement, and redundancy or shortening of the lead loop all predispose to movement. Both pacing and sensing functions are compromised by displacement. In addition to assessing lead position on chest x-ray, electocardiogram comparison may show a change in the pacer spike vector or QRS vector. Phrenic nerve or diaphragmatic pacing can dramatically indicate lead displacement.

Perforation by the endocardial lead, most commonly within the first 96 hours after insertion, is another early difficulty. Pericardial tamponade can be the result of this. The chest x-ray is again valuable in making this diagnosis, or, if septal perforation has occurred, the QRS pattern can change from a RBBB pattern to that of LBBB.

As the lead becomes secured by fibrotic tissue, trouble can arise related to lead fracture and changes in the pacing threshold. Fracture is most likely to occur at areas of stress or fixation, and approximately 5% of replacements are done for this reason. Loss of capture or intermittent sensing and capture can result, as well as an alteration of the threshold for both sensing and voltage. The chest x-ray reveals the source of the problem.

With fibrotic tissue formation, the distance of the electrode from excitable tissue increases, and the pacing threshold rises. Thrombus about the tip, or displacement can also be responsible for this increase in energy needed to depolarize the heart. Threshold increases by 100% at the end of the first month, and can reach 2 to 2½ times the initial value with time. Intermittent or complete lack of capture can be the result.

Administration of mineralcorticoids or potassium-glucose solutions also increase threshold, whereas catecholamines, activity, and glucocorticoids will lower it. These changes are mediated through alterations in the intracellular – extracellular potassium concentration.

Battery failure is usually a late source of difficulty. Fluid leaks, seen as an early complication with mercury battery packs, do not occur with the newer energy sources. With lithium and nuclear powered sources, there is a gradual and continuous depletion of energy. This is seen as a drop in rate of firing, and, when a 10% rate change has occurred, replacement should be electively undertaken. Mechanical means to assess rate change, including telephone hook-ups, monitor small changes more accurately than individuals. Mercury battery failure can occur more abruptly, with warning signs being diminished spike width or change in spike configuration, decreased rate, intermittent capture, or loss of sensing function.

Rarely an accelerated rate can result from battery failure. Although most units have a rate limiting device (maximum rate of firing of 120-130) runaway with rates of over 200 can occur. As drug therapy is useless in this setting, the treatment consists of gaining surgical access to the generator, and cutting the wires close to their origin. The patient's underlying rhythm can then be supported by medical means if necessary, until a new pacemaker is inserted.

Sensing can be diminshed by fibrosis or lead displacement as previously mentioned, and also by a fall in the amplitude of the R wave secondary to an infarct or pharmacologic agent. External signals can occasionally be interpreted as cardiac in origin (microwaves, high frequency noises, etc.) interfering with the sensing function of the pacemaker. Most units are designed so as to revert to a fixed rate in this event.

An understanding of the mechanisms of pacemaker failure can assist the Emergency Physician in diagnosing not only that a problem exists, but also the possible etiology and management.

See page 91 for ECGs and Case Histories