and sisters, particularly over admissions and patients' records. On clinic days there was direct contact with outpatients and there were occasional queries which necessitated the secretaries giving joint attention to the problem in question.

(6) Visits to Wards etc.—These included occasions spent on trips to wards (occasionally on other floors of the building) and additional contacts with medical staff, the duplicating service department, photographic department, medical records department, and the clinic and x-ray rooms in the basement.

(7) General Clerical Work.—This included filing (summaries, letters, etc.), cataloguing research information, noting the movement of records, etc.

(8.) Telephone Calls.—The use of the telephone was noted under four headings: (a) Internal, contact with doctors and records, transport, x-ray, and other internal hospital departments; (b) External (short) and (c) External (longer), included sending telegrams concerning admission to the wards; and (d) External (doctors and clinics).

Appendix 2: Role Analysis

Date:
Title of Role:
Occupant:
Organization:
Notes on Position of Role in Organization

Column 1	Column 2	Column 3	Column 4	Column 5
Objectives	Responsibilities	Limits	Weight of Responsibility	
Work to be done, duties, tasks, etc., with objectives stated in terms of results required, standards achieved, situations maintained, etc.	Decision making, exercise of choice, discretion, judgement, assessment, evaluation, initiative, authority	To decision making, etc., not already clear from Columns 1 and 2.	Consequences of marginally poor decision making	Review mechanisms

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Clinical Problems

Results of Closure of Loop Transverse Colostomies

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Summary

The postoperative course of 139 patients who underwent closure of a loop transverse colostomy at St. Mark's Hospital between 1961 and 1970 after distal resection and anastomosis of the large intestine for neoplastic or diverticular disease has been reviewed in detail. There were no deaths and the incidence of breakdown at the site of the colostomy closure was 2.9%. The procedure can be straightforward and safe.

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Introduction

The operation of colostomy closure has a notorious reputation for subsequent breakdown and leakage of faeces.¹ This view was recently substantiated by Knox, Birkett, and Collins,² who showed in a review of 179 patients that there was a morbidity from faecal fistula of 23% and a mortality of 2.2% after closure of a temporary colostomy. A recent editorial in the *British Medical Journal*³ further emphasized these hazards.

Some authors have shown, however, that closure of colostomies may be achieved with fewer complications. Barron and Fallis⁴ reported only one faecal fistula in 200 patients who underwent intraperitoneal colostomy closure by excision and anastomosis. They also reported that only a few patients developed a subcutaneous wound infection and that incisional hernia was a problem of minimal importance. Green⁵ reported four serious colonic complications in a series of 86 patients, of whom three required reoperation. Hubbard, Norico, and Harris⁶ reported five cases of wound infection and two cases of

TABLE I—Results of All Loop Colostomy Closures at St. Mark's Hospital between 1961 and 1970

Type of Colostomy	Disease	No. of Patients	No. without Complication	Complications		
				At Site of Closure	At Site of Distal Anastomosis	Wound
Transverse colostomy ..	Neoplastic disease Diverticular disease	98	74	4	2	18
		41	35	Nil	Nil	6
Total		139	109	4	2	24
Transverse colostomy ..	Miscellaneous Miscellaneous	28	22	1	—	5
Sigmoid colostomy ..		24	19	2	—	3
Grand total		191	150	7	2	32

postoperative ileus as the only local complications in a series of 45 patients.

This paper reports the results of closure of loop transverse colostomies at St. Mark's Hospital between January 1961 and December 1970.

Patients and Techniques

In the 10-year period under study a total of 191 patients underwent closure of a loop colostomy (Table I). In 139 of these a loop transverse colostomy was closed as part of a staged procedure in the treatment of neoplastic or diverticular disease of the distal large intestine. This is the group of patients discussed in this paper, as these conditions are the most common indications for colostomy construction with subsequent closure. There were 86 males and 53 females and their age distribution is shown in Table II.

TABLE II—Age Distribution of 139 Patients with Diverticular and Neoplastic Disease undergoing Loop Transverse Colostomy Closure

Age in years ..	≤30	31-40	41-50	51-60	61-70	71-80	>80
No. of patients ..	2	5	18	49	42	20	3

Closure was also carried out on 28 patients with a loop transverse colostomy and 24 with a loop sigmoid colostomy in the left iliac fossa after treatment of other anorectal conditions. The outcome of colostomy closure in these patients is shown in Table I, but this specialized group will not be further discussed.

The construction of the transverse loop colostomies was undertaken by the surgical staff of St. Mark's Hospital and a number of surgeons elsewhere. Fifty-five of the colostomies were constructed before the definitive operation for the underlying disease, usually because of intestinal obstruction or perforation; 65 were constructed at the time of the definitive operation because the anastomosis had been technically difficult or the bowel inadequately prepared; and 19 were constructed after the definitive operation because of anastomotic breakdown. A low anterior resection was performed in 74 of the patients with neoplastic disease as the lower edge of the tumour was less than 12 cm from the anus.⁷ The remaining patients with neoplastic disease and those with diverticular disease had either a high anterior resection or a resection with a more proximal anastomosis.

The indications for colostomy closure were a healed anastomosis and an unobstructed distal large intestine. The preparation of the patient and the technique of the operation have been described elsewhere.⁸ Before the operation all the patients underwent chemotherapeutic bowel preparation and restriction of solid food. In addition, the distal large intestine was washed out with a solution of phthalylsulphathiazole. The continuity of the colon was re-established by simple closure of the colostomy in 132 patients and by excision of the colostomy with anastomosis in seven. In most patients the closure was performed in two layers with continuous all-coat chromic catgut

and interrupted seromuscular silk sutures. The closure was intraperitoneal in 130 cases and extraperitoneal in only nine. A superficial wound drain was inserted in 92 patients and an intraperitoneal drain in 16; 31 patients had no drain.

In the statistical analysis of the results the Fisher exact test was used.

Results

Of the 139 patients 109 (78.5%) had an uneventful post-operative course, and 73 of these had been discharged from hospital by the 14th postoperative day. Six of the 109 patients were in hospital for longer than three weeks for reasons unrelated to their colostomy closure.

The remaining 30 patients (21.5%) had postoperative complications, which were related to the large intestine in 6 (4.3%) and to the wound in 24 (17.2%).

There were no deaths.

COLORECTAL COMPLICATIONS

Six patients had complications involving the large intestine, which were related to the site of the colostomy closure in only four (2.9%). The other two patients had complications at the site of the original rectal anastomosis; one patient developed a rectovaginal fistula and the other a pericolic abscess, both of which necessitated re-establishment of the colostomy.

Three of the four patients who had a leak at the site of their colostomy closure developed transient faecal fistulae which healed spontaneously. The other patient developed peritonitis and required a laparotomy with re-establishment of the colostomy. Some of the factors which were possibly related to these complications were reviewed.

Age and Sex.—There were no differences in the incidence of dehiscence between age groups or between the sexes.

Pathology of Resected Specimen.—The four patients who developed a leak at the site of the colostomy closure had had resections for neoplastic disease. Although this complication did not occur in patients undergoing treatment for diverticular disease the difference in incidence was not statistically significant.

Height of Rectal Anastomosis.—There was no difference in the incidence of leakage between those with high and those with low anastomoses.

TABLE III—Incidence of Complications related to Age of Colostomy

Time from Construction to Closure	No. of Patients	Complications			
		At Site of Closure	At Site of Distal Anastomosis	Wound Infection	Incisional* Hernia
≤28 Days	38	4 (10.5%)	Nil	9 (24.0%)	Nil
>28 Days	101	Nil	2 (1.9%)	11 (10.9%)	4

*See text; only 46% of the patients were followed for one year.

Interval between Construction and Closure.—In 38 cases the colostomy was closed within one month of its construction, in 37 within two months, in 16 in the third month, and in the remaining 48 after a longer period. All the four leakages occurred in patients whose colostomies were closed within a month of construction, whereas no leakage occurred when this interval was longer than one month (Table III); this difference is statistically significant ($P < 0.005$). In addition, all four patients with leakage had their colostomy constructed at the time of the definitive operation; there was no leakage from colostomy closure in patients who had presented with colonic obstruction or perforation due to neoplastic or diverticular disease and in whom the colostomy had been established before definitive resection.

Type of Closure.—Two of the patients who had leakage at the site of colostomy closure had an intraperitoneal and the other two an extraperitoneal operation. As there were only nine extraperitoneal operations in the series this difference is significant ($P < 0.05$). All four patients with leakage underwent simple colostomy closure and none excision of the colostomy with anastomosis, but this difference is not significant.

WOUND COMPLICATIONS

Complications of the wound occurred in 24 patients, 20 having wound infections and four developing an incisional hernia. Only wounds which discharged either pus or serosanguinous fluid were regarded as infected. In this series infection was a minor complication and did not prolong the stay in hospital. Four patients were found to have an incisional hernia during the follow-up period, but as only 64 (46%) of the 139 patients were followed up at St. Mark's for more than a year this figure probably does not represent the true incidence.

Two factors which were possibly related to the complication of wound infection were studied.

Interval between Construction and Closure.—In addition to an increased incidence of leakage from the site of colostomy closure there was also a significantly increased incidence of infected wounds ($P \approx 0.05$) in patients who had their colostomies closed within 28 days of their construction (Table III).

Drainage.—The incidence of wound infection in relation to the presence or absence of a superficial or intraperitoneal drain is shown in Table IV. The differences are not significant.

TABLE IV—Incidence of Wound Infection in relation to Method of Drainage

	No. of Patients	Wound Infections	
		No.	%
Wound drain	92	10	11
Intraperitoneal drain	16	4	25
No drain	31	6	19.4

Discussion

The review of these cases of colostomy closure at St. Mark's Hospital was undertaken because it was felt that recent reports exaggerated the hazards of this procedure. At this hospital there seemed to be far fewer postoperative complications than have been reported elsewhere. Particular attention was paid to closure of transverse loop colostomies carried out as part of a staged procedure in the treatment of distal neoplastic or diverticular disease. The results of this survey show that the operation can be undertaken with no mortality and with a rate of faecal leakage from the site of closure of less than 3%. This compares favourably with the figures reported by Knox *et al.*³ but is in no way unique, for Barron and Fallis⁴ carried out intraperitoneal colostomy closure on 200 patients with very few complications. Despite the generally recognized hazards of this procedure there are very few reports giving details of its outcome.

There is still a good deal of controversy concerning the place of

staged operations compared with immediate resection in the emergency treatment of complicated disease of the distal colon and rectum. In recent years the tendency has been towards a more aggressive approach by primary resection and anastomosis, and good results have been reported by proponents of this method.⁹ It has even been suggested that primary resection is preferable to a staged procedure because of the complications of the subsequent colostomy closure and the additional time spent by the patient in hospital.⁶ Other authors¹⁰ have shown, however, that immediate resection carries a greater morbidity and mortality than a staged procedure. Cohn¹¹ concluded from experiments on dogs that the initial treatment of colonic obstruction should be by proximal colostomy rather than immediate resection. He stated that "in the face of these results in an experimental animal, where resistance to infection and trauma is much greater than in patients, the performance of a one stage resection and anastomosis with or without antibiotic protection in a left colon obstruction must be classified as an unwarranted risk and should not replace the safety of the time honored simple decompressing colostomy." Such a decompressing colostomy must be made with a view to its ease of closure and so sited that its presence does not interfere with the distal resection.¹²

Before a transverse colostomy is closed it is important to make sure that there is no distal obstruction and that the anastomosis has healed. This may be determined with a barium-enema examination or by the passage of methylcellulose distally from the colostomy. When a barium-enema examination has been performed residual barium must be washed from the distal bowel, as if it remains in the lumen it may become inspissated resulting in obstruction. In this series two patients needed re-establishment of their colostomy as it had not been recognized that the rectal anastomosis had not healed soundly.

The four patients with leakage had simple closures, but as excision of the colostomy and anastomosis was performed on only seven of the 139 patients statistical comparison was precluded. The fact that only four out of 132 patients developed an anastomotic leak after simple closure shows that this is a safe procedure.

It has been suggested by Knox *et al.*³ that colostomy closure is less hazardous when carried out extraperitoneally. The present report suggests that intraperitoneal closure is a safe operation, confirming the view expressed by Barron and Fallis.⁴

The incidence of wound infection showed no correlation with the presence or absence of wound drainage. However, most of the wounds were drained superficially—a procedure still advocated.

It is of interest that in this series complications occurred only in patients whose colostomy was constructed at the time of large-bowel resection and in whom closure was carried out within the next 28 days. One reason for a faecal leak in such patients might be technical difficulty at the time of closure, as a colostomy is often oedematous and congested for a short time after its construction. If these signs persist, the opening in the abdominal wall is probably too tight. This will gradually result in the colostomy becoming thickened and rigid. No technical difficulty should be encountered in closing a thin-walled colostomy which is pale in colour and through which a finger will readily pass. Another possible reason for leakage is the fact that operations on the colon produce collagen lysis throughout the gastrointestinal tract which might delay the healing of an anastomosis constructed within the next two or three weeks.¹³ In addition to anastomotic breakdown, however, wound infection was significantly more frequent after closure of a colostomy within 28 days of its construction compared with later closure.

In conclusion, these results show that colostomy closure can be a straightforward procedure without mortality and with minimal morbidity. Simple intraperitoneal closure is advised provided the colostomy has been satisfactorily constructed. Reports from a specialist hospital must always be viewed with caution, as with selection of patients the results may not neces-

sarily be applicable to patients seen at a district general hospital. Our findings suggest, however, that successful colostomy closure is not dependent on the age of the patient or the disease for which the distal resection is performed. While breakdown is thought to be due primarily to a failure of technique, closure of a colostomy within one month of its construction should be undertaken with caution.

We are grateful to the surgical staff of St. Mark's Hospital for allowing us access to records of patients under their care, and to Miss J. W. Phillips, medical records officer, for her help.

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Emotional Problems of Childhood and Adolescence

The Psychosomatic Approach in Paediatrics

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The psychosomatic approach is by no means universally endorsed by the medical profession. The conservative doctor views it with distrust, believing that psychology bears little relevance to "real" disease, while the rabid enthusiast overstates the case by his emphasis upon analytic symbolism—for example, that diarrhoea in colitis signifies riddance of "bad" thoughts.

Somewhere between these two extremes a group of disorders undoubtedly exists in which, over and above the acknowledged role of emotional precipitants, psychological factors do seem to influence both prognosis and therapeutic response—the more so in children because of their relative vulnerability and interdependence on the family. These disorders include migraine, atopic eczema, asthma, spastic colon, peptic ulcer, and, perhaps more equivocally, ulcerative colitis.¹ The object of this paper is to promote the rational management of such conditions in childhood through a clearer understanding of the aetiological principles involved.

Consider, for example, the following contrast in case histories:

Illustrative Case Extracts

John aged 9, has been asthmatic since infancy. Tests of ventilatory function confirm serious bronchopulmonary involvement, meriting massive steroid therapy. Despite this, he still spends long periods in hospital, where his cushinoid appearance and stunted growth are of major paediatric concern. John's father had been away from home for long periods when the boy was younger. He is as intolerant of illness in himself as in others, and constantly exhorts the boy to "do without his medicine." John's mother has a better understanding of the problem but is unable to influence her husband. There is now a second child—a girl aged 2, asthmatic-free, and clearly father's favourite.

This boy has hardly known his father, yet now he finds himself in unfair competition with his sister and further disadvantaged by his bronchospasm. Not surprisingly, he resents the asthma, defiantly trying to suppress symptoms and curtail medication, even when clearly incapacitated and at risk.

By comparison, James, aged 10, is a physiologically "mild" asthmatic, whose ventilatory function is virtually unimpaired; yet he too has a poor record of school attendance, with frequent visits to his doctor, and repeated referral to hospital to try to establish a stable treatment regime. Skin sensitivity tests have proved consistently negative, and the response to disodium cromoglycate disappointing, there has been recourse, even in this case, to short reducing courses of steroid in the hope of "stabilizing" the asthma.

Yet James's personal circumstances are very different from those of John. He is an only child, born after three successive abortions, and was said to be a "weakling" as a baby. When asthma first developed at the age of 4 both parents became acutely concerned, taking it in turns to sit up at night to nurse him through nocturnal episodes. The boy himself is fearful of his asthma, avoiding any situation which might remotely spark off an attack. The slightest wheeze necessitates time off school and consequently he is falling behind already in his attainments.

Case Comparison

Judged by purely somatic criteria, both these boys are asthmatic; in both, the condition is of long standing (six and eight years, respectively) with repeated referral to hospital, appreciable loss of schooling, and resulting academic retardation. Moreover, both are being treated with cortisone. When, however, the comparison is couched in psychosomatic terms, significant differences emerge, which have both therapeutic and prognostic implications.

For example, John's need for steroid is so vital as to be potentially life-saving because of his very poor ventilatory reserve, whereas in James's case it is neither vital nor even physiologically indicated, because ventilatory function is substantially intact. Why then is he being over-treated? By the same token, the degree of disablement experienced by James is out of all proportion to his known potential as measured by spirometry. He is therefore suffering needless handicap, not solely attributable to disordered physiology. Conversely, at the other extreme

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