Second Class Mail Registration No. 5363
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THE NOVA SCOTIA MEDICAL JOURNAL

The Changing Face of Family Practice

One of the articles in this issue of the *Journal* reminds us of the many talents and factors that might be needed to make up a caring family physician. This article, *The Scientific Basis of Family Medicine* by Dr. A.M. Burditt was the first submitted to the Editor by electronic mail, from computer to computer, and this new technology reminds us of the changing methods and means used in the more practical world of primary care. Changes that over the last few years have been controversial seem by now to be moving toward acceptance. Their impact is difficult to project, but an examination of them deserves review at this time.

One of the more rapidly changing aspects of primary care is that of manpower. Recent decreases in the number of admissions to Dalhousie Medical School will probably mean fewer physicians entering practice in Nova Scotia, unless immigration increases. The percentage of graduates which chose to enter a specialty other than general practice seems to be stable; thus the decrease will mostly be reflected in family practice.

Increasing numbers of our graduating classes are also female and fewer of these female physicians seem to be choosing surgical or longer residency programs. If there are fewer graduates going into family practice and more of them are female — then not only the face but the body becomes significantly different. The pun is intended.

These women graduates are now finding a place in teaching departments and activists groups where their influence is being felt. Their assumption of positions in organized medicine deserves both praise and encouragement. The pattern of practice in which they seem to hold less ambitious income goals allows them to spend more time with fewer patients. This may, however, mean a further decrease in effective manpower in primary care.

The National Advisory Council on Family Medicine Training is now in place and is completing the implementation of the Wilson and Cox Task Forces. This is the final result of the criticism of the College of Family Physicians' training programs which occurred at the General Council of the C.M.A. in 1981. Following that meeting, a Task Force on Education for the Provision of Primary Care Services was formed and, after much study, controversy, and discussions, its recommendations were accepted and are in place. At least partially due to that task force, most provinces have increased their number of training positions in family medicine and have moved toward making it mandatory for a two-year training program prior to licensure. Nova Scotia has been cautious to say the least in this regard but Government, Medical School and the profession seem to recognize the need for a two-year training program in this Province also.

The recent *Brief to the Commission on Health Care* submitted by the Nova Scotia Chapter of The College of Family Physicians and the Section of General Practice of The Medical Society of Nova Scotia has also taken note of the rapidly changing circumstances in primary care. This Brief takes up the challenge to work with Government in a gatekeeper role. A recent editorial in this *Journal* by Dr. M. Gross has discussed this challenge with some insight. If primary care does indeed assume a gatekeeping role, we will need to examine the repercussions closely. The primary contract is between the physician and his patient and only secondarily does a physician have a contract to general society and his welfare. Methods of becoming a meaningful partner with Government will have to evolve and physicians will need and expect to have some real say in policy and administration.

The concerns of Government and of Society regarding health care costs must be acknowledged. Limited billing numbers, differential pay according to location, limitations in emergency centre destinations, are all results of this concern. Such measures as these could limit the ability of the family physicians to respond to new needs such as home care or preventive medicine.

Threats of litigation may limit the scope of practice in primary care. Trends for family physicians to opt out of the practice of obstetrics and emergency rooms are real and have been documented. They are at least a partial response to increasing insurance premiums and perception of risk.

Also, many family physicians are developing special areas of interest within family practice, e.g. geriatrics, emergency room service, palliative care, occupational medicine, and sports medicine. While sometimes beneficial this move, if carried forward, could weaken any individual doctor's mandate as a general practitioner in the community. It would make him or her less able to provide a sensible range of care without referral and on a continuing basis. Once again, a doctor in the gatekeeping role will be required to understand many of the new technologies in almost all fields of medicine as well as to be able to evaluate them both from a therapeutic and cost effective point of view.

In summary, manpower (number and sex), training, partnership with Government, new trends in roles and practice are all changing the face of family medicine now more particularly than in the past 25 years. We must examine the developing situation carefully in order to preserve the traditions while choosing the new directions that secure the best care for Nova Scotians.

Certainly other specialties are changing and evolving rather rapidly in Nova Scotia and deserve comment; submissions are welcome and encouraged. □

J.F.O'C

Are you moving? Are you entering or re-entering practice?
Are you going on sabbatical? Are you going back into training?
Or, are there any other changes that will affect your dues?
If so, please let us know.

Preparations are already underway for the annual billing of The Medical Society dues.

With the growth of The Society, the variety of billing requirements, changes in our mailing list and membership records, it is important to plan ahead and start preparations early.

We know that the status of some members has already changed and that others intend to change in the coming year.

Unless notified, we will be billing according to last year's records.

135th Annual Meeting

The Medical Society of Nova Scotia

November 24 - 26, 1988

Diagnosis and Treatment Planning of Dentofacial Deformities

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For centuries artists have been fascinated by the concept of craniofacial proportion. In the 16th century, Leonardo da Vinci attempted to define certain relationships of craniofacial structure in profile view (Figure 1). Recent advances in our understanding of the craniofacial complex provide a sound scientific basis for the correction of dentofacial deformities. The purpose of correcting them is to establish a harmonious facial balance and a stable functional dental occlusion. The intent of this paper is to discuss the diagnosis, treatment planning and management of specific dentofacial deformities.

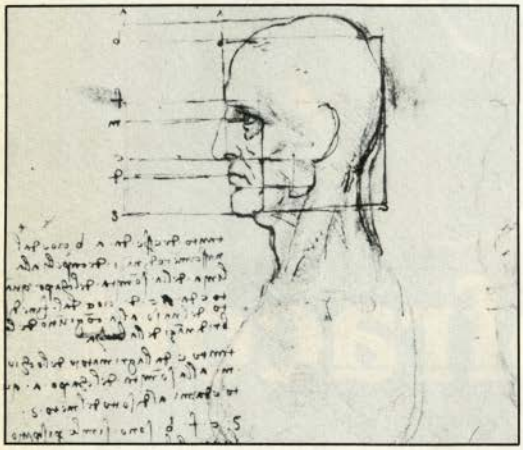

Fig. 1 16th century sketch by Leonardo da Vinci which defines the artist's concept of the relationships of craniofacial structure in profile view.

EVALUATION AND TREATMENT PLANNING

The evaluation and treatment planning of patients with dentofacial deformities follows a systematic protocol. Medical and dental histories and examinations, with appropriate consultations to allied health professionals, constitute the initial screening for people who would benefit from orthognathic surgery. Attention is then focused on the craniofacial region to delineate functional and esthetic deformities in the frontal and profile view. After the clinical assessment, specialized radiographs are interpreted. Finally, examination of plaster dental models mounted on a semi-adjustable articulator offer a third dimension to the diagnostic impression gleaned from two dimensional radiographs.

A unique component of the radiographic assessment is the analysis of the standardized lateral view of the craniofacial and craniospinal region; the cephalometric radiograph. The architectural and structural analysis of Delaire is an improvement on conventional cephalometric analyses because it is based on the patient's own unique cranial, spinal and maxillofacial anatomy.[1] This analysis identifies normal craniofacial components and, based on their morphology, indicates a more balanced position for the dysmorphic structures. The completed analysis offers both a graphic diagnostic summary and a visual treatment objective (Figure 2).

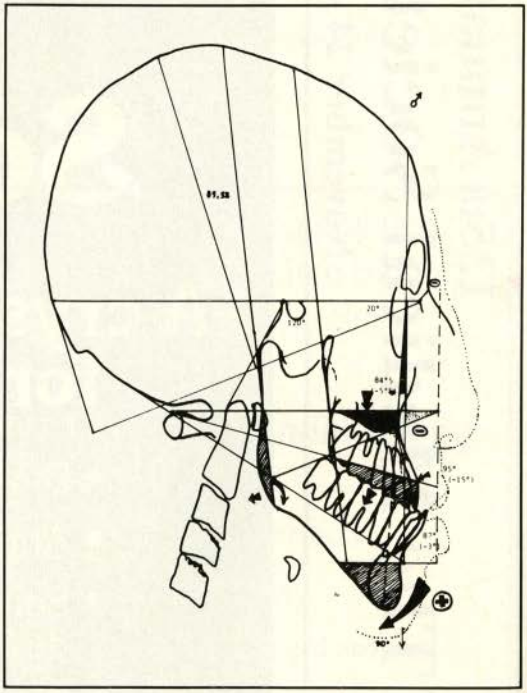

Fig. 2 The lateral craniofacial architectural cephalometric analysis provides both a graphic diagnostic summary and visual treatment objective.

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Upon completion of the cephalometric analysis the plaster dental models are examined. The mounted models represent the pre-operative occlusion. Mock surgery can then be performed on the models to simulate all dento-alveolar movements required at surgery. Based on the results of mock surgery the immediate postoperative occlusion is defined (Figure 3). Should the diagnostic study indicate the requirement for a significant alteration of the skeletal and dento-alveolar position a surgical splint can be fabricated. Acrylic splints based on the postoperative occlusion, when incorporated into fixation, enhance surgical accuracy and aid in maintaining the osseous segments in a stable relationship (Figure 4).

TREATMENT

A wide variety of dentofacial deformities which represent dysfunction and facial imbalance exist in humans. Deformities of dento-alveolar origin usually can be corrected by conventional orthodontics. Deformities of the maxillofacial skeleton which are superimposed upon dento-alveolar malrelations, require the combined efforts of the orthodontist and the maxillofacial surgeon. It is important that the patient, surgeon and orthodontist share and understand treatment objectives from the start. Optimal results are not realized if an attempt is made to correct the patient's orthodontic problem first, and then if unsuccessful, to refer the patient for surgery. Pre-surgical orthodontics is designed to remove any dento-alveolar compensations to the skeletal malformation. The maxillary teeth are placed in their correct positions relative to the maxilla, and the mandibular teeth are placed in their correct positions relative to the mandible. Although an extreme interarch disharmony may be present at the time of surgery, it reflects the true extent of the skeletal dysmorphosis, stripped of all dento-alveolar compensations. The pre-surgical orthodontics takes approximately 8 to 12 months. Post-operative orthodontics makes minor occlusal corrections to enhance stability, function and esthetics. This phase of treatment is typically of six months duration.

SURGERY

Following the patient's admission to hospital, consultations with the appropriate health professionals, particularly the anesthesiologist and the dietitian, are completed. Particular care is taken to familiarize the patient and the family with the events which will occur within the hospital. This is important because individuals seeking orthognathic surgical treatment are generally healthy adolescents or young adults, ill at ease within the hospital environment. Special attention to the unique aspects of orthognathic surgical care should

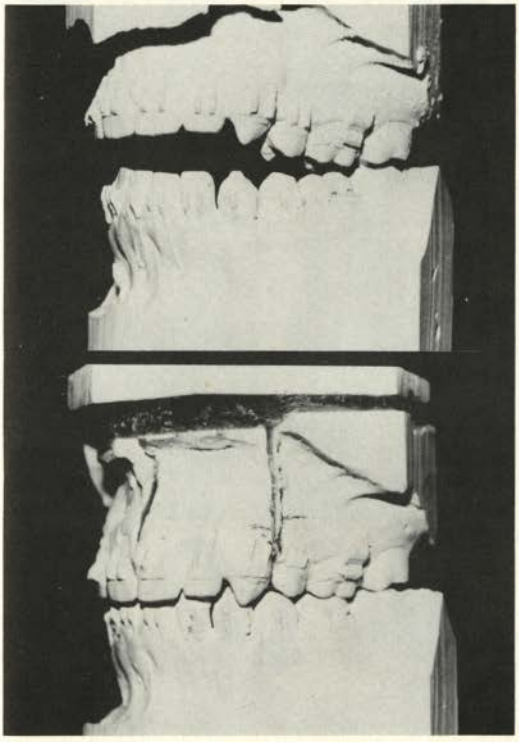

Fig. 3 Plaster models indicating pre-surgical dental occlusion and predicted post-surgical relationship.

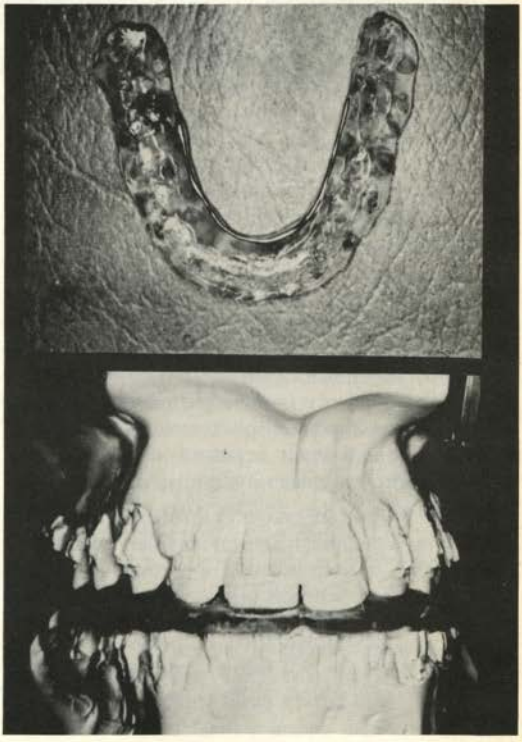

Fig. 4 Acrylic splint used to enhance surgical accuracy.

be outlined in detail pre-operatively so as to allow time for comprehension and acceptance. These special factors include prominant and significant edema, maxillo-mandibular fixation, impaired alimentation and the realities of the hospital environment.

Intra-operative care includes the appropriate use of antibiotics, anti-inflammatory steroids, controlled hypotensive general anesthesia and meticulous attention to surgical technique. Of particular use to orthognathic surgeons is controlled hypotensive aneathesia. Precious *et al.* demonstrated that the judicious use of hypotensive aneasthesia in orthognathic surgery reduces both blood loss and operating time.[2] The reduction in the blood loss intra-operatively lesens the need for transfusion products with concomitant reduction in morbidity and mortality associated with transfusion. Postoperative, postanesthetic concerns are compounded by the fact that the patient's jaws are wired together. Co-operation and communication between the surgeons, the anesthesiologist and the recovery room staff, ensures patency of the patient's airway during the recovery of protective reflexes. Patients are encouraged to ambulate on the first postoperative day. The mean duration of hospital stay is approximately five days.

SPECIFIC DENTOFACIAL DEFORMITIES

A common condition is mandibular deficiency. This deformity can result from an absolute micrognathia or from relative retrognathia of the mandible, a combination which is frequently found, in combination with maxillary excess. Accurate diagnosis which discriminates between the two variants is important in order to maximize surgical gain and minimize error. The variability of the skeletal, occlusal and growth characteristics of this group of deformities has been determined and described more appropriately as a syndrome.[3] Obwegeser introduced the sagittal split ramus osteotomy of the mandible for the correction of mandibular dysgnathias.[4] The operation as it is performed today has been modified by Dal Pont,[5] Hunsuck[6] and Epker.[7] The predictability, safety and versatility of the operation is the result of later modifications of Obwegeser's method.[8] Mandibular deficiency is most often corrected by the intra-oral bilateral sagittal split osteotomy as shown in Figure 5. Figure 6 shows a patient at age 11, before surgery and five years after surgery at age 16.

Maxillary deformities occur in three dimensions. One very common example is vertical maxillary excess. This condition can occur in isolation or in combination with other deformities. Schendel provided a useful classification of vertical dysplasias in the maxillo-facial region.[9] Maxillary vertical excess is corrected via a Lefort I, maxillary osteotomy/ostectomy with superior repositioning.[10] (Figure 7). The facial appearance, before and after surgery, of a typical vertical maxillary excess is shown in Figure 8. The biological and clinical foundation for the safety and versatility of the Lefort I in

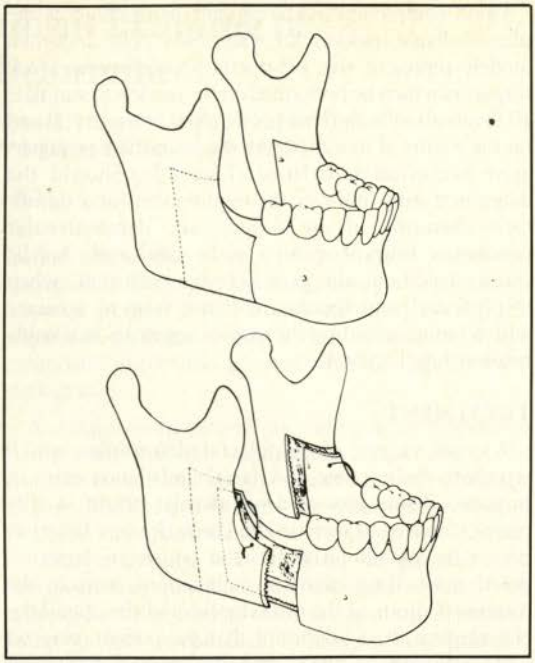

Fig. 5 Modified sagittal split osteotomy of the mandible.

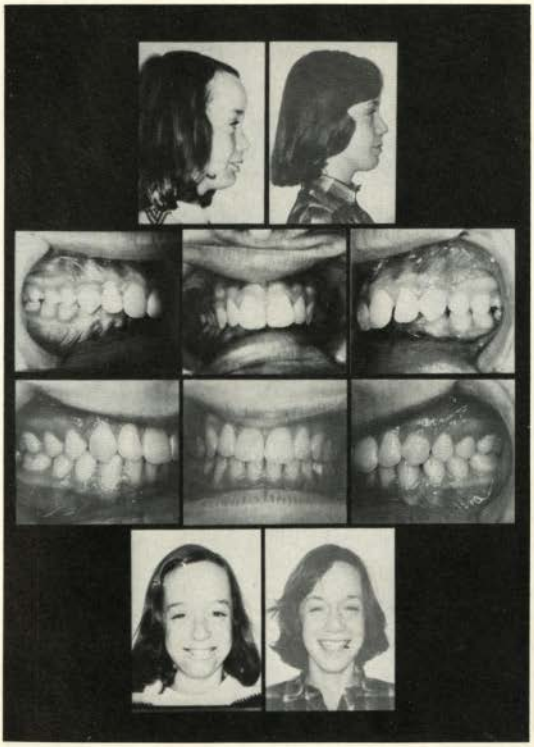

Fig. 6 Pre- and Post-treatment occlusion and facial views of a typical patient with mandibular deficiency.

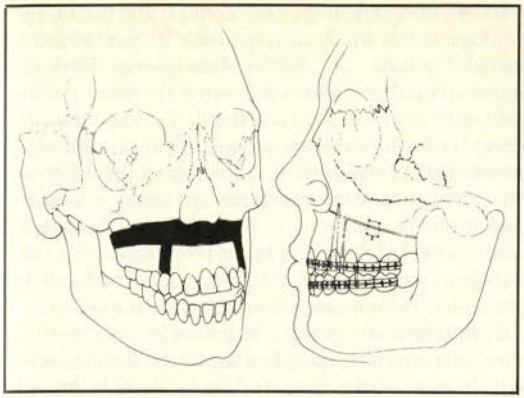

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Fig. 7 LeFort I osteotomy of the maxilla: A, proposed resection of the maxillary bone. B, completed operation.

Fig. 8 Facial veiws before and after LeFort I maxillary surgery demonstrating improved facial balance.

the correction of maxillary dysgnathias has been put forth by Bell.[10]

Severe dentofacial deformities involve combinations of maxillo-mandibulo-malar abnormalities. In such cases the midfacial components must be addressed through the Lefort II and III osteotomy approach. The clear enhancement of facial balance following combined maxillo-malar-mandibular surgery to advance the midface, retroposition the mandible and establish both hard and soft tissue equilibrium is demonstrated in Figures 9, 10, 11, 12, 13 and 14.

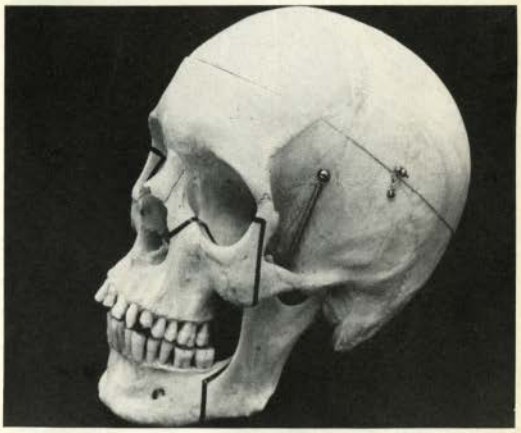

Fig. 9 Dry skull representation of modified LeFort III osteotomy and sagittal split osteotomy of the mandible.

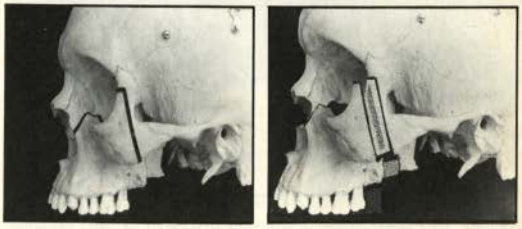

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Fig. 10 (A) Dry skull representation of modified LeFort III osteotomy. (B) Proposed post surgical advancement with bone grafting.

Frequently, dentofacial osseous structures are excessive in size with respect to the available soft tissue mask. The resulting labiomental dysfunction, with lip incompetence is shown in Figure 15. Note the necessity to contract the labiomental muscles in order to achieve lip closure. The aberrant labiomental muscular function results in the loss of lower lip pout and a flattened chin. Functional genioplasty is the procedure of choice in dealing with the myocutaneous sequelae of increased anterior mandibular vertical dimension.[11] (Figure 16). The term "functional" genioplasty represents a paradox. In the past, surgery of the chin has been thought of only in terms of cosmesis. The functional genioplasty is a procedure which is carried out to improve labiomental function through changes to the osseous, myo-osseous and cutaneous relations of the chin. The improved facial balance eliminates muscle dysfunction. Figure 17 shows the postoperative lateral cephalometric radiographic result of a functional genioplasty.

The sequelae to both the occurrence and primary closure of labio-maxillo-palatine clefts is well-known to

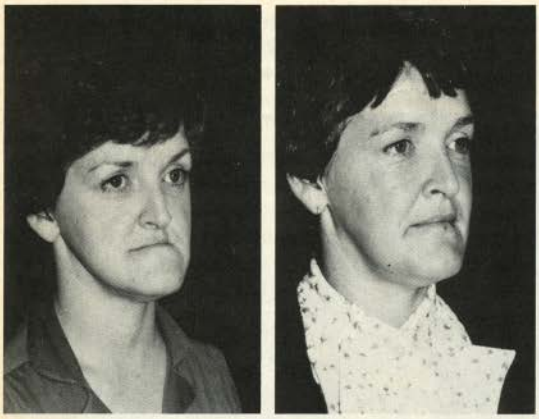

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Fig. 11 (A) Presurgical and (B) postsurgical facial views of a patient who underwent modified LeFort III midface osteotomy. Improved facial balance results.

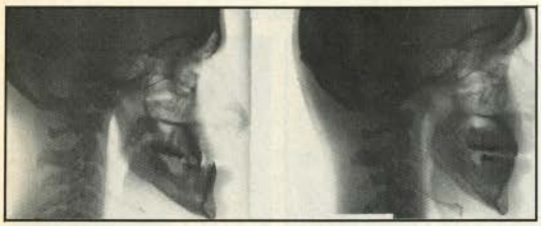

Fig. 12 Pre- and post-surgical radiographs of a patient who underwent modified LeFort III maxillary osteotomy with bone grafting and concomitant mandibular surgery.

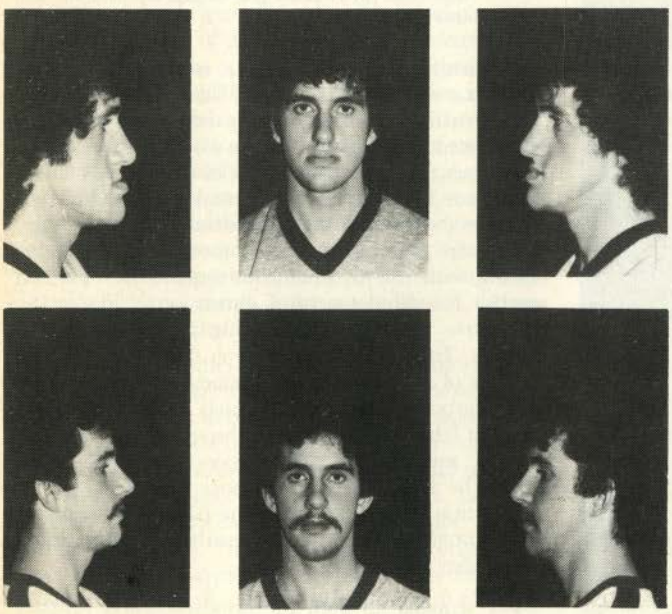

Fig. 13 Pre- and post-operative views of patient in Figure 12.

orthognathic surgeons. The natural and iatrogenic etiologic factors which are responsible for these sequelae include, the nature and severity of the primary defect, the initial surgical procedure used to treat the defect and the skill with which it was carried out. The nature of the defect has been somewhat overlooked in that insufficient attention has been directed to the role of the deformed facial musculature on growth and development. Delaire[1] and Precious and Delaire[12 13] pointed out the importance of the facial muscles in the morphogenesis of the maxilla, the pre-maxilla and the superior dental arch. In particular, Delaire has demonstrated the importance of the orbicularis oris muscle.[1] This muscle is composed of three anatomically and physiologically distinct bands which influence the growth of the pre-maxilla through the median septum of the upper lip. The other labial and nasogenal muscles affect the action of the orbicula-

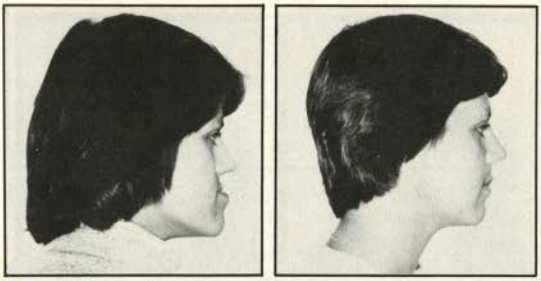

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Fig. 14 (A) Pre- and (B) post-operative facial views of a patient who underwent LeFort I maxillary advancement surgery with concomitant retropositioning of the mandible by sagittal split osteotomy.

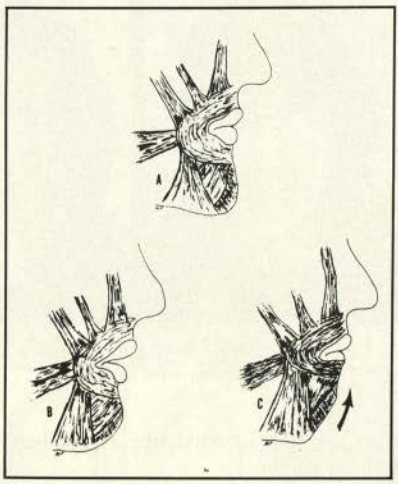

Fig. 15 (A) normal harmonious labiomental muscular balance and lip competance. (B) lip incompetence with open mouth posture. (C) flattening of anterior surface of the chin due to active contraction of labiomental muscles to achieve lip closure.

ris oris and also act directly in the morphogenesis of the paranasal region. Abnormalities of the insertion of the nasolabial musculature on the nasal septum and the anterior nasal spine are responsible for the functional anomalies in cases of cleft lip-cleft palate. Therefore, it is necessary to understand the relationship which exists between the morphology of the skeletal and dental structures, and the overlying musculature in the diagnosis and treatment of dentofacial deformities associated with cleft lip and cleft palate. It is for these reasons that nasolabial muscle reconstruction should be carried out during definitive orthognathic surgery. Furthermore, treatment which does not address this relationship is functionally inadequate. Figure 18 shows a patient who has had both orthognathic surgery and secondary reconstruction of the nasolabial muscles, a procedure which is necessary in the majority of cases of correction of secondary cleft lip and cleft palate deformities.

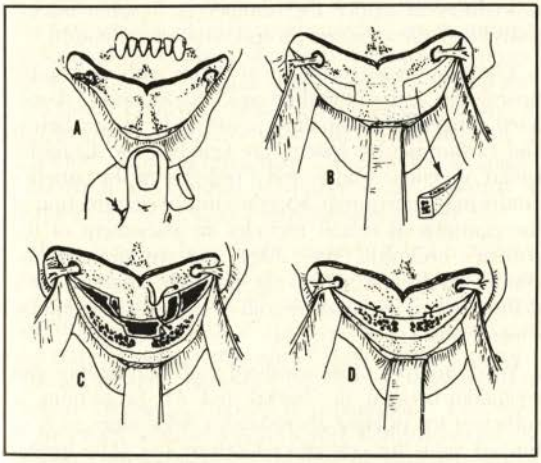

Fig. 16 Surgical procedure of functional genioplasty. A, exposure of anterior surface of mandible and mental nerves. B, outline of osteotomy-ostectomy cuts. C, creation of tenon and mortise. Placement of direct transosseous wires. D, superiorly repositioned and advanced inferior bony fragment and labiomental muscles.

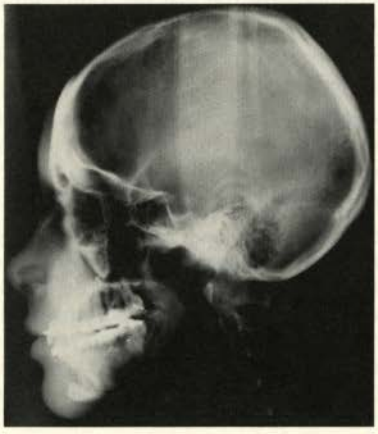

Fig. 17 Post-operative lateral cephalometric radiographic result of functional genioplasty procedure.

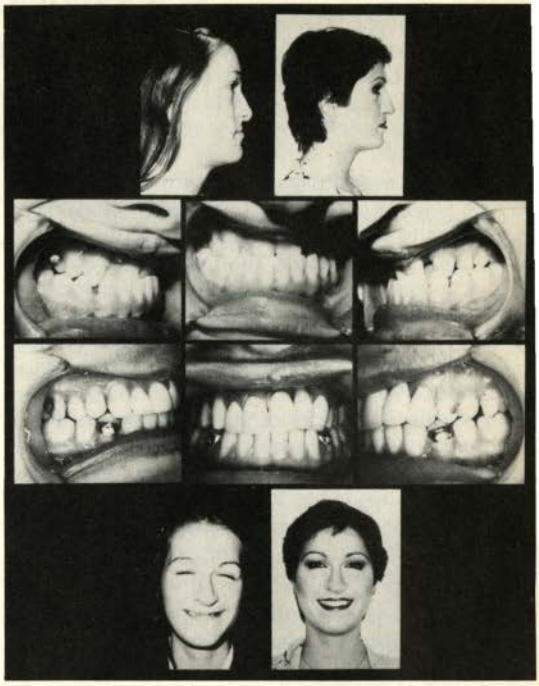

Fig. 18 Pre- and post-treatment occlusion and facial views of a patient who underwent orthognathic surgery and secondary reconstruction of the nasolabial musculature.

SUMMARY

Evaluation and treatment of dentofacial deformities must be based on sound knowledge of craniofacial balance, craniofacial growth, orthodontic treatment principles and precise surgical techniques. The inappropriate obsession with cosmetic implications of the functional correction of facial deformities has lulled both patients and clinicians to overlook basic functional principles which apply to all parts of the body. When one has corrected all the deformities which are possible to correct, such that there is equilibrium among all the hard and soft tissues of the face, then the correction of the dysfunction carries with it an improved cosmetic result.

Correction of dentofacial deformities using orthodontic and surgical means can be carried out safely and predictably, if careful attention is directed to the systematic evaluation of each deformity. Selected cases have been presented to illustrate the salient clinical features of specific and more common deformities. As with any surgical procedure, the risk of surgery must be carefully weighed against the expected benefits by all concerned. □

References on page 103.

Cranofacial Surgery

A PERSPECTIVE

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The paper entitled *Diagnosis and Treatment Planning of Dentofacial Deformities* presents an excellent overview of the management of dentofacial deformities. As the authors have stated, the purpose of correcting them is "to establish an harmonious facial balance and a stable functional dental occlusion". To this end, the maxillofacial surgeon and orthodontist use clinical assessment, plaster dental models and 2-dimensional cephalometric radiographs in defining the malocclusion and associated deformity of the maxillo-mandibular skeleton. Surgical treatment aims to correct the malocclusion by osteotomy and repositioning of the maxilla and/or mandible. Repositioning of these facial skeletal elements is necessarily associated with an alteration of the patient's profile, and this must be considered in treatment planning.

A distinction, however, should be made between such dentofacial deformities, characterized by malocclusion with associated maxillo-mandibular skeletal deformity, and craniofacial deformities, which extend into the upper reaches of the facial area. The latter comprise complex traumatic, neoplastic or congenital deformities which involve the orbits primarily, but frequently include midfacial or cranial components, or both.

Craniofacial deformities are characterized by abnormalities in the size, shape, symmetry or spatial orientation of the orbits. Most importantly, these deformities are frequently associated with malformation of adjacent anatomical parts:

1. ocular abnormalities and extraocular muscle dysfunction;
2. deformities of the periorbital soft tissues (epicanthal folds, canthal dystopia, colobomas, ptosis);
3. abnormalities in the shape and volume of the cranial vault, resulting from premature sutural synostosis;
4. fronto- or naso-ethmoidal meningoencephaloceles, dermoid cysts and glial tumors; and
5. clefting or hypoplasia of the central nasomaxillary complex or the lateral zygomatico-maxillary complex.

Although malocclusion can also be a prominent feature of a craniofacial deformity, it is clear that the management is necessarily more involved than in patients with isolated dentofacial deformities. Rather than focusing on the occlusal relationships, primary consideration must be given to the neurological, ocular, soft tissue and cranio-orbital skeletal components of the disorder. The investigation and treatment of craniofacial deformities therefore demands a multi-disciplinary team approach. In addition to the plastic surgeons, the team normally includes a pediatrician and/or internist, neurosurgeon, ophthalmologist, speech pathologist, geneticist, psychologist, psychiatrist and social worker.[1] The integrated team approach permits a comprehensive evaluation of the patient,[2] facilitates combined operative procedures to reduce the number of hospital admissions,[3] and offers the best prospects for rehabilitation.[4]

The pre-operative assessment begins with a complete neurologic and ophthalmologic examination. Associated congenital anomalies, particularly of the airway and cardiovascular system, are searched for. Chromosomal or genetic studies and a pedigree of the patient's family may be required. Specific clinical examination of the craniofacial region includes an assessment of the patient's occlusion; size, shape and symmetry of the cranial vault and orbits are precisely analysed; any deformities of the nasoethmoid or zygomaticotemporal sites are noted.

While analysis of standardized skull radiographs and cephalometrics in the lateral and AP projections is sufficient for isolated dentoskeletal deformities, it is of limited value for craniofacial deformities. The limitations include:[5]

1. poor definition of soft tissues;
2. restriction to lateral and frontal planar (2-dimensional) analyses;
3. difficulties with reproducible positioning of the subject's head;
4. the persistence of geometric magnification error on the image; and
5. the failure to present the complex three dimensional spatial relationships of craniofacial components.

All of these limitations have been overcome by the advent of computed tomograpy (CT) scanning. High resolution axial CT scans clearly define thin elements and subtle defects of the bony facial structure, while brain morphology and intraorbital soft tissues can be visualized with unprecedented detail. Data obtained from serial transverse scans can be further reformatted to provide 2-dimensional images in any sagittal, coronal or oblique plane desired. Measurements taken from CT scans can be applied directly without adjustment because there is no geometric magnification error.

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Most recently, computer graphics have been employed in the production of accurate 3-dimensional images from 2-dimensional data obtained from standard scanners. The osseous reconstructions resemble black and white photographs of a dry skull and can be displayed from any desired perspective. These 3-D images are of particular value to the craniofacial surgeon, in their capacity to reveal subtleties of asymmetry, the spatial relationships of critical anatomical structures, the position of encephaloceles, etc.

Therefore, in most centers, current pre-operative evaluation of all major craniofacial deformities routinely employs high resolution axial CT scans with selective reformations and 3-D surface reconstructions.[6-8]

The surgical correction of craniofacial deformities comprises wide exposure of the skeleton, osteotomy and repositioning of malpositioned bony segments and reconstruction of deficient areas. A combined intracranial-extracranial approach is frequently necessary to adequately visualize and protect both orbital and intracranial contents. This kind of surgery carries a significant risk of morbidity and mortality. In a combined report encompassing 793 craniofacial operations from six centers, Whitaker *et al.* reported a mortality rate of 1.6% and complication rate of 16.5%.[9]

Many patients have severe associated upper airway problems, and complications resulting from intubation and anesthesia should be anticipated.[10] Operations requiring an intracranial approach can be associated with post-operative cerebrospinal fluid leak,[11] inappropriate antidiuretic hormone syndrome,[12] meningitis,[13] cerebral edema and epidural hematoma.[14] Freihofer documented similar neurological complications in patients with extracranial midface osteotomies, where the cribriform plate was inadvertently fractured.[15] Procedures which encroach upon the orbit, including Le Fort III and malar osteotomies, risk injury to the intraorbital contents. In a review of 900 cases, Tessier reported a variety of complications, including blindness, hemianopsia, diplopia, corneal ulceration, telecanthus, canthal dystopia, and obstruction of the lacrimal sac or the nasolacrimal passage.[16]

The magnitude of craniofacial surgical cases and the potential complications warrant a coordinated team approach both intraoperatively and in the post-operative monitoring of the patient. The risks of morbidity and mortality can then be kept to a minimum.

In view of the preceding discussion, specific reference should be made to the authors' description of a Le Fort III osteotomy and combined maxillo-malar-mandibular surgery to correct "severe dentofacial deformities". A Le Fort III osteotomy involves mobilization and displacement of the entire midface-malar complex as a composite bone segment. Repositioning of this maxillo-malar segment in any dimension, besides correcting a malocclusion, has multiple other effects:

1. The inferior half of the bony orbital rim and walls is included in the Le Fort III segment. Displacement of this segment in any dimension therefore necessarily alters the dimensions and volume of the orbital cavity and the degree of ocular globe projection. Where resulting defects in the floor and medial wall of the orbit are not adequately reconstructed, globe ptosis and diplopia can occur.
2. The lacrimal sac and nasolacrimal duct are carried forward with the Le Fort III segment. Obstruction and rupture have been reported.[16]
3. The facial features which are altered by the procedure include the projection of the cheeks and inferior orbital rims, the length and dorsal angle of the nose and the projection of the upper lip.
4. There is a risk of fracture lines extending to the optic canal or cranial base, resulting in previously described neurologic and ocular complications.

Patients being considered for such surgery would therefore certainly benefit from a multidisciplinary team assessment, CT scan radiographic evaluation and precise post-operative monitoring of neurologic and ocular function, as described previously.

The management of patients with a cleft lip and palate deformity should also be specifically addressed. The labio-maxillo-palatine cleft is not an isolated anatomic defect, but is frequently associated with:

1. nasal deformity;
2. velopharyngeal incompetence and speech disorder;
3. middle ear problems;
4. family history;
5. other congenital anomalies; and
6. maxillary growth deficiency.

As in craniofacial deformities, optimal care is provided by a multidisciplinary team approach. Infants are initially assessed by a pediatrician, plastic surgeon, otolaryngologist, speech pathologist, pedodontist and orthodontist. To evaluate the long term sequelae of surgery and growth of the maxilla, serial assessments are routinely conducted by the team to follow the patient through childhood and adolescence.

In treating the secondary deformities in a cleft lip and palate patient, it is extremely important to consider all aspects and features of the deformity, rather than just the dentoskeletal relationship. Specifically:

1. In patients with a previously repaired cleft palate, and particularly those with previous pharyngeal flap procedures for velopharyngeal incompetence, maxillary osteotomy and advancement can result in speech problems: increased nasal resonance and less efficient velopharyngeal valving. Pre- and post-operative assessments of velopharyngeal functioning and appropriate modifications in surgical technique are mandatory.

2. The associated nasal deformity should be assessed regarding the need for corrective rhinoplasty or septoplasty.

3. The abnormal insertions of the orbicularis oris muscle in the cleft lip deformity and its subsequent effect on growth of the premaxilla, maxilla and nose were described by Latham[17] and Fara.[18] Dissection, re-orientation and repair of the orbicularis oris muscle sphincter to restore function and normalize growth was described by Fara in 1971.[19] This muscle repair is a well established procedure which is now routinely performed at the time of primary lip repair. A revision of the nasolabial muscle reconstruction or lip scar is only occasionally required and should be performed by the primary plastic surgeon. □

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Screening for Colorectal Cancer

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Screening for colorectal cancer is a controversial and confusing topic. There is a vast literature on colon cancer screening and, to some extent, this compounds the confusion.

SCREENING CONCEPTS

Screening is now a familiar concept. It is the detection of disease at an asymptomatic stage in a large, healthy population. Case-finding is a less familiar concept. Case-finding is the application of screening techniques to detect disease in asymptomatic patients already within the medical framework. For clinicians, seeing patients in their offices on a daily basis, case-finding — or screening of their own patients, as opposed to the general public — may be the more relevant and more practical issue.

There is a single goal of cancer screening: to improve survival by detecting and eradicating localized (or premalignant) disease. For this goal to be realized, a disease must meet certain criteria (Table I).[1] The disease must be common and of public significance.[2] The natural history must be suitable and it must be alterable; that is, there must be an asymptomatic period and the disease must be detectable during this period. Treatment during the asymptomatic phase must interrupt the natural history and result in a survival benefit beyond that achieved by treatment at a later, symptomatic stage.[3] The tests used to detect the condition must be acceptable to asymptomatic individuals,[4] and effective treatments must exist.[5] The final criterion involves cost, and this is extremely difficult to assess. The cost of screening should fall within the framework of public health expenditures, but more importantly, the results of screening must justify these costs.[1]

How well does colorectal cancer fit these criteria?

TABLE I

CRITERIA FOR SCREENING

1.	Common and Significant
2.	Natural History (a) asymptomatic period (b) detectable (c) interruption → survival benefit
3.	Tests
4.	Treatment
5.	Cost

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COLORECTAL CANCER

Colorectal cancer is common and significant, and there are approximately 150,000 new cases per year in North America. The overall cure rate is under 50%, making colorectal cancer the second leading cause of cancer death. To add to its significance, treatment alone has failed to improve the survival figures for the past 30 years.[2 3] It is estimated that the lifetime risk of developing colorectal cancer for an infant born in this decade is approximately 5%.[4]

The natural history of colorectal cancer is perfectly suited to screening. It is important to understand the natural history in order to assess the role of screening, and I shall review the natural history of colon cancer in a little further detail (Fig. 1).

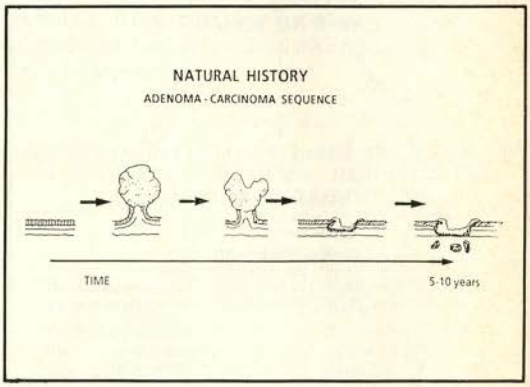

Fig. 1

With the arrival of the colonoscopy era, the "adenoma-carcinoma sequence" has progressed from a plausible hypothesis to a scientific fact. With only a few exceptions, colon cancers arise from adenomatous polyps.[5] The progression of normal colonic mucosa through the stages of adenomatous polyp, polyp with early cancer, cancer confined to the bowel wall, and cancer with spread to lymph nodes or distant organs, is one which occurs slowly, probably over five to ten years.[6 7] This protracted time course provides an excellent opportunity for screening to intercept the disease at an early and potentially curable stage. Cancer in a polyp is virtually 100 percent curable, usually by endoscopic polypectomy alone, and cancer localized to the bowel wall has a cure rate of 80 percent. But survival rates plummet with the appearance of lymph node metastases, and distant metastatic disease to liver or lung is only rarely curable.[8 9]

At what point along this path an individual develops symptoms and is brought to medical attention is highly variable; but this is a critically important point with respect to the role of screening. Large series consistently demonstrate that approximately one-half of patients who have colon and rectal cancer present with their first symptom after nodal or visceral metastases have already developed.[10 11] This late stage of presentation severely limits our ability to interfere with the natural history of the cancer.

Once symptoms have appeared, it does not seem to matter how early or aggressively the patients are investigated. When patients with symptoms which have been present for less than three months are compared with patients who have had symptoms for a year or more, the staging of the tumors, and the survival experience, is equivalent.[12 13 14] In other words, we cannot wait for symptoms to develop if we hope to have a major impact on this disease, even if symptoms are intensively investigated. The disease must be picked up at its earliest — that is to say, its pre-symptomatic — stages.

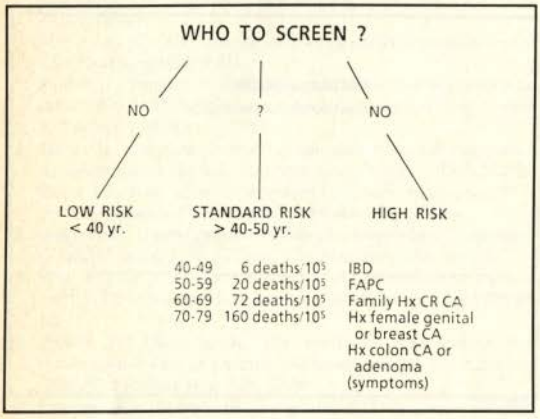

Fig. 2 Risk Factors for Colorectal Cancer

RISK OF COLORECTAL NEOPLASIA

Before examining the tests available for colorectal cancer screening, we must decide who should be screened. Who should be screened within a population depends on the risk factors for the development of colorectal cancer (Fig. 2).

The population can be divided into three groups in terms of colorectal cancer risk, and two of these groups are determined by age alone. In the absence of other risk factors, colorectal cancer is a rarity below the age of 40 years. The incidence of the disease in this age group is too low to make screening worthwhile.

At the other end of the risk-scale are those individuals with features which place them at above average or even high risk for colorectal cancer. Such features include the inflammatory bowel diseases, (ulcerative colitis and Crohn's disease of the colon,) familial adenomatous polyposis coli, a family history of colorectal cancer, a history of female genital or breast cancer, and a personal history of colon cancer or adenoma.[1] These patients do not need to be screened — their higher than normal risk for colorectal cancer demands an individualized program of on-going surveillance. For most in this group, this lifelong surveillance program will consist of periodic total colonoscopy.

The standard or average risk individual has only one risk factor: his or her age. The death rate from colorectal cancer begins to rise in the fifth decade, and roughly triples with each decade thereafter.[15] It is in this standard risk segment of the population that screening may have a role to play.

SCREENING TESTS

To be considered appropriate for screening, a test must possess certain qualities. These include *sensitivity* (the ability of the test to be positive when the disease is present); *specificity* (the ability to be negative when the disease is absent); and *predictive value* (the probability that the disease is present given a positive test result). In addition, the test must be acceptable to the healthy individuals who are subjected to it, and to the physician involved in its administration. It should be safe, non-invasive, and inexpensive.

Unfortunately, tests which have high sensitivity and specificity ratings — total colonoscopy and air contrast barium enema — are also inappropriate as screening modalities because of their expense, invasiveness, and unacceptability to healthy, asymptomatic individuals. When a screening test is positive, one of these confirmatory diagnostic modalities is required. Colonoscopy has emerged as the diagnostic gold-standard for colonic polyps and cancers, and also has the therapeutic potential of endoscopic polypectomy.[1 16 17]

Tests of lower sensitivity and specificity, but which may have potential as screening tools, include, digital rectal examination, testing the stool for trace amounts of blood, and rectosigmoid endoscopic evaluation.

1. Digital Rectal Examination

The digit is safe, cheap, and relatively acceptable to doctor and patient, but the sensitivity and specificity are exceedingly low. Over the past 30 to 50 years, a changing distribution of colorectal cancer has been documented. Numerous surveys show that the incidence of cancer of the rectum is falling, while over the same period of time, there has been an increasing incidence of right-sided cancers.[18] This shift towards the right colon has diminished the ability of the six to seven centimetre digital examination to capture a significant percentage of colorectal neoplasms. Whereas digital examination had the capacity three decades ago to capture close to half of colorectal neoplasms, this percentage had dropped to the 10-15 percent range.

This concept of changing distributions of colorectal cancer is critically important, and has a dramatic impact

on all modalities where effectiveness is determined by length of colon palpated or inspected.

2. Fecal Occult Blood Tests

The testing of stool for blood is not as substantially affected by the changing distribution of cancer. There are many kinds of fecal occult blood tests, but all are based on two assumptions: that they can reliably detect trace amounts of hemoglobin mixed in with the stool, and that colon cancers and polyps bleed. These turn out to be very large assumptions.

The tests which are most widely available and which have received the greatest testing are the Hemoccult and Hemoccult ii slide kit. The Hemoccult ii kit is based on the ability of a phenolic compound, in this case guaiac resin loaded onto a filter-paper slide, to be reduced in the presence of hydrogen peroxide by a substance with peroxidase activity, such as hemoglobin. The phenolic reduction of the guaiac results in a blue coloration of the filter paper (Fig. 3).

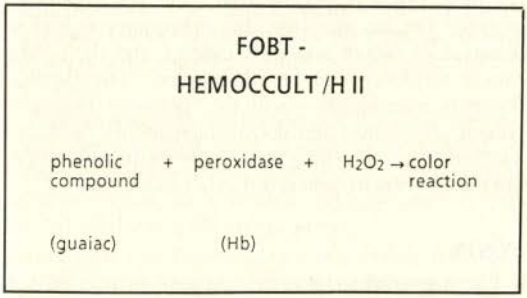

Fig. 3 Fecal Occult Blood Test With Hemoccult/Hemoccult ii Tests

The problem with the fecal occult blood tests is that both of the earlier assumptions are not completely true. There is normally a small amount of blood lost from the gastrointestinal tract — in the range of 2 ml per day, or the equivalent of 2 mg of hemoglobin per gram of stool.[19] This amount of hemoglobin will be picked up by the Hemoccult ii test approximately ten percent of the time; but losses of hemoglobin have to be ten times this great — in the range of 20 mg of hemoglobin per gram of stool — to be detected consistently by this technique.[20 21] This is a problem, because many cancers and most polyps do not bleed this much, and the bleeding is intermittent rather than continuous.[22] This results in a sensitivity of the Hemoccult ii for cancer of 50 to 65 percent, and for polyps of 40 percent.[23] In other words, at least one-half of the neoplasms will not be detected by this technique.

There are other factors which interfere with the usefulness of this test: the test is not specific for hemoglobin which has been lost from neoplasms, and normal GI blood loss and blood loss from non-neoplastic lesions such as diverticula or angiodysplasia, may also give positive results; the test is not specific for human hemoglobin, so that the hemoglobin of ingested meat can produce a positive test; and peroxidases other than hemoglobin, such as those in broccoli, turnip, and other vegetables can also reduce guaiac and produce the color reaction. Other agents or factors, such as Vitamin C and iron, and specimen storage, also interfere with the sensitivity and specificity of the test.[23]

To try to reduce these confounding factors and increase the predictive value of fecal occult blood testing, most studies have been carried out with specific protocols. Oral intake is restricted to a meat-free, low peroxidase diet. Fibre is added with the unsubstantiated expectation that a lesion may be induced to bleed by a bulky stool. More than one sample is examined but the exact number is quite arbitrary, and the duration of storage is minimized.

Table II summarizes the data from 25 large uncontrolled population studies using the Hemoccult or Hemoccult ii tests.[1 23 24] These studies show the following: compliance varies tremendously depending on the population, the method of contact, and the use of public education programs. In most studies involving the general public, compliance figures are very disappointing. When the study population is made up of motivated volunteers or clinic patients, compliance may be 70 to 80 percent.

TABLE II

SUMMARY OF DATA FROM 25 LARGE, UNCONTROLLED POPULATION STUDIES USING HEMOCCULT OR HEMOCCULT ii TESTS

FOBT — Clinical Data (Uncontrolled Studies)	
Patient compliance	15-80% (30%)
Rate of + slides	2-6% (3%)
Predictive value CA	3-16% (5%)
Predictive value polyps	6-36 (< 20%)
Enrolled with CA	0.03-0.2%
Staging of detected CA	60-80% Dukes' A,B

The rate of slide positivity runs between two and six percent of tests, and the predictive value for cancer of a positive test is three to sixteen percent. In other words, only a small minority of positive tests is due to cancer. Benign polyps, which are more common than cancers, are detected more frequently; still, the predictive value for polyps was generally less than 20 percent.

The number of individuals found to have cancer is only between three and twenty per ten thousand enrolled in the studies.

However, the stage of detected cancers was favorable: between 60 and 80 percent of cancers were Dukes' stage A or B, that is, the cancer was confined to the bowel wall, or was through the bowel wall but without lymph node involvement.

These studies indicate that testing for blood in the stool can detect neoplasms at a more favorable stage than is generally experienced by awaiting symptom

development. While this may benefit an individual patient, these uncontrolled studies cannot answer the main question: do populations screened with a fecal occult blood test have a lower mortality from colorectal cancer than unscreened populations? Currently, we cannot answer this question, and only with controlled trials will we be able to do so. Three such trials, in New York,[25] Minnesota,[26] and Nottingham, England,[27] are nearing their final stages, and hopefully, will start to answer this important question.

For now, we can conclude that fecal occult blood testing has generally poor patient participation; there is a high miss rate for cancers and polyps, and the low specificity creates false positive tests and these patients, without disease, go on to further, invasive investigations at great expense. Finally, there remains no absolute proof of decreased mortality as a result of fecal occult blood testing. On the positive side, fecal occult blood testing is non-invasive, and early, curable lesions can be detected. The cost per lesion detected is unclear, but the test itself is inexpensive.

3. Sigmoidoscopy

Proctosigmoidoscopy refers to the inspection of the rectum and distal sigmoid colon with a rigid 25 centimetre endoscope. This is the traditional proctosigmoidoscope and most of the studies of endoscopic screening relate to this instrument. In recent years, sigmoidoscopy has also come to refer to the endoscopic visualisation of the left colon with a flexible fibreoptic instrument of 60 cenimetres length. This instrument makes possible a more proximal examination of the colon, and with the proximal migration of colorectal cancer in recent decades, the flexible instrument is replacing the rigid instrument as a screening tool.

To say the least, the rigid instrument has never been popular with patients, nor has it gained wide utilization by physicians. Although 40 to 50 percent of colorectal cancers are still within 25 centimetres of the anus, the average depth of insertion is only 16 to 18 centimetres resulting in low sensitivity for the examination.[22] The yield of cancers on initial rigid sigmoidoscopic examination has been 0.15%, or one in 700 examinations of patients over 40.[29]

The flexible instrument has not been as extensively studied. It appears to have better patient acceptance, and the yield of neoplastic lesions is increased over the rigid instrument by a factor of 2 to 3.[30] But the flexible instrument requires training and endoscopic expertise, and the benefits thus far have not been shown to justify the cost. A shorter 30 centimetre flexible instrument is being studied, and although this may be simpler to use and avoids the costs of training, the sensitivity and yield will necessarily decline.

The value of the rigid sigmoidoscope has been demonstrated in three important studies. Between 1940 and 1956 at the Strang Clinic-Preventive Medicine Institute in New York City, 26,000 asymptomatic patients over the age of 40 underwent digital rectal examination and rigid sigmoidoscopy. Fifty-eight cancers were detected; 90 percent of these were localized, and 15 years later, of 50 patients who were available for follow-up, 90 percent were alive and well.[29] This survival experience is twice that expected in a general population with colon and rectal cancer. At a Kaiser-Permanente Hospital in California, a controlled study of rigid sigmoidoscopy showed a small but statistically significant decrease in mortality from colon cancer.[31] At the University of Minnesota, 18,000 patients were examined by rigid sigmoidoscopy over a 25 year period; when polyps were seen they were removed or destroyed. The incidence of rectosigmoid cancer in this group of patients was 15 percent of expected.[32]

In conclusion, rigid sigmoidoscopy has low sensitivity — primarily due to the proximal migration of neoplasms and the short depth of insertion of the instrument. It is not popular, and it is not being widely used; in a recent survey by the American Cancer Society, over half of patients over the age of 40 undergoing a complete physical examination were not sigmoidoscoped.[33] On the plus side, this technique can lead to detection of polyps and early cancers, and the polyp-cancer sequence can be interrupted. The flexible fibreoptic instruments — with their potential for greater patient acceptance, and documented higher yield, are taking over as a screening modality from the rigid scope, but the cost-benefit ratio is still to be calculated.

COSTS

I have avoided tackling the cost issue in any detail. A look at this difficult issue will indicate that it is complex.

On the expenditure side, there is the cost of the screening test as well as the cost of the confirmatory diagnostic tests. And it must be remembered that in the case of a fecal occult blood test, at best only one in four patients with a positive test will be found to have a colorectal neoplasm, and three out of four will undergo expensive and invasive work-up for reassurance only. There is loss of time for both physician and patient, and this time is particularly expensive when it involves patients without disease. Finally, there is the cost of the sequence of events set in motion by the discovery of a benign adenoma. Such a patient is at high risk for colorectal cancer and enters a surveillance program of regular colonoscopy.

The cost per cancer detected in various screening programs has been estimated from $11,000 to over $1,000,000.[23]

In order to calculate the savings, there is some information still to be generated, for example, how many cancers are avoided by removing polyps, and what is the risk of a particular adenoma degenerating into a carcinoma? (Virtually all colorectal carcinomas arise from adenomas, but do all adenomas eventually become carcinomas?) And there are some ethical and moral

questions to answer: what is the cost of treating early lesions, compared with dealing with colon cancer in its advanced, often devastating and fatal stages? And how do we quantify survival? These questions are not easily answered.

RECOMMENDATIONS

Another question which is not easily answered is central to this discussion: should we be screening the Canadian population over the age of 40 for colorectal cancer? As of 1987, I do not feel that this approach can be recommended. In the absence of documented compliance, survival benefit, and cost-effectiveness, the answer to the screening question is a cautious "NO". However, I think there is sufficient evidence to suggest that case-finding — or screening within our own clinical practices — may be of benefit and is advisable.

Recommendations for the standard risk group begin at age 50, with annual digital rectal examination and annual fecal occult blood testing with six slides and an appropriate diet. Sigmoidoscopy should be performed annually for two years, and if negative every three years thereafter. The flexible scope is the preferred instrument, but if this is not readily available, the rigid instrument is acceptable.

Patients with a positive screening test go on to total colonoscopy. Where this cannot be completed, is refused, or is not available, an air contrast barium enema in combination with flexible sigmoidoscopy is performed as an acceptable compromise.

It is important to remember that screening for cancer is a form of secondary prevention — the detection and erradication of precursor lesions and early cancers. While developments in this area are expected, in the future we must see a greater understanding, emphasis, and application of primary prevention: the identification of genetic and environmental factors responsible for colorectal neoplasms, and the removal of these factors. It is primary prevention that will allow the barn door to be closed before the horse has escaped. □

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Angioaccess Techniques for Chronic Hemodialysis

RESULTS IN A SMALL REGIONAL REFERRAL CENTRE

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Since the late 1970s, Sydney City Hospital in Sydney, Cape Breton Island, has maintained a small Hemodialysis Unit. The patient load for chronic dialysis usually ranges from between 15 to 25 patients, but this number may increase substantially from time to time, for variable periods of acute hemodialysis.

The vascular surgeons at Sydney City Hospital have assumed the responsibility for trying to maintain reliable angioaccess for this group of patients. This could involve establishment of temporary access in patients requiring dialysis for at least a couple of weeks; establishing a permanent A/V fistula in patients new to the dialysis programme; or dealing with complications which may arise from pre-existing fistulae. A substantial number of our patient population had already been referred to Halifax as part of their original work-up for renal failure. Many returned with functioning autogenous arteriovenous fistulae which required no further attention. Nonetheless, a substantial number are still required to have their fistulae either created or revised in our hospital. It is the purpose of this paper to review our experience in this regard. The primary motivation for analyzing the data from this small group of patients was concern regarding an apparently high infection rate of polytetrafluoroethylene (PTFE) angioaccess grafts.

Angioaccess for chronic hemodialysis seems to have begun with a description of the Scribner external shunt in 1960. A much more reliable technique was described by Brescia and Cimino in 1966 and this technique, involving a distal autogenous arteriovenous fistula between the radial artery and cephalic vein at the wrist, remains the gold standard.[1] A wide variety of ingenious variations of this technique have been described over the past several years with generally good results reported.

When distal upper extremity autogenous A/V fistulae are no longer possible in any given patient, a complex variety of more involved techniques must be considered. This usually consists of using a synthetic prosthesis or endogenous saphenous vein grafts implanted in a variety of locations. The patency rates are lower and the complication rates considerably higher in the sub-group of patients requiring this type of procedure.

This report summarizes our experience with some techniques for angioaccess in chronic hemodialysis and will focus particularly on that sub-group of patients which appear to require prosthetic grafts.

At the beginning of this study a fair number of external Scribner-type shunts were placed for temporary angioaccess, usually while awaiting maturation of a more permanent autogenous A/V fistula. Our Unit now has switched over almost completely to the use of large bore subclavian catheters of the double lumen variety, (Shiley Uniflex, Flexicath 3000, Vasacath, Cardiovision), for use in short term dialysis. These devices appear to be more reliable and have the advantage of sparing the small peripheral vessels for use in possible future A/V fistulae. We have not reviewed our data on temporary angioaccess devices for this report.

MATERIALS AND METHODS

The data presented are based on a retrospective review of 50 consecutive patients treated in the Renal Dialysis Unit, beginning in 1980 and extending until 1985. All patients had their original procedures for angioaccess carried out in Sydney by one of two vascular surgeons. The type of angioaccess procedure used was chosen by the attending surgeon and based on historical, physical, radiologic, and hemodynamic information. Evaluation of the brachial, ulnar, and radial pulses, Allen's test, and inspection of the distended forearm veins were carried out routinely. These could be supplemented by segmental doppler pressures or, in more complicated cases, particularly those involving revisions, angiographic studies.

RESULTS

Table I demonstrates the distribution of our patients by etiology of their end stage renal failure. The preponderance of patients with glomerulonephritis and hypertensive atherosclerotic etiologies are similar to those generally described in the literature.[2]

TABLE I

DISTRIBUTION OF PATIENTS BY DIAGNOSIS

Glomerulonephritis	24
Hypertensive/Atherosclerotic	15
Post ATN	4
Polycystic	2
Pyelonephritis	2
Diabetic	2
Fanconi's	1

Table II indicates the age range of our population from 18 to 76 years with a mean of 52.5 and the male to

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female ratio of 28/22. The mean age at time of initial angioaccess procedure is somewhat older than that in a large series of Winset, who reported a mean of 45 years in a total of 508 patients. However, both our age range and mean are very similar to a series reported in 1986 by Kherlakian, *et al.*, where the mean age for their autogenous A/V fistulas was 50 and for his PTFE grafts 53, in a total of 200 patients.[3]

TABLE II

GROUP CHARACTERISTICS

Age Range	18 - 76 years
Mean Age	52.5
Male/Female	28/22
Total	50

In trying to construct cumulative patency data for the various types of fistulas which we performed, we were hampered by the relatively small number of patients and also by the constant flow of patients in and out of the renal dialysis group. Table III demonstrates the more common modes of exit from the hemodialysis group. There were 21 deaths over the 5 year period, and nineteen were transplanted. The six which sustained rejections were later placed back on hemodialysis, sometimes requiring a revision of the previous angioaccess site. Some patients left the group to go on peritoneal dialysis at home. Two failed and were later returned to the hemodialysis group. One patient, who had sustained a post-D.I.C. renal failure which had required intermittent dialysis for a long period of time, eventually improved to the point where no further hemodialysis was necessary.

TABLE III

MODE OF EXIT FROM HEMODIALYSIS

Deaths	21
Transplant	19
Rejection	6
Peritoneal*	4
Spontaneous Recovery	1

*2 Failed: Reinstituted Hemodialysis

TABLE IV

INITIAL A/V FISTULA

Brescia-Cimino	47
PTFE (Straight) Forearm	1
Antecubital Autogenous	1
Forearm Vein Graft	1

Of the patients which we observed over this 5 year period, 47 of the 50 had had a distal Brescia-Cimino type of fistula as the initial procedure (Table IV). One patient had already had extensive obliteration of veins after a prolonged period in the Intensive Care Unit and it was necessary to go directly to a PTFE graft initially. The other two patients had had previous multiple fistulae in Halifax and alternative methods were necessary in each case; autogenous fistulae were constructed in the antecubital area and in one patient saphenous vein was used.

Table V is a simple breakdown of the re-operative rates of the Brescia-Cimino fistulae. 8.5 percent were not satisfactory, either because of immediate thrombosis or failure to mature into a state satisfactory for easy access, and had to be revised within 14 days. However, once the fistulae were being used for adequate dialysis, this particular type was quite reliable and subsequently operations were scattered over the 5 year period for a variety of reasons. Twenty-four of the 47 patients required only that one initial fistula until they either are exited from the study (Table III) or this 5 year period was completed.

TABLE V

RE-OPERATIVE RATE OF BRESCIA-CIMINO FISTULAE

	Number	Percentage
Immediate (1-14 Days)	4	8.5
Late (1-5 Years)	19	30.5
No. Re-op	24	61.0

Table VI lists the late complications of the Brescia-Cimino fistulae which required revision. The usual reason for a second operation was occlusion or, more commonly, progressively diminishing flow in the fistula to the point where adequate dialysis could not be maintained. This was the case in 25 percent of fistulae. One patient developed an infected mural thrombus and a localized area of aneurysm formation after a few years, which required revision. Four patients with significant aneurysm formation were revised, but no new fistula was constructed. Three patients had symptomatic distal venous hypertension. All of these were treated by simple distal ligation of the venous back-flow, leaving the original fistula intact. Although some cases of arterial steal, cardiac failure, and pulmonary embolism has been reported with these fistulae none of our patients with this type of fistula developed these complications.[4]

TABLE VI

LATE COMPLICATIONS OF BRESCIA-CIMINO FISTULAE REQUIRING REVISION

Complication	Number	Percentage
Low Flow	12	25.5
Infected Aneurysm	1	2.2
Aneurysm	4	8.5
Painful Thumb (Venous Hypertension)	3	6.4
Steal	0	0
Cardiac Failure	0	0
Pulmonary Embolism	0	0
	20	42.6

In Table VII, we illustrate the female preponderance in patients who went on to require multiple fistulae of any type. Thirty-one percent of the females eventually

required multiple fistulae as compared to only 14.2 percent of the male patients. The same preponderance of female patients had been noted by Kinnaert *et al.*, who reported 40 percent of women and 18 percent of men eventually requiring multiple fistulae.[4] These authors, however, examine their patients over a longer time period of up to 11 years.

It seems reasonable to assume that the female group experiences more difficulties because of the lower flow through the fistulae necessitated by the size of the vessels used in the fistulae, particularly the venous end, since patency rates are definitely improved with higher flow rates.

TABLE VII

MULTIPLE FISTULAE MALES VS FEMALES

	Female	Male
Total Patients	22	28
Number with Multiple Fistulae	7(31.2%)	4 (14.3%)

Once all suitable distal sites in the upper extremities become exhausted, including obvious antecubital sites, for procedures such as basilic vein grafts, some type of PTFE fistula was constructed.[5] Most of these patients then seemed to embark on a course characterized by multiple revisions and efforts to keep these grafts patent or replace them as necessary over the next several years and this tendency is documented in Table VIII. There were nine patients who eventually received a PTFE fistula. Most had at least two previous autogenous fistulae. All except one required a subsequent re-graft at some point for an average of 1.8 procedures. This does not include those patients who were subjected to immediate thrombectomies using Fogerty catheters which extended the life of some of the PTFE fistulae. In our experience, though, every patient who required thrombectomy eventually required a revision or replacement of the PTFE graft. It was this sub-group of patients that went on to an exceptionally high number of interventions. One patient had seven different procedures over the 5 year period to maintain adequate angioaccess. These averages (Table VIII) would undoubtedly be higher but for the inclusion of the one patient who had no previous fistulae and who required no other fistula except for the initial PTFE shunt, which is still patent after 5 years.

TABLE VIII

OPERATIVE PROCEDURES IN PATIENTS WITH PTFE GRAFTS

	Number	Range
Patients	9	
Mean No. Previous Fistulae	1.9	(0 - 3)
Mean No. Subsequent Fistulae	1.1	(0 - 3)
Mean Total Fistulae Over 5 Years	4.1	(1 - 7)

As demonstrated in Table IX, thombosis or unacceptable out-flow stenosis in a PTFE fistula occurred in 12 grafts, requiring new fistulae in eleven. Two patients developed pulsatile pseudoaneurysms at the site of a needle puncture. These two sites soon became frankly infected in both patients, then thrombosed. Together with the now frankly infected grafts, both required removal and replacement with a new fistula. Four patients had symptomatic steal, one in the lower extremity and three in the upper extremity. None of these fistulae were removed; two were banded and two accepted their symptoms.

TABLE IX

COMPLICATIONS PTFE FISTULAE

	Number	New Fistula
Thrombosis/Outflow Stenosis	12	11
Pseudoaneurysm	2	2
Infected Graft	3	3
Steal	4	0

TABLE X

PTFE GRAFT INFECTIONS

Total Infections	5
Percent of Patients	55
Percent of PTFE Grafts	31
New Fistula Required	4
Complete Removal of Infected Graft	4

Data concerning PTFE graft infections are presented in Table X. Of the nine patients who required PTFE grafts, five eventually developed a graft infection. Of the 16 PTFE grafts, this represents an infection rate of 31 percent. Four grafts had to be removed; one could be treated with a localized excision of the infected area and a bypass. Three were converted to a PTFE fistula in the contralateral arm, one to a saphenous vein loop on the contralateral forearm. All grew *Staphylococcus aureus.* Some also grew *Staphylococcus epidermidis.* This group of patients with graft infection had high morbidity and a long hospital stay as a result of this complication.

DISCUSSION

Several authors have recently reviewed their results of angioaccess in large groups of hemodialysis patients.[4,2,6] To a large extent the composition of the groups by age and diagnosis were very similar to that of a small population, although there is a tendency for the patients in general to be somewhat younger than those in our series. There is general agreement that the Brescia-Cimino type fistula remains the "gold standard" of angioaccess for this kind of patient and, with any luck at all, patients in which a shunt of this variety is well established, may never require further manipulations.

It is in the area of secondary procedures where there appears to be some considerable difference of opinion. As pointed out by Dagher, many surgeons are employing one or another type of synthetic prosthetic vascular graft to facilitate access in patients where customary forearm sites have been exhausted.[5] Some authors have

presented data to support their opinion that these prosthetic fistulae may even be compared directly with autogenous fistulae in terms of complications and patency rates.[3] In our experience and in that of a much larger series, patients requiring PTFE or other prostheses experience much higher infection and thrombosis rates: Winsett's group even noted that the mortality rate resulting directly from complications of the access procedures was much higher in the synthetic graft groups, further supporting the position of the primary autogenous A/V fistula as the procedure of choice for the chronic hemodialysis access.[2]

When one considers the location of this prosthetic material under the skin and the multiple punctures of large bore needles through the skin directly into this prosthesis, it is little wonder that infection rates are high. One would be extremely loathe to carry out even a single puncture into a prosthetic graft placed for bypass purposes in a lower extremity and yet we expect these grafts in other locations to withstand multiple punctures. Furthermore, each of these needle punctures must, by necessity, cut a small flap in the PTFE which must heal by coagulation and fibrosis and, no doubt, there is a hematoma of varying sizes initially, further setting the stage of incubation of any seeded bacteria and subsequent graft infection.

As the result of the review presented above, surgeons at our institution are more inclined to look for secondary procedures other than prosthetic graft installation to establish angioaccess in those difficult patients with previous failed distal autogenous fistulae. Our recent experience with upper arm fistulae, using basilic and cephalic veins, is encouraging and many other variations such as those published by Dagher will no doubt be useful.[5]

No doubt there will still be some patients in whom there appears to be no alternative but to choose a prosthesis. Renewed vigilance regarding technique of needle insertion, skin preparation, and early treatment of suspected out-flow stenosis of these grafts will be mandatory.

SUMMARY

This report presents a retrospective analysis of 50 patients for which permanent angioaccess procedures for chronic renal dialysis were performed in Sydney City Hospital. The superiority of the distal forearm autogenous A/V fistula was well documented, as almost half of these patients never required any other kind of fistula as long as they received hemodialysis. The general composition of our group indicated similarities to other larger published series.

We found that high morbidity and infection rates were associated with PTFE fistulas of 16 different fistulas implanted. Of this type, five became infected. Although this figure is not too different from that reported in the literature, the morbidity associated with this complication is impressive.

We conclude that in patients with failed forearm fistulae, every effort should be made to find some type of endogenous fistula, including free saphenous vein grafts, before choosing a prosthetic conduit. Although PTFE is easy to insert and allows early access, long term complications are high. □

ACKNOWLEDGEMENTS

The authors are indebted to Dr. Anitra Laycock, Halifax Infirmary for gathering reference material for this paper; also to Audrey Acker, R.N., Head Nurse, Renal Dialysis Unit, Sydney City Hospital, who gathered the raw data on which this report was based. Thanks also to Mrs. Jan Terry for typing the manuscript.

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Physician Apprehension in Requesting Organ Donation
REASONS AND RECOMMENDATIONS

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As a consequence of improvements in surgical technology, immunosuppression, organ preservation and modern public attitudes, organ transplantation has moved from the realm of experiment to that of acceptable treatment. Transplantation has become the treatment of choice for many patients with end-stage cardiac, pulmonary, hepatic, bone marrow, pancreatic and renal failure. In addition, corneal, bone and skin transplantation has drastically improved the quality of life for thousands of people.

In 1984, approximately 8,000 visceral organs were transplanted in the United States with kidneys accounting for 7,000.[1] In Canada approximately 800 kidney transplants are being performed annually.[2] In 1986, 109 kidneys were transplanted at the Victoria General Hospital and Izaak Walton Killam Hospital in Halifax, N.S. and 59 kidneys and 5 livers transplanted in 1987. With an increase in success rates and cost effectiveness of transplantation, the demand for cadaveric donor organs has increased to a point where 165-170 patients in Atlantic Canada are on the Transplant Wait List at the Multi-Organ Transplantation Center at the Victoria General Hospital.

The decrease in supply of transplantable organs is the primary reason for the large number of patients on the waiting list. A records survey conducted by the N.S. Department of Health showed that in 1982/83, 104 people who were eligible organ donors died in Nova Scotia; 111 in 1983/84; and 126 in 1984/85.[2] These account for only 2% of the total number of deaths. This number of potentially transplantable organs would more than adequately supply the large demand of donor organs in Atlantic Canada.

Although there has been an increase in organ availability over the last 5 to 10 years, the transplant community still feels that there could be more rapid progress in this area.[1] One limiting factor seems to be physicians' reluctance to approach the surviving family for organ donation.[1,3-9] The following discussion suggests reasons for the reluctance of physicians to request organ donation and recommendations for alleviation of the problem.

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RELUCTANT REQUESTORS

Many factors are thought to play a part in a physician's apprehension regarding asking the surviving family if they would consider organ donation. The following is a list of some of the factors that have been documented:

1. In a survey of 117 emergency room physicians, a frequently cited reason why organ donation was not requested was the dislike of discussing the subject at a time of intense grief.[9] Some physicians also felt that they would add to the grief and burden of the family at a very sensitive time. Dr. Michael Murphy, Co-director of the Emergency Department at the Victoria General Hospital in Halifax, believes that requesting organ donation after telling a family that a loved one has died, is one of the most difficult tasks a physician has to perform.

2. Some physicians fear that the family, in some instances, may think that not enough was done to keep the patient alive or that the family or physician may feel that "she/he has failed".

3. In some hospitals, especially those that do not perform organ transplantation, there may be a lack of knowledge or confusion regarding: the legal aspects of organ donation (including brain-death laws),[1,3,9] medical criteria necessary to fulfil requirements for organ donation,[8] and the process of contacting the transplant unit or program.[8,9]

4. Another main reason why critical care staff hesitate to request organ donation from the surviving family is that they are not adequately trained in discussing the subject.[8,10] Dr. Murphy feels that some are simply very uncomfortable with the subject and therefore shy away from it.

5. A request for organ donation may place the physician who cared for the deceased patient in conflict of roles because, in asking for organ donation, she/he is now being an advocate for another patient. It is felt by some that this may add to a physician avoiding the donation request.[3]

6. Although there is a large amount of coverage in the public media and medical journals and education in medical schools, some physicians still consider transplantation an experimental procedure.[11] Until such

primary care physicians have patients who require organ transplants in order to survive, they may continue to consider it experimental.

7. Finally, some physicians feel that they have a lack of time (too busy);[7] are apathetic; or feel that "transplantation is not their job".[10]

APPROACHES TO THE PROBLEM

1. In an effort to increase awareness and encourage the physician's role in organ donation, the Canadian Medical Association in August of 1986 supported in principle the concept of "recorded consideration". This concept proposes that physicians routinely record whether a dying or brain-dead patient meets the criteria for organ donation, whether or not the family has been approached and either the reasons for not approaching the family or the outcome of the request.[6] It is hoped that when recorded consideration "is adopted into hospital policy the emphasis is on the positive aspects of organ donation as an important and recordable event".[12] This process would facilitate organ donation and make the attending physician less reticent about asking the surviving family to consider organ donation.

In the United States, about 30 states followed Oregon's example and enacted legislation requiring that hospital personnel routinely provide surviving families the opportunity to authorize donation.[1,3] Following implementation of the law, the Stanford University Medical Centre experienced a 38% increase in heart and heart-lung donations and New York an increase in total organ donation by 48%. However, this initial upsurge has not been borne out in subsequent reporting periods. Such legislation is currently being advocated by some in Canada.[6]

2. Another manner in which to improve awareness of organ transplantation within the medical profession is by ensuring that hospitals have established policies on organ donation. In January of 1987, the Canadian Council on Hospital Accreditation in its surveys of hospitals began noting if hospitals have policies or procedures regarding determination of brain death, identification of and consent for potential donors, support for the surviving family, contacting transplant centers, transportation of the donor body or organs and organ transplantation where applicable.[6]

3. It has been shown that many families find comfort in the knowledge that some good has come from their tragic loss[13] and that their gift has helped ease their grief.[9] Some survivors have also experienced regret at not having authorized organ donation or similarly that they were not given the opportunity to authorize a donation.[3] Educational programs for physicians should deal with their practical issues as well as legal and ethical concerns. Other practical issues are: medical criteria for donor evaluation, contacting appropriate personnel and regional transplant programs, and ways to improve the request process.

4. While the physician or critical care staff are best suited to identify a potential donor, some have suggested that the request may be better received if a trained requestor is employed.[3,10] The requestor would be introduced to the family by the attending physician but not be involved in either the care of the deceased or in the transplantation process itself. In Oregon, the designated requestor is usually a registered nurse but physicians, hospital clergy and social workers have also been trained as requestors.[3]

CONCLUSION

The above discussion deals briefly with factors that have made physicians reluctant to request organ donation from the surviving family in the past. In addition, some ways to alleviate this problem have been recommended. With heightened public awareness and a change in the attending physician's role in organ donation, the supply of cadaveric donor organs will adequately meet the needs in order to better the life of many people. □

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It is a profound and necessary truth that the deep things in science are not found because they are useful; they are found because it was possible to find them.

J. Robert Oppenheimer (1904-1967)

Camp Hill and the Smallpox Outbreak of 1938

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Canadian Press Clipping March 8, 1938:

"For the first time in its history, 21 year old Camp Hill Hospital with its hundred Great War Veterans is under . . . quarantine . . . as the result of the discovery of a case of smallpox."

BACKGROUND

Smallpox occurred in Halifax in 1907 and again in a protracted epidemic that persisted from 1917 to 1920. During the latter outbreak 5,000 Haligonians were vaccinated against the "dreaded" disease but, in the intervening years, there were no reminders of its lethal potential and the populace became complacent. As early as 1932 the stage was set for Camp Hill's involvement with the smallpox outbreak at the end of the decade. It was then that the Department of Pensions and National Health agreed to help overcrowding at the Victoria General Hospital by accepting sick mariners at Camp Hill.

Finally, there was a policy of the Quarantine Service known as "radio pratique" that was instrumental in the development of the smallpox outbreak. We shall look at the role it played, but first let us look at the source of the infection.

S.S. CITY OF AUCKLAND

The *S.S. City of Auckland* was a freighter carrying general cargo. She left Calcutta on January 17th 1938 and arrived in Colombo on January 23rd. The ship then proceeded to the Red Sea, making calls at Port Sudan and Port Said, where two crew members were replaced. A brief stop was made at Gibraltar on February 18th for coal and on the same day the *City of Auckland* left port bound for Halifax.

Ali Tobaruck, a 30 year old coal trimmer on the *City of Auckland* reported for work as usual on March 4th, two days out of Halifax. The next day he complained of back pain. Native crews on ships frequently worked under a native foreman called a serang who could speak English and act as an interpreter. So the seaman's complaint was translated and taken to the steward. Castor oil was prescribed; the complaint was not recorded in the log book or reported to the Captain, H.D. Jenkins.

Halifax, *c.* 1935. Looking south-east and showing Tram Barns, Ships at Seawall, Nova Scotian Hotel, and Immigration Building next to the liner

Another situation that contributed to Camp Hill's involvement was an hiatus that occurred in 1938 regarding hospital facilities for infectious diseases. The hospitals on Lawlors Island had been used since the 1870s for quarantinable diseases but they had not been used for many years and fallen into disrepair. The new infectious disease hospital at Rockhead was not quite ready for use in March of 1938.

As the freighter approached Halifax harbour it wired the Quarantine Service requesting radio pratique. Pratique was a licence granted to enter port once quarantine regulations had been fulfilled. Originally it

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was granted only after an officer had inspected the ship, its crew and log book. It was a time consuming procedure and had generally been replaced by the more commercially convenient radio pratique. This permitted the captain merely to send a message under oath that his vessel was free of disease and had not called at any infected ports. The vessel would then be given permission to dock and the official quarantine forms could be filled out.

The *City of Auckland* had been granted radio pratique. However, Canadian Pacific had failed to transmit the permission by telegraph. So on the morning of March 6th the *City of Auckland* was anchored in the harbour with her quarantine flag flying.

Dr. J. S. DOUGLAS, ASSISTANT QUARANTINE OFFICER

Dr. Douglas arrived at Kings Wharf on Sunday morning March 6th at 8:00 AM intending to board the quarantine boat, the Sulucan II, for the trip to Pier 37 where the *City of Auckland* should have been docked. Instead he was informed by the customs boat crew that the *City of Auckland* was anchored in the stream with her "Q" flag flying.

Unfortunately Dr. Douglas could not foresee the benefits of keeping the ship precisely where it was. Instead he boarded the vessel and discussed with Captain D.H. Jenkins the failure to receive the message granting him permission to dock. He then cleared the ship after getting a signed affidavit and checking the crew's vaccination documents. All the crew had been vaccinated in Calcutta with the exception of the two crew members who had joined the ship at Port Said. The results of the vaccinations had not been recorded. Despite this and the fact that the Halifax Quarantine Service received weekly copies of the Saigon health bulletin indicating that smallpox was "extremely prevalent in Indian ports," Dr. Douglas did not muster the crew for inspection.

The *City of Auckland* proceeded to Pier 37 where the ship was to be fumigated prior to discharging her cargo. During the fumigation process the crew was transported by bus to the Immigration quarters at pier 21.

Dr. LYALL COCK, IMMIGRATION OFFICER

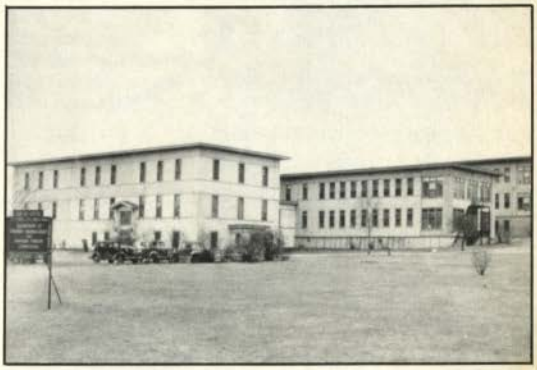
Dr. Cock was responsible for sick mariners and so he was called when Ali Tobaruck collapsed in the restaurant at pier 21. He examined him in the Immigration detention centre on the second floor of the building. The seaman was obviously ill and in pain with a temperature of 104 and a pulse rate of 125. He had a papular rash on his forehead and face, a confluent "hard papular rash" on his back, a few papules on his chest and abdomen and quite a number on his legs. Dr. Cock also noticed an old vaccination scare on his left shoulder.

Dr. Cock's diagnosis was smallpox and he had a dilemma on his hands. If Ali remained in the Immigration centre, the entire staff would have to be quarantined and no passenger boats could land in Halifax for the duration of the quarantine. The *City of Auckland* was being fumigated and the two quarantine hospitals were not in active use. Dr. Cock felt he had only one course of action available and that was to send him to Camp Hill Hospital. He contacted Dr. Hugh Collins, the admitting resident, and requested that he send an ambulance for Ali. He also requested that he be isolated and that the diagnosis be confirmed by senior staff physicians.

Dr. HUGH COLLINS, RESIDENT CAMP HILL HOSPITAL

Dr. Collins was hesitant but felt compelled to accept the sick mariner. He isolated him and, with the aid of the orderlies, undressed and examined him. During this time Dr. Collins later recalled that Ali was coughing and spitting a great deal and both orderlies, Reginald Smith and Edward Liggins were in close contact with him. Next, Drs. John Rankine, Kirk Maclellan and Kenneth MacKenzie were asked to examine the patient and confirm the diagnosis. There was no doubt in the doctors' minds that this was a full blown case of smallpox. Immediately, the arrangements were made to transfer the patient to Lawlor's Island.

The examination room was scrubbed with soap and water and a 1/20 solution of carbolic acid and sealed. Then, in an inexplicable lapse of quarantine procedure, both orderlies were allowed to go home.



Camp Hill Hospital, c. 1938.[1]

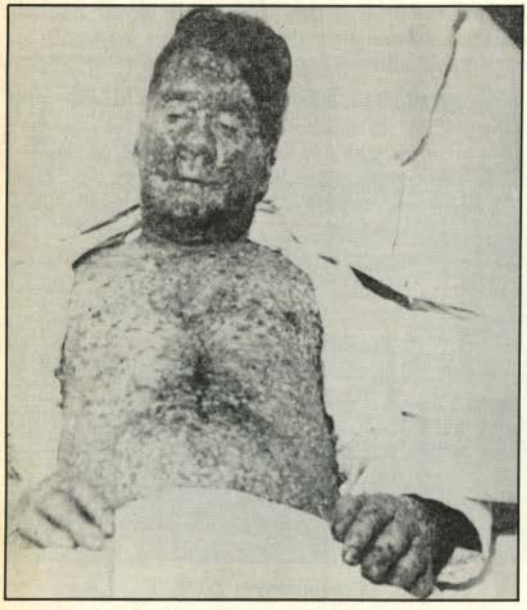
CAMP HILL

Monday, March 7th the patients and staff of Camp Hill were vaccinated against smallpox. There were 11 exceptions, and these were elderly, debilitated or very ill patients. Walter Callow, one of Camp Hill's most famous residents was one of the exceptions. The same day Dr. Maclellan, the chief medical officer at Camp Hill, in consultation with the federal authorities and the city board of health, placed Camp Hill in quarantine. The entrances were locked, quarantine notices were

posted and a guard was placed on the front door. Later Commissioner S.T. Wood provided RCMP officers to guard the premises. Approximately 50 members of the Camp Hill staff were quarantined at Rockhead Hospital and were transported daily to and from the hospital.

Reginald Smith's vaccination didn't "take" and, as there was no evidence that his vaccination in 1914 had been successful, he was revaccinated on March 12th. Mr. Liggins had had successful vaccinations in the past and his March 7th vaccination was reported as a primary take.

Dr. M.A. MacAulay, the district health administrator at Camp Hill, had been the Smith and Liggins' family physician. He looked after the quarantine of their homes and the vaccination of their contacts, some 40 in all. On March 16th Dr. MacAulay made a house call and found Mr. Smith was not well. The next day there were quite a few "suspicious spots" and preparations were made to transfer him to Lawlor's Island. The day was stormy and so the transfer was postponed until the morning of the 18th. Edward Liggins joined the group on Lawlor's Island that same evening, despite his vaccination status, a victim of smallpox.

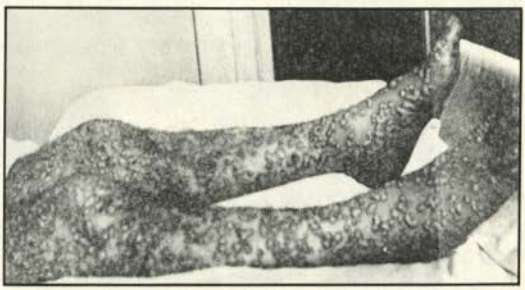


Orderly with smallpox, Lawlor's Island, 1938.[1]

The team that went to Lawlor's Island to look after the smallpox patients were Dr. Collins, Nursing Sister M.C. Macdonnel, and Orderly Walter K. Wilson. William Zinc, an orderly who had had close contact with the infected cases, did not have a satisfactory reaction to his vaccination and was sent to Lawlor's. Mr. Beed, an orderly with Immigration service, was feverish and had an exaggerated local reaction after his vaccination and he too joined the group in quarantine. These two orderlies developed no further clinical signs and were very helpful in caring for the two patients.

Initially, the quarantine at Camp Hill was only partial and a memo from Dr. Kirk Maclellan indicates that they continued to admit patients, including a sick mariner, up until March 17th. After that date a "rigid" or complete quarantine was placed on the hospital. This meant that veterans could not be discharged, elective admissions had to be cancelled and agreements were negotiated to admit veterans on an emergency basis to local hospitals. The Halifax Infirmary agreed to admit sick mariners [non infected cases] during the Camp Hill quarantine. Despite these arrangements the Canadian Legion began to express its displeasure. The *Halifax Mail* reported on March 22, "A resolution protesting admittance of a seaman stricken with smallpox into Camp Hill Hospital was endorsed by the Cape Breton Command over the weekend." Similar resolutions were passed at other branches and sent to the Federal Minister of Health, the Honourable C.G. Power.

In the meantime, Dr. C.P. Brown the chief quarantine officer for Canada, arrived in Halifax to oversee personally the quarantine. On March 21st he went to Lawlor's Island and reported: "he [Reginald Smith] is distinctly more toxic today — his face a swollen mask. I have very little hope that he will recover." Edward Liggins apparently had benefited from his previous vaccinations. Dr. Brown felt that, "he is ill enough but not alarming at all."



Legs of orderly with smallpox, Lawlor's Island, 1938.[1]

There were the usual minor inconveniences resulting from the quarantine. Dr. Brown reported to his superiors in Ottawa that his vaccination site was so itchy that it kept him awake for several nights. Then there was the boredom of the veterans who had to be confined to the hospital. The Camp Hill Chaplain, Rev. Ambrose, wrote a poem that gives us some insight as to how they passed their time.

In quarantine for many a day
One hundred [Great War] veterans lay
Till the smallpox scare had passed away;
And some were bald, and some were grey,
But most could crib or rummy play,
Or make at billiards, some display.
.....

In the last lines of the poem Rev. Ambrose points out some of the veteran's bones of contention as well as their relief at the outcome of the quarantine:

We had no leave, nor extra pay,
So I cannot say that we were gay,
Tho' delighted the sick passed not away.

.....

The quarantine at Camp Hill Hospital was officially lifted on April 2nd 1938.

OUTCOMES

Ali Tobaruck died of smallpox on March 9th and was buried on Lawlor's Island. Reginald Smith and Edward Liggins both recovered, although Mr. Smith was badly scarred.

A commission of inquiry was established by the Federal Government to report on the smallpox outbreak. They had two recommendations, the first was that the practice of radio pratique be reviewed by the Quarantine Service and secondly that a quarantine hospital be readily available. Both of these recommendations were acted upon. All ships from the Far East were quarantined and their passengers and crews were inspected for evidence of infectious disease. The facilities at Rockhead were quickly completed and were made available before the quarantine was lifted at Camp Hill.

The Hon. C.G. Power announced on March 31st: "No sick mariners will in the future be sent to Camp Hill Hospital". This decision satisfied the veterans, however with the onset of World War II, the policy was reversed.

The cities of Halifax and Dartmouth indirectly benefited in that approximately 20,000 people were vaccinated as a result of the outbreak. Subsequently, strict attention worldwide to vaccination programs has resulted in the irradication of smallpox. □

ACKNOWLEDGEMENT

I would like to thank Owen McInerney, medical archivist for his invaluable help in obtaining the documents and photographs for this article.

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DIAGNOSIS AND TREATMENT PLANNING OF DENTOFACIAL DEFORMITIES

Continued from page 85.

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ADVERTISERS' INDEX

The Scientific Basis of Family Medicine

Anna Mary Burditt,* MD, CCFP, FCFP, (Retired),

Halifax, N.S.

Medical faculties sometimes ask, "What is the scientific basis of Family Medicine?" as if the presence of Family Medicine in the university were dependent on the answer. Responses to the question are as variable as the specialties of those replying. An Internist cites Internal Medicine as the basis of Family Medicine; an Epidemiologist claims it to be Epidemiology; a Family Medicine administrator suggests it is coordination of the other medical sciences.

When a Dean of Medicine put the question to a family physician who practised in a town which we shall call Esop, she replied with a fable:

The Scientific Basis
A FABLE
By Esop's Physician

Once upon a time in the city of Lost Art, Scientia, there was a great university dedicated to Applicable Science. Its teachers were brilliant scientists from every useful walk of life — doctors, engineers, physicists, chemists, botanists and many, many others. They were proud of their knowledge and achievements, and they knew that outside their walls others made use of their wisdom.

One day a master artist applied to teach at the University. "You see," he said, "I use your knowledge and I would like to work in your centre. My students would learn the finest scientific techniques directly from you and I could teach them how to select the tools most useful for their task. I would then show them how to apply your scientific techniques, incorporating the knowledge and training you have given them into works of art that would enrich the world. In return, we would paint for you, portraying the beauty of science through our art, enabling everyone, not just those who come to the university in search of scientific wonders, to benefit from your knowledge and our skills. We could also share our knowledge of art with your students, developing their talents to the fullest."

After much debate the scientists agreed to see the artist's work, so they could judge for themselves the scientific basis of his art and know whether or not he deserved a place in their university. The artist selected a great painting of a family, tilling its garden. He hung it in the rotunda of the university and the scientists came to view it.

"I see," said the chemist, "the scientific basis of art lies in a knowledge of the pigments. I could teach this man a great deal. He has selected fine pigments, but he needs to know more about their chemistry." The physicist disagreed. "The true scientific basis of painting," he said, "is the study of light." He held up a prism and thought of all the knowledge he could impart to the art students.

An anatomist joined the discussion. "Look at those central figures," he said. "Anatomy is the scientific basis of painting. The students need to know more anatomy." "But no matter how much anatomy they know they cannot apply it without coordination of eye and hand," said the neurologist. "I must help them understand the intricacies of their own nervous system so they can develop their skills to the utmost, for this is the scientific basis of their art."

"Why, gentlemen," said the horticulturist, you haven't even noticed the garden. The artist has a considerable knowledge of plants. I could teach his students so much more, introducing them to new varieties, revealing the beauty of their structure, giving them a scientific basis for their art."

"Affect," murmured the psychiatrist, "note the affect . . . ."

But he was interrupted by the Secretary to the Dean. "Scientific basis?" she asked. "Aren't you asking the wrong question? He uses each of your sciences, but look how he integrates them, and incorporates his own skills. Can you not appreciate his art?" The scientists scoffed and turned away.

The artist stepped out of the shadows.

"Their knowledge is valuable, indeed," he said, "yet if I were to put a canvas before them, all of them together could not produce a work of art like mine." Reclaiming his painting, he started to leave. At the door, he turned back.

"No," he said, "someday they will realize they need me as much as I need them." He set his easel in the centre of the rotunda and began to paint. As the scientists scurried about their business, they walked around him.

MORAL:

Though we inquire into the science of the art,
We know it takes more, full beauty to impart.
Though specialists expound from their position,
There's more to producing a Family Physician. □

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Current Topics in Community Health

Selected by: Dr. Frank M.M. White
Department of Community Health and Epideminology
Dalhousie University, Halifax, N.S.

NORTH PRESTON PROJECTS TO RECEIVE INCREASED FUNDING

The Provincial government is helping Halifax County to fund an extensive $7 million North Preston renewal program by providing increased water and sewer assistance, home improvement projects and job retraining. The housing assistance is expected to create about 25 new homes and upgrade many others, particularly in the Downeytown area where small lot sizes have made development difficult or impossible. Municipal Affairs Minister Laird Stirling, defending the level of funding, stated that severe health problems dictate the need.

Eight provincial government departments are taking part in the renewal program. The first phase of the water and sewer project is expected to start in May and the majority of that work is expected to be completed by December. Mr. Stirling, local MLA and Community Services Minister Tom McInnis, Housing Minister Mel Pickings, Advanced Education and Job Training Minister Edmund Morris, Halifax County Warden Art MacKenzie and local county Councillor Wayne Adams hailed the project as a new beginning for the black community. "I know this is going to mean a lot to the community of North Preston," said Warden Art MacKenzie. "I am sure when it is all brought together, it is going to be a model community."

Source: Article by Randy Jones, *The Mail Star*, March 31, 1988.

Comment

Serious environmental health problems have been documented in this small Nova Scotia community. Specifically this includes the occurrence of extensive roundworm infestation, especially amongst children and youth, making it the most northerly community in the world in which this condition is endemic.[1,2] Although this and other environmental health problems have been recognized for many years, the community lacked the tax base to justify provision of public services to the level enjoyed by most Nova Scotia communities. This situation has been aggravated by generally unfavourable land conditions, rendering such development more complex than usual. The co-operative decision reported here, including additional funding for essential housing assistance and job retraining, has the potential to alleviate many of these problems.

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NORTH PRESTON MATRIARCH 'MUM SUZE' DIES AT 105

SMITH, Susie — 105, North Preston, died Thursday (April 14) in Dartmouth General Hospital. Born in Cherrybrook, she was a daughter of the late John and Louise (Cane) Bundy. She was a member of St. Thomas United Baptist Church and was a choir member for more than 50 years. She was a member of the East Preston Ladies Auxilary and was a member of the Helping Hand Society of Halifax. The subject of a 1986 CBC-TV documentary, 'Mum Suze' lived in North Preston for more than a century, raising, by her account, 19 children. She accomplished this, in harsher times, by transporting kindling, herbs and vegetables 25 kilometres to Halifax by horse and cart and peddling them door to door. She was also called upon within her community to supply many health remedies. Through all the years and many hardships, Mom Suze's family and North Preston — Canada's largest and oldest all-black community — became one and the same. She is survived by a son, 84 grandchildren, 350 great-grandchildren; 250 great-great-grandchildren; 10 great-great-great-grandchildren.

Source: *Mail Star*, April 6, 1988

WHAT DO YOU KNOW ABOUT INTERNATIONAL CHILD HEALTH TRENDS?

Times change and so can a nation's health status. The United Nations Children's Fund (UNICEF) publishes an annual report on The State of the Worlds Children which lists an array of basic indicators. Some comparisons may surprise you. The table below provides examples, based on a 4 level classification of under 5 mortality experience. The complete table actually lists 131 countries, and amazingly this measure of child mortality has shown improvement in all of these since 1960 (except for Mozambique, Angola and Iran for which no data are available in 1986).

An international comparison based on two different years permits comparison of times as well as places. For example, in both 1960 and 1986 western style industrial democracies enjoyed the most favourable rankings based on under 5 child mortality. However, a number of other countries are catching up. The following in 1986 had surpassed the U.S. rate as recorded in 1960: Israel, Czechoslovakia, Greece, Cuba, Poland, Hungary,

Bulgaria, Portugal, Costa Rica, Kuwait, Jamaica, Trinidad and Tobago, Chile, U.S.S.R., Yugoslavia, Rumania, and Mauritius.

Many countries of course still have distressingly high rates of child mortality and several of these have experienced violent conflict during this period of analysis (e.g., Afghanistan, Ethiopia, Uganda). Other countries often considered to be advanced in the economic and industrial sense still have unacceptably high rates (e.g., Saudi Arabia, India, South Africa). Others have moved more rapidly forward, with outstanding gains in some (e.g., Papua New Guinea, Burma, China). Still others have joined the most favourable category (e.g., Jamaica, Costa Rica, Cuba).

These gains, although not possible to fully explain, have been attributed largely to education, public health and social measures, such as literacy programs, access to drinking water, and improved primary health care (including expanded immunization services). The generalized decline in birth rates throughout most of the world, with consequent reductions in family size, is likely to have been a powerful social factor. While economic development is also an important factor, its impact is indirect and requires equal effort in the areas of health and social policy development.

Of course, dry statistics can never tell the whole story. For this reason, the following article on Southern Africa and the hidden casualties provides a more graphic insight on the impact of apartheid and military conflicts in that region.

Source: Dr. Frank White, Department of Community Health and Epidemiology, Dalhousie University

Reference

The State of the Worlds Children, United Nations Children's Fund, Oxford University Press, 1988.

SOME BASIC HEALTH INDICATORS FOR SELECTED COUNTRIES

Country	Under 5 MR 1960	Under 5 MR 1986	Rank	Adult Literacy % M/F	% Access to Drinking Water	Immunization (% Polio < Age 1) 1985-86
Very High 45 MR (over 170)	308	211	1-33	43/22	29	21
Afghanistan	380	325	1	39/8	16	9
Ethiopia	294	255	5	NA/NA	6	6
Mozambique	302	NA	8	52/22	13	32
Angola	346	NA	10	49/NA	28	58
Haiti	294	176	31	40/35	32	19
Uganda	224	174	33	70/45	16	21
High 45 MR (95-170)	251	125	34-64	68/50	51	37
Iran	254	NA	38	62/39	76	72
India	282	154	41	57/29	54	45
Saudi Arabia	292	105	58	35/12	91	79
South Africa	192	101	59	NA/NA	NA	NA
Nicaragua	210	100	60	NA/NA	56	80
Vietnam	233	95	64	88/80	41	37
Middle 45 MR (26-94)	138	108	65-96	89/85	66	71
Papua New Guinea	247	90	67	55/35	16	37
Burma	229	89	69	NA/NA	23	4
Jordan	218	62	78	87/63	78	54
Albania	164	50	81	NA/NA	NA	94
China	202	47	82	82/56	NA	68
U.S.S.R.	53	28	96	NA/NA	NA	95
Low 45 MR (25 and under)	43	13	97-131	97/93	NA	90
Jamaica	88	24	99	90/93	86	74
Costa Rica	121	23	101	94/93	91	90
Cuba	87	19	106	96/96	NA	88
USA	30	13	111	NA/NA	NA	NA
Canada	33	10	124	NA/NA	NA	NA
Sweden	20	7	131	NA/NA	NA	98

Note: NA indicates information not available in required format. MR = mortality rate.

SOUTHERN AFRICA: HIDDEN CASUALTIES

The direct effects of apartheid on the children of South Africa have made the news in most nations in 1987. Less has been heard of the indirect effects of the apartheid conflict on the 15 million young children of the nine neighbouring states — Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia and Zimbabwe.

In the most severely affected countries, economic disruption and military activities have increased child death rates by an estimated 75%. Mozambique and Angola, in particular, have seen their child death rates rise to among the highest in the world.

While drought, floods, falling trade, and past domestic policies have all contributed to this crisis, a 1987 report for UNICEF concludes that "the main culprits are war and economic pressure."

Hardest hit are Angola and Mozambique. Ever since achieving independence from Portugal in 1975, both countries have been beset by internal fighting and external attacks. Nonetheless, both countries had made an impressive start in mother and child care, immunization, essential drugs, drinking water supplies, and food availability for the poorest.

But with the beginning of the 1980s came a stepping up of externally-supported disruption, and among the casualties have been the frail structures of health and education. In Mozambique, for example, 585 health posts and health centres — almost half the total — have been destroyed since 1982. Over a third of all schools have also been wrecked or abandoned, leaving more than 500,000 primary-school children without education.

"One of the deadliest weapons of the war," says the report, "is the mass terrorism carried out by forces which have burned crops and farmhouses, pillaged and destroyed schools, clinics, churches, mosques, stores and villages, poisoned wells by throwing bodies down them, and attacked the transport system, which is a vital part of rural life."

Health workers, schoolteachers and pupils, foreign aid personnel, and vehicles transporting medical supplies and food have all been attached with the aim of making large areas ungovernable. Power plants, ports and railway lines have also been targeted, along with tea estates, mines, cement plants and petroleum installations.

The costs of all this have also helped to sabotage services for mothers and children. Since 1980, losses caused by the military and economic struggle over apartheid are estimated at $17 billion for Angola, $5.5 billion for Mozambique, and $5 billion for the other seven states of the region.

The direct human costs of warfare amount to at least 100,000 deaths in Angola and Mozambique alone. But most of the region's deaths are not caused by weapons. They are caused by malnutrition and diarrhoea, by untreated respiratory infections, and by diseases which could have been prevented by immunization.

Health policies in Angola and Mozambique, during the late 1970s, looked likely to reduce under-five death rates to below 200 per 1,000 births (Tanzania's present level, for example, is 185 per 1,000). Instead, the rate in both countries has now risen to at least 325 per 1,000. It can therefore be estimated that approximately 140,000 young children have died in Angola and Mozambique this last year simply as a result of the armed struggle. "Every four minutes," says the UNICEF report, "a small Angolan or Mozambican child was lost who otherwise would have lived."

Peace, and an end to apartheid, are the prerequisites for both health and development in southern Africa. In the meantime, millions of children could be saved from the worst consequences of the conflict if the international community were to provide urgently needed finance, food, drugs, vaccines, transport, water supplies and help for improving food production.

Source: The State of the World's Children, UNICEF, 1988. □

An Appreciation

DR. JOHN OSLER MACNEIL

The recent passing of Dr. John Osler (Tubby) MacNeil of Glace Bay, N.S. has left a void in that large coal mining town and surrounding area seldom, if ever, equalled.

Dr. J.O. received his early education in Glace Bay and St. Mary's High School, Halifax. His pre-medical studies were at St. Francis Xavier University, Antigonish and in 1945 he received his medical degree from Dalhousie University in Halifax, N.S.

He served one year with the Royal Canadian Army Medical Corps with the rank of Major and a short period with the Department of Veterans Affairs, Camp Hill Hospital.

In 1948 he joined the medical practice of the late Dr. M.G. Tompkins in the town of Dominion. This was followed by three years of post-graduate studies in the department of surgery at the Victoria General Hospital in Halifax.

In 1951 he received a Fellowship in the Royal College of Surgeons of Canada and in 1953 a Fellowship in the American College of Surgeons. Also in 1951 he began a surgical and medical practice in Glace Bay that continued, uninterrupted, until his death on Jan. 2, 1988.

Dr. MacNeil held offices including the presidency of the Surgical Association of Nova Scotia but his great fame in the coal mining communities, where severe accidents and fatalities are a way of life, resulted from his tremendous surgical skills and total devotion and dedication to his patients.

He was a perfectionist in all respects and raised the level of hospital care locally, by his insistence and personal example that all personnel involved, perform at all times the utmost of their abilities. He was equally well-known for his keen sense of humor and love of the reasonable practical joke.

Dr. MacNeil had two consuming hobbies, collecting and listening to the classical music of the world's greatest masters, and his love of woodworking at which he was considered a master craftsman. To his children Ian, Sharon, Kevin, Paul and John O. Jr., he left articles of superb craftsmanship that should endure for centuries.

This remarkable man followed his father into the medical profession. His father, Dr. Dan MacNeil was a renowned athlete, skilled surgeon and a great humanitarian. Dr. Dan died in 1935 when Dr. Tubby was 14.

The MacNeil family has provided expert medical services to their mining community for almost all of this century and with the continuation of the practice by two sons of the late Dr. J.O. and his wife Claire (Tompkins) MacNeil, the practice should continue well into the next century. Dr. John O. Jr. is currently in the family practice in Glace Bay and Dr. Kevin is in post graduate studies in internal medicine in Halifax.

Len Stephenson (Best friend)

□

OBITUARIES

Dr. Bernard Miller, (79) of Halifax, N.S. died on April 10, 1988. Born in Neil's Harbour he graduated from Dalhousie Medical School in 1931. After a six-year interruption for wartime service he received his orthopaedic surgery degree from the University of Liverpool in 1948. He returned to Halifax later that year and was among the leading figures in the fight against polio. He was a member of The Medical Society of Nova Scotia, the Canadian Medical Association, the Canadian Orthopaedic Association and was past director of the Victorian Order of Nurses. He is survived by three sons and a daughter. The *Journal* extends sincere sympathy to his family.

Dr. John Stanton, (75) of Halifax, N.S. died April 30, 1988. Born in Mulgrave he graduated from Queen's University in Kingston, Ontario in 1941. He practised in Canso until he became Director, for several years, of the Health Units of Pictou, Antigonish and Guysborough and then he moved to the Department of Health in Halifax. He was a member of The Medical Society of Nova Scotia and in his retirement years the medical advisor to the Nova Scotia Liquor Commission. He is survived by his wife and two sons. The *Journal* extends sincere sympathy to his wife and family.

Dr. Frank S. Ozvegy, (68) of Yarmouth County, N.S. died on April 26, 1988. Born in Hungary he graduated from medical school in Hungary in 1944. He came to Canada in 1957 and commenced training in radiology; after finishing training he became Head of the Department of Radiology and then Chief of Staff of the Yarmouth Regional Hospital. He was a member of The Medical Society of Nova Scotia and the Canadian Medical Association. He is survived by his wife, to whom the *Journal* extends sincere sympathy. □