

THE NOVA SCOTIA MEDICAL BULLETIN

EDITORIAL BOARD

Editor-In-Chief
Dr. J.F. O'Connor

Associate Editor
Dr. A.C. Irwin

Dr. A.J. Buhr
Dr. J.A.R. Tibbles
Dr. J.P. Welch
Dr. W. Putnam
Dr. T.J. Murray

Managing Editor
Mr. D.D. Peacocke

Editorial Assistant
Mrs. T. Clahane

Guest Editor: Dr. A.J. Buhr

Founding Meeting Atlantic Provinces Orthopaedic Society



(Left to right) Drs. John C. Acker, Halifax, Bernie Miller, Halifax, E. Wilson Ewart, Moncton, O. John White, Moncton, Ted Shapter, St. John's, Tom Acker, Halifax, and Kal Seaman, Saint John.

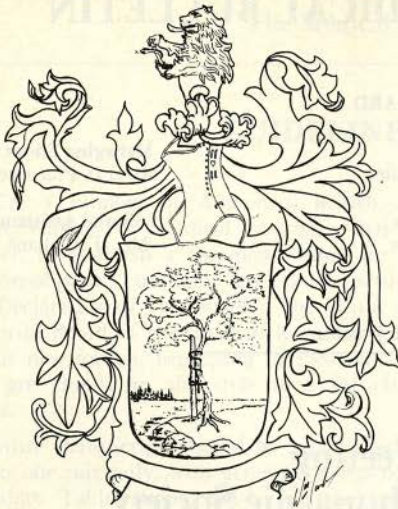
On a very cold and stormy night on the 23rd of January 1960 the above orthopaedic surgeons from all over the Atlantic Provinces gathered together in Moncton, New Brunswick, to form a Society of orthopaedic surgeons dedicated to the advancement of orthopaedics throughout the area. Realizing that personal contact between the various practising surgeons was of great importance, the Society very wisely included their wives who have contributed greatly to the furtherance of social and academic contacts.

Throughout the ensuing years the Atlantic Provinces Orthopaedic Society has grown to include some 41 orthopaedic surgeons. Many famous teachers from around the world have been honoured to be guests at our meetings and have done much to further the knowledge and expertise of our members.

O.J.W.

□

Heraldic Insignia — Atlantic Provinces Orthopaedic Society



In 1741, Nicholas André, Professor of Medicine at the University of Paris, published a book on the prevention and correction of musculoskeletal deformities in children.

He created for the book's title the word "orthopaedic" from 2 Greek roots, orthos (straight) and paidia (rearing of children).

His illustration for this book, of a staff used to straighten a growing sapling, has become the international insignia of orthopaedic societies.

This tree rooted on a rocky coastline, was the heraldic insignia I created for the Atlantic Provinces Orthopaedic Society in 1985. It symbolizes their work to provide competent service in this specialty in our Atlantic region.

Wm. D. Canham, M.D., F.R.C.S.(C),
Orthopaedic Surgeon, Dartmouth, N.S.

GUEST EDITORIAL

Orthopaedic Surgery in the Atlantic Provinces

More than 60 years ago, the first graduates completed training in the United States as specialists in Orthopaedic Surgery, and returned to practise in the Atlantic Provinces. In Newfoundland, Dr. Louis Conroy, who had trained with Steindler, returned to St. John's and began the enormous task of dealing with the Island's large caseload of Orthopaedic diseases. Tuberculosis was virtually endemic, and such diseases as poliomyelitis, osteomyelitis and congenital deformities were everywhere. He stimulated others to specialize in the same field, and many returned to form the nucleus of a long Orthopaedic tradition in Newfoundland.

In Nova Scotia, Dr. T.B. Acker graduated from Dalhousie in 1921 and went to the United States to study with MacAusland in Boston, and returned to Halifax to begin practice in July of 1923. In July 1924, he established an Orthopaedic Clinic at the Dalhousie University Health Centre. He was joined by his brother, Dr. J.C. Acker, both Lunenburgers, and together they practised in Halifax all their lives, becoming legends by virtue of their selfless efforts to bring Orthopaedic care to the small communities of Nova Scotia and Newfoundland. Travelling by boat and train, it was not usual for schedules to be altered and boats delayed until a clinic was finished, and all patients seen. Dr. B.F. Miller, a native of Cape Breton, did graduate work at the University of Liverpool after World War II, in which he rose to the rank of major, and returned to Halifax. Thus began the growth and development of Orthopaedic Surgery at Dalhousie University.

Dr. Ewart in Moncton and Dr. Torrie in Fredericton were outstanding early role models for others to take up this specialty and, as a result, New Brunswick has a long and strong history in this Specialty. In recent years, graduates of Dalhousie have been providing for the Orthopaedic needs of Prince Edward Island.

In 1969, Orthopaedic Surgery became, with the assistance and vision of Professor Ian MacKenzie, a separate Division within the University Department of Surgery. At Dalhousie University, a training program, under the Chairmanship of Dr. R.H. Yabsley, was begun in the 1970's, and since that time, 20 graduates have gone into the communities of the Maritimes — only 2 moving to the U.S., perhaps the best record of any training program in Canada.

In 1984, the Division of Orthopaedic Surgery of Dalhousie was approached by Memorial University concerning its training program in Orthopaedic Surgery. As a result of these discussions, in collaboration with the Royal College of Physicians and Surgeons of Canada, Dr. R.H. Yabsley was appointed Program Director of a separate but parallel program in Orthopaedic training. With this appointment an opportunity, probably unique in Canada, was provided to address the training and manpower needs of the Atlantic Provinces.

In 1960, the Atlantic Provinces Orthopaedic Society under the auspices of the Canadian Orthopaedic Association was formed. It has flourished and continued to grow, meeting annually, in different cities of the Atlantic Provinces, providing an opportunity for presentation and sharing of scientific information, enabling job opportunities to be explored and friendships deepened and created.

This issue of *The Nova Scotia Medical Bulletin* represents the contribution that all of the above have made to the growth and development of this major specialty in the Atlantic Provinces of Canada. □

R.H.Y.

Diagnosis and Treatment of Rotator Cuff Disease

Douglas C. Macmichael,* B.Sc., M.D., F.R.C.S.(C),

Saint John, N.B.

The rotator cuff is the mobile tendinous socket for the gleno-humeral joint. It consists of the tendons of four muscles: the subscapularis, supraspinatus, infraspinatus and teres minor, blending with the capsule of the shoulder joint. It slides under the acromion, distal clavicle and coraco-acromial ligaments. E.M.G. studies of the rotator cuff muscles show that the supraspinatus muscle is active through the full range of abduction. It is also the main force preventing downward subluxation of the humerus with the arm hanging down. The remainder of the rotator cuff is active in depressing the humeral head during abduction and flexion. Clinically, external rotation is another important function of the rotator cuff. Another significant anatomic feature of the rotator cuff is its blood supply. MacNab has shown that there is an area of poor vascularity in the distal portion of the subscapularis. This may account for the fact that most pathology of the rotator cuff starts in this area.

The rotator cuff can be involved in different clinical states. The patients may present with an acutely painful shoulder with no history of injury. This is most likely an acute calcific bursitis, perhaps deposits occurring in slightly degenerate tendons. Treatment of this is with a strong anti-inflammatory orally, or an injection of Cortisone in the subacromial bursa. Occasionally, the calcium becomes a chronic deposit which causes chronic low-grade pain or the "so-called" impingement syndrome. This may require excision of the calcium deposit. If this procedure is necessary, often the tendons need suturing and resection of the anterior-inferior acromion to prevent further impingement syndrome.

The other major problem occurring with the rotator cuff is tearing of the tendons. Tears may be traumatic or attritional in nature. Figures show from 8% to 24% torn rotator cuffs at autopsy. These figures are used to suggest that rotator cuff tears are almost a normal finding and hence not significant. In some people, they may not cause any symptoms, but rotator cuff tears are the cause of major disability in many patients. The torn rotator cuff itself causes pain and weakness of the shoulder. Over time, a major tear of the rotator cuff can lead to destruction of the gleno-humeral joint, the so-called "rotator cuff arthropathy". Another common painful condition, the stiff or "frozen

shoulder" is often a result of favoring the shoulder because of pain produced by movement in patients with minor tears of the rotator cuff or bursitis. Interestingly, stiffness does not occur in patients with massive tears of the rotator cuff as the muscles are no longer attached to the humerus, hence they cannot tighten and prevent motion.

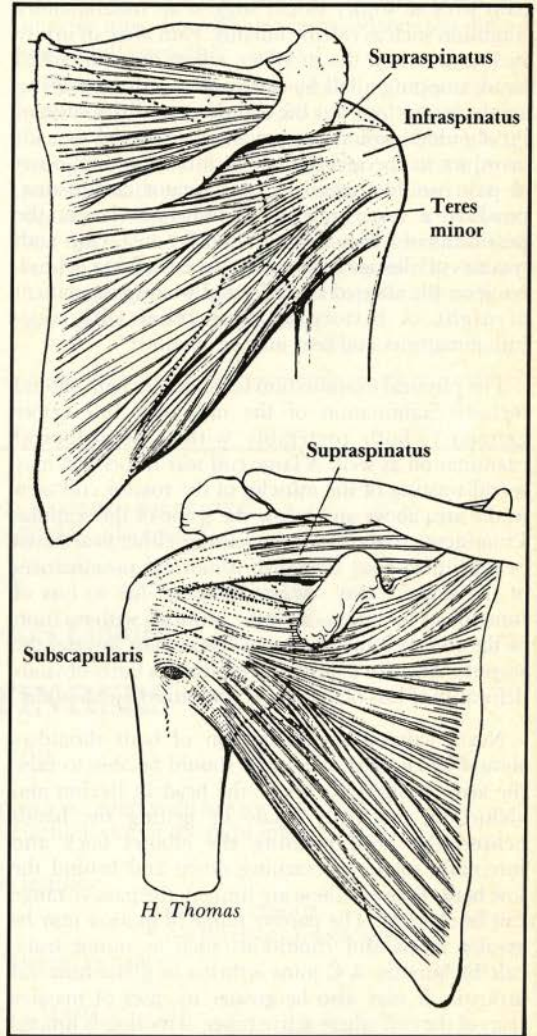


Figure. Diagram of the anterior and posterior surfaces of the rotator cuff.

*Orthopaedic Surgeon, Staff, Saint John Regional and St. Joseph's Hospitals, Saint John, N.B.

Considering all these various disorders related to rotator cuff pathology, understanding and proper treatment of rotator cuff injury is important. An understanding of what pathology is occurring depends on findings in the history and physical exam supported by other tests. Patients generally present because of pain in the shoulder area. Pain felt on top of the shoulder may be from the acromio-clavicular joint or neck structures. Pain felt more laterally in the area of the deltoid is most often related to the subacromial bursa and rotator cuff. It may also occur with glenohumeral joint disease or proximal humeral pathology. Pain from rotator cuff disease may also radiate laterally to the elbow and occasionally to the wrist. One must then differentiate this from cervical disc disease. How the pain started is helpful. Acute pain without injury would suggest an inflammatory condition such as calcific bursitis. Pain after an injury such as a fall on the shoulder, elbow or outstretched hand, stopping a fall by catching something causing an abduction force on the shoulder, or dislocation of the shoulder, would suggest an acute tear of the cuff or injury to the gleno-humeral joint. Gradual onset of pain would suggest chronic rotator cuff disease, possibly a tear, and one should not forget the possibility of a tumor in the shoulder area. Pain with rotator cuff disease is typically worse reaching behind, lying on the affected shoulder and waking the patient at night. A history of some relief with anti-inflammatories and heat may be obtained.

The physical examination for shoulder pain should include examination of the neck and full upper extremity, both preferably with a neurological examination as well. A large cuff tear inspection may reveal wasting of the muscles of the rotator cuff seen in the area above and below the spine of the scapula. Prominence of the distal clavicle due either to arthritis or old injury may be noted. Abnormal prominences of the scapula may suggest winging due to loss of function of the serratus anterior, scoliosis with rotation of the ribs or some abnormal tissue mass around the scapula. Anterior dislocation produces a fairly obvious deformity of loss of the round contour to the shoulder.

Next, active range of motion of both shoulders should be checked. A patient should be able to raise the arms straight up beside the head in flexion and abduction, externally rotate by getting the hands behind the head pushing the elbows back and internally rotate by reaching down and behind the low back. If any of these are limited, the passive range can be checked. The passive range of motion may be greater in painful conditions such as minor tears, calcific bursitis, A-C joint arthritis or gleno-humeral arthritis. It may also be greater in cases of massive tears of the cuff where active range of motion is limited by poor motor function. Passive range of motion will be the same as active range in cases of "frozen shoulder", either due to anatomic abnormalities, such

as old injuries, missed posterior dislocations, or "adhesive capsulitis", the most common cause due to favoring the shoulder for some previous painful condition.

Palpation of the sternoclavicular joint, clavicle, A-C joint, anterior and lateral to the acromion for the subacromial bursa and rotator cuff, with the arm hanging and moving, over the biceps tendon, the coracoid process the axilla, occasionally the scapula as it moves over the posterior thorax, and the supraclavicular fossa all should be done. With rotator cuff disease, tenderness and crepitus may be elicited anterior or lateral to the acromion. Tenderness in the other areas point to other anatomic areas as cause of the pain. Strength of the shoulder should next be tested in abduction to 90°, and external rotation with the arm by the side elbows bent 90° to determine the status of the rotator cuff. If pain seems to cause giving way, then the subacromial bursa can be blocked by injecting 2 to 4 cc of Xylocaine and testing repeated. Weakness in external rotation with pain eliminated, I feel, is the most sensitive test for significant rotator cuff tears. Finally, a complete examination of the remainder of the upper extremity should be carried out.

After the physical examination, plain x-rays of the shoulder should be evaluated. Included in this should be A-P views in internal and external rotation and a lateral or axillary view. Signs of rotator cuff disease include: calcium in the area of the rotator cuff, cystic or sclerotic changes in the area of the greater tuberosity and narrowing of the space between the acromion undersurface and the humeral head to less than 7 millimetres. A shoulder arthrogram is indicated if the diagnosis cannot be established clinically or if surgery is indicated.

Treatment of rotator cuff disease is mainly conservative. For those with minimal pain not interfering with daily activity, moist heat to the shoulder and NSAID's are usually all that is necessary. Subacromial injection of Cortisone is the second phase of treatment if there is no response to NSAID's. Physiotherapy can also be used either before or after injection of the subacromial bursa. Injections can be repeated two to three times. However, repeated injections can cause harm. One patient required a shoulder fusion after an average of one injection a year for over 20 years. If after three injections in the same area there is no relief, then further investigations are necessary to determine if surgery is indicated or if the diagnosis is correct.

Surgery is indicated for rotator cuff tears mainly in chronic tears with chronic pain not responsive to the previously described conservative methods. Occasionally, repair may be indicated in the acute situation but I have not done this as yet. Calcium deposits, if chronic and causing impingement, may require excision. Relief of pain is the main reason

for surgery. Several large reviews have been reported recently with generally good results in 85% to 90% of patients. In my own review of my first 14 patients, the results were comparable. Most patients were men, the right shoulder was involved in 9 cases, the left in 5 cases. The average age was 58 years. Just over 50% of the patients could relate the onset of pain to an injury. The average duration of symptoms was 29 months. Pain was present in all cases. Weakness was present in 13 out of 14 patients. Only 3 patients had full active range of motion. At the time of surgery, 9 had large tears with wide separation, 3 had tears less than 2 cm in size and 2 had partial tears. Surgery involved anterior-inferior acromionectomy and resection of the coraco-clavicular ligament in all cases to decompress the cuff and allow better access for repair. Repair involved primary resuturing in 6 cases. In 4 cases, debridement with suturing was achieved. Repair by suturing to bone was necessary in 4 more cases. In 1 case, I used a piece of the coraco-clavicular ligament as a patch although I do not favor this technique. Although not included in the series, I recently had one lesion that I could not repair fully. I was able to mobilize the anterior half of the cuff and repair this but the posterior portion could not be mobilized. This will occur in any large series. Methods have been described to mobilize the supraspinatus muscle or to use grafts of various materials. At present, I would not recommend these techniques.

Also, the tension on the repair should allow the arm to rest at the side when finished. This is preferable to using abduction splints.

The patients are immobilized in a velpau bandage for 4 to 6 weeks. Passive range of motion to 90° flexion is begun about day 5 after surgery and continued daily until active motion is begun. Improvement will continue up to 1 year after repair.

Pain relief was total in 12 of 14 patients. One patient had rerupture of the cuff but was dying of lung cancer at the time and nothing further was done. Another patient had good initial pain relief but reruptured when he required defibrillation after suffering an M.I. He was successfully repaired one year later. Full strength occurred in only 50% (7 out of 14). Patients with minor tears obtained full strength, those with massive tears showed some improvement but did not obtain full strength.

In conclusion, repair is indicated to relieve chronic pain due to rotator cuff tears and has a good success rate in relief of pain. Small tears should have better strength recovery than massive tears. However, most patients with rotator cuff disease or tears can be managed nonoperatively. With attention to the history and physical, the diagnosis can be made with reasonable accuracy. Treatment can then be tailored to the problem. Repair of the torn rotator cuff is a good procedure when indicated. □

Are you losing revenue when you leave your practice?
Are you a physician looking for placement?

Let

Med-Pro Services Limited

LOCUM FINDERS

help you.

We offer a professional Nova Scotia physician supervised service to doctors.
We actively search for the right replacement doctor or the right job for you.

Our services features:

- No up front fees
- Individual attention
- Progress reports
- All necessary paper work

Placement in the Atlantic Province

For further information: call: C. Horner 1-902-421-7538
or write: Med-Pro Services Limited, P.O. Box 294, Dartmouth, N.S., B2Y 3Y3.

The Medical Society of Nova Scotia

Young Tower, Suite 305
6080 Young Street
Halifax, Nova Scotia B3K 5L2
(902) 453-0205

EMPLOYMENT OPPORTUNITY

Co-Ordinator Professionals' Support Program

You will be aware that The Medical Society of Nova Scotia, at Council 1985, approved the establishment of a program *designed to facilitate the recognition and amelioration of addictive disorders affecting professionals* who are members of the sponsoring organizations. At this time, the Medical Society and Dental Association, both of Nova Scotia, are the sponsoring organizations.

The approval included provision for hiring a Co-ordinator whose duties would be to design, co-ordinate, and implement the policies and procedures established by the sponsoring bodies and the Committee.

The full details of the Program are set out in the December 1985 issue of *The Nova Scotia Medical Bulletin* beginning on page xxxiii of the Proceedings of Council (1985).

The position of Co-ordinator is part-time salaried, initially involving about 2½ days every other week. Salary is based on Medical Society sessional rates.

The incumbent must have very specific knowledge, skills and experience. Degrees in Psychology, Psychiatry, Social Work, or other human service fields will be valuable. He/she must also have training relating to recognition and treatment of alcoholism and other forms of chemical dependency to ensure effectiveness of the assessment and referral resource. The incumbent, who must be a *medical doctor* of some experience, must be recognized as an individual with ability to make wise, fair, honest judgment in all matters and be a person possessing a high degree of sensitivity in dealing with individuals and their problems.

Interested persons should send their resumes in confidence to:

Dr. B.J. Steele, Chairman
Professionals' Support Program Committee
The Medical Society of Nova Scotia
6080 Young Street, Suite 305
Halifax, Nova Scotia
B3K 5L2

Thank you for your co-operation.

Myoelectric Prostheses

R.N. Scott,* P.Eng., C.C.E. and E. Gozna,* M.D., F.R.C.S.(C),

Fredericton, N.B.

Myoelectric control systems utilize the electrical signals generated by voluntary contraction of the muscles in an amputee's stump to control electrically operated prostheses. This paper traces the history of myoelectric prosthetics in Canada and specifically in the Atlantic Provinces. Special mention is made of the indications for very early fitting of congenital amputees and of a current research study pertaining to the myoelectric fitting of pediatric amputees. The paper concludes with a brief comment on the future development of myoelectric systems.

BACKGROUND

Though considered by many to be a product of the bionic age, the first myoelectric prosthesis was made in 1948 in Munich, Germany. This work, however, was not followed up and only was rediscovered in 1969. The first myoelectric prosthesis to be used in Canada was made in the USSR and brought to this country in 1964 by Dr. Gustav Gingras, then medical director of the Rehabilitation Institute of Montreal.

Canadian research in myoelectric control began in 1960 at the University of New Brunswick, as part of an effort to secure technical assistance for two quadriplegic patients at the newly opened Forest Hill Rehabilitation Center in Fredericton. A number of interested engineers came together to address this problem and, from this applied research nucleus, the present Bio-Engineering Institute developed. In 1965 the Institute shared the Canadian Rehabilitation award with the Ontario Crippled Children's Center for its contribution in the design of a myoelectric prosthesis for a young amputee in North Bay, Ontario. Through a crude system by today's standards, this was the forerunner of the UNB system which has now been fitted to some 400 amputees throughout Canada and the USA. This system is unusual in that it uses a single muscle to control both opening and closing of an artificial hand.

In 1980, the Institute's direct involvement in fitting and training of amputees was facilitated by establishment of the Fredericton Myoelectric Prosthetics Clinic. This interdisciplinary clinic serves primarily the Atlantic provinces, roughly one-third of its current caseload of 52 amputees is from Nova Scotia. The age distribution of these amputees is indicated in Table I.

*Bio-Engineering Institute, University of New Brunswick and Dr. Everett Chalmers Hospital, Fredericton, N.B.

TABLE I

CASELOAD
FREDERICTON MYOELECTRIC PROSTHETICS CLINIC
(as of January 1986)

Age Range	Number of Clients
0-5 yr	14
6-18 yr	24
19-	14

PRESENT STATUS

Tremendous advances have been made in the last 30 years in the area of myoelectric prosthetics. Currently, most myoelectric prostheses are assembled from selected modular components. The electric hands are available in sizes for ages from two years to adult. These hands are manufactured in Canada, West Germany and England. Powered wrist modules are made in West Germany, and powered elbows in Canada and the USA. The myoelectric control systems themselves are fabricated in Canada, West Germany and the USA. As the diversity of components increases, the task of selecting the optimal configuration for a specific amputee becomes increasingly difficult. This is one of the primary reasons for the tendency to centralize myoelectric prosthetics service in specialized clinics.

It is difficult to determine accurately the number of new myoelectric prostheses fitted in Canada each year. However, some estimate it to be about 200. Most of these fittings are to unilateral below-elbow amputees for whom the myoelectric prosthesis offers significant advantages in cosmesis, freedom from harness, and function.

A serious deficiency with present systems is that size and weight limitations preclude fabrication of a powered shoulder unit for the shoulder disarticulation or fore-quarter amputee. These levels of amputation remain very difficult prosthetics problems.

The absence of an effective replacement for normal sensory feedback is a concern, and considerable research is being directed to solving this problem. Though this area of research is promising, and prototypes of a sensory feedback system have been evaluated favourably, it is several years before it will be fully developed for clinical use.

The indications for myoelectric prosthetic fitting have changed dramatically during the past decade.

Initially it was felt that myoelectric prostheses should be provided only to mature adults who could not be fitted successfully with conventional prostheses. This doctrine has become obsolete. Today the myoelectric prosthesis is recognized as highly successful regardless of patient age or previous prosthetic experience. With an increasingly sophisticated patient population, there is growing demand for myoelectric prosthetic fitting. For most below-elbow amputees, the myoelectric prosthesis is a very gratifying appliance which the amputee will frequently choose in preference to a conventional cable operated prosthesis.

Recent studies have shown that very early fitting of the traumatic amputee has been highly successful.¹ As well, recent work from Scandinavia has indicated that very young congenital amputees tend to develop a bilateral activity pattern more effectively if fitted myoelectrically at a young age.²

PEDIATRIC PROSTHETICS

One of the more exciting topics of research at the UNB Bio-Engineering Institute concerns the optimal age of fitting infants with congenital limb deficiencies. Prompted by the work of Sorbye,² who pioneered paediatric fitting of myoelectric prostheses, the Institute is engaged in a formal study of early fittings. When referrals are made at birth, the protocol for a



The advantages of a self-suspended myoelectric arm are apparent in this photo of an 11-year old traumatic B/E amputee.

unilateral below-elbow amputee involves fitting a passive prosthesis (for symmetry, body image and balance) at a few months of age. This is gradually weighted so that by the time a myoelectric prosthesis is fitted (at about 18 months — see Table II), the child is accustomed to the full weight. The powered prosthesis is self-suspending and where possible, totally self-contained. Where space does not permit, as with a very long residual limb, an external battery pack is used. Though this study is only in its preliminary stages, early data from these fittings tend to support the idea that having a myoelectric prosthesis during the period of development of normal motor skills leads to optimum bilateral activity.

TABLE II
PAEDIATRIC STUDY - AGE OF FITTING
MYOELECTRIC PROSTHESIS

Age of Fitting	Number of Clients
(Still in passive prosthesis)	5
17 mo.	1
18 mo.	2
19 mo.	1
20 mo.	1
24 mo.	1
28 mo.	1
33 mo.	1
49 mo.	1 (traumatic amputation)
	14

THE FUTURE

Objectives for further development of myoelectric prostheses obviously include provision of more functions, especially for the high-level amputation, and provision of sensory feedback. One technique being explored in the Institute will use a surgically-implanted telemetry system to give two-way communication to muscle and peripheral nerves.³

Possibly of more clinical importance at this time is the development of a greater awareness among the medical profession of the status of myoelectric prosthetics. Only when this is accomplished will amputees have reasonable hope of achieving optimum rehabilitation. To this end, the Institute continues to offer annually a short course and symposium "Myoelectric Controls"*.

Certainly the feats with which Jamie Sommers and Steve Austin indoctrinate the TV audience are not achievable. But with continued development today's prostheses, already excellent in many ways, will seem very crude a decade from now. □

*For information contact the Director Bio-Engineering Institute, University of New Brunswick, P.O. Box 4400, Fredericton, N.B. E3B 5A3 506-453-4966

Acknowledgements and References on page 86.

Arthroscopic Surgery

J.D. Amirault,* M.D., F.R.C.S.(C),

Halifax, N.S.

HISTORICAL PERSPECTIVE

Dr. Kenji Takagi, who was Emeritus Professor of Surgery at Tokyo University, made the first attempt at observing the internal appearance of a cadaver knee by means of a cystoscope in 1918. Because of the small size of the joint spaces and their non-extensible internal surfaces, modifications were necessary. In 1937 he displayed a focus adjustable arthroscope at the International Exposition in Paris. His student, Dr. Masaki Watanabe, introduced his own number 21 arthroscope and published an atlas of arthroscopy in 1957. Arthroscopy had its initial role as a diagnostic tool, however, interest soon turned to operative arthroscopic procedures. In 1962 Dr. Watanabe removed a bucket handle tear of the meniscus arthroscopically.

In Canada, Dr. Robert Jackson, and in the United States, Dr. Richard O'Connor, visited Dr. Watanabe in the late 1960s and early 1970s. These men have been largely responsible for investigation and spread of interest in arthroscopic surgery in North America.

As with the development of the arthroscope, arthroscopic instruments went through a gradual metamorphosis. The early designs employed concepts used in developing E.N.T. and ophthalmological tools. Arthroscopic surgical instruments of necessity require that they be sharp and strong enough not to break during surgery in the joint cavity, or damage intra-articular tissues. The designs must facilitate the function required of the instrument. As a result, a host of surgical tools has been manufactured.

The technology has progressed to the point where most community orthopedic centers have the facility to perform arthroscopic surgery.

TECHNIQUE

In North America, arthroscopy and arthroscopic surgery are performed in a fluid medium. The joint is distended with fluid prior to insertion of the arthroscope or arthroscopic instruments. In Sweden, the joint is distended with carbon dioxide and surgery is performed in a gas medium.

The actual technique varies with the training and preference of the surgeon. For the most part, arthroscopic surgery is done under a light general

anesthetic, although it may sometimes be done under local anesthetic injection into the joint.

In the knee, the scope is introduced through a 0.5 cm anterolateral stab wound incision. The instruments are introduced through a 0.5 cm anteromedial stab wound. Continuous inflow and outflow of irrigation fluid allow for distention of the joint capsule and ease of visualization. These portals may vary depending on the location of the pathology.

Arthroscopic surgery may be performed by the surgeon observing directly through the eyepiece of the arthroscope and performing surgery with the opposite hand. More recently interest has shifted to the use of a television camera attached to the eyepiece. All manipulation of the scope and surgical instruments is done in reference to the image on the monitor.

For the most part, arthroscopic surgery has addressed the intra-articular pathology of the knee, although more recently interest has shifted to the shoulder and ankle.

RESULTS

The obvious advantages of arthroscopic surgery include small incisions, reduced morbidity and potential for rapid recovery. Attendant with this is a reduced demand on hospital services, as the majority of these cases are performed as a day patient surgery. Few patients require formal physiotherapy, as would be required with arthrotomy post-operatively. Reduced time lost from work and decreased compensation payments are other advantages. Early return to sporting activity is achieved.

The first 20 cases of arthroscopic partial meniscectomy performed at Camp Hill Hospital within the last six months were reviewed. All 20 patients felt their surgery was successful in eliminating their symptoms. The average time from surgery to return to work was 10 days. The average number of oral analgesics (Tylenol 3®) taken post-op was 7.6 tablets. The average time of return to regular sporting activity, where applicable, was 13.5 days.

The figures for formal arthrotomy of the knee for meniscectomy were not obtained for comparison, however experience would indicate morbidity is far greater than the figures here. Certainly it has been shown that those patients who underwent arthroscopic partial meniscectomy who demonstrated degenerative joint changes at surgery, fared less well than those with completely normal articular cartilage.¹

*Head, Orthopaedics Division, Department of Surgery, Camp Hill Hospital, Halifax, N.S.

CONCLUSIONS

Arthroscopy and arthroscopic surgery have become a major part of the armamentarium of most orthopedic surgeons. The decreased morbidity and acceptable results of treatment justify its use. This, however, should not lead to indiscriminate use of these techniques. As with any surgical procedure a careful history and physical examination, as well as a good clinical judgment are extremely important in outlining indications for surgery.

The enthusiasm of some investigators and equipment manufacturers should not blind surgeons into accepting irrational forms of treatment. Scientific method is necessary to compare results of newer techniques in arthroscopic surgery to more conventional methods of treatment. Through sound judgment and good surgical technique, I feel arthroscopic surgery will continue to be of benefit to patients and find its proper place as an orthopedic tool. □

Bibliography

1. Ferk RD, Davis JR, Friedman M, Del Pizzo W, Snyder S, Beran C. Arthroscopic Partial Meniscectomy Analysis of Unsatisfactory Results, *Arthroscopy* 1985; 3: 44-52.
2. Gillquist J, Oretorp N. Arthroscopic Partial Meniscectomy, *CORR* 1982; 169: 29-33.
3. Ikeuc H. Trial and Error in Development of Instruments for Endoscopic Knee Surgery. *Orthoped Clin North Amer*, April 1982; 263-276.
4. Sprague NF. Operative Arthroscopy, *CORR* 1982; 167: 4-5.

MYOELECTRIC PROTHESIS

Continued from page 84.

ACKNOWLEDGEMENTS

Basic research in the 25-year project at UNB has been funded primarily by the Natural Sciences and Engineering Research Council. More applied research has been supported by Health and Welfare Canada, under a program which received substantial emphasis as a consequence of the thalidomide tragedy. Development and clinical evaluation has been funded by the Canadian Imperial Bank of Commerce and by the War Amputations of Canada.

References

1. Malone J M *et al.* Immediate, Early and Late Postsurgical Management of Upper-Limb Amputation, *J Rehab Res Dev* 1984; 21: 33-41
2. Sorbye R. Myoelectric Prosthetic Fitting in Young Children, *Clin Orthop Rel Res* 1980; 148: 34-40
3. Lovely D F, Hudgins B S, Scott R N. Implantable Myoelectric Control Systems with Sensory Feedback, *Med Biol Eng Comput* 1985; 23: 87-89

CAMO

- Superior Office Management
- Improved Patient Care
- Less Time Doing Claims
- Increased Profitability

Over 77 physicians now using CAMO

CAMO Plus now available

Guaranteed



FOR FURTHER INFORMATION CONTACT:

CompuCroft

Consulting Associates,

Suite 3030, Halifax Shopping Centre
7001 Mumford Road
Halifax, Nova Scotia
B3L 4R3
902-455-2300

The Moore's Prosthesis: An Idea Whose Time Has Come?

Ian Holmes,* M.B., Ch.B.,

Sydney, N.S.

A review of the literature on the use of the Moore's prosthesis in displaced fractures of the femoral neck demonstrates a number of problems. A similar review of the available alternatives, and of the results of Moore's used in Sydney over a six year period does not suggest the need for a dramatic change of approach. An algorithm suggesting preferred approaches is present.

For at least twenty years now, the Austin Moore unipolar femoral endoprosthesis has been widely used in the treatment of femoral neck fractures. Proponents claim that it is easy and quick to insert, minimising operative stress on the elderly patient and permitting early return to the upright, ambulant posture. However, all apparently sound approaches to treatment can bear review from time to time and the appearance on the market of a number of "Moore replacements", each with its own claimed advantages, suggested that a review would be timely. We shall discuss in turn; the problem, reports on the validity of the Moore's as a solution, alternatives currently being proposed, their usefulness in our regional hospital situation, and the way ahead.

PROBLEM: "THE UNSOLVED FRACTURE"

Fifty years ago, Kellogg Speed used this term to describe intracapsular fractures of the femoral neck.¹ He was aware of avascular necrosis and nonunion as the principal problems requiring solution, and noted between 60-70% "good results" as being reported from manipulative reduction and cast treatment. He even went on to suggest the latter as "a more or less orthodox line of care"! It is highly unlikely that anyone in Nova Scotia has had a hip fracture treated in this way recently, yet the basic problems remain unchanged.

Its blood supply, running through the retinacular fibres of the capsule, is critical for the survival of the femoral head. It is not clear whether that survival is jeopardised more by direct injury to the retinacular vessels, or their tamponade by haemorrhage within the capsular sleeve. Garden's classification shows a progressively poorer femoral head survival with increasing fracture displacement, but we still cannot look at X-Rays of a fresh fracture and say with certainty, "this will/that will not survive".²

Primary internal fixation is usually chosen for Garden Types I & II; in these fractures the chances of restoring the pre-injury state are good, and the advantages considerable.

Prosthetic replacement has been the preferred treatment in:

1. The physiologically elderly who are presumed to be able to tolerate only a single operative procedure.
2. Those whose fractures offer a high chance of avascular necrosis. (i.e. Garden's Type III & IV fractures)

The Moore's has usually been chosen in the former situation because of simplicity and speed, and sometimes in the latter to "gain time" before a total joint replacement need be used. This relatively simple approach has been questioned by a variety of authors, but unfortunately "no two series. . . matched for age, sex, mental status and ambulatory status. . . have been compared".³ We shall now look at some of these critiques, the problems they identify, and some proposed solutions.

WHAT'S WRONG WITH THE MOORE?

1. **Mortality.** Critics of the use of primary prosthetic replacement⁴ are quick to point to the high mortality rates (20-40% at six months) found with the procedure. These results however refer to retrospective studies, and randomised prospective studies of the basically similar Thompson prosthesis show no difference between mortality rates for fixation or prosthesis.^{5 6 7} One author describes these rates as "awesome", as indeed they are, but bearing in mind the population, they are hardly unexpected.
2. **Infection.** Differences in what constitutes a wound infection can account for great variety in reported rates, and from 2-42% has been recorded in Moore's! The median incidence is probably about 8%, comparing unfavourably with the 1% or so usually found with primary internal fixation.
3. **Technical Problems.** Apart from infection, technical problems peculiar to the procedure include dislocation, acetabular chondrolysis, loosening, and medial migration of the prosthesis into the pelvis. Although not always symptomatic, it is these problems which can lead to the need for operative revision, signifying failure of the original procedure.

*Orthopaedic Surgeon, Sydney City Hospital, Sydney, N.S.

OPTIONS AND ALTERNATIVES

1. **Dislocation** may be the herald of an unwelcome deep infection. When this is not the case, review usually implicates poor technique in the form of malrotation of the prosthesis in the femur, excessive varus, cutting the femoral neck too short, or choice of a narrow stem prosthesis making for a loose fit. Conditions such as Parkinsonism and tight adductors call for an anterior approach which, however, may lead to a stiff hip which functions less well.⁵

2. **Pain** may result from chondrolysis, medial migration or loosening; it is the principal indication for revision to a total joint replacement, imposing the stress of a second operation on a patient who is already debilitated. Some ways to reduce pain include:

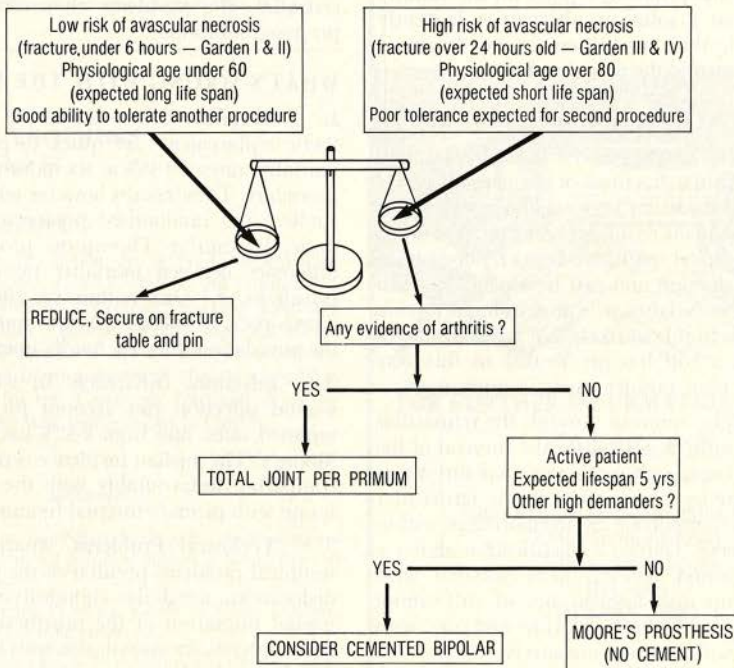
Cement the prosthesis in place; it is ironic that, just when total joints appear to be going "cementless", we should find that hemiarthroplasties which are cemented have a halved revision rate.⁸ Cement however does not alleviate chondrolysis or acetabular penetration, in fact it probably worsens the problem.⁹ Furthermore, should revision to Total Hip be required, removing the cement can significantly complicate that procedure.

Primary total hip at first sight offers a way out of the above difficulties by doing the definitive procedure at once. However, reported retrospective studies which could be expected to include a greater proportion of relatively "fit" individuals, show mortalities of 3-7% at one and 19% at six months, wound infection rates between 1-7%, and dislocation rates of 8-13%.

Bipolar prostheses are claimed to offer the short, simple operative procedure of the Moore, ready revision to total hip if required, and a lower need for revision because of their double bearing structure. They consist of the stem of a total hip which has its regular 22 or 32 mm ball covered by a composite polyethylene and steel ball of a size appropriate to the individual's acetabulum. Precise size matching of the outer (steel/cartilage) joint is claimed to reduce chondrolysis, and because most of the articulation is expected to occur at the inner (steel/polyethylene) joint, wear on and protrusion of the acetabulum should be reduced.

Unfortunately, recent reports show similar complication rates to the alternatives already described, and moreover, the inner ball joint has almost completely ceased to function after three months — so that at five years the protrusion rate is the same as for a solid prosthesis!¹⁰

SUGGESTED ALGORITHM FOR THE INTRACAPSULAR HIP FRACTURE



THE SYDNEY EXPERIENCE

Sydney City Hospital acts as the referral centre for most of Cape Breton Island. A retrospective review of 79 patients who had Moore's Prostheses implanted between November 1978 and November 1984 yielded the following statistics:

79 Patients: 62 female, 17 male.
Age range 37-97 years* Mean 77
8 died in the first month (10%)**
4 developed deep infections (5%)
1 dislocated (1%***)
17 complained of *some* chronic pain
2 of these required revision to Total Hip.

*,** One patient was 37 years old, dying of metastatic lung cancer when operated upon as a palliative procedure; a fairer mortality rate is probably 9%

*** This dislocation was of a new, long-stem component, cerclaged and cemented into place in treating a fracture around the stem of a previously satisfactory Moore's.

These rates for mortality, infection and dislocation compare quite favourably with one Canadian series,⁴ and not unfavourably with those of the "alternatives" discussed above. Chronic pain (though not usually bad enough to demand revision) stands out as the price we ask some of our Moore's patients to pay — indicating that we have some way to go yet in solving the unsolved fracture!

"Gentlemen, I give you the Moore's Prosthesis: an idea whose time has come". □

FOOTNOTE

Four patients in this series had Moore's prostheses inserted for fractures which had originally been Garden Type I's, but which reached us about two weeks after the original injury, and the head "fell off". I believe they would have been better to have been pinned whilst still impacted.

References

1. Speed K. The Unsolved Fracture. *Surg Gynecol Obstet* 1935; **60**: 341.
2. Garden R S. Stability and Union in Subcapital Fractures of the Femur. *J Bone Joint Surg* 1964; **46B**:630-47.
3. Door L S. Hip Fractures in Elderly and Senile Patients. *Ortho Clin North Am* 1981; **12**:157.
4. Hunter G A. Should We Abandon Primary Prosthetic Replacement for Fresh, Displaced Fractures of the Neck of the Femur? *Clin Orthop* 1980; **152**:158-161.
5. Sikorski J M, Barrington R. Internal Fixation Versus Hemiarthroplasty for the Displaced Subcapital Fracture of the Femur. *J Bone Joint Surg* 1980; **63B**:357-361.
6. Riley T B H. Knobs or Screws? A Prospective Trial of Prosthetic Replacement Against Internal Fixation of Subcapital Fractures. *J Bone Joint Surg* 1978; **60B**:136.
7. Soreide O, Molster A, Raugstad T S. Internal Fixation Versus Primary Prosthetic Replacement in Acute Femoral Neck Fractures: A Prospective Randomised Clinical Study. *Br J Surg* 1979; **66**:56-60.
8. Brownett J P. The Uncemented Thompson Prosthesis. *J Bone Joint Surg* 1981; **63B**:634.
9. Drinker H, Murray W R. The Universal Proximal Femoral Endoprosthesis. *J Bone Joint Surg* 1979; **61A**:1167.
10. Soreide O, Molster A, Raugstad T S. Replacement with the Christiansen Endoprosthesis in Acute Femoral Neck Fractures. *Acta Orthop Scand* 1980; **51**:137-44.

The Division of Nephrology at Dalhousie is seeking patients with nephrogenic diabetes insipidus, or carriers of this illness, who would be interested in participating in a research study. Volunteers would be evaluated for one day, during which a brief dehydration test would be carried out, and samples of blood and urine would be obtained. The objective is to develop a picture of the natural history of this condition, and to improve our ability to detect carriers.

Physicians are urged to have patients in their practice affected by this condition contact. . . .

Dr. David Hirsch
Division of Nephrology
Victoria General Hospital
Ambulatory Care Centre (Dickson Building)
Room 5079 - 5th Floor,
Halifax, N.S. B3H 2Y9
Telephone: 902-428-3764

The Many Faces of Posterior Dislocation of the Shoulder

C.L. MacMillan,* M.D., C.R.C.P.(C),

Halifax, N.S.

There are subtleties of posterior dislocation of the shoulder which can result in misdiagnosis and disastrous delay in appropriate treatment. The AP radiograph is very important but must be supplemented by an orthogonal view.

INTRODUCTION

Posterior dislocations of the shoulder are classified as subacromial, subglenoid, and subspinous. The subglenoid and subspinous are rare and do not present a diagnostic problem.

The radiographic findings of subacromial dislocations are subtle and easily missed and the clinical findings may also be misleading. Close attention must be paid to the AP radiograph. I prefer to radiograph all shoulders in the true AP projection.^{1,2} (Figure 1).

concentric in the glenoid, a posterior dislocation must be suspected (Figure 2).

In patients with subacromial dislocation, the articular surface of the head is first to leave the glenoid and the humerus is therefore internally rotated resulting in the appearance called "the empty head sign" (Figures 2B & 2D).

If the dislocation has been present for several hours, the internal rotation may have reduced itself (Figure 2C). Occasionally the head may be dislocated superiorly (Figure 2E). A large haemarthrosis may also widen the joint space (Figure 2A).

In any patient with a history of shoulder trauma an orthogonal view of axillary type is recommended (Figure 3).

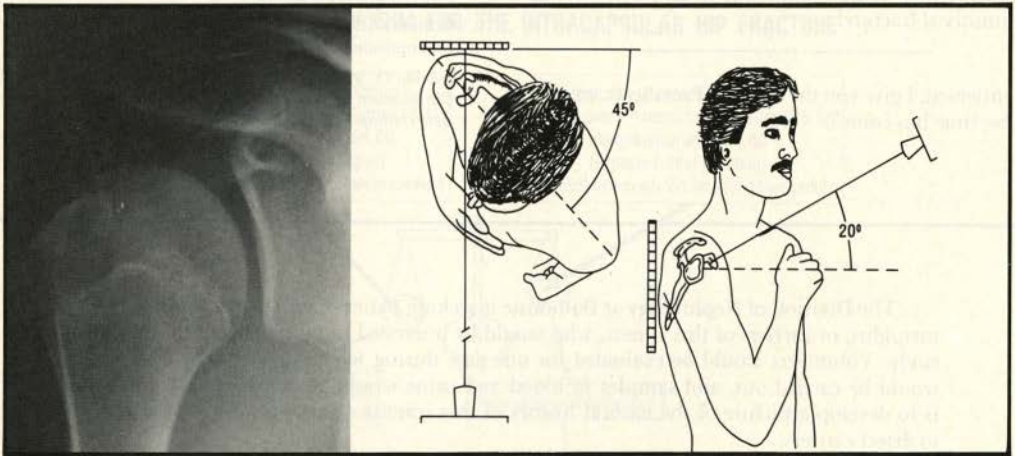


Fig. 1 True AP of the shoulder. Anterior and posterior glenoid margins are superimposed. The acromion is projected off the humeral head. The greater tuberosity is seen in profile.

DISCUSSION

If the joint space is other than 3-6 mm wide (measured from the anterior glenoid margin if it is not a true AP view), and/or the humeral head is not

The injured limb may have to be supported when this examination is done. Transthoracic lateral projections may be misleading and should be avoided.

A 60 degree anterior oblique or true lateral scapula is the alternative view. This can be done erect or supine without moving the injured limb. It is more difficult to identify the glenoid but the humeral head if posteriorly dislocated will be "hanging in the air" (Figure 4).

*Assistant Professor, Department of Radiology, Victoria General Hospital, Dalhousie University, Halifax, N.S.

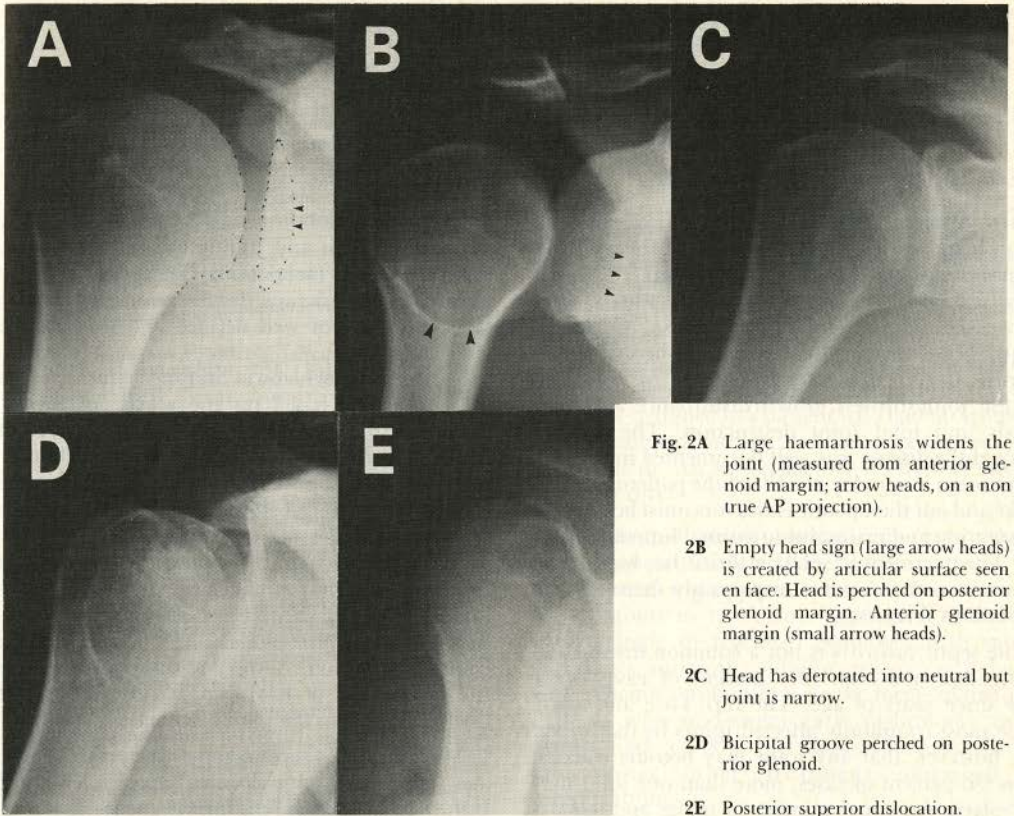


Fig. 2A Large haemarthrosis widens the joint (measured from anterior glenoid margin; arrow heads, on a non true AP projection).

2B Empty head sign (large arrow heads) is created by articular surface seen en face. Head is perched on posterior glenoid margin (small arrow heads).

2C Head has derotated into neutral but joint is narrow.

2D Bicipital groove perched on posterior glenoid.

2E Posterior superior dislocation.

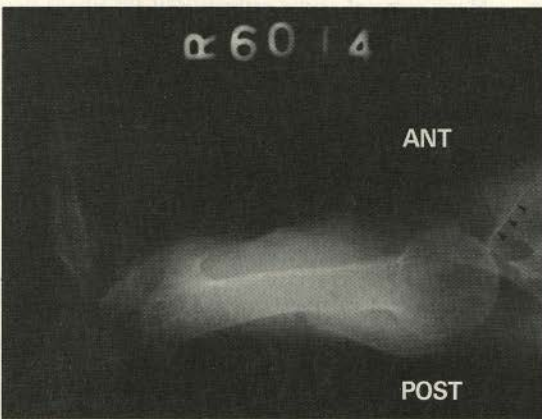


Fig. 3 Axillary view. The humeral head is perched on the posterior glenoid margin (small arrow heads).

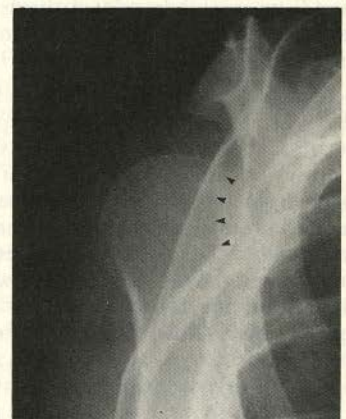


Fig. 4 The humeral head lies posterior to the glenoid margin (arrow heads). □

References

1. Resnick and Niwayama, *Diagnosis of Bone and Joint Disorders*. W.B. Saunders Company, 1981, 268-270.
2. Amy Beth Goldman, *Shoulder Arthrography: Technique, Diagnosis, and Clinical Correlation*. Boston: Little Brown & Co., 1982.

The aim of science is not to open a door to infinite wisdom but to set a limit to infinite error.

— B. Brecht

Septic Arthritis in Children

Edward P. Abraham,* M.D.,

Halifax, N.S.

When pyogenic bacteria, with the exception of tuberculosis, enter any joint, an inflammatory response usually ensues. The result is septic arthritis otherwise known as "Tom Smith's" arthritis, after Smith (1874) who recognized this disease. A delay in diagnosis or adequate treatment may be crippling. Complications encountered consist of ongoing infection, joint stiffness, growth disturbance, avascular necrosis and total joint destruction. The natural history of the disease was well documented in the pre-antibiotic era but, today, the life of the patient is rarely at stake and our therapeutic endeavors must be directed to restoration and maintaining normal function of the limb. The treatment of septic arthritis has been based on numerous theories but surprisingly there exists a lack of clinical reviews.

Acute septic arthritis is not a common disease and investigators note that fifty percent of cases occur before three years of age. The hip, knee and ankle are the most commonly affected joints in that order. Note, however, that any joint may become infected and in ten percent of cases, more than one joint may be involved. An equal number of males and females are affected. It is interesting to note that acute osteomyelitis, a closely related disease, is twice as common in males than females. There is no obvious reason for this discrepancy.

Bacteria may enter a joint by either a hematogenous route (most common) or by direct spread from an adjacent metaphyseal osteomyelitis. This latter mechanism is interesting because it is unknown whether or not the bone or joint become infected primarily. In infants, because of the transphyseal communication of blood supply between the epiphysis and metaphysis, any joint associated with a metaphyseal infection may become septic. In older children, the growth plate allows no vascular communication between the metaphysis and epiphysis and, unless the metaphysis is intrasynovial as in the shoulder or the hip, it is unlikely that spread from a metaphyseal osteomyelitis will enter a joint. Another mechanism of inoculating a joint is directly from puncture wounds. The virulence of the infecting organism and the resistance of the host determine whether or not suppuration will follow. Infancy, trauma, chronic disease or prior arthropathy increase the risk of infection.

The inflammatory process in septic arthritis starts in the synovium and joint fluid. Pus and articular cartilage are not compatible. The specific mechanism of cartilage destruction, despite numerous experimental studies, is not well defined and this problem is wide open for investigation. Two basic mechanisms proposed are biochemical and mechanical. Biochemical effects are based on the release of proteolytic enzymes, either from neutrophils or bacteria, resulting in articular damage. It is now known that chondroitin sulphate, hexosamine and collagen all decrease in concentration long before there are gross changes in articular cartilage and these biochemical changes are irreversible. Mechanically, pressure from prolonged joint swelling may enhance the destructive reactions taking place in cartilage. Pocketing of pus under pressure, in the presence of fibrin, induces adhesions, decreases joint lubrication and subsequently decreases the production of hyaluronic acid. This results in further trauma to the joint cartilage.

The organisms most commonly encountered in all age groups are staphylococcal species. *Hemophilus influenzae* is the next most prominent organism seen frequently between the ages of six months to two years. Many cases of septic arthritis (30-40%) have negative joint cultures. Prior usage of antibiotics or laboratory and culture techniques may account for this phenomenon. A host of other organisms — streptococcus, pneumococcus, salmonella, meningococcus and anaerobes may be cultured.

As primary care physicians, it is likely that you will see a few cases of acute joint infection. The possibility of misdiagnosis is very significant. One must remember to suspect infection in any acute joint disease. The diagnosis of septic arthritis is largely clinical and ancillary studies are generally simple.

In an infant, formulating a diagnosis of septic arthritis, or for that matter osteomyelitis, may be a challenging task. The infant has all those features of septicemia — irritability, apprehension, failure to feed, dislike of being handled, fever — and is usually in the process of being investigated for pyrexia of unknown origin. We all know what the differential diagnosis is in this situation but we must also think of the possibility of musculoskeletal sepsis in such a situation. A septic joint in this situation (or infected bone) may not be obvious, particularly if the joint in question is not peripherally located.

Classically, when the hip is involved, it is flexed, abducted and externally rotated. There may be other

*Third year resident in Orthopaedic Surgery, Department of Surgery, Dalhousie University, Halifax, N.S.

subtle signs such as groin swelling, asymmetrical buttock creases or, less subtle, frank dislocation. Particular attention should be paid to the attitude of all limbs, the amount of spontaneous movement and the willingness of the infant to be examined, care being taken not to disturb the favored limb until near the end of the exam. A musculoskeletal examination must be thorough by examining the head and neck, upper limbs, spine, hips and lower limbs. Tenderness to palpation, swelling around or in a joint and intense erythema highly suggest infection. An attempt to gently move the affected joint produces an irritable response.

In contrast to the infant, the child presents with an acute fulminating disease but this does not always hold true. Fever, tachycardia, severe pain and reluctance to move the limb are the classical findings. There are patients who do not present in such a clear-cut fashion and these deserve special attention. These patients may have a remarkable arc of motion present in the suspected joint and may not be systemically ill. The key is that there is a sudden loss of normal motion and of all the clinical indicators, this seems to be the most reliable in septic arthritis. The classic "frozen" joint is not always seen. One must also investigate to determine whether or not there is an associated osteomyelitis. Prolonged observation, the use of anti-inflammatory medications, muscle relaxants and analgesics, in the situation where the diagnosis is uncertain, may be devastating. At some point early in the course of being investigated, if there is doubt, the patient deserves a second opinion from another one of your colleagues.

The white blood cell count is not consistently elevated in all cases. The erythrocyte sedimentation rate is usually abnormally high. X-rays in general are not helpful except to show soft tissue swelling and sometimes joint effusion. A late diagnosis may manifest radiologically as a spectrum ranging from mild to severe arthritis. Chronic osteomyelitis may be seen adjacent to the joint. Blood cultures and gram staining and culturing of joint effluent are definitive diagnostic tests. Bone scanning demonstrates hyperemia in the involved joint and may reveal an osteomyelitis.

The differential diagnosis is long but entities such as JRA, traumatic synovitis, cellulitis, acute rheumatic fever, Legg-Perthes' and others do not require the emergency attention that an infection in the joint warrants. Although it is the subject of another discussion, acute osteomyelitis may present in somewhat similar fashion and is usually a metaphyseal infection around a joint. This is another entity deserving urgent treatment.

The principles of treatment are to decompress the joint, treat the systemic effects of sepsis with antibiotics and rest the joint. More recently, investigators have

studied the merits of continuous passive motion in the face of a septic joint. Although most physicians agree with this treatment philosophy, the issues of how and when the joint should be decompressed, the use of drains, suction irrigation systems, the antibiotic protocol, etc., have not been standardized.

At the Izaak Walton Killam Hospital for Children in Halifax, we reviewed septic arthritis patients occurring over the last two decades. None of these children was immuno-suppressed or had puncture wounds. Patients having at least two years follow-up were the subject of a study. Our data compared with the literature in terms of sex, distribution, age, joint involvement, types of organisms, frequency of positive cultures and complications. We felt a satisfactory result should be assigned to a patient who had no symptoms, normal range of motion and normal x-rays as a result of treatment. An unsatisfactory result was anything less than this.

One group of patients in the study presented early, were diagnosed early and had early treatment. This time interval was approximately 5.0 days from onset of symptoms to treatment. Aspiration of the joint (either single or repeated) combined with systemic antibiotics, antibiotics alone or arthrotomy of the joint with systemic antibiotics were the forms of treatment. Patients who underwent early arthrotomy in this group had a 100% satisfactory result. Patients undergoing other treatment described had complications.

Another large group presented late after the onset of symptoms because of misdiagnosis. They all experienced unsatisfactory results despite the treatment at this point. Furthermore, because of misdiagnosis, resulting complications and overall morbidity, they required prolonged hospitalization and reoperation for the treatment of the ongoing infection, growth disturbance and arthritis.

If a patient had an associated osteomyelitis and early decompression was performed at the same time as the arthrotomy, then these patients all had satisfactory results. We felt that the best result was obtained by early surgical decompression, systemic antibiotics and gradual restoration of motion to the limb.

Many investigators feel that repeated needle aspiration of a peripheral joint is a viable treatment. First of all, most studies advocating this method of treatment have less than satisfactory results. The argument against repeated aspiration is based on this and the fact that very fibrinous debris cannot be aspirated through a needle. The procedure is also painful and uncertain in inexperienced hands.

In conclusion, one must not treat an acute joint disease very lightly. In the absence of any obvious reason for a sudden decrease in the motion about a

Continued on page 95.

The High Energy Open Tibia Fracture: Evaluation and Treatment

Ross K. Leighton,* M.D., F.R.C.S.(C),

Moncton, N.B.

The high energy open tibia fracture still remains one of the most challenging orthopaedic injuries to treat. The complications (nonunion, malunion, soft tissue atrophy, and infection) are high with the amputation rate approaching 15%. I have found that a protocol based on the principles of initial extremity evaluation and management, followed by a logical sequence of staged reconstruction, is the key to lower limb salvage.

The initial goals of the Orthopaedic Surgeon in the evaluation and treatment of the Grade III open tibia fracture are three-fold:

1. to maintain or establish adequate perfusion;
2. to prevent infection; and
3. to stabilize the bone and soft tissue.

Reconstructive procedures can only be considered in a viable, noninfected stabilized limb.

THE FRACTURE

Chapman determine the forces involved in four usual mechanisms of fracture¹:

Fall (off curb)	100 ft./lb.
Skiing	300 - 500 ft./lb.
Gunshot Wound	2,000 ft./lb.
Bumper Injury (20 m.p.h.)	100,000 ft./lb.

Therefore, the mechanism of injury defines the clinical course of the fracture.

Stage I: Evaluation

Initial assessment of the patients' injuries includes a history of the injury mechanism, the patients' tetanus status and a discussion with the paramedics concerning the accident scene. Remembering that up to 80% of these patients have associated injuries, treatment of the open tibia fracture must not distract from the usual advance trauma life support (A.T.L.S.) evaluation and resuscitation protocol for trauma patients.

The evaluation of the lower extremity must be thorough, looking specifically at all its integral parts, nerves, vessels, muscle compartments, bony construct, and skin. A complete examination is often not possible without anesthesia, but a neurovascular examination must receive detailed attention. The single most

important factor in salvage of the ischemic limb is prompt recognition of the vascular injury and expeditious repair. Positive physical signs are present in 82% of patients on admission.⁴

The angiographic examination can be combined with the evaluation of the thoracic and/or pelvic vessels in a multiple trauma patient, or performed in the operating room by a single shot femoral technique. Diminished pulses in a high energy proximal tibia fracture, tibia fracture with an unstable knee, or distal femur fracture, demands angiography.

Stage II: Debridement and Stabilization

Gross contamination is removed with jet lavage after the initial prep. A tourniquet is placed high on the thigh but is not inflated unless an uncontrolled coagulopathy develops. The wound should be explored and debrided sequentially by layers. Ten to twelve litres of lavage fluid should be utilized. The introduction of the surgical lavage instrument has been a tremendous advance in wound therapy. A pressure of at least 15-25 PSI at the tissue is required for effective debridement. Only surgical wounds are closed. The patient should be scheduled for re-exploration of the wound at 24-48 hours.

Stabilization must be achieved by:

1. External fixator (most widely accepted for extra-articular fractures);
2. Unreamed nail and/or fibular plate; or
3. Dynamic compression plate.

The restoration of anatomic alignment and length with the elimination of fracture motion is the goal of any fixation method.

If an external frame is utilized, it should use only 5 mm half pins with triangulation of the frame for increased stability.

Stage III: Wound Care

Antibiotics are continued for only seventy-two hours unless a clinical wound infection develops. Whirlpool treatment is used as an adjunct to surgical debridement in some cases.

Stage IV: Soft Tissue Coverage

Thirty to forty percent of Grade III tibia fractures will require a myoplasty procedure. The gastroc flap

*Orthopaedic Surgeon, Staff, Moncton City Hospital, Moncton, N.B.

is utilized in the proximal one third, soleus flap in the middle one third, and a free flap in the distal one third. Once soft tissue closure is attained and the wound is dry, bone gaps can be bridged by standard or microvascular bone grafts. Chapman and Bray *et al* prefer standard bone grafts and have bridged bone gaps of up to 23 cm. successfully. If microvascular techniques are chosen, an osteomyocutaneous flap may be utilized as a single stage procedure.

Stage V: External Fixators Removal

Most external fixators are removed by six to ten weeks if the fracture will accept loading, and the patient placed in a functional brace. Occasionally the external fixator is progressively weakened and weight bearing initiated.

All high energy open tibia fractures require a great deal of commitment, not only by the Surgeon taking care of the fracture but also by the patient in order that a sensate, warm, and functional limb can be the final outcome of the treatment process. □

Bibliography

1. Chapman MW. Personal Communication, 1985.
2. Findlay JA. The Motorcycle Tibia Injury. *Injury* 1972; 4: 75.
3. Johner R, Wruhs O. Classification of Tibial Shaft Fractures and Correlation With Results After Rigid Internal Fixation. *Clinical Ortho* 1983; 178: 7.
4. Keeley SB, Snyder WH, Weigelt JA. Arterial Injuries below the knee. *J Trauma* 1983; 23: 285.
5. Nicholl EA. Closed and Open Management of Tibial Fractures. *Clin Orthop* 1974; 105: 144.

SEPTIC ARTHRITIS IN CHILDREN

Continued from page 93.

joint, infection must be strongly suspected. We feel the time to begin treatment is early by surgical decompression. Systemic antibiotics are given parenterally until the temperature decreases, symptoms subside and the erythrocyte sedimentation rate falls. All of these factors occur usually within 2-3 days. Arbitrarily, without any scientific proof, we feel 10 days to 2 weeks of oral antibiotics at the time of discharge from the hospital is all that is required. Our efforts are to try and prevent future deformity and subsequent prolonged morbidity so the children require close follow-up. Usually by 6 months the patient is completely recovered with no limp and normal range of motion. □

References

1. Abraham EP, Hyndman JC, Brown DC, Sinclair A, Leahy JL. Septic Arthritis in Children. — *unpublished data*.
2. Nade S. Acute Septic Arthritis in Infancy and Childhood. *J Bone Joint Surg* 1983; 63-B: 234-241.
3. Lunseth PA, Heiple KG. Prognosis in Septic Arthritis of the Hip in Children. *Clin Orthop* 1979; 139: 81-5.
4. Paterson DC. Acute Suppurative Arthritis in Infancy and Childhood. *J Bone Joint Surg* 1970; 52-B: 414-82.
5. Goldenberg DL, *et al*. Treatment of Septic Arthritis: Comparison of Needle Aspiration and Surgery as Initial Modes of Joint Drainage. *Arth Rheum* 1975; 18: 83.

Rakesh Jain

Chartered Accountant

Suite 1205, 1505 Barrington Street
Maritime Centre 429-2220

Douglas E. Sawyer, P. Eng.

CONSULTANT: MANAGEMENT/FINANCIAL PLANNING*

WHITE POINT
902/354-3696

902/429-3479
804-5885 SPRING GARDEN ROAD
HALIFAX, N.S. B3H 1Y3

YOUR GUIDE TO FINANCIAL FREEDOM

Whatever may be the quantity that a man eats, it is plain that if he is too fat, he has eaten more than he should have done.

— Samuel Johnson (1709-1784)

“Signs” of Altered Gait

J.L. Leahey,* M.D., F.R.C.S.(C),

Halifax, N.S.

Observation of the altered “signs” of a motion disorder efficiently brings one to the source and degree of pathology. Knowledge of which sign to watch, what it means and a little practice are all that’s required.

Gait observation is a critical part of the musculo-skeletal examination. Significant disease processes of any system will always give some manifestation of altered movement. This can range from slowness, to lurching, to spending less time on one extremity.

As with any other examination gait observational skills take time to perfect. The first requirement for observing motion disorders is to have an area to make the observation i.e. hallway of at least 20 feet or a large room. Commonly with our efficient 2 or 3 examination room set-up, the patient is usually already unclothed in a small room “to promote efficiency”. We therefore miss the opportunity to examine gait and are left only with evaluation of the patient subject complaints versus the objective documentation of his movement disorder.

Most significant gait parameters can be examined with the patient fully clothed.

After observation the next requirement is to make a meaningful interpretation of the pathologic process. One must decide which criterion to observe to determine normal from pathologic.

Instead of concentrating on individual segments, consider the body as a point (center of mass) which moves through our space (gravity) by predetermined laws.

Conceptually our mass can be divided into two units, our upper body and our lower extremities. The extremities are either in stance or swing. The upper body stays in its normal midline position unless the support side has a problem. The alterations of the upper body in relation to the support side are deviating toward the support side, spending less time on the support side, a vertical drop with shortening of one side, or abnormal temporal relationship between the upper and lower segments.

In moving through space our center of mass for efficiency stays in a well defined “envelope”. This envelope has dimensions of height, width and length (velocity or distance/time) and has qualifications of

cadence (regularity) and density (relative time on each side).

If we consider the potential deviations that the center of mass makes from normal than we can relate these pathologic alterations to the most probable disease states.

“Signs” of pathologic shifts of our center of mass are not age dependent but are disease related and categorization of these shifts simplifies the process of recognition of disease states that are somewhat age dependent.

The following signs will be reviewed:

Sign	Center of Mass Alteration
Trunk Shift (Asymmetric, Symmetric)	Lateral Asymmetry
Short Stance Time	Density
Diminished Stride Length	Frequency
Limb Length Difference	Vertical Asymmetry
Gait Slowness	Velocity
Altered Cadence	Serge
Swing Phase Asymmetry	Velocity

ASYMMETRIC TRUNK SHIFT

Lateral lurch (trunk shift) of the upper body toward the involved support limb is pathognomonic of hip pathology. This lurch happens in stance phase of gait while in swing phase the upper body returns to a more mid-line position. A temporal look at this sign would reveal the following most likely diagnosis.

1. The newly walking child with this sign has congenital hip disease.
2. The four year old has synovitis of the hip.
3. The active small seven year old male probably has avascular necrosis (Legg-Perthes Condition).
4. The endomorphic 11 year old female or 13 year old male has slipped femoral capital epiphysis.
5. In the second or third generation hip dysplasia in the female or the late effect of incongruous healing of “Legg-Perthes” would present as trunk shift.
6. The forty year old alcoholic or the steroid dependent asthmatic or renal transplant recipient with trunk shift has avascular necrosis until proven otherwise.
7. Osteoarthritis of the hip gives the mechanical alteration of trunk shift. The degree of trunk

*Paediatric Orthopaedic Surgeon, Staff, Izaak Walton Killam Hospital for Children, Halifax, N.S.

shift corresponds to the significance of arthritis involvement.

We emphasize the "sign" of trunk shift as a reflection of hip mechanical alteration as frequently the "symptom" of hip disease is knee pain. Occasionally the 13 year old obese male trunk shifts to the x-ray department for his second set of knee x-rays as the "knee-jerk" response of symptom investigation is performed instead of observation of a very sensitive sign. Meanwhile, the femoral capital slip progresses untreated resulting in permanent deformity and limp.

SYMMETRIC TRUNK SHIFT

Muscular dystrophy and other neuro-muscular weakening conditions are associated with symmetric trunk shift. As abductor musculature is weaker than normal at mid-stance phase of gait the center of mass is unable to be held in its normal mid-line position and it moves toward the support side. Gait becomes a series of lateral excursions in addition to slower forward progression. With progression of disease, velocity slows further, lumbar lordosis develops and the arms become abducted for balance.

In addition to symmetrical weak muscles being responsible for trunk shift, the structural abnormality of genu valgus is also associated with this sign. Pregnancy and obesity also generate symmetric trunk shift due to increased mass.

SHORT STANCE TIME

Asymmetric stance time or alteration in gait "density" is usually the result of altered structural integrity, irritative focus or inflammatory lesion. The "tack in the shoe gait" is seen with metacarpal fractures, undisplaced tibial or fibular fractures, osteochondritis dissecans or early osteomyelitis or septic arthritis. As a generalism, short stance usually indicates a peripheral problem (i.e. knee level or below).

The reason for this hinges on the body ability to compensate mechanically. At the ankle the mechanical and anatomic axes are together so the only way to decrease load is to reduce the time spent on the extremity. At hip level the anatomic and mechanical axes are quite divergent so a significant trunk shift will considerably reduce hip force before it becomes necessary to shorten stance time. If things could be simplified to "pure" situations, short stance implies ankle or foot pathology. Short stance with a small amount of trunk shift is knee disease and pure trunk shift with no alteration in stance time is hip pathology. The addition of short stance to significant trunk shift suggests gross hip disease.

Normally we can lurch or trunk shift and reduce our hip force from 2.4 to 0.8 body weight (a reduction of 300%) before requiring any stance-time compensation.

The phenomena of increasing mechanical alteration of a developing condition can be seen with Legg-Perthes. Trunk shift develops before short stance. A good parental historian reports the patient "walked funny" (trunk shift) for a couple of months before he developed "limp" (short stance) at which time he presents for diagnosis. Changes in the femoral head are always present for months before the diagnosis is made and the "funny gait" is the increasing trunk shift before "limp" which is short stance time in the popular sense occurs.

Mechanically speaking the "health" of the femoral head can be assessed by the degree of trunk shift not by the appearance on x-ray. The end point of treatment of hip pathology is when trunk shift ceases despite what the x-ray shows. X-ray changes lag behind clinical signs.

DIMINISHED STRIDE LENGTH

Relaxation of hamstring musculature is necessary for proper stride. In children as opposed to adults, structural signs appear before neurologic compromise. The young disc patient will present with a short stride. The first sign of a symptomatic spondylolisthesis will be hamstring spasm manifested by short stride in gait.

Adult disc patients will usually be complaining of leg and back pain accompanying their altered stride length.

Cerebral palsy gait can be variable depending upon the degree of and area of involvement. A common pattern is the spastic diplegic with flexed knees and short stride due to hamstring spasticity.

LIMB LENGTH DIFFERENCE

Efficient gait maintains the center of mass within small vertical limits. Limb length difference are usually significantly compensated for in gait by the body attempting to lengthen the short side by walking in equinus or walking with the knee flexed on the long side. Twenty-five to thirty degrees of knee flexion can compensate for five cm of limb length difference in an adult.

To observe for the dynamic limb length difference, concentrate on the height of the head as a patient walks toward or away from you and mentally mark the maximum height of the head for each stance. The difference in head heights is the dynamic limb length difference. Most of the time we are surprised how much less this dynamic limb difference is as compared to the static limb length difference.

There is no universal agreement as to what level of limb length difference should be treated. Most feel 2.5 cm or greater (of adult height) is a reasonable difference to treat. Certainly in the child with limb length difference predicted at maturity of greater than 2.5 cm, limb length equalization is a reasonable consideration.

The information on back pain and scoliosis because of limb length difference is very soft. 50% of people will have back pain who are otherwise normal. Comparison of limb length difference measured statically to dynamic measurement has not been done. Prediction of long term disability because of a static measurement without measurement of the dynamic situation in my view is invalid.

GAIT SLOWNESS

Walking velocity is very consistent and is usually slowed when pathology is present. Greater than one metre per second is a fairly normal speed. Significant cerebral palsy or muscular dystrophy slows gait velocity to 1/4 to 1/8 metre/second.

Trunk shift is energy inefficient and thus overall slows gait to a mild degree. Cardiovascular and respiratory pathology reflect directly in diminished gait velocity.

Ask oneself the question "how fast is the patient moving?"

ALTERED CADENCE

Cadence is defined as the number of steps per minute but we will expand the concept to include gait regularity or smoothness. Our center of mass as we progress forward describes a series of sinusoidal waves with maximum heights at stance phase. In swing we experience the lower amplitude with higher velocity. The quality of cadence can include the regularity of our speed throughout the cycle. The chief example of movement disorders that exhibit high rates of altered speed through the cycle are Cerebral Palsy and other spasticity producing conditions.

In addition, any condition that restricts range of motion of joints from whatever cause alters gait cadence. With a stiff knee, the source of gait alteration is obvious, but when a stiff hip or stiff ankle is present we're first alerted to the lack of gait smoothness which tells us pathology is present then closer observation reveals the area of concern.

SWING PHASE ASYMMETRY


Observation of the non-planted swing-phase limb can do much to diagnose muscle imbalance. Swing-phase supination of the foot implies imbalance. The possible causes are tibialis anterior or posterior over-activity or under-activity of the peroneal group. Cerebral palsy commonly has spasticity of the tibialis posterior. Foot equinus is due either to over-active Gastroc-Soleus Complex as in cerebral palsy or under-activity of tibialis anterior and peroneal groups as in Charcot-Marie-Tooth and other peripheral neuropathies. The slap-foot component is present with neuropathies or peripheral peroneal nerve injury. The scissoring of cerebral palsy implies over-active adductors while toeing-in in cerebral palsy implies hip internal rotation spasticity. □

ACKNOWLEDGEMENTS

I would like to thank my orthopaedic colleagues at I.W.K. Hospital for Children for their ideas and input in helping me to better understand movement disorders.

References

- V Inman. *Human Walking*. Baltimore: Williams & Wilkins, 1981.
VH Frankel. *Basic Biomechanics of the Skeletal System*. Philadelphia: Lea & Febiger, 1980.



ALFRED J.
BELL & GRANT Limited
INSURANCE SPECIALISTS

suite 1306, purdy's wharf, 1959 upper water st.
p.o. box 8, halifax, n.s., b3j 2l4

"INSURANCE — THAT'S ALL!"

- Business and Personal Tax Planning
- Personal Financial Planning
- Preparation of Financial Statements
- Computerized Accounting Systems

Suite 1100
Cogswell Tower
2000 Barrington Street
Halifax, Nova Scotia
(902) 421-1734

**Doane
Raymond**

Chartered Accountants

Observations on the Quest for the Perfect Operation

R.H. Yabsley,* M.D., F.R.C.S.(C),

Halifax, N.S.

Who can say for certain who performed the first arthroplasty of the hip? Barton of Lancaster, Philadelphia, tried to create an arthroplasty through the formation of a pseudarthrosis of the femur in 1826. Ollier in 1885 attempted to achieve it through the formation of a new joint by the interposition of a muscle flap, while Gluck attempted to fix ivory ball and socket joints using a concocted glue or cement in 1895. Others developed various unipolar designs, some of them quite successful and, in 1938, Phillip Wiles of the Middlesex Hospital in London attempted to replace both the femoral head and acetabulum with stainless steel components. Haboush appears to have been the first to use acrylic as a cement to fix a hip prosthesis.¹

It is generally accepted that the greatest contributions were made by the late Sir John Charnley. He is regarded the world over as the doyen of all those pursuing the quest of the "perfect operation."

An opportunity to study in Europe in the 60s via a McLaughlin Scholarship provided a unique opportunity to observe at first hand those early developments in what has become one of the most successful orthopaedic operations performed all over the world.

The concept of replacing a diseased part with an artificial one which would work as well as the patient's original joint is dazzling and, as yet, unrealized. There are major considerations to be respected in performing the procedure, and despite what seems to be a popular lay misconception, it is not for everyone who has "arthritis of the hip."

Because it has inherent shortcomings, it is essential that there be a repertoire of procedures available so that the needs of patients may be best met.

- A. What is suitable in later life may not be appropriate in middle age.
- B. What is suitable for unilateral disease may not be suitable for bilateral disease.
- C. What is best for an arthritic hip with a good range of motion may not be best for one with a poor range.
- D. What is best for a labourer may not be suitable for a sedentary worker.³

There are many permutations and combinations involving diseases, patients, pain, personality, and the procedures commonly used. It is the purpose of this essay to consider them in relation to decision making and expectations of surgery for this disorder.

THE DISEASE

Arthritis forms the basis for a huge industry in the United States. Precise figures do not exist, but estimates place it between \$8 and \$10 billion a year, and accounts for \$7 billion a year in lost wages and taxes.⁷

It has over 100 forms and affects 1 in 7 Americans. A new case is diagnosed every 33 seconds. It has been stated, "If cancer and heart disease can be thought of as a death sentence, then arthritis can be thought of as life imprisonment. Once it strikes you may have to live with it for the rest of your life."⁷

Sales of arthritic medication retail close to \$3 billion annually. Annual aspirin sales alone in the United States are approximately \$900 million, while the more potent prescription items like Motrin, Voltaren, and Indocid total approximately \$1 billion.⁷

Over 200,000 total hip replacements, (a \$300 million a year market), and probably almost as many total knee replacements, are carried out annually in the United States, at a cost of about \$1 billion, and growing at a rate of 10% per year.¹⁰ In fact, the whole spare parts industry is booming. More than 100,000 breast implants were carried out in 1983. In that same year, more than 40,000 finger joints were inserted, and there was a market for 100,000 artificial limbs — 80% of them legs.⁹

THE PATIENTS

Almost all surgical patients who seek surgical help do so because of pain. They may have other difficulties related to the arthritic condition, such as limited motion, or a short leg, but it is the pain which is what they want taken away. In some, it is present 24 hours a day, and so severe that they have to sleep in a chair. Leaving their home or apartment independently may be impossible. Truly, life imprisonment! Further, they may suffer the indignity of being unable to attend to their bodily needs, or even to dress themselves without help because of pain.

If the patients are elderly and if the disease process is amenable to management by total joint arthroplasty, it is likely that much or all of their pain can be relieved.

*Professor of Surgery (Orthopaedics), Dalhousie University; Chief of Orthopaedic Surgery, Victoria General Hospital, Halifax, N.S.

Not all, however, can be managed in this fashion. For those who are younger, or suffer from other disorders, other procedures, with quite different implications for the patients, may be indicated. Such patients might be those in middle life, suffering from the sequelae of congenital dislocation of the hip, Legge Perthe's disease or post-traumatic arthritis. It is interesting to note, however, that by the turn of the century, 14% of the population will be over the age of 65 years.¹⁰

Orthopaedic procedures with limited goals, for the younger patients especially, represent a tremendously important investment on the part of the patient and involve compromises and adjustments which both patient and doctor must ensure are realistically understood and accepted before any procedure is ever carried out.

THE PAIN

I am constantly amazed at the amount of pain that this condition frequently produces. This can be appreciated by the gratitude of patients, even when the pain has been only relieved, rather than abolished, or when post-operative function in the opinion of the surgeon is not particularly impressive.

This is to be contrasted with the results of surgery of backache in its various forms where, it seems, it is exceptional for patients following surgery to make light of residual pain. It often appears that in backache, the pain is never 100% organic and that the patients' personality is an integral part of the syndrome.² Certainly, if one considers to what extent functional aspects enter into the total pain picture in three common pain states *viz.* arthritis of the hip, low back pain and neck pain, one cannot but be impressed with the feeling it is almost nonexistent in patients with hip arthritis, often important in those with low back pain, and virtually always of significance in those suffering from neck pain. In view of the fact that some of the common procedures used in the management of arthritis of the hip have very definite, and often limited, goals, it is important to consider some aspects of the decision making process on the part of the patients and the surgeon.

THE PERSONALITY

One often hears the expression; "suffering from pain." However, patients certainly can have pain without "suffering", and suffering in the absence of pain *per se*.⁵ How a person makes a choice for surgery, especially upon his musculoskeletal system which forms such a vital part of his fight-flee-flow capability is dependent to a very large degree upon, among other things, his personality. How he perceives his disability, his expectations and his outlook may well be decisive in any decision, at least on the part of the surgeon to recommend, or not recommend, a given operative procedure.

There is evidence to suggest that the values patients place on the benefits of treatment may be quite different from those of doctors. This may explain some of the social, economic and legal consequences when surgery fails to meet the expectations of the patients. It has been suggested that when it comes to taking risks in medical care, patients behave much as they do in other situations.⁴

Psychological research has also suggested that most people are willing to take serious risks when they expect losses, but not when they expect gains.⁸ It follows then that patients will take serious risks if their lives are at stake, as the result of, for example, trauma, but not if the cost-benefit ratio is even only slightly in their favour. Such situations might occur in deciding for or against elective surgery with very definite and limited objectives. Much of orthopaedic surgery falls into these two categories — trauma surgery and reconstructive surgery. Could it be, therefore, that the high incidence of failed candidates of back surgery, where the cost-benefit ratio is often so marginal, is because these individuals are risk takers in nonmedical life style situations or because they are so socioeconomically desperate? It has been estimated that for perhaps a third to a half of the care that doctors as a whole deliver, the benefit and the risks are evenly balanced — described by the economists as "the flat of the cost effectiveness curve."⁴

THE DOCTORS

Who would want a pessimistic doctor to treat him? Few, I am sure. Most, however, would prefer a physician who is honest professionally and, at the same time, skilled in the Art. To that end, it has been demonstrated that physicians bring an inherently natural optimism to their work, and that patients encourage.⁴ Quite naturally!

The patient's legal right to all the information necessary to make decisions about his health is now well established. It is rare that patients ask penetrating questions and many seem willing to undergo surgery with an astonishingly small amount of intelligent "informed consent". Perhaps this should surprise and concern us. After all, in telling children bedtime stories, we have all had the experience of wanting them to hear the "good parts" — often over and over, and experienced the backlash from an unhappy patient.

It is therefore not surprising that many patients, when made aware of the "flat of the cost effectiveness curve", decline surgery. And rightly so.

The threat of a malpractice suit is increased if the doctor allows a patient to anticipate results which will not be realized. It is therefore not difficult to see how this may happen in view of this inherent enthusiasm on the part of physicians which he even tends to carry over into his family. Surgical rates are as high, or higher, as in other professional nonmedical groups.

It is apparent that physicians place a high value on surgical care, and that they believe in the procedures that surgeons provide.⁴

In the event, however, of a successful malpractice suit, the patient, in the United States at least, should not draw much solace: it has been estimated that only 28 cents of every dollar paid in premiums ever reaches those who sue!⁶

THE OPERATIONS

In the light of these considerations, let me briefly review some of the commoner operations that are carried out for the treatment of those with adult arthritic diseases of the hip.

A. Osteotomy of the Hip: This procedure, devised principally by Pauwells of Germany and McMurray of England in the 1930s, is designed to relieve pain and preserve the patient's own hip joint. It is generally carried out in younger patients with osteoarthritis of the hip and is likely to be "successful" in 75-80% of cases. While relief of pain may be complete, it is more likely to be reduced, but not eliminated. The range of motion of the hip will probably not be increased, and the patient may have to accept a hip "lurch" and a shortened limb of 2 centimeters or so. The procedure essentially represents a surgically controlled intertrochanteric fracture. Should the procedure fail, it can be salvaged by total joint arthroplasty.

Thus, even a "successful" osteotomy carries with it significant disability. Careful patient selection and informed consent play a vital role in selecting and employing this procedure, as the results, while often spectacular, are more likely to be modest. Contrast this with the purveyors of pills who regard any pill that helps the patient, even a little, as successful!

B. Arthrodesis of the Hip: An operation not to be undertaken lightly — not by the patient, and certainly not by the surgeon! It is generally carried out for young patients with unilateral noninflammatory hip disease. It will relieve pain arising from the hip joint, because the joint itself is abolished. The joint is fused and will therefore not move. It is generally held that women find this loss more unacceptable than men, perhaps because of perception of it being unattractive, limiting their role in intercourse or making childbirth more difficult. A male, on the other hand, if a labourer, can perform heavy labour with it — which he probably could not do if he had had an osteotomy or an arthroplasty. It might not be acceptable, however, if he were a taxi driver or a truck driver or a plumber.

Patient compliance of a high degree is required as the procedure may well require the patient to be recumbent for several months after surgery — or even to be in a large hip spica cast during this period.

C. Arthroplasty: For all intents, this term virtually refers solely to total or bipolar joint replacement. In

the twenty-five or so years that it has been widely available, a number of changes have occurred.

The designs have changed to lessen the incidence of breakage, so that now this complication has disappeared. This change has also resulted in diminished likelihood of loosening. Revision rates of 10% in 10 years are still realistic however. Designs are currently being employed which permit fixation of the components, without the use of cement, by permitting the prosthesis to be biologically held, not by cement, but by osteointegration. It is too soon to state how successful these designs will be and what problems they will bring, but cement use still plays a very important role in this operation.

New materials are being introduced, especially in the form of ceramics, but these are not currently being widely used.

Despite popular belief, the operation is best reserved for the elderly or those where nothing else is available. It may be performed primarily — or as a salvage for another procedure which has failed. It is most successful in relieving pain. It may be disappointing if the patient anticipates a "normal hip". The range of motion may not be increased, but occasionally a leg length deficiency can be slightly decreased. It is probably reasonable to expect the procedure to last a minimum of 10 years.

CONCLUSION

I have attempted to review the various parameters which enter into and affect the decision to carry out an operative procedure for alleviation of arthritis of the hip, in the light of the procedures commonly used, the patients who are the ones seeking help and the surgeons who are the providers of this care. □

References

1. Scales JT. Symposium on "Lubrication and Wear in Living and Artificial Human Joints". Paper 13: Arthroplasty of the Hip Using Foreign Materials: A History. 1967, pp 1-18.
2. Charnley John. Low Friction Arthroplasty of the Hip Joint. *The Spectator*, 1964.
3. Charnley John. Surgery of the Hip Joint. *Brit Med J* 1960; 1: 821-826.
4. Bunker John P. When Doctors Disagree. *The New York Review of Books*. April 25, 1985, pp 7-12.
5. Cassell EJ. The Nature of Suffering and the Goals of Medicine. *New Engl J Med*, 1983; 306:639-645.
6. Brinkley John. Physicians Have an Image Problem — It's Too Good. *New York Times*, Feb 10, 1985.
7. Kleinfield NR. Arthritis: Building an Industry on Pain. *New York Times*, August 18, 1985.
8. Tversky A, Kahnman D. The Framing of Decisions and the Psychology of Choice. *Science*, 1981; 211: 453-458.
9. Kleinfield NR. Companies in Search of Bionic Man. *New York Times*, November 20, 1983.
10. Halter Peter. Orthopaedics Will See Long Term Growth. *High Technology*, Nov 1985.

Genetics in Orthopaedics

Gerald P. Reardon,* M.D., F.R.C.S.(C),

Halifax, N.S.

The etiology of many orthopaedic diseases is unknown. This includes not only rare conditions, but also such common problems as scoliosis, clubfoot and congenital hip dysplasia. Many of these diseases have a genetic basis, wholly or in part, and this article will explore the genetic factors involved in a number of prominent musculoskeletal conditions.

Developmental disorders may be present at birth (congenital) or become apparent at a later age. These disorders may result from genetic factors, environmental factors, or a mixture.

Genetic abnormalities may be divided into three groups:

1. Chromosomal anomalies;
2. Single gene disorders with dominant, recessive, or X-linked patterns; and
3. Multifactorial disorders, due to the interaction of multiple genes together with environmental factors.

Chromosomal Anomalies

Every cell in the body, except those in the gonads, contains 46 paired chromosomes, 23 from each parent. They are grouped as 22 pairs and two sex chromosomes, X and Y. They are numbered according to size, the largest being number 1 and the smallest number 22. Chromosomal disorders may result from numerical errors or structural errors. Numerical errors include trisomy (the addition of an extra chromosome), the most common of which is Down's syndrome; and monosomy and deletion (the loss of a whole or part of a chromosome). The loss of a whole chromosome is not compatible with life, but partial deletions occur, for example, Turner's syndrome (XO).

These numerical errors also include mosaics, in which more than one cell line persists as the embryo develops. Structural errors can occur causing chromosomal abnormalities, such as translocation — this involves transfer of genetic material from one chromosome to another — and ring chromosomes, in which there has been a partial deletion at both ends of a chromosome, and the two ends join up; malformation syndromes result from this.

*Orthopaedic Surgeon, Active Staff, Halifax Infirmary and Camp Hill Hospitals, Assistant Professor, Dalhousie University, Halifax, N.S.

Single Gene Disorders

These disorders are caused by the mutation of single genes. The reason for mutation, that is, a change in chemical structure, is unclear, but one factor associated with mutation is an increase in paternal age. In these disorders, there are four typical patterns of inheritance: autosomal dominant, autosomal recessive, X-linked dominant, and X-linked recessive. Autosomal dominant disorders are clinically apparent when only one gene of a pair is abnormal. Up to 50% of all first degree relatives are affected. Many of these disorders involve structural non-enzyme proteins like collagen. Examples are achondroplasia, Ehlers-Danlos syndrome, and Marfan's syndrome.

Autosomal recessive disorders are clinically apparent only when both genes of a pair are abnormal. Up to 25% of siblings are affected with the same disorder. Both parents of an affected individual must carry the gene, and an affected individual must necessarily pass the gene on to all his own children, but the condition is not apparent in them. Points to note are that a high proportion of consanguineous parents may be found; isolated communities for religious or geographical reasons will show an unusual concentration of these recessive disorders; and a further point is that many of these disorders involve enzyme systems. Examples are homocystinuria, all mucopolysaccharidoses except Hunter's syndrome.

X-linked or sex-linked inheritance means that the concerned genes are on the X chromosome. Characteristic patterns emerge because the male has only one X chromosome and the female two. X-linked recessive inheritance is more common than X-linked dominance, and shows a typical pattern in which only males are affected and only females are carriers (e.g. hemophilia and Duchenne's muscular dystrophy). An affected father can never pass the disorder to his sons, but all his daughters will be carriers. The female carrier will pass the affected X chromosome, on average, to half her sons, who will exhibit the disease, and half her daughters, who will be carriers.

X-linked dominant inheritance is much rarer. There is a preponderance of affected females because of the possibilities of the abnormal gene being carried on either X, and as with all dominant disorders it will be clinically apparent even when only one of the gene pairs is abnormal. Again, the rule holds that an X-linked condition can never pass from father to son, but in X-linked dominance an affected father can pass

the disorder to all his daughters and an affected mother to half her daughters and half her sons.

In families in which a heritable disorder has occurred, it is important to be able to answer questions on the risk of the same disorder recurring. The need for accurate genetic counselling is even more important now that prenatal diagnosis is becoming possible.

The following is an attempt to summarize recurrence risks:

Chromosomal Anomalies — almost invariably are sporadic with little chance of a second child being affected. The exception is trisomy 21 (Downs').

Single Gene Disorders — counselling is usually not difficult, as the inheritance patterns are well documented.

Multifactorial Inheritance — counselling is more difficult, but risks are low, mainly in the order of two to five percent of first degree relatives affected with the same disorder.

Sporadic Case — counselling is very difficult when parents and the rest of the family are normal and this is the first deformed or diseased child. Various possibilities are:

1. There is no genetic basis, but the deformity results from some intra-uterine environmental accident.
2. There may be a new mutation of a gene responsible for a dominant trait. Suspicions would be aroused if age of the father was above average. Subsequent sibs would be normal, but one in two of the children of the affected individual would manifest the disease.
3. It could be the first appearance of a homozygote in a recessive disorder. This is likely to be an enzyme deficit, and it may be possible to detect this in both the patient and the parents.
4. If the patient is retarded and has generalized developmental anomalies, then there may be a chromosome defect, which can be diagnosed by examining cultured cells from the patient.
5. A case may be only apparently sporadic in that the apparent father is not necessarily the real one.³

Utilizing the preceding information with regards to genetic patterns as background, we will now discuss some prominent musculoskeletal abnormalities.

IDIOPATHIC SCOLIOSIS

This is a structural scoliosis for which no cause can be found, and it is the most common of all types of scoliosis. Diagnosis is made by excluding all other causes, such as congenital, neuromuscular, neurofibromatosis, etc. Idiopathic scoliosis is divided into

three groups according to the age of onset: infantile (0-3 yrs.), juvenile (3-10 yrs.), and adolescent (10-15 yrs.).

Infantile idiopathic scoliosis — in Europe, the incidence is 1.3/1000 infants of three years and under.⁴ In North America, the condition is very uncommon — the frequency is much less than the European experience. This difference is felt to be on environmental basis, as genetically the two areas must be similar. Infantile scoliosis is more common in males, with a ratio of 3:2. This is in marked contrast to the adolescent group in which girls are more commonly affected. The curve is usually a left thoracic curve. At least half the cases resolve spontaneously without treatment; however, progressive infantile scoliosis, untreated, results in severe crippling deformity, as the curve worsens the whole time the child is growing.

Familial incidence shows an increase in the proportion of 1st, 2nd and 3rd degree relatives that are affected when compared to general population figures, but no clear genetic pattern has emerged. Instances of infantile scoliosis occur amongst relatives of the adolescent type and vice versa, indicating probable similar etiology. Family data relating to parental age, birth order, and birth history does not differ from normal.

Adolescent idiopathic scoliosis — this condition is as common in North America as in Britain, and is probably more common in whites than blacks. The ratio is seven girls to one boy. Curves may be thoracic, thoracolumbar, or lumbar. Ninety percent of thoracic curves are to the right, unlike infantile curves.

The proportions of 1st, 2nd, and 3rd degree relatives are considerably higher than those found in infantile idiopathic scoliosis. It appears that 1st degree relatives are affected equally, and the lowest figure given is 5% of them with a curve. If only female patients and their female relatives are considered, the lowest figure is 12%. The general population incidence is only 0.2%.⁴

Present data are consistent with either X-linked dominant inheritance with reduced penetrance, or with multifactorial inheritance. The former is felt to be more likely. With regards to genetic counselling, it is felt that the risk to sibs or to children of an affected individual is not less than 5-7% and possibly much higher if very minor curves are included.

CONGENITAL HIP DYSPLASIA

There are considerable differences in the incidence of congenital hip dysplasia in different parts of the world. Figures for Europe and North America are usually quoted at about 1 per 1000. This figure is much higher if all neonates are examined during the first week of life when a "clicking" hip may be found. The disorder is almost unknown among the African Bantu, and there is a very low incidence in Chinese. On the other hand, Lapps and certain American

Indians, have a much higher rate of CDH. These variations are probably due to both genetic and environmental differences. The female to male ratio is 3:1 in the neonate and 5:1 for older cases. Several studies have reported that the proportion of affected sibs is about 6%.² CDH is more common in the first born. There is also an association with breech presentation or version late in pregnancy. These features indicate intra-uterine environmental influences rather than genetic influences. It is possible that these intra-uterine factors merely trigger the deformity in individuals who are genetically predisposed.

There are definite genetic factors acting here, as evidence from studies showing the proportions of 1st, 2nd and 3rd degree relatives with CDH. However, environmental factors also play a major role — excess of first born children, excess of breech presentations, and excess of winter births. The multifactorial nature of this deformity is shown by the increasing risk in families with more than one affected individual. For example, with normal parents the risk of subsequent sibs of an affected patient is 6%. If one parent has CDH the risk to a child is 12% (sons — 6%, daughters — 17%). If one parent and one child has CDH then the risk to a second child is 36%.²

MULTIPLE EXOSTOSES

This condition is highlighted by the presence of multiple osteochondromas affecting many skeletal sites. This is of autosomal dominant inheritance. The sex ratio is probably equal. Thus, one half of all children of an affected individual will also display evidence of this disorder.

RADIO-ULNAR SYNOSTOSIS

This deformity occurs in various forms. The upper end of the radius may be absent and its shaft fused to the ulna; the upper one-third of the radius and ulna may be fused with a radial head which is present but malformed; or a malformed head of radius is held to the ulna by a thick interosseous ligament. The condition presents with loss of pronation and supination and is usually diagnosed in childhood. There is little disability. As an isolated trait it has been described both as of sporadic occurrence and of dominant inheritance. It may also occur as part of other more extensive syndromes.

CLUBFEET

The incidence of congenital idiopathic talipes equinovarus (clubfeet) is approximately 1 per 1000. There is a 2:1 male to female ratio. The incidence of the same deformity amongst first degree relatives is 20 to 30 times higher than the normal population incidence in white races.⁶ This indicates a strong genetic factor in clubfeet. The proportion of affected relatives indicates multifactorial inheritance.

The deformity probably results from a genetic predisposition acting together with some intra-uterine environmental factor. The exact nature of these is obscure. Risk figures in genetic counselling are not straight forward, as the deformity is multifactorial, but they are much increased for subsequent children when there is already more than one affected patient in the family.

1. If the parents are normal and the patient is male, the risk to another sib is 2%.
2. If the parents are normal and the patient is female the risk to another sib is 5%.
3. If one parent is affected and has one child affected, the risk to a second child may be as high as 25%.⁶

LEGG-PERTHES

The incidence is approximately 1 per 2,000 in the general population. The male to female ratio is approximately 4:1 or 5:1. Risk to siblings is about three percent. No figures are available for proportions of parents or children affected with the same disorder. Inheritance is probably multifactorial with a very low risk of recurrence.

SPONDYLOLISTHESIS

A survey was carried out on 147 first degree relatives of 47 patients with spondylolisthesis of L5 and S1.⁶ Twelve patients had dysplastic type and 35 had isthmic type. Nineteen percent of relatives had spondylolysis. The affected patients with the dysplastic form had a higher proportion of affected relatives (33%) than had those with the isthmic type (15%), but both figures are significantly in excess of the estimated frequency for the general population of under 1% and 5% respectively. It was concluded that the developmental defects of the vertebrae associated with spondylolysis are not etiologically related to neural tube defects. The one in three risk of spondylolysis to near relatives with the dysplastic form of spondylolisthesis was emphasized in order that any deformity in their siblings and children could be recognized early. This survey was too small to clearly identify a pattern of inheritance, but it probably lies between autosomal dominant with reduced penetrance and multifactorial inheritance.

TARSAL COALITION

The most common types of tarsal coalition are talocalcaneal and calcaneo-navicular fusion. The incidence varies between 0.7% and 2%. Cases may be sporadic, but there are a number of reports of affected families in which these fusions appear to be of autosomal dominant inheritance.

NEURAL TUBE DEFECTS

This includes anencephaly and myelomeningocele.

These are felt to belong to the same etiological group. They are the most common of all congenital malformations. The incidence of each is about two per 1,000 total births. The incidence has been noted to be lower in blacks than in whites in different areas. That is, the racial difference in incidence is maintained in a variety of geographical areas and cultures, which is evidence that these anomalies are, in part at least, genetically determined. There are 3 times more females than males with anencephaly, and in myelomeningocele the male to female ratio is 1.5 to 1. Studies show that approximately 5% of siblings are affected with similar malformations, which is an increase of 7-10 times over the normal population incidence. It has also been found that if there are already two affected sibs, the risk of a third being affected is considerably greater, approximately 10%.¹

An interesting point is that a number of surveys have reported a higher incidence of neural tube defects on the mother's side of the family, and amongst her sister's children, but not her brother's children. It seems probably that it is not the fetal genotype but the maternal one, together with the intra-uterine environment, which are important in these defects.

To summarize known data, there is good evidence for the importance of genetic factors in the same racial incidence after immigration and in the higher proportion of concordance in monozygous than in dizygous twins. There is also evidence for environmental factors — increased maternal age, birth order effect (more common in the first born), seasonal variation (significance is obscure) and social class. It is probable that there are multiple contributing factors rather than one single environmental agent.

To summarize, there are many musculoskeletal conditions influenced by genetic factors. Some of the more prevalent conditions have been discussed, along with some basic factors involved in inheritance patterns. □

References

1. Bunch Wilton H. *Myelomeningocele, Pediatric Orthopaedics*. Philadelphia: Lippincott, 1978.
2. Coleman SS, MacEwen GD. *Congenital Dislocation of the Hip in Infancy*, AAOS Instruc. Course Lect., 21-155, 1972.
3. Cowell Henry R. *Genetic Aspects of Orthopaedic Conditions, Pediatric Orthopaedics*, Philadelphia: Lippincott, 1978.
4. Cowell HR, Hall JN, MacEwen GD. Genetic Aspects of Idiopathic Scoliosis. *Clin Orthop* 1972; **86**: 121.
5. McKusick VA. *Medical Genetics, The Principles and Practice of Medicine*, (17th ed.) East Norwalk: Appleton, Century, Crofts, 1968.
6. Wynne-Davies R. *Heritable Disorders in Orthopaedic Practice*. London: Blackwell, 1973.

HOUSE CALLS

At Investors, we don't keep bankers hours. We keep yours. So if you can't come to me, I'll come to you.

I can help you put together a written, comprehensive financial plan that will help you reach your personal financial goals.

If you need advice on anything from saving taxes to investment opportunities, call me today.



MURRAY SMITH
SIMPSONS MALL, HALIFAX, N.S.
BUS. 423-8294 RES. 835-9983



MEDICAL PRACTICE PRODUCTIVITY CONSULTANTS IN MEDICAL OFFICE MANAGEMENT

2737 Robie Street, Halifax, Nova Scotia B3K 4P1
477-1358 or 454-6641

23 Cedar St., Stellarton (P.O. Box 437) B0K 1S0
755-5962

SPECIALIZING IN:

- policy and procedure manuals, customized to fit individual medical practices to ensure continuation of routine office procedures.
- temporary and permanent secretarial services
- overload typing
- filing systems
- office analysis
- conference planning
- customized appointment books

EFFICIENT OFFICE SYSTEMS ENSURES SATISFIED PATIENTS, STAFF, AND PHYSICIANS.

New Life on the Arctic Coast: An Orthopaedic Look at Spence Bay

B.J.S. Grogono,* M.B., F.R.S.C.(C),

Yellowknife, N.W.T.

There are some thirty-eight nursing stations in the vast expanse of the western region of Canada's Northwest Territories. They are an integral part of the modern hamlets that stretch from the south shore of Great Slave Lake to the rugged communities that are dotted along our Arctic Coast. Although I have had the opportunity to visit several of these stations, it is Spence Bay that has brought me the most unforgettable experiences.

My first visit was a few years ago, when the temperature was in the forty below range and the last days of December daylight was bidding goodbye. A vast sheet of iridescent pink filled the sky and the air was as sharp as a razor. Daylight lasted about an hour and I dashed out from my clinic for a few seconds to admire its final curtain call, before the Arctic was enshrined in darkness that would last two months.

My next encounter was in the spring, when the entire settlement seemed to glow with excitement as the grip of winter was released. The snow responded with the reflected gold of the sun and everyone seemed to be gathering their komatiks together, for a trip out on the wide Arctic trails to see their friends in Pelly Bay or other communities, travelling along many bumpy miles behind the rocketing power of their snowmobiles.

On my most recent trip, summer was just coming to an end. We flew over from Cambridge Bay in a fifty year old DC3, and I could discern the raw stretches of the Arctic coastline and identify the rugged tooth-like shape of the Boothia Peninsula that juts out from Canada's northland.

I was travelling with Dr. Brian Finnmore, the highly experienced and enthusiastic doctor who has replaced Peter Sarsfield (of *Arctic Diary* fame). Brian's journey would take him on to Pelly Bay on his regular round trip and he would not be returning to his new home in Cambridge Bay for two weeks. As we chatted, we both admired the spaciousness of the northern coast and marvelled at the twists of history that has brought this remote part of the globe prominence.

The name Gjoa Haven, where I left Brian at the first stage of his rounds, rings a familiar bell. The story of Roald Amundsen, a man of resource and painstaking efficiency who beat Captain Robert Scott

to the south pole, began here when he ploughed through the Northwest Passage in 1904. Gjoa Haven is a beautiful little harbour which is encased in ice for the greater part of each year. The first Canadian ship to travel this passage was the *Aklavik* in 1937. She was a Hudson Bay Company supply ship and travelled east through the Bellot Strait that transects the Boothia Peninsula. She met up with the *Narscopie*, another Hudson Bay Company boat, and exchanged goods with the local Inuit at the newly constructed settlement of Ross, set in the picturesque eastern coast of this historic peninsula.

It was over this land that Sir John Franklin and his men desperately dragged their boats as they tried to find food. They died of undetermined causes but left their traces behind. A sextant, some silverware and several skeletons are all that remained of these adventurers.



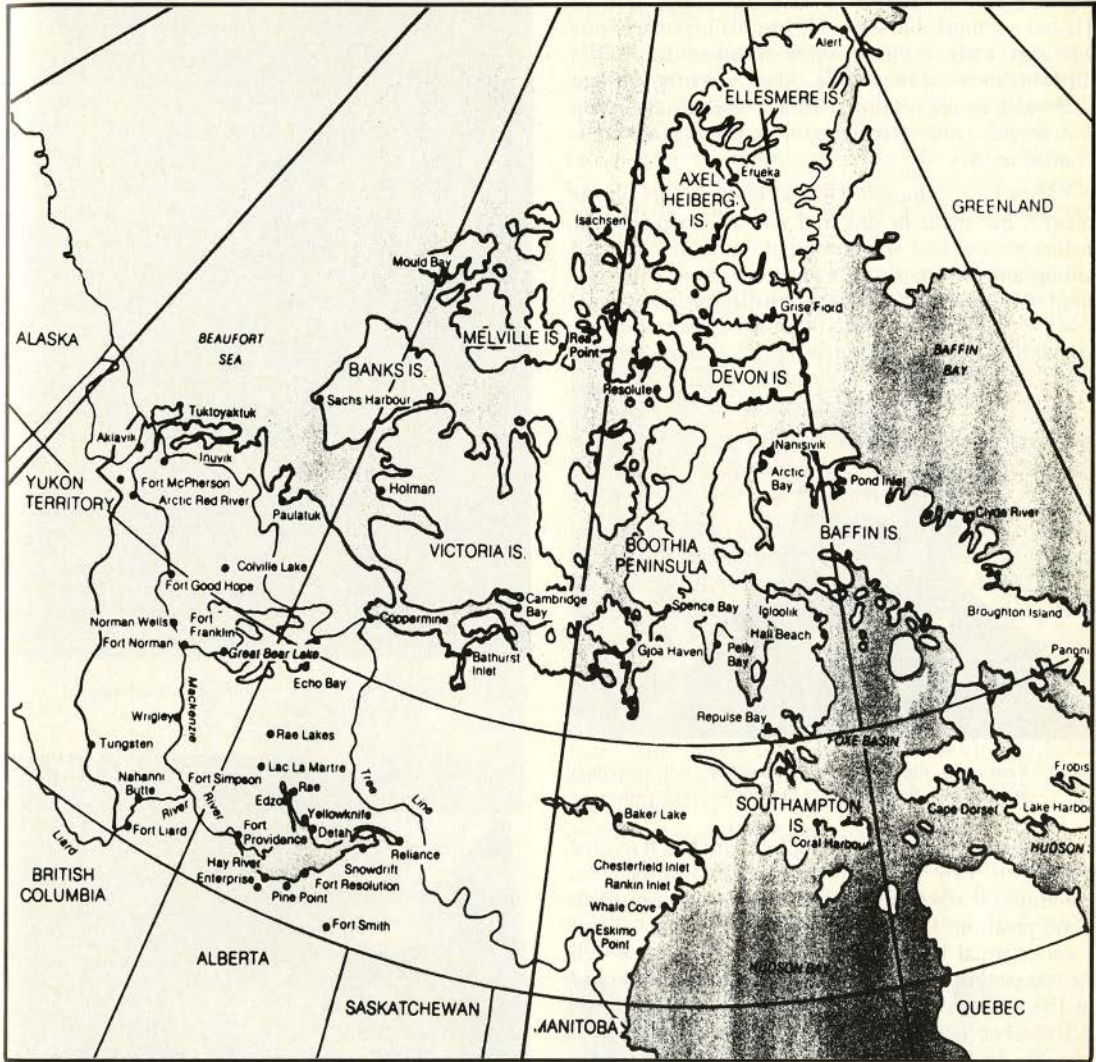
Fig. 1 Spence Bay, September 1985. This is where the icebreaker *Camsell* arrived during my stay.

Nowadays there are a collection of neat organized settlements sprinkled along this coast, and they are modern hamlets. The people are no longer dependant on seal oil, whale blubber and Arctic wildlife for their energy. Fuel is brought in by barge from the south and arrives once a year at each community. If the barge's passage is blocked by ice, fuel is flown in by Hercules aircraft (not a cheap alternative at \$27,000 per load and it might take 100 loads per settlement!).

These reflections eventually lead to more practical affairs and the annual orthopaedic clinic at Spence Bay. After skirting the southern rim of the Peninsula,

*Orthopaedic Surgeon, Staff, Stanton Yellowknife Hospital, Yellowknife, N.W.T.

NORTHWEST TERRITORIES



our aircraft lands in a cross wind, one wheel touching first and the others following. We hasten in a van to the Nursing Station, which juts up and gazes over the rock-lined bay. The sea is dark green and reminds me of our Atlantic shore. I deposit my bags and I am greeted by two nurses who invite me to share their soup and sandwiches.

Pat is a small and wiry nurse from Asia. Joan is a strong West Indian, who did her midwife training in England.

“I’ve got a full slate of patients for you”.

I am introduced to Anita, a native health worker who interprets Inuktitut and to John, the man who takes and develops the x-rays. Together, they form a team that provides health care, organize specialist

consultations and all telephone calls. Eye clinics, gynaecology, ear, nose and throat consultations are all held regularly here, as well as the regular visits of Dr. Finnemore.

It is rare for babies to be born here nowadays but today is different and, as I start my orthopaedic clinic, the labour room is being prepared for a mother who is in premature labour.

One of my first patients is a sturdy middle-aged man who has a noticeable limp and a glint in his eye. “You remember me don’t you?”.

I think back to my earlier visit when we first met. The temperature was forty below and there was a biting wind. He was taking a brisk morning stroll and, on seeing a stranger in town, invited me into his office

for coffee. This time he was coming for a check of his amputation stump and his well-worn prosthesis. He has a remarkable story. He lost his leg many years ago after unsuccessful attempts to correct deformities attributable to spina bifida. More recently, he had suffered a stroke resulting from a cerebral aneurysm but he has made a remarkable recovery after intracranial surgery.

"They never thought I would make it back to the office". But make he did, and now he stood proudly before me and had only a trace of dysphasia. The old stump and prosthesis were in good shape. "All you need is a new strap for that old artificial leg of yours".



Fig. 2 Veteran of the north. An amputation and a cerebral aneurysm are things he takes in stride in Spence Bay.

My next patient was a young boy who had fractured his femur two years previously. We nursed him carefully on traction and his fracture had united in good position. It was interesting to see that his legs were of equal length and gratifying to see how well he was walking. John took an x-ray and we all looked at the result. He smiled and later introduced me to his mother who must have been one of the local beauties in her youth. She had the fine tattoo marks on her face and arms. These adornments are the very same configuration described by the German explorer, Franz Boas, in his illustration of the Inuit of Cumberland Straits during his exploits in 1885. This custom has since been discontinued.

After the clinic was over, Anita led me briskly through the rows of wooden houses and over the rocks, until we came to a long wooden ramp that led to a front door. "This is Sossie's place".

Sossie is a cheerful middle-aged woman who is a paraplegic. I had heard much about her and we went inside for a visit. Children were playing on the floor, and an older man was preparing to serve supper. Sossie was sitting in an old Everest and Jennings wheelchair by the table.

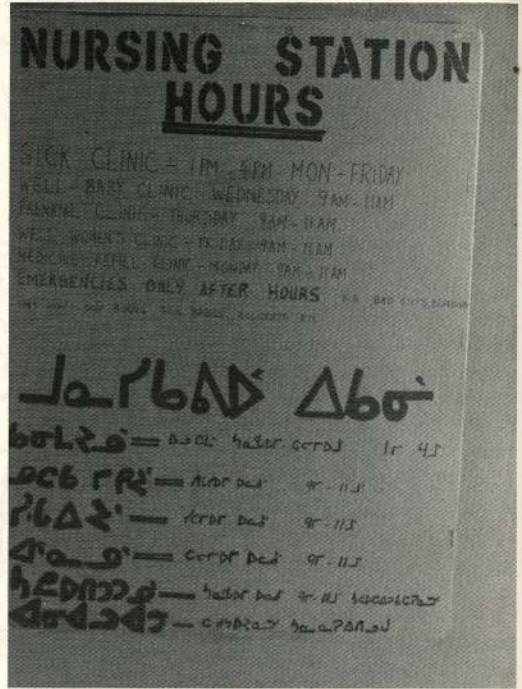


Fig. 3 Notice on the Nursing Station entrance is bilingual.



Fig. 4 This young boy broke his femur two years ago. John has taken his x-ray and we study the result.

"You don't mind if the doctor asks you a few questions?". Anita was tactful in explaining my presence and interpreted Inuktitut with skill.

Sossie's story was sad and dramatic. She had gone south to have her baby but, unfortunately, her epidural anaesthetic went wrong and she became paralysed. It didn't stop her from enjoying life and, after her return, she continues to be very active. "Oh yes, she goes everywhere with us", explained her husband. "In the summer she goes out to the camp, and in the winter she drives a snowmobile". "We all help her to move around", said one of the children.

I took another look at her and circumspectly brought out my pin. "Can you feel this?". I tested her as she sat in her chair and I could just discern a catheter. She was obviously in good health. Her level was about T10. She is a born humorist and smiled readily, as we took photographs and thanked her.



Fig. 5 The three-wheel "all terrain" vehicle is the favorite way to go to the Hudson Bay Store.

Back at the Nursing Station, there is an atmosphere of tension brewing. A young woman is in premature labour and Joan is coping. By 5:30 the membranes have ruptured and, a couple of hours later, she delivered a baby girl. At first, the infant looked small and frail. I attempt to help with resuscitation as Pat sucks out the mucus, wraps the babe in a blanket and adjusts the oxygen. The tiny child looks amazingly fragile and I marvel at nature's delicate balance as her breathing improves gradually and she gives a feeble cry.

Mother looks up from her bed, calm, and a little pale. The telephone is busy as Joan is contacting the experts. "Yes, the child is three pounds, about thirty-three weeks, and is crying".

We transfer her to an incubator as Joan enters. "Dr. Clarence Moisey says we must get a blood sugar and set up a drip". So after some struggle we manage to set up an intravenous in the internal saphenous vein and do the necessary blood test. We place the baby back in the incubator and wait.

Mother seems quiet but calm — her intention was

to give the baby away to the grandmother as she had with her first born. Father arrives and starts playing cards with his wife.

We keep vigil over the occupant in the incubator. At 9:40 p.m., all is hustle. Dr Moisey the paediatrician and Katy the nurse arrive in a flurry of blankets, incubator and oxygen. Dr. Moisey peers through our incubator at the minute parcel of life. He pulls back the cover and listens and examines. "Some things good, some things bad". He screws up his face. "Give me an intrathecal".

He wraps the diminutive skull in a warm towel. Miraculously, scalp veins appear like large rivers in the Mackenzie delta. Soon, a drip is running briskly and the child is wrapped up again — this time in a bubble plastic sheet as well as a blanket. She looks snug and cozy in her new home.

Another 'phone call. "Send your jet to Yellowknife and we'll meet you there. I think the child could develop respiratory distress syndrome".

So long before midnight, the caravan is on its way. A frail little human being, her paediatrician, her nurse, her incubator, her oxygen, and a series of aircraft to transport her a thousand miles or more to the latest technology available.

Joan is left alone, the only nurse at the station now, as Pat has taken the opportunity to fly south as her contract has ended. "There's one consolation", says Joan, "the mother is going to keep the child. I have been talking to her. I said 'why are you giving away your children?'. 'One day, you will want one of your own and you won't be able to have one'".

Mother was quiet for awhile after her child had gone south. She expressed her thoughts as the Inuit do, by moving her nose. "I think I'll keep her. Her name will be Joan".



Fig. 6 Anglican Church, Spence Bay.

The next day was another orthopaedic clinic and a chance to visit the icebreaker Camsell that emerged out of the Arctic seas, but that is another story.

Life continues to beat its fascinating rhythm up in Spence Bay. □

Beer as Medicine*

T.J. Murray, M.D., F.R.C.P. (C), F.A.C.P.,

Halifax, N.S.

The history of beer as medicine is as long as the history of beer itself. The first records of beer come from Egyptian papyri of 5,000 years ago. In the Book of the Dead there are references to a brew called Hek, made from barley, and in a papyrus of the same age we read of many indications of Hek being used for medicinal purposes. This type of beer became part of the general diet but was used primarily by the lower classes. The upper classes, who drank wine, attempted to close the many shops that sold Hek.

Beer making became known in the Middle East about 4,000 years ago and, although it was not popular in Greece, it was said that Dionysus (Bacchus) fled from Mesopotamia in disgust at the addiction of the people to drink. In Sumer nearly half the total grain yield was used in brewing, under the protective eye of Ninski the goddess of baking, and perhaps we can see how malting with yeast was discovered as the trades of brewing and breadmaking were combined.

Graffiti discovered by archeologists in one of the Chaldees indicated that drink had deteriorated, and the first legal code ever devised, that of King Hammurabi of Babylon in 1750 BC, condemned weak and over-priced ale.

The Jews made a brew with hops called sicera, which was supposed to protect them from leprosy. It was said that the Jews did not get leprosy during their captivity in Babylon due to the medicinal effects of their beer.

It is thought that the seafaring Phoenicians brought beer making to many other areas of the civilized world. Ale making in Britain was well known by the 1st century, but the conquering Romans, who drank wine, were repelled by the sweet tasting ale of the natives. By King Alfred's time it was established as one of the requirements men needed to run a country - "land to live on, and the gift of weapons, and the ale and food and clothes".

In Britain brewing was taken up primarily by monks and large amounts were consumed as part of the meals. At some monasteries a monk had a daily ration of a gallon of beer. The first public houses were also run by the monasteries, and were built by the side of roads for travellers. Initially kings and noblemen

stayed at the local manor, and their retinue were put up in other houses or inns. These inns became popular for other travellers, the manor steward was replaced by an innkeeper, and a sign of the manor was hung outside. This became the origin of the inn and pub signs, designed to be identified by the illiterate.

Large establishments such as monasteries and colleges had their own breweries. Queens College, Oxford, founded in 1340, continued brewing right up until 1939. Traces of monastic breweries can still be seen in the ruins of many of the great abbeys in England. At Fountain Abbey the malt house alone was 60 square feet, and the brewery could produce 60 barrels of strong ale every ten days. Their ration for a monk was 8 pints of ale per day.

In the 13th century ale was an important part of daily life. It was regarded as a food, as a preserver of good health, and was mixed with many medicines and prescriptions by the physicians and apothecaries. It was even used for baptism in some cases, and in Iceland was used in the eucharistic service as no wine could be made in the cold environment.

In Medieval times most families made their own ale, usually by an alewife. Most of the professional brewers were women, and of the 252 tax paying traders of Faversham, in 1327, 84 were alewives. A good alewife might sell her ale to others, and would indicate this by having a long pole out in front of her house, with a bush hanging from the end, or grapes if she also sold wine. The word bush is still common in pub names.

Ale began to be replaced in popularity by beer in the 15th century, and in 1436 a royal writ of Henry VI, *The Mystery of Free Brewers*, commented beer made with hops as "notable, healthy and temperate" and "the authentical drinke of Englande". Beer was a continental drink which came to England in the 15th century, replacing unhopped ale which usually was made with herbs or spices.

There continued to be arguments over the presence of hops in ale, but John Gerard in his writings in 1593 declared the beneficial medicinal effects of beer, such as cleansing the body and purging the blood. He declared that "the manifold virtues in hops do manifestly argue the wholesomeness of bere above ale; for the hops rather make it a phisicall drinke to keepe the body and health, than an ordinarie drinke for the quenching of our thirst".

*Address to Society for The History of Medicine, November, 1985.

Correspondence: Dr. T.J. Murray, Clinical Research Centre, 5849 University Ave., Halifax, N.S., B3H 4H7.

In Anglosaxon times ale was considered to be possessed of the highest medicinal virtues. Beer is mentioned in the Saxon Leechdoms as an ingredient in many medicines. Over many centuries beer was regarded as a treatment for lung disease. It was suggested in the Leechdom that for lung disease one should take clear, rather than sweet ale. For fever, drink clear ale with wormwood, githrife, betony, bishop-wort, macrubium, fen mint, rosemary, and other herbs. For one "friend-sick", with a diseased mind, the recipe was — "mix a number of herbs with clear ale, sing seven masses over the worts, add garlic and holy water and let him drink out of a church bell." Finally the lunatic should give alms and pray for God's mercy.

Presumably the intoxication of criminals before execution was a final act of kindness, and it was tradition to give a bowl of ale before the final curtain was wrung down. A bowl of ale was given before hangings at Tyburn, and the Bowyard, High Street, St. Giles, comes from the bowl of ale served at the Hospital of St. Giles for anyone being executed in the Court there. Sir Walter Raleigh had a cool bowl of ale before his execution, and Hugh Langton and Hugh Lattimer drank a bowl of spiced ale the night before they were burned alive. Mary, Queen of Scots, drank the brown beer of Burton-on-Trent when imprisoned. There is also an old expression "Saddler of Bawtry was hanged for leaving his liquor". Apparently Saddler refused his bowl of ale before hanging, and a reprieve arrived one minute after he was dropped. If he had tarried with his ale he would have been saved.

Beer was not primarily associated with death or executions, however, and had a firmer reputation for extending life and preserving one into a ripe old age. Many of the medieval writings comment on the ability of ale and beer to keep one healthy to old age. An English tombstone to Henry Jenkins noted he died in 1670 at the "wonderful age of 165 years, took his ale whenever he could get it". MacLean, who had been a comedian at Covent Garden, drank a pint of hot stout daily at the Antelope in White Hart Yard, which he said prevented any inward pains, and allowed him to live to the age of 107.

Ale and beer were part of daily life in an amazing number of ways. There are prescriptions for using ale to stain fishing lines a watery green, and monks fed carp ale-soaked bread. It was used to make sauces, fatten fowl, clean crepe, and polish furniture. They washed the outside walls of their houses with it, and used it to harden cement. It was mixed with sugar to attract bees to hives, and there are even reports of fires being put out with ale. Grooms would rub horses hoofs with ale in Norman times, and this persisted up until the last century. Cakes and ale were served on the twelfth day of Christmas, with a bean and pea hidden in the cakes. He who found the bean became

king of the bean, and she who found the pea became the queen.

HOPS AS MEDICINE

Initially hops in beer and ale was controversial; it became accepted later that the less sweet and slightly bitter taste was an improvement and the hops were felt to impart some healthy qualities. William Coles, herbalist, in *History of Plants* (1657) said that some types of hops are cures for half of mans ills.

The advisors of George III advised that he sleep on a pillow filled with hops when he was ill. Hops were used for hysteria, for the treatment of gout and for making many poultices. In Murray's *Handbook of Kent* he recommends invalids spend the day in hop gardens breathing the air. As this air contained lapuline, this was regarded as scientific by Cook. Lapuline is the yellow dust over hops and was commonly used to treat stomach ills. Hops were also used to make a bath and in America hops were used as medicine in a tincture, a liquid, and an oleo-resin.

PRESCRIPTIONS

Ale was a staple in life. It also had a central place as a medicine, particularly when mixed with other ingredients.

Hiccups were cured by pounding a root of jarrow, adding it to good beer and drinking it lukewarm. Sore knees in Saxon times were cured by adding wood wax and hedge rife to ale and rubbing it on the sore joint. Jaundice in the 16th century was cured by a prescription of a gallon of ale, with a pint of honey and two handfuls of red nettles. This mixture was drunk each morning for two weeks.

Prescription for a cough was as follows: one quart of ale; a handful of red sage; boil and strain. Add one-quarter pound of treacle; drink warm at bedtime. Such prescriptions were usually drunk warm and an old pamphlet printed for Henry Overton in 1641 called "Warme Beere" indicated that it was much more wholesome than beer drunk cold.

Thomas Cogan in 1584 in *The Haven of Health* advocated beer for "rewmes and gout". He cautioned against wine, idleness and surfeit for these patients. In his unusual book he talks of beer being invested by the worthy Prince Gambrinius in 1786 before Christ, as indicated by Lanquette in his Chronicle. He also gave a peculiar recipe for butter beer which was used for cough and shortness of breath. It does sound rather good — strong ale with the ingredients of fresh butter, sugar candy, licorice, ginger, long pepper and greens; boil and drink the mixture hot. Some add yolk of an egg or two to strengthen it. In fact, this prescription of buttered ale for cough can be found in medical writings over a number of centuries. In Pepys' Diary he mentions taking buttered ale each morning, made from ale brewed without hops, butter, sugar and

cinnamon. He was known to like ale and constantly sought out Bidde's ale.

In the French medical encyclopedia of the time there was an article on the value of ale as medicine, and also John Taylor in *Drinke and Welcome* in 1585 wrote that ale was used for many diseases. He concluded "ale is universal, and for virtue it stands allowable with the best recipes of the most antientest Physicians". He found himself "unable to expresse the wonders operated by Ale".

In a curious pamphlet *Panala Alacagholica* (1623) there was a description of how to make a healthy medicated beer. Medicated ales and beers, such as Dr. Butler's ale, were popular for centuries.

Dr. Butler's ale recipe in *The Book of Notable Things* is as follows:

Take Senna and Polypedium each four ounces
Agrimony and Maiden hair of each a small handful
Scurvy grass a quarter of a peck.
Bruise them grossly in a stone mortar
Put them in a canvas bag.
Hang the bag in nine or ten gallons of ale.
When well worked and when three or four days
old,
It is ripe enough to be drawn off and bottled.

This ale was sold at houses that had Butler's head for a sign, such as Tobias' Coffee House in Pye Corner, and Mr. Lansdale's in Newgate Market. There is still a pub called Dr. Butler's Head in London and my wife and I recently enjoyed a pleasant lunch there. Dr. Butler's ale was used as an excellent stomach drink, "to help digestion, dissolve congealed phlegm, cure colds, cough, ptisical and consumptive distempers". It was taken in an evening to "moderately fortify nature, cause good rest and usually corroborate the brain and memory."

By 1585 there were 26 breweries in London alone, producing 648,960 barrels of beer annually. There still was a controversy over whether ale or beer were more healthy, but in Hone's Table Book of 1620 there is discussion of the medicinal value of ale over beer and wine. This was confirmed in the old ballad "Nottingham Ale" that taunts doctors for forbidding the healthy drink:

Ye doctors, who more execution have done
With bolus and potion, and powder and pill,
Than hangmen with holter, and soldier with gun,
or miser with falhom, or lawyer with quill,
To dispatch us the quicker, you forbid us malt
liquor
Til our bodies grow thin, and our faces look pale;
Observe them who pleases, but cures all diseases
Is a comforting dose of good Nottingham ale.

Although there were arguments over ale and beer, there was general contempt for small beer by those who loved strong:

Ye who drinks small beer, goes to bed sober,
Falls as the leaves do fall, that fall in October;
He who drinks strong ale, goes to bed mellow,
Lives as he ought to live, and dies a jolly fellow.

John Taylor, the self styled water poet (1580-1653) condemned beer as "a Dutch borish liquor, a saucy intruder in the land, whereas ale makes the footmen's head and heels so light that he seems to fly as he runs; is the warmest lining of a naked man's coat; it satiates and assuageth hunger and cold". He adds that it is a specific medicine against "melancholy, tremor, cordis, maladies of the spleen, grippings of the guts, and stone in a bladder or kidney. It relieves the agonies of gout, siatica, fevors, agues, and rhums, and provokes urine wonderfully".

Ale probably the first anaesthetic and we have a prescription by Dr. Solas Dodd, writing in *Natural History of the Herring* (1753): "take the oil pressed out of fresh Herrings, a pint, a boar's gall, juices of henbane, hemlock, arsel, lettuce, and wild catmint, each six ounces; mix, boil well, and put into a glass vessel, stoppered. Take three spoonfuls and put in a quart of warm ale, and let the person to undergo any operation drink of this by an ounce at a time, til he falls asleep, which sleep he will continue the space of three or four hours, and all that time, he will be unsensible to anything done to him."

There are accounts of a cure of severe fever in the Earl of Bath with small beer; a collier named Hunter was cured of leg paralysis with new ale in 1758; George Peel cured consumption with ale and herbs. Beer wort was a common treatment for tuberculosis in England. Monsieur Fremy of Beaujon Hospital, Paris, gave malt powder and ale baths to 64 subjects to test the effects of ale on consumption, but with only marginal and temporary results, he thought.

OTHER CONTENDERS

Gin

In 1669 William of Orange made it legal for anyone to distill spirits and a new contender arrived on the scene, cheap gin. By 1740 there was an epidemic of alcoholism created by the cheap gin and in some parts of London one in four houses was a gin shop. It cost only a penny for a large portion of gin. You may remember Hogarth's two prints, one showing "Gin Lane" with everyone in a state of degradation, and his other print "Beer Street" in which everyone looks prosperous and healthy. To encourage the drinking of beer, the government enacted in 1830 the Beer Act. This, oddly enough, accentuated the problem, as cottage beer houses were opened everywhere and many used the opportunity to brew their own beer. The large beer brewing concerns took exception to this erosion of their markets and hit back by concentrating on their licensed houses which alone could sell gin. So the

brewers began to buy and convert pubs and to build new ones, originating the process of the gin palace, the grand Victorian corner pub or boozier, which primarily sold gin. Thus the Beer Act initially aggravated the evil that they hoped to combat.

The pub then fell into disrepute and was only revived as a pleasant community meeting place during the First World War. The unusual pressures in the munition workers of Gretna caused the government to step in and control the licensed hours in that area, called the Carlisle Experiment. This was the beginning of state controlled pubs and began the improved public house movement and the origin of pub hours, "temporary" in 1915 but persisting to this day. Most of the English are as bewildered as North Americans by the bizarre concept of pub hours, different in many areas, that originated in Gretna in World War I. Gradually beer again took its place in the daily life of British working class. Dr. Paris said "happy is the country whose laboring classes prefer such a beverage to the mischievous potations of ardent spirits".

Tea

Despite its high price, tea became fashionable in the middle of the 18th century but was initially regarded as evil. William Corbett in 1822 denounced tea for not contributing to the cultivation of a single acre of English land; "beer on the other hand was a moral species of beverage, full of patriotic, unfrench, unpapistist, unforeign associations, as much a part of our national heritage as the Magna Carta. "What two ideas", asked Sidney Smith, "are more inseparable than beer and Britannia?" Some go so far as to suggest the word Britain comes from the Greek word for beer, although this is probably not correct.

Cider

Cider became well known in England in the sixteenth century. Two things then became known from a medical point of view as time went on. It could cause lead poisoning if the cider was left in certain vessels, and it was early noted that it could cure scurvy on long voyages. Unfortunately, this early observation of the treatment of scurvy was ignored and it remained for a few centuries to pass before a treatment was recognized. Cider, in its color and fermentation products, was connected with the four humors, and thought to be a natural, healthy drink when taken hot. It was used to treat fever, to loosen the bowels and to cure illnesses of the spleen. It was said that cider raised spirits, lowered temperature and opened the bowels. It cured rheumatism, and prevented stones. It was felt that getting drunk twice a day on cider was a moral but not a medical problem as it also preserved one into old age.

Coffee

Coffee arrived on the scene rather late, although it

was known in the Arab world in the 15th century. It appeared as a major popular drink in the late 17th century, and was very popular during the rise of the coffee house in the 18th century. There was a period during the 18th century that coffee houses became very numerous and arose everywhere. The tremendous rise in the popularity of the coffee house was equalled only by its rapid disappearance by the middle of the 18th century. There was, at that time, a long running argument on whether coffee was good or evil for one's health, and this argument continues today. Bacon said that coffee comforted the brain and the heart, and helped digestion. Richard Burton mentions coffee for digestion and alacrity, and Thomas Willis said that he would sometimes send his patients to the coffee house rather than to the apothecary shop. An old proverb says "if you but this rare Arabian cordial use, then thou may'st all the doctors' shops refuse."

THE FEAR OF ADULTERATION

Although ale and beer were regarded as very healthy foods, and part of the daily diet of all, including children, there was a general fear of the dangers of adulteration of these drinks. Some of the oldest laws, including the code of Hammurabi, deal with the penalties for improper brewing. In 1519 the most famous law to regulate the purity of beer was passed in Germany, and is still in force today. It states that only barley malt, water and hops can be used for brewing. Adulteration of beer had been widespread, particularly when the price of malt and hops rose. Unscrupulous brewers added substances such as molasses, licorice, opium, tobacco, and sulphuric acid to the brew. A number of substitutes were made to produce the bitter taste when hops became very expensive.

The Domesday Book mentions 43 brewers and shows that the maintenance of standards by public brewers was a matter of great concern. In Chester the penalty for brewing bad ale was punishment by ducking or a fine of 4 shillings. The strangest test was the one in which a town official, wearing leather breeches, would sit on a bench covered with ale and if the breeches stuck to it the beer was passed as strong enough. There is some controversy about the interpretation of the test however. Some say if the breeches stuck there was a lot of sugar present and fermentation was not complete.

There was great concern in the 19th century, not only about the amount of gin being drunk, but some of the poisonous adulterations of beer carried out by unscrupulous publicans. One beer recipe called for bidriol (sulphuric acid), oil of omens, oil of turpentine, spirit of wine, sugar, lime, rose water, alum ale, and salt of tartar. These problems encouraged an alternative drink.

At one point the French began to publish reports that strychnine was being produced and shipped to England to impart the bitter flavour to English ale. Eventually the *Lancet's* "Analytical Sanitary Commission" had to check on the leading firms in the Burton region. They found no evidence of any adulteration with strychnine.

There was then a rumor by the French that gunpowder was put in English ale to give it the appearance of strength when the top was opened. Because of these concerns in the last century a system of constant checks on brewers were developed, but in 1881 it must have been very difficult because there were twenty thousand brewers in England. Teetotalers in the 19th century constantly spread rumors of various chemicals and poisons being added to beer. This continues to occur in England today and in March 1985 a newsletter of CAMRA, the Campaign for Real Ale, discusses rumors of adulteration and watering of English beer by publicans.

GOOD VERSUS EVIL DEBATE

Until the 18th century ale and beer had a prominent place as a health-giving food in the life of most people. With the rise of alcoholism and the popularity of cheap gin and other liquors in the early 19th century a major debate raged over the moral question of alcohol in any form. The most important early document was Benjamin Rush's "Inquiry into the Effects of Spiritous Liquors on the Human Body" written in the mid 1780s. He was not temperance, however, and he placed beer and wine within the range acceptable for temperate and healthy living, and was writing primarily about hard liquor. As the temperance movement developed it took on the concept of abstinence, not temperance, and to all forms of alcoholic drinks. The medical profession tended to move closer to the social and religious groups with radical views, and medical student and physician temperance societies were formed. The scandal of alcoholic doctors became the target of public and professional groups alike. The medical profession only moved away from its association with temperance movements after the Civil War, which brought with it a new wave of alcoholism.

In the mid 1860s a major debate developed on the scientific evidence for the therapeutic use of alcohol. The major medical view was that alcohol had a beneficial effect, therapeutically proven by ages of physicians' clinical experience rather than any scientific evidence for its value. The *Lancet* and *British Medical Journal* both noted this but the *BMJ* in 1865 said it more emphatically: "We are certainly not disposed to allow the chemist or the physiologist to settle a question of this kind — for there is one great authority, experience, which is greater than theirs". In keeping with the times British physicians used science to explain and legitimize, not to validate or to test therapeutic practice.

In the mid 19th century medical practice underwent a major change from the practice of *depletion* (blood letting, purgatives) to *stimulation* (alcohol, drugs, nourishment). Brandy was particularly used as a treatment, as much as three pints a day prescribed for a patient. Temperance societies asked physicians to produce evidence that alcohol was a strength and forcing food necessary for a proper diet. Temperance groups argued that the doctors' opinion that alcohol was an invigorating and nourishing medicine was encouraging and legitimizing alcohol use, encouraging requests for this treatment, and encouraging young people to drink.

Physicians argued that they were not in conflict with social and moral arguments as they were merely treating disease, and turned to scientific arguments to support their stand, resting primarily on their experience in practice, indicating that alcohol was beneficial when used in a specific fashion medically.

Robert Bently Todd, a London physician and Professor of Theology and Morbid Anatomy at Kings College, was the leading medical proselytizer of "alcoholic therapeutics". He felt that it was necessary for combustion and direct stimulation of the nervous system and that it was the "fastest food". Todd made alcohol treatment respectable and many doctors used alcohol to the exclusion of most other forms of therapy. Later Todd's view, that alcohol was entirely utilized by the body with none excreted, was challenged and his theories later rejected. Doctors then began to suggest alcohol should be banned as a treatment, but most just abandoned the theory and kept the treatment. The observation that alcohol lowered temperature led to a popular new theory which continued until the 20th century.

CONCLUSION

In this century beer has taken its place as a pleasant social drink, in moderation a valued part of a meal. We now recognize, however, that it is an incomplete food, with some direct toxic effects, and a potential for addiction. People who abuse beer and other alcoholic drinks, often decrease their dietary intake, and therefore become deficient in vitamins, particularly thiamine. Thus in excess, and particularly in prolonged excess, there is the danger of intoxication, chronic toxic effects, vitamin deficiency, and addiction, or chronic alcoholism. We no longer regard beer as an important therapeutic agent, and particularly not a panacea, although we may use it as an appetite stimulant, and a pleasant component of diet in hospitals and geriatric homes. Like so many other things in life it can be a pleasant and valued experience. Abused it can be a scourge.

Continued on page 115.

An Appreciation

DR. CHARLES ALEXANDER ROBERTSON

One would do well to live as full a life by age 40 as Dr. Charles Robertson. It was then that Multiple Sclerosis developed and on May 7, 1986 at 55 it struck him down. He was a member of The Medical Society of Nova Scotia from 1966-81 when he retired due to illness.

Dr. Robertson was influenced by his father, the late Dr. George G. Robertson, who had a large general practice in "The Gorbals" district of Glasgow, Scotland. George had to be tough, innovative, and infinitely kind to treat his 20,000 patients in this famous slum.

Charles obtained a M.B. Ch.B., in 1956 from the University of Glasgow. After his internship, he served as Medical Officer for the British Parachute Training School. In 1960 his love for the "free fall" lead him to found the Scottish Parachute Club. During these early years he also competed as an acrobatic pilot and was an accomplished swimmer and diver.

Dr. Robertson joined his father's practice 1959-65 in Glasgow. Itchy feet and a need to be his own man brought him to Pictou, N.S., 1965-68. His practice became too busy without a partner so he returned to London, England for one year to obtain a Diploma in Obstetrics. When he returned to set up his general practice it was to Bridgewater, N.S. He was always energetic on his patients' behalf. To my knowledge his use of hypnotherapy was a first in our town, although more commonplace in Britain. He was on staff at the Dawson Memorial Hospital and a stalwart member of the Lunenburg-Queens Branch Society.



He is survived by his wife Gerd who made it possible for him to retain dignity to the end. His elder son, George, is at Dalhousie University doing research in Neurosciences. Andrew is a certified shipwright and a marine engineer with our Coast Guard. Ruth enters the V.G.H. school of nursing this year. His mother lives in Glasgow. He was predeceased by his brother Richard.

Ewart A. Morse, M.D.

□

BEER AS MEDICINE

Continued from page 114.

The memory of an age when beer was regarded to have wondrous powers is evoked by grandmothers who give young women stout as a stimulant, and the English ads that state "Guinness is good for you".

In our age we generally agree that beer and ale in moderation are a pleasant and healthy addition to the diet, but hold no magic promise and have inherent dangers because of the addictive and toxic properties of alcohol and the incomplete nature of these drinks as food when little else is eaten with them. □

ADVERTISERS' INDEX

Bell and Grant Limited	98
CompuCroft Associates Ltd.	86
Doane/Raymond	98
Division of Nephrology - Dalhousie	89
Investers Syndicate	105
Jain, Rakesh C.	95
Medical Practice Productivity	105
Med-Pro Services Ltd.	81
Insurance Services - Ont. Med. Assoc.	OBC
Sawyer, Douglas E.	95