

An introduction to
Stoma Care
a guide for health care professionals



 Coloplast

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The word stoma is derived from a Greek word meaning mouth or opening. To form a stoma, the bowel is divided surgically, and the ends brought to the body surface either as a loop or end stoma. We are looking at output stomas, colostomies, ileostomies and urostomies.

Introduction

The first surgical stomas were created on battle casualties in the early 18th century. Today it is estimated that about 80,000* people in the UK have stomas of various types (Figure 1). Care teams including a surgeon, a specialist nurse and other healthcare professionals have been set up to specifically help stoma patients, their family and carers both before and after the operation.

* Department of Health Statistics 1998
The figures quoted are correct at the time of publishing



Figure 1
Epidemiology of
stomas in the UK

** Data source Medicare Audits (July 1998 - June 1999)

In the future, the number of permanent stomas created each year may decrease, for several reasons. Multi-disciplinary teams specialising in colorectal disease have led to improvements in the diagnosis of predisposing conditions, and perhaps more effective drug therapy of these conditions, may reduce the need for the major surgical undertaking of stoma formation.

New developments in surgical instruments and operative techniques, such as stapling devices, internal pouches or reservoirs and artificial sphincters, may also become more widely adopted as well as adjuvant therapies such as preoperative radiotherapy and postoperative chemotherapy which improve surgical outcomes.

Types of stoma

Temporary stomas:

Temporary stomas divert faecal material to the abdominal surface and allow healing or resting of a distal portion of the bowel to protect an anastomosis. Continuity of the bowel can later be restored. Examples of temporary stomas are loop ileostomy and loop colostomy.

Permanent stomas:

Permanent stomas are necessary after resection of the rectum and all or part of the colon, when continuity of the bowel cannot be restored. In the case of advanced colorectal cancer they may be created to relieve obstruction.

Urinary diversion stomas:

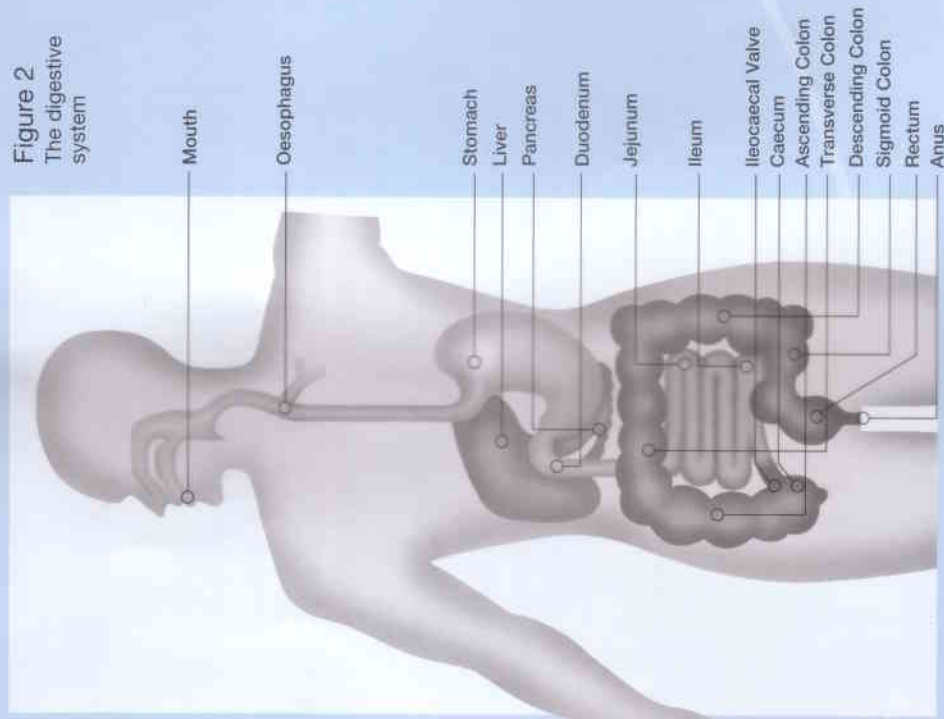
A urinary diversion (urostomy), allows urine to be passed out through a stoma instead of via the urethra.

In order to discuss the function and management of the stomach, the basic anatomy and physiology of the digestive and urinary systems must be understood.

Anatomy and physiology of the digestive system

The digestive system is a continuous muscular tube beginning at the mouth, running through the body and ending at the anus (Figure 2). Its function is to digest food into simple components that can pass through the wall of the system into the bloodstream.

Figure 2
The digestive system



Complementary to the digestive system are a number of organs that produce enzymes to aid digestion. These include the salivary glands, gallbladder, liver and pancreas. The digestive system is lined with epithelial cells, which are specialised to absorb fluid and nutrients.

Food is physically broken down in the mouth by chewing, and mixed with saliva from salivary glands. Saliva contains an enzyme which begins the breakdown of starch. The pulpy bolus of food is then passed to the stomach via the oesophagus, a muscular tube, 30-40cm long.

The stomach: the hollow muscular bag of the stomach lies just below the diaphragm, and acts as a reservoir which churns the food and continues the process of digestion. While the food remains in the stomach it is mixed with gastric juice which is very acidic and contains enzymes.

At the distal end of the stomach is the pyloric sphincter, which controls the passage of contents. Food generally stays in the stomach for 1-4 hours, after which the semi-digested fluid, called chyme, is released in small quantities into the duodenum, the first part of the small intestine.

The small intestine: the stomach contents pass into the duodenum at intervals, where they are mixed with secretions from the pancreas, liver and intestinal wall. This completes the digestion of proteins, fats and carbohydrates.

The contractions of the wall of the small intestine mix the chyme with the enzymes, and ensures absorption of nutrients takes place. The absorptive surface area of the small intestine (6 metres) is greatly increased by the presence of multiple tiny, finger-like projections called villi. Vitamin B12 and bile salts are absorbed in the terminal ileum. This is an important consideration if an ileostomy is to be formed above this, as nutritional deficiencies and pernicious anaemia may occur. Undigested food waste passes into the large intestine via the ileocaecal valve.

The large intestine: (or colon), is 1.5m in length and is divided into sections – the ascending, transverse, descending and sigmoid colon, plus the rectum and anus. The appendix is a small, blind-ended pocket, 6-8cm long, close to the junction of the ileum with the caecum (the initial portion of the colon).

The principal functions of the colon are the absorption of water (1000ml), electrolytes from food waste, and the secretion of mucus to lubricate faeces. The rectum acts as a reservoir for faeces until it is convenient to evacuate from the anus.

Food entering the stomach creates a powerful muscle contraction known as the gastrocolic reflex. This propels faecal material along the sigmoid colon and into the rectum, which is normally empty. The entry of faeces stimulates neuromuscular reflexes of defaecation, this results in the desire to pass faeces.

Implications of removing part of the digestive system

Removal of any part of the bowel will inevitably affect the digestive and absorptive process. For example, because most salts and water are reabsorbed in the colon, a patient with an ileostomy is particularly liable to salt depletion and dehydration. The function of the remaining digestive tract should be considered when monitoring the patient and advising on diet, or on travel to a warm climate where sweating may upset the delicate water/salt balance. Such problems are less likely to occur with a colostomy than with an ileostomy.

Predisposing diseases of the digestive system

Some of the common bowel conditions which may require stoma formation are listed below.

Figure 3
Predisposing diseases of the digestive system

Colostomy	Ileostomy
The most common indication is for	The most common indication is for
<ul style="list-style-type: none"> ● Carcinoma 	<ul style="list-style-type: none"> ● Crohn's disease
Other indications	Other indications
<ul style="list-style-type: none"> ● Diverticular disease ● Crohn's disease ● Irradiation damage ● Bowel ischaemia ● Faecal incontinence ● Volvulus ● Trauma ● Congenital abnormalities ● Hirschsprung's disease 	<ul style="list-style-type: none"> ● Ulcerative colitis ● Carcinoma ● Familial polyposis coli ● Irradiation damage ● Trauma ● Meconium ileus ● Constipation

Inflammatory bowel disease

The term inflammatory bowel disease encompasses two main diseases – Crohn's disease and ulcerative colitis. The severity can range from mild to very severe and life-threatening. Both diseases exhibit periods of remission and relapse.

Ulcerative colitis is characterised by inflammation of the mucosa of the colon, most often starting in the rectum and spreading distally. Often the whole colon becomes involved. The mucosa is inflamed and haemorrhagic.

The symptoms are:

- Bloody diarrhoea, often with large volumes of mucus and urgency
- Anorexia
- Anal soreness and pain
- General malaise
- Anaemia
- Abdominal pain

In some patients, ulcerative colitis is no more than a minor recurrent nuisance, while for others it causes prolonged ill health.

Most patients are managed medically, the mainstay of treatment being mesalazine, with corticosteroid enemas; Steroids may be used during severe exacerbations. In ulcerative colitis severe exacerbations may lead to toxic dilatation of the colon with a risk of perforation. This is an indication for emergency surgery, though whenever possible, elective surgery is preferred. Elective surgery to remove the colon may be needed for persistent symptoms, because of the increased risk of colonic cancer developing and general poor health caused by the chronic condition.

Procedures

The standard operation is sub total colectomy (removal of the colon whilst retaining the rectum). This allows the patient time to recover. If after surgery diagnosis is confirmed as ulcerative colitis, restorative surgery can be considered (eg. ileo anal pouch see page 18). The alternative is a pan procto colectomy and formation of permanent ileostomy.

Crohn's disease causes inflammation and ulceration of any part of the digestive system. The section most commonly affected is the distal ileum. Crohn's disease of the colon may be difficult to distinguish from ulcerative colitis, it is characterised by inflammation of the full thickness of bowel as well as intermittent diseased bowel (skip lesions). Fistulas between the bowel and other structures, such as skin, bladder or other bowel loops, can develop. These are not features of ulcerative colitis.

The symptoms of Crohn's disease are:

- Rectal bleeding
- Colicky pain caused by strictures in the bowel
- Diarrhoea
- Weight loss
- Anaemia in severe disease (and the patient may become toxic and feverish)
- Extra-intestinal manifestations e.g.-
 - Arthritis
 - Finger clubbing
 - Skin changes
 - Anal tags
 - Fissures

Medical treatment of Crohn's disease is similar to that for ulcerative colitis. Antibiotics may be given to resolve the secondary infections which can occur.

With active disease in the small bowel the affected section will be resected or stricturoplasty¹ performed. If the colon is affected a colectomy is typically formed.

¹ Allen RN, (1997) Inflammatory Bowel Disease, Churchill Livingstone.

Familial Adenomatous polyposis

Familial polyposis is a dominant inherited condition which affects both sexes equally. The large bowel becomes studded with multiple polyps, all of which carry a risk of becoming malignant. The colon and rectum are generally removed, and in some cases a restorative procedure may be possible. Genetic counselling and possibly screening are needed for the family.

Diverticular disease

Diverticular disease is a common disease of the over 40s and affects 35% of all people over 60 years of age.² Lack of fibre in the diet and straining at stool leads to high pressure in the bowel and hypertrophy of the muscles as they attempt to move small amounts of faeces along the colon. The increased pressure forces the mucosa through defects in the bowel wall, and faeces become trapped in these mucosal pouches or diverticulae. Irritation by the trapped faeces may result in inflammation, pain and bleeding; this is known as acute diverticulitis. Severe cases carry a risk of abscess formation and perforation.

Acute diverticulitis is first treated conservatively with antibiotics, nasogastric aspiration and intravenous hydration. When the inflammation settles, the patient may commence oral fluids and gradually progress to a high-fibre diet. Surgery may be required for complications of diverticular disease, such as abscess formation, peritonitis, fistula and intestinal obstruction. The affected sections of bowel are excised, and a colostomy (which may be temporary) is formed to allow the distal parts of the bowel time to recover.

² Keighley MRB & William NS (1999). *Surgery of the Anus, Rectum & Colon*. 2nd Ed WB Saunders, London.

Carcinoma

Colorectal cancer is the second biggest cancer killer in the UK and is most prevalent in those over 70 years of age, however the incidence of this being found in younger people is increasing. There are 30,000 cases and 19,000 deaths per annum.³

The onset of the disease is insidious and symptoms are not obvious, particularly if it occurs in the caecum or ascending colon. Presenting symptoms commonly are a change in bowel habit, tenesmus or rectal bleeding. Symptoms of advanced disease include intestinal obstruction, perforation and resulting peritonitis.

Treatment is invariably surgical, (about 80% is quoted in clinical guidelines) and depends on the location and extension of the tumour. Generally, the affected section of bowel is excised, with anastomosis of the cut ends where possible (perhaps protected by a loop stoma), or formation of a permanent colostomy when anastomosis is impossible. Because the disease presents late, the primary tumour has often metastasized before surgery and the overall prognosis may be poor.

Patients have adjuvant radiotherapy and/or chemotherapy as part of their treatment and according to their histological prognosis.

Hereditary Non Polyposis Colon Cancer (HNPCC)

HNPCC is a familial form of colon cancer. A person is at increased risk if he/she has 2 first degree relatives, one of which is under 45yrs at diagnosis.

Solitary polyps which become malignant are associated with breast and gynaecological cancers. Family members should be screened from age 30yrs onwards.

³ Effective Health Care (1997). *The Management of Colorectal Cancer*. NHS Centre for Reviews and Dissemination, University of York.

Basic principles of stoma surgery

Certain principles are common to all stoma surgery. For example, the bowel must not be put under undue tension in bringing the stoma to the surface, and an adequate blood supply must be maintained.

Laparotomy incisions should always be positioned well away from potential stoma sites, and the body contours of the patient taken into account when deciding on the stoma site (see page 27), the most common practice is the use of a mid-line incision.

The surgical technique used depends on the type of stoma created. They are:

- Loop colostomy
- Loop ileostomy
- End colostomy
- End ileostomy

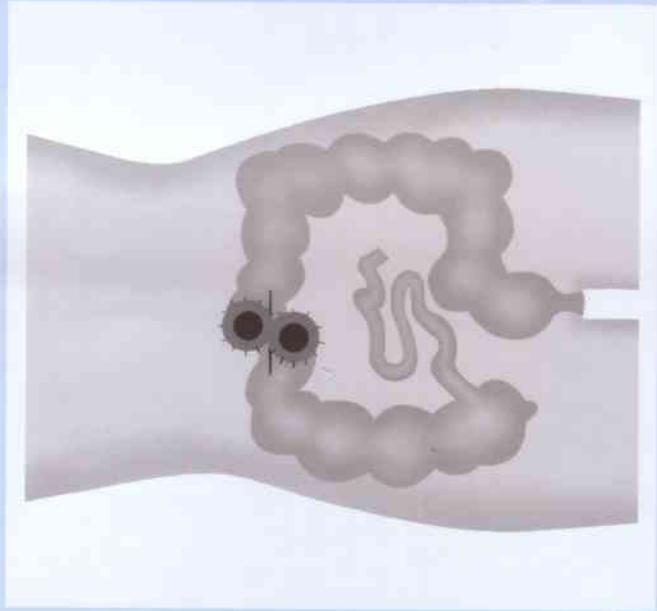
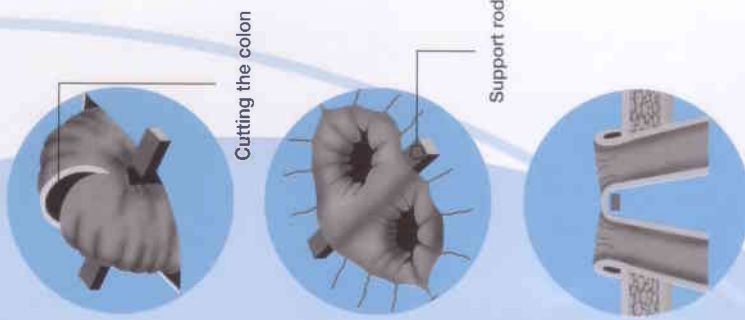


Figure 4
Diagram of a loop colostomy

Figure 5
Formation and appearance of a loop colostomy



Loop colostomy

A loop colostomy (Figure 4) is formed in order to protect an anastomosis as previously mentioned.

A loop of the colon is brought to the surface of the body through a small incision (5cm) and supported on a rod until healing and fixation occur. Removable plastic support rods are often used. The cut bowel wall is usually sutured to the skin edge (Figure 5). A loop colostomy can usually be closed after 6-8 weeks.

A loop colostomy in the sigmoid region (at the lower end) produces more solid faeces. However, this type of stoma is more often made in the most mobile region of the transverse colon, because it can readily be brought to the body surface and allows mobilisation of a longer length of colon for restoration of bowel continuity at later surgery.

Loop ileostomy

A loop ileostomy allows for defunctioning of the colon and/or protection of anastomosis to allow healing of distal excisions and lesions (e.g. fistulas).

Loop ileostomy may be preferable to loop colostomy because:

- It is possible to site well to facilitate good management
- It is less bulky
- The effluent is relatively inoffensive and more predictable

A loop ileostomy, is formed by bringing out a section of ileum to the abdominal surface (Figure 6) and supported on a plastic rod. After the ileum has been cut round two thirds of its circumference on one side of the loop, a spout can be formed from the longer arm of the loop (Figure 7).

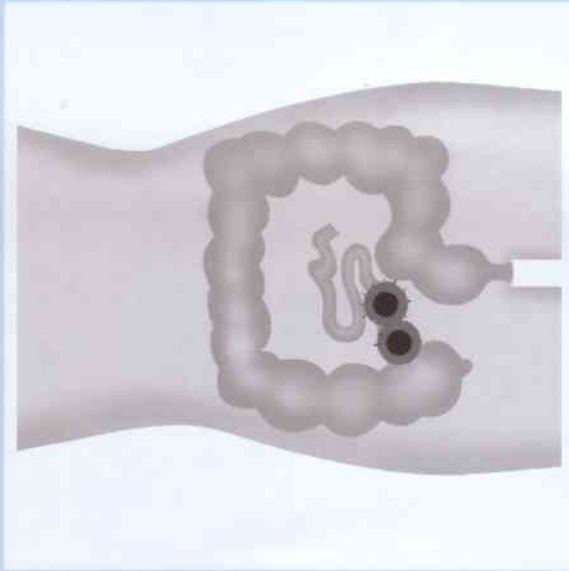


Figure 6
Location of a loop ileostomy

Figure 7
Formation and appearance of a loop ileostomy



The ileum is cut close to the skin margin



ileostomy 'spout'



Low colonic anastomosis: the advent of stapling guns has allowed low rectal anastomosis to be performed. These may be protected by a loop ileostomy.

ileo-anal pouch: in the pouch operation a reservoir is constructed from a loop of terminal ileum before anastomosis to the anal canal, which has had its mucosa stripped to prevent recurrence of the disease (Figure 8, page 18). The newly formed pouch or reservoir is protected by a loop ileostomy. This can be closed 8-12 weeks later when radiographic studies show viability of the pouch. The patient evacuates the pouch spontaneously 4-6 times each day. This operation is available in some centres, though it is only suitable in ulcerative colitis and familial polyposis coli and not normally done for Crohn's disease.

Colo-anal pouch: is done instead of an anterior resection – it gives better functional results and is usually protected by a loop ileostomy.

Permanent colostomy

A permanent colostomy is usually formed in the treatment of carcinoma of the lower third of the rectum or anus, or less commonly following irreparable injury to the rectum.

When the rectum is involved in the disease process it will be removed; the colon is then mobilised, and the cut end brought to the abdominal surface at an opening approximately 2cm in diameter, and usually sited in the left iliac fossa (Figure 9, page 19). The mucous surface of the colon is sutured to the skin (Figure 10, page 19).

Permanent ileostomy

A permanent ileostomy is created when the entire colon needs to be removed. This occurs most often in inflammatory bowel disease, but may also be necessary in familial polyposis and very occasionally in cases of colorectal cancer.

The ileostomy is usually sited in the lower right iliac fossa (Figure 11, page 19). The ileum is divided about 2cm in front of its junction to the caecum, and then brought out through a 2cm incision in the rectus muscle to a length of about 6-7cm. It is sutured to the abdominal wall to prevent it retracting, and turned 'inside out' (everted) to form a spout of 2-3cm in length (figure 12, page 19). This spout is necessary to keep the extremely irritant ileal fluid off the sensitive skin.

Kock pouch: in an attempt to provide continence for those that have had their rectum removed, Kock devised an internal reservoir, constructed from the terminal ileum with an outlet valve to the body surface. The ileostomy reservoir, or Kock pouch, is managed by the patient intubating the pouch with a special catheter. It is now less popular since the availability of the ileo-anal pouch procedure.

Figure 8
Construction of an ileo-anal pouch

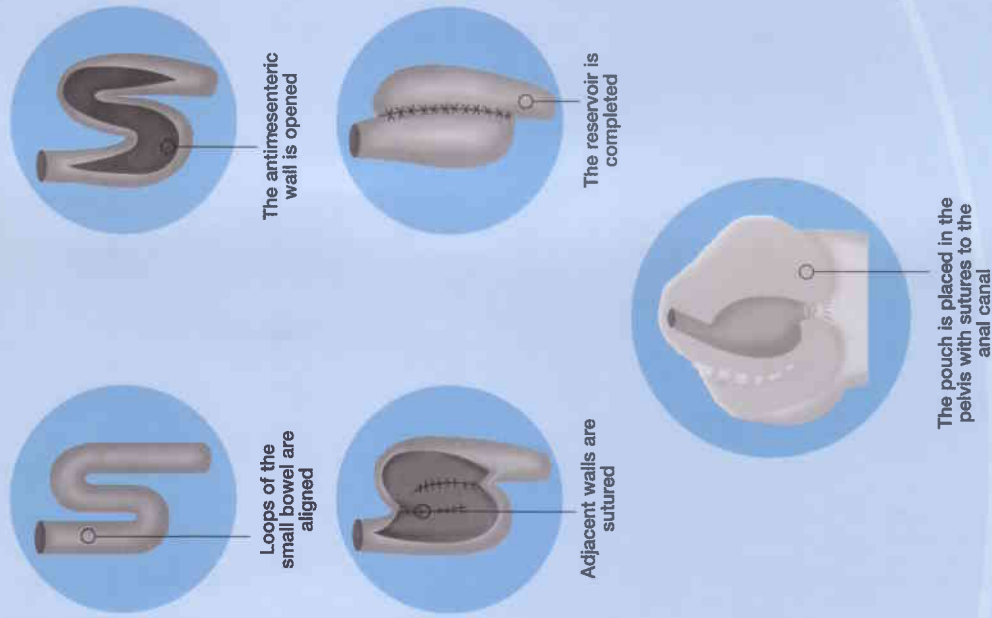


Figure 9
Diagram of an end colostomy

In this case, the rectum has been left in situ, and may be oversewn or brought to the body surface as a mucous fistula. It may also be completely removed and the anus closed surgically.

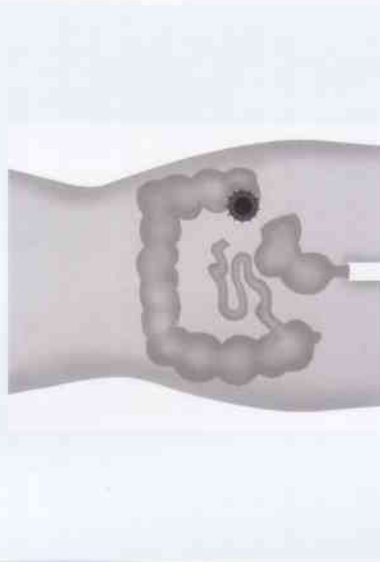


Figure 10
Appearance of an end colostomy

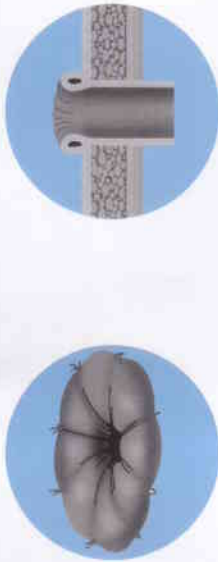


Figure 11
Diagram of an end ileostomy

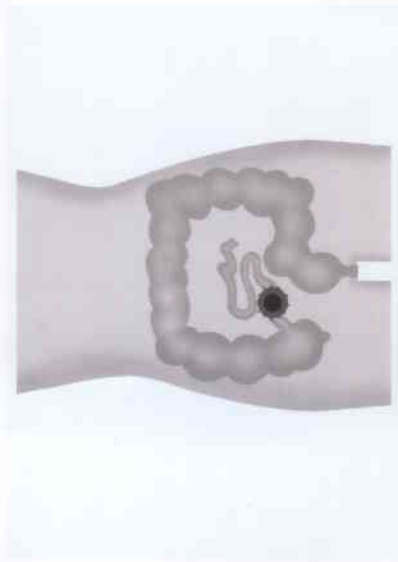


Figure 12
Appearance of an end ileostomy

