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CAEP REVIEW

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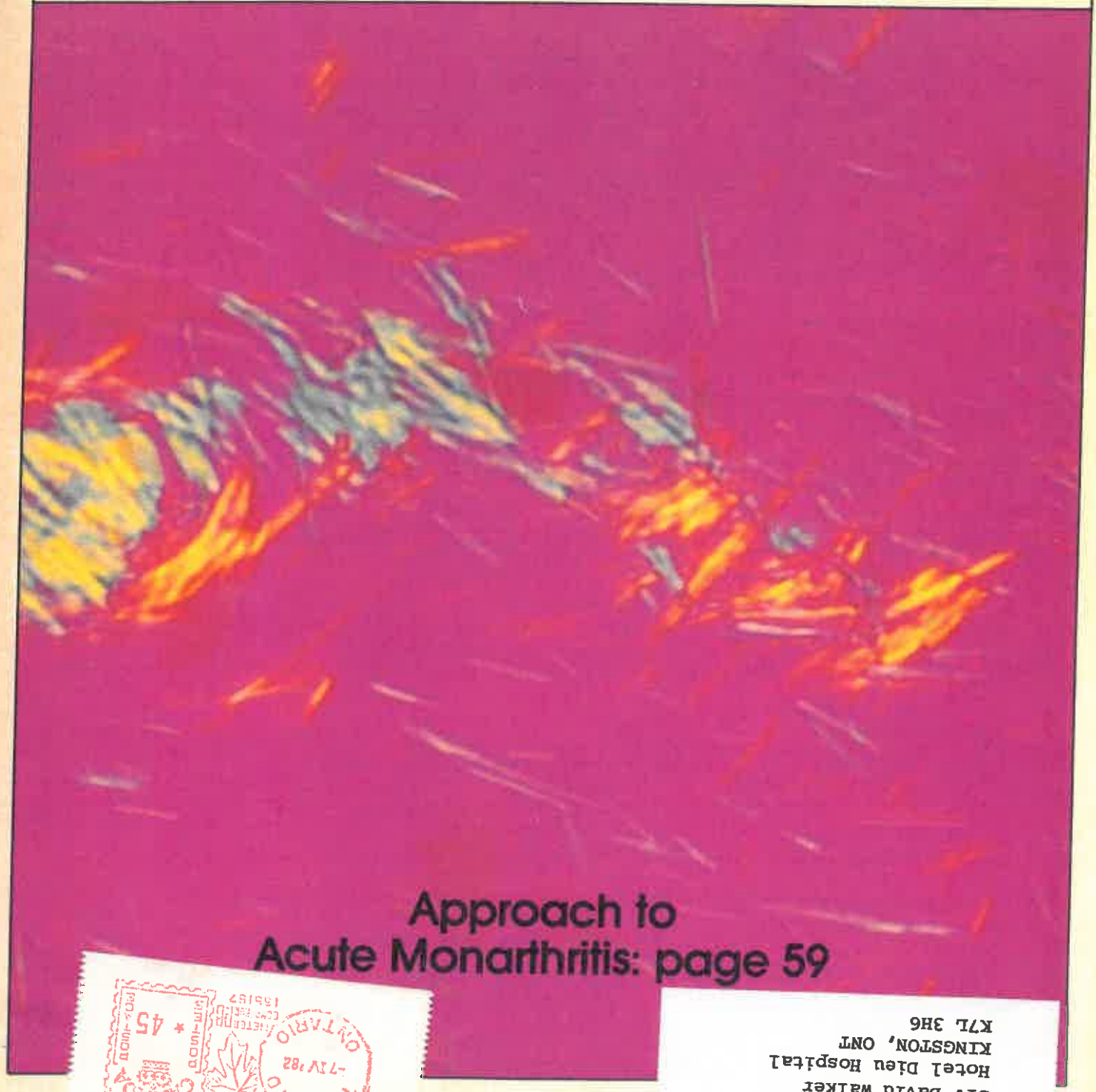

Approach to Acute Monarthritis: page 59

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CAEP REVIEW

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Our Mistake

Last issue, we made a serious mistake. Some copies of CAEP REVIEW 3 (1) contained an advertising insertion inadvertently placed in the middle of the centrefold advertisement. Fortunately, few of the copies mailed to subscribers contained this error. However, it was clearly our mistake and we sincerely regret any confusion or misunderstanding that it may have caused. We also greatly appreciate the understanding shown by the advertisers involved.

Resident's Corner

At last October's meeting of the Resident's Committee there appeared to be some confusion as to the structure and function of the Resident's Committee within CAEP. Several misunderstandings were identified. (1) the belief that the Resident's Committee is a separate association with input to CAEP analogous to the relationship between EMRA and ACEP in the US; (2) a fear that the Resident Committee is dictated to and controlled by the executive of CAEP. Clearly these misunderstandings have arisen from a general lack of knowledge of the CAEP constitution. I should like to clarify some of these points.

The CAEP constitution outlines the structure and function of the Resident's Committee. (1) **Appointments:** "the executive may appoint standing or other committees to assist the executive in its work . . ."(IV-1). (2) **Structure:** "All resident and student members of the Association shall be considered to be members of this Committee. This committee shall be chaired by a Resident Member who is nominated by the Executive, after consultation with the Resident Committee, and ratified by the membership at the Annual Meeting."(IV-8) (3) **Function:** ". . . shall be to consider all matters of interest and relevance to trainees in Emergency Medicine programs and to make suitable recommendations to the Executive"(IV-8). Further "Resident members shall enjoy the privileges of membership, the right to vote at the Annual Meeting and to hold appointed office. They shall not be entitled to hold elected office . . ."(I-8)

Thus the Resident chairman is an appointee of the executive, as are all the other standing committee chairmen. Consequently, while invited to attend Executive Meetings, the Resident chairman has no voting power on the Executive. Of interest is the fact that only the Resident Committee offers nominations for chairman from the committee itself. The Nominating Committee fulfills this function for all other standing committees.

When the Resident Committee was first established by the founding members of CAEP, it was their intention that it fulfill the following functions: (1) as a forum for residents to communicate areas of interest and concern with one another, (2) to bring to the attention of the CAEP Executive issues pertinent to residents that CAEP may not be aware of, (3) to stimulate an interest in CAEP among residents that would, in the future, lead to involvement on other committees or on the Executive as resident members progress to become active members. It is strongly felt that future CAEP leadership will evolve from resident ranks.

Until recently, the Resident Committee has been relatively inactive, likely due to a general disinterest on the part of the Resident membership. This attitude has certainly been reversed as evidenced by the keen interest shown at the Resident meeting in October. As a result of that meeting, there are now designated resident representatives from all EM training programs: Don Livingstone, vice-chairman (London), Francois Cousineau (Kingston), Deirdre Anglin (Montreal), Charles Vanderwater (Ottawa), and myself, chairman (Calgary).

Recently, two resident representatives, Don Livingstone and Francois Cousineau, attended a CAEP Executive meeting in Toronto at which resident matters were discussed at some length. The conclusions reached were (1) to support the role of the Resident Committee as outlined in the Constitution, (2) to encourage resident participation in all Executive meetings by the presence of the Resident chairman or resident representatives whenever financially and geographically feasible. The latter proviso is a result of CAEP's rather limited financial resources in providing transportation across Canada to Resident members.

What needs to be determined now is the function of the Resident Committee within the broad guidelines outlined in the constitution. In order to allow all residents to have some input as to the direction that the Resident Committee should take and the issues that it should concern itself with, a questionnaire is being sent to all the resident representatives. I hope to communicate the results in the next issue of CAEP Review.

If you have any concerns, questions or disagreements please feel free to contact me.

Dr. Ingrid Vicas
Chairperson, Resident Committee

CALL FOR ABSTRACTS FOR 1982 CAEP CONFERENCE

Abstracts of original scientific papers relating directly to Emergency Medicine will be considered for presentation at the 1982 CAEP Conference to be held September 28th-30th, 1982 in Calgary, Alberta.

Abstracts should be submitted to:

Dr. M. Hodsman,
c/o Foothills Hospital,
1403 29th St. N.W.
Calgary, Alberta T2N 2T9.

President's Notebook

The President-Elect, Rocco Gerace, and I had the recent pleasure of visiting with the Board of The American College of Emergency Physicians in Dallas. The meeting took place over a four-day period and involved both a long-range strategic planning session and a normal Board Meeting. Both Rocco and I found the experience enlightening and helpful to the future endeavors of The Canadian Association of Emergency Physicians.

The long-range planning session involved a workshop with a professional planning firm. This helped us organize the ideas and problems into a format for which programmes could be developed which meet stated objectives. The process essentially involved taking all the issues and problems facing The American College of Emergency Physicians, priorizing them, then deciding which of the issues could be met with given resources. Long-range planning is viewed as what the organization should discuss in the next three to five years. There are many similarities in the endeavors and problems of The American College of Emergency Physicians to our own organization. We felt that it was a worthwhile project to endeavor to create a similar set of circumstances and a long-range planning session in Canada in the near future. It is our hope to make this a major part of the next Executive Meeting, scheduled to be held in Vancouver in the month of April.

At the American College of Emergency Physicians Board Meeting, we had an opportunity to discuss international membership and the Annals of Emergency Medicine with the ACEP Administration and Executive. These issues are currently being dealt with at the subcommittee level of the ACEP Board. The process is a very reasonable one, but involves a good deal of time considering the Board meets only a few times a year. Thus, currently the financial impact of international membership and the furnishing of the Annals to The Canadian Association of Emergency Physicians at a bulk rate, either tied or not tied to international membership, is being discussed. The deliberations are scheduled to be reported at the next ACEP Board Meeting, after which we will report back to you. Again, the process takes time, and if your subscription to the Annals is due in the next month or two, I would certainly renew it. It is unlikely we will have the process of negotiation and ratification completed prior to our next Annual Meeting in September.

Finally in this report, I would like to communicate with you regarding the issue of exam preparedness. It is never too early to begin the process of expanding one's depth of knowledge in a given field. Currently, The Royal College Specialty Committee on Emergency Medicine is looking at the possibility of acquiring parts of the American exam, which would make up a portion of the proposed Canadian examination process. Once these negotiations are finalized, a further meeting of the Specialty Committee will be necessary. The conclusions will then go to the Accreditation Committee and finally, on to The Royal College Council. I am as yet uncertain as to the time frame, but hope this process would be completed within the year. An examination would follow within some months of the completion of the above process.

I believe it is important that the membership understand the eligibility requirements and the breadth and depth of knowledge involved in the process. When all deliberations are complete, the written requirements will be widely publicized. In the meantime, I would suggest that study groups and a look to the future would be appropriate. Depth is an interesting issue and it has been looked at in several of the university centers in Canada in terms of examinations, in particular, centers with residents in training in Emergency Medicine. As a philosophy, it would be important that a physician studying in depth in Emergency Medicine would be expected to perform on written and oral examinations to the same level as a fellowship candidate in any other specialty. For example, if you are presented with a case clinical scenario such as a child with meningitis, you would be expected to display a level of knowledge comparable to a fellowship candidate in Paediatrics up to and including the care involved in the early investigation and management of that patient. When it comes time to talk about the chronic and long-term complications of meningitis, and how they might direct the care of the child over subsequent months and years, the knowledge of the Emergency Physician is going to be expected to slip behind that of the Paediatrician. However, I believe this example illustrates the depth we suggest is appropriate in emergency care. I hope this will help you plan your studying process constructively. With each Executive Meeting, we plan to explore this issue with the local Emergency Physicians in each of the centers we visit. Also, we would certainly appreciate written questions and suggestions from the membership.

I shall look forward to communicating with you again in the next issue.

G. Powell, M.D.

President

February 8, 1982

Editorial

A Time For Leadership

The terrible human toll on Canada's highways continues relatively unabated. A year ago on these pages, Dr. William Ghent re-counted the grim dimensions of the problem. While trauma is exceeded by both heart disease and cancer in terms of the number of deaths per year, trauma claims its victim much earlier — in the second and third decades mostly. In 1976, cancer accounted for the loss of 135,000 persons years, heart disease — a 192,000, while fully 234,000 person years were wasted by trauma. These gruesome statistics did not begin to relate the cost in terms of long-term disability as a result of trauma.

The past decade in Canada has seen a slight reduction in traffic mortalities in different jurisdictions. Governments claim this to be a result of seat belt legislation, motorcycle helmet legislation and speed limit legislation. However, seat belt compliance continues to be as low as 40-55% in many communities, even though an innovative program of enforcement and public education in Ottawa Carlton has shown the potential for significant long-term improvements in compliance rates.

Clearly, leadership is needed from the medical community to continue and improve efforts aimed at prevention. Emergency Physicians have a responsibility to speak out, and to advocate for, improved enforcement and compliance with seat belt legislation, as well as in the continuing battle with the drinking driver.

But there will always be some Canadians who will fall off their motorcycles, and there will always be others who will drink and drive their cars into one another or off the road. How prepared the medical community is for these patients in their first few hours after injury is critical. Perhaps more than in any other area of medicine, what we as physicians do, has a significant, measureable impact on outcome.

There is now an opportunity for Emergency Physicians in Canada to play a crucial role in improving the preparedness of the medical community for trauma patients. Two major developments are taking place in the field of trauma in which we have a very direct interest — the development of Trauma Centres and the beginning of Advanced Trauma Life Support (A.T.L.S.) training in Canada.

Trauma Centres are a concept long overdue in Canada. Studies from Orange County, California, as well as experience at Canada's oldest Regional Trauma Unit, The Sunnybrook Medical Centre, in Toronto, have shown clearly that an organized, systematic approach to the management of trauma patients does make a difference in outcomes. Equally apparent, for those in the field, is the recognition that a major contributing factor to our lack of preparedness is, plainly stated, specialty chauvinism. It has taken us far too long to learn the lesson that trauma is not a "neurosurgical disease", an "orthopedic disease", a "thoracic" "abdominal" nor "general surgical disease". Trauma is a *multi-system* disease which is best managed by an *interdisciplinary* team. There is a world of difference between the patient with an isolated head injury and the patient with the same head injury in addition to orthopedic, vascular, and abdominal injuries.

The implications then for Emergency Physicians are obvious. We represent the only clinical specialty with an interdisciplinary perspective. Emergency Physicians can and should be directing the initial assessment and management of the multiple injured patient. Emergency Physicians can and should be leading the effort to establish trauma centres in larger urban communities, to rationalize referral patterns for trauma patients, to develop protocols at both the hospital and community levels for managing trauma patients, and to argue for the necessary funding to meet both the clinical and research implications of the establishment of trauma centres. Without the unique interdisciplinary "front end medicine" perspective of Emergency Physicians, trauma centres stand libel to the same sub-specialty bias that has characterized trauma care to date.

The second major development in trauma care at present is Advanced Trauma Life Support (A.T.L.S.) training. Developed by the Lincoln Medical Education Foundation, who also began Advanced Cardiac Life Support (A.C.L.S.), and now sponsored by the American College of Surgeons (ACS) Committee on Trauma, A.T.L.S. is now being offered in Canada. ACS regulations require that at least half of the faculty for each course should be surgeons. This is felt to be appropriate because many of the skills being taught are indeed surgical skills. However, the knowledge base and the clinical judgment involved clearly fall within the domain of Emergency Medicine — the priorities of the assessment and resuscitation of the critically injured patient. Canadian Emergency Physicians have been among the first enthusiastic students and instructors of A.T.L.S. In order for A.T.L.S. training to have a statistically significant impact on outcomes, an enormous number of Emergency Physicians and primary care physicians need to be trained. Each course, however, can only handle sixteen students, so a lot of courses must be put on in the next few years in Canada. Again, Emergency Physicians should be playing leadership roles in this area.

We have a rare opportunity then, over the next decade, to have a major impact on the third leading cause of death in our society. We seem to be at one of those rare moments in

history when the universe is unfolding as it should. Government and the public seem ready to understand that slick mass media campaigns aimed at prevention will not make the problem go away. They appear to be more favorably disposed to considering methods such as A.T.L.S. training and trauma centres which can improve survival. The medical profession has shown itself ravenous in its desire to learn more about trauma, if interest in A.T.L.S. is to be any gauge. And all of this coincides with the recognition and the development of Emergency Medicine as Canada's newest specialty.

All of the elements then are in place. It is a time for leadership indeed, and that leadership should and must come from Emergency Physicians.

Membership

Application for CAEP Membership

Yes, I want to join the growing number of my colleagues as a member of the Canadian Association of Emergency Physicians. Please find my cheque or money order enclosed, made payable to C.A.E.P.

- ☐ Active Member — $125 (full-time E.P.)
- ☐ Affiliate Member — $75 (major interest, but less than 80% of practice)
- ☐ Resident Member — $25 (in Emergency Medicine Residency Programme)
- ☐ Student Member — $10 (interested medical students)

Send to:
Dr. Marvin Yake,
Dept. Emergency Medicine,
Victoria Hospital,
291 South Street,
London, Ontario
N6A 4G5.

Please give preferred mailing address

Name _____

Street _____

_____

City _____

Province _____

Postal Code _____

Letters to the Editor

Dear Sir:

The burgeoning interest in Emergency Medicine has been responsible for the rapid development of Residency Training Programs across Canada. It seems paradoxical, therefore, to report that one of the oldest of these programs, at the University of Western Ontario, in London, Ontario, has been discontinued. The reason for its cessation, and the message that it contains, is important for all who are involved with the development of accredited training in Emergency Medicine.

The Residency Program in Emergency Medicine at Western has its origins in the mid 1970's; at that time, the concept of training in Emergency Medicine, within the structure of a General Residency in Internal Medicine was formalized. Two years of the four year Internal Medicine Residency were devoted to Emergency Medicine. During that period, time was spent in the Emergency Room, in surgical rotations, and in those medical rotations that were thought to have application to the Emergency Room situation, such as Intensive Care, Coronary Care and cardiology. The other two years were spent doing training typical of other General Medical Residents, in such areas as rheumatology, respirology and gastroenterology. It was implicit that, at the completion of training, the Fellowship in Internal Medicine would be attempted.

The program generated widespread interest from applicants across Canada, and it received generally strong support within the Department of Internal Medicine. Partially because of physical constraints dictated by the volume and type of Emergency care delivered in London, and partially because the Emergency Medicine Residency slots were funded by the Department of Internal Medicine from a general pool of residency positions, enrolment into the program was limited to two residents per year.

However, recently the Ontario Government has felt it necessary to curtail the total number of funded postgraduate training positions in the province. Consequently, over the next four years, the Department of Internal Medicine, at the University of Western Ontario, will see its quota of residency positions fall by 17%. For a variety of internal reasons, the Department of Medicine has decided to direct these cutbacks at several of its smaller programs, including the Training Program in Emergency Medicine. Consequently, no new applicants are being accepted into the program.

The counterproductive nature of this action, given the clearly recognized need for trained Emergency Physicians, is obvious.

Seemingly, no training program in Emergency Medicine in Canada, no matter how great the need for Emergency Physicians, is exempt from such a situation, as long as the programs are funded through other, well established, Departments from a limited pool of postgraduate training positions. As financial constraints become more severe, Emergency Medicine Training Programs may find themselves squeezed out, unless they have independent and guaranteed funding.

Don Livingstone,
Resident,
Division of Emergency Medicine,
Department of Internal Medicine,
University of Western Ontario

Dear Sir:

I am able to share the following information as it concerns the first examination in emergency medicine to be conducted by the College of Family Physicians of Canada. The examination will be held in October-November 1982. The Committee on Examinations has been most active, and is designing an examination that in all probability will comprise three different examination instruments — all written. A research project is currently being developed to measure the relative value of an oral examination versus a modified essay type examination to evaluate certain competencies appropriate to the particular responsibilities of emergency physicians. The results of this project will influence the ultimate decision as to whether or not oral examination instruments will be used in the examination leading to a Certificate of Special Competence in Emergency Medicine. This in turn will influence the number and location of examination centres. If the decision is reached to use only written examinations — it is probable that a larger number of centres will be used. Again, this will depend to a considerable degree on the number of applicants. The examination fee has not been determined, and this too will be influenced to some extent by the decision as to whether or not the overall examination will include oral examination instruments.

I regret that I cannot be more specific in describing the details of the actual examination process. Again, rapid progress is being made in the design and content of the examination, with a view to being in a position to conduct the first examination in October or November of 1982. As these details have been finalized — your courtesy in publishing them in the CAEP Review would be appreciated.

Sincerely,
Donald I. Rice, M.D.
Executive Director.
College of Family Physicians of Canada.

Dear Sir:

The proliferation of letters and editorial response (CAEP Review January 1982) begs for further comment.

It will be evident that a lot of energy is being expended on a polarization of positions and protection of assets, and this is

probably not surprising since progress for one group may well be seen as threat to another. However, the intense feelings in the January correspondence would seem to suggest that the two protagonists have just discovered each other. In fact, this divergent perception of emergency medicine has been simmering in Ontario since 1970 when a handful of physicians — Mackenzie, Dagnone and Ferguson — began to promote emergency medicine as a credible and viable element of medical practice. Unashamedly influenced by the EM tide in the United States, the basic premise was clinical skills — formally acquired, finely honed and frequently applied — and all directed toward better management of the acutely ill and injured patient. That goal would seem, then as now, to be unassailable; the problem has been how to achieve it given the competing fiscal, political and educational priorities which are all around us.

The emergency medicine scenerio of the past 12 years is similar to the evolution of Anesthesia following the Second World War. That is not to say that the comparison is identical, and no doubt some would dispute the analogy. Nevertheless, I think there would be general agreement that the Royal College anesthetist has become a valued member within the profession. While it is true that an anesthetist monopoly occurs in the hospitals of most cities, it is equally true that there is still a place for the practice of quality anesthesia by other physicians in many communities — some in proximity to Metropolitan Toronto. Therefore, whatever the current trend in anesthesia may be, there is no doubt that some mutual acceptance and symbiosis has existed in this area of medicine for more than 40 years. It seems clear that even in 1982, not only are there *anesthetists*, but there are also *doctors who give anesthetics*, and the overall system simply could not function without the combined contribution of both groups.

I believe that the same sort of co-existence, consistent with the historical development of most of the subdivisions within medicine, can and should form the functional model for emergency medicine in Canada for many years to come. That being the case, the efforts of the past decade to achieve a single emergency medicine credential may well not have been in vain. In fact, the dual route via the College of Family Physicians and the Royal College may prove to be more functional and compatible over time than the corresponding American equivalent, for while the U.S. experience may offer guidelines and lessons, it does not necessarily provide all the answers for the Canadian scene.

We should, therefore, recognize and validate the simultaneous need for *emergency physicians* and *physicians who work in emergency (departments)*. The concept of emergency medicine as personified by the Royal College emergency physician committed not only to patient care, but also to teaching and research can then be put into perspective. At the same time, the intent is surely not to flood the medical community with such persons even if the residency slots and other logistics would allow it. Meanwhile, the extra year added to the family medicine residency, and devoted to emergency medicine, may prove to be the most significant step forward in the past 25 years. It will create a medical *generalist* unprecedented in primary care. All of this will take several years to evolve, and therefore contemporary physician anxieties based on the expectation of precipitous change would seem unwarranted.

As a long time observer of the emergency medical care scene in Ontario, I would urge both Colleges and their adherents to get on with it. While much has been accomplished, more remains to be done, and it is toward this that we should direct our energy and resolve.

Sincerely yours,
A.C. Strickler, M.D.
Department of Occupational Health
Toronto General Hospital
101 College Street
Toronto, Ontario.

The Development of National Guidelines for Hospital Emergency Units

by David L. Martin

Background

For about 10 years, a Federal-Provincial committee has been preparing guidelines for most specialized units and services in hospitals. The most recent to be developed is the soon-to-be-published Guideline for Hospital Emergency Units.

An earlier study revealed that much work could be done to improve emergency medical services. That study resulted in a six-volume report, "Emergency Services in Canada", which has received wide distribution. It also preceded two other Federal Government publications, "Design Considerations for Hospital Emergency Departments" and the "Space Planning and Evaluation Methodology Series Volume 3, Emergency Departments".

As the information in the "Emergency Services in Canada" study was becoming dated, and as it was felt desirable to issue a consolidated guideline in the format of the other thirty plus guidelines, it was decided to convoke a temporary ad hoc group to produce a current guideline. Membership in the group was by invitation, but was designed to provide as broad a representation as possible of the many types of professional persons involved in delivering emergency health care: CAEP was represented directly by its secretary, Dr. Peter Lane. Other representatives included anaesthetists, a family physician with an interest in emergency units, a surgeon, emergency department nurses, federal and provincial emergency health service authorities as well as other emergency physicians. The author, as leader of the 1975 study and a member of the Working Group on Special Services in Hospitals, acted as chairman.

Address for reprints

Mr David L Martin
Consultant in Health Administration
Institutional and Professional Services
Health Services Directorate
Health and Welfare Canada

The Scope and Provisions of the Guidelines

The new guideline, "Emergency Units in Hospitals", does not consider in any depth pre-hospital emergency care, except for its role as one of the external elements interacting with hospital emergency units. It is hoped that a separate guideline for pre-hospital emergency care can be developed.

This guideline, besides being restricted to the emergency unit, follows the same format as the other Special Services Guidelines. Emphasis is given on assessing the hospital's and unit's capability to deliver emergency services throughout the 24 hour period, and developing community plans based on that assessment — even if it means closing down less active or less capable emergency units for some or all of the 24 hour period and redirecting traffic to units with greater resources.

Emergency units are delineated into four categories: comprehensive, major, general and basic. There is one more category than the ACEP recommendations — the basic unit, which would provide basic services to remote areas, including airway resuscitation, stabilization of a patient in shock and immediate management of major body system injuries, with protocols for transfers. Basic units may be required to operate without the physical presence of physicians.

It is not expected that many hospitals woud fit the "comprehesive" category, as even teaching hospitals may specialize or divide the patient populations by discrete specializations in major urban centres. The concept of a major hospital emergency service then is a flexible one, requiring some detailed understanding of the hospital's normal care program.

The guideline suggests that "the appropriate health authority implement a selection and referral pattern which utilizes resources in the best interests of the community", considering such factors as methods of management, prehospital service and transport capabilities, distances between facilities, non-urgent community emergency service requirements, and availability of support services and financial resources.

The guideline provides for the promulgation of policies and the establishment of appropriate communication channels. A handy reference list of policy, protocol or procedure topics requiring written notice is included as an appendix. Provision is also made for the appointment of "medical director of the emergency unit" and a unit nursing supervisor.

Detailed considerations also cover the staff establishment, coverage, and training and qualifications of all medical, nursing and other staff working in the unit. It is considered essential that all physicians working in emergency units and all unit nursing staff have BCLS. ACLS certification should be available within every hospital, 24 hours a day, from either physicians or registered nurses. In the major and comprehensive units (hospitals), physicians with ACLS should be available in the Unit.

Certification in emergency medicine (from the CFPC, RCPS or ABEM) is essential for the medical directors of major and comprehensive units, and also for other physicians working in comprehensive units, and preferred in major units. Advanced Trauma Life Support Certification will be similarly treated when it becomes widely available. Similarly, detailed qualifications have been proposed for nursing staff.

Emergency Unit categorization has also been based on the supporting medical and hospital services available to or within the unit — and these have been outlined in some detail in "check-list format" in the appendices. Similar attention is given to the physical components of emergency units. Both the distribution of various types of activity areas (treatment rooms, etc.)

From the Editor

and support areas, and equipment and design criteria for each have been included. (However, these do not supersede the "Design Considerations" or "Space Programming Methodology" manuals referred to earlier. Readers contemplating the design of new or renovated physical facilities should continue to refer to those publications.)

Distribution of the Guidelines

As the production of all guidelines is a federal-provincial endeavour, initial distribution (for the first three months after publication) to individuals and institutions in a Province is through the provincial health authority. Those wishing to obtain a copy of the guidelines as soon as they are available should contact their provincial government hospital services authority. (After three months, copies may be obtained also from Health and Welfare Canada). National organizations may obtain copies of the guideline immediately upon publication from Health and Welfare, Canada.

Copies of the "Design Considerations for Emergency Departments" and "Space Programming and Evaluation Methodology Series, Volume 3, Emergency Departments" may be obtained by writing to the Publications Coordinator, Health Services and Promotion Branch, Health and Welfare Canada, Ottawa, K1A 1B4.

Finally, any comments on the guidelines may be addressed to the author. (With the publication of the new guideline, the 6-volume report will no longer be distributed).

Are You Ready?

There's a curious anxiety among Canadian Emergency Physicians these days — they drink more coffee, fidget at meetings, have bags under their eyes and seem to be attending more and more rounds. Indeed, they even seem to be buying text books, and setting up journal clubs and study groups! You guessed it — the exams are coming!

After lobbying so vociferously for so many years for certification and recognition, many of us have suddenly found ourselves amid the quicksand of ambivalence. Soon, we'll be sitting the exams of either the Royal College of Physicians and Surgeons of Canada (RCPS) or the College of Family Physicians of Canada (CFPC). For many, it will be the first exam since the LMCC so many years ago.

In the last two issues of the Review, we have attempted to inform readers of the plans of the two Colleges. In fact, both seem to be well on the road to developing accreditation and examination procedures, all of which should be in place within the next eighteen months. So, with many of the political and bureaucratic details out of the way, Emergency Physicians must "show their stuff".

Many groups of Emergency Physicians have started study groups to go over the basic and clinical sciences necessary to prepare. How is your group doing it? Will you be ready? Do you have suggestions that would help others prepare? The CAEP Review wants to know how Canadian E.P.'s are preparing. Starting with the next issue, we hope to include suggestions from readers as to how to structure study schedules and study groups, what sorts of topics should be covered, what types of questions to prepare for, etc. So please, tell us what your group's plans are, and how you're personally preparing for . . . the EXAMS!

In this issue

The Scientific Section of this issue contains articles that will interest most Emergency Physicians. Dr. Adel Fam has produced an excellent article "Approach to Acute Monarthritis". This represents a superb, practical review of an often troublesome group of diagnostic and therapeutic problems for the Emergency Physician.

Drs. O'Connor and Dagnone have presented a useful report of their experiences managing a group of patients with spontaneous pneumothoraces. This sort of series is well within the clinical and academic capabilities of most CAEP members and we hope that many more such practical articles will come our way in the near future.

This issue's "Case Conference", edited by Dr. Charles Ramesar, deals with one of the commoner etiologies of bloody diarrhea presenting in the Emergency Department, campylobacter. "ECG Rounds" presents an often perplexing diagnostic dilemma in dysrhythmia recognition.

Mr. David Martin of Health and Welfare Canada has written a summary of the soon to be published "Guidelines for Emergency Units". This document will go a long way towards assisting physicians and health planners in the rationalization of Emergency Services and the categorization of Emergency Departments across Canada.

We hope and trust these topics are of interest to you. As always, we welcome comment and criticism. Also, again, we would particularly like to know how readers are preparing for upcoming examinations.

Scientific Section

Outpatient Management of Spontaneous Pneumothorax

by H. Michael O'Connor, M.D., B.Sc., L.E. Dagnone, M.D., C.C.F.P., A.B.E.M., T.A. Salerno, B.Sc., M.D., C.M., M.Sc., F.R.C.S.(C)*

Abstract

The experience gleaned from an ongoing study of "spontaneous pneumothoraces" presenting to our Emergency Department indentifies the feasibility of electing outpatient management in a significant proportion of these cases.

Using radiological parameters to define a pneumothorax of less than twenty percent as a "small pneumothorax" and a pneumothorax of greater than twenty percent as a "significant pneumothorax", the mangement of thirty-eight cases of spontaneous pneumothorax is present.

Ten patients presenting with "small spontaneous pneumothoraces" were discharged from the Emergency Department without needles or tube intervention. Follow-up arrangements at two to three day intervals identified complete resolution in an average of ten days without incident.

There were sixteen episodes of "significant spontaneous pneumothoraces" that resulted in hospitalization. Chest tubes were inserted and connected to underwater drainage. The average age in this group was 29.5 years. The average length of hospital stay was 5.8 days.

Twelve patient presentations of "significant spontaneous pneumothoraces" were managed as outpatients. In the Emergency Department, using local anaesthesia, chest tubes were placed and connected to a standard Heimlich valve. After securing the valve to the chest tube, the chest x-ray was repeated. The patient was then asked to return for follow-up assessment at two to three day intervals. The majority of patients were in the department for less than three hours. The average age of this group was 31.5 years.

There were no chest tube related complications in either group. With continued air leak or failed re-expansion of the affected lung after seven days of conservative management, thoracotomy was recommended. Five patients in the hospitalized group and four patients in the outpatient group underwent thoracotomy.

The Heimlich valve facilitates the management of spontaneous pneumothorax in an efficient, cost effective manner. Outpatient management for young selected individuals presenting with spontaneous pneumothorax can be pursued as an option to inpatient hospitalization.

continued on page 54

Résumé

L'expérience acquise lors de l'étude en cours de cas de pneumothorax spontanés vus à notre Service d'urgence, démontre la possibilité de choisir, dans une proportion importante de ces cas, un traitement en externe.

A l'aide des clichés radiologiques, on définit un pneumothorax de moins de 20 pour cent comme étant un "petit pneumothorax", et celui de plus de 20 pour cent, comme étant un "pneumothorax significatif". Le traitement de 38 cas de pneumothorax spontanés sont décrits.

Dix sujets atteints de "petits pneumothorax spontanés" furent congédiés de l'urgence sans thoracocenthèse. Le suivi à intervalles de deux à trois jours montre une guérison sans incident sur une période moyenne de dix jours.

Seize cas de "pneumothorax signficatifs spontanés" furent hospitalisés. On inséra des tubes de drainage thoracique scellés sous l'eau. L'âge moyen de ce groupe était de 29,5 ans et la durée moyenne du séjour, de 5,8 jours.

Douze sujets atteints de "pneumothorax spontanés considérables" ont été traités en consultation externe. Au service des Urgences, sous anesthésie locale, des tubes furent introduits dans la cage thoracique et raccordés à une valve Heimlich standard. Une radiographie de la poitrine a été refaite après fixation de la valve au tube thoracique. Le patient a été prié de revenir à la consultation pour une évaluation ultérieure à deux ou trois jours d'intervalle. En majorité, la durée de l'intervention était inférieure à trois heures. La moyenne d'âge de ce groupe était de 31.5 ans.

Aucune complication imputable au tube thoracique n'a été constatée, quel que soit le groupe. En l'absence de réexpansion ou de fuite d'air du poumon affecté au bout de sept jours de traitement prudent, la thoracotomie à été recommandée. Cinq patients du groupe des hospitalisés et quatre du groupe des non hospitalisés subirent une thoracotomie. La valve Heimlich facilite le traitement des pneumothorax spontanés d'une façon aussi efficace qu'économique. Le traitement des patients aux consultations externes pour les sujets jeunes, sélectionnés, présentant un pneumothorax spontané peut être tentée en tant qu'option à l'hospitalisation.

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INTRODUCTION

The experience gleaned from an ongoing study of spontaneous pneumothoraces presenting to our Emergency Department identifies the feasibility of electing outpatient management of a significant proportion of cases.

Spontaneous pneumothorax, as a clinical entity, is recognized in ever increasing numbers in an otherwise healthy predominantly male population[1]. In 1819, Laennec reported the first case of spontaneous pneumothorax associated with emphysematous bullae[2]. It was a further one hundred years before a large series by Kjaergaard established that spontaneous pneumothorax was not necessarily a byproduct of tuberculous lung disease[3].

There is general agreement that air leaking through the wall of a bulla into the pleural cavity results in spontaneous pneumothorax[4]. However, there is still considerable variation as to the clinical management of this problem. The majority of patients have been managed exclusively in hospital with chest tubes connected to underwater drainage until the lung showed full expansion.

This article reviews our recent experience with the outpatient management of patients presenting to the Emergency Department with spontaneous pneumothorax. Review of the literature reveals only two previous reports of outpatient management utilizing intercostal tube drainage[5,6].

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Materials and Methods

The participants in this study presented to our Emergency Department over a thirty-four month period. All cases of spontaneous pneumothorax were confirmed radiologically. Excluded from the study were all patients who had recently undergone surgery and those patients with significant pulmonary disease such as emphysema, chronic infection and malignancy. All episodes of traumatic pneumothorax were also omitted.

Using radiological parameters, all pneumothoraces were classified as "small" or "significant". A small pneumothorax indicates less than twenty percent loss of normal lung volume. If, on a PA chest film, the edge of the collapsed lung is less than one centimetre from the lateral chest wall or less than three centimetres from the apex, the pneumothorax is small.

Any pneumothorax greater than twenty percent was classified significant.

All patients with a small spontaneous pneumothorax were treated conservatively without intervention by needle aspiration or chest tube drainage. Patients returned home with arrangements for regular radiological followup.

All patients with a significant spontaneous pneumothorax were managed with chest tubes. During the first sixteen months of this study, these patients were hospitalized and underwater drainage was utilized.

More recently, outpatient treatment has been offered to all patients with significant spontaneous pneumothorax. Using local anaesthetic, a 20F or 24F chest tube is inserted into the fourth intercostal space at the anterior axillary line. The tube is immediately connected to a Heimlich flutter valve and then is sutured and taped to the chest wall. (Fig. 2) A follow-up chest film is then obtained to assess tube position and

Figure 1: Heimlich valve

lung re-expansion. Patients are given instructions to return if they have any further breathing difficulties. The majority of patients are in the Emergency Department for less than three hours. Follow-up chest x-rays are arranged in three days time. The chest tube is removed at the time of the first checkup provided there is complete re-expansion and absence of any air leak. The chest tube and Heimlich valve remain in place if these criteria are not met. Thoracotomy is recommended to all patients with failed lung re-expansion or continued air leak after seven days.

Results

A total of ten patients presenting with small spontaneous pneumothoraces were discharged from the Emergency Department without chest tube intervention. All patients re-expanded completely in an average of ten days.

Sixteen separate episodes of significant spontaneous pneumothorax occurring in fifteen patients resulted in hospitalization and the insertion of chest tubes. Chest tubes were removed after an average of 5.5 days. The average length of hospital stay was 5.8 days. There were no in-hospital complications. Five patients underwent thoracotomy for failed re-expansion or continued air leak. The average age in

this group was 29.5 years.

Twelve patients with significant spontaneous pneumothorax were managed as outpatients. Eight pneumothoraces resolved completely with outpatient treatment. The chest tube and Heimlich valve were removed after an average of 3.9 days. Four patients ultimately underwent thoracotomy for incomplete resolution of their pneumothorax. The average age in this group was 31.5 years. There were no complications of outpatient management.

Discussion

The Heimlich valve (Fig. 1) was originally described in 1968 for use in the drainage of both fluid and air following elective thoracotomy[7]. In 1974, the Heimlich valve was reported useful in the management of tension pneumothorax in neonates resulting as a complication of assisted ventilation[8]. The Heimlich

Figure 2: Heimlich valve secured to patient's chest

valve offers numerous advantages over underwater drainage. It is light weight, portable and its mechanism is simple and easily understood by inexperienced hospital personnel.

We are reporting the successful management of twenty-two of thirty-eight (58%) episodes of spontaneous pneumothorax with outpatient followup only. In 1976, Mercier reported the management of 166 of a total of 226 episodes of spontaneous pneumothorax in their outpatient clinic.

The protocol in the above mentioned study differed somewhat from ours. All males had chest tubes placed in the second interspace at the mid clavicular line. All patients in that series underwent up to twelve hours of underwater drainage prior to their discharge with a Heimlich valve. The Mercier group reported a single superficial wound infection as their only complication. There were no complications of outpatient treatment in our series.

While four of the twelve episodes of spontaneous pneumothorax initially managed as outpatients underwent thoratotomy, five of sixteen hospitalized patients required the same operative procedure. Incomplete resolution due to continued air leak or incomplete lung expansion is considered a natural course of the disease, rather than a complication.

Spontaneous pneumothorax is rarely a life threatening condition. Spontaneous hemopneumothorax has been reported in some large series[9,10]. This problem is easily recognizable and certainly merits hospitalization. Isolated reports of respiratory failure in association with spontaneous pneumothorax have been restricted to those patients with pre-existing compromise of respiratory reserve.

The likelihood of recurrence of spontaneous pneumothorax within a five year period is as high as fifty-five percent! Should the decision be made to treat a second episode of pneumothorax conservatively, we would still advocate a chest tube and Heimlich valve as the method of choice. There is considerable controversy as to whether or not operative intervention should be offered to a patient presenting with a recurrent pneumothorax.

We are now recommending that the majority of patients presenting with spontaneous pneumothorax be considered as candidates for outpatient management, provided they have none of the medical contraindications listed above.

This form of treatment has been shown to be a safe, effective alternative to inpatient hospitalization. In circumstances where it is deemed necessary to admit a patient following chest tube insertion, then the use of a Heimlich valve should significantly reduce the number of in-hospital days. The Heimlich valve facilitates the management of spontaneous pneumothorax in an efficient, cost effective manner.

This study was supported by the Ontario Heart Foundation Grant 2-4.

TABLE 1 **Management of Spontaneous Pneumothorax**

Pneumothorax	Number	Hospitalized	Outpatients
Small (<20%)	10	—	10
Significant (>20%)	28	16*	12**
Total	38	16	22

* 5 Required Thoracotomy
** 4 Required Thoracotomy

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Approach to Acute Monarthritis:

Identification of Crystals in Synovial Fluid Using Compensated Polarizing Light Microscopy

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Abstract

The more common causes of acute monarthritis are trauma, gout, pseudogout, acute infectious arthritis and monarticular rheumatoid arthritis. Synovial fluid analysis is most valuable in establishing the diagnosis. The diagnosis of gout and pseudogout can be rapidly and accurately established by microscopic demonstration of typical crystals in synovial fluid from affected joints. Basic concepts and technique for compensated polarized light microscopic examination of joint effusions for cystals, are briefly outlined.

Résumé

Les causes les plus courantes de la monoarthrite aigue sont: le traumatisme, la goutte, la pseudo-goutte, l'arthrite infectieuse aigue et l'arthrite rhumatoide monoarticulaire. L'analyse du liquide synovial est très utile pour établir le diagnostic. On peut diagnostiquer rapidement et avec précision la goutte et la pseudo-goutte grâce à l'identification au microscope des cristaux typiques présents dans le liquide synovial des articulations atteintes. Les concepts de base et la technique de l'examen au microscope optique polarisant des épanchements articulaires, à la recherche des cristaux, sont présentés brièvement.

Pain, swelling and stiffness of one joint developing over 1 - 3 days with joint tenderness, warmth and loss of function is a common presentation in the emergency room. This communication presents a systematic approach to the differential diagnosis of the patient presenting with acute monarthritis, emphasizing the important diagnostic features of the more common acute monarticular syndromes encountered in daily practice. Simple methods of synovial fluid analysis, and use of compensated polarizing light microscopy for crystal identification, are briefly discussed.

General Considerations

There are several disorders which may present as, or be associated with, acute monarthritis (Table 1).[1-5] Leading causes include trauma, crystal-induced synovitis and infection. Any form of polyarthritis, such as rheumatoid arthritis or seronegative spondyloarthropathies may also present initially with monarticular involvement. Awareness of this possibility should be kept in mind when the patient is first seen. Another point to remember is that peri- and juxtra-articular conditions such as acute tenosynovitis, bursitis, osteomyelitis, or osteonecrosis, may be mistaken for acute arthritis. The most immediate concern of the physician is the recognition of infectious arthritis; delay or failure to diagnose infection can lead to joint destruction, permanent disability or even death. Gout and pseudogout cause intense articular inflammation with severe pain and joint swelling. Prolonged disability can be avoided if diagnosis is established early and appropriate treatment promptly instituted.

Table 1: Causes of Acute Monarthritis

1. **Trauma**
Traumatic synovitis, ligamentous or meniscal tear, hemarthrosis, fracture, loose bodies.
2. **Crystal-induced arthritis**
Gout, pseudogout, calcific periarthritis/arthritis.
3. **Infectious arthritis**
4. **Inflammatory arthritis**
Monarticular rheumatoid arthritis, monarticular spondyloarthropathy e.g. psoriatic arthritis, enteropathic arthropathy, Reiter's syndrome.
5. **Spontaneous hemarthrosis**
Hemophilic arthritis,
6. **Miscellaneous and rare**
Intermittent hydrarthrosis, palindromic rheumatism, sickle-cell arthopathy, leukemic arthritis, Behcets' disease, erythema nodosum, etc.

Precise diagnosis of the type of monarthritis depends, in general, on careful analysis of historical, objective and laboratory data.[1-5] Important historical data include location of joint pain (articular versus periarticular); presence of joint swelling, stiffness or loss of function; history of trauma; previous joint symptoms or attacks of arthritis; and associated systemic or extra-articular symptoms such as fever, chills, distant focus of infection, skin rash, tophi, subcutaneous nodules, urethritis, etc. A thorough examination of the patient is essential for a precise diagnosis. The presence of a systemic or extra-articular feature may provide a diagnostic clue to the type of arthritis e.g. gouty tophi, psoriasis, etc. Careful evaluation of all joints and the spine is also important; lesser degrees of involvement in other joints may be overlooked because of the intensity of the process in one joint.

The most helpful initial laboratory studies include complete blood count, erythrocyte sedimentation rate, synovial fluid analysis (if effusion is present), rheumatoid factor, serum uric acid and urinalysis.[6] Radiographs of the affected joint should be compared to those of the contralateral normal joint.

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Radiographic examination is particularly useful in the diagnosis of acute arthritis due to trauma, pseudogout or calcific periarthritis. By contrast, radiographic abnormalities occur relatively late in the course of gout, joint infection and inflammatory arthridites. A normal radiograph, therefore, does not exclude a diagnosis of arthritis. Additional laboratory studies (e.g. blood cultures, antinuclear antibodies, serum complement, HLA antigen testing, etc) and more specialized diagnostic procedures (e.g. arthroscopy, arthrography, scintigraphy, synovial biopsy) may be required in light of historical and objective findings and initial laboratory results.

Synovial Fluid Analysis

Synovial fluid (SF) analysis is particularly useful in the diagnosis of monarthritis of acute onset.[1-8] SF, even in trace amounts, should be examined whenever there is an accessible joint effusion. Joint aspiration is a simple, safe procedure and the information gained from SF analysis may prove invaluable. The most helpful examinations on SF are gram stain, culture, microscopic examination of crystals and cell count and differential. Diagnostic possibilities based on the results of SF analysis are summarized in Table 2. Normal and non-inflammatory (Group I) fluids are clear and viscid. Fluid dropped from a syringe will string out for 5 or more cm before breaking. The mucin clot test is performed by adding a small volume of SF to 5% acetic acid. Normally, and in non-inflammatory effusions, a firm clot of protein-bound hyaluronic acid which does not break up on shaking, is formed. In most inflammatory (Group II) and septic (Group III) effusions, the fluid is turbid, the viscosity is reduced and the mucin clot is friable and fragments readily on shaking. Non-inflammatory fluids have a low leukocyte count ($<2000/mm^3$ with $<25\%$ neutrophils). The count is usually high ($>2000/mm^3$ with $>25\%$ neutrophils) in inflammatory and septic effusions.

Table 2: Diagnostic Possibilities from Synovial Fluid Analysis in Acute Monarthritis

I. **Group I (non-inflammatory)SF** (high viscosity, firm mucin clot, WBC $<$ $2000/mm^3$, PMN $<25\%$)
1. Trauma: Traumatic synovitis, ligamentous or meniscal tear, loose body
2. Subsiding or early inflammatory arthritis, RA

II. **Group II (inflammatory)SF** (low viscosity, poor mucin clot, WBC $>$ $2000/mm^3$, PMN $>25\%$)
1. Crystal-induced arthritis: gout, pseudogout
2. Monarticular rheumatoid arthritis
3. Monarticular spondyloarthropathy: psoriatic arthritis, enteropathic arthropathy, etc.

III. **Group III (septic)SF** (low viscosity, WBC $>50{,}000/mm^3$, PMN >50-75%, positive gram stain and/or culture)
Infectious arthritis

IV. **Group IV (hemorrhagic)SF** (Sanguinous, viscosity, WBC and PMN % variable) Spontaneous hemarthrosis due to hemophilia or other bleeding disorders or intra-articular pathology.

Examination of SF by Compensated Polarizing Light Microscopy:
Compensated polarizing light microscopy (cPLM) provides a rapid and precise technique for the identification of crystals in SF.[9-13] A detailed description of the optical principals of polarized light is beyond the scope of this communication. The following is a brief, simplified outline of the basic concepts and technique for cPLM examination of SF.

The polarizing microscope (Figure 1) is equipped with 2 conventional polarizing filters and a first-order red compensator. An ordinary microscope

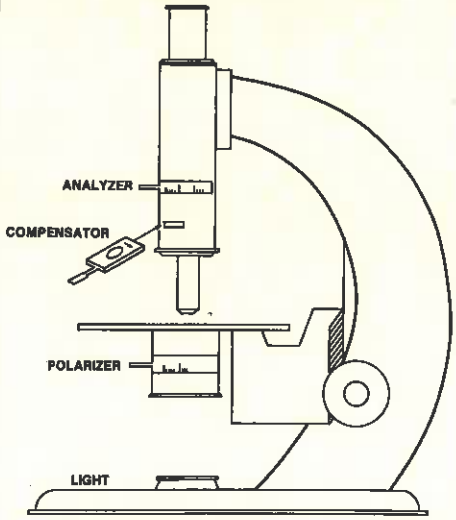

Figure 1: Polarizing microscope with polarizer, analyzer and compensator.

can be equipped with a "polarizer" filter placed between the condenser and light source, and an "analyzer" placed above the objective. A substitute compensator can be made by applying 2 layers of transparent cellophane tape on a glass slide and placing it on top of the polarizer.[14,15] Polarizing filters permit light to pass in a single plane as if through the slots in a grid. Thus, white light passing upward through the polarizer becomes orientated into a single plane (A_____A in Figure 2). A second polarizing plate (analyzer) is placed between the specimen and the examiner's eye.

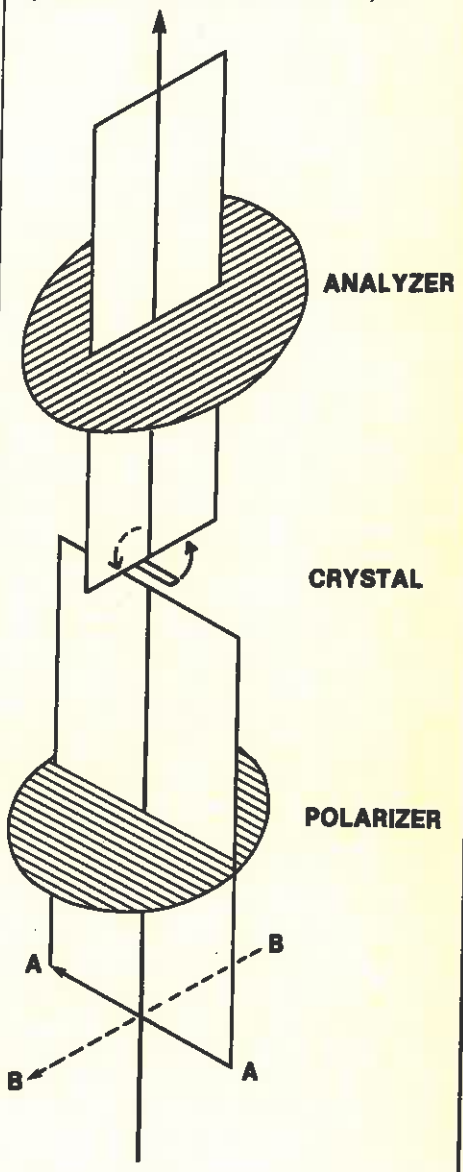

Figure 2: A simplified analysis of light path in polarizing microscope: polarizer and analyzer are at 90° to each other (see text).

When the axes of transmission of the 2 polarizers are perpendicular to each other (A_____A and B_____B in Figure 2), no light passes through and the background appears dark. A crystal placed in the light path between the polarizer and the analyser, will alter the direction of plane polarized light leaving the polarizer. Upon striking the birefringent crystal, the light is split into 2 refracted rays (Figure 3): "slow" ray with greater angle of deviation and "fast" ray with a lesser angle of bending from the optic axis. As can be imagined, a portion of light emerging from the

crystal, especially the slow ray component, will be rotated enough to pass through the analyzer. The analyzer repolarizes the emerging light before bringing it to the observer's eye. That

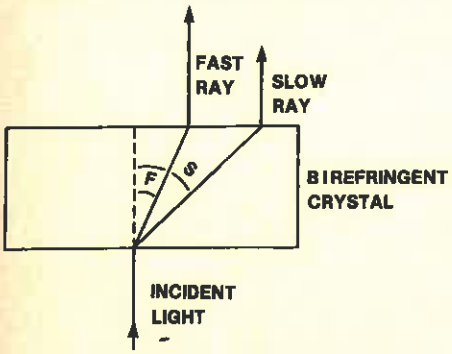

Figure 3: Incident polarized light is resolved into fast and slow rays upon striking a birefringent crystal.

portion of light that has been rotated by the crystal will, therefore, reach the eye and appear bright against the dark background. Most crystals are "birefringent" i.e. they are capable of resolving polarized light into 2 perpendicular planes vibrating at different angles from the incident ray.

The compensator is merely a more efficient birefringent filter. A first-order red compensator retards red light and the polarized background becomes red instead of black. The microscope is set so that the planes of vibration of the polarizer and analyzer are at 90° to each other. The compensator is placed between the polarizer and analyzer with its optic axis at 45° to both polarizing lenses. The axis of slow vibration of the compensator is indicated by an arrow (Figure 1).

Technique of Examination of SF by cPLM for crystals If crystal-induced synovitis is suspected, it is important to examine all SF specimens for crystals. A definitive diagnosis can often be made on a tiny drop of SF from the tip of the aspirating needle. A drop of SF is placed on a clean glass slide and a coverslip is mounted over the specimen. The wet, unstained smear, is first examined without polarized light and the number of white and red cells noted. The polarizer and analyzer are then applied and the polarizer rotated until the darkest possible microscopic field is obtained. The specimen is first scanned for birefringent material using low power. Crystals are distinguished from dirt or other contaminating materials by their symmetry, parallel straight edges and homogeneous appearance. They are never jagged, rounded or curved. Once located, a crystal can be identified by inserting the red compensator. Note is made of the crystal's shape, colour and direction of its long axis in relationship to the axis of the compensator. The marked axis of slow vibration of the compensator, is mentally projected onto the stage, and the specimen slide (or stage) is then rotated till the examined crystal becomes parallel with the axis of the compensator. Blue colouration of the crystal in this position signifies "positive birefringence" and yellow, "negative birefringence". A positively birefringent crystal will turn yellow when its long axis is perpendicular to the axis of slow vibration of the compensator, while a negatively birefringent crystal will become blue in the comparable position.

Pathological Crystals in Synovial Effusions

1. **Monosodium urate (MSU) crystals** Intra- and extracellular MSU crystals are seen in SF obtained during an attack of gouty arthritis. The crystals (Figure 4) are needle-shaped, 2-20 μ in length and exhibit strongly negative birefringence.

2. **Calcium pyrophosphate dihydrate (CPPD) crystals** are found in SF during an attack of pseudogout. The crystals (Figure 5) show weakly positive birefringence. They are smaller in size (0.5 - 10 μ), and are more variable in configuration. They are commonly rhombold-shaped but may assume needle, rectangular, or rod forms.

3. **Dicalcium phosphate dihydrate (DCPD) crystals** are occasionally found in association with CPPD crystals in patients with pseudogout. They may rarely cause acute arthritis.[16] The crystals are rod-shaped, 0.5 - 4 μ in length, and exhibit strongly positive birefringence.

4. **Cholesterol crystals** appear as large, flat, rectangular or square-like plates with one or more notched corners, 10 - 80 μ in size (Figure 6). The notched appearance results from irregular stacking of the crystals and their tendency to adhere to one another. The crystals variously demonstrate weakly positive and negative birefringence. Rod- and small needle-shaped cholesterol crystals, 1 - 5 μ in size are rarely observed.[17] Cholesterol crystals are occasionally found in rheumatoid, and less frequently, osteoarthritic joint effusions.[17] There is no known acute articular syndrome associated with these crystals.

5. **Hydroxyapatite (HA) crystals** identification of HA crystals in synovial effusions is extremely difficult.[18] The crystals are usually present in small amounts, their size is below the limits of resolution of light microscopy (50 - 200 × 5 - 20 nm), and they are non-birefringent unless aggregated along the same axis. The crystals can be identified by x-ray

Figure 4: Synovial fluid from a joint involved with acute gout. Monosodium urate crystals within a neutrophil.

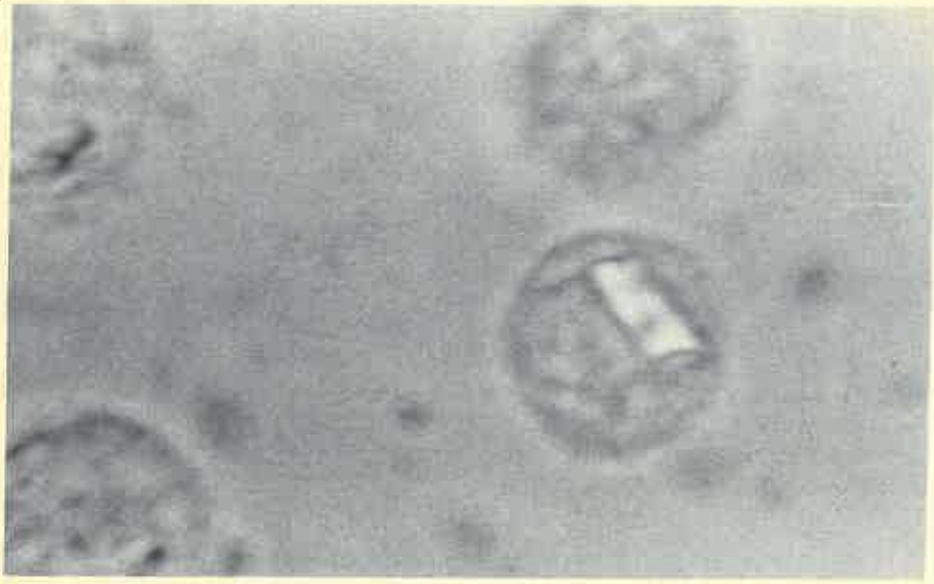

Figure 5: Synovial fluid of a patient with acute pseudogout. Phagocytosed calcium pyrophosphate dihydrate crystal.

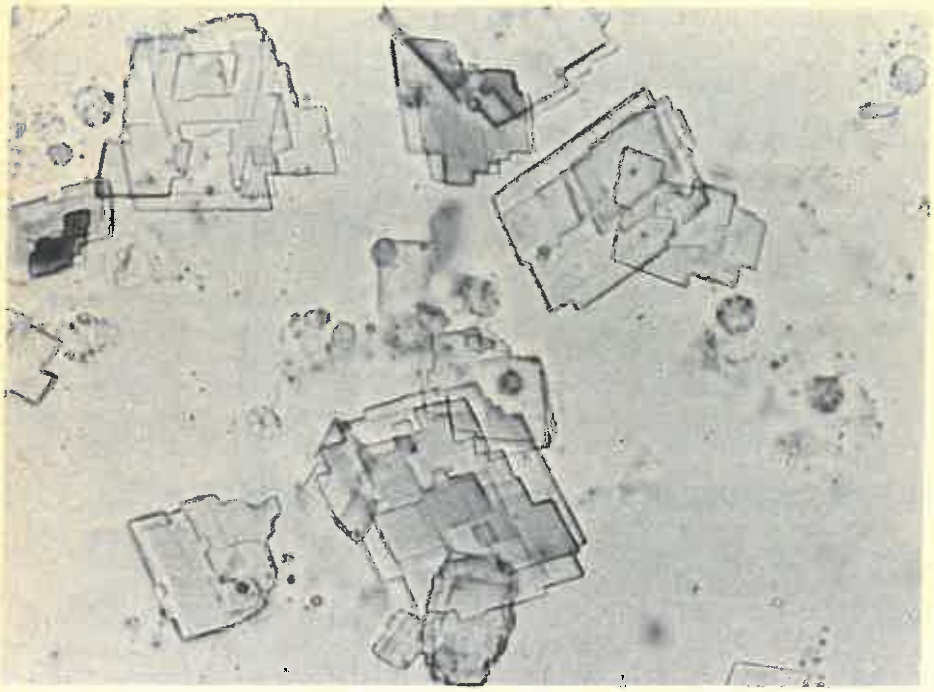

Figure 6: Cholesterol crystals in synovial fluid.

powder difraction analysis, transmission and scanning electron microscopy (Figure 7) and energy-dispersive x-ray analysis. Deposition of HA crystals in and around the joints is associated with the syndrome of acute calcific periarthritis/arthritis.

Other Crystalline and Birefringent Materials Most steroid preparations used for intra- and extra-articular injections are suspensions of corticosteroid esters. Injection of these suspensions may occasionally produce a transient, self-limited, crystal-induced inflammatory synovitis, designated "post-injection flare".[19] Microscopic examination of SF from joints recently injected, may demonstrate these corticosteroid crystals. For example, methyl prednisolone acetate (Depo-Medrol) crystals appear as extracellular or phagocytosed small, rounded or pleomorphic fragments which tend to clump together (Figure 8).[20] They exhibit strong birefringence but have no definable longitudinal axis; thus their sign of birefringence cannot be determined.

Other crystalline materials which may closely simulate MSU or CPPD crystals include insolubilized crystalline anticoagulants used for SF collection e.g. calcium oxalate,[21] ethylene-diaminetetracetic acid (EDTA)[11] or lithium heparin.[22] Other artifacts which might be mistaken for crystals include dirt particles, scratches on glass slide and coverslip, cartilage fragments or collagen fibrils in degenerative arthritis, birefringent congo red-positive "amyloid bodies" in amyloid arthritis,[23] and fragments of metal[24] or methyl methacrylate bone cement[11] after prosthetic arthroplasty.

Data Synthesis and Differential Diagnoses In the majority of patients, a reasonable differential diagnosis can be formulated after the initial examination and results of SF analysis. Diagnostic possibilities, based on the results of SF examination are outlined in Table 2. While it is not practical to give details on all possible disease processes, the following is a brief summary of the more common causes of acute monarthritis encountered in practice.

I. **Trauma**

Joint swelling with or without hemarthrosis may result from trauma, particularly if the injury involves ligamentous or meniscal tear, or dislocation or fracture in the area of the joint. A history of trauma can usually be obtained but occasionally, the injury may have been so minor an event that it is forgotten, or it may not be recalled for other reasons such as alcohol or seizure. When available, SF is non-inflammatory (Group I). An impacted loose body may also result in acute, painful swelling of a joint. Radiographs are usually helpful but arthroscopy may be necessary for diagnosis.

Trauma is also a frequent precipitating factor in gout and pseudogout. In these disorders, however, there is usually a time lag of several hours or days between the injury and onset of joint swelling, whereas in traumatic arthritis the pain and swelling immediately follow the injury. Minor trauma may also bring a pre-existing condition to patient's attention e.g. Reiter's disease, psoriatic arthritis.

II. **Crystal-induced Synovitis**

1. **Acute gout** Gouty attacks tend to affect joints of the lower extremity particularly the metatarsophalangeal joint of the great toe. The acute arthritis often peaks within 24 hours producing a warm, red, tender joint with inflammation of the surrounding soft tissue resembling cellulitis. Middle aged and elderly men are

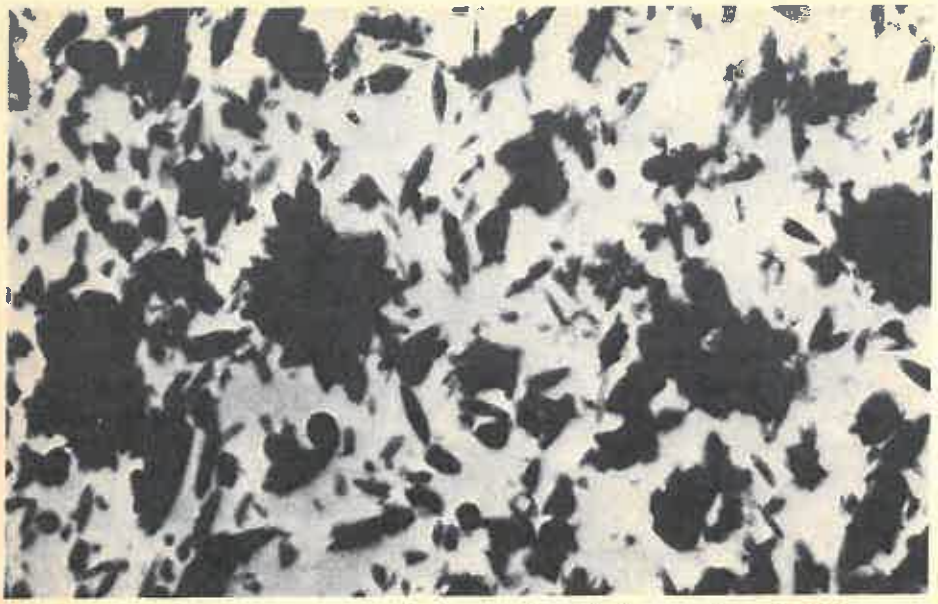

Figure 7: Transmission electron micrograph of aggregates of hydroxyapatite crystals (× 44,000).

Figure 8: Methyl prednisolone acetate crystals.

commonly affected and the disease is rarely seen in premenopausal women. A history of previous attacks can sometimes be obtained and family history may be positive. Most patients have hyperuricemia, although the serum uric acid level may be normal particularly during the initial stages of the disease and in patients receiving allopurinol or uricosuric drugs. The diagnosis can be firmly established by identification of MSU crystals in SF from affected joint.

2. **Acute pseudogout** Pseudogout is a relatively common arthritic disorder that occurs most often in elderly patients. Men and women are almost equally affected. The knees and wrists are the most commonly involved joints.[25] The acute inflammation resembles gout, hence the term "pseudogout". Calcification of hyaline and fibrous articular cartilage (chondrocalcinosis) is the radiologic hallmark of the disease. SF is typically inflammatory (Group II) and the diagnosis depends on detection of CPPD crystals in joint fluid. In a minority of cases, pseudogout is associated with hyperparathyroidism or hemochromatosis.

3. **Acute calcific periarthritis/arthritis** This is a less common type of crystal-induced arthritis which results from deposition of HA crystals in and around the joints. The syndrome is characterized by articular or periarticular inflammation associated with transient juxta-articular radiologic calcific desposits.[18] The shoulders and hips are the most commonly affected joints followed by knee, elbow, wrist, metacarpophalangeal and metatarsophalangeal joints. It produces acute inflammation with severe pain, swelling and redness of a joint that can closely mimic gout, infectious arthritis or cellulitis. The acute inflammation is usually associated with transient periarticular radiologic calcific deposits. When available, SF is either Group I (non-inflammatory sympathetic effusion from periarticular inflammation) or II (inflammatory). cPLM may reveal "shiny coin" bodies or neutrophils with phagocytosed ovoid bodies. Definitive identification of HA crystals in the SF or periarticular deposits can be made by electron microscopy and x-ray powder diffraction analysis.

III. **Acute Infectious Arthritis**
This is the most threatening of the acute monarthritides, because, if untreated, it can lead to joint destruction and systemic complications. The infection is usually associated with intense local inflammation, fever, chills, peripheral and synovial fluid leukocytosis. It commonly affects large joints although small joints of hands and feet are occasionally involved. In adults, the gonococcus is the most common cause of infectious arthritis. Other causative organisms include staphylococcus aureus, streptococcus, pneumococcus, meningococcus and gram-negative bacilli.[26] Infectious arthritis should be suspected if the patient is either young or old, if there is pre-existing joint disease, a primary focus of infection (e.g. pneumonia, bacterial endocarditis) or a debilitating illness (malignancy, diabetes, alcoholism, drug abuse, etc.). The diagnosis can be established by demonstration of micro-organisms on gram stain or culture of SF, blood cultures and cultures from primary site of infection.

IV. **Inflammatory Arthritides**
The patient presenting with acute monarthritis may represent the early phase of a disease which, with time, will involve several joints or evolve into a chronic arthritis.

1. **Monarticular rheumatoid arthritis** Rheumatoid arthritis (RA) may remain localized to a single joint for a variable period of time before other joints become involved.[27,28] It usually presents as acute or subacute monarticular arthritis, especially of the knee, in a young woman. Early diagnostic clues include inflammatory (Group II) SF, low SF complement, a positive rheumatoid factor in serum and/or SF, and synovial biopsy showing synovial lining cell hyperplasia, villous hypertrophy and subsynovial infiltrates of lymphocytes and plasma cells.

2. **Monarticular spondyloarthropathy** The seronegative spondyloarthropathies comprise ankylosing spondylitis, psoriatic arthritis, Reiter's syndrome and enteropathic arthropathy (arthritis of inflammatory bowel disease). Acute monarthritis may rarely occur in any of these conditions as the initial event or as recurrent episodes of arthritis. When available, SF is usually inflammatory. In this group of diseases, tests for rheumatoid factor are characteristically negative in both serum and SF and the diagnosis usually depends on associated clinical features e.g. spondylitis, psoriasis, urethritis, conjunctivitis or colitis.

V. **Miscellaneous arthritic conditions that may present as monarthritis**

1. **Spontaneous hemarthrosis** Non-traumatic, intra-articular hemorrhage is an uncommon cause of a warm, painful joint. The diagnosis is suggested by the finding of a bloody effusion. Leading causes include hemophilia, other bleeding disorders, villonodular synovitis and primary and secondary joint neoplasms.

2. **Intermittent hydrarthrosis** This rare disorder is characterized by periodic attacks of monarticular effusion occuring at regular intervals every 1 to 4 weeks. Local signs of inflammation are usually minimal or absent. The knee is the most commonly affected joint. SF is group I or II and laboratory values are often normal.

3. **Palindromic rheumatism** is another rare arthritic disorder characterized by irregular episodes of severe joint pain, swelling, redness, tenderness and stiffness developing spontaneously and lasting 3 to 7 days. Joints most commonly affected are wrists, hands, knees and ankles. A history of such repeated episodes is suggestive of the disease. SF is non-inflammatory. Up to one-third of these patients progress to develop typical rheumatoid arthritis.

4. **Behcet's disease** Behcet's disease is a rare cause of acute, intermittent monarthritis. The diagnosis is based on associated extra-articular features such as aphthous stomatitis, recurrent genital ulcers, iritis, pyoderma, arthritis and vascular and neurologic abnormalities.

Summary

Acute monarthritis presents a frequent problem in the emergency room. Leading causes include trauma, gout, pseudogout, infectious arthritis and monarticular rheumatoid arthritis. The many etiologies of acute monarthritis require an orderly approach to differential diagnosis. The diagnosis rests upon a detailed history, examination of affected joints, other joints and of the patient as a whole, and on a few carefully selected laboratory studies including radiographs of affected joint and synovial fluid analysis.

Synovial fluid analysis is the key to the diagnosis of acute monarthritis. Examination for gram stain and culture and for crystals by compensated polarizing light microscopy can provide early diagnosis in a large percentage of cases. Other synovial fluid findings are less helpful but serve to limit the diagnostic possibilities and allow categorization into the appropriate major group. If synovial fluid is unobtainable, a diagnosis can usually be made from other aspects of the clinical presentation, aided by laboratory and radiological investigations. (for instance, gonococcal arthritis, in a young woman with history of exposure, characteristic skin lesions and organisms isolated from primary site; gout in a middle aged man, with history of previous attacks, podagra and hyperuricemia).

If an early diagnosis cannot be made, and if infection, crystal-induced arthritis and intra-articular hemorrhage have been ruled out, it is sufficient, under these circumstances, to treat the patient symptomatically with rest to the affected joint and a non-steroidal anti-inflammatory drug and await the results of laboratory studies. Blind management, empirical use of antibiotics and unjudicious intra-articular steroid injections must always be avoided. If the diagnosis is not apparent after 1 to 4 weeks of observations, in addition to the initial work-up, other more specialized diagnostic procedures such as arthroscopy or synovial biopsy may be required.

Acknowledgement

The author wishes to thank Mrs. Janet Hays for excellent secretarial assistance.

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continued on page 68

Case Conference

Campylobacter Enterocolitis

by James L. Tomarken, M.D.*

Case Report

A 24-year-old male presented to the Emergency Department in January of 1982 complaining of headache, fever, and diarrhea of three days duration. The patient seemed confused, in that he was uncertain as to how he got to the Emergency Department, and why he had come on that night. He thought that he had been watching television with his friends who had urged him to seek medical attention because of his feeling unwell.

He recalled not feeling well for approximately one month with intermittent hot and cold feelings which had been diagnosed as "the flu". In addition, he had been home to a rural area one week prior to coming to hospital, at which time he had visited a friend on a sheep farm, spending some time where the sheep were kept. He had been taking only enteric coated aspirin for his present 3 day illness.

Past medical history revealed a similar illness approximately one year previously. He had had a lumbar puncture performed at that time which was normal, and the diagnosis had been made of "meningismus".

On examination, the patient was toxic looking with a temperature of 39.4°C. Vital signs were stable and he was not dehydrated. There were no abnormalities on physical exam, specifically the abdominal examination was unremarkable. On assessment of mental status, he was slow and imprecise in his answers, but oriented in all three spheres.

The lab data revealed a normal hemoglobin, white blood cell count, blood sugar, electrolytes, BUN and urine. As well, a chest X-ray and EKG were normal. A lumbar puncture was normal, including normal protein and sugar levels and cell count. Blood and stool cultures were taken.

Forty-eight hours after admission the stools were positive for *Campylobacter jejuni*. The patient was treated with oral Erythromycin for ten days. He was discharged home after 4 days, completing his treatment and full recovery at home.

General Discussion

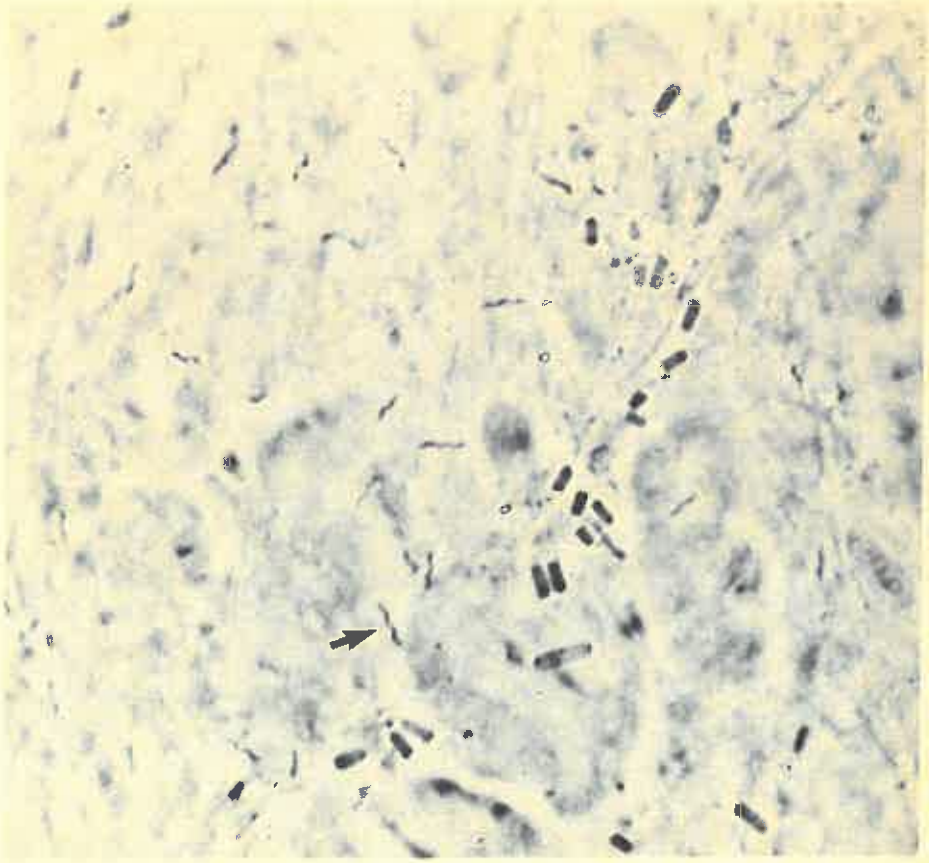
This case represents one of the less common situations where antibiotics are beneficial in the treatment of acute infectious diarrhea.

Campylobacter jejuni, previously known as "related" vibrios, is a gram-negative rod which has been known to exist since 1931.[1] In 1972 it was first isolated from stool.[1]

There are two species of *Campylobacter* that are implicated in human disease. *Campylobacter jejuni* is the more common organism with its major manifestation being enterocolitis. *Campylobacter fetus* subspecies *fetus* is often associated with abortions in sheep and cattle, as well as bacteremic illnesses in compromised patients.

Campylobacter jejuni is now one of the commonest identifiable causes of bacterial diarrhea and there are now cases reported secondary to consumption of unpasteurized milk, contaminated water, contact with domestic animals (commensal in the intestinal tract of sheep), and ingestion of contaminated chicken.[1] Person to person transmission is rare.

Campylobacter enterocolitis has shown a gradual rise since 1977 due to the increasing awareness of, and facility in,



Gram stain of Campylobacter je juni

*Emergency Department
Toronto General Hospital

isolating the organism. *Campylobacter* and *Salmonella* are the commonest causes of bacterial diarrhea with *Shigella* and *Yersinia* much less common.

The age group of 0-5 year olds seems to have the highest reported incidence. No age group is exempt, but the actual incidence is difficult to estimate because of the self-limited nature of the disease and the higher incidence of children seeking medical attention.

The most common presenting symptoms are fever, crampy abdominal pain and diarrhea which can be bloody. Headaches and myalgias can be present. Less commonly, seizures, associated with meningitis, have been noted in children.

The organisms have an incubation period of 2-11 days, averaging 2-5, with *Salmonella's* being shorter – 1-3 days. This difference can be helpful in establishing the diagnosis.

There are usually no specific physical findings. Stools may be positive for occult blood and a wet preparation of fresh stool stained with Wright stain, may show white blood cells. When viewed with a phase contrast microscope, stool, gram stained with carbol-fuchsin counterstain, has shown a high yield of the curved spiral morphology of the *Campylobacter* organism. (Arrow – Figure 1) A higher yield has been reported with "grossly bloody or exudative stools".[3] Blood cultures and an elevated white blood cell count are found in 1/3 of patients.

Sigmoidoscopy can demonstrate a spectrum of pathology from normal mucosa to a red friable edematous colitis with crypt abscesses, a picture indistinguishable from acute ulcerative colitis.

Bacterial diarrhea can be caused by either an enterotoxin, as in cholera, or by invasion of the bowel wall, as in *Shigella*. *Campylobacter* is similar to the invasive diarrheas in its clinical symptomatology and pathology.

Treatment

Antibiotics are not routinely used for acute infectious diarrhea because the disease is usually self limited. *Campylobacter* enterocolitis usually lasts for only a few days.

Campylobacter jejuni is sensitive, in vitro, to erythromycin, tetracycline, chloramphenicol and the aminoglycosides. Erythromycin is the drug of choice for the treatment of *Campylobacter* enterocolitis. It appears to decrease the severity and length of the illness, as well as clearing the organism from the stool. In Canada, 1% of *Campylobacter* strains are resistant to erythromycin, with 10% resistance noted in other parts of the world.

Fifteen percent of *Campylobacter* strains are resistant to tetracycline. It should not be used in children because of the high incidence of resistance and its teeth staining properties.

Aminoglycosides are not effective when given orally and their parenteral use is usually reserved for the more serious forms of the disease.

Erythromycin is therefore safe to use, without antibiotic sensitivity, because of the small number of resistant strains. For children, the erythromycin estolate is used in doses of 25-50 mg/kg/day in three divided doses for 7-10 days, while adults are given the stearate at a dosage of 250-500 mg qid for 7-10 days.

Two special situations deserve mention. First – exacerbations of ulcerative colitis may be due to *Campylobacter jejuni*. This would require antibiotic rather than steroid treatment. Secondly – *Campylobacter jejuni* can cause acute infectious diarrhea in pregnant women, especially in the last trimester. Since the organism can be secreted in the stool for up to two months, it can be a source of neonatal infection and amenable to treatment.

The complications of *Campylobacter* infections are not common but can be life threatening. The list includes: 1) dehydration, 2) acute abdomen causing unnecessary operations, 3) bacteremia, 4) post infectious arthritis and Reiter's Syndrome, 5) meningitis, 6) lower G.I. hemorrhage, 7) convulsions, and 8) cholecystitis.

Question:

Which cases of Campylobacter enterocolitis require antibiotic treatment?

Comment:

The majority of patients will recover spontaneously. Apart from the situations mentioned above which require antibiotic treatment, those cases of enterocolitis that are prolonged or severe should be treated as well. Generally, in-patients are treated while out-patients are not.

The author would like to acknowledge the assistance of Dr. M. A. Karmali, Department of Microbiology, The Hospital for Sick Children, Toronto.

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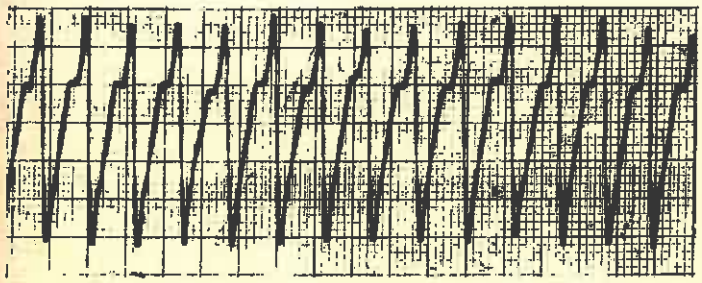
ECG Rounds

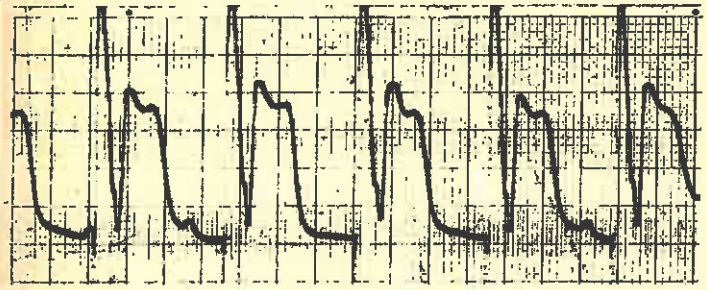
Case I

A 65-year-old female presented in the Emergency Department having been sent in from her cardiologist's office. She had gone to him complaining of her heart racing and feeling lightheaded. She had awakened with this sensation, and it had now persisted for 6 hours. Her only medication is Pronestyl, and she had a pacemaker inserted 2 years ago.

BP 100/60 P: regular, around 300



Case I: rhythm strip A

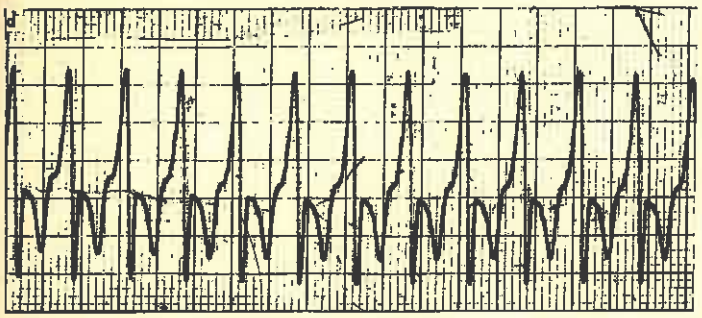


Case I: rhythm strip B

Case II

A 39-year-old male arrived in the Emergency complaining of a rapid heart rate of 3 hours duration. He has had similar episodes in the past, but they usually resolve spontaneously over 15 or 20 minutes. He has never before sought medical help with regards to these episodes. He is not on any medications, and has no history of cardiac problems.

BP 110/70 P: around 200



Case II: rhythm strip

See page 68 for interpretation of results

ECG Rounds

Acute Monarthritis from page 64

EGG Rounds — Interpretation

Case I

Rhythm strip A

Rate: 300
Rhythm: regular
P waves: not identified
QRS: wide (greater than .12), slurred
ST segments: not identified
Rhythm strip: post Lidocaine 100 mg bolus and drip at 3 mg/min

Rhythm strip B

Rate: 93
Rhythm: regular, paced
P waves: not correlated with QRS
QRS: greater than .12

Impression: The initial rhythm strip could represent PAT with aberrant conduction, although a more likely diagnosis would be ventricular tachycardia. Following the lidocaine injection, there is a paced rhythm with a ventricular response of 93.

The most important point in regard to this difficulty in differentiating these two arrhythmias is that if doubt arises, they should be managed as being ventricular in origin. Carotid massage and valsalva manoevre will not create any difficulty and should be attempted; however, if these are not successful, pharmacological agents are used which would be appropriate for a ventricular arrhythmia, and cardioversion may be necessary.

Case II

Rate: 215
Rhythm: regular
P waves: appear to occur in upstroke of the S-wave at rate of 215
QRS: 12
ST: depressed 4 mm
T: upright

Impression: PAT. This is based on the narrow QRS complexes, P waves, regularity of the rate and the clinical setting.

Points which can be used to differentiate between PAT with aberrancy and ventricular tachycardia include:

1. Clinical setting and history — V-tach rare without CAD
   previous episodes and response to therapy
2. Rate — V-tach usually less than 220-250
3. Rhythm — perfect regularity favours PAT
4. Fusion beats — very useful when present
5. Response to carotid massage/valsalva — none with V-tach
   PAT may respond
6. Previous ECG's — may demonstrate BBB as having previously been present.
7. P-Waves — in PAT usually occur 1:1 with QRS complexes either before, during, or after the QRS complex
   — In V-tach: If identifiable, the atrial rate is different from the ventricular rate and the P-waves are not correlated with the QRS complexes
   — special leads may bring P waves into evidence (esophageal leads)

See page 67 for ECGs and Case Histories

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Noticeboard

Emergency Physicians

Applications are invited for full-time positions in the Department of Emergency Medicine at a Univ. of Toronto Teaching Hospital, commencing Aug. 1st, 1982.

Responsibilities will include thirty-two hours of clinical medicine weekly with teaching and research responsibilities.

Applicants should be career oriented and have appropriate residency training and/or extensive emergency department experience.

Please forward applications with curriculum vitae and three references to:

Dr. I. G. Hastie,
Chief,
Department of Emergency Medicine,
Wellesley Hospital,
160 Wellesley Street East,
Toronto, Ont.
M4Y 1J3.

Advanced Cardiac Life Support —

Ottawa, Ontario

Canadian Heart Foundation ACLS Provider Certification Course, co-sponsored by Algonquin College and Emergency Physicians of Ottawa, May 14, 15, 16, 1982. Course particulars can be received by contacting:

Wayne Lewrey, E107,
Algonquin College,
1385 Woodroffe Avenue,
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Opening for full time physicians starting July 1, 1982. Remuneration by the shift at approximately $34 per hour. Very comfortable pace. Must have ACLS and Ontario Licence.

For information contact Dr. C. Winegard, Director of Emergency Departments, Sarnia General Hospital and St. Joseph's Hospital, c/o Sarnia General Hospital, 220 Mitton Street North, Sarnia, Ontario.

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Victoria Hospital Corporation, London, Ontario, is seeking applications for Chief of the Department of Emergency Medicine.

The hospital is an 864 bed hospital affiliated with The University of Western Ontario and there are approximately 60,000 patient visits per year to the Emergency Department.

In addition to a clinical commitment, the successful candidate will assume administrative duties and will be responsible for co-ordinating teaching at both undergraduate and postgraduate levels within the Department. The candidate will be eligible for an academic appointment within the Department of Medicine.

Remuneration is negotiable and will be based upon qualifications and experience. Forward application with Curriculum Vitae to Dr. J.D. Brown, c/o Victoria Hospital Corporation, 375 South Street, London, Ontario N6A 4G5.

Emergency Physicians

Full-time position for career oriented emergency physician, in Welland County General Hospital, located in the Niagara Peninsula. Competitive salary, 4 weeks vacation. Apply in writing to Dr. G.J. Alexander, President; Welland Emergency Associates, c/o Welland County General Hospital, Third Street, Welland Ont., L3B 4W6.

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Sponsored by McMaster University and the Hamilton Academy of Medicine.

This course will include lectures as well as a selection of early morning and late afternoon workshops.

Workshop Topics — Cadaver lab, cardiology, radiology, practical sessions, dog lab and suture lab, critical care workshop.

Speakers — Drs. A. Abraham and A. Jarvis, Toronto. Dr. P. Safar, Pennsylvania, Dr. W.A. Gent, Kingston, Dr. J.R. Roberts, Pennsylvania and distinguished local faculty.

Fees full programme (excluding workshops) $210.00. Daily Rate — $55.00, Workshop fees — $75.00 — $125.00 each. Dates — April 19-23, 1982.

For more information, please call Programme in Continuing Medical Education, McMaster University (416) 525-9140, Extension 2219.

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A Medical Director is required for the Emergency and Ambulatory Department of a 310 bed acute treatment general hospital. The Department deals with approximately 65,000 cases a year and is the 24 hour emergency centre for the Region.

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700 Paris Street
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High volume tertiary care Emergency Department affiliated with McGill University in Montreal seeks Emergency medicine graduate or minimum 3 years full time experience.
Package includes 4 weeks vacation plus 1 week conference.
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Candidate must be bilingual, and have ACLS, CMPA and Quebec Licence.
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Advances in Emergency Care

July 11-14, 1982:
Advances in Emergency Care
Ninth Michigan Emergency Medicine Assembly

Michigan ACEP will host its Ninth Emergency Medicine Assembly at the Grand Traverse Hilton, located 6 miles northeast of Traverse City, Michigan.

The three and one-half day program will review recent advances in cardiopulmonary resuscitation, neurological emergencies with emphasis on cerebral resuscitation, acute infectious diseases, and newer modalities useful in the evaluation of abdominal pain. Regional participation in clinical pathological conferences is shared once again by emergency medicine residency programs in Michigan, Ohio, Wisconsin, Illinois and Indiana.

Program Chairman Richard M. Nowak, M.D., of Henry Ford Hospital's Department of Emergency Medicine invites the submission of abstracts of original, unpublished scientific papers for presentation during the Assembly. Deadline for submission of abstracts is May 1, 1982.

Application for CME credit will be made to the American College of Emergency Physicians, the American Association of Osteopathic Physicians and Surgeons, the American Academy of Family Physicians, and the Michigan Department of Public Health.

The Orient 1982

Emergency and Primary Care in Peoples Republic of China, Japan, Hongkong, and Thailand, June 7-25, 1982. Sponsored by the Institute for Emergency Medical Education and Washington Chapter American College of Emergency Physicians. Contact:
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ACEP, AAFP, AMA and Nursing credit in process.

Emergency Update

Third Annual Postgraduate Course in Emergency Medicine

Dates: April 19-23, 1982

Sponsored by McMaster University and the Hamilton Academy of Medicine

Location: McMaster University Medical Centre, Hamilton Ontario

Contact: Continuing Medical Education McMaster (416) 525-9140 Ext. 2219

Upcoming Meetings

"6th Annual Course on Emergency Management"

Dates:
Friday April 30th, 1982
Saturday, May 1st, 1982
Sunday May 2nd, 1982

Site:
Skyline Hotel,
Dixon Road & Highway 27,
Toronto, Ontario

Sponsor:
Toronto Western Hospital,
Emergency Associates

Contact:
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c/o Mrs. Anne Grant,
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