

The amount of compressed gas—for example, oxygen—needed to power a ventilator over a long flight may be considerable, and cylinders are bulky, heavy, and difficult to secure. Oxygen cylinders are considered dangerous cargo. The aircraft emergency oxygen supply is for practical purposes not accessible for use, though small portable cylinders are carried by airlines for emergency use.

COMPATIBILITY AND PORTABILITY

It is essential that all electrical and electronic equipment is carefully checked for its avionic compatibility before being used on an aircraft. Unsuitable equipment may emit radiation frequencies that interfere with the navigation and signalling equipment of the aircraft. This may preclude use of equipment from intensive care units, however portable.

FACILITIES

Even on a large aircraft the facilities for disposing of items such as bedpans are very limited. Special diets can usually be provided if ordered in advance. The proximity of other passengers makes the problems of dealing with incontinence in an unconscious patient no easier, and all paralysed or unconscious patients should have bowel emptying performed as thoroughly as possible before emplaning on a long flight.

Lighting levels may be poor, especially at night, when main cabin lighting is turned off. The usual overhead reading lights may not be adequate. Only basic first-aid facilities are carried on civil aircraft, and all medical and nursing requirements must be taken. It is essential to oversupply, as opportunities for restocking en route may not occur.

Cabin staff are most willing, but are fully occupied with their normal duties, and can rarely help with patient care. Medical advice may be obtainable through the aircraft captain by radio in an emergency, though reception conditions may not always be helpful.

REFUELLING STOPS

It will not always be practicable to remove a patient from the aircraft during refuelling stops. During this period, in hot climates, the conditions inside an aircraft may become very hot and humid. Because of the distance of most large airfields from city centres it may not be possible to obtain medical or nursing help—airport medical staff may be more oriented towards industrial health and immigration problems than treatment of the seriously ill.

DRUGS AND OXYGEN

It is essential to carry any drugs that may be needed in sufficient supplies to cover both the journey and intermediate stops and any unforeseen delays. It is advisable to keep one's requirements simple, and administration is best carried out in accordance with "Zulu" time (Greenwich Mean Time) rather than the varying local times. To avoid problems with the authorities it is advisable not to take narcotic drugs and to use, for example, pentazocine injections as a strong analgesic. Drugs that are sensitive to heat when stored should be avoided.

Sufficient oxygen should be carried to cover one's maximum estimated requirements, bearing in mind that as well as the flight time there may be a considerable period of time on the ground at the beginning and end of the flight. If necessary arrangements must be made for resupply at intervening stops along the route.

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References

- ¹ McGuire, E. J., *Health*, 1974, 2, 28.
- ² Richards, P. R., *Practitioner*, 1973, 210, 232.

Letter from . . . Chicago

Pyramids and Primary Care

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During his extensive travels through the lands of the ancient world Herodotus observed that among the physicians of the venerable kingdom of Egypt "some specialized in diseases of the eyes, teeth, head or belly, while others dealt with the kind of illness that could not be exactly localized" (*Herod*, 2, 84). But while these ancient Egyptian generalists may well have been consultant physicians, at the top of the medical pyramid, who made the correct diagnosis when the head and belly specialists disagreed on a case of abdominal migraine, the modern American general practitioner has clearly become the low man on the totem pole, and, in fact, he is in danger of extinction. Within 40 years the number of general practitioners in the

U.S. has dropped from 120 000 to 50 000. Of all doctors in the country fewer than one-half are primary physicians and fewer than one-fifth are general practitioners. Yet the need for primary care remains as great as it was 15 years ago, when Dr. Henry Miller wrote that "the most searching questions which face medicine at the present time concern family practice."

Through its legislative agents, the general public has of late expressed displeasure at this peculiar deficiency of American medicine, and even among the ivory towers and orange groves of academia echoes of discontent and a massive decline in grant moneys have at last prompted concern over what to many has long been one of the more remote frontiers of medicine. Last year Dr. Francis Moore, Professor of Surgery at Harvard, declared that "he did not waste any tears over whether the G.P. is here to stay or not," but conceded that he "wasted a lot of worry whether our access modes were in the situation they should be." In truth, medical care is at times inaccessible, often discontinuous and impersonal, and usually expensive. Critics of the system have described the overall situation as an unmitigated disaster.

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Meanwhile, an increasing number of Americans are treated in hospital emergency rooms for episodic illnesses and in outpatient departments for more chronic conditions. A few ageing general practitioners are still around, and lately their declining numbers have been reinforced by an infusion of young people who refuse to spend one-half of their lives in training and who prefer to enter practice after internship. In addition, a variety of specialists, surgeons, urologists, and even ophthalmologists supplement their interest and income by also engaging in general practice.

Great Golden Calf

In urban areas, however, the general internist provides the bulk of primary care. A recent survey of internists and specialists trained at the Mayo Clinic showed that three-quarters spent over one-half of their time as first-contact physicians and that many devoted as much as 75 to 90% of their practice to primary care. Other surveys have confirmed this trend. And, since the internist provides most of the primary care anyway, it has been argued that other kinds of primary physicians are not needed and that the new specialty of family practice is a flimsily contrived fad, a great golden calf being held up before the populace.

The other major partner in primary care is the paediatrician. Indeed, so completely has paediatrics become identified as a primary care specialty that its very nature and survival has recently come under discussion. The president of the American Academy of Pediatrics sees the need for an "exact definition" of the paediatrician, and some think that paediatrics will go under as a specialty if current stresses and competitive trends continue. The birth rate has fallen drastically, children are healthier, there is competition from paediatric nurse practitioners and well-baby clinics, and after years of treating dripping noses and reassuring anxious mothers the paediatrician may no longer feel competent to manage the occasional complicated case. And now comes the additional threat from family practice.

Moreover, for various reasons, the internist-paediatrician team has not been able to solve the "crisis" in medical care. This may be because of insufficient numbers, of maldistribution, or—as it has been charged—because training programmes produce physicians who are not interested in the humdrum of primary care. Some years ago joint programmes were set up by hospital departments of medicine and paediatrics in conjunction with neighbourhood health centres with the aim of producing primary care physicians; but many of these programmes ran into difficulties and some were discontinued because of poor liaison between participating disciplines. Moreover, they were too few and too late, coming as they did in the wake of the unexpected success of the family practice movement.

Family practice, indeed, has become the "darling of the moment." Programmes were begun in the sixties, eloquently defended at the time by those who deplored the dual role of internists and paediatricians in caring for the members of one family, and who saw the need for a front line physician who would manage 80% of all problems and refer the rest to appropriate specialists. Well over 200 programmes are now in existence, supported by special federal funding and legislation and blessed by the American Medical Association—which has urged that at least 50% of all American medical graduates should enter primary care residencies. As a result of these trends, family practice programmes are popular, competitive, and attractive to an increasing number of young Americans. As many as 40% of the graduates of some of the more prestigious medical schools enter them. Training is for three years after graduation, the emphasis is on internal medicine and paediatrics, and much attention is given to outpatient work, continuity of care, and the management of the family as a whole. But while the primary care physician is now in great demand by the public, the Government, and most of organized medicine he may also expect to earn less money and work longer and more irregular hours than the specialist.

Disquiet Among Internists

Nevertheless, the success of family practice has produced some disquiet in the internal medicine camp, and has led to increasing attempts to establish the internist as a primary care specialist. Last year the American Board of Internal Medicine clearly spelled out its resolution to certify primary care physicians who will "offer patient access to continuing comprehensive medical care of the highest quality." Exclusion from primary care would be a major blow to the internist, who, as one physician put it, would starve if he had to depend on referrals. The seriousness of the threat is shown by the recent formation of the Federated Council for Internal Medicine, which includes the American Board of Internal Medicine, the American College of Physicians, the American Society of Internal Medicine, and the Association of Professors of Medicine. At the first meeting of the Council the role of the internist in primary care was promoted in no uncertain terms.

There is clearly then a source of potential conflict between the family practitioner and the general internist, whose training has now been reduced to three years. There are questions of status, appointment to community hospitals, function in multi-specialty group practices, and competition for patients. The family practitioners and their leaders feel better qualified for primary care and claim the internist is too organ-oriented and handicapped by not having the satisfaction of treating the whole family. Some among the internists believe there is room for both internists and family physicians but that their roles should be defined more clearly. Others have questioned the need for family practitioners, since care can be provided by the various specialties. Others still consider that the promised influx of family practitioners "is so much pie in the sky," since their numbers will remain insufficient and since the internists will continue to provide most of the primary care. Indeed, at one regional meeting of the American College of Physicians the focus on family practice at the expense of the internist was deplored and called a medical socioeconomic fad. Most people, it was said, want the personal physician rather than the family physician, because the nature of the family itself has changed; and someone suggested that the legislative emphasis on family medicine may result in training programmes turning out doctors who are no more knowledgeable than the physician's assistants with whom they will be working.

Also in need of definition is the relation of family practice to the long-established departments of internal medicine in universities and medical schools. This at a time when academic departments of medicine are also moving to assert their claim in the field of primary care. At the most research-oriented medical school in Chicago the chairman of a medical department—traditionally organized along subspecialty lines—announced in 1974 the creation of a general medical service, and even found it necessary to define "What is an internist?" But his definition was suspiciously close to that of the family practitioner, and provoked the rejoinder that family practice can more appropriately satisfy the medical needs of the community because it is oriented towards patients and not towards organs or systems.

"Expert in Ambulatory Medicine"

Other chairmen of departments of medicine have also expressed concern at the apparent invasion of their territory, and some believe that primary care divisions should be established within departments of medicine—presumably on the same organizational level in the academic hierarchy as oncology and rheumatology. Some of these issues were epitomized in an article in *Modern Medicine* entitled "Family practice leaders, academicians, at odds over primary care," and reportedly family practitioners were "appalled" at Dr. Robert Petersdorf's suggestion to "define the family physician as an expert in ambulatory medicine and having him turn over his patients to a hospital specialist when hospitalization is required."

Thus, far from there being a vacuum in primary care, the field is hotly contested. But, while the internists continue to fight for a piece of the action, not everybody is happy about a drift which encourages ambitious trainees to take subspecialty boards and which deals a death-blow to the older concept of the general internist as a consultant. This point of view has been espoused by Dr. John Moyer, who believes that present trends are doing to the general internist what internal medicine did to the general practitioner in the past, leaving the internist with what is left over after all the subspecialists have scooped up the "cream of the crop."

Perhaps then there will be weeping at the demise not of the kindly old G.P. but of the general consulting physician as he

was understood in the days before the fragmentation of medicine. One might recall that in 1885 Samuel Wilkes warned that "since medical specialism has no basis in nature, it therefore cannot be attempted without detriment to the patient."¹ Yet 90 years later the head and belly doctors are firmly established at the apex of the pyramid, and their respective teams of fellows and research associates stand poised to work-up completely and separately the referred patient with abdominal migraine.

Reference

- ¹ Wilkes, S., *Lancet*, 1885, 21, 940.

Hospital Topics

Closure of Abdominal Wounds by Adhesive Strips: A Clinical Trial

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Summary

In a randomized trial of wound closure in 512 abdominal wounds, wounds were closed with either reinforced Steristrip skin closures or interrupted silk sutures. Comparisons were made of wound pain and discomfort, wound infection, discharge, redness, width, and skin reaction. The causes of peeling of the tapes were assessed. The results showed that tapes were significantly more comfortable and that patients preferred them to sutures ($P < 0.01$), but wide scars occurred more often. There was no difference in rates of wound infection and no case of allergy to the tapes was seen. Closure of abdominal wounds by these tapes is a satisfactory procedure that could be used more extensively.

Introduction

The concept of using surface adhesive tape to close surgical wounds is not new and antedates the development of a satisfactory suturing technique. Linen strips were used in Egypt in 1600 B.C.¹ Ambroise Pare² and John Hunter³ both described techniques of sutureless skin closure, but sutures have been the usual method of wound closure since the advent of aseptic surgery enabled a safe and reliable method of suturing wounds to be carried out.⁴ Sporadic attempts to reintroduce adhesive tape have failed because of the difficulties of producing a material that could be sterilized while retaining its adherent properties.

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Golden⁵ described the use of a sterilizable tape which caused no chemical irritation, could be removed painlessly, permitted free evaporation of fluids, and was easy to handle while wearing surgical gloves. This Steristrip skin closure has now been modified and has twice the adhesion to skin and three times the tensile strength of the original tape. There are many reports of the satisfactory use of such tapes in series of up to 500 patients but there are no reports of a randomized clinical trial. This paper reports our experience in such a trial of 512 abdominal incisions.

Patients and Methods

All patients over the age of 20 years undergoing elective abdominal surgery were eligible for inclusion in the trial. Patients undergoing emergency surgery and some having stoma construction were excluded. Patients who died or in whom the wound was reopened were excluded from analysis. Altogether 512 wounds were available for study.

The deep layers of the wound, including peritoneum and muscle sheaths, were closed with monofilament nylon. Near and far sutures and continuous monofilament nylon were used in all vertical incisions. Closure of subcutaneous fat by catgut sutures was optional but not widely used. In obese patients (abdominal wall fat > 2 cm) interrupted silk sutures, at least 3 in (7.6 cm) apart, were permitted in taped closures. The skin was closed by either sutures or tapes, determined by drawing a card in the operating theatre while the deep layers were closed.

The tapes used were $\frac{1}{2}$ in \times 4 in (1.3 cm \times 10.2 cm) reinforced Steristrips (R 154, 3 M U.K.). They were applied as follows: the skin was cleaned and dried, and skin hooks were applied to each end of the wound and held so that the incised edges lay together. A tape was laid on the skin on the side away from the surgeon and traction applied until accurate alignment was obtained, and the tape was then laid across the wound. Further tapes were then laid in place leaving $\frac{1}{8}$ -in (3.2-mm) gaps between tapes. Obliquely lying tapes were then added as necessary. The incision and the tapes were covered by a Microdon dressing.

In the postoperative phase the wound could be examined by removing the Microdon dressing. This was done by dividing the Microdon dressing along its non-adherent central portion parallel to the incision and peeling each half away from the wound: Steristrips were removed