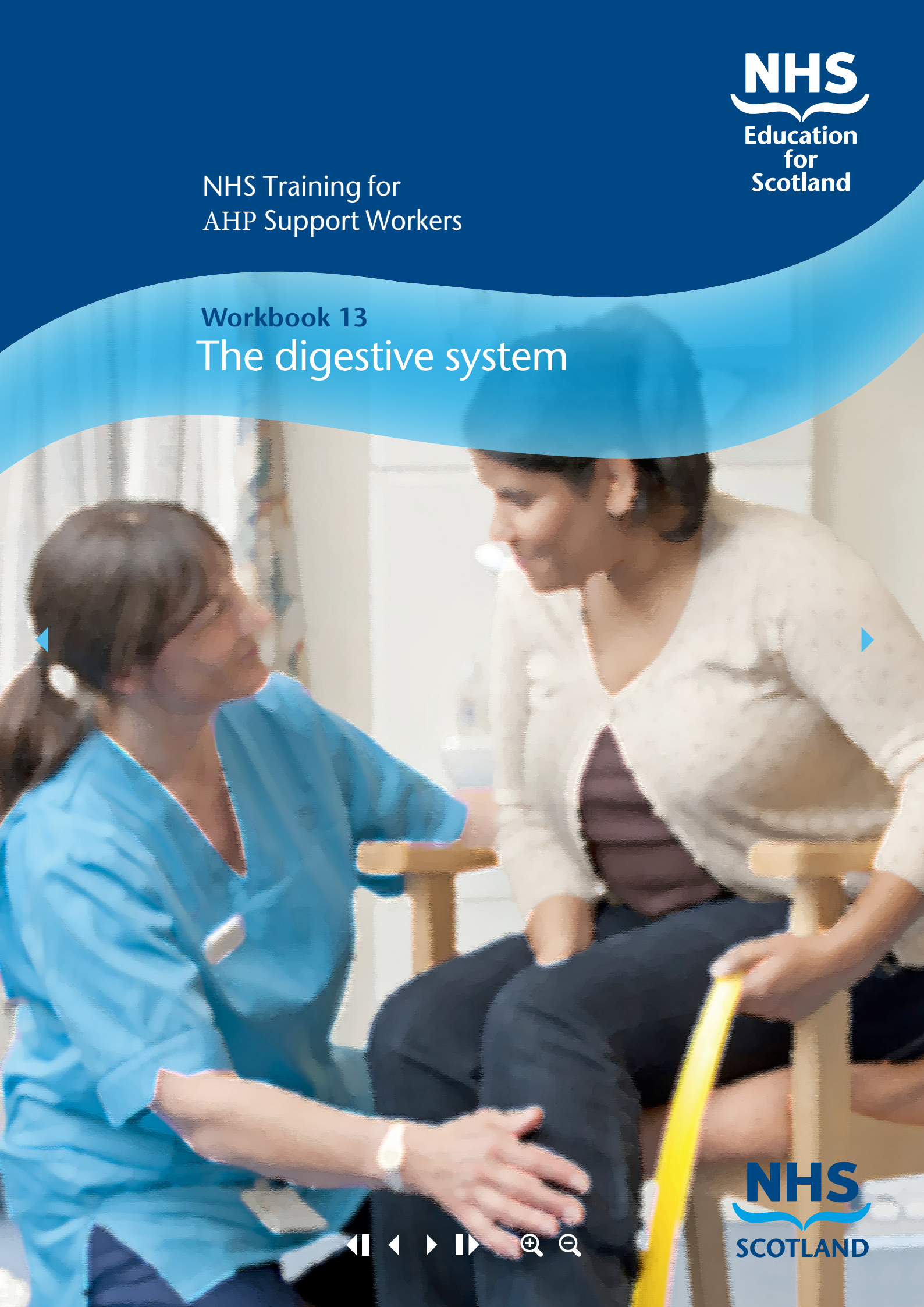
NHS Education for Scotland

NHS Training for
AHP Support Workers

Workbook 13

The digestive system



NHS SCOTLAND

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Workbook 13

The digestive system

13.1 Aim

The aim of this workbook is to introduce the Healthcare Support Worker (HCSW) to the structure and function of the digestive system.

13.2 Learning outcomes

By the end of this workbook you will be able to briefly describe the main functions of:

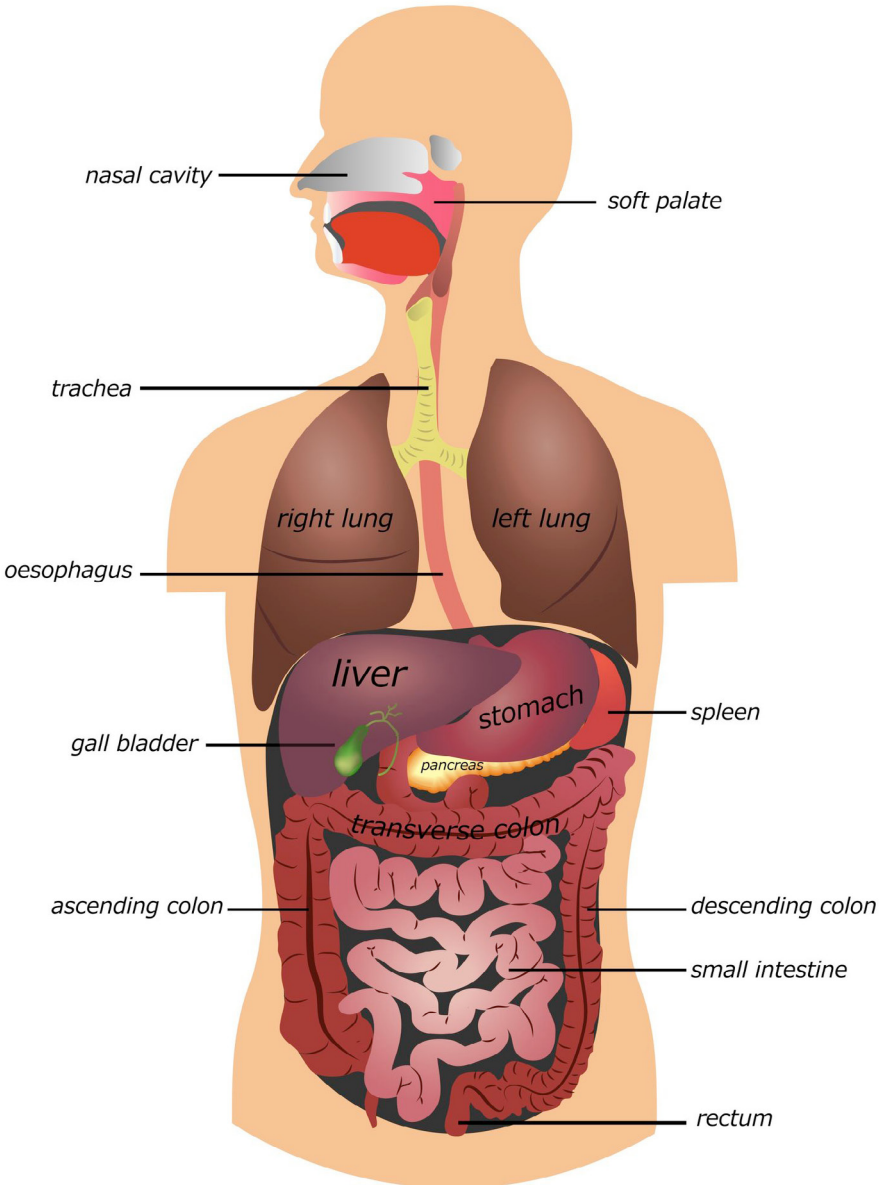
- The digestive system
- The liver
- The gall bladder
- The major endocrine glands
- The kidneys
- You will be able to describe the effects on a person of kidney failure and urinary tract infection.

13.3 Digestive system

The task of the digestive system is the physical and chemical breakdown of food.

Following ingestion, food and fluids are processed by the digestive organs, so that nutrients can be absorbed from the intestines and circulated around the body.

Any residue of food that is not digested is solidified and eliminated from the body in the form of faeces. Food is moved through the digestive tract by muscular contractions called **peristalsis**.



The liver

The liver is in the upper right part of the abdomen.

It has many functions which include:

- Storing glycogen (fuel for the body) which is made from sugars. When required, glycogen is broken down into glucose which is released into the bloodstream.
- Helping to process fats and proteins from digested food.
- Making proteins that are essential for blood to clot (clotting factors).
- Processing many medicines which you may take.
- Helping to remove or process alcohol, poisons and toxins from the body.
- Making bile which passes from the liver to the gut and helps to digest fats.

Some liver diseases and disorders:

- Alcoholic liver disease
- Hepatitis – inflammation of the liver
- Cirrhosis – caused by heavy drinking

The gall bladder

The gall bladder is a small pear-shaped organ on the underside of the liver that is used to store bile (see diagram). Bile is made in the liver and is stored in the gall bladder until it is needed to help the digestion of fat.

Cholecystectomy

This is removal of the gall bladder almost always because of the formation of gall stones and subsequent development of symptoms.

The appendix

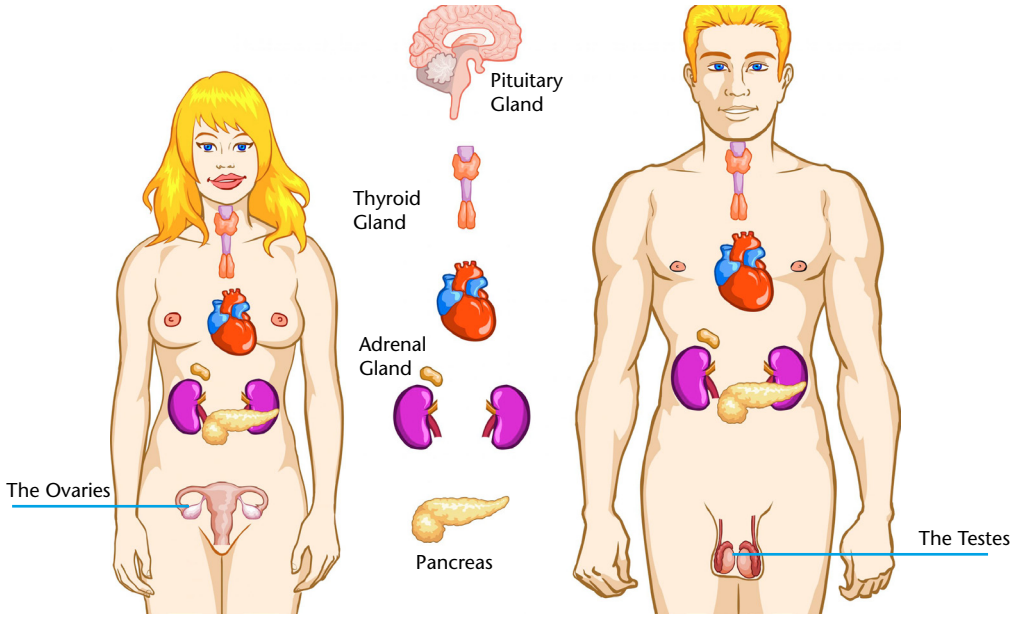
The appendix is a short, blind ended tube attached to the large intestine and has no known function.

13.4 The endocrine system

Major endocrine glands

The endocrine system consists of several glands that secrete hormones into the bloodstream. The pituitary gland is considered the 'master gland' of this system, mainly because some of the hormones it produces directly cause other glands to secrete their hormones.

The hormones produced by this system of glands help to control growth, development, mood and well being, metabolism and reproductive functions of the body. They can also affect skin colour, and the sense of smell and taste. So when a disorder occurs, there are a wide variety of possible side effects that might occur.



The pancreas
The pancreas secretes hormones that control glucose levels in the blood.

The thyroid gland
This gland controls metabolism, including the maintenance of body weight, the rate of energy use and heart rate.

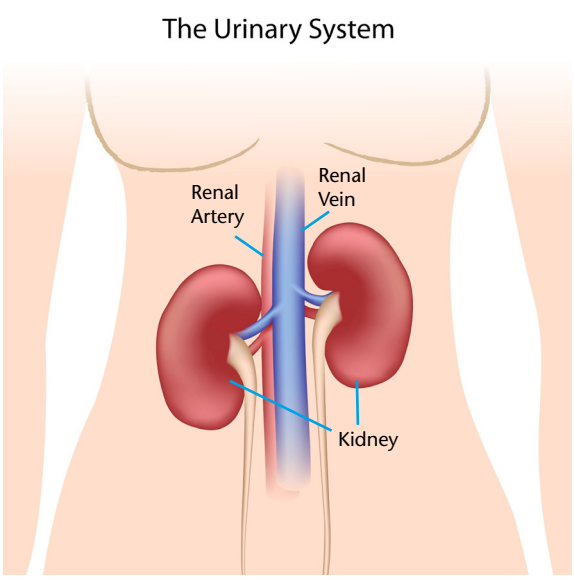
The ovaries
The two ovaries produce the female sex hormones progesterone and oestrogen.

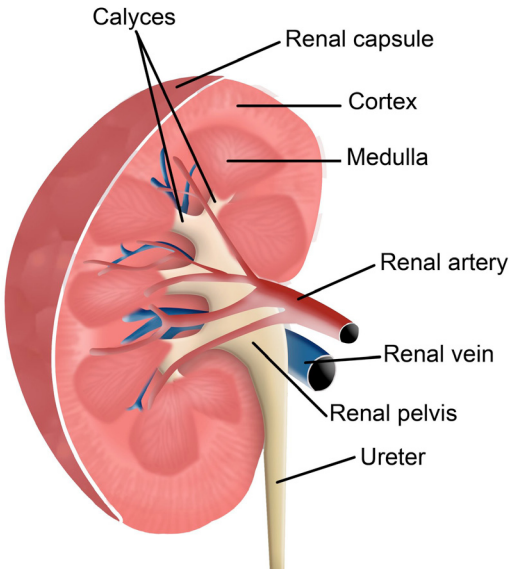
The testis
The male sex hormone testosterone that controls sperm production is released in the testis.

The adrenal gland
The adrenal gland on each kidney produces several hormones that influence the body's metabolism and response to stress.

13.5 The kidneys

The kidneys are found just under the ribcage above the small of your back. The blood arrives through the renal artery and leaves in the renal vein. The kidneys produce urine which is carried to the bladder along the ureter. The diagrams below show the structure of the kidneys.





Blood enters the kidney through the renal artery. The blood is filtered through the glomeruli to extract the nitrogenous waste products and excess water that make up urine. The urine flows through the ureter to the bladder; the cleaned blood then leaves the kidney via the renal vein.

The action of the kidneys is vital and so kidney failure is serious. However, if one kidney fails, the other enlarges to take over its function. A patient with two defective kidneys may still continue near-normal life with the aid of dialysis using a kidney machine or continuous ambulatory peritoneal dialysis (CAPD), or by a kidney transplant. Other diseases of the kidney can include the formation of kidney stones. These hard stones can build up as a result of high levels of blood calcium or high levels of uric acid, and can cause intense pain as they travel down the ureter, as well as causing bleeding in the tissues of the urinary tract.

Urinary tract infection

Urinary tract infection (UTI) is a common infection that usually occurs when bacteria enter the opening of the urethra and multiply in the urinary tract. The urinary tract includes the kidneys, ureters (tubes that carry urine from the kidneys to the bladder), bladder, and urethra (tube that carries urine from the bladder). The special connection of the ureters at the bladder help prevent urine from backing up into the kidneys, and the flow of urine through the urethra helps to eliminate bacteria. Men, women, and children can develop UTIs.

Types of UTIs

Urinary tract infections usually develop first in the lower urinary tract (urethra, bladder) and, if not treated, progress to the upper urinary tract (ureters, kidneys).

- Bladder infection (cystitis) is by far the most common UTI.
- Infection of the urethra is called urethritis.
- Kidney infection (pyelonephritis) requires urgent treatment and can lead to reduced kidney function and possibly even death in untreated, severe cases.
- Urinary catheterization (small tube inserted into the bladder through the urethra to drain urine) can also cause UTI by introducing bacteria into the urinary tract. The risk for developing a UTI increases when long-term catheterization is required.

Acute or sudden kidney failure occurs when the kidneys suddenly stop filtering the blood. The signs and symptoms may include:

- fluid retention
- bleeding, often in the stomach or intestines
- confusion
- seizures
- coma

Chronic kidney failure can lead to congestive heart failure, weak bones, stomach ulcers and damage to the central nervous system.

Signs and symptoms often do not appear until irreversible damage has occurred. They include:

- high blood pressure
- unexplained weight loss
- anaemia
- nausea and vomiting
- malaise or fatigue
- headaches
- reduced urine output
- muscle twitches and cramps

End-stage kidney disease

Patients whose kidney failure has progressed to the point that they cannot recover become extremely unwell. Often it is these patients that you will come across in hospital or in the community.

The effects of end-stage disease include:
- anaemia
- high blood pressure
- congestive cardiac failure
- bone disease
- digestive tract problems
- loss of mental functioning

These patients are often immobile and unwell, requiring frequent kidney dialysis to maintain removal of waste products. Sometimes, a kidney transplant is the only option to enable them to live a normal life.

Symptoms of **lower UTI** (for example, cystitis, urethritis) in adults include the following:
- back pain
- blood in the urine (hematuria)
- cloudy urine
- inability to urinate despite the urge
- fever
- frequent need to urinate
- painful urination (dysuria)
- confusion – this may be the only sign of infection in elderly patients

Symptoms that indicate **upper UTI** (for exampe, pyelonephritis) in adults include the following:
- chills
- high fever
- nausea
- pain below the ribs
- vomiting

Treatment

UTIs are treated with antibacterial drugs. The type of drug used and the duration of treatment depend on the type of bacteria.

Evidence

In your own words, briefly describe the function of:

The digestive system
The liver
The gall bladder
The major endocrine glands
The kidneys

Evidence

Briefly describe the effects on a patient of:

Urinary tract infection
Kidney failure

Evidence

If you have treated patients with kidney failure or urinary tract infection, describe the impact of the condition on what you were able to do with the patient.

Acknowledgements
NHS Tayside

13.6 The digestive system workbook completion

Your supervising physiotherapist will sign your portfolio to indicate that you have completed this workbook successfully.

Objective	Therapist's signature	Date
Describe the main function of the digestive system		
Describe the main functions of the liver and gall bladder		
Name the main endocrine glands in the body and their functions		
Describe the main functions of the kidneys		
Discuss the effects kidney failure may have on a patient		
Discuss the effects of a urinary tract infection and how this may influence your intervention with a patient		

Support worker (name)
Support worker's signature
Therapist (name)
Therapist's signature
Date

13.7 The digestive system reflection

Suggested KSF Dimensions: C2, HWB2
This form should be placed in the appropriate section of your portfolio.

What did you learn from this module?
How has this influenced your work?
Date module completed

NHS Education for Scotland

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