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JOSEPHINE G PATERSON

The digestive system: part 1


Abstract

This article, which forms part of the life sciences series and is the first of two articles on the digestive system, explores the structure and function of the digestive system. It is important that nurses understand how the digestive system works and its role in maintaining health. The article describes the gross structure of the gastrointestinal tract along with relevant physiology. It also outlines several disorders of the gastrointestinal tract and their treatment and nursing management. The second article will explain the liver, pancreas and gall bladder and their digestive functions, and provides a brief overview of the disorders of chronic liver disease, pancreatitis and gallstones.

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lamina propria that supports the epithelium and is a layer of connective tissue containing lymphoid tissue that protects the gut from intestinal bacteria (Tortora and Derrickson 2013). The outermost layer of the mucosa, the muscularis mucosa, is a thin smooth muscle layer.

The submucosa is a thick layer of connective tissue that contains nerves, blood vessels and glands (Seeley et al 2007). This layer enables the gastrointestinal tract to stretch to accommodate food passing through it (Sherwood 2013). The nerves form plexuses controlled by the autonomic nervous system, and these networks of nerves are important for the control of secretions of the organs of the gastrointestinal tract (Tortora and Derrickson 2013).

The muscularis externa is usually made up of two layers of smooth muscle, an inner circular layer and an outer longitudinal layer. The muscles work together to produce propulsive and mixing movements (Sherwood 2013). Movement and the production of secretions in the gastrointestinal tract are under the control of the autonomic nervous system through the myenteric plexus found between the muscle layers (Tortora and Derrickson 2009a).

The serosa is an outer layer of connective tissue that covers the digestive organs and prevents friction between them by discharging a thin serous fluid during peristaltic movement. The serosa is also called the visceral peritoneum and covers the organs in the abdominal cavity, while the parietal peritoneum lines the abdominal wall (Tortora and Derrickson 2013). Within the folds of the peritoneum, blood vessels, lymphatic vessels and nerves supply the abdominal organs (Tortora and Derrickson 2013). The omentum, a fold of peritoneum that is described as a fatty apron hanging over the abdominal organs (Waugh and Grant 2010), contains many lymph nodes that protect the gastrointestinal tract from infections and prevent them from spreading outside the gastrointestinal tract (Tortora and Derrickson 2013). Throughout much of the gastrointestinal tract, the serosa is continuous with the mesentery, a double fold of peritoneum that suspends the digestive organs from the inner walls of the abdominal cavity (Sherwood 2013).

**Mouth**

The mouth or oral cavity consists of a roof, a floor and walls. The lips at the opening of the mouth guide and keep food in the mouth (Sherwood 2013). The tongue is composed of skeletal muscle covered with mucous membrane and is attached to the floor of the mouth by the frenulum. It guides food during mastication, forming of the bolus or small ball of food and swallowing (deglutition), and is also important for taste and speech. The tongue is covered by protrusions called papillae, some of which contain taste buds that when stimulated, create an enjoyable subjective feeling of taste (Tortora and Derrickson...
2013). The taste buds also stimulate the production of secretions from the salivary glands, stomach, pancreas and gall bladder in preparation for the arrival of food in the digestive system (Sherwood 2013). The roof of the mouth contains the hard and soft palates. Sections of the palatine and maxillary bones of the skull form the hard palate, while the soft palate comprises muscle lined with mucous membrane and is found at the back of the mouth (Thibodeau and Patton 2008). Originating from the free edge of the soft palate is the uvula, a conical muscular process. This protects the nasopharynx during swallowing.

In the adult mouth, there are 32 permanent teeth consisting of incisors, canines, premolars and molars. The incisors are chisel shaped and designed to cut into food. The canines have a pointed surface and are designed to tear and shred food, while the premolars and molars are designed to crush and grind food. The molars can apply a crushing force of 200lb (Sherwood 2013). A bolus of food is created once food has been chewed.

There are three major pairs of salivary glands that release saliva into the oral cavity. The parotid glands are the largest salivary glands and are found in front of and under each ear. The submandibular glands are located in the floor of the mouth and the sublingual glands are located in the floor of the mouth in front of the submandibular glands (Waugh and Grant 2010). Approximately 1L of saliva is produced daily by the salivary glands (Thibodeau and Patton 2008), consisting of 99.5% water and 0.5% electrolytes and proteins (Tortora and Derrickson 2009b, Sherwood 2013). Salivation, the process of producing saliva from the salivary glands, is controlled by the autonomic nervous system (Tortora and Derrickson 2009b). Saliva has the following functions:

- It contains the enzyme salivary amylase that begins the process of carbohydrate digestion in the mouth (Sherwood 2013). According to Tortora and Derrickson (2009b), this process continues for approximately one hour until the gastric acids inactivate salivary amylase.
- It contains the enzyme lysozyme, which has an antibacterial action and destroys bacteria in the mouth.
- It washes away material that may act as a food source for bacteria and helps to keep the mouth and teeth clean.
- The thick mucus present in saliva aids swallowing by moistening and lubricating particles of food and decreasing friction as the particles move through the oesophagus.
- Bicarbonate buffers in saliva neutralise acids in food so that dental caries are prevented (Sherwood 2013).

**Pharynx**

The pharynx is formed of muscle and lined with a mucous membrane (Seeley et al 2007). The tonsils in the pharynx are made up of lymphoid tissue, which protect the body from infection (Sherwood 2013).

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**FIGURE 2**

Layers of the gastrointestinal tract

- **Mucosa:**
  - Epithelium
  - Lamina propria
  - Muscularis mucosae

- **Muscularis:**
  - Circular muscle
  - Longitudinal muscle

- **Submucosa:**
  - Mucosa-associated lymphatic tissue
  - Glands in submucosa

- **Gland:**
  - Duct of gland outside the gastrointestinal tract (such as pancreas)

- **Serosa:**
  - Areolar connective tissue
  - Epithelium

- **Vein, Artery:**
  - Submucosal plexus (plexus of Meissner)
  - Nerve
  - Mesentery

- **Lumen:**
  - Myenteric plexus (plexus of Auerbach)
The pharynx consists of the nasopharynx, oropharynx and laryngopharynx (Waugh and Grant 2010).

The nasopharynx is essential in respiration; however, the oropharynx and laryngopharynx are shared by the respiratory and digestive systems. Air enters the pharynx on its way to the lungs, while food travels through the pharynx on its way to the stomach. The bolus of food is voluntarily moved from the mouth to the oropharynx by swallowing (Figure 3). Receptors in the pharynx act in response to the pressure from the bolus by sending impulses to the swallowing centre in the medulla oblongata of the brain stem. The swallowing centre acts so that the soft palate rises up to block the nasopharynx, stopping food and fluid from entering it, and the epiglottis moves upwards and forwards so that the opening of the larynx is closed and the bolus passes over it and on into the laryngopharynx and then the oesophagus (Watson 2005). When the bolus enters the pharynx, swallowing is under involuntary control (Waugh and Grant 2010). The oropharyngeal stage of swallowing only lasts for approximately one second while the bolus moves from the oropharynx to the oesophagus (Sherwood 2013).

**Oesophagus**

The oesophagus is a muscular tube, about 25cm long with a diameter of 2cm, which starts at the laryngopharynx and ends at the stomach, and is a passageway for food. At each end of the oesophagus there is a sphincter. At the pharyngeal end, the upper oesophageal sphincter is closed except while swallowing to avoid air passing into the oesophagus. The closed sphincter prevents the aspiration of food from the oesophagus into the lungs. At the lower end of the oesophagus at the entrance into the stomach is the cardiac or lower oesophageal sphincter that is closed except during swallowing. It inhibits food contents that are acidic from refluxing from the stomach into the oesophagus (Waugh and Grant 2010). The oesophagus also has an upwards curve as it goes through the diaphragm, preventing food going back into the oesophagus once it has entered the stomach (Waugh and Grant 2010). Mucus secreted from the mucosa of the oesophagus lubricates and assists the movement of food (Seeley et al 2007). Food is moved through the oesophagus on a peristaltic wave started by the swallowing centre in the medulla oblongata so that the bolus is pushed from the top to bottom of the oesophagus towards the stomach. The lower oesophageal sphincter relaxes allowing the food to pass into the stomach.

**Stomach**

The stomach, which is J-shaped, lies under the diaphragm in the upper part of the abdominal cavity. It is divided into three parts: the fundus, which lies near the lower oesophageal sphincter; the body, which is the middle part; and the...
antrum, which is the lower part containing the pyloric sphincter that controls the amount of food leaving the stomach and entering the small intestine (Sherwood 2013). The stomach looks small when empty, with the capacity increasing in response to ingesting a big meal. According to Tortora and Derrickson (2009b), it can cope with up to 6.4L of food because of the presence of rugae or folds in the mucosa and submucosa of the stomach that flatten, enabling it to expand to accommodate ingested food (Seeley et al 2007). The experience of eating too much distends the stomach, causing discomfort. The mucosal lining of the stomach is formed from simple columnar epithelium and contains many gastric pits, which are openings for the gastric glands. The gastric glands under the surface of the mucosa are made up of specialised cells that secrete gastric juice into the stomach and secrete water and mineral salts. The specialised cells in the gastric glands include:

- Goblet cells found on the inner surface of the stomach, and lining the gastric glands, produce mucus to coat and protect the stomach lining from the effects of hydrochloric acid and pepsin. Parietal cells produce hydrochloric acid and intrinsic factor. Hydrochloric acid is responsible for achieving a pH 2 within the stomach. The pH in the stomach kills bacteria present in ingested food. Intrinsic factor is required for the absorption of vitamin B12 in the small intestine and for the normal production of red blood cells. A shortage of intrinsic factor leads to pernicious anaemia.
- Chief cells produce pepsinogen, the inactive precursor of pepsin, an enzyme that digests protein. Pepsin requires a pH 2 to work (Tortora and Derrickson 2009b). The hormone secretin is released from the duodenal mucosa once the pH falls to 2 and stimulates the flow of alkaline pancreatic juice to neutralise the effects of the acidic chyme. Cholecystokinin is released from the intestinal glands when the chyme in the duodenum contains amino acids and fatty acids. It stimulates the release of pancreatic juice, causes the gall bladder to contract and slows gastric emptying, creating a feeling of fullness or satiety (Tortora and Derrickson 2009a).

**Small intestine**

The small intestine is an estimated six metres long and is divided into three parts: the duodenum, which is attached to the pylorus and is 2.5m long; the jejunum, which is 2.5m long; and the ileum, which is 3.5m long (Seeley et al 2008). The ileum is attached to the large intestine at the ileocaecal sphincter (Waugh and Grant 2010). The small intestine has an important role in the absorption of food, and the cells of the submucosa and mucosa are designed to maximise absorption by increasing the surface area greatly through circular folds, villi and microvilli (Seeley et al 2007). The circular folds in the mucosa and submucosa promote mixing of chyme as it moves through the small intestine. The villi are about 0.5-1.5mm long and are finger-like projections on the mucosa. Each villus contains a blood capillary network and

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a lacteal. Microvilli are hair-like projections of epithelial cells covering the villi. Microvilli produce digestive enzymes and absorb digested food. The products of carbohydrate and protein digestion from the gastrointestinal tract are absorbed into the blood capillaries from the microvilli (Tortora and Derrickson 2009b). The lacteals absorb lipids from chyme. Also present in the intestinal epithelium are goblet cells that secrete mucus.

Intestinal glands are situated at the base of the villi and secrete intestinal juice consisting of mucus and water. The pH of the fluid is normally between 7.8 and 8.0 (Waugh and Grant 2010), and these secretions help to protect the small intestine from the acidic effects of chyme and the activity of digestive enzymes. They also help to keep chyme in its liquid form to increase the likelihood of digestion in the small intestine. The intestinal glands contain endocrine cells that secrete secretin and cholecystokinin. Groups of aggregated lymph nodules are found in the ileum called Peyer’s patches and these protect the small intestine when microbes may be present (Seeley et al 2007).

When acidic chyme enters the small intestine, ducts in the middle third of the duodenum deliver pancreatic juice and bile from the liver. These and intestinal juice come into contact with the contents of the small intestine and digestion of the nutrients is completed. The duodenal glands in the mucosa secrete alkaline mucus that helps with the neutralisation of the gastric acid in chyme (Tortora and Derrickson 2009b).

Stimulated by the presence of chyme, segmentation contractions from smooth muscle in the intestinal wall move food along the small intestine. Segmentation contractions occur when contracted rings in the small intestine relax and the relaxed rings contract so that chyme is chopped and thoroughly mixed as it moves backwards and forwards between the rings. Segmentation becomes more forceful after a meal (Sherwood 2013). As well as mixing chyme with digestive juices, segmentation ensures that as much of the chyme as possible is in contact with the mucosa for absorption (Tortora and Derrickson 2009b). When the meal has been absorbed, peristaltic contractions move the remains of the meal towards the large intestine.

Large intestine

The large intestine or colon is approximately 1.5m long and continues from the end of the ileum to the anus (Tortora and Derrickson 2009b). The large intestine is made up of the caecum, ascending colon, transverse colon, descending colon, sigmoid colon, rectum and anal canal (Waugh and Grant 2010). Between the ascending colon and the transverse colon there is a bend called the hepatic or right colic flexure and between the transverse colon and the descending colon there is another bend called the splenic or left colic flexure. The vermiform appendix is found on the caecum and is a small tube that is closed at one end and contains the same layers as the rest of the colon, but more lymphoid tissue is present (Waugh and Grant 2010).

Food residue enters the caecum from the ileum through the ileocaecal valve. The contents of the ileum enter through this valve, however they cannot return into the ileum as the folds of tissue of this valve are forcibly closed when caecal contents try to move backwards (Sherwood 2013). This is a safety mechanism, preventing bacteria from the large intestine from entering the ileum. Once food matter reaches the large intestine, it is no longer called chyme (Thibodeau and Patton 2008) and it takes on the consistency and colour of faeces, as water and salts are absorbed.

There are 500 different species of bacteria found within the large intestine, and they are harmless to humans unless they are transferred to other parts of the body (Waugh and Grant 2010). The bacteria cause the release of hydrogen, carbon dioxide and methane as a result of the bacterial fermentation of unabsorbed nutrients, particularly carbohydrate. These gases form flatus in the large intestine (Tortora and Derrickson 2009b). Any proteins that are present are broken down into amino acids, and bilirubin is broken down into simple pigments including stercobilin giving faeces a brown colour (Tortora and Derrickson 2009b). Vitamin K is manufactured by bacteria in the large intestine, while B complex vitamins are also products of bacterial action. Once these vitamins have been produced in the large intestine, they are absorbed into the bloodstream (Thibodeau and Patton 2008).

The contents of the large intestine take an estimated 18-24 hours to pass along its length (Seeley et al 2007). Faecal matter is made up of water, cellulose fibre, microbes, epithelial cells lost from the walls of the gastrointestinal tract, fatty acids and mucus secreted from the epithelial lining of the large intestine (Waugh and Grant 2010). It is important that faecal matter does not take too long to travel through the large intestine because increasing amounts of water will be absorbed the longer the contents remain in the system resulting in constipation, whereas if bowel contents travel through too quickly, diarrhoea can occur because less water is absorbed.

Arrangement of the muscle layers encourages the movement of faecal contents through the large intestine. The outer longitudinal smooth muscle layer does not completely surround the...
large intestine, but has three longitudinal bands of smooth muscle running the entire length of the intestine called taeniae coli. They stop at the junction between the sigmoid colon and the rectum (Waugh and Grant 2010) and are shorter than the underlying smooth muscle. Tonic contractions of the bands gather the colon into a series of pouches called haustra. During hastral churning, the walls contract and squeeze the contents into the next hastrum; however, there is a significant increase in movement of the large intestine after meals (Tortora and Derrickson 2009b). Large areas of the transverse colon contract at the same time, propelling faeces along most of the length of the large intestine and into the rectum within seconds. These contractions are called mass movements.

The presence of faeces in the rectum causes tension, leading to stimulation of stretch receptors which trigger the defecation reflex (Seeley et al 2007). This reflex causes the internal anal sphincter to relax and the rectum and sigmoid colon to contract forcibly. If the external anal sphincter also relaxes, then defecation takes place. Defecation can be prevented because the external anal sphincter is made up of skeletal muscle and is under voluntary control (Tortora and Derrickson 2009b). Although distension of the rectum produces the urge to defecate, if it is not appropriate at that time, the external sphincter can be voluntarily tightened so that defecation does not take place until a more suitable time. During the process of defecation, the abdominal muscles contract at the same time as a forcible expiration against a closed glottis, the Valsalva manoeuvre occurs accompanying voluntary straining movements. This results in an increased intra-abdominal pressure that helps to expel faeces (Sherwood 2013).

**Disorders of the digestive system**

There are several disorders that may affect the digestive system. This article focuses on gastro-oesophageal reflux disease and inflammatory bowel disease.

**Gastro-oesophageal reflux disease**

Gastro-oesophageal reflux disease is also known as GORD or GERD, dyspepsia, indigestion and heartburn (Stevens 2006). Many people in the UK experience dyspepsia or reflux-like symptoms annually, but not all episodes will be reported to a healthcare professional (NHS Choices 2012a). GORD has been defined as ‘a condition which develops when the reflux of stomach contents cause troublesome symptoms and/or complications’ (Richter 2007).

There are two common symptoms. The first is heartburn, characterised by a burning pain behind the sternum that may radiate into the jaw and around the ribs. The second symptom is regurgitation or reflux of acid into the throat (Selby 2010). Pain may occur before, during or after eating, and it may come in waves, may be constant and may worsen on lying down and cause nausea and vomiting.

GORD occurs when the acidic gastric contents reflux into the oesophagus. Normally, the lower oesophageal sphincter is closed to the backflow of gastric contents, but the sphincter can weaken as a result of ageing, increased pressure from the stomach because of a high body mass index, and delay in stomach emptying caused by a high fat diet (NHS Choices 2012b). Pain is caused by the reflux of gastric contents, which leads to mucosal damage to the oesophagus as a result of the acid nature of the stomach contents (Selby 2010). Other symptoms may include hoarseness, chronic laryngitis, sore throat, feeling a ‘lump in the throat’, asthma, chronic cough and dental erosions (Sveen 2009). Dental erosions can occur when stomach contents reflux into the oral cavity. There seems to be a link between asthma and GORD, the exact reason for this is unknown, but small amounts of stomach contents may be aspirated into the trachea causing inflammation and inducing asthma (Sveen 2009).

Many people link their symptoms to overeating and, therefore, they do not report their symptoms. However, they may not sleep well and they may avoid certain foods or activities that cause irritation or pain. Assessment of patients should include a history of symptoms and other symptoms should be checked for, including weight loss, dysphagia, presence of any abnormal masses in the abdomen, vomiting and iron deficiency anaemia, because these are red flag symptoms requiring further investigation (Fairclough and Silk 2009). There is no evidence to suggest that endoscopy is required if symptoms are benign although troublesome, and the National Institute for Health and Care Excellence (NICE) (2004) has produced guidance on the need for endoscopy. This guidance is reinforced by a report for the Scottish Intercollegiate Guidelines Network (SIGN) (2003).

Management of patients with GORD includes a review of medicines that can cause dyspepsia such as non-steroidal anti-inflammatory drugs and nitrates (NHS Choices 2012b). Advice should be given relating to lifestyle factors, including adoption of healthy eating, weight reduction and smoking cessation. Drug therapy should include either a one or two-month supply of a proton pump inhibitor (PPI) or testing for
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*Helicobacter pylori* and eradication therapy if it is confirmed as being present (NICE 2004). PPIs work by reducing the acidity produced in the stomach (Wood 2011) and include omeprazole and esomeprazole. SIGN (2003) recommends non-invasive faecal antigen testing to identify the presence of *H. pylori* and if present, this can be managed by a one-week course of a PPI and an antibiotic such as metronidazole. Antacids, alginites and anti-secretory medications may also be useful (NHS Choices 2012b), and advice should be provided on the avoidance of triggers.

**Inflammatory bowel disease**

The two forms of inflammatory bowel disease are Crohn’s disease and ulcerative colitis. The underlying cause of these conditions is unknown, but evidence suggests that inflammation is caused by bacteria (Pullen and Julian 2012). The risk factors for the disease include:

- Having a family history of inflammatory bowel disease.
- Age – any age group can be affected by inflammatory bowel disease, but there is an increased risk between the ages of 15-35 (Dettinger et al 2008) and 50-70 years (Boirivant and Cossu 2012).
- Urban areas – the prevalence is higher than in rural areas (Dettinger et al 2008).
- Lifestyle and environmental factors, including diet and exposure to industrial chemicals.
- Smoking has been linked to the development of Crohn’s disease (Pullen and Julian 2012). Although patients with Crohn’s disease and ulcerative colitis follow a pattern of exacerbations and remissions (Bodger 2011), the effects on the intestinal wall and, therefore, the presentation and management are different.

**Crohn’s disease**

Crohn’s disease can arise anywhere along the gastrointestinal tract. However, it most commonly affects the terminal ileum. The lining of the intestine develops ulcers, which is then replaced with scar tissue, causing the wall of the intestine to thicken and develop into fibrous tissue and causing a narrowing of the intestine lumen. The intestine becomes oedematous and skip lesions form. These problems can lead to a bowel perforation or obstruction as the lumen narrows if left untreated. As a result of the damage to the walls of the intestine, the ability of the intestine to absorb nutrients and fluids may be affected, leading to malnutrition and weight loss (Pullen and Julian 2012). The signs and symptoms of Crohn’s disease are dependent on where the disease occurs and include:

- Low grade pyrexia.
- Fever.
- Weight loss.
- Loss of energy.
- Up to ten bloody diarrhoea episodes daily (Pullen and Julian 2012).
- Development of a tender mass in the lower abdomen.
- Cramping in the right lower quadrant especially after a meal (Dettinger et al 2008).

Diagnosis is confirmed by history, physical examination, endoscopy, colonoscopy, and haematological, radiological and histological findings.

**Ulcerative colitis**

Ulcerative colitis affects the mucosa of the large intestine only and is limited to the colon and rectum, with continuous inflammation. The colon is red and oedematous and ulcers form on the mucosal lining, bleeding occurs and the lining becomes thickened, causing narrowing of the lumen of the intestine and shortening of the large intestine (Pullen and Julian 2012). The intestine can perforate and abscesses can form, and these changes can influence the elasticity of the intestine and its absorption of water and nutrients. The signs and symptoms of ulcerative colitis include (Boirivant and Cossu 2012):

- Abdominal pain that is relieved with bowel movements.
- Bloody diarrhoea and rectal bleeding.
- Passage of mucus or pus or both.
- Rectal urgency.
- Weight loss and fatigue.

Diagnosis is confirmed by history, endoscopy, barium enema and negative stool sample for infections.

**Nursing management of Crohn’s disease and ulcerative colitis**

Common to both conditions is the need to carry out an assessment of the frequency of bowel movements, overall nutritional and hydration status, and any signs of infection. Conservative management includes teaching patients about appropriate dietary choices, adhering to drug regimens and ensuring they replace any fluid losses. If the patient requires surgery, the nurse should provide emotional support to enable the individual to deal with any changes to body image.

Drug therapy aims to reduce inflammation and provide symptom relief. The drugs used to treat Crohn’s disease and ulcerative colitis have a number of different actions and include:

- Aminosalicylates – these are anti-inflammatory drugs that act on the digestive system. Mesalazine is used as a first-line treatment.
If mesalazine is not successful, a course of corticosteroids can be used in place of or along with mesalazine, although corticosteroids should not be administered for more than three months because of their potential side effects such as weight gain (Dettinger et al 2008), and their ability to suppress the immune system.

- Immune modifiers, such as azathioprine, can be used to reduce inflammation by suppressing the immune response.
- Antibiotics, such as metronidazole, may be necessary if there are any signs of infection related to fistulae, abscesses or medications that cause immunosuppression (Pullen and Julian 2012).
- Biological modifiers, such as infliximab, can be used to induce remission of the condition. If conservative therapy is unsuccessful and/or there are complications, surgery may be necessary. In patients with ulcerative colitis, a total colectomy is required and this will cure the disease. Crohn’s disease is incurable, therefore the goals of surgery are to manage symptoms and decrease complications. Bowel surgery consists of the removal of the affected area and rejoining the bowel. A temporary or permanent ileostomy may be performed, and patients need to be aware of watery stools, managing their ileostomy, replacing fluids, and monitoring fluid intake and output (Dettinger et al 2008).

**Conclusion**

This article introduces the reader to the anatomy and physiology of the digestive system, an understanding of which is essential to assisting patients with eating and drinking. Disorders of the digestive system are common and nurses in every sphere of practice will encounter patients with these conditions. By understanding the normal structure and function of the digestive system the nurse is better able to respond to patients experiencing digestive dysfunction NS.

**POINTS FOR PRACTICE**

- In your area of clinical practice, reflect on how the activities of eating and drinking might impinge on a patient’s overall wellbeing?
- How can bacteria from the large intestine be transferred to other parts of the body? What advice should patients be given to prevent such transfer?
- What are the side effects of long-term use of corticosteroids?

**GLOSSARY**

**Enzymes**

Specialised protein molecules that act as catalysts. Catalysts speed up specific chemical reactions without being changed or consumed during the reaction process.

**Fistula**

A passageway between two organs that do not normally connect.

**Plexus**

A complex network of nerves.

**References**


NHS Choices (2012a) *Indigestion*. tinyurl.com/9ua7z4n (Last accessed: January 24 2014.)


