Follow up after colorectal resection is a surgical tradition, which has become a routine part of clinical practice consuming considerable amounts of scarce resources and for which there is precious little evidence of benefit to the patient.

Colorectal cancer is a common condition and is the third most common cancer in the UK. The main treatment for this disease is surgical excision. Each consultant colorectal surgeon sees an average of 50 new patients with colorectal cancer each year and probably sees them in an outpatient clinic between one and four times per year. The cost of this type of follow up is uncertain but a recent survey in the United States showed the cost of five years’ follow up varied from $900 to $27,000 per patient. As there are over 30,000 new cases of colorectal cancer per annum in England and Wales the use of NHS resources for this group of patients alone is likely to run into tens of millions of pounds per annum.

EXECUTIVE SUMMARY

1 Although there is no evidence that intensive follow up for the detection of recurrent disease improves survival, it is reasonable to offer liver imaging to asymptomatic patients under the age of 70 in order to detect operable liver metastases once during the first two years after resection. (Recommendation Grade:A)

2 Although there is no evidence that colonoscopic follow up improves survival, it does produce a yield of treatable tumours. It is recommended that a “clean” colon is examined by colonoscopy five years after surgery and thereafter at five yearly intervals up to the age of 70 years. (Recommendation Grade:B)

3 In the absence of randomised trials, the only realistic argument for routine follow up is patient support and audit. Audit should be focused on outcome measures.

PREVALENCE AND INCIDENCE

There are approximately 30,000 new cases of colorectal cancer per annum in England and Wales. On average therefore each consultant surgeon probably sees 50 new cases per year. As overall five year survival is around 40%, assuming that patients are discharged five years after resection or at age 70, each surgeon probably has around between 100 and 200 patients attending follow up appointments each year. Some surgeons see patients at three monthly intervals during the first year but most revert to annual appointments thereafter.

Colorectal cancer is the third commonest malignancy in the developed world. It accounts for about 20,000 deaths per year in the England and Wales. Although the incidence and mortality of colorectal cancer have generally been static for the past 40 years there is some recent evidence to suggest that the incidence of the disease is falling in both the UK and USA. The reasons for this slight decline are uncertain but may be related to earlier diagnosis and increased public awareness of the condition. For colon cancer there are almost equal proportions of men and women affected, most commonly between the ages of 60 and 80. Rectal cancer is more common in men.

INTERVENTION

(1) Reasons for follow up

The management of colorectal cancer patients after treatment has been completed is controversial. Some of the reasons for follow up after apparently curative operation for colorectal cancer are identified below and the difficulties highlighted:

(a) Detection of problems related to recent surgical procedure—wound healing, stoma problems, urinary and sexual difficulties after rectal surgery.

(b) Detection of recurrent disease at an early or pre-symptomatic stage when further attempts at cure might be possible. Up to 50% of colorectal cancer patients will develop a recurrence of their tumour and most of these will die from their disease. But can the process of follow up prevent this?

(c) Surveillance for metachronous tumours. Between 5% and 10% of patients will develop metachronous tumours.

(d) Provision of psychological support for the cancer patient. The need for such support varies widely from patient to patient and may not be best provided in a surgical outpatient clinic (stoma care support being a prime example).

(e) Facilitation of audit. As a relatively recent indication for surgical follow up, few surgeons have used the opportunities to obtain their own outcome data from their follow up regimen.

THE PROCESS OF FOLLOW UP

A follow up programme for colorectal cancer patients usually includes outpatient visits, clinical evaluation, haematological, radiological, and colonoscopic evaluation. There are potentially thousands of possible combinations of frequency and intensity of these components. This is reflected in the wide variations in practice.

(a) Detection of recurrent disease

As 80% of recurrences after resection of colorectal cancer occur within the first two years after surgery it has been traditional to undertake more intensive follow up during this period. Despite this policy, the majority of patients become symptomatic from recurrence between hospital appointments. The Wessex audit found that 78% of local recurrences and 62% of distant recurrences were symptomatic at the time of presentation, and some patients wait for their next appointment before reporting their symptoms. Even when an intensive investigation programme has been implemented it fails to detect approximately 50% of asymptomatic recurrences, but the diagnosis of asymptomatic recurrence is more likely to result in attempts at curative re-operation. The outcomes for re-operation in this situation tend to come from large specialist centres that quote mean survivals of around 30% at three years. As only 30% of patients with recurrent disease are suitable for further surgery the global results after diagnosis of recurrent disease are very poor. The proportion of patients in whom potentially curable recurrences are discovered is probably less than 1% overall. Nevertheless several studies have demonstrated that patients...
with asymptomatic recurrences are more likely to undergo
attempts at potentially curative operations, but with little
evidence of survival advantage for most patients.15 16 1
By contrast one study has demonstrated that patients with
advanced but asymptomatic colorectal cancer show an
improvement in survival if given chemotherapy while still
asymptomatic rather than waiting for symptoms to
develop.17 18 Further studies in this area are awaited.
A meta-analysis17 of published studies to determine
whether intensive follow up is of benefit was unable to iden-
tify a single randomised trial with patients allocated to follow
up or no follow up groups. Among the seven non-randomised
studies in which controls were either historical or self selected
(defaulted from follow up) the authors were unable to draw
definite conclusions.

The role of carcinoembryonic antigen (CEA) monitoring is
uncertain. There is still no evidence that the lead time
provided by CEA monitoring confers any survival benefit.15 19
The results of a major prospective randomised study on CEA
monitoring, set up in 1983 are awaited but initial results indi-
cate that second look surgery prompted by a rise in CEA has
no effect on survival (J Northover, personal communication,
evidence category: Ia).

A Scottish randomised controlled trial showed that patients
discharged to general practitioner based follow up did not
suffer greater morbidity or mortality than those followed up in
a surgical outpatient clinic in hospital. The increased GP
workload was only two extra surgery attendances per doctor per year and the majority of GPs were willing to undertake
this work.20

(b) Surveillance for metachronous cancers

There is no evidence that colonoscopic follow up has a signifi-
cant impact on survival after surgery for colorectal cancer.
Nevertheless patients with colorectal cancer have a predispo-
sition to further adenomas and a second primary (meta-
chronous) cancer in the remaining large bowel.21 22 23 Survell-
ance colonoscopy after the initial resection results in a
substantial yield of such tumours.24 25 On this basis patients
should probably undergo colonoscopic follow up, and if the
colon is free of tumours then further colonoscopy should be
repeated at three to five yearly intervals.26 27 The frequency of
such examinations and the age at which surveillance should
cease cannot be determined from published data. A minimum
standard would be five yearly surveillance once a “clean” colon
is established and to cease surveillance at the age of 70 years.
Availability of resources currently dictates follow up policy in
many institutions.

Local recurrence of rectal cancer should be palpable by dig-
tal rectal examination, or seen at rigid sigmoidoscopy. There is
no evidence that such examinations improve survival.28 29 The
results of re-operation in this group are generally
disappointing.30

(c) Provision of psychological support

Limited evidence suggests that non-intensive surveillance
(colonoscopy and computed tomography every three to five
years) is beneficial, but that more intensive annual or biannual
follow up confers no additional benefit.31 Whether the interval
between follow up visits should be three or five years is
currently uncertain. There is limited evidence to suggest that
follow up is reassuring to most patients.10 11

(d) Facilitation of audit

Surgeons in the UK are required to audit their practice as a
part of clinical governance. Without this information the
stimulus to investigate and perhaps change personal practice
is lost.

To monitor performance surgeons must audit results of
their surgery and for this some form of follow up is essential.
However, audit cannot be carried out properly without the
allocation of adequate resources.

**COSTS AND BENEFITS OF FOLLOW UP**

A rough estimate in calculating the cost of follow up for colo-
rectal cancer is £50 for an outpatient attendance, £150 for a CT
scan of the abdomen and pelvis, and £150 for a colonoscopy.
Assuming six monthly follow up, one CT scan and one colon-
oscopy in five years this would cost £800 per patient over five
years. Given that only 50% of patients might be expected to
survive five years and some would be deemed too frail for fol-
low up this cost may be halved. In a community of 300 000
there may be 250 patients being followed up after bowel can-
cer resection including about 175 patients/annum requiring
colonoscopy. The cost of this follow up would be £250 000 per
year for this group of patients (with wide confidence intervals!)

A recent survey in the United States showed a wide range of
costs of follow up per patient. The cheapest regimen cost $900
(approximately £500), while the most expensive was almost
$27 000 (approximately £15 500) per patient over five years.33
Although follow up practices in the UK are likely to be closer
to the cheaper end of this survey, the number of patients
undergoing follow up for colorectal cancer indicates that we
are spending millions of pounds on an activity of uncertain
benefit.

**RECOMMENDATIONS FOR AUDIT**

(1) The National Health Service Health Technology Assess-
ment Group is commissioning trials of different follow up
regimens after “curative” resection of colorectal cancer and
this should provide much needed information but it will be
some years before these data are available.

(2) In the meantime, it behoves us all to rationalise our fol-
low up programmes. The data available suggest that in general
current regimens for follow up are wasting resources.

The above guidelines should facilitate decisions to trim
excessive regimens and provide opportunities to re-allocate
NHS resources for cost effective services.

**References**

of Population, Censuses and Surveys Department of Health. London:
HMSO, 1995. (Category: Ila)
NCI, NIH Publ No 92–2789. Rockville, MD, NIH, 1992. (Category: 
Ila)
4 Kiemeny J, Brunvelds D. Detection of recurrence after surgery for colorectal
5 Umplesby HC, Ferron B, Symes MO, et al. Viability of exfoliated
6 Cochranne JPS, Williams JF, Faber KG, et al. Value of outpatient
follow-up after curative surgery for carcinoma of the large bowel. BMJ
1980;1:593–5. (Category: III)
7 Hutton NR, Hargreaves AW. Is long-term follow-up of all colorectal
8 Tornqvist A, Eklund G, Leandoer L. The value of intensive follow-up
(Category: Iib)
9 Bohm B, Schwenk W, Jucke HP, et al. Does methodic long-term follow-
up affect survival after curative resection of colorectal carcinoma? Dis Colon
Rectum 1993;36:280–6. (Category: Iib)
Guidelines for follow up after resection of colorectal cancer
