

An audit of provincial gastroenterology services in the Western Cape

G. WATERMEYER, F.C.P. (S.A.), CERT. GASTROENTEROL. (S.A.)

M. E. C. VAN WYK, DIP. NURSING (GENERAL AND MIDWIFERY)

P. A. GOLDBERG, F.C.S. (S.A.) M.MED. (SURG.)

Division of Gastroenterology, Departments of Medicine and Surgery, Groote Schuur Hospital and University of Cape Town

Summary

Background. While disorders such as gastro-oesophageal reflux disease, gastrointestinal (GI) cancers and inflammatory bowel disease are prevalent among all racial groups in the Western Cape, there is little knowledge of local GI service provision. The state of equipment, facilities and staffing is largely unrecorded and to date unknown. The aim of this study was to audit the availability of GI facilities in the provincial sector, which provides care for the majority of people in the Western Cape.

Method. All hospitals in the Western Cape providing endoscopy were evaluated by means of a hands-on audit, to identify available organisational infrastructure. Data including staffing, details and utilisation of existing equipment, maintenance and disinfection techniques and delays in service provision were collected.

Results. Over a period of 12 months, 17 Western Cape hospitals were visited: 3 tertiary, 5 regional and 9 district-level institutions. There are currently 89 GI endoscopes in state service, with an average age of 6.1 years (range 1 - 23 years). While most institutions utilise video endoscopy, in many instances equipment is near the end of its economic life. A total of 26 434 endoscopic procedures were performed over a 12-month period. Overall at least 60% of all adult endoscopy was undertaken at tertiary institutions. The mean delay from consultation until gastroscopy or colonoscopy was 9.25 weeks (range 0.5 - 28 weeks) and 8 weeks (range 1 - 20 weeks), respectively. Only 1 tertiary and 1 regional hospital employed fully trained, registered nurses, and the majority of institutions did not conform to internationally accepted standards for the maintenance and disinfection of endoscopic equipment.

Conclusion. While endoscopy equipment is widely distributed throughout the province, it is evident from this study that services in the Western Cape fall short of international standards, with delays in endoscopic provision, lack of adequate equipment, inadequate scope maintenance and disinfection and a shortage of trained staff. As such, much of the population reliant on state facilities has poor access to GI health care. These deficiencies need to be addressed.

Gastroenterology is an important and often undervalued component of care provided in state services. Gastrointestinal (GI) symptoms are among the commonest complaints for which patients seek medical attention, with the annual prevalence of dyspepsia approximating 25%.¹ Furthermore, serious GI disorders such as gastric cancer, colon cancer and inflammatory bowel disease are prevalent among all racial groups within the Western Cape.^{2,3}

There is little knowledge of GI service provision in the Western Cape. Many smaller hospitals have initiated their own endoscopy services based on perceived need and the availability of local skills. Much of the infrastructure has been provided by donations from the community. The state of equipment, facilities and staffing is largely unrecorded and to date unknown. There has been no centralised plan to provide GI health care in this province, and in many institutions there has been no budget to upgrade, repair or maintain services.

The aim of this study was to audit the availability of GI services in the provincial sector, which provides care for the majority of people in the Western Cape.

Method

Data collection

A questionnaire was forwarded to the administrators of hospitals in the Western Cape to ascertain the provision of GI services in individual institutions. The hospitals with GI endoscopic services are listed in Table I and the distribution within the province is shown in Fig. 1. After this, these hospitals were visited by a specialised GI team. A hands-on audit was undertaken to identify available organisational infrastructure.

The following data were collected:

1. Facility: endoscopy venue (in theatre v. stand-alone endoscopy suite)
2. Staffing (number and level of training)
3. Details of endoscopic equipment: fiberoptic or video, date of purchase and physical condition
4. Availability of ancillary equipment
5. Maintenance and disinfection of endoscopic equipment
6. Number and type of procedures performed
7. How the service is rendered
8. Delays in endoscopic service provision
9. Limitations of existing services.

TABLE I. INSTITUTIONS IDENTIFIED WITH GASTROENTEROLOGICAL SERVICES THAT WERE FURTHER EVALUATED

Level of institution	Hospital
Tertiary	Groote Schuur Hospital
	Red Cross Hospital
	Tygerberg Adult Hospital
Regional	Tygerberg Paediatric Hospital
	George Hospital
	Paarl Hospital
	Somerset Hospital
	Victoria Hospital
District	Worcester Hospital
	Beaufort West Hospital
	Eerste Rivier Hospital
	G. F. Jooste Hospital
	Helderberg Hospital
	Hermanus Hospital
	Karl Bremer Hospital
	Knysna Hospital
	Mossel Bay Hospital
	Oudtshoorn Hospital
Vredendal Hospital	

provides an endoscopy service in partnership with its tertiary institution. The data from this district hospital are included with the tertiary institution, resulting in 18 hospitals that provide endoscopic services.

Facilities

All tertiary and 4 regional hospitals have stand-alone endoscopy units. In contrast, all district hospitals that have equipment and 1 regional hospital perform endoscopy in theatre. Paediatric endoscopy is performed at tertiary centres only.

One district hospital has no equipment but has 3 trained endoscopists. Patients from this institution are transported to a tertiary hospital and serviced on a dedicated endoscopy list by the medical staff of the district hospital, but the nursing staff and equipment are supplied by the tertiary institution. All data from this institution are included in the data from that tertiary institution.

Staffing

Full-time and part-time sub-specialist medical and surgical gastroenterologists provide service at the tertiary institutions. In addition, medical and surgical sub-specialist trainees and medical and general surgical trainees provide endoscopic services. At regional and district institutions, the majority of service is provided by full-time and part-time general surgeons. At some institutions, the medical specialists share the services provision. Only 1 tertiary and 1 regional hospital have fully trained registered nurses involved with the endoscopy services. One regional hospital has a self-taught registered nurse. One tertiary hospital has registered nurses who have recently migrated into endoscopy. The other units use enrolled nurses from theatre.

Endoscopic equipment

There are a total of 89 GI endoscopes in public institutions in the Western Cape. These comprise 52 gastroscopes, 24 colonoscopes, 10 duodenoscopes and 3 flexible sigmoidoscopes. The average age of the endoscopes is 6.1 years (range 1 - 23 years); 15 are 15 years old or older (Fig. 2). Most institutions use video endoscopic equipment but have some fiberoptic equipment as backup. A single regional hospital and 5 district level hospitals have only fiberoptic equipment. All institutions have gastroscopes. Colonoscopes are available at all tertiary and 4 regional institutions. Three district hospitals have colonoscopes. Two tertiary and 1 regional institution have duodenoscopes. The duodenoscope at the regional hospital is not used.

One regional hospital has a 22-year-old endoscope on its books, but the instrument's whereabouts are unknown. One busy district hospital has very old equipment that is in a poor state. Fig. 2 shows the age of endoscopes throughout the Western Cape and Fig. 3 the age of endoscopes at the two major teaching hospitals.

Ancillary equipment

Equipment for biopsy and polypectomy was available at regional and some district hospitals. All endoscopy areas were equipped with basic blood saturation monitoring, though at one regional hospital the monitoring equipment did not work.

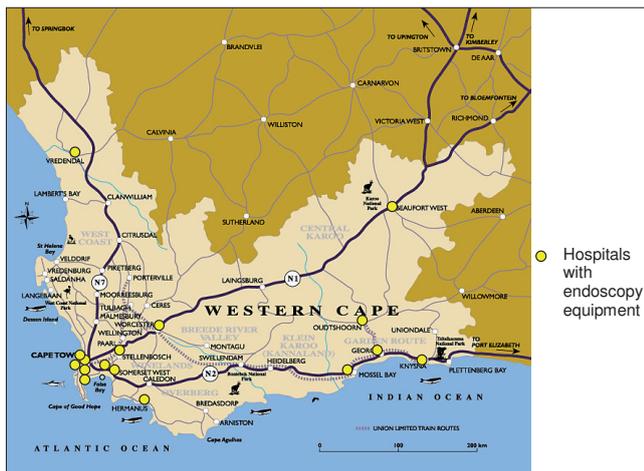


Fig. 1. Distribution of hospitals with endoscopic equipment.

Performance

The number of gastroscopies performed each year at each institution was compared with the waiting time. The average annual number of gastroscopies performed at each institution per half-day session was compared.

Utilisation of existing equipment was evaluated by assessing the total number of oesophagogastroduodenoscopies (OGDs) performed per endoscopy area per half-day endoscopic session per year.

Results

Over a period of 12 months 18 hospitals were visited: 3 tertiary, 5 regional and 10 district-level institutions. Within the tertiary services there were 2 paediatric and 2 adult endoscopic divisions. The 18 institutions are listed in Table I. One district hospital has no endoscopic equipment, yet it

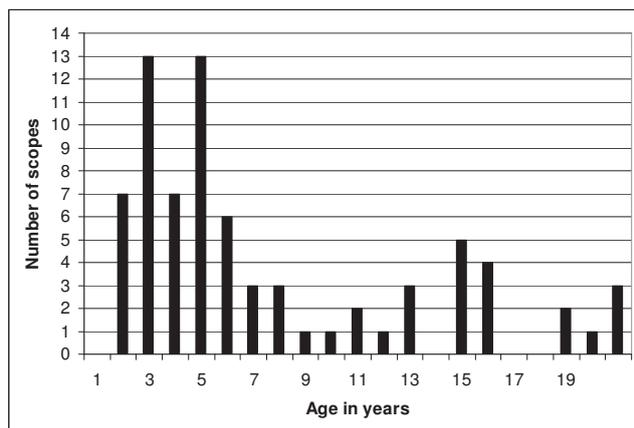


Fig. 2. Age of endoscopes in the Western Cape.

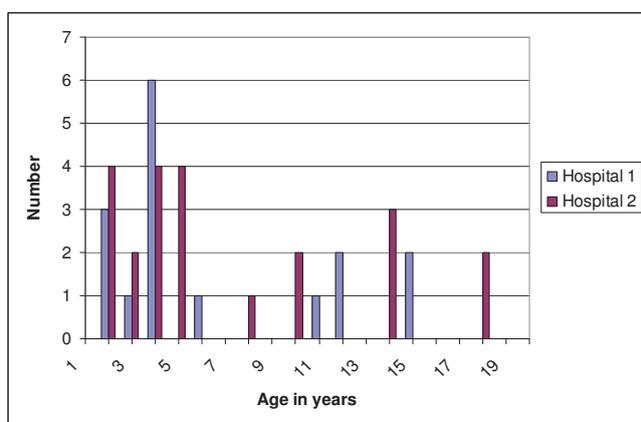


Fig. 3. Age of endoscopes at the two major teaching hospitals.

Maintenance and disinfection of endoscopic equipment

Automatic reprocessing equipment was available at 1 adult and 1 paediatric tertiary institution. All other institutions used manual reprocessing. Fume cupboards were available for reprocessing only at the tertiary centre where manual reprocessing was used.

Leakage testing equipment was available at all endoscopy units but was only used routinely where trained nursing staff was available.

Procedures

All units provided basic diagnostic OGD until recently, when 2 district hospitals had their services suspended due to the withdrawal of outreach endoscopists from their regional hospital. All tertiary and 4 regional hospitals, as well as 2 district hospitals, offer diagnostic colonoscopy and simple polypectomy. Interventional upper endoscopy to manage bleeding peptic ulcers and oesophageal varices is provided by both adult tertiary institutions, as well as 3 regional and 2 district hospitals.

Percutaneous endoscopic gastrostomy (PEG) placement is offered by the tertiary units, as well as 2 regional and 2 district level institutions.

Endoscopic retrograde cholangiopancreatography (ERCP), complex polypectomy and other interventional endoscopy remains exclusively within the practice of Groote Schuur and Tygerberg hospitals, with a single unit providing endoscopic ultrasound (EUS) and double-balloon enteroscopy (DBE). Table II documents the number of procedures performed during 2006. Over 60% of all adult endoscopy was undertaken at Groote Schuur and Tygerberg hospitals

TABLE II. ENDOSCOPIC PROCEDURES PERFORMED IN 2006

	Tertiary		Regional	District
	Adult	Paediatric		
Diagnostic OGD	8 449	180	5 547	3 451
Therapeutic OGD*	616	44	198	4
ERCP	672	4	0	0
Therapeutic ERCP procedures†	830	1	0	0
Rigid sigmoidoscopy	1 317	0	30	60
Flexible sigmoidoscopy	225	0	0	10
Colonoscopy and simple polypectomy	2 572	33	584	420
Colonoscopy and large polyp removal or other intervention‡	298	0	1	0
PEG placement	74	15	16	4
Oesophageal manometry	309	4	0	0
Oesophageal pH studies	176	10	0	0
Anal manometry	120	2	0	0
Stent placement§	100	3	20	0
Endoanal ultrasound	100	0	0	0
EUS	0	0	0	0
DBE	5	0	0	0
Totals	15 793	296	6 396	3 949

* Variceal injection or banding, injection of bleeding peptic ulcers, gastric argon plasma coagulation (APC), gastric polypectomy, oesophageal dilatations (pneumatic or savary), pneumatic pyloric dilatations, placement of naso-jejunal feeding tube.
 † Sphincterotomy, biliary or pancreatic stent placement, stone extraction, endoscopic drainage of pancreatic cysts.
 ‡ Colonic stricture dilatation, colonic APC.
 § Oesophageal, stomach/duodenal, colonic.

Service provision

An emergency diagnostic and therapeutic upper GI service is offered at all tertiary and regional and some district institutions. Emergency colonoscopy is offered at 1 tertiary institution.

At all institutions, except 1 tertiary, elective upper GI endoscopy is booked after a clinical consultation by the endoscopist. In a single tertiary service, the endoscopy is performed on the same day as the consultation. Elective duodenoscopy and colonoscopy is booked after a consultation wherever it is performed.

Most elective endoscopy is performed as an outpatient procedure in all institutions, unless the patient's clinical condition warrants admission. The exception is at 2 regional institutions, where patients are admitted to the surgical ward the day before the procedure. The procedure is performed in theatre, and they are discharged the next day.

Most endoscopy is performed under no or light sedation, except at 1 regional institution, where colonoscopy is routinely performed in the operating theatre under general anaesthetic.

Delays in service provision

The mean delay from the time a patient is booked for a consultation with the GI service until a gastroscopy is performed is 9.25 weeks (range 0.5 - 28 weeks). The actual waiting times are displayed in Fig. 4.

The mean delay from consultation until colonoscopy is 8 weeks (range 1 - 20 weeks) Figs 5 and 6 display the delay in service provision and the number of procedures performed at each hospital.

Limitations of existing services

Most units felt that difficulty in replacing broken and obsolete equipment was a major constraint. The difficulty in finding trained nursing staff and retaining them was a major hurdle. Many services were concerned that the core package of services would result in even longer waiting lists.

Paediatric endoscopy services

Paediatric endoscopy services are provided exclusively by Red Cross Children's Hospital and Tygerberg Paediatric Unit, with no routine paediatric endoscopy available at any regional or district institutions (Table II).

Performance

Fig. 5 documents the annual number of gastroscopies performed at each institution and the time it takes from booking to when the procedure is performed. Fig. 6 examines the annual number of gastroscopies performed per half-day session.

Discussion

This is the first comprehensive audit to determine the availability of GI endoscopy services in the provincial sector of the Western Cape. It demonstrates that endoscopy equipment is widely distributed throughout the province. The majority of the equipment in the larger centres is video based, with fiberoptic equipment in only 1 of the regional hospitals. However, many of the district hospitals still use

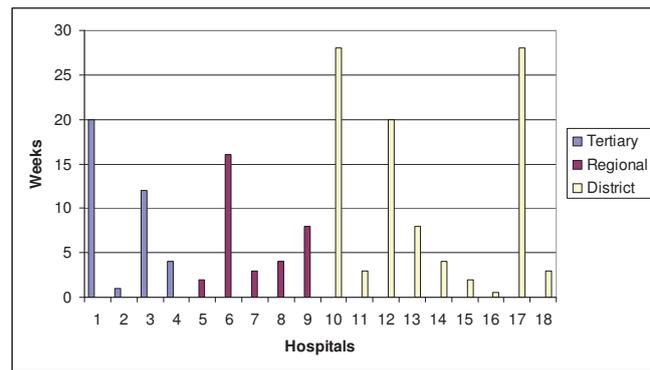


Fig. 4. Delay from booking to procedure (gastroscopy).

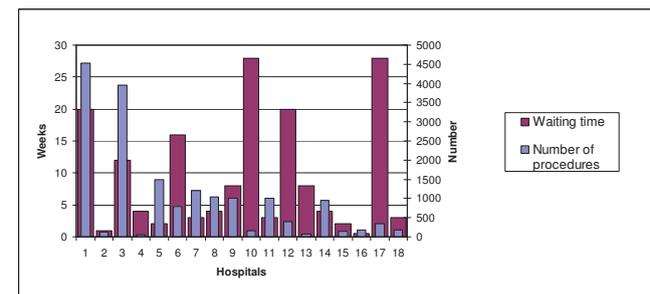


Fig. 5. Annual number of gastroscopies performed and waiting time for a gastroscopy for each institution.

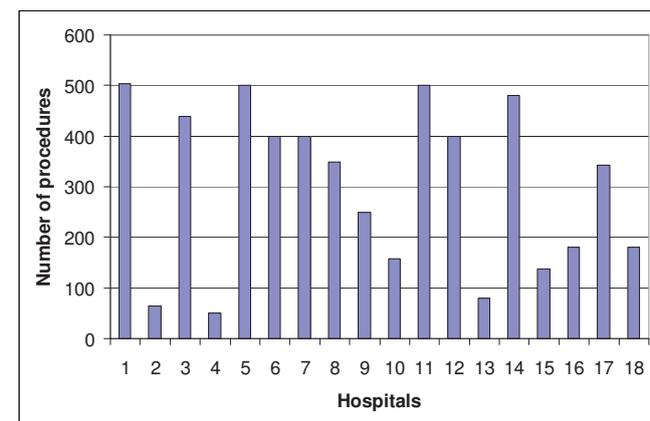


Fig. 6. Annual number of gastroscopies performed at each institution per half-day session.

fiberoptic equipment. Most of the equipment is in good condition. At only 1 district hospital was the equipment in a poor state. In spite of the poor equipment, this hospital provides one of the busiest district services.

Much of the equipment is underutilised, particularly at regional and district level.

The major problems identified across the province were:

1. Much of the equipment is near the end of its economic life.
2. There is a shortage of trained nursing staff, with only 1 tertiary, 1 regional and 1 district hospital having adequate staffing.
3. There is a critical shortage of trained endoscopists. Endoscopists at the regional and district level have many other roles that compete with the endoscopy service.
4. The reprocessing of equipment is haphazard and at most institutions exposes staff unnecessarily to noxious chemicals.

5. The delay in provision of service is appreciable.

It is evident from this study that endoscopic services are strained, as shown by both delays in endoscopic service provision, and shortage of trained staff. As such, much of the population reliant on state facilities has poor access to GI health care.

Guidelines from most professional GI bodies suggest early endoscopy (i.e. endoscopy as soon as is possible given availability) in all individuals with dyspepsia over the age of 45 - 55 years and in all individuals with alarm symptoms (such as anaemia, dysphagia or weight loss).^{1,4} The National Institute for Health and Clinical Excellence (NICE) guidelines stipulate endoscopy within 2 weeks of referral for these 'high-risk' subjects.⁴ The findings in this audit (9-week delay) suggest that endoscopic services in the Western Cape are currently unable to approach this standard of care.

In the metropolitan areas the demand for service is high, while in the areas of lower population density there are facilities, but a lack of personnel has closed services. Upper GI endoscopy is a simple, quick and safe procedure, which in the workup of dyspepsia is equivalent to an ECG in diagnosing ischaemic heart disease. It needs to be readily available at all the institutions where there is currently equipment, particularly given the high prevalence of gastric cancer in the Western Cape. Gastric cancer is the 10th leading cause of death (including trauma/violent death, HIV infection and tuberculosis³) in males over 45 years of age and the 8th in males over 60. These figures may reflect the long waiting time to gastroscopy at most facilities. Gastric cancer has a dismal prognosis if not diagnosed when surgically resectable, with many patients succumbing to the illness within months if it is inoperable.⁵ Waiting lists in many of the institutions evaluated exceed the natural history of this malignancy. This point is particularly valid in the 2 district hospitals where endoscopic services were recently suspended. In both institutions the waiting time for gastroscopy has increased from a maximum of 14 days to 28 weeks, which means a certain death sentence for individuals with undiagnosed gastric cancer.

Outside the tertiary and most regional institutions, there is a lack of appropriate equipment. This impacts on the health and safety of endoscopy personnel. The high prevalence of HIV in our province mandates conversion of the fiberoptic scopes used in one-third of district level hospitals to video equipment.⁶ Video scopes offer many technical advantages over their fiberoptic counterparts, but most importantly reduce the risk of exposure to contaminated bodily fluids.⁷ It is essential that fiberoptic endoscopy in the Western Cape is replaced with video scopes as soon as possible. The province is in the process of systematically addressing this issue, and endoscopy has been prioritised for upgrading over the next 3 years.

The lack of automatic endoscopic reproducers for scope cleaning in most facilities audited results in exposure of endoscopy staff to unacceptable levels of glutaraldehyde and is in contravention of standard occupational health and safety recommendations.⁸

From this audit it is also clear that the vital role of the GI-specialised nurse has been largely overlooked in this province, with only 3 institutions employing individuals with the necessary training and qualifications. Endoscopic equipment is costly to purchase and upkeep requires a great deal of expertise. Specialised GI nurses are necessary to ensure proper endoscopy maintenance and adequate disinfection, as well as to ensure the success of endoscopic procedures. Considering absence due to holidays, sick-leave and continuing medical education it is recommended that a minimum of 6 endoscopy-trained nurses is necessary to run an effective endoscopy service.⁹⁻¹² Training of GI-specialised nurses must therefore be a priority in the future.

A training system needs to be established to train general practitioners in rural areas to perform basic upper GI endoscopy in the outlying regions of Beaufort West, Oudtshoorn and Vredendal. A mobile service needs to be established to service areas such as Atlantis, Saldanha, Swellendam and Ceres.

Conclusion

Provincial gastroenterology-endoscopy services in the Western Cape fall short of international standards. Lack of adequate equipment and endoscopy-trained staff, particularly at district level hospitals, has resulted in poor GI health care for the majority of our population. These deficiencies need to be addressed.

The authors would like to thank Dr B. Engelbrecht, Dr B. Jacobs, Dr A. Krajewski and Dr P. Ciapperelli for initiating and supporting the undertaking of this audit. We would also like to thank Mrs P. Smorenberg for administrative assistance.

REFERENCES

1. Talley NJ, Vakili NB, Moayyedi P. American Gastroenterological Association technical review on the evaluation of dyspepsia. *Gastroenterology* 2005; 129: 1756-1780.
2. Wright JP, Froggatt J, O'Keefe EA, *et al.* The epidemiology of inflammatory bowel disease in Cape Town 1980-1984. *S Afr Med J* 1996; 70: 10-15.
3. Bradshaw D, Nannan N, Laubscher R, *et al.* South African National Burden of Disease Study, 2000, Estimates of Provincial Mortality. Cape Town: Medical Research Council, 2004. <http://www.mrc.ac.za/bod/bod.htm> (last accessed 18 April 2008).
4. National Institute for Health and Clinical Excellence. *Dyspepsia: Managing Dyspepsia in Adults in Primary Care*. London: NICE, 2004.
5. Yeoh KG. Review. How do we improve outcomes for gastric cancer? *J Gastroenterol Hepatol* 2007; 22: 970-972.
6. *Antenatal Survey 2002: National HIV and Syphilis Antenatal Sero-prevalence Survey in South Africa - 2002*. Pretoria: Department of Health, 2003. <http://www.doh.gov.za/docs/reports/2002/hiv-syphilis.pdf> (last accessed 18 April 2008)
7. Lennard-Jones JE, Williams CB, Axon A, *et al.* Provision of gastrointestinal endoscopy and related services for a district general hospital. Working party of the Clinical Services Committee of the British Society of Gastroenterology. *Gut* 1991; 32: 95-105.
8. Cleaning and disinfection of equipment for gastrointestinal endoscopy. Report of a working party of the British Society of Gastroenterology Endoscopy Committee. *Gut* 1998; 42: 585-593.
9. Mulder CJJ, Tan ACITL, Huibregtse K. Guidelines for designing an Endoscopy Unit: report of the Dutch Society of Gastroenterologists. *Endoscopy* 1997; 29: I-IV.
10. Axon ATR. Staffing of endoscopy units. *Acta Endoscopica* 1989; 19: 213-216.
11. Lennard-Jones JE. Staffing of a combined general medical service and gastroenterology unit in a district general hospital. *Gut* 1989; 30: 546-550.
12. Burnham WR, Lennard-Jones JE, Slade GE. Report of a working party on the staffing of endoscopy units. *Gut* 1987; 28: 1682-1685.