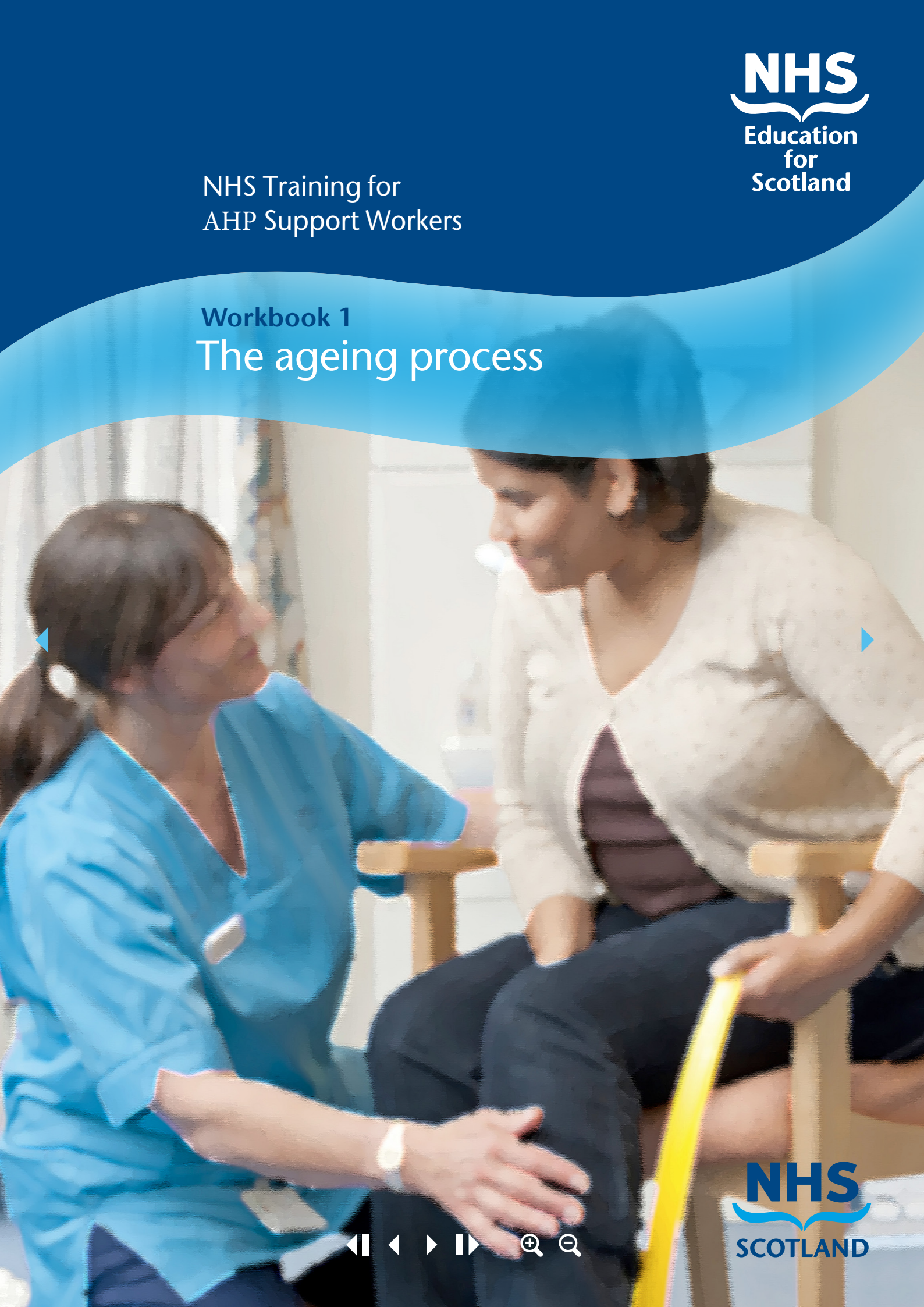
NHS Education for Scotland

NHS Training for
AHP Support Workers

Workbook 1

The ageing process



NHS SCOTLAND

Contents

Workbook 1

The ageing process

1.1 Aim

The aim of this training programme is to provide the Healthcare Support Worker (HCSW) with knowledge and understanding of how the ageing process affects the major systems of the body.

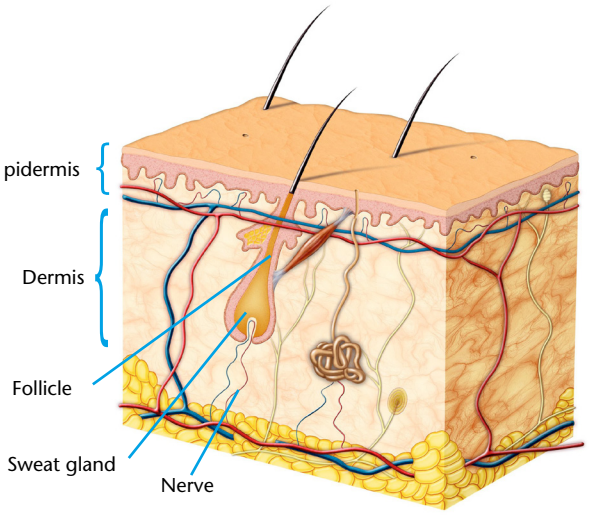
1.2 Learning outcomes

By the end of this workbook you will be able to:

- Describe how the normal ageing process affects the major systems of the body
- Discuss how the ageing process can affect patients attending treatment

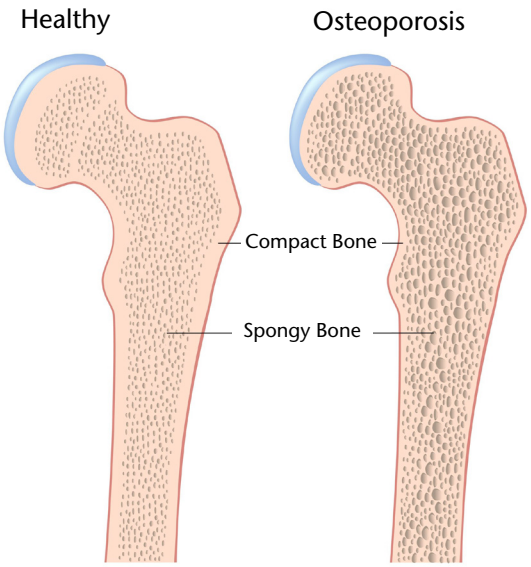
1.3 The ageing process

Ageing is a normal process which causes observable changes in structure and function. There is a decline in various physiological processes as a result of a decline in the processes of repair. This decline affects the major systems of the body.

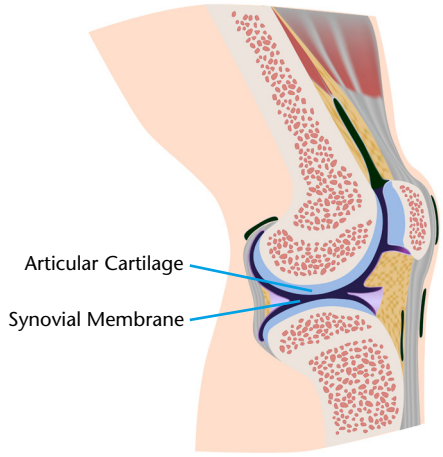


Skin
In an older person, the deep layers of the skin tissue have fewer cells. As a result, they lose flexibility and have less resilience. The skin becomes thinner and more fragile, and starts to wrinkle; the blood vessels in the skin are also less elastic, so that even minor injuries can cause bruising.

A thick top layer and many elastic fibres in the deeper layers help to maintain the smoothness of young skin. In older skin, a thinner outer layer and fewer elastic fibres cause the skin of the older person to look loose, with creases and wrinkles.



Skeletal system
From middle age onwards, bones start to lose density and become more brittle. By the time a person has reached the age of 70, skeletal density has often been reduced by about a third.



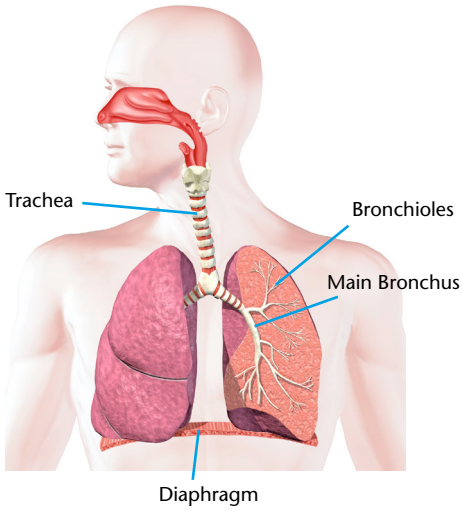
Articular system
Most of the age-related changes to joints are caused by lack of exercise. Cartilage does not have a blood supply and relies instead on synovial fluid moving in and out of the joint to nourish it and take away waste products. This requires joint movement and some joint stress.
A sedentary lifestyle causes the cartilage to shrink and stiffen, reducing joint mobility.

Muscular system
Muscle loses size and strength as we get older. This is caused by a number of actions working in combination, including:

- Individual muscle fibres shrink in size.
- Muscle fibres reduce in number.
- Lost muscle fibres are replaced by non-functioning fibrous tissue.
- The energy 'powerhouse' within each muscle cell, called the mitochondria, reduces its output.
- Enzyme changes within each muscle cell reduce the amount of available energy.
- The nerve impulses that control muscle cells are not transmitted as efficiently.

Muscle loss is a normal consequence of ageing. The average loss of strength in the front leg muscles of the upper thigh (the quadriceps) is about 20–40% by the time one reaches their seventies and eighties.

Respiratory system



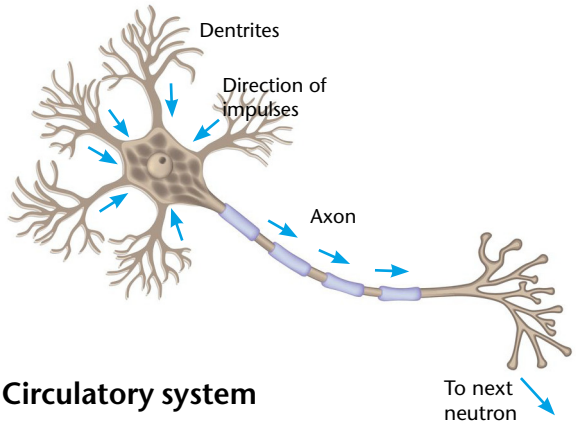
With ageing the:

- air sacs and tissues of the respiratory tract become less elastic and more rigid
- lungs become less elastic
- chest wall becomes more rigid

As a result there is a:

- decrease in pulmonary lung capacity
- reduction of vital capacity by 35% by age 70 (the maximum amount of air that can be exhaled from the lungs)
- decrease of oxygen levels in the blood

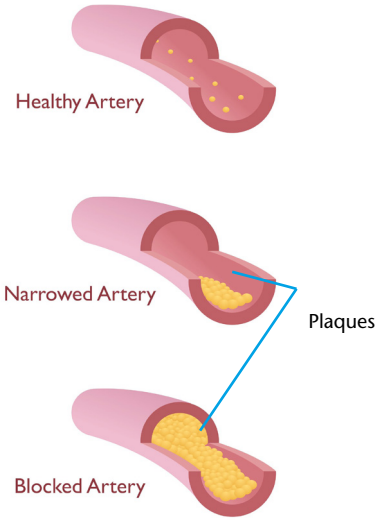
Nervous system



As we age neurons are lost, associated with this decline is:

- Decreased capacity for sending nerve impulses to and from the brain.
- The speed of impulses decreases.
- Voluntary motor movements slow down.
- Reflex time for skeletal muscles increases.
- Deep reflexes diminish.

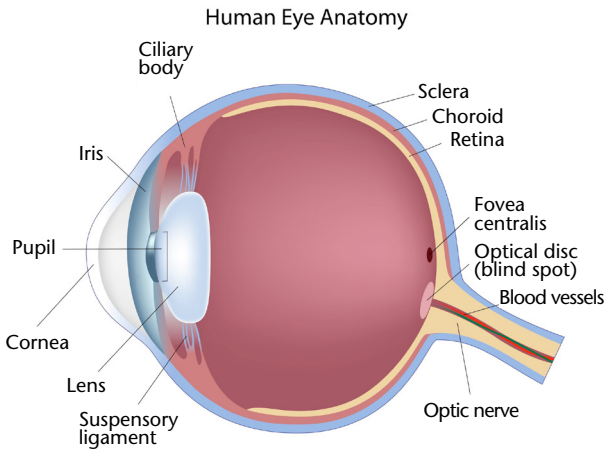
Circulatory system



In many older people, the internal lining of the arteries thickens with fatty deposits called plaques. These plaques may cause blood clots to form and restrict blood flow.

Narrowing of the arteries and a reduction of elasticity in blood vessels forces the heart to work harder; and, like all muscles, the heart becomes weaker and less efficient with age.

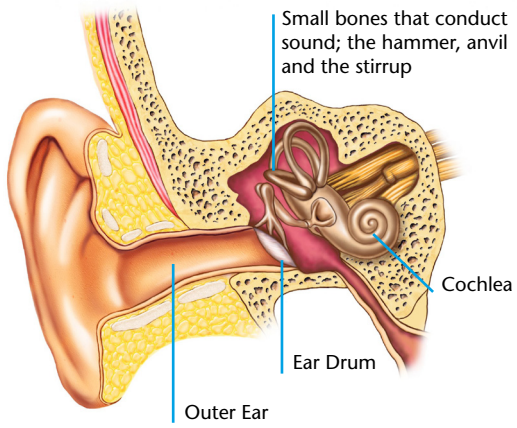
Impaired vision



With age, vision may become impaired by structural changes that affect the ability of the eyes to focus on nearby objects. Loss of the tissue elasticity can stiffen the lens of the eye so that it is unable to change shape and create a clear image on the retina.

Vision is also sometimes affected by degeneration of the central area of the retina or by the formation of a cataract (clouding of the lens).

Hearing loss



Ageing usually causes a loss of sensitivity to sounds, which may become duller or distorted so that speech becomes difficult to follow. High- pitched sounds are the first to become difficult to detect and eventually, all frequencies are affected.

Hearing loss in older people may be due to degeneration of the cochlea; repeated or prolonged exposure to loud noises hastens this deterioration.

Vestibular system

The vestibular system contributes to maintaining our balance and spatial orientation. Part of this system includes the labyrinth of the inner ear.

The number of nerve cells in the vestibular system grows smaller with age, beginning at about age 55. The loss becomes more severe as ageing progresses.

1.4 Decline of body organs

In young people, organs such as the liver and the kidneys have a greater functional capacity than the body needs; they can sometimes compensate for damage due to disease. With age, these organs become less efficient and even a minor illness may cause them to fail.

Some decline in liver function is normal with increasing age. Deterioration may be greatly accelerated by damage from alcohol or chronic infection. By the age of 70, kidney function has usually declined to about 50% of its efficiency at the age of 40. The decline continues and accelerates in old age.

Memory loss, dementia and ageing

Memory loss is common in ageing, but there is a difference between normal forgetfulness and dementia. In your work as a support worker you may come across people with dementia. It is important therefore to understand the effects of dementia on performance of everyday tasks.

Normal forgetfulness
As we get older, the most common change that we complain about is memory change. Memory change associated with healthy ageing does not interfere with everyday life in any dramatic way. Everyone is different, and the effect of getting older on memory is different for each person.

Recent research indicates that getting older has an impact on attention processes, our ability to get new information into storage, recall time and on 'tip of the tongue' experience.

Recent research suggests that immediate memory and lifetime memory do not change as we get older. One of the main symptoms of dementia is memory loss.

Dementia
We all forget things from time to time, but the loss of memory with dementia is different. It is persistent and progressive, not just occasional. It may result in the person losing a job. It may mean forgetting to light the gas. It may mean not being able to find the way home. Eventually, it may mean forgetting how to dress or how to bathe.

An example of normal forgetfulness is walking into the kitchen and forgetting what you went in there for, or misplacing the car keys. The person with dementia, however, may lose the car keys and then forget what they are used for.

A huge range of abilities exists across the general population. Every single individual experiences variations in memory over the course of a lifetime. Just as certain people have a talent for music and others do not, some of us are naturally gifted at various types of remembering.

Dementia causes progressive and consistent memory loss. Memory loss with dementia is persistent and progressive, not just occasional.

Memory loss may progress as follows:

- **Events** may forget part or all of an event and memory may sometimes be vague.
- **Words or names** progressively forgets words and names of people and things; words or names are on the tip of the tongue.
- **Written and verbal directions** progressively loses ability to follow directions.
- **Stories on TV, in movies or books** progressively loses ability to follow stories.
- **Stored knowledge** over time loses known information such as historical or political information. While recall may be slower, information is essentially retained.
- **Everyday skills** may progressively lose capacity to perform tasks such as dressing and cooking.

Evidence

Describe in your own words the effects of normal ageing on the various systems of the body. Give an example of how these changes would affect/contribute to injury.

Skeletal system
Muscular system
Circulatory system
Respiratory system
Vestibular system
Nervous system
Memory

Acknowledgements *NHS Tayside*

1.5 The ageing process workbook completion

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

Objective	Therapist's signature	Date
Describe how ageing affects the major systems of the body		
Discuss how ageing affects conditions commonly seen in physiotherapy		

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

1.6 The ageing process reflection

Suggested KSF Dimensions: C2, HWB2, HWB7
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

in association with CHARTERED SOCIETY OF PHYSIOTHERAPY

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