



Study/Facilitation Notes for Back Care & Bone Health

The NCEF in Association with the IHF

Fit For Life Lifestyle Management Specialist Module

This Module is accredited by the University of Limerick and carries 15 ECTC Credits



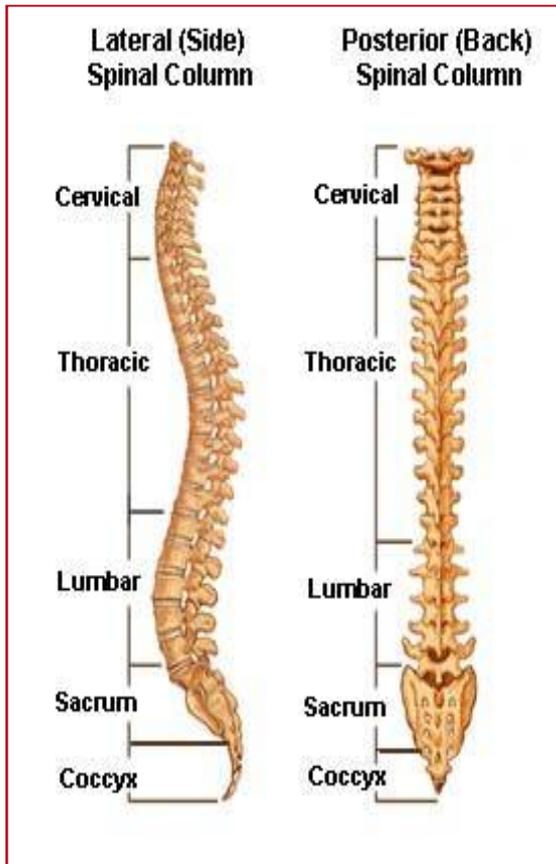
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Learning Outcomes for this unit:

- Describe the structure of the spine
- List the Risk Factors for back pain
- Describe common causes of back pain
- Describe good posture
- Outline methods for the prevention of back pain
- Describe appropriate exercise for back pain sufferers
- Define osteoporosis
- Discuss its stages
- Discuss exercise prescription for strengthening bones
- Participate in short activity session
- View sample session plan and supporting materials

Session outline:

- How does the spine work?
- Identify types of back problems
- Identify the risk factors that influence back problems
- Preventing back pain
- Osteoporosis and its effects
- Exercises for strengthening bones
- Activity session



Structure of the Spine

Good Posture

- Neutral alignment that requires the minimum amount of effort for your body to maintain.
- How is your posture?
- Posture check

Viewed from the side, a plumb line would pass:

- through the mid-line of the ear
- through the centre of the shoulder
- through the centre of the hip joint
- just behind the kneecap
- just in front of the ankle joint

How many people do you know suffering from back pain?

What is the most common type?

Caused by?

Risk Factors for Back Pain

- Overweight
- Frequent bending over (and poor alignment)
- Lack of flexibility in lower back and upper thigh muscles
- Weak trunk muscles – “core” muscles
- Trunk muscle imbalance
- Age
- Osteoporosis
- Previous back problems
- Sport (if repetitive or high intensity)
- Poor posture or postural imbalances
- Incorrect exercise technique
- Lifestyle – work/home/family
- Improper lifting technique
- Poor fitness levels
- Overuse
- Poor footwear
- Foot alignment

Types of Back Problems

The term sciatica describes the symptoms of leg pain and possibly tingling, numbness or weakness that travels from the low back through the buttock and down the large sciatic nerve in the back of the leg. The vast majority of people who experience sciatica get better with time (usually a few weeks or months) and find pain relief with non-surgical treatment. For others, however, sciatica can be severe and debilitating.

The clinical diagnosis of sciatica is referred to as a "radiculopathy", which means simply that a disc has protruded from its normal position in the vertebral column and is putting pressure on the radicular nerve (nerve root) in the lower back, which forms part of the sciatic nerve.

An important thing to understand is that sciatica is a symptom of a problem—of something compressing or irritating the nerve roots that comprise the sciatic nerve— rather than a medical diagnosis or medical disorder in and of itself. This is an important distinction because it is the underlying diagnosis (vs. the symptoms of sciatica) that often needs to be treated in order to relieve sciatic nerve pain. Common causes of sciatica are a lumbar herniated disc, spinal stenosis or degenerative disc disease

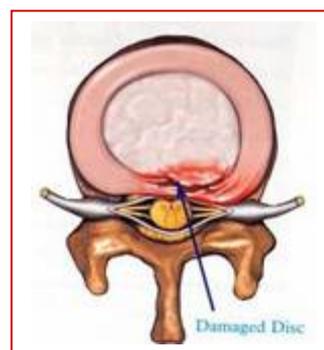
Sciatica occurs most frequently in people between 30 and 50 years of age. Often a particular event or injury does not cause sciatica, but rather it tends to develop as a result of general wear and tear on the structures of the lower spine.

Ref:(www.spine-health.com)

Sciatica Symptoms

For some people, the pain from sciatica can be severe and debilitating. For others, the pain might be infrequent and irritating, but has the potential to get worse.

While sciatica can be very painful, it is rare that permanent nerve damage (tissue damage) will result. Most sciatica pain syndromes result from inflammation and will get better within two weeks to a few months. Also, because the spinal cord is not present in the lower (lumbar) spine, a herniated disc in this area of the anatomy does not present a danger of paralysis.



Other Types of Back Problems

- Wear and Tear – Arthritis/degenerative disease
- Strained muscles due to a sudden or unexpected movement
- Muscles are more easily strained if fitness is poor
- Muscles not warmed up before exercise or if fatigued
- Strained ligaments – injured when joint is stretched to its limit and held there too long, or repeated too often

Prevention of Back Pain

- Standing Posture – low-heeled shoes
- Use ledge to relieve stress on back
- Work surfaces at correct height
- Seated posture – sit with knees higher than hips
- Use foot rest
- Stand with weight equally on both legs
- If standing for prolonged periods, keep moving from foot to foot, do not remain on one leg only or stand with hip thrown out
- Have a chair that supports lower back
- Adjust monitor height if necessary
- Have orthopaedic bed
- Bend knees
- Have supportive pillow
- Lifting – 3Bs
- Footwear while exercising
- Exercise technique
- Exercise intensity



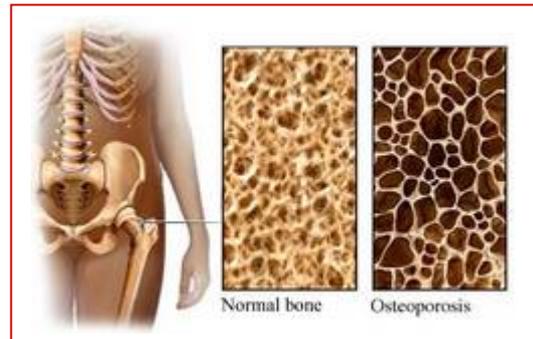
Osteoporosis – “silent” disease

One in two women and one in 5 men will have an osteoporosis-related fracture in their lifetime (NOF)

Osteoporosis is characterised by a low bone mass and deterioration of the bone tissue.

The disease drains the bones of their mineral content (calcium and phosphate) and increases their susceptibility to fractures.

In healthy individuals bone eroding cells called “osteoclasts” are constantly being removed from bone tissue while new bone cells called “osteoblasts” are being made. If the delicate balance between bone formation and resorption is altered and more bone is lost than formed, osteoporosis will occur



In healthy individuals, old bone tissue is constantly being replaced with new

Osteoporosis can occur when bone tissue is broken down and not replaced

Determinants of Bone Health

- While genetic factors play a significant role in determining bone mass, controllable lifestyle factors such as diet and physical activity can mean the difference between a frail and strong skeleton.
- Adolescence is a particularly critical period for developing Peak Bone Mass (defined as the maximum bone density an individual will ever have, is usually reached between ages 18 and 25) because the velocity of bone growth doubles and approximately 40% of the peak bone mass is laid down. At the end of puberty the epiphyses - places where bone is first laid down during growth, especially at the ends of long bones- fuse, and linear growth stops. However, bone mass continues to increase and by the age of about 20, 90- 95% of peak bone mass is attained.
- Physical activity is important for bone health throughout life. It helps to increase or preserve bone mass and to reduce the risk of falling. All types of physical activity can contribute to bone health, albeit in different ways.
- Maintaining a healthy body weight is important for bone health throughout life. Being underweight raises the risk of fracture and bone loss. Weight loss is associated with bone loss as well, although adequate diet and physical activity may reduce this loss.

- Amenorrhea (cessation of menstrual periods) after the onset of puberty and before menopause is a very serious threat to bone health and needs to be attended to by individuals and their health care providers.
- Smoking can reduce bone mass and increase fracture risk and should be avoided for a variety of health reasons. Heavy alcohol use has been associated with reduced bone mass and increased fracture risk.

source: www.surgeongeneral.gov/library/bonehealth

- Rate of bone lost with advancing age, menopausal period being a time of considerable concern for women. During the perimenopausal period osteoporosis affects mainly the spongy bone which predisposes it to compression fractures of the vertebrae and also fractures of the wrist after a fall.
- In older adults there is a progressive loss of both spongy bone and compact bone which predisposes to hip fractures (Spiriduso, Francis & McRae, 2005) Calcium plays an important role in maintaining bone. Calcium alone cannot prevent or cure osteoporosis, but it is an important part of an overall prevention or treatment program.
- One way to increase the amount of calcium in your diet is to eat calcium-rich foods like low-fat milk, cheese, broccoli and others.
- While osteoporosis is a disease primarily associated with older people, the results of a new study indicate that efforts to prevent it should actually start before puberty.

Exercise for Bone Health

- Bones will only build where stimulated by stress of overload, ie an increase of effort.
- Walking is ineffective as a bone-building stimulus
- However adding impact e.g. walking faster/jogging/skipping/Irish dancing will increase strain/stress on bones
- Resistance work: using muscles helps to stimulate bone growth - body resistance, elastic resistance, etc

Exercise Programming

- Mechanical stress must be applied to those areas where osteoporotic fractures occur
- Principle of specificity - bone only responds at the site where mechanical stress is placed(Lanyon, 1992)
- Principle of overload
- Principle of reversibility
- Include exercises that improve “core” strength and trunk stability
- Focus on using good posture while standing/walking/working
- Make sure to balance your activities – avoid too much repetition in any one area
- Include flexibility for functional independence and improved posture

The FITT Principle

Clients on preventive programme and those with osteopenia can follow the ACSM Guidelines (2012)

CV

- F - 3-5 days per week
- I - Moderate to high
- T - 20-60 minutes. Sedentary or older adults may need to begin with a 10 minute exercise session and gradually increase time as their CV endurance improves.
- T - Walking is ineffective as a bone-building stimulus
However adding impact e.g. walking faster/jogging/skipping/Irish dancing will increase strain/stress on bones

Those diagnosed with Osteoporosis may have to sit for CV exercise

LME

Clients on a preventative program can follow the exercise guidelines for general population:

- F - 3-5 times per week
 - I - 40-50% of 1RM
 - T - as long as it takes to complete 10-15 reps
 - T - Resistance training, circuits, body conditioning etc
- Include exercise to strengthen muscles of the back, arms, shoulders, trunk and hips.
Muscle strengthening exercises will decrease the risk of falls and fractures

For those with diagnosed osteoporosis the following guidelines may be followed (ACSM 2012)

- F - 2-3 days per week.
 - I - Body Weight. Additional resistance may be applied conservatively using a weighted vest (up to 10lbs)
 - T - 5-8 reps, 1-3 sets
 - T - 4-6 weight bearing, lower body strength exercises. Dynabands may be used to facilitate range of motion exercises .
- Radius (forearm): sponge ball squeezing, press ups (wall/floor)
Hips: abduction/adduction with dynabands/ankle weights, squats, leg press
Back: Focus on posture
Rhomboids/traps, lats, erector spinae and abdominals (stability work)

Balance Work

- Many medications affect balance and increase the risk of falling for older adults.
- Balance work using a chair or bar for support eg. one legged standing
- Other forms include Tai chi, step (slow tempo), walking along a line

Contra-indicated exercises if diagnosed with osteoporosis

- Forward spinal flexion and spinal rotation
- Avoid side bending,
- Abdominal work in supine position
- Pilates/yoga exercises in supine position or with spinal rotation
- High Impact exercises

Questions?

Conclusion

- Identify any risk factors for back problems that you may face (identify possible causes).
- Identify lifestyle changes that could help alleviate or prevent back pain.
- Commit to performing suitable exercises to strengthen bones & improve posture – Back Care Mini Plan

Resources

The Back Care Book - a guide to keeping your back healthy. Available on <https://www.healthpromotion.ie/hp-files/docs/HPM00207.pdf>