Middle Articles

Organization of a Surgical Unit in a Remote Area

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Introduction

The modern organization of hospital services which has developed since the passing of the National Health Service Act of 1948 has inevitably resulted in a reappraisal of the function of the small peripheral hospital. The demands of economy and efficiency have necessitated the closure of some and the redesignation of others, coupled with a general movement towards increasing centralization. It must be accepted that all treatments requiring a high degree of specialization in knowledge and equipment must be the responsibility of the larger hospitals, but the extent to which peripheral services can be evolved is amply demonstrated by the situation in the Shetland Islands, where expansion has been encouraged by the factor of geographical isolation.

In obtaining a true perspective it must be remembered that the consultant staff in such areas have completed exactly the same training as their colleagues in the larger centres and maintain an up-to-date approach to diagnostic and therapeutic techniques, through the medium of specialist journals and by attendance at conferences and refresher courses. The situation is far removed from the description given by Ogilvie (1953): "The surgeon in a small hospital is now doing the work that was formerly done by half a dozen general-practitioner surgeons, men who know their strength and their weaknesses, who would not willingly face a death or a bad result and who were ready to call in a consultant in a difficulty. There he works alone, helped only by sisters who accept him at his own valuation, and he has soon hung so many medals on himself that he clanks when he operates." In fact, the staff of such units are by no means incapable of detached and critical judgement, and the surgeon is sharply reminded of his limitations and failures by frequent contact with patients and their relatives outside the walls of the hospital.

Geography of Shetland Islands

The Shetland Islands constitute the most northerly county of Scotland, being approximately equidistant from Aberdeen to the south, Bergen to the east, and the Faroe Islands to the north-west (Fig. 1). The population at the 1961 Census was 17,812, being concentrated predominantly on five islands—Mainland, Yell, Unst, Whalsay, and Burra Isle. The largest town is Lerwick, situated on the east coast of Mainland, with a population of approximately 6,000. In addition to local residents a considerable number of hospital patients are drawn from British and Continental fishing fleets which operate around the coasts, in addition to which the summer tourist season provides an influx of about 15,000 visitors.

History of Hospital Service

Up to the end of the nineteenth century no hospital facilities were available in Shetland, all cases which could not be handled

in their homes having to be transferred to the Scottish mainland. In 1902, however, a hospital incorporating four male and four female beds was opened in Lerwick, financed by two local ladies and called the Gilbert Bain Hospital in memory of

FIG. 1.—Geographical position of Shetland.

their brother. Two extensions were later added, and the final complement was established at 31 beds and two cots. Until 1924 the surgical duties were carried out by local practitioners, but in that year a full-time surgeon, Mr. R. H. Rose-Innes, was appointed and the hospital thereafter operated exclusively as a surgical unit. X-ray and electric lighting plants had been installed during 1920 and 1921, but no qualified radiographer was available until 1947; in the same year it was decided to employ a physiotherapist and to send local personnel for short training courses to enable them to carry out duties as laboratory technician and orthopaedic technician respectively.

As the work of the hospital increased it became obvious that the facilities provided were inadequate, and in the years before the second world war money was raised by local subscription towards the erection of a new building. Plans were approved, a Department of Health grant was obtained, and tenders were secured, but the outbreak of war resulted in the cancellation of the project. A further attempt in 1947 was rendered abortive by the financial situation at the time. However, after the advent of the National Health Service the North-Eastern

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Regional Hospital Board gave its support to the construction of a new hospital; after prolonged negotiation with the Department of Health, the project was incorporated in the National Building Programme and foundation work was begun in 1957. The hospital was completed in 1961, coming into operation in May of that year, and was formally opened by Her Majesty Queen Elizabeth the Queen Mother in August. The total expenditure involved was about £410,000 (Fig. 2).

Plan of the Hospital

The accommodation provided consists of: (1) a basement area comprising kitchen, boiler-room and engineer's workshop, orthopaedic technician's workshop, laboratory, and a corridor which connects the main building to the residential wing for nursing, domestic, and junior medical staff; (2) a ground floor containing a large waiting-hall for patients and visitors, reception office and records office, outpatient and casualty suite, physiotherapy department, x-ray department, and twin operating-theatres; and (3) two identical wards, each of 28 beds, placed on the first and second floors and divided into open cubicles accommodating from one to eight patients.

Close to the physiotherapy department on the ground floor is a beautiful chapel endowed with money provided by the War Commemoration Committee in memory of Shetland men and women who died in the second world war; this chapel is in regular use for religious services in the hospital.

Organization of Surgical Unit

The surgical unit occupies the whole of the first-floor ward and 10 beds on the second floor, though a certain degree of flexibility exists in relation to the beds for acute medical cases. In addition eight surgical beds are retained in the old hospital to accommodate convalescent patients and those who may require prolonged nursing care.

The medical staff consists of one full-time consultant surgeon, a surgically qualified general practitioner working part-time, a part-time registrar, and a full-time house officer. The hospital is recognized by the surgical colleges. The nursing authorization is for 20 trained staff (including matron and deputy matron) and 25 pupil, auxiliary, and State-enrolled nurses to cover the medical and surgical beds. In 1965 a training school for State-enrolled nurses was established, accepting a maximum of six pupil nurses twice a year. The ancillary staff consists of a radiographer, a physiotherapist, an orthopaedic technician, and a laboratory technician. This latter post has proved very

difficult to fill, and in effect almost all laboratory investigation has been carried out through a prepaid service operated by the City Hospital, Aberdeen. The only exception is the examination of pathological specimens, which are handled by the department of pathology at Aberdeen University.

The fundamental responsibility of the unit is to make provision for all emergency and elective general surgery for the Shetland community and for the seafaring population operating in the area. Apart from highly specialized procedures no general surgical cases are sent to hospitals outside Shetland, as the facilities and equipment available are adequate to cope with the comprehensive range of work required. An almost equivalent service is available for gynaecological cases, the exceptions being patients requiring radiotherapy as a supplement to surgery, or those whose treatments involve special skills—for example, culdoscopy. In the orthopaedic field the major commitment is the treatment of trauma, some of the worst cases being accidents at sea. An appreciable number of elective operations are performed, however, including meniscectomy and various arthroplastic procedures. In contrast to the limited range of operative work the proportion of orthopaedic cases seen at outpatient clinics is extremely high. There is a 24-hour casualty service provided by the resident house officer with the supervision and assistance of the consultant surgeon.

Because of the remoteness of the area and the possibility of delays in transport it is necessary that the unit be equipped to deal with both neurosurgical and thoracic surgical emergencies; in addition, certain investigative procedures in these specialties are performed, particularly oesophagoscopy and cerebral angiography. The extent of involvement in ear, nose, and throat surgery is limited to that required to avoid expensive and unnecessary journeys to the Aberdeen hospitals for relatively minor operations—for example, the removal of tonsils and adenoids.

Anaesthetics are administered by three local general practitioners, all of whom have undergone courses of training at teaching centres and are fully conversant with modern techniques and equipment.

Fig. 3 shows the steady growth in the work of the surgical unit. The table shows the range covered by some of the commoner operations performed during the five-year period from 1963 to 1967.

Theatre and Outpatient Schedule

Tuesday and Thursday are reserved for operating sessions, while outpatient clinics are conducted on Monday, Wednesday, and Friday mornings, an average of between 15 and 20 patients being seen at each. In addition, short clinics are held on Friday

FIG. 2.—*New Gilbert Bain Hospital.*

FIG. 3.—Increase in surgical operations in Shetland during 1951-67.

afternoon and Saturday morning. Consultations are entirely by appointment, booking being done by means of a standard pre-paid card incorporating history, provisional diagnosis, treatment given, relevant past illnesses, timing of appointment, urgency and request for ambulance transport. Time is reserved at the end of each clinic for emergency bookings. So far as is practicable the system of reference through the family doctor is extended even to the casualty department. The allocation of appointments is entirely in the hands of the secretarial staff, two in number at present, who also act as switchboard operators and receptionists, undertake the filing of records and x-ray films, and are responsible for the typing of all hospital correspondence.

Some of the Commoner Operations Performed During 1963-7

Gastrointestinal	Appendicectomy	184
	Vagotomy + gastroenterostomy or pyloroplasty	35
	Partial gastrectomy	21
	Resection of colon	34
Biliary	Excision of rectum	10
	Cholecystectomy	82
	Operations on common bile duct	14
	Prostatectomy	72
Genitourinary	Nephrectomy	8
	Pyeloplasty or ileal loop operations	7
	Pyelolithotomy	5
	Pelvic floor repair	127
Gynaecological	Hysterectomy	34
	Caesarean section	82
	Pinning of femoral neck	36
	Hip arthroplasty	17
Orthopaedic	Menisectomy	22
	Mastectomy	31
	Tonsillectomy	172
	Operations on varicose veins	134
Miscellaneous	Herniorrhaphy	189

The surgical services are supported by an extensive system of clinics operated by consultant staff from Aberdeen. Three-monthly outpatient sessions are conducted by a gynaecologist, an orthopaedic surgeon, and an ear, nose, and throat surgeon. Once a year a combined clinic for the assessment and follow-up of cases of malignant disease is held jointly by the local surgeon and the head of the malignant disease unit at Aberdeen Royal Infirmary. An ophthalmologist visits at three-monthly intervals, and a similar frequency is observed by a consultant dental surgeon, who undertakes an operating-list in addition to seeing outpatients. Outside the surgical field are a physician (monthly), a psychiatrist (two-monthly), a paediatrician (six-monthly), and a dermatologist (six-monthly). Periodic visits are paid to the outer isles by the ophthalmologist, the E.N.T. surgeon, and the psychiatrist.

Transport

An equally close liaison exists with the Aberdeen hospitals as regards the admission of patients for investigation and treatment outside the scope of the local unit. As might be expected transport may present the major problem. The most reliable method of transfer is by the direct steamer service that operates

twice weekly, but considerable discomfort may result from rough weather. Sitting patients may travel on scheduled air flights, with or without an escort, and even stretcher cases can travel in this way if bookings are such as to permit the removal of several seats. This method of transfer is often used, particularly during the summer months, when direct flights operate to Aberdeen; in the winter difficulties may arise because of the long delay which occurs in Orkney. In cases of serious illness or in certain special circumstances—for example, a pregnant woman beyond the 32nd week of gestation or persons to whom altitude restrictions apply—recourse is made to the excellent Air Ambulance Service run by British European Airways, using four-engined Heron aircraft. The right to order an air ambulance is vested exclusively in the consultant surgeon and the medical officer of health in his capacity as medical superintendent of the hospitals.

Transport within the Islands is on the whole highly efficient. There are very few areas from which patients cannot be brought to hospital within four hours by ambulances on the mainland or specially fitted Land Rovers on the larger islands combined with the scheduled ferry services or special hire of these boats. Fishing boats are placed at the disposal of the medical services when required. In extreme weather conditions the hospital service has often been indebted to the two local lifeboats for their assistance. Helicopters are available from the Royal Naval Air Service at Lossiemouth, but the distance involved and operational restrictions have virtually ruled out these machines as a practicable proposition.

Academic Activities

Resident clinical clerkships are offered to students from British and foreign universities, board and lodging being provided free of charge. This provision has expanded until it has been necessary to impose a quota limitation of a maximum of five students at any one time. While working in the hospital students are attached for the most part to the resident house-surgeon, receiving instruction in all the duties pertaining to this post and taking an active part in carrying out the practical procedures involved. Clinical demonstrations are undertaken by the consultant surgeon during ward rounds, outpatient clinics, and operating sessions. These activities have proved of mutual benefit to the students and the local staff.

The main restriction on research projects is the absence of a laboratory technician, so that the accent must be on clinical studies rather than complicated biochemical investigations. In this respect Shetland provides a wealth of interesting pathological conditions which is probably unsurpassed in any other area of comparable population. The concentration of all acute treatment in one institution and the relatively static nature of the community also increase the opportunity of accumulating valuable series of cases for examination. Recently the invitation has been accepted to participate in official trials of certain new drugs under the sponsorship of manufacturing companies.

Administration

The convenience of communications has resulted in the Shetland hospitals being placed under the administration of the North-Eastern Regional Hospital Board based in Aberdeen. Within the islands there is a local board of management of 14 members which works in close co-operation with the clinical staff. As a board-room was not included in the plans of the new hospital, meetings are held in the council chambers of the town hall, the administrative offices being sited in a house close to the hospital. The duties of medical superintendent are vested in the medical officer of health, an arrangement which

greatly assists the integration of hospital and local authority medical services.

Conclusion

At a time when the whole future of the small hospital is in the balance it is hoped that the foregoing survey helps to illustrate the extent to which local services can be developed, not with a view to achieving complete independence, but rather in closer integration with the larger hospitals and universities. Decisions on the degree of expansion which can be justified must be taken by careful appraisal of the interests of the patient on the one hand and the question of expense and efficiency on the other. Where a surgical unit of the type described is estab-

lished in an area which is remote from the nearest large centre, and subject to irregular transport and communications, one must face the fact that the standards of staffing and equipment required may impose a level of expenditure which is out of proportion to the population served. The criteria employed in assessing such financial outlay are therefore entirely different from those which apply to the large hospital or to the small hospital which has easy access to the central complex.

I wish to thank The Shetland Times, Ltd. for permission to reproduce Fig. 1, which is taken from *The Islands of the North*, by W. P. L. Thomson, and Mr. Dennis Coutts for Fig. 2.

REFERENCE

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General-practitioner Obstetric Beds in a Consultant Unit

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Oldershaw and Brudenell (1968) described the use of obstetric beds in a consultant unit by general practitioners. The area of London with which they dealt is a little to the south of our similar scheme based on the Lambeth Hospital but virtually abutting upon it. With the help of Dr. Oldershaw a similar use of beds in a consultant unit was devised, and because of his help our scheme in the St. Thomas's group of hospitals is almost identical with the one described by Oldershaw and Brudenell, and so the description will not be repeated.

The Board of Governors of St. Thomas's agreed to make available to general practitioners in the area four beds in the consultant unit at the Lambeth Hospital. At first it was thought that since most of the bookings would be on social grounds a ten-day stay might have to be budgeted for. Therefore it was felt that the four beds might cope with about 120 patients per year. General practitioners in the area were written to and asked if they could estimate how many deliveries per year they might be willing to deal with in hospital. Allowing for 150 deliveries per year we were vastly oversubscribed. So until we knew how the scheme was going to work it was limited to 12 doctors, whose total estimated deliveries would come to about 150 per year. They were offered and accepted an honorary contract with the Board of Governors.

Results

The scheme started in March 1966, and so has now been running for two and a half years. During that time we might have expected to have had 300 childbirths supervised by general practitioners, and this would have been a minimum figure. On a five-day stay it could have been doubled. Even those booked mainly on social grounds do not stay longer than six or seven days. In fact there have been only 86 deliveries of patients booked for general-practitioner beds in the two and a half years. This is a bed occupancy of about one patient every ten days, giving a rate of about 25%. The overall bed occupancy in the unit is about 80% to 85%, and over the same period about 4,500 women were delivered.

The antenatal care of all these 86 patients was scrupulously carried out and left nothing to be desired. The communication

card carried by the patients made for very easy transfer of the patient from one doctor to another.

Of the 86 patients 41 were visited at some time during the first stage of labour by their booked doctors, but 20 of these visits were made by one man. He looked after 47 patients out of the 86, so for visiting he scored 42%, while the others between them scored 53%. However, the same doctor was present at the delivery of 22 of his 47 patients and so scored 47%, while his colleagues were present at delivery in 11 out of their 39 deliveries, a score of 28%. These scores are all increased slightly when account is taken of the fact that five women were admitted to hospital in the second stage of labour, when there was no time for the doctor to be called.

In nine cases there was great difficulty in contacting the doctor, and in four other cases the doctor told the labour ward staff that he was not to be called further about his patient. Especially with the increasing use of emergency call services it is often difficult to get into touch with general practitioners on their days off. A barrier between them and the hospital is interposed first by the G.P.O. telephone service and a second by the call service. Only the utmost persistence will make these two bodies divulge the telephone number of a doctor who does not wish to be called, and search through the telephone book shows that some are "ex-directory."

Discussion

There was great initial enthusiasm for the scheme, which was shared on all sides. Both general practitioners and consultants know each other and share confidence in each other's abilities, and nothing said here is to be interpreted as an attack on those general practitioners who belong to and are most welcome in the consultant unit. But our experience seems to show that the local general practitioners overestimated their needs at the beginning, and they underestimated their difficulties in getting to see their patients during labour and at delivery. There are many valid and good reasons for this, and this report is in no sense intended to be a complaint, for the hospital staff have been ready and willing to look after and deliver the patients, none of whom has suffered, since the co-operation between the general-practitioner service and the hospital has been so close and the results for both mothers and babies have been so good that comment upon them is superfluous. Moreover, there has been the inestimable benefit to these mothers of continuity of antenatal

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