MEDICAL PRACTICE

Hospital Topics

General surgical workload in England and Wales

TIMOTHY G ALLEN-MERSH, RICHARD J EARLAM

Abstract

An attempt was made to measure the workload of a typical general surgical firm (two part time consultants and their junior staff) serving a population of 100 000 in England and Wales. This provides a background against which to plan curricula for undergraduate and postgraduate teaching, as well as being a guide to the experience that a surgical trainee should get in a suitable training post. The effect of changes in surgical staffing on the number of operations done by a surgeon may also be estimated.

Introduction

The workload of a hospital doctor is important in deciding on the required number of hospital consultants and their juniors, training programmes for specialisation, and the teaching of undergraduates. Although there has been some debate about the number of consultant general surgeons required for England and Wales,[1] this has not, to our knowledge, been based on a quantitative assessment of the national workload in general surgery.

Measurement of a doctor's workload is difficult and controversial, but in surgical practice components of the workload that can be measured are: the number and type of operations performed, the number of inpatients, and the number of outpatient and domiciliary consultations. The purpose of this study was to provide a quantitative description of the work done by the consultant general surgeons in England and Wales (almost 1000 serving about 50 million inhabitants). The results were related to a population of 100 000 so that individual surgeons, serving different sized communities, may relate their own experience to the figures given.

The London Hospital, London E1 1BB
TIMOTHY G ALLEN-MERSH, MD, FRCS, senior surgical registrar
RICHARD J EARLAM, MCHIR, FRCS, consultant surgeon

Correspondence to: Mr Timothy G Allen-Mersh.

Methods

The most recent year for which complete statistics are available is 1978, so this year was chosen for the study. Outpatient attendance and bed occupancy figures in general surgery were obtained from SH3 national summaries collected by the Department of Health and Social Security.[2]

Outpatient numbers were divided by 52 to convert them from annual to weekly attendances. Estimates of the number and type of surgical operations were obtained from the hospital inpatient inquiry 10% sample of discharges, derived principally from hospital activity analysis and processed by the Office of Population, Censuses and Surveys on behalf of itself and the DHSS.[3] The proportion of urological procedures performed by general surgeons are contained in Ashley and Collingwood's report on urological requirements in Great Britain.[4] The incidence of different cancers was taken from the cancer registry of the Office of Population, Censuses, and Surveys.[5]

The number of consultant surgeons in each region was found in tables issued by the DHSS.[6] Most consultant surgeons are not contracted to work for the National Health Service for the full working week (11 notional half days). The total number of consultants may be misleading, and a more appropriate measure of consultant manpower is the whole time equivalent. This is calculated by adding up the number of contracted notional half days a week and dividing by 11.

Results

All figures are given as the means for England and Wales per 100 000 population unless otherwise stated. The population of England and Wales in 1978 was 49·1 million.

OUTPATIENTS

One hundred and thirty three surgical outpatients per 100 000 population were seen each week. Thirty eight (29%) of these patients were new referrals, while 95 (71%) were "old," being seen for further investigations, results of tests, or diagnosis or as a routine postoperative visit. In addition, two patients per 100 000 population were seen each week in domiciliary consultations.[7]

INPATIENTS

Thirty seven patients per 100 000 population were admitted each week under the care of a general surgeon into beds on a surgical ward. Seventeen (46%) of these patients were emergency admissions, and the remaining 20 (54%) were admitted either from the waiting list (13; 36%) or by diary booked admission and inpatient transfer from another specialty (7; 18%). The mean number of patients occupying general surgical beds at any time was 47 per 100 000 population. Only 43 (91%) of these patients are recorded as general surgical admissions; one reason for this discrepancy may be that the remaining four patients occupying general surgical beds were not admitted under the care of a general surgeon. The mean hospital stay for patients occupying general surgical beds was 8·2 days.

Twenty nine (62%) of the 47 patients occupying general surgical beds underwent an operation while in hospital. The commonest reason for a patient occupying a general surgical bed without undergoing an operation was observation after a head injury (six patients a week per 100 000 population), which accounted for 39% of the non-operative cases in a general surgical ward.

TABLE I—*Top 20 general surgical operations*

Operation	No per 100 000	Total No in England and Wales
Appendicectomy	143·5	70 480
Inguinal hernia repair	129·6	63 650
Benign breast disease (excision biopsy)	75·5	37 100
Cholecystectomy	73·9	36 310
All anal operations (including fissure, fistula, and haemorrhoids)	71·6	35 160
Cystosocopy with or without bladder diathermy*	62·3	30 620
Varicose veins	54·7	26 880
Malignant skin lesion (excluding melanoma)	51·6	25 330
Circumcision	44·6	21 920
Prostatectomy*	35·5	17 420
Mastectomy	29·9	14 670
Orchidopexy	23·6	11 580
Colectomy, total or partial	21·5	10 570
Rectal carcinoma, excision or diathermy	18·8	9 240
Thyroidectomy	17·3	8 500
Vagotomy	16·9	8 280
Hydrocele (aspiration or excision)	11·7	5 730
Femoral hernia repair	11·6	5 720
Amputation of leg for vascular disease	8·7	4 250
Defunctioning colostomy	8·0	3 940

*Excluding operations performed by whole time urologists.

SURGICAL OPERATIONS

Roughly 645 000 general surgical operations were performed in England and Wales during 1978. The 20 most commonly performed operative procedures accounted for 68% of all general surgical operations (table I). An allowance has been made, in accordance with Ashley and Collingwood's report,[4] for the urological procedures performed by urologists.

Details of peripheral vascular procedures are not included in the hospital inpatient inquiry tables. The incidence of leg amputation for vascular disease was 8·7 per 100 000; many of these patients would have undergone one or more revascularisation procedures. The incidence of abdominal aortic aneurysm grafting was 2·2 per 100 000 population.

Half of the procedures in table I have been classified as major surgical operations.[8] To provide a better perspective of

TABLE II—*Cancer managed by general surgeons*

Disease	Incidence per 100 000 population	Total	Operation*	No of operations per 100 000 population	Total
Colonic and rectal cancer (all):	47·3	23 248			
Colonic cancer	28·8	14 144	Colectomy	21·5	10 570
Rectal cancer	18·5	9 104	Excision or diathermy of rectum	18·8	9 240
Small-bowel cancer	0·5	253	Small-bowel resection	1·5	720
Breast cancer	44·2	21 701	Mastectomy	29·9	14 670
Cancer of nipple	0·3	127			
Skin cancer (excluding melanoma)	41·0	20 140	Excision or destruction of skin lesions	54·8	26 900
Malignant melanoma	3·5	1 731			
Gastric cancer	24·9	12 242	Gastrectomy or gastroenterostomy (without vagotomy)	15·7	7 790
Bladder cancer	16·7	8 214	Endoscopic diathermy	32·7	16 040
			Open diathermy	1·3	660
			Cystectomy	0·9	440
Prostate cancer	15·1	7 410	Prostatectomy	56·3	27 650
Pancreatic cancer	11·5	5 642	Biliary bypass	2·8	1 380
Ampullary cancer	0·3	135	Pancreatoduodenectomy	0·4	220
Duodenal cancer	0·2	76			
Oesophageal cancer	8·0	3 933	Oesophagectomy	2·0	1 000
			Palliative tube	1·5	750
Cancer of kidney	4·9	2 402	Nephrectomy with or without ureterectomy	6·0	2 970
Cancer of ureter	0·3	149			
Hodgkin's disease	2·8	1 354	Cervical node excision biopsy	6·2	3 030
Non-Hodgkin's lymphoma	3·2	1 574	Splenectomy	3·6	1 790
Reticulum cell sarcoma	3·0	1 459			
Thyroid cancer	1·4	704	Thyroidectomy	17·3	8 500
Testicular cancer	1·7	827	Orchidectomy	5·7	2 800
Liver cancer	1·6	790	Hepatectomy	0·1	70
Gall bladder cancer	1·2	568			
Bile duct cancer	1·0	468			
Cancer of tongue	1·0	509	Excision or diathermy	1·3	620
Parotid cancer	0·7	322	Excision of salivary gland	6·2	3 040
Other salivary cancer	0·2	81			
Cancer of penis	0·5	265	Excision of penis	0·4	180
Adrenal cancer	0·2	74	Adrenalectomy	0·4	210
Endocrine malignancy except pituitary, thyroid, adrenal, and parathyroid	0·1	25	Excision of endocrine gland except pituitary, thyroid, adrenal, and parathyroid	0·1	40
Total	236·8	116 298		261·7	128 630

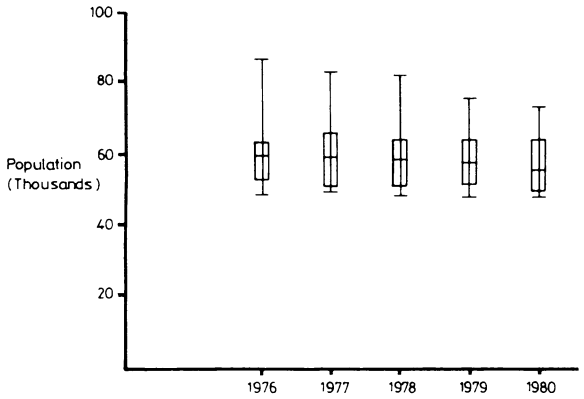
*Number of operations quoted includes those performed for benign disease.

the serious diseases managed by general surgeons, the incidence of cancers dealt with by general surgeons is summarised in table II. Eight patients per 100 000 population underwent outpatient day case surgery each week.[2]

GENERAL SURGICAL CONSULTANTS

Of 945 consultant general surgeons in England and Wales in 1978 (849 whole time equivalent), 124 (13%) held whole time contracts with the NHS, the remainder being employed on part time contracts. The variation between regions in the size of population served by a whole time equivalent general surgical consultant for the period between 1976 and 1980 is shown in the figure. During this period there was an increase in the number of surgeons employed in the less well staffed regions, which resulted in a small reduction in the median of the ratio of population to surgeon for all regions from one whole time equivalent consultant surgeon per 59 000 population to one per 55 000 population.

The variation in staffing between regions shown in the figure refers to the average or mean staffing level in each region.



The variation in the size of the population (thousands), served by one whole time equivalent general surgeon, between regions in England and Wales from 1976 to 1980 is presented in a "box and whisker" format. The "box" represents a quartile above and below the median (horizontal line), and encloses half the variation in regional mean staffing levels. The "whiskers" at each end represent the upper and lower extremes of regional mean staffing levels.

This hides an inequality in staff distribution between districts within a region. In the North East Thames Regional Health Authority, for example, there was a fivefold difference in staffing levels between districts, varying roughly from one whole time equivalent consultant surgeon per 19 000 population in one district to one per 100 000 in another.[9] Thus there is a much greater disparity in staffing levels between districts within a region than is the case between regions. This is not apparent from the figure, where only the mean for each region is shown.

Discussion

An attempt has been made to provide a quantitative estimate of the workload in general surgery in England and Wales based on the figures that are available. There are some important reservations.

(1) Figures recording the number of operations are collected by clerical staff from details contained in the hospital case notes, in particular from discharge summaries. Owing to a combination of factors, such as inaccurate discharge summaries, complicated illnesses or operations, multiple operations during one admission, anomalies between regions in the recording of day case surgical admissions, and inexperienced clerical staff, this may underestimate the work done,[10] perhaps by as much as 20%.[11] The number of operations done is certainly not overestimated.

(2) The figures obtained refer to 1978, and the management of some conditions has changed since then. For example, the number of hospital admissions for duodenal ulcer has fallen with the introduction of H_2 histamine blockers,[12] and operations for inguinal hernia and varicose veins may have become more common.[13] In addition, the figures may have altered because of changes in the incidence of disease since 1978.

(3) The operative workload does not necessarily correlate with the amount of work in the postoperative period. For example, anterior resection of the rectum would be followed by more complications than would the four inguinal hernia repairs that could be done in the same operating time. The number of leg amputations for peripheral vascular disease is a poor guide to the workload in vascular surgery since many of these patients undergo one or more reconstructive procedures before amputation, and in many cases amputation is avoided.

(4) Few general surgeons will have a practice identical with that described because the interdistrict variation in size of population served by a general surgeon may distort the nature of the workload. For example, if appreciable numbers of non-urgent cases, such as patients with varicose veins, travel to less busy districts to receive quicker treatment the pattern of work in both districts will be distorted. In addition, most general surgeons develop a special interest that affects the pattern of work referred to them.

Despite these reservations, the figures presented provide a quantitative estimate of the demand placed on a general surgical firm (perhaps two part time consultants and junior staff) serving a population of 100 000 in England and Wales. This is a useful background against which to plan curricula for undergraduate and postgraduate surgical teaching, as well as providing a guide to the experience that a surgical trainee may be expected to acquire in a suitable training post. For example, in a three month attachment to this surgical firm a medical student could be expected to have seen in the wards about 18 patients being treated for anal conditions (piles, fissure, or fistula) and five cases of rectal carcinoma. In one year working on this firm a junior would help in the management of, and perhaps operate on, some of the 78 patients with a benign breast lump and 15 undergoing mastectomy.

The results of this study allow the effect of changes in surgical staffing on the number of operations done by a surgeon to be assessed. A consultant surgeon serving a population of 70 000 might expect to perform one thyroidectomy a month. If the size of the population served was reduced to about 10 000 as advocated by Bengmark[14] this surgeon would do under two thyroidectomies a year, and the incidence with which a patient with thyroid cancer was seen would be reduced to one patient every six years.

Decisions about future numbers of consultant general surgeons and junior staff, as well as about the training of registrars and undergraduates, depend on estimates of the national workload in general surgery. So it is important that surgeons make sure that the information being collected in their hospitals is correct. We have attempted to provide some idea of the size of the cake; only when this has been determined can there be informed discussion about the size of each individual slice.

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Contemporary Themes

Control and prevention of tuberculosis: a code of practice

JOINT TUBERCULOSIS COMMITTEE OF THE BRITISH THORACIC SOCIETY*

Abstract

The Joint Tuberculosis Committee has compiled a report that is designed to answer the questions most commonly asked about the control and prevention of tuberculosis. Advice is given on assessing the degree of infectivity and on the segregation of patients. The measures necessary to protect National Health Service workers depend on the risk of exposure, and health authorities should follow the advice given by the Department of Health and Social Security. Chest x ray examinations may be recommended for those entering the teaching profession and may be necessary for staff and children when tuberculosis is discovered in a schoolchild. The diagnostic, protective, and therapeutic measures required for contacts depend on the degree of infectivity in the index case, the closeness of contact, and the ethnic group of the index case. The incidence of tuberculosis is much higher among some immigrant populations than among the native population and screening programmes are needed (a) to detect cases of active tuberculosis, (b) to identify infected individuals without active disease, and (c) to identify those in need of vaccination. Finally, the current recommendation that BCG vaccinations should be offered routinely in schools to children aged 10-14 has been highly effective in preventing tuberculosis and should be maintained.

Introduction

The Joint Tuberculosis Committee is receiving with increasing frequency inquiries about the control and prevention of tuberculosis. The need for information has resulted from the recent retirement of many physicians with experience in tuberculosis[1] and changes in staff during the current reorganisation of the National Health Service. Moreover, there are great differences in the incidence of tuberculosis between different regions of England and Wales[2] so that in some regions control and prevention of tuberculosis is a major concern of health workers, whereas in others the occasional case of tuberculosis poses an unfamiliar problem, giving rise to doubt and controversy.

The Joint Tuberculosis Committee has produced a report with the object of providing a code of practice incorporating the answers to questions that have arisen most often in regard to the control and prevention of tuberculosis.

Infectiousness and segregation of patients with tuberculosis

For practical purposes the only source of tuberculous infection is a person with pulmonary tuberculosis in whose sputum tubercle bacilli are present in sufficient numbers to be seen on direct examination of sputum smears. Patients with pulmonary tuberculosis in whom three or more sputum smears give negative results on direct smear examination, should be regarded as non-infectious (this includes patients whose sputum appears negative on direct examination but proves to be positive on culture).

Non-pulmonary tuberculosis is also non-infectious even though tubercle bacilli may have been cultured from specimens from the lesions.[3] All patients diagnosed as having tuberculosis, whether infectious or not, must be notified as suffering from tuberculosis. Some problems of tuberculosis notifications have been reviewed recently by the Joint Tuberculosis Committee.[4]

Patients become non-infectious very soon after starting chemotherapy which includes rifampicin and long before the disappearance of acid fast bacilli from sputum smears. The number of live tubercle bacilli in sputum (as shown by growth in culture) falls by 99% after the first two weeks' chemotherapy.[5] For practical purposes patients with pulmonary tuberculosis in whose sputum tubercle bacilli were seen on direct examination should be regarded as non-infectious after two weeks of chemotherapy including rifampicin but may not remain so unless regular and adequate chemotherapy is continued thereafter.[6] This recommendation does not

*This report was prepared by a subcommittee appointed by the Joint Tuberculosis Committee whose members were Dr K M Citron, Dr Martin McNicol, Dr R Raynes, and Dr G O Thomas. It was written by Dr Citron.

Correspondence to: 30 Britten Street, London SW3 6NN.