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CAEP REVIEW

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From the Editor

This issue of the Review sees the advent of what will hopefully become a regular feature, the "Journal Club". Dr. Ian Cordon, a residency trained Emergency Physician from Calgary and, until recently, Australia, will contribute summaries of articles of relevance to Emergency Physicians published in other journals. As can be seen from this group of articles, they are selected from a wide variety of sources, and should prove a valuable addition to the Review.

It's a pleasure for me to report that we have noticed a significant improvement in both the quality and number of articles submitted for publication lately. As research and writing form the core of the body of knowledge of a medical discipline, this bodes well for the health of Emergency Medicine in Canada. We hope it continues.

This will likely be the last issue for which I serve as the editor of the Review. I hope to take a rest from the responsibilities over the next year. It has been a challenging, albeit time consuming job, to develop the journal. With the advent of new editorial staff, a number of changes in format and content are contemplated. Reader's input and suggestions have been valuable in the past and would be greatly appreciated now. Please take some time to think about the Journal and what you would find useful in the future.

Peter L. Lane, M.D.

President's Notebook

As the fiscal year of the Association draws to a close, so too does my term of office. In this, my last President's Report, I would like to outline the activity of the Association over the past year and give some of my impressions of the future.

During this year, specialty recognition has been achieved. In November of 1982, the College of Family Physicians of Canada conducted the first exam toward the Certificate of Special Competence in Emergency Medicine. This represented the first formal recognition examination in Emergency Medicine in Canada. Although there were some minor concerns regarding the content of the examination, it can be considered to have been a success. I would like to take this opportunity to congratulate those individuals who have successfully completed this recognition process.

In September, the Royal College of Physicians and Surgeons of Canada will conduct the first written exam which will eventually lead to a fellowship of the Royal College. The successful candidates will then be eligible to sit the oral exam later in the year. This does indeed represent a significant milestone for Emergency Medicine in Canada. A debt of gratitude is owed to Dr. John Duff, Chairman of the Specialty Committee. He has consistently been most supportive of Emergency Medicine as a primary specialty and I am quite sure that this commitment has been reflected in the activity in progress we have seen thus far. I am most pleased that Dr. Duff has accepted an honorary membership in the Canadian Association of Emergency Physicians and extend to him the appreciation of the entire membership. We are pleased that during the past year, the Executive has had the opportunity to provide some input into the specialty recognition process on behalf of Emergency Physicians across the country.

During this year, the Association's application for incorporation has been accepted by Consumer Incorporate Affairs Canada. The Executive believes that this will contribute to a more smoothly run organization. Carrying this process further, the Association has applied to Revenue Canada for charitable status. One can not over emphasize the importance of meaningful research to a developing specialty. It is hoped that with the approval of charitable status, the Association will be able to generate donations to a research fund to allow

and encourage original research in Emergency Medicine. Following the completion of this process, I am sure those charged with the management of this fund will be approaching all of us for charitable donations. I sincerely hope that these requests do not fall on deaf ears.

Following discussions with the American College of Emergency Physicians, CAEP is about to initiate distribution of its first public service announcement. The American College was kind enough to give us complete use of a poisoning prevention spot for distribution in Canada. Work is under way to adopt this film for the Canadian scene and in fact time has been scheduled in at least one television station for its broadcast. Hopefully, this spot will be distributed across the country and will be the first of many in the attempt of the Association to make some impact in public education.

As your President, I was most pleased to accept an invitation to the founding meeting of the Quebec Association of Emergency Physicians. The organization of this association represents a milestone for Emergency Physicians within Quebec. It was reminiscent of the founding meeting of CAEP. On behalf of the Association I would like to thank them for the opportunity of addressing their founding meeting and wish them a great deal of success. Further, I look forward to a meaningful relationship between CAEP and the Quebec Association much like the relationship CAEP has with other provincial Emergency Physician groups.

A little over a year ago, a long range planning meeting was held by the Executive to deliberate the future course of the Association. A number of recommendations were generated by that meeting and a survey is currently being conducted by the Standards Committee to obtain input from the membership. I am quite sure that the information gleaned from this survey will be used extensively in planning the course of CAEP and thank all of you who replied, for your time and effort.

The Education Committee of the Association is investigating the role of Emergency Medicine in undergraduate and postgraduate medical curricula. It is hoped that eventually a position paper will be forthcoming from the Association recommending standards for inclusion of Emergency Medicine at the medical schools across the country. This represents a significant portion of the activity of the Association Executive over the past year. It has been fruitful and to me, as your President, rewarding. However, where is the Association headed in the years to come?

As has been alluded to before, it is hoped that sections will be created in the organization to promote various components of Emergency practice. In particular, it is hoped that a section on Paediatric Emergency Care will be initiated with Paediatric Emergency Physicians in centres across the country. Creation of such a section can only enhance the quality in standards of emergency care delivered to the paediatric patient.

Given that a high standard of emergency care across the country is a mandate of the Association, I feel obliged to comment on a recent edition of Canadian Family Physician.[1] The position of The College of Family Physicians of Canada was that "certification of special competence in Emergency Medicine would not be required, expected or *even encouraged* for the family physician who works a regular shift in an Emergency Department." It goes on to say that family physicians own qualifications would be adequate certification of competence. The article goes on to indicate that physicians who work full-time or major part-time in an Emergency Department would be appropriate candidates for the Certificate of Special Competence. This is clearly contrary to former positions.

It seems inconsistent that an individual who has equivalent responsibility in providing a high standard of emergency care requires less training, simply because he provides this care less frequently. In fact, one might even feel that the converse would be the case. However, we must put these inflammatory turf issues behind us and work with all primary care and specialty disciplines in an attempt to achieve the standards of care which we promote.

In closing, I would like to express my appreciation for having been given the opportunity to serve as your President over the past year. I would like to thank the members of the Executive and Committee Chairmen for the time and effort they have expended in the past year. The chores and responsibilities undertaken by these individuals represent the major bulk of the activity of the Association. Finally, I wish to thank each and every member for their ongoing support. It is only with a broad based loyal membership that the Association can promote the high standard of emergency care in Canada.

ROCCO GERACE, M.D.

1. Patey, P.E. (letter): Emergency Medicine. Canadian Family Physician. 29:416, 1983.

Resident's Corner

Yes, But Will There Be Jobs?

Although most decisions to enter a postgraduate training program are based on the appeal of the specialty, applicants are usually cognizant of the associated lifestyle, income potential, and employment opportunities.

Certainly those considering specialty training in Emergency Medicine are attracted by their previous experiences in the Emergency Department at both the undergraduate and the postgraduate level, and by their perception of the Emergency Physician's lifestyle. In addition, since it is a young specialty, it is usually assumed that "good" jobs will be available.

Most Residents currently enroled in Emergency Medicine Training Programs aspire, upon completion of their training, to positions reflecting their experience gained at University based medical systems. They are looking for jobs that offer a large patient volume, including a high incidence of critically ill individuals and of trauma, in association with good facilities and supportive services. In short, they are looking for positions at large, preferably University affiliated, urban hospitals.

This year, those positions were available; a very conservative estimate is that at least twelve jobs fulfilling these criteria were open in Canada. The situation in five years is probably less optimistic, and certainly less clear.

Emergency Physicians have historically been a rather transient group, often only working in that capacity for several years. However, with the development of specialists in Emergency Medicine, increasing stability within the profession has developed, and that turnover has diminished. Unlike other, longer established groups of specialists, there is no eflux, through retirement, out of the system; those Emergency Physicians currently in "prime" positions are, on average, young and will be around for many years.

Nevertheless, the system is not yet static; even at well established centres, dropout still occurs, albeit at a diminishing rate, and many Departments are, at present, increasing the number of physicians on staff. In addition, there are hospitals within large urban areas that are only now beginning to utilize specialists in Emergency Medicine in their Emergency Departments; the extent to which this phenomenon will occur is, at present, unclear.

It is apparent, therefore, that the opportunity for employment, in the capacity that most applicants to, and Residents in, Emergency Medicine Training Programs aspire is at present unpredictable. A manpower study by CAEP, which is currently getting underway, may soon offer some information in this regard. However, it is clear that those individuals entering Emergency Medicine Training Programs may find themselves working in smaller centres, with smaller patient volumes, and at less glamorous jobs.

Donald J. Livingstone, M.D.

Information for Authors

Guidelines for submission of manuscripts for publication

The CAEP Review invites authors to contribute appropriate manuscripts for publication on topics relevant to the practice of Emergency Medicine and the organization of Emergency Medical Services. Manuscripts and other communications should be addressed to the Editor, CAEP Review, care of Department of Emergency Services, Sunnybrook Medical Centre, 2075 Bayview Avenue, Toronto, Ontario; M4N 3M5. A covering letter should accompany submissions indicating the principal author with whom the negotiations can be undertaken regarding any revisions that are seen to be necessary prior to publication. The letter should also specify whether or not the material has been submitted to any other periodicals for consideration for publication.

Guidelines for the presentation of manuscripts

The CAEP Review adheres to the requirements for manuscripts submitted to biomedical journals as contained in the Declaration of Vancouver of January 25th, 1978.*

Manuscripts should be typed, double spaced including the title page, abstract, text, acknowledgements, references, tables and legends and illustrations. Each component of the manuscript should begin on a new page. Authors should keep copies of everything submitted.

Title Page The title page should include the title of the article which ought to be concise and informative. The title should be amenable to indexing. The title page should also contain the full name, academic degrees, and affiliations of each author. The title page should include the name of any organization sponsoring an assembly or meeting in which the article may have been originally presented. If the research has been supported by grants, such financial support should be acknowledged on the title page. Finally, the title page should also contain the address for reprint requests.

Abstracts All original contributions and review articles should be preceded by an abstract, typed, double-spaced on a second page following the title page. The abstract should be no more than 150 words, stating the purpose of the study, basic procedures involved, principal findings including statistical significance, and principal conclusion drawn. Abbreviations or symbols should be avoided wherever possible. Below the abstract up to 10 key words or short phrases should be provided which will assist indexers in cross-indexing articles.

Text The text of original articles of a basic science or clinical nature should conform to acceptable standards for scientific articles. It should be divided into introduction, methods and materials, results, and discussion section.

Introduction The introduction section should clearly state the purpose of the article and should give only references pertinent to the rationale for undertaking the article. The review of the literature should not be included in the introductory section.

Methods and Materials The methods and materials sections should clearly and thoroughly outline the methodology and materials employed in the undertaking of the study. In particular, the selection of clinical or experimental subjects should be well defined, apparatus used should be specified, and references relating to the selection of materials and methods should be given, such that other investigators can reproduce the methods and evaluate the results. Any new or substantially modified methods should be described fully, giving reasons for their use and evaluating their limitations.

Results The results of experiment should be presented in a logical sequence in the text with tables, illustrations, graphs, etc. to clarify important results or observations.

Discussion The discussion of the findings should relate the observations to other relevant studies. It should emphasize new and important aspects of the study and conclusions. The discussion section should not comprise an exhaustive literature review.

Acknowledgement Persons who have made a substantial contribution to the study, yet who are not listed as authors may be acknowledged.

References References should be listed in the form as adopted by Index Medicus and the National Library of Medicine in United States. All authors should be listed in studies with three or fewer names. Otherwise, the first three names only should be listed. Journal name should be abbreviated again according to the style in the Index Medicus. The title of the article should be included.

Tables Each table should be typed separately on a piece of paper double-spaced. Tables should have a short heading. Explanations should appear in the footnote not in the heading. If data is from other sources, this should be indicated and permission should be obtained and acknowledged. Tables should not be submitted as photographs.

Illustrations Illustrations should be submitted as sharp, glossy, black and white photographs 5 x 7 or 8 x 10 (12.7 x 17.3 cm. or 20.3 x 25.4 cm.) Figures should be professionally drawn, lettered and photographed-free-hand or typewritten letters are unacceptable. Lettering should be consistent throughout and sufficient size that when photo reduced will still be legible. Illustration should be accompanied by a brief legend on a separate piece of paper indicating the purpose of the content of the illustrations. Abbreviations should be avoided or explained. Photographs of patients who are recognizable should be accompanied by a consent form.

Preparation of other material

The Review will consider material other than original experimental work. In particular, the Review will from time-to-time publish review articles from experts in the field who have conducted a thorough literature search. Papers submitted of this nature should comprise of extensive literature reviews on a narrow clinical topic, well-referenced, and of significant relevance to the clinical practice of Emergency Medicine.

Emergency case reports will also be accepted for publication. Such papers should comprise a brief factual presentation of an emergency case. Reports accepted for publication will be of cases of unusual problems or innovative therapies. Following the case presentation should be a brief discussion of the diagnosis and treatment and subsequently, a brief review of related literature.

The Review will also consider for publication, guests editorials from time to time. These should represent an authoritative opinion or comment on current problems faced by Canadian Emergency Physicians. They may relate to the educational, clinical research, administrative, political aspects of Emergency Medicine.

Letters to the Editor will be published regularly in the Review. Such letters should be addressed to the Editor and should comprise brief comments on topics recently discussed in the Review or elsewhere. In addition, brief communications of cases or other items of interest will be considered for publication in this section from time to time. In each case, the letter must be clearly signed by the author with a return address, and permission to publish indicated.

Approval to publish

All manuscripts submitted for publication will be reviewed by the Editor or other members of the Editorial Board. If any substantial changes are to be made in the manuscript, a copy will be forwarded to the author prior to publication for approval. Authors are responsible for all statements made in the text including changes suggested by the Editor. No changes will be accepted after final approval by the author has been made.

Deadlines

The CAEP Review is a quarterly publication with press dates the first day of each quarter. Copy deadlines are the 8th of the preceding month. Material to be considered for publication and review by the Editorial Board should be submitted at least sixty days prior to publication to date.

Address all correspondence to:
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*These requirements known as the Declaration of Vancouver were agreed upon at that city on January 25th, 1978. Members of the International Steering Committee included J.F. Murray, M.D. (Chairman); E.G. Huth, M.D.; S. Lock, M.A.M.B.; W.R. Barclay, M.D.; S. Crawford, Ph.D.; R.W. Mayo; H.R. Meiss; I. Munroe, M.D.; F.H. Porcher, M.A.; A.S. Relman, M.D.; D.A.E. Shephard, M.B.; T. Southgate, M.D. Enquiries regarding the Declaration should be sent to Dr. E.J. Huth, Annals of Internal Medicine, 4200 Pine Street, Philadelphia, PA 10904 U.S.A.

Scientific Section

"Journal Club" by Ian Cordon, M.D.

The Journal of Trauma. 1982. Vol. 22, No. 4, pp 291-294.
J Weigelt *et al.* Management of asymptomatic patients following stab wounds to the chest.

Most authorities recommend admission and observation for 24-48 hours for asymptomatic penetrating chest injuries. This study concerns 110 consecutive patients over a one-year period with stab wounds to the chest and no symptoms of intrathoracic injury, plus a normal inspiration and expiration chest radiograph. They were detained in the Emergency Department for six hours and the Xrays repeated. If this remained negative they were discharged and requested to return in 24 hours for another chest Xray (or sooner if symptomatic). Ten patients had developed hæmo, hæmo-pneumo, or pneumothorax by the six hour examination, none being massive or tension. Of those discharged and requested to return, 51% failed to comply. Of the 49% who showed up, all had normal repeat Xrays. The authors were unaware of any late complications in the group managed without hospitalization.

The American Journal of Surgery. 1982. Vol 144, No. 6, pp 642-645.
W. Ryan *et al.* Penetrating injuries of iliac vessels. Early recognition and management.

The authors present 114 patients with penetrating injuries to the iliac vessels with an overall mortality of 25% and if both artery and vein involved, of 47%. Twenty-one of the 28 deaths were directly attributable to hæmorrhagic shock or coagulopathy and occurred within 48 hours. One of the explanations for the high mortality is the lack of convenient structures to tamponade bleeding from these vessels and another is delay in getting to the operating room. This may be due to a tendency not to take a lower abdominal, buttock, or perineal wound as seriously as one might a chest wound, for example. In fact the authors appeared highly embarrassed and received vigorous criticism from the panel for the delay between presentation and reaching the operating room. The average time was 36 minutes for those with no measurable blood pressure and 60 minutes for those who did not respond to resuscitation. The consensus was that in patients with penetrating abdominal wounds below the umbilicus and marked hypotension, iliac vessel injury is presumed and every effort should be towards immediate surgery.

The American Journal of Surgery. 1982. Vol. 144, No. 6, pp 153-157.
R. Ward *et al.* The effects of ethanol ingestion on the severity and outcome of trauma.

Emergency Physicians are only too familiar with the myriad ways alcohol can effect patients and their illnesses. Alcoholics give the impression of leading "charmed lives" with respect to an apparent tendency to escape the expected medical consequences of their actions. This article suggests there may be more than just righteous indignation to such an impression.

Almost 1,200 patients admitted to a trauma service were assessed for injury severity, mortality, and level of alcohol on arrival. Thirty-two percent had alcohol in their blood (mean 149mg%). The Injury Severity Scale averaged 19.9 for the alcohol group, 17.4 for the no-alcohol group (no statistical significance). The total mortality was significantly lower in the alcohol group (10.9% *vs* 16.5%) and this was constant at all levels of blood alcohol (except for the ten patients over 300mg%, all of whom lived). The two groups had a similar age distribution.

Various explanations are proposed for this apparent protective effect of alcohol after injury, e.g. increased substrate for post-injury hypermetabolism, increased catecholamines (a direct effect of alcohol), and reduced platelet aggregation, reducing the risk of intravascular coagulation. Possibly future studies may show this observation to be artefactual but it is certainly ironic.

N. E. J. M. 1982. Vol 307, No. 26, pp 1618-1627.
E. Braunwald. Mechanism of action of calcium channel blocking agents.

More and more patients arive in the Emergency Department with cardiovascular complaints already receiving the new super-drugs nifedipine, etc. However there can be few Emergency Physicians who have a clear idea of how calcium channel blockers work, and what they may or should be used for.

If you have any desire to understand the rationale behind the development and actions of this class of drug, then I recommend shutting out all distractions for half an hour and ploughing through this article. It is in two parts. The first will provide *deja vu* phenomena from those dim days of biochemistry and physiology. The second will demonstrate such subjects are relevant to clinical medicine. Specifically, the action of calcium channel blockers in the following areas is discussed: vasospastic angina, effort-induced angina, myocardial ischæmia, myocardial infarction, myocardial preservation, arrhythmias, systemic hypertension, pulmonary hypertension, congestive heart failure and hypertrophic cardiomyopathy. These drugs are not going to go away so this is a good place to start.

N. E. J. M. 1982. Vol. 307, No. 18, pp 1101-1105.
W. Weaver *et al.* Ventricular defibrillation — a comparative trial using 175J and 320J shocks.

This is a prospective trial from Seattle of high and low energy defibrillation by paramedics in out of hospital cardiac arrest where the initial rhythm was ventricular fibrillation. Two hundred and forty-nine patients were randomly allocated to a 320J or 175J defibrillation level while an otherwise standard ACLS protocol was followed. Overall survival was

independent of energy level. The initial rhythm after electric shock was related to outcome. Survival rate was 42% in patients with an initial supraventricular rhythm, against 14% with asystolic. Atrioventricular block occurred much more frequently (39% *vs* 12%) in the 320J group but this was usually transient and did not effect ultimate outcome.

Surgery. 1982. Vol. 92, No. 4, pp 646-653.
S Sachs *et al*. Acute mesenteric ischæmia.

The miserable state of treatment for acute mesenteric ischæmia is discussed following an analysis of a series of 49 patients over 15 years. The overall mortality was 65% but this varied considerably according to the underlying pathology. Arterial thrombosis had a 100% mortality which is in keeping with most series. Venous thrombosis had a better prognosis (36% mortality) and arterial embolization a 64% mortality. Unfortunately surgical resection remains the mainstay of treatment but more hopeful techniques include angiography and infusion of papaverine and revascularization by bypass grafting (endarterectomy failed in this series but has met with success in others). Emergency Physicians should be aware that early diagnosis does effect prognosis and it is generally agreed that prognosis is worse if peritoneal signs are present by the time the diagnosis is made. Therefore a high index of suspicion is important especially with elderly patients with abdominal pain associated with generalized arteriosclerosis, atrial fibrillation, or recent MI. Ultimately mortality in mesenteric arterial disease can only be lowered dramatically if patients at risk are identified and undergo revascularization procedures prior to developing ischæmia and infarction.

J. Neurosurgery. 1982. Vol. 57, pp 114-127.
D. Pang *et al*. Spinal cord injury without radiographic abnormalities in children.

Pang *et al*. describe a rare but serious syndrome which Emergency Physicians must be alert to. Of the 36 children seen at a referral centre over a 20 year period with spinal cord injury, 24 had no evidence of fracture or dislocation on Xray examination, including tomography. It is with this subgroup termed SCIWORA (Spinal Cord Injury Without Radiographic Abnormality) that this paper is concerned.
The level of injury was cervical in 20 patients and TI-6 in the remainder. Many were from road accidents but 42% were from various types of falls. In 52% of cases neurological impairment was delayed, the average delay being 30 hours. Many of these children remember retrospectively having transient symptoms of parathesiæ, numbness or weakness at the time of injury and consequently all children presenting with such ubiquitous injuries as chin and forehead lacerations should be questioned for neurological symptoms. The mechanism of this syndrome is unknown but the authors suggest the increased flexibility of the pædiatric spine may lead to momentary deformations and even subluxations sufficient to damage the cord but which then spring back into normal alignment. Fortunately pædiatric spinal cord injuries are rare (approximately 1-10% of all cord injuries); however the prognosis is grim with most severe lesions showing little or no recovery. Probably the diagnosis of SCIWORA cannot be made in the Emergency Department as a child with neurologic impairment and a normal cervical spine Xray must first have an occult (or missed) unstable fracture excluded by tomography.

J. A. M. A. 1982. Vol. 248, No. 15, pp 1872-1874.
D. Tandberg. Glass in the hand and foot. Will an Xray film show it?

Sixty-six pieces of glass of every conceivable origin (e.g. windscreens, beer bottles, Christmas tree lights) and varying sizes were driven into dead chicken legs. When Xrayed all types of glass were easily seen except when the glass was overlying bone, when only pieces greater than 2mm were visible. This demonstrates what most Emergency Physicians are aware of even though textbooks (including Schwartz) invariably state only the old-fashioned leaded glass is visible.

Lancet. 1983. No. 8320, pp 326-329.
K. Starke *et al*. Hepatic and cerebral pathology findings in children with fatal salicylate intoxication.

Reye's syndrome is of unknown ætiology. Bizarre causes such as toothpaste have been proposed. Most recently there has been shown to be an association between Reye's syndrome and aspirin. Epidemiologic studies have shown from 97-100% usage of salicylates among children with Reye's syndrome. The authors have examined the liver and brains of 12 children with fatal salicylate intoxication and found the patholgy to be indistinguishable from that of Reye's syndrome. As the type of degeneration found is relatively rare (other than in Reye's syndrome) they hypothesize that the prodromal illness may increase sensitivity to therapeutic levels of salicylate and the structural changes seen in Reye's syndrome are in part due to salicylate.

J. A. M. A. 1982. Vol. 248, No. 13, pp 1632-1635.
R. Sheep *et al*. Fatal cardiac tamponade. Occurrence after left internal vein catheterization.

The authors describe a fatal case of cardiac tamponade following a teflon central venous cannula passing through the superia vena cava into the pericardial sac following a left internal jugular approach. They describe two nonfatal cases of hydromediastrinum and hydrothorax also after left internal jugular catheters — all occurring within three months. In reviewing the literature they point out that cardiac tamponade is a recognized though rare complication and is usually caused by perforation of the right atrium or right ventricle. They suggest that because of the tortuous route from the left internal jugular to the SVC the right be used whenever possible, but if the left is used then a flexible

catheter be inserted. They also suggest since the pressure in any of the great veins of the chest is within 1mm of right atrial pressure that the catheter should not be placed distal to the aortic knob on Xray as this will ensure placement is proximal to the pericardium.

J. Neurosurgery. 1982. Vol. 57, p 153.
M. Javid *et al.*

This is an interesting letter to the editor concerning the phenomenon of rebound increase in intracranial pressure after a mitral lowering by hyperosmolar agents such as mannitol. The authors cite their studies and state categorically that "rebound" does not exist, and was an artefactual observation prior to the advent of ICP monitoring. The traditional cautions given an Emergency Physician contemplating using mannitol in a moribund patient with raised ICP are that mannitol may increase intracranial bleeding, may upset fluid and electrolyte balance, may cause the physician to incur the wrath of the neurosurgeon, and may be followed by a fatal "rebound" rise in ICP. Maybe at least the last fear is unfounded.

N. E. J. M. 1983. Vol. 308, No. 4, pp 191-194.
D. F. Thompson *et al.*

The authors posed as the parents of a child with a possibly toxic aspirin ingestion and phoned 15 regional poison control centres and 15 nonregional centres asking for advice. The overall management was judged incorrect in 60% of the calls to nonregional centres against 94% correct by regional centres. Also 33% of nonregional centres advised the parents to give their child salt water, mustard water, raw eggs or place their fingers down his throat to make him vomit. There are many unanswered questions such as who was answering the phone, whether they were exceeding their authority, whether any protocol or reference like poisindex was available? It is too tempting to make sweeping generalizations on the basis of a simplistic study like this.

Smith, J., Norman, J.: The fluid of choice for resuscitation of severe shock. *Br. J. Surgery, 69*:1982, 702-705.

Using a canine model animals were bled to produce severe shock and then various fluids were reinfused to maintain a normal (canine) CVP. Five fluids were randomly allocated, these being three colloidal solutions, Ringer's lactate, and a crystalloid/colloid mixture of the ratio 2:1. Several parameters were examined during and after resuscitation including cardiac output, total peripheral resistance, oxygen availability and oxygen debt.
During resuscitation there was no significant difference between any of the groups except that it took over twice as much volume of Ringer's lactate to maintain the CVP compared with the other groups. After resuscitation however comparison of Ringer's lactate and Dextron 70 showed worse figures for Ringer's lactate in almost every category including statistically significant lower cardiac output and higher peripheral resistance. In the Ringer's lactate group the hæmatocrit was significantly higher suggesting less retention of crystalloid fluid within the vascular space. Of interest, the crystalloid/colloid mixture out performed all the groups and the authors conclude that the debate between colloid and crystalloid for resuscitation of shock is rather artificial as a combination seems better and they imply this is commonly used.
Naturally, since this is an animal study, it will be of limited interest to those who favour crystalloid only, their argument being that crystalloid and blood may be a still superior mixture. This is a British study and reminds us (in North America) that, in Europe, colloid solutions are the norm for hypovolæmic shock. In Copenhagen for example there is an on-call physician 24 hours a day whose job it is to rush to the scene of serious accidents armed with dextran and morphine; this system has been claimed to have saved many lives.

Editorial: *Brit. Med. J., 296*:1983, Jan., 246-247.
This editorial provides some up-to-date information on the progress of research into perflurochemicals otherwise known as artificial blood. These chemicals are able to carry large quantities of dissolved oxygen, and, if perfected the list of potential uses is virtually endless — and very relevant to emergency medicine. Obvious examples are hæmorrhagic shock, surgery, coronary ischæmia and of course Jehovah's Witnesses. In another decade they may profoundly alter the practice of emergency medicine.

Ahmed, S., Morris, L.: Renal parenchymal injuries secondary to blunt abdominal trauma in childhood: 10 year review.
Br. J. Urology, 54:1982, 470-477.

The authors present 66 consecutive cases of pædiatric blunt renal injury. They describe the clinical and radiological findings of contusion, laceration and transection and the rather high incidence of complications especially in those cases of transections of the upper pole of the kidney managed conservatively. There is some discussion of the controversy surrounding surgical intervention, i.e. conservative management of Group II (laceration and transection) patients and the authors give the impression that on the basis of their experience represented here they will become more surgically aggressive. There is no discussion of renal pedicle injuries (Group III) as it is taken for granted that these will be operated upon acutely. The fairly high incidence of blood clot obstruction of the pelvicaliceal system (4/43, 3 asymptomatic) lends support to the policy of obtaining an IVP in all patients presenting with even microscopic hæmaturia after blunt trauma.

Editorial, *Aust. N.Z. J. Med., 12*:1982, 579-580.

This editorial by W. Gans on the very topical subject of coronary thrombolysis has appropriate references for a complete review. He describes the technique of early intracoronary artery infusion of streptokinase, preferably directly at the site of coronary artery occlusion, with subsequent reversal or diminution of the evolving myocardial infarction. This is the state of the art of reduction of infarct size and may have profound implications for emergency physicians who will be called upon more and more to identify as early as possible candidates for this procedure. The economic implications may also be profound though perhaps double-edged, as while the cost may be tremendous it may be offset if the result is to increase the number of patients able to return to productivity in the workforce.

McCarthy, P. *et al.*: Observations scales to identify serious illness in febrile children. *Pædiatrics, 10*:1982, 802-809.

About 5-6 years ago McCarthy *et al.* produced a series of articles in which they attempted to identify those children with serious infections, particularly bacteræmia and meningitis. They tried statistical juggling with combinations of such parameters as level of fever, total WBC, % polymorphs, % band forms, absolute polymorphs and ESR and were unable to provide a recipe that worked in a reproducible manner. This study is that sequel and consists of an attempt at quantifying those features that lead one to judge a child to be toxic. Many pædiatricians or experienced FPs place a great deal of emphasis upon their impression as to a child's "sickness", McCarthy *et al.* have tried to break down the components that lead to this impression.
Many historical and observational clues were tried and rejected but a final scoring system analogous to an Apgar seems to provide some valuable information. Children under two were observed and scored for each of six items, i.e. skin colour, quality of cry, reaction to parents, level of consciousness, hydration, and sociability. Numerical scores of one, three or five were allocated in each category and totalled so that a pink, well hydrated, alert, smiling child with an occasional strong cry that ceases when picked up by Mum would score the minimum of six and a virtually moribund child would score thirty. Among 165 patients examined in the study, of the two-thirds who scored less than 10 only 2.7% had serious illness, while 12 of 13 scoring above 16 had a serious illness (92.3%). Perhaps the biggest challenge is to identify these children in the intermediate group of whom 25% were seriously ill. This article provides by way of a "predictive model" a useful scale for clarifying the thought process we have to go through when starting to evaluate the young febrile child.

Collett, B.: Traumatic hyphæma. *Ann. Ophthalmology:14*, 1982, 52-56.

This is a truly superb review of the pathology, treatment, complications and controversies in traumatic hyphæma. I wholeheartedly recommend it to be read, photocopied and kept by anyone interested in more than just the diagnosis of hyphæma. In the same issue of this Journal there is a brief but interesting paper by V. Clever on the results (successful) of home treatment of hypæma.

Sohn, N. *et al.*: The levator syndrome and its treatment with high-voltage electrogalvanic stimulation. *Am. J. Surg., 144*:1982, 580-582.

The authors describe an innovative and apparently highly successful treatment for the levator syndrome. As improvement was determined by the subjective decrease in the unpleasant symptom and there was no attempt at a control group, one could take issue with the results. The importance from an emergency physician's point of view is to serve as a reminder that this is a difficult diagnosis to make but is more likely to be made if aware of its existence. Having aroused your interest perhaps, the article by Grant (*Disc. col. rect. 18*:1975, 161-163) includes a more thorough description of the syndrome.

Dale, W.: thoracic outlet compression syndrome. *Arch. Surg., 117*:1982, 1437-1445.

This article examined the different surgical alternatives to treatment of thoracic outlet compression syndrome and advises extreme caution both in indications for operation and in surgical technique. There is a brief review of the syndrome but the references include some more extensive reviews. The interest lies in the identification of brachial plexus injuries as a more common complication than was realized, and in the fascinating if somewhat egocentric discussion that follows the paper.

Interpretation of EKGs by Emergency Physicians

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

Abstract

This paper describes an audit which examined the ability of emergency physicians to accurately interpret electrocardiograms performed in the emergency department at the time of primary patient contact. EKG changes were divided into major and minor categories according to the seriousness of the abnormality observed.

Interpretive accuracy for EKGs showing myocardial infarction, major arrythmias, and acute ischemia was 100%, 98% and 88% respectively. Conclusions drawn from this study confirm that the experienced emergency physician can recognize the great majority of pathological EKG changes seen during initial patient assessment in the emergency department.

Résumé

Cet article décrit une vérification qui a étudié la capacité des médecins d'urgence d'interpréter avec exactitude les électrocardiogrammes effectués dans le département d'urgence lors du premier contact avec le malade. Les altérations de l'ECG sont divisées en catégories majeures et mineures selon la gravité de l'anomalie observée.

La justesse de l'interprétation des ECG indiquant un infarctus du myocarde, des arythmies majeures et une ischémie aiguë fut de 100%, 98%, et 88% respectivement. Les conclusions tirées de cette vérification confirment que le médecin d'urgence expérimenté peut identifier la grande majorité des altérations pathologiques de l'ECG rencontrées dans le département d'urgence lors de la première évaluation du malade.

One of the compulsory skills of an emergency physician involves the interpretation of electrocardiograms. In fact, it is difficult to imagine any physician staffing an emergency department without a comprehensive working knowledge of electrocardiography. It is commonplace in the emergency department for situations to arise in which treatment decisions based on EKG findings must be made promptly. In these instances delay is inadvisable and rapid access to an internist's interpretive opinion is often not available.

A physician need only work in an emergency department for a short time to appreciate the potential for misadventure if pathological EKG changes are not recognized or are misinterpreted. Hence it is vital that emergency physicians exhibit EKG assessment capabilities that are of a high caliber.

Key Words

- EKG interpretation
- electrocardiography
- audit
- emergency department

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In an attempt to evaluate the process of emergency department EKG interpretation in Kitchener-Waterloo, an audit was undertaken in which the emergency physicians' interpretive skills were assessed at the time of first patient contact. Kitchener-Waterloo's two active treatment hospitals accommodate 90,000 emergency department patients per year. The thirteen emergency physicians are required to maintain competence in EKG interpretation. As well, ongoing review is provided by 'quiz EKGs' posted monthly at both hospitals. Most EKGs are read within twenty-four hours by the internists and, in most cases, copies of the final EKG report are forwarded to the appropriate emergency physician a few days later. These reports act as valuable teaching aids. A copy of the EKG is also attached to the emergency department chart and becomes a permanent part of the patient's record whether or not he is admitted to hospital.

The objectives of this audit were:

1) to determine concordance figures for the initial emergency department interpretations and the final EKG reports of the internists,
2) to assess the incidence of normal versus abnormal EKGs done in the emergency department,
3) to determine the availability and utilization of previous EKGs in the assessment of present EKG changes, and
4) to act as an educational tool for the emergency physicians such that areas of weakness in EKG interpretation could be identified.

The EKG interpretations represented by this audit were made only by the emergency physicians. Ours is a non-teaching centre that functions without house staff. Seventy-three percent of our patient volume occurs at times when there is no specialty support staff available in the hospital. As a result the emergency physicians have developed a degree of independence and confidence in their evaluation of EKGs. It is our experience that an

internist is seldom consulted regarding primary EKG interpretation.

Methods

During the three month study EKG interpretations for 1,060 patients were documented by means of questionnaires which were completed by the emergency physicians at the time of treatment. Once a questionnaire had been completed it was sent to the EKG lab along with the tracing, thereby preventing any subsequent alteration of the interpretation.

About fifty EKGs performed during the study period had no questionnaire filled out. It was therefore appropriate to determine whether or not this was a legitimate consequence of the constraints of time in a busy emergency department or a deliberate avoidance of the questionnaire in the more complicated tracings. A subsequent comparison of EKGs with and without completed questionnaires showed no selection/exclusion bias in terms of the difficulty of the EKG interpretation.

As with a previous audit undertaken at our centre[1], interpretive accuracy was assessed on the basis of concordance figures, i.e. the agreement in interpretation between the emergency physician and the specialist (internist). The EKG reports of the internists were held to be the standard by which the emergency physicians' reports were judged. In those few cases where there was some question as to the appropriateness of the internist's interpretation, a cardiologist was called upon to adjudicate.

Results

Of the 1,060 EKGs involved 60% were normal (Table I). The 40% abnormals break down into 30% which showed new abnormalities and 10% which were unchanged from previous EKGs. In 18% of cases previous EKGs were utilized (Table II). When they were used the emergency physician's interpretation was recorded only when there were new EKG changes present (i.e. credit was given only when interpretive skills were used).

EKG changes were classified into major and minor criteria. The former included acute infarctions, major arrythmias (atrial fibrillation and flutter, P.S.V.T., junctional) acute ischemia, and major blocks (BBB, bifascicular block, second and third degree block). The latter represented old infarctions, minor ST-T

TABLE I — General Data

I) **Normal EKGs**				
i) independent interpretation (no previous EKGs)	600	(56%)	642	(60%)
ii) previous EKGs available	42	(4%)		
II) **EKGs with new abnormalities**				
i) independent interpretation (no previous EKGs)	277	(26%)	315	(30%)
ii) changed compared to previous EKG	38	(4%)		
III) **EKG unchanged — remains abnormal**			103	(10%)
			1,060	100%

TABLE II — Use of Previous EKGs

I) EKG changed	38	(4%)
II) EKG unchanged — remains abnormal	103	(10%)
III) EKG unchanged — remains normal	42	(4%)
	183	18%

TABLE III — Concordance — Major Criteria (225 cases)

I) acute infarctions	26/26	(100%)
II) arrythmias*	61/62	(98%)
III) acute ischemia	74/84	(88%)
IV) major blocks i) BB	39/43	(91%)
ii) other**	4/10	(40%)

* • atrial fibrillation 47/47
• P.S.V.T. 9/9
• junctional 4/5
• atrial flutter 1/1

61/62

** • third degree block 1/1
• bifascicular block 3/9

4/10

TABLE IV — Concordance — Minor Criteria (249 cases)

I) old infarction	41/45	(91%)
II) minor ST-T changes	40/92	(44%)
III) 1st degree block	11/19	(58%)
IV) axis deviation	25/51	(41%)
V) hypertrophy	13/18	(72%)
VI) other changes (e.g. digitalis effect, paced, etc.)	20/24	(83%)

changes, first degree block, axis, hypertrophy, and other changes (e.g. pacing, digitalis effect, etc.). There were 225 major criteria changes and 249 minor criteria changes noted on the final EKG reports (Table III). The cumulative total for abnormal findings was therefore 474. Fifty-six (56) EKGs had more than one abnormal finding so that there were actually 418 abnormal cardiograms (40%) out of the total of 1,060 (Table I).

Concordance for acute myocardial infarction was 100% (Table III). The concordance for arrythmias was 98% (61/62). Only one major arrythmia misinterpretation was made — this was a case of junctional rhythm.

The concordance for acute coronary ischemia was 88%; however, oftentimes "ischemic changes" (in lieu of "nonspecific ST-T changes") were subtle and seemed more subjective than objective. It should be remembered that coronary insufficiency, as it relates to the S-T segment and the T wave, has reasonably distinctive characteristics. S-T segment alterations which are ischemia induced usually are in the form of a sharp-angled ST-T junction resulting in horizontality of the S-T segment, or depression of the S-T segment with 'plane depression' or 'sagging depression'. Coronary insufficiency is also manifested by low or inverted T waves, or T waves that display symmetrical limbs and an arrowhead shaped vertex (or nadir). These criteria notwithstanding, there is no doubt that interpretation of certain ST-T changes can sometimes be difficult. It is the wise physician who heeds Shamroth's caveat: "It cannot be stressed too strongly that clinical judgment is paramount and that too much weight must not be placed on an equivocal electrocardiographic change as the sole criterion of coronary insufficiency".[2]

The category of 'bundle branch block' (which included RBBB, LBBB, hemiblock, and intraventricular conduction delay) showed a concordance of 91% (Table III). Only three of nine bifascicular blocks (RBBB, left anterior hemiblock) were diagnosed correctly. Of the others the RBBB was recognized but the left anterior hemiblock component was overlooked. The only case of complete heart block was interpreted correctly.

Concordance for minor criteria EKG changes are shown in Table IV. In many cases the internists reported minor criteria changes that the emergency physician did not and vice versa. The magnitude of the concordance figures for this group seemed to depend in large part on the objectivity of the change being measured. For instance, 'minor ST-T changes', a somewhat subjective diagnosis, showed a concordance of only 44%.

Discussion

Cases of EKGs with major criteria changes totalled 225. Of these, 10 (4%) were nonconcordant for 'acute ischemia', 10 (4%0) were nonconcordant for 'major blocks', and one (0.4%) was nonconcordant for 'arrythmias'. Despite the failure of initial EKG interpretation in these patients, all but four (3 BBB's, 1 bifascicular block) were admitted to hospital anyway as a result of other clinical indications (e.g. suspicious chest pain).

No patient was sent home with an acute infarction, a major arrythmia, or gross ischemia. As determined by a chart review, those who were discharged were diagnosed as having problems unrelated to the cardiovascular system (e.g. bronchitis). Ectopics (PVCs, PACs) were not assigned incidence figures because, in many cases, blatantly obvious ectopics were not recorded by either the emergency physicians or the internists in their reports, yet these premature beats had been treated where indicated. It became clear that the problem was one of documentation rather than identification and thus realistic figures for ectopic recognition could not be quantitated.

Not unexpectedly there was frequent disagreement between the emergency physicians and the internists involving EKG changes based on less objective criteria (e.g. nonspecific ST-T changes, borderline first degree block, borderline left ventricular hypertrophy). Thus the overall results showed that concordance for minor criteria changes was significantly less than for major criteria changes.

Conclusions

There are many symptom complexes which call for an EKG as part of the clinical workup (e.g. chest pain, weakness, syncope, palpitations, accelerated hypertension, CVA). Of all EKGs done for these indications in this study, 60% were normal and 30% showed new abnormalities. The vast majority of EKGs with major criteria changes were correctly interpreted by the emergency physicians. No patient was discharged with a serious rhythm disturbance or ischemic abnormality. Minor criteria changes were often susceptible to dissenting interpretations between the emergency physicians and internists due to the subjective nature of these changes. This audit has been instructional to the emergency physicians in our centre in that they are now more cognizant of minor EKG changes and look more carefully for a left anterior hemiblock when an EKG reveals RBBB.

It is clear from the results of this study that a high standard of EKG surveillance can be maintained when emergency department electrocardiograms are interpreted by experienced emergeny physicians.

Acknowledgement

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References

1. McKinnon, K.D.L., Baskerville, L.A.: Interpretation of Xrays by emergency physicians. CAEP Rev 3: 97-99, July 1982.
2. Shamroth, L.: An Introduction to Electrocardiography. (5th ed.; London: Blackwell Scientific Publications, 1980)

The Potential of Prophylactic Lidocaine in the Reduction of Prehospital Mortality in Acute Myocardial Infarction

by Les Vertesi, M.D.

Abstract

A retrospective analysis of cardiac arrests from ischemic heart disease that occurred after the arrival and during the attendance of the paramedic ambulance was undertaken in the Greater Vancouver area, in order to determine how many cases might have benefited from prophylactic lidocaine. Of 61 such cases encountered over a 2 year period, the majority (64%) arrested in bradyventricular rhythms in which lidocaine would have had no benefit. Most of the others survived their arrest and were discharged from hospital. Only 2 deaths during the 2 year period might possibly have been prevented by prophylactic lidocaine. The cost benefit potential for the use of prophylactic lidocaine on paramedic ambulances is discussed.

Résumé

Une analyse rétrospective des arrêts cardiaques causés par une ischémie coronarienne s'étant produits après l'arrivée des techniciens médicaux d'urgence a été entreprise dans la région du Vancouver métropolitain afin de déterminer le nombre de personnes qui auraient pu bénéficier de l'administration de xylocaine prophylactique. Parmi 61 cas rencontrés sur une période de deux ans, la majorité (64%) présentait une bradydysrythmie pour laquelle la xylocaine n'aurait eu aucun effet bénéfique. La plupart des autres malades survécurent à l'arrêt et furent congédiés de l'hôpital. Seules deux morts au cours de la période de deux ans auraient peut-être pu être prévenues grâce à de la xylocaine prophylactique. On présente l'étude coût bienfait de l'utilisation de la xylocaine prophylactique par les techniciens médicaux d'urgence.

Introduction

Cardiac arrest is the most serious complication of acute myocardial infarction (AMI) and prehospital cardiac arrest accounts for 50 - 60% of all deaths due to arteriosclerotic heart disease.[1] The advent of coronary care units (CCU's) has improved survival rates of patients with heart disease in the hospital, while ambulance paramedic programs[2-4] have attempted to extend the concept of CCU treatment into the prehospital phase of AMI. The usefulness of paramedics in the resuscitation of cardiac arrest has been extensively studied[5-7] but the preventative aspects of their work have not.

The treatment of "warning arrhythmias" in AMI by lidocaine to prevent ventricular fibrillation is a widely accepted practice in general use in most CCU's in North America. Premature ventricular contractions (PVC's) that meet any of the following criteria have, in the past been shown to be more likely to progress to ventricular tachycardia or fibrillation: 1) 6 or more PVC's per minute, 2) PVC's occuring in runs of 2 or more, 3) PVC's beginning on the preceding T wave, and 4) PVC's of multifocal origin.[8]

There is a growing school of opinion that the administration of lidocaine should not be restricted to those patients who exhibit these "classical" criteria of ventricular irritability, but that "prophylactic" lidocaine should be administered to all patients suspected of AMI because the commonest mechanism of death is sudden ventricular fibrillation without any warning arrythmias.[9-12]

The proponents of this "prophylactic" use of lidocaine argue that the relative safety of this drug is such that this form of use is justified because the classical criteria of ventricular irritability do not reliably predict who will arrest. Although there is now considerable support for the use of "prophylactic lidocaine" in this way, the practice is by no means universal.[13]

The Vancouver area has had a paramedic ambulance service in operation since 1975.[14] The service is owned and operated by the Emergency Health Services Commission, an agency of the Provincial Ministry of Health. Paramedics in British Columbia have received over 1800 hours of training and are licensed to employ medical techniques such as IV therapy, endotracheal intubation, cardiac monitoring, defibrillation, and the use of selected cardiac drugs. Arrythmias are managed by intravenous drug therapy including atropine for bradycardia associated with hypotension, and lidocaine for ventricular arrythmias. The paramedics have been taught to recognize the "classical criteria" of ventricular irritability noted above and to treat these cases with lidocaine. The management of patients with suspected acute MI not in actual cardiac arrest comprises about 60% of the paramedic workload in Vancouver.

Physicians who support the new use of prophylactic lidocaine without classical indications are dominant in some hospitals in the Vancouver area, but not in others. Those who use prophylactic lidocaine in their own CCU's naturally

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wish to extend its use into the prehospital setting as well; but, since the ambulance is centrally operated, it is desirable to maintain a uniform standard of practice in all regions. The issue of whether to change paramedic protocols to include the use of prophylactic lidocaine posed a real dilemma; it was impossible to please all the hospitals with any one policy. However, before instituting any policy changes, regarding the use of lidocaine, it was decided to examine the available evidence.

Method

Since the immediate objective of prophylatic lidocaine in the ambulance is the prevention of cardiac arrest during the pre-hospital period, those patients who actually had suffered an arrest during this interval would constitute the class of potential "treatment failures" who might have benefited from the regimen. Accordingly, the paramedic records of all patients who had suffered a cardiac arrest in the Vancouver area while a paramedic team was in attendance, during the two year period July 1979 - June 1981, were collected and examined retrospectively. Attention was confined to those cases where no cause for the arrest other than arteriosclerotic heart disease was evident. Information tabulated included the following parameters: initial vital signs (blood pressure, respiratory rate, and heart rate), initial cardiac rhythm, frequency of ventricular ectopic beats, whether or not "classical" indications for lidocaine therapy were present, whether or not lidocaine was administered prior to the arrest, initial arrest rhythm, and ultimate fate of the patient (died or discharged alive). Resuscitation by the paramedics once the arrest was established followed the Advanced Cardiac Life Support Guidelines (A.C.L.S.) of the American Heart Association.[15]

Following the resuscitation, all patients were taken to the nearest hospital with emergency facilities and admitted to an intensive care or coronary care unit. Information relating to survival in hospital was obtained from the respective medical records departments of the hospitals involved. No attempt was made to assess "quality of life" nor to follow patients beyond the point of hospital discharge.

Both the presence of pulmonary congestion and the presence of hypoperfusion have long been known to correlate with hospital mortality in the CCU environment.[16-17] Patients were therefore classified into 2 groups according to hemodynamic status based on their initial vital signs: 1) "stable" patients were those that had an initial blood pressure of 100 mm. systolic or greater and no signs of respiratory difficulty. 2) "unstable" patients were those with signs of pulmonary edema (as evidenced by elevated respiratory rate and subjective shortness of breath) or with cardiogenic shock (as evidenced by initial systolic blood pressure less than 100 mm. systolic that could not be explained on the basis of an arrhythmia).

Initial cardiac rhythms at the time of the arrest were also classified as either 1) "VFT" to include ventricular fibrillation or ventricular tachycardia (arrhythmias in which lidocaine is indicated) or 2) "BV" to include bradyventicular arrhythmias such as idioventricular rhythm, electromechanical dissociation, heart block with bradycardia and asystole, (arrythmias in which lidocaine is known to be of no benefit).

Lidocaine, when given, was administered intravenously according to a standard protocol of 1-2 mg/kg bolus, followed by a continuous infusion and a second bolus of 1 mg/kg after about 5 minutes to cover the "lag period".[18] Indications for lidocaine therapy were considered to be those "classical" indications described above. The term "prophylactic lidocaine" has been reserved for the use of lidocaine in the absence of any of these indicators.

Statistical probabilities were calculated using the continuity correction for chi-square values. In tables with small expected frequencies the p values for Fisher's exact test are given instead.

Results

A total of 61 cases of cardiac arrest during attendance were recorded during this time period, representing about 3% of the 2256 patients transported by paramedics as "suspected acute MI". Of the 61 cases, the majority (64%) presented initially with unstable hemodynamic status (Table 1). There was a clear tendency for this group to arrest in a BV rhythm rather than VFT ($p=0.00$).

Although the majority of the unstable cases (75%) were associated with hypotension, (Table 11) the tendency to arrest in a BV rhythm rather than VFT was also prevalent in those with pulmonary edema.

In the group of cases presenting initially with stable vital signs, the predominant mechanism of arrest was VFT (Table III); the large majority (13 of 16) of these cases however survived their cardiac arrest and were utlimately discharged alive. ($p=0.0013$). On the other hand, only 5 of 39 cases (12%) in the unstable group managed to survive their cardiac arrest.

The majority of stable cases presenting in VFT (10 of 16 or 67%) did so without classical warning arrhythmias (Table IV). One patient presenting with warning arrhythmias arrested before any lidocaine could be administered. Two patients presenting without warning arrythmias were the only ones in the study that received prophylactic lidocaine; both survived their episode of ventricular fibrillation and were ultimately discharged from hospital. Only two patients presenting without classical indications for Xylocaine died as a result of their arrest.

Discussion

The study is hampered somewhat by the fortunate fact that cardiac arrest while attended by the paramedics is not a frequent occurrence. In the majority of cases, the cardiac arrest could have

TABLE I

Mechanisms of Cardiac Arrest in relation to hemodynamic status

Hemodynamic Status	Arrest in VFT	Arrest in BV	Total
Stable	16	6	22
Unstable	6	33	39
TOTALS	22	39	61

$p = 0.00$

TABLE II

Mechanisms of arrest in hemodynamically unstable patients

Type of Instability	Arrest in VFT	Arrest in BV	Total
Pulmonary Edema Alone	0	9	9
Cardiogenic Shock	6	24	30
TOTALS	6	33	39

Fisher's $p = 0.30$

TABLE III

Relationship of Initial Arrest Rhythm to Survival

Hemodynamic Status	Arrest Rhythm	Died	Survived	Total
a) Stable	VFT	3	13	16
	BV	6	0	6
			Fisher's $p = 0.0013$	
b) Unstable	VFT	5	1	6
	BV	29	4	33
TOTALS		43	18	61

TABLE IV

For Stable Patients Arresting in VFT: Classical Indications for Lidocaine by Survival

Classical Indications for Lidocaine	Died	Survived	Totals
Present	1	5	6
Absent	2	8	10
TOTALS	3	13	16

been termed "secondary" to the underlying hemodynamic problem; in these cases, it is unlikely that the arrest could have been prevented by lidocaine or any other drug unless the underlying hemodynamic problem was corrected first. The use of prophylactic lidocaine in the presence of hemodynamic instability is supported by some authors,[12] but not by others.[9] Some suggest using it in reduced dosage due to impaired liver excretion.[11] However the tendency in this study for these patients to arrest in bradyventricular rhythms in which lidocaine is of no value would seem to remove whatever support existed for its use in this group.

In those patients presenting with stable vital signs, there is a better case for use of prophylactic lidocaine. Ventricular fibrillation without any prior warning arrhythmia does seem to be a not infrequent occurrence in this group. Although the numbers involved in this study are admittedly small, it is clear that prophylactic lidocaine does not universally protect against ventricular fibrillation, even in the hemodynamically stable patient (as evidenced by our 2 cases). In any event, the large majority (81%) of patients in this category survived their arrest and were discharged alive, which after all should be accepted as the ultimate objective of the exercise.

In this study, the universal use of prophylactic lidocaine might have prevented the deaths (in theory at least) of only 2 people, over the course of 2 years. Against this potential benefit, one should weigh the cost, both financial and in side-effects, of administering lidocaine to all 2,256 patients transported as suspected acute MI during the period examined in this study. One should also include as potential side effects that group of patients (not examined in this study) who initially present with stable vital signs, but later develop hemodynamic complications and bradyventricular arrhythmias in which lidocaine might be contraindicated.

One should be cautious in projecting any validity from this study into the in-hospital setting: after all, the prevalent mechanisms of death in the two are not necessarily the same. It is commonly assumed that (primary) ventricular fibrillation accounts for the majority of all prehospital deaths.[11] This assertion is not supported by the evidence in this study; however, we have been limiting ourselves here to those patients who arrest after arrival of the paramedic unit. The majority (approx. 90%) of prehospital deaths occur before the ambulance arrives.

The possibility that different patterns of

death may prevail for pre-arrival, in-transport, and in-hospital time periods is an intriguing idea and one that would be an interesting topic for further investigation. However, on the basis of this study at least, the case supporting the use of prophylactic lidocaine during the prehospital phase of AMI is a tenuous one indeed.

References

1. Wallace, W.A., Yu, P.N.: Sudden Death and the Prehospital Phase of Acute Myocardial Infarction. Annual Review of Medicine 26:1 - 7, 1975.
2. Cobb, L.A., Alvarez, H., Copass, M.K.: A rapid-response system for out-of-hospital cardiac emergencies. Medical Clin North Am 1976; 60:283-290.
3. Crampton, R.S., Aldrich, R.S., Gascho, J.A., Miles, J.R., Stillerman, R.: Reduction of prehospital, ambulance and community coronary death rates by the community-wide emergency cardiac care system. Am J Med 1975; 58: 151-165.
4. Briggs, R.S., Brown, P.M., Crabb, M.E., et al: The Brighton resuscitation ambulances: a continuing experience in prehospital care by ambulance staff. Br. Med J 2: 1161, 1976.
5. Eisenberg, M., Bergner, L., Hallstrom, A.: Paramedic programs and out-of-hospital cardiac arrest: I. Factors associated with successful resuscitation. Am. J Public Health 1979; 69: 30-38.
6. Bergner, L., Eisenberg, M., Hallstrom, A., Becker, L.: Evaluation of Paramedic Services for Cardiac Arrest, Publ. by National Center for Health Services Research, Research Report Series. DHHS Publ. No. (PHS) 82-3310, December 1981.
7. Vertesi, L., Wilson, L., Glick, N.: Cardiac Arrest: Comparison of paramedic and conventional ambulance services. Can. Med. Ass. J. April 1983; 128: p 809-813.
8. Lown, B., Fakhro, A.M., Hood, W.B.: The Coronary Care unit. JAMA 1967; 199: 188-198.
9. Valentine, P.A., Frew, J.L., Mashford, M.L., Sloman, J.G.: Lidocaine in the Prevention of Sudden Death in the Prehospital Phase of Acute Infarction. N. Engl. J. Med 291: 1327-1331, 1974.
10. Wyman, M.G., Hammersmith, L.: Comprehensive treatment plan for the prevention of primary ventricular fibrillation in acute myocardial infarction. Am. J. Cardio 33: 661-67, May 1974.
11. Noneman, J.W., Rogers, J.F.: Lidocaine Prophylaxis in Acute Myocardial Infarction. Medicine Vol. 57, No. 6: P501-515, 1978.
12. Harrison, D.C., Berte, L.E.: Should prophylactic antiarrhythmic drug therapy be used in acute myocardial infarction? JAMA 1982, Vol. 247: 14 p 2019-2021.
13. Borak, J., Veilleux, S.: Prophylactic lidocaine: Uncertain benefits in emergency settings. Ann Emerg. Med. 11: 493-496, Sept. 1982.
14. Vertesi, L.: The paramedic ambulance: a Canadian experience. Can. Med. Ass J. 119: 25-28, July 1978.
15. Standards and Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC). JAMA 1980; 244: 453-509.
16. Killip, T., Kimball, J.T.: Treatment of Myocardial Infarction in a Coronary Care Unit. Am J Cardiol 20: 457-464, Oct. 1967.
17. Forrester, J.S., Diamond, G.A., Swan, H.J.C.: Correlative Classification of Clinical and Hemodynamic Function after Acute Myocardial Infarction. Am J Cardil 39: 137-145; Feb. 1977.
18. Wyman, M.G., Lalka, D., Hammersmith, L., Cannom, D.S., Goldreyer, B.N.: Multiple Bolus Technique for Lidocaine Administration During the First Hours of an Acute Myocardial Infarction. Am J Cardio 41: 313-317, Feb. 1978.

Tropical Diseases in the Emergency Department

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Abstract

The ease, frequency and speed with which people travel back and forth across the globe for business and pleasure these days means that emergency room physicians are very likely to see international travellers and immigrants who have fallen victims to illness acquired during travel. In particular, febrile and diarrheal illnesses are the most common afflictions of the traveller. While an enteric illness may cause an elevated temperature, and a fever may initiate diarrhea (especially in children), these two clinical presentations will be discussed separately.

Résumé

De nos jours, la facilité, la fréquence et la rapidité avec lesquelles les gens parcourent le monde par affaires ou par plaisir signifient que les médecins d'urgence sont susceptibles de rencontrer des voyageurs internationaux et des immigrants victimes de maladies contractées en voyage. Les maladies fébriles et diarrhéiques en particulier, sont celles qui affligent le plus souvent le voyageur. Bien qu'une affection intestinales puisse causer une hyperthermie et que la fièvre puisse entrainer une diarrhée (surtout chez l'enfant), ces deux symptômes cliniques seront présentés séparément.

Introduction

When confronted with the patients in the emergency room, regardless of the presenting complaint, the simple question, "Where have you been?" should always be asked. While some infectious agents are specific for certain areas of the world, one can assume that the common causes of diarrhea and fever in travellers are endemic throughout most of the Third World. Travellers themselves may know whether epidemics were in progress or malaria was endemic along their route.

"What did you do while you were there?" should also be asked. Those tourists staying in urban areas and on the tourist routes are at less risk, but people staying in one, two or no-star hotels or in private homes, especially in rural areas, are at significant risk for the acquisition of disease.

Finally, an important question is, "What precautions did you take?". Did the patient drink the local water or unpasteurized milk; eat raw, fresh vegetables or uncooked meat; have contact with ill persons; swim in bilharzia (schistosomiasis) infested fresh water lakes or streams, obtain pre-travel immunization and receive chemoprophylaxis for malaria?

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Fever

In descending order of frequency, the commonest causes of imported fever are malaria, typhoid fever, arbovirus infections, the prodrome to hepatitis and fevers associated with predominantly diarrheal illnesses, such as shigellosis, salmonellosis, campylobacterosis and toxigenic *E. coli* enteritis. Finally, the "exotic" viral illnesses (Lassa, Ebola and Marburg), although extremely rare in travellers, are mentioned only because their marked contagiousness and high case-fatality rate means that they must be considered in the differential diagnosis.

Malaria

Any traveller who has spent time in the tropics, however brief, may develop malaria within one to two years following his/her return. Fever in a recently returning traveller should always be considered to be "malaria until proven otherwise". Almost all tropical and subtropical areas (with the exception of some Caribbean islands), are endemic for malaria. Specific regional information is available from most departments of public health. In the history, the use of antimalarial chemoprophylactic drugs should be determined. In many endemic areas, a single agent such as chloroquine, pyrimethamine or proguanil is sufficient. However, potentially fatal *Plasmodium falciparum* malaria now is resistant to these drugs in many parts of the world (at present, Southeast Asia, Indonesia, East Africa, and South America) and requires a different prophylactic agent. The currently recommended drug is Fansidar, a combination of pyrimethamine and sulfadoxine. Unfortunately, Fansidar alone does not provide complete protection against *P. vivax* and for this reason, it is often given with chloroquine.

If prophylactic medications are taken throughout the period of exposure and for 6-8 weeks following departure from endemic areas, suppressive cure of sensitive strains of falciparum and malariae malaria can usually be assured. However, malaria chemoprophylaxis does not always work. Even strict adherence to the appropriate dosage schedule will not prevent sensitive *P. vivax* or *P. ovale* infections from relapsing after therapy is

stopped, but prophylaxis will suppress the symptoms or modify the clinical course sufficiently to mask some of the characteristic features.

The *minimum* incubation period for malaria is 8-10 days. The onset of illness is very nonspecific: myalgia, headaches, backache, malaise and fever. After a few days, the malaria parasites' erythrocytic cycle in the blood stream synchronizes and the typical fever pattern of recurrent fever and chills every 48 to 72 hours emerges. *Plasmodium falciparum* malaria often has no fever periodicity and therefore the diagnosis should not be ruled out merely because the fever pattern is not periodic.

Whenever the diagnosis of malaria is considered, Giemsa or Field's stained thick films or Wright's or Giemsa stained thin blood films should be examined. Thick films concentrate the parasites and aid in the *diagnosis* of malaria, but are difficult to read accurately; thin blood films are used to determine the *species* of malaria and the density of parasitemia. If expertise in the interpretation of these films is not available, the slides should be referred to the nearest centre with such experience.

Laboratory abnormalities common in malaria include anemia, leucopenia and thrombocytopenia. Marked anemia, hemoglobinuria and jaundice are ominous signs in falciparum malaria, indicating "Blackwater fever", an acute hemolytic syndrome, or imminent cerebral malaria, which presents with seizures or impaired level of consciousness.

Treatment of malaria depends on the "nationality" of the infection, i.e. its country of origin, the species of malaria and the severity of illness. All sensitive malarias can be treated with oral chloroquine phosphate, or with intravenous chloroquine or quinine if oral medications cannot be given. Falciparum malaria from areas of known drug resistance should be treated with two drugs: quinine plus a second medication which can be tetracycline, trimethoprim-sulfamethoxazole or pyrimethamine-sulfadoxine (Fansidar). Since *P. vivax* malaria has dormant forms in the liver, in addition to chloroquine, patients must be treated with primaquine phosphate to bring about a so-called "radical cure". Because *P. falciparum* malaria is a potentially life-threatening illness, all patients with this infection should be admitted to hospital and monitored closely. This is not necessary for infection with other malaria species.

TABLE I

Microorganism	Incidence in Travellers' Diarrhea
Toxigenic *E. coli*	65%
Shigella, Salmonella, Campylobacter, Yersinia, *V. parahemolyticus*	25%
Reovirus (rotavirus)	7%
Giardia lamblia or *E. histolytica*	3%

TABLE II
Characteristics of Small and Large Bowel Diarrhea

	Small Bowel	Large Bowel
Pathogens	Toxigenic *E. coli* *V. cholera* rotavirus *Giardia lamblia*	*E. coli* (invasive) Shigella *E. histolytica* *V. parahemolyticus*
	Salmonella Campylobacter Yersinia	
Location of pain	mid abdomen	lower abdomen, rectum
Volume of stool	often large, watery	usually small, may be mucoid or bloody
Stool microscopy	WBC, RBC's rare	WBC, RBC's common
Proctoscopy	normal	mucosal ulcers, hemorrhage friability

Typhoid Fever

This systemic infectious disease has a world-wide distribution, is transmitted by contaminated food and water and has an incubation period which averages 12 days but may range from 3 to 60 days. The typical early symptoms include continuous fever, headache, cough, anorexia, constipation, abdominal pain, splenomegaly, relative bradycardia and a rose coloured rash on the trunk. However, these classical symptoms may not be present since typhoid can present with a variety of clinical syndromes including hepatitis, pneumonia and neuro-psychiatric illness. Diagnosis is made in the early stages of the illness by growing the organism from blood or bone marrow and later from stool and urine. Leucopenia with lymphocytosis is common. The treatment of choice at present is either trimethoprim-sulfamethoxazole or chloramphenicol.

Viral Hepatitis

Hepatitis A is by far the most common viral hepatitis in travellers. Prior to the development of jaundice, patients may complain of anorexia, nausea, vomiting, malaise arthralgias, myalgias, headache, sore throat and cough. Liver pain and tenderness may not be prominent at this stage. A low grade fever is more often seen in the prodrome of hepatitis A than hepatitis B though the infrequent "serum sickness"-like prodrome to hepatitis B may include even high fevers.

Arbovirus Diseases

The arboviruses are a large heterogenous collection of organisms, which have as a common feature their transmission by various blood-sucking arthropods (usually mosquitoes or sandflies). The clinical illnesses which are caused by them, however, can be grouped into those which cause central nervous system disease, usually with encephalitis; benign fevers of short duration; hemorrhagic fevers; and polyarthritis and rash. The most important tropical diseases among these are dengue fever, usually a benign illness consisting of fever, headache and limb pain, and yellow fever, whose classic triad is jaundice, hemorrhage and albuminuria.

Although these viruses cannot be transmitted from person to person by body excretions or secretions, parenteral transmission is possible. As with hepatitis patients, "blood precautions" should be used.

Exotic Viruses

This group of viruses includes Lassa Fever, Ebola and Marburg viruses. They are acute febrile illnesses, frequently lethal and except for supportive therapy and prayer, lacking for specific treatment. Their incubation period may be as long as three weeks, or as short as a few days and each is a disease of *rural Africa*. Therefore, they should be considered in the differential diagnosis of *any* febrile patient with travel in *rural* Africa within the previous three weeks.

Lassa fever, confined to West Africa, begins gradually with fever, chills, malaise, headache and myalgia, and often goes on to include pharyngitis with pseudomembrane formation. Abdominal pain, vomiting, facial swelling and hypotension may occur. The illness is fatal in 15-25% of cases.

Ebola virus disease, described only in northern Zaire and southern Sudan, is characterized by an abrupt onset of headache, malaise, fever, diarrhea and abdominal pain. Pleuritic pain, cough and pharyngitis are frequent and a maculopapular rash may appear. Hemorrhagic events are common and may result in shock and death. The mortality rates have been as high as 80% in some areas.

Marburg virus disease is named for the German town in which it was first seen amongst laboratory workers exposed to imported African green monkeys. After a short incubation period, an abrupt onset of headache, malaise, backache and fever occurs. Conjunctivitis is frequent, and watery diarrhea, lethargy, mental dullness and an exanthem are common. A maculo-papular rash appears on the fifth to seventh day and spreads centrifugally to the extremities, then desquamates. Hemorrhagic events occur about the same time. Mortality rates approach 25% of infected individuals.

If one of these illnesses is suspected, the local medical officer should be contacted immediately in order to arrange transportation of the patient to a high-security isolation unit. No blood or other body fluids should be obtained and any biological samples taken should be retrieved and treated as biohazard. Strict isolation procedures including gown, gloves, mask and boots should be implemented.

Tuberculosis

Despite the relatively high prevalence of active tuberculosis amongst Third World populations, active TB as a cause of illness in returning travellers, or even in new immigrants, is very rare. Studies have documented that dormant tuberculosis in immigrants screened in their homelands for active disease prior to immigration, does not usually develop for at least one year after arrival.

North American Fevers

Finally, it should also be remembered that returned travellers may also develop "native" fevers. Respiratory and urinary tract infections afflict individuals both in the tropics and at home, so these more mundane etiologies should not be overlooked.

Diarrhea

It is estimated that up to 50% of travellers to the tropics will develop diarrhea. Most will experience a self-limited illness which is but a nuisance. A few, however, will develop more serious or even life-threatening diarrhea and present themselves to the Emergency Department. The emergency physician must be aware of the common causes of traveller's diarrhea to ensure that the necessary investigations are carried out and early appropriate therapy initiated.

Etiology

Many micro-organisms are capable of causing diarrhea in travellers. Table I lists the important etiologic agents and their relative incidence in traveller's diarrhea.

By far, the commonest cause of traveller's diarrhea is toxigenic *E. coli*. The elaborated toxin, almost identical to cholera toxin, activates adenyl cyclase and cyclic-AMP resulting in a net secretion of fluid and electrolytes from the small intestine. Typically, the traveller who acquits toxigenic *E. coli* is well for the first 2-3 days with the onset of illness occurring in the first two weeks after arrival. The disease begins abruptly with abdominal cramps followed by watery diarrhea consisting of 3-8 but rarely more than 15 bowel movements per day. The illness is self-limited,

averaging 1-5 days in most cases, although in some instances diarrhea may persist for weeks.

Falciparum malaria may present with profuse diarrhea and vomiting. This diagnosis must always be considered and ruled out in any febrile patient arriving from the tropics.

Non-infectious causes of diarrhea to be considered include lactose intolerance, post-infectious irritable bowel syndrome, antibiotic-induced colitis and tropical sprue.

Clinical Approach

The most convenient way of approaching the problem of diarrhea in travellers is to classify the causes by their site of action, namely large bowel or small bowel (Table II).

Diarrhea originating in the small bowel is usually watery and may be voluminous, sometimes causing significant dehydration. Blood and mucous are typically absent from the stools as the organisms tend to be "non-invasive". Pain may be experienced in the peri-umbilical region. On proctoscopy, the rectum appears normal. If stool is stained with methylene blue and examined by microscopy, red and white blood cells are usually absent. On the other hand, large bowel diarrhea is usually caused by organisms which have the ability to invade the bowel mucosa. The stool may contain blood or mucous and microscopy may show RBC's, WBC's or both. The discomfort is often lower down in the abdomen and tenesmus due to rectal involvement may occur. Proctoscopy may reveal ulceration, hemorrhage and friability.

History

Several points in the history might lead one to the correct diagnosis. First, one must ascertain whether the patient has been in the tropics, as this piece of information will not always be offered. The nature of travel is important. The well-seasoned businessman staying in first-class hotels and sipping only Perrier water is likely to acquire enterotoxigenic *E. coli*, while the adventurous backpacker, trekking through the boonies and eating and drinking whatever is available, will be exposed to many more potential pathogens.

One should inquire if the patient has been on antibiotics either prophylactically or therapeutically and whether antimalarials have been taken.

The onset of diarrhea and its relationship to the traveller's arrival in or departure from the tropics is often a helpful clue to ruling in or out parasitic infections. Both amebiasis and giardiasis, the common parasite pathogens have relatively long incubation periods ranging from one to three weeks. Thus, the traveller who develops symptoms within the first week after arrival in the tropics is more likely to have a bacterial or viral rather than a parasitic cause for his diarrhea, whereas parasites may be responsible if diarrhea begins 1-2 weeks after return from the tropics. As opposed to bacterial and viral infections which usually have an abrupt onset, parasitic infections tend to begin insidiously. When fever and chills accompany diarrhea, 'invasive' pathogens rather than parasites or toxin-producers are usually the causative agents. Diarrhea made worse by ingestion of milk products suggests lactose intolerance which frequently accompanies giardiasis, but may be seen in association with any insult to the upper small bowel.

Physical Examination

The most important part of the physical exam is to assess the patient's state of dehydration. The location of abdominal tenderness may help to differentiate large from small bowel involvement. Toxic megacolon may be suggested by abdominal distention and absent bowel sounds. Splenomegaly is a feature of both malaria and typhoid fever. Observation of the gloved finger after the rectal examination may disclose the presence of frank blood or pus.

Laboratory Investigations

The first step in diagnosis is the examination of stool for WBC's and RBC's, using a methylene blue stain. Numerous WBC's and RBC's suggest an invasive pathogen such as Shigella, Salmonella or Campylobacter. A stool culture for bacterial pathogens should be sent. If "sheets" of WBC's are seen, a presumptive diagnosis of shigellosis may be made.

Next, the stool should be examined for ova and parasites. In an emergency room setting, a fresh saline and iodine stained preparation is sufficient. Permanent stained preparations and concentrates should be examined at leisure by a well-trained parasitology technologist. The finding of hematophagous trophozoites (i.e. trophozoites containing ingested red cells), of *E. histolytica*, is diagnostic of invasive amebiasis.

Phase contrast microscopy of fresh stool may be helpful in identifying the typical morphology of non-cholera vibrios and hence a presumptive diagnosis of Campylobacter enteritis can be

entertained before the culture results are available.

Sigmoidoscopy may be useful if the initial examination of the stool suggests an invasive pathogen. If amebic colitis is suspected, a rectal scraping from the surface of an ulcer or friable mucosa should be mixed with a drop of saline on a glass slide and examined immediately under the microscope for hematophagous trophozoites. Blood for amebic serology should also be drawn.

Thick and thin smears for malaria should be done in febrile patients. The pH of the stool may be tested and if acidic, this may suggest lactose intolerance.

If required, further investigations such as multiple stool exams for parasites, radiological examinations, and tests for malabsorption, should be done either as out-patient procedures or after admission to hospital.

Treatment

Further management of the patient is determined by the clinical picture and the initial laboratory findings. Most patients with diarrhea will recover rapidly with a clear fluid diet. Milk products should be avoided. If the patient is significantly dehydrated, intravenous fluids may be required. If the patient is not seriously ill, one can wait for the results of stool culture or other parasitological exams before beginning specific treatment. In the case of an ill patient who has numerous WBC's on stool examination, treatment for shigellosis should be initiated, preferably with ampicillin or trimethoprim/sulphamethoxazole. For the specific treatment of the other causes of diarrhea, the reader is referred to the appropriate references listed in the bibliography.

The use of antiperistaltic agents loperamide, (imodium) and diphenoxylate (Lomotil) should be discouraged. They may, in fact, enhance symptoms and prolong excretion of the offending organisms. Toxic megacolon has been reported as a complication of anti-peristaltic drug usage in the treatment of amebic and bacillary dysentery.

Conclusion

Diarrhea and fever in the returning traveller are unusal problems in the emergency room but need not be perplexing ones. Armed with the knowledge of the common etiologies to be considered, the emergency room physician can proceed with a logical approach to investigation which will lead to an accurate diagnosis and early, appropriate treatment.

Acknowledgements

We wish to thank Ms. Pam Pickering for her excellent secretarial assistance and infinite patience.

Selected References

1. Gorbach, S.L., Hoskins, D.W., Traveller's Diarrhea, Disease-a-Month, 1980, *XXVII*: October.
2. MacLean, J.D., Medical problems imported from the tropics, Modern Medicine of Canada, 1980, *35*:1536-43.
3. Simpson, D.I.H., Marburg & Ebola virus infections: a guide for their diagnosis, management and control, WHO Publications #36, 1977, WHO, Geneva.
4. Knobloch, J., McCormick, J.B., Webb, P.A., et al, Clinical observations in 42 patients with Lassa Fever, Tropenmed. Para. 1980, *31*:389-512.
5. Claquin, P., and Keystone, J.S., Malaria, Medicine North America, 1981, 1st series. 1001-1007.
6. Kean, B.H., Reilly, P.D., Malaria — the mime: recent lessons from a group of civilian travellers, Am. J. Med., 1976, *61*:159-64.
7. Spence, L., Yellow Fever and dengue, Medicine North America, 1981, 1st series, 967-969.
8. Hoffman, T.A., Ruiz, C.J., Counts, G.W., et al, Waterborne Typhoid fever in Dade County, Florida: Clinical and therapeutic evaluations of 105 bacteremic patients, Am. J. Med., 1975, *59*:481-7.

CAEP Leadership

Emergency Medical Training Programmes

RCPS

Kingston, Ontario

Hospitals Kingston General Hospital, Hotel Dieu Hospital

University Queen's

Programme Director Dr. L. E. Dagnone, Emergency Dept., Hotel Dieu Hospital, Kingston, Ontario, K7L 3H6

Length of Programme 4 yr post-M.D. or 3 yr post internship

Size maximum of four (4) residents per year.

Accreditation RCPS (pending)

Toronto, Ontario

Hospitals Toronto General, Sunnybrook Medical Centre, Hospital for Sick Children

University of Toronto

Length of Programme four (4) yr after graduation, three (3) yr after rotating internship.

Size 3 residents per year.

Accreditation RCPS(C) (pending)

Programme Director Dr. Bruce Rowat, Director of Emergency Department, Toronto General Hospital, 101 College St., Toronto, Ont. M5G 1L7
Deadline for applications: Oct. 1 of each preceding year.

London, Ontario

Hospitals: St. Josephs Hospital, University Hospital, Victoria Hospital

University: University of Western Ontario

Length of Program: Three years — post internship

Size: One resident per year

Accreditation: R.C.P.S. (pending)

Program Director: Dr. R. G. Anthony, Department of Emergency Medicine, Victoria Hospital, 375 South Street, London, Ontario N6A 4G5
Phone: (519) 432-2352

Deadline for Application: September 15th

Montreal, Quebec

University McGill University

Hospital Royal Victoria Hospital Emergency Department

Program Director Dr. Wayne Smith, 687 Pine Avenue West, Montreal, Quebec H3A 1A1

Length of Programme 3 years

Prerequisites at least 1 year mixed or rotating internship

Number of Residents Accepted per year: 4 residents

Deadline for applications October 30, 1983

Accreditations: RCPS(C) (pending)

Calgary, Alberta

University of Calgary

Hospital Affiliation Foothills Hospital, Alberta Children's Hospital

Programme Director R. Abernethy, Div. Emergency Medicine, Foothills Hospital, 1403-29th Street N.W., Calgary, Alberta T2N 2T9

Number of residents accepted per year: one

Length of Program: 3 yr post internship

Deadline for application: Oct. 30

Accreditation: RCPS(C) (pending)

CFPC

Toronto, Ontario

Hospitals Toronto Western, Sunnybrook Medical Centre, Hospital for Sick Children

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Program Director Dr. Calvin Gutkin, Toronto Western Hospital, c/o 751 Dundas Street West, Toronto, Ont. M6J 1T9

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Size 4 residents per year

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Deadline for Applications: September 30.

Calgary, Alberta

University of Calgary

Hospital Affiliation Foothills Hospital, Alberta Children's Hospital

Programme Director R. Abernethy, Div. Emergency Medicine, Foothills, Hospital, 1403-29th N.W. Calgary, Alberta T2N 2T9

Length of Program: one year post CCFP

Number of residents per year: two

Deadline for applications: Oct. 30

Meetings to note

Clinical Toxicology National Symposium:
September 12 and 13, 1983. Winnipeg, Manitoba. This intensive symposium is designed to provide physicians, nurses and clinical pharmacists with a basic understanding of the assessment and management of the acutely poisoned patient. Topics include: assessment and management of common poisonings; pharmacokinetics; frequent overdoses; poisoning and the elderly; and poison prevention. Guest speakers: Lewis Goldfrank, M.D., Robert Peterson, M.D., Ph.D., and Michael McGuigan, M.D.
For information, contact
Atlanta Sloane-Seale, Continuing Education Division, University of Manitoba, Winnipeg,
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Clinical Toxicology:
A National Symposium: Winnipeg, September 12, 13, 1983. Designed for physicians, nurses and clinical pharmacists. Topics include: assessment and management of common poisonings; pharmacokinetics; frequent overdoses; poisoning and the elderly; and poison prevention.

Guest speakers: Lewis Goldfrank MD; Robert Peterson MD, PhD; and Michael McGuigan MD.

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The Oshawa General Hospital invites applications for the position of Director of Emergency Services

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The CAEP Residents Committee is currently developing a pool of electives in such areas as trauma, toxicology, pre-hospital care, pediatric Emergency Medicine, disaster planning, Emergency Department administration, and research, to which all Resident Members would have access.

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If you feel that you could sponsor such an elective, or alternatively that you have enjoyed particularly good training in some area of Emergency Medicine during your training, please complete the form below.

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CAEP Position Paper on Pre-hospital Care

Preamble:

Pre-hospital care refers to medical care provided by health workers outside of the setting of the hospital prior to that patient's arrival in the hospital. As such, pre-hospital care is but one component of the total emergency medical services (EMS) system. The planning, design and operation of the total EMS system falls within the domain of the discipline of emergency medicine. Advances in one area of EMS must be balanced and co-ordinated with advances in other areas.

Introduction:

Recent recognition of emergency medicine as a specialty in both Canada and the United States has been paralleled by an increasing awareness of the importance of pre-hospital care. With that awareness, however, has come the realization that the tremendous clinical and technological advances in hospital based medicine have not been accompanied by significant advances in the delivery of health care prior to the arrival of patients at a medical facility. It still holds that in most Canadian communities the most sophisticated medical care in the world is made available only after the patient arrives at the hospital of his or her own accord.

The recent recognition of the specialty of emergency medicine has been based primarily upon developments and improvements in the patterns in quality of care in hospital emergency departments. However, emergency physicians are increasingly becoming involved in the whole range of EMS activities including disaster planning, citizen education, pre-hospital care, etc. These areas are essential components of the discipline of emergency medicine and communities are increasingly looking to emergency physicians as experts in the field.

Emergency physicians have to date been active in improving the interface between pre-hospital and hospital based emergency care. In many areas they have had significant influence with government and other authorities to improve facilities and service available. They have been involved in planning, educational programs and in teaching pre-hospital care workers. There is evidence, both in Canada and in the United States, that this effort has resulted in significant improvements in patient morbidity and mortality. There is no longer any controversy about the importance of pre-hospital care or about the benefits of the involvement of the emergency physicians.

Resolution:

Whereas one of CAEP's organizational objectives is the improvement of emergency care in Canada and whereas CAEP represents the interest of all emergency physicians in Canada and whereas there is an urgent need to plan and improve the level of pre-hospital care available across the country.

Therefore, be it resolved that:

(i) CAEP recognizes that pre-hospital care is but one component of the overall Emergency Medical Services system and that EMS as a whole falls within the domain of the discipline of emergency medicine.

(ii) Pre-hospital care should be delivered by specialized health workers specially trained and dedicated to this mode of health care delivery.

(iii) CAEP recognizes the need for these national standards for the training and accreditation of these specialized workers.

(iv) Emergency physicians should play a major role in the planning and accreditation of educational programs for these health care workers.

(v) Emergency physicians should play a major role in the teaching of medical skills to pre-hospital care workers.

(vi) CAEP should undertake with other agencies a public awareness of the importance of pre-hospital care and promote improvements in the field.

Approved, Oct. 1981