Welcome to your advanced Fitness Pilates certification for Orthopaedic Conditions.

We are so pleased that you have chosen to upskill your knowledge and take your teaching to this advanced level with us.

This course will provide you with a thorough understanding of the most common orthopaedic conditions including osteoporosis, arthritis and back pain. It will also equip you with the knowledge and skills to adapt and modify the original mat Fitness Pilates exercises, providing you with a process to assist in the prevention, rehabilitation and management of some of the most common orthopaedic conditions.

It is vital that you understand that as a Fitness Pilates instructor, no matter what level of training you have had, you are not qualified to diagnose a condition and clients must always get correct diagnosis for their G.P. or Physiotherapists. You will be required to work alongside these professionals and gain knowledge from their diagnosis with your client.

Always make sure that clients have been cleared to exercise with you and offer 1-2-1 or small group sessions with clients who have similar conditions first before you allow these clients to participate in your mainstream classes. It will require a considerable amount of flexibility and patience to achieve long-term sustainable results and a degree of self-questioning to ensure you are highly effective in the services you provide and your interactions with others.

What you receive from this Advanced Certification Course –

- One live contact day which includes In-depth information, analysis and solutions on common Orthopaedic conditions that you are faced with every time you teach Fitness Pilates
- Fully in depth training manual including advanced Anatomy & Physiology relating to each Orthopaedic condition
- Online learning portal which includes videos on Improved Biomechanics and Functional Movement & pain management through movement techniques as well as ‘Do’s and Don’ts’ Fitness Pilates exercises for each condition.
- 10 min skype or telephone call with your tutor to aid your completion of this course
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Assessment Criteria

In order to successfully achieve your Fitness Pilates for Orthopaedic conditions certification you will be required to complete the following -

Gain full marks on the open book exam paper - this paper consists of 40 multiple choice questions

Submit a detailed case study for two clients with One different condition from the following List -
Sciatica
Arthritis
Hypermobility
Rotator Cuff injury
Osteoporosis
Hip or knee replacements
Non specific lower back disorders
Herniated Disc
Pyriformis syndrome
Tennis or golfer elbow
Trochanteric bursitis of the hip,
Meniscal tears
Ligament injuries in the knee

Your case study should include -
Detailed health consultation
Detailed description of clients condition
1x detailed pilates class plan per client including warm up, 6 main exercises & stretch exercise showing progressions to be made on main moves after 4 -6 weeks of progress (So you will complete two if these as you are case studying two clients)
Detailed evaluation explaining the choices you have made for your two clients

You are required to complete all parts of the assessment within 4 months from the contact day. If an extension is required, then this is chargeable at £15 per month.

If your case study refers within the 4 month deadline then reattempts are free of charge, if the learner refers outside of the 4 month deadline then a £25 resubmission fee is in place.
Arthritis

The term arthritis means inflammation of one or more of the joints. There are more than 100 different forms of arthritis. In this lesson we’ll look at the two most common forms which are osteoarthritis and rheumatoid arthritis.

Arthritis is a very common condition and a leading cause of disability affecting approximately 10 million people in the UK alone.

Symptoms: The main symptoms of arthritis include, pain, stiffness, restricted movement of the joints, inflammation and swelling, and warmth and redness of the skin over the joint. It can also result in muscle weakness and fatigue.

What is osteoarthritis?

Osteoarthritis is a progressive, degenerative disease of the synovial joints in which the articular cartilage becomes pitted, rough and brittle and is gradually lost.

Underlying bone thickens and broadens: As the cartilage deteriorates, the underlying bone thickens and broadens to reduce the load on the cartilage.
Bony spurs are formed: The ends of the bones become exposed and bony spurs are formed at the outer edges of the joint.

Knobbly joint: This gives the joint a knobbly appearance and reduces the cavity in the joint space, which restricts joint movement.

More about osteoarthritis

The synovial membrane and joint capsule can also thicken causing the space inside the joint to get narrower. This leads to the joint becoming stiff, painful to move and sometimes inflamed. Sometimes part of the cartilage can break away from the bone leaving the bone ends exposed. These may then rub against each other causing the ligaments to become strained and weakened. This results in a lot of pain and changes the shape of the joint.

Osteoarthritis typically affects the knees, hips, feet, spine and hands.

Causes of osteoarthritis

Although the precise cause of osteoarthritis is unclear there are a number of factors which contribute to its development. These allow it to be categorised into two basic types:

1. Primary osteoarthritis
2. Secondary osteoarthritis
What is the difference between primary and secondary osteoarthritis?

- Primary osteoarthritis is associated with the normal wear and tear of ageing.
- Secondary osteoarthritis is associated with injury, obesity, heredity or other causes.

Which age group is most affected?

Although osteoarthritis can develop at any time, age tends to be the strongest predictor of osteoarthritis as it usually develops in people over 50 years of age.

Can younger people be affected too?

Yes, younger people can also be affected by osteoarthritis, often as a result of an injury or other joint condition.

Does it affect both men and women to the same extent?

No, osteoarthritis is more common among women than men.

Severity and consequences

Rheumatoid arthritis is the second most common form of arthritis.

Severity: Rheumatoid arthritis is more severe but less common than osteoarthritis and affects around 400,000 people in the UK.

Consequences: Within 10 years of the onset of rheumatoid arthritis, at least 50% of patients in developed countries are unable to hold down a full-time job.

Your Notes:
What is rheumatoid arthritis?

Rheumatoid arthritis is an autoimmune disease in which the body’s immune system attacks its own tissue. The affected tissue in this case is the cartilage and the synovial membranes of the joints.

Rheumatoid arthritis is characterised by inflammation of the joints which causes swelling, pain and loss of function.

Inflammation of the synovial membrane: The primary symptom of rheumatoid arthritis is inflammation of the synovial membrane. If ignored or left untreated, the synovial membrane thickens, leading to an accumulation of fluid. The increased pressure within the joint leads to pain, discomfort and localised tenderness.

Granulation tissue: The synovial membrane will then start to produce an abnormal granulation tissue called pannus.

This sticks to the joint’s surface and will start to erode the cartilage, sometimes completely.
Immovable joint: When the cartilage has been destroyed, fibrous tissue joins the exposed bone ends. The fibrous tissue then ossifies, creating an immovable joint.

Distortion of the fingers: It’s the growth of the granulation tissue that leads to the distortion of the fingers that is commonly seen in people with rheumatoid arthritis.

**Joints affected**

A major distinction between the two main types of arthritis is that rheumatoid arthritis first affects the small joints, whereas osteoarthritis first affects the large joints. Rheumatoid arthritis initially affects the joints of the fingers, wrists, feet and ankles.

It may progress to the hips, knees, shoulders and neck. It primarily affects the skeletal system bilaterally or symmetrically. For example if rheumatoid arthritis starts to affect the right wrist, it’s more than likely to affect the left wrist at some stage too, but not necessarily to the same degree.

**Progression of rheumatoid arthritis**

As rheumatoid arthritis progresses, the ligaments supporting the joints are damaged and the tendon sheaths can also be affected, leading to rupture of the tendon. The inflammation can also affect the bursae.

The condition may resolve spontaneously, but tends to progress steadily with periods of relapse and remission. It may eventually burn itself out, leaving severely deformed joints.

**Signs and symptoms of rheumatoid arthritis**

As we have seen, the main symptoms of rheumatoid arthritis are swollen, stiff and painful joints. These usually vary over time.

Some symptoms only cause me mild discomfort

Some clients get a ‘flare-up’ or ‘flare’ when symptoms are really bad. It’s impossible to predict when they’re going to happen which makes this really difficult to live with for a lot of people. They can last anywhere from a couple of days to a few weeks.

**Causes of rheumatoid arthritis**

Although the precise cause of rheumatoid arthritis is not understood, it is associated with higher than normal levels of the antibody rheumatoid factor and so is referred to as an autoimmune disease.
What happens to the immune system?

The immune system sends antibodies to the lining of the joints where instead of attacking harmful bacteria, they attack the tissue surrounding the joint.

Which age group is most affected?

Although it can occur at any age, it’s most common between the ages of 30 and 50.

Does it affect men and women to the same extent?

No, women are three times more likely to be affected by the condition than men. This may be due to the effects of oestrogen which research has suggested could be involved in the development and progression of the condition.

Is there anything else that can cause the disease?

Viruses and bacteria may also be involved in the development of rheumatoid arthritis although research is not yet conclusive. A predisposition for developing rheumatoid arthritis can also be genetically inherited.

Treatment and management of arthritis

There is no cure for arthritis, but there are a number of treatments and lifestyle changes that may help to slow the progress of the disease and manage its symptoms.

Medication: Medication for arthritis may include non-steroidal anti-inflammatory drugs and pain relieving drugs.

Self-management: Joint protection measures, exercise, and education for self-management are essential components of a comprehensive management programme.

The goals are to:

- Decrease impairment
- Maintain or restore function
- Protect joint structures from further damage and
- Maintain healthy levels of physical activity

Multi-disciplinary approach: The comprehensive management of arthritis is often multi-disciplinary. It can involve GPs, rheumatologists, physiotherapists, occupational therapists and exercise professionals.

If joints become severely damaged, then surgeons may also become involved to replace them.
Exercise and Arthritis

Clients with arthritis are often reluctant to exercise thinking it will damage their joints further. However, joints are designed to be moved and so, in reality, inactivity can be more problematic as it will cause the muscles and surrounding tissues to become weak.

Benefits of exercise:

- Improve muscle strength and endurance
- Reduce stiffness and improve flexibility
- Reduce pain
- Manage body weight which, in turn, can reduce the stress placed on joints
- Improve balance and proprioception and
- Improve well-being

Types of exercise:

Clients with arthritis are recommended to take part in regular exercise and are advised to include general physical activity such as walking, cycling, swimming and strengthening and stretching exercises specific to the affected joints.

Fitness Pilates exercises for Arthritis -

The hip and knee are the most commonly affected sites. Here are some preparatory Pilates exercises that will specifically help to strengthen, stretch and mobilise the hip and knee joints.

Stretches for the hamstrings, hip flexors, quads, abductors, adductors, glutes, and calves are also suitable.

Your Notes -

- Knee Drop
- Leg Slide
• Scissors
• Swimming - prone and 4-point kneeling
• Swim leg - single and double
• Hamstring Curls (as in adapted One Leg Kick with the chest on floor, a slow speed and without a pulse)
• Shoulder Bridge
• Glute Strengthener with bent knee
• Side Lying Series
• Table Top Tap downs
• One Leg Circle

Considerations when planning the class

This section focuses on exercise considerations for the hip and the knee joints. This is because these are the most commonly affected joints you will come across and are the joints most exercised in Fitness Pilates. However, the principles outlined can be applied to other joints.

Consult their GP: As a Fitness Pilates instructor you should be guided by your client’s health professional and avoid exercises that are painful or aggravate symptoms.
Clients should consult their GP prior to taking part in an exercise programme and you need to follow any guidelines provided by their health professional which may differ from the recommendations given in certification.

Use props: You must be aware of the extent of your client’s pain and disability. Exercises will need to be modified to account for this and you will need to use props such as Pilates pillows, yoga blocks and towels to create comfortable, correctly aligned start positions.

Adapt exercises: Painful joints may prevent a client from adopting certain positions. For example, 4-point kneeling may be inappropriate for clients with arthritis in the knees, wrists or hands. This will impact on a number of exercises such as Push Up, Leg Pull, Cat Stretch and Swimming. You’ll need to adapt these exercises to prone lying or give an alternative.

Advice on progressions: Progression of the exercises and whether your client is ready to perform the other Fitness Pilates exercises in the original mat repertoire will depend on:

- Their ability to maintain correct alignment
- Their ability to perform the exercises with good core strength and stability
- Pain and movement limitations, and
- Guidelines provided by their health professional

Other exercise considerations

Here are some other exercise considerations when working with arthritic clients.

Progressive warm up: Start with an appropriate warm up of smaller range movements and ease into the main exercises gently, increasing range of movement and intensity gradually.

Increase range of movement: Gradually progress range of movement to work up to the client’s normal pain-free range.

Use warm-up moves that create a rehearsal effect for the main exercises to follow. For example - circle the leg on the floor in preparation for 1 Leg Circle in the main session.

Avoid painful movements: Avoid painful movement and pain above the client’s normal joint pain.

Stop if swelling develops: The client should stop exercising if swelling or heat develops.
No pain two hours post-exercise: Clients may experience some post-exercise discomfort which is normal. However if this lasts for more than two hours then it is a good indication that they are trying to do too much.

Don’t exercise on swollen or painful joints: Clients with rheumatoid arthritis should not exercise swollen or sore joints. They should seek their GP’s advice on exercising during a flare-up, though generally clients listen to their own body and can keep doing gentle mobility exercise. They should also avoid overexertion and becoming fatigued.

Exercise in the morning: Many clients with osteoarthritis and rheumatoid arthritis are at their least painful in the morning after they have moved around a little and so would benefit from exercising at this time if possible.

Seek medical advice: If a client experiences new pain or if you are unsure, refer them for medical advice.

The Shoulder and its conditions

The shoulder girdle: The shoulder girdle consists of the scapula and clavicle which generally move as a unit. It does not have a direct attachment to the vertebral column. The only link to the axial skeleton is via the sternoclavicular joint.

The clavicle articulates with the scapula via the acromioclavicular joint.

The shoulder joint: The humerus joins the scapula at the shoulder or glenohumeral joint. This is a ball and socket joint formed by the articulation of the head of the humerus and the glenoid cavity of the scapula.

Shoulder movement: The wide range of movement available at the shoulder complex is made possible by the combination of the mobility of the three interdependent joints, that is:

• The Sternoclavicular joint
• The Acromioclavicular joint and
• The Glenohumeral joint
The shoulder girdle is not dependent on the shoulder joint or its associated muscles for movement. However, the shoulder joint and girdle do work together when performing movements of the arm.

The muscles of the shoulder girdle are essential for stabilising the shoulder complex. This stability gives the muscles of the shoulder joint a stable base from which to exert force when performing powerful movements involving the humerus.

During many shoulder movements this often requires the muscles of the shoulder girdle to maintain the scapula in a relatively stable position which is why scapular stabilisation is so important.

**Extreme ranges of motion**

When the shoulder joint moves through more extreme ranges of motion, the muscles of the shoulder girdle contract to move the shoulder girdle as well. This enhances the movement of the entire upper extremity.

For example, abduction of the shoulder joint is accompanied by upward rotation of the scapula, while adduction of the shoulder joint is accompanied by downward rotation of the scapula.
The shoulder gets much of its stability from the short muscles attaching the scapula to the humerus and fusing with the outer capsule. Together these muscles are known as the ‘rotator cuff’.

**Muscles:** The rotator cuff includes the muscles supraspinatus, infraspinatus, subscapularis and teres minor.

**Acting as ligaments:** Being very close to the joint, the rotator cuff muscles and tendons act as ligaments and help prevent the lax (loose) capsule getting trapped during movement.

**Instability problems:** The shoulder joint allows a wide range of motion in many planes and consequently has a significant degree of laxity. This often results in instability problems such as rotator cuff impingement, subluxations and dislocations.

**Supraspinatus:** Within the rotator cuff, the tendon of the supraspinatus is the most likely to be affected by injury. This is because it sits between the acromion of the scapula and the head of the humerus and so is compressed with all shoulder movement.

**Infraspinatus:** The name of this muscle derives from its position: *infra* means ‘under’, and *spinatus* refers to the spine of the scapula.

The infraspinatus provides sideways (lateral) rotation of the humerus (together with the teres minor). It also assists in adduction of the shoulder and stabilises the head of the humerus within the shoulder socket.

**Teres minor:** The teres minor is the small (*minor*), long and round (*teres*) muscle.

It laterally rotates the humerus, assists in adducting the shoulder and helps to stabilise the shoulder socket.

**Subscapularis:** *Scapula* is Latin for ‘shoulder blade’, so the subscapularis muscle is the muscle under the shoulder blade.
This muscle medially rotates and pulls the head of the humerus down as the arm is raised. It is the muscle that may get damaged if someone twists your hand behind your back!

The subscapularis originates under the scapula and inserts onto the top of the humerus.

**Commonly injured:** The rotator cuff is the most commonly injured structure within the shoulder. This is due to its location and involvement in practically every movement of the shoulder. It is also due to the increasing occurrence of poor posture, as seen in the kyphotic posture which is thought to contribute to the condition.

Your Notes:

Tendinopathy refers to ‘disease of the tendon’.

Rotator cuff tendinopathy therefore refers to disease of tendons of the rotator cuff muscles.

Treatment of rotator cuff conditions is aimed at addressing both the tendinopathy and the associated problems such as shoulder instability and weakness, soft tissue tightness and poor scapular control.

**What the doctor will prescribe:**
Most Doctors will prescribe pain relief and rest for treating the tendinopathy. Clients may take over-the-counter pain relief and anti-inflammatories. Some may also benefit from icing the area. Clients will be told to avoid activities that are painful or irritate symptoms. Physiotherapists may treat pain with ultrasound as well as perform soft tissue therapy and prescribe specific exercises. If symptoms are severe or ongoing the GP may give a corticosteroid injection to reduce symptoms and allow the client to move.

**Rotator cuff conditions:**

The three most common rotator cuff conditions you are likely to encounter in your Fitness Pilates classes:

1. Rotator cuff tendonitis
2. Rotator cuff impingement
3. Rotator cuff tear

However, you may also encounter clients with a frozen shoulder, which affects approximately one in twenty people!

All of these conditions can be both painful and restrictive. It’s important that as a Fitness Pilates instructor you have an understanding of them so that you can modify and adapt exercises appropriately.

**Rotator Cuff Tendonitis:**

**What is it?** Rotator cuff tendonitis refers to inflammation or irritation of the tendon. If there’s long-term inflammation then calcium may be deposited in the tendons leading to calcific tendonitis.

**Causes and risk factors:** Tendonitis usually occurs as a result of overuse or a single traumatic incident such as wrenching the shoulder.

**Signs and symptoms:** The tendon of the supraspinatus muscle is the most commonly affected tendon therefore pain is usually felt on abduction, which is lifting the arm up to the side, and on internal rotation when putting the hand up behind the back.

Pain is usually felt as an ache deep in the shoulder joint and over the outside of the shoulder and upper arm. With an overuse injury pain may come on gradually. However, with a direct injury pain is usually sudden.

If one of the other rotator cuff muscles is involved then pain may be felt in other areas of the shoulder and with other shoulder movements.

**Treatment:** Complete recovery can be expected with adequate rest and conservative treatment as described earlier.
Your Notes:

Rotator Cuff Impingement:
What is it? The subacromial space which the supraspinatus passes through can be reduced by up to 50% if the supraspinatus muscle is injured or not working properly. The growth of bony spurs or irritation of associated bursae may also reduce the subacromial space.

The supraspinatus muscle can therefore be impinged by being pressed against the underside of the acromion when lifting the arm. As a result the tendon becomes irritated and inflamed.

Causes and risk factors: Impingement may occur as the result of repeated overhead movements such as painting, throwing, swimming and overhead racket sports, or from joint abnormalities such as bony spurs.

Signs and symptoms: A client with impingement will have pain when doing anything with their arms above their head. They’ll also have weakness in the shoulder muscles and will find it difficult to put their arm up behind their back, such as when getting dressed.

Treatment: Treatment is conservative as described earlier and clients should avoid activities which will irritate the condition, such as those involving taking the arm above 90 degrees.

In cases where symptoms are severe or occur as a result of bony spurs, surgery may be required to widen the subacromial space.

Your Notes:

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Rotator Cuff Tear:
**What is it?** A rotator cuff tear or strain tends to occur in the tendon rather than the muscle belly. Tears are classed as either partial thickness, which are small minor tears, or full thickness, which are complete tears.

**Causes:** A rotator cuff tear is more common in the over 40s as the result of rotator cuff impingement. If it occurs in younger people it’s normally the result of an injury such as a fall on the outstretched arm.

Risk factors include heavy lifting and repetitive shoulder movement in an overhead position. As with tendonitis and impingement, this includes activities such as painting, swimming, overarm throwing and overhead racket shots. A tear may also follow a previous shoulder injury, tendonitis or impingement.

As we get older and with disuse the muscle fibres weaken and are more susceptible to tearing so there is also a degenerative risk of developing a tear.

**Signs and symptoms:** Clients may experience pain, stiffness, weakness and instability in the shoulder and upper arm. The severity of symptoms will depend on the size of the tear.

Both passive and active movements of the arm will be limited and pain will be worse on certain movements such as those involving activities with the arm above the head. This can be day-to-day activities such as getting dressed, combing or brushing the hair or even reaching for a door handle. People will normally have difficulty lying on the affected shoulder at night due to pain.

**Treatment:** If the tear is small or of partial thickness it should heal well with conservative treatment as described earlier.

If the tear is large or of full thickness then surgery may be required to repair the tear or remove bony spurs. This is usually done by performing an arthroscopy.

**Fitness Pilates exercise considerations**

When designing a Fitness Pilates programme with a rotator cuff tendinopathy in mind there are a number of considerations you should be aware of.
Correct diagnosis: Signs and symptoms of rotator cuff conditions can be confusing as a client may have more than one condition. There can be further confusion if the shoulder pain they feel is being referred from the neck, caused by something other than a rotator cuff condition. For these reasons it is important that your client gets a correct diagnosis from their GP or physiotherapist. You should NEVER try to diagnose their condition.

Follow medical advice: You and your client should follow any guidelines and advice provided by the GP or physiotherapist. If a client is recovering from surgery they should have been given rehabilitation exercises which you should familiarise yourself with.

Use props: Remember that due to pain and restriction in movement clients may not be able to get into certain positions or may not be able to perform certain exercises. You’ll need to be able to modify positions by using towels, Pilates pillows or yoga blocks.

Adapt your exercise prescription: Exercises may need to be adapted to avoid painful or irritating movements, for example by reducing the lever length or perhaps giving an alternative exercise altogether. Some clients may be happy to perform one of their rehabilitation exercises as an alternative during the class, so it’s a good idea to speak to them before the class.

Rehabilitation: You’ll need to know what stage of recovery your client is at to ensure you select appropriate exercises for them. Any rehabilitation programme will be aimed at improving mobility, strengthening the rotator cuff and scapular stability muscles, and correcting postural imbalances.

Progressions: Clients need to restore mobility and gain good scapular stability before progressing to exercises that involve bigger movements or which require longer lever lengths, such as the straight arms in Swimming and the strength exercises Side Bend or Side Plank and full Leg Pull/ Full Plank

Exercises should be performed with correct posture and scapular stability.

Beneficial Pilates exercises

The following exercises will help to mobilise and stretch the shoulder and address kyphotic postural imbalances. We will be going through each of these during the training day.

Exercises should be performed in a pain-free range of movement. A client may experience some discomfort but should avoid pain.

Mobility and stretching: The following are suitable mobility and stretching exercises:

• Cobra Stretch
• Swan Dive with the arms down to encourage thoracic extension
• Spine Twist
• Open Door
• Pendulum Swings
• Toy Soldier
• Arm Circles
• Shoulder Rotation Control
• Dumb Waiter
• Walking Up Wall Stretch - front and side
• Chest Stretch
• Arm Across Chest Stretch
• Arm Up Back Stretch
• Arm Down Back Stretch

Your Notes:

Posture correction: It’s likely a client may need to correct elements of a kyphotic posture. Fitness Pilates exercises to address this include:

• Swan Dive and Spine Twist for thoracic mobility
• Chest stretch, Swan Dive and Back extension for upper back strength
• Shoulder Retraction (V W) and modified Press Up for scapular stability
• Thread like a needle
Strength & Stability exercises:
The following exercises will help to strengthen and stabilise the shoulder. As before, exercises should be performed in a pain-free range of movement.

**Elevation and depression:** Elevation is shrugging the shoulders. Depression is drawing the shoulder blades down the back. This exercise can be performed in a standing, sitting, supine and 4-point kneeling position.

**Protraction and retraction:** This can be performed in a standing, sitting, supine and 4-point kneeling position. It primarily helps to stabilise the shoulder, but will also help to strengthen it.

Focus on the retraction element by squeezing the shoulder blades together for a count of five and then relaxing. Repeat this up to 10 times.

**VW:** This is a scapular stabilisation exercise and combines retraction and depression. It can be done standing, supine, prone (lying with hands under the forehead), and in 4-point kneeling. This can be done as a holding exercise or a repetition exercise.

**Swan Dive:** This exercise focuses more on stability, but will also help to strengthen the area. It can be performed with the arms on the floor to focus on the shoulder V-shape and lifting the arms off the floor to increase upper back strength.

You may need to reduce the lever length because of pain in this position, or if the client cannot maintain scapular stability. You can progress them as they get stronger and more stable.

**Swimming arms:** Swimming arms is more of a strengthening exercise, but will also aid stability. When performing Swimming arms clients should focus on maintaining scapular stability. You may need them to reduce the lever length and bend their elbows as in the Swan Dive to help with this.

**Press Up and modified Press Up:** Press Ups and modified Press Up will help to strengthen the serratus anterior muscle which, along with the rotator cuff muscles, is very important in scapular stabilisation.

**Other exercises:**
- Dumb Waiter and shoulder internal and external rotation - strengthen the rotator cuff
- Neck alignment exercises such as Head Nod and Head Turning
- Back Extension (with dart arms)
Frozen Shoulder

Frozen shoulder is more a description than a diagnosis. The medical term is ‘adhesive capsulitis’.

For someone with this hypomobility condition, the connective tissue around the shoulder joint has become inflamed. This has caused thickening and tightening in the joint and subsequent loss of mobility.

Diagnosing adhesive capsulitis can be difficult because its symptoms are similar to a variety of shoulder-related musculoskeletal conditions, but the main confusion lies in determining exactly what it is and why it happens. This confusion stems back to the 1800s and still remains today.

Symptoms

The two defining factors of frozen shoulder are pain and stiffness.
Pain and stiffness can make even the simplest daily tasks, such as getting dressed and combing your hair, difficult to carry out.

Symptoms can range from mild and hardly noticeable, to extremely painful with very limited range of movement.

**Diagnosis**

Diagnosis of frozen shoulder is made following an assessment by a GP or physiotherapist. As part of this assessment they’ll carry out a physical examination. This is necessary as a number of shoulder conditions are often mistaken for frozen shoulder.

**Active and passive:** With a true frozen shoulder both active and passive movements are affected. In other shoulder conditions only active movement is affected with passive movement at the shoulder joint usually still good, if affected at all.

**Movement limitations:** For someone with a frozen shoulder, movement is limited in what is known as a capsular pattern which affects lateral rotation, abduction and medial rotation.

**Causes**

Although the exact cause of frozen shoulder is still unknown, it appears to be more common in people between the ages of 40 and 60 and more common in women than men. There’s also an association with people who have diabetes and thyroid disorders.

Frozen shoulder is classed as being either primary or secondary in nature.

**Primary frozen shoulder:** Primary frozen shoulder has no specific cause and the onset of symptoms is slow and gradual. Consequently people often don’t notice it until it starts to become a problem.

**Secondary frozen shoulder:** Secondary frozen shoulder occurs as a result of an injury or soft tissue pathology such as a rotator cuff tear, impingement syndrome or overuse activities. Other risk factors include:

- **Osteoarthritis**
- **Traumatic arthritis**
- **Immobilisation or splinting - which means the shoulder isn’t moved for a long time**
- **Poor posture - because a rounded upper back and shoulders means the shoulder joint can’t work effectively and may lead to pinching and shortening of tissues**
Phases of frozen shoulder

Frozen shoulder follows three phases. Each phase can last several months. Consequently some clients may be affected for up to two years or longer. Each person with frozen shoulder is different, however and some phases may last longer.

- Phase 1 is the freezing phase and can last up to nine months
- Phase 2 is the frozen phase and can last from three to twelve months and
- Phase 3 is the thawing phase and can last from five months to nearly two years.

2-9 months - Freezing phase: The ‘freezing’ phase, also known as the ‘painful’ phase, comes first. There’s no history of injury but over a period of two to nine months there’ll be a gradual onset of pain and stiffness in the shoulder.

The pain will be deep, aching and nagging in nature and worse at night when lying on the affected side. Pain will become more severe over of couple of months and will limit movement.

3-12 months - Frozen phase: Phase two is the ‘frozen’ phase, also known as the ‘restrictive’ or ‘stuck’ phase. It lasts up to three months.

During this phase pain will subside although stiffness will remain. Clients may experience some pain at the extreme ranges of movement and movement will be very limited.

5 months to 2 years - Thawing phase: The third and last phase is the ‘thawing’ or ‘resolution’ phase as movement gradually returns. This phase can last anything from five months to nearly two years.

Fitness Pilates exercise considerations

People with frozen shoulder, especially in the early stages, tend to avoid movement due to pain and probably a lack of understanding of the condition. Therefore a vital part of treatment is to ensure the client is given good advice as to the self-limiting nature of the condition.

Let’s look at some other tips you should be aware of when working with clients.

Treat each client as an individual: As a Fitness Pilates instructor, you need to be aware that depending on the stage of the condition, clients may be in pain and will have varying degrees of stiffness in the shoulder joint. The severity of symptoms varies from person to person as well as between the stages of the condition, so you must treat each person individually.

Modify arm movements: You will need to make adaptations to exercises requiring arm movement such as those used in Toy Soldier. Modifications will also be necessary
to the arm circle movements seen in Double Leg Stretch and those used in Curl Ups when the hands are behind the head. Depending on how limited the range of movement is in your client you may simply need to reduce the lever length, reduce the range of movement or take the arm movement out of the exercise completely.

**Consider start positions:** Pain in the shoulder and limited range of movement can make it difficult for a client to get the arm into certain positions. This will not only affect an exercise involving arm movement, but will also affect how comfortable they are getting into position to start an exercise.

For example, lying on the arm in a side-lying position will prove uncomfortable as will lying prone with the head on the hands and lying supine with the hands behind the head.

**Use props:** For clients who have movement limitations, props can help them lie in a pain-free position. Use yoga blocks, small pillows or rolled-up towels to help with this. For example, during a side-lying exercise you could place a prop under the head and suggest they lie with the arm in front of them.

**Modify weight-bearing exercises:** Pain and weakness may make it difficult for a client to bear weight on the joint. Exercises in a 4-point kneeling position, the full Plank position or Leg Pull and Side plank or Bend will all therefore be affected.

To allow your client to exercise in a more comfortable position they could try lying on their front instead of 4-point kneeling. They could try using a pillow and moving the position of the arm in side-lying exercises. For Side Bend they could choose an easier arm position. If they still find this too painful, they should simply avoid the exercise.

**Encourage pain-free movement:** Arm movements should only be performed if the shoulder is in a good, pain-free position. Encourage clients to move within a pain-free range of movement and with good scapular control.

**Working with the physio**

As well as being aware of the exercise considerations in the previous step, you’ll find it useful to know the focus of exercise therapy throughout the various phases of frozen shoulder. By being aware of the stages of rehabilitation that are prescribed by physiotherapists, you can help ensure your Fitness Pilates exercise prescription supports the work of your client’s physiotherapist. The exercises for mobility, stretching, stability, strengthening and postural correction described in the Rotator Cuff section, would also be appropriate.

**Phase 1 rehabilitation:** During phase 1 the focus is on encouraging passive movement. This should be done within a pain-free range so as not to irritate the joint or cause further inflammation. Passive movement should be performed without active muscle involvement, such as in the exercise Pendular Swing.
In addition, active assisted movements can be performed, which is when the unaffected arm is used to help move the affected one. For example, holding the hands together and taking the arms overhead. These types of exercise are normally prescribed by the client’s physiotherapist so you can look to incorporate these rehabilitation exercises during a class as alternative exercises for them.

**Phase 2 rehabilitation:** During phase 2, the focus is to progress the client’s flexibility. To help achieve this the client should perform the Dumb Waiter and the shoulder stretches mentioned in Rotator cuff conditions, which include Walking Up Wall, Chest Stretch, Arm Across Chest, Arm Up Back and Arm Down Back stretches.

Scapular stability should also be progressed and strengthening encouraged using exercises like the Shoulder V and Modified Press Up, but make sure your client does not force the movement.

**Phase 3 rehabilitation:** During phase 3, the focus is to increase the client’s range of movement and further increase their strength. Range of movement can be progressed by trying to move into end-range stretching.

Increasing the resistance by using a weighted Pilates ball or theraband during exercises will help improve their strength, but only if movement is still improving and there is no pain.

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**Tennis & Golfer’s Elbow**

**What are Tennis and Golfer’s elbow?**

Tennis elbow and golfer’s elbow are the common names given to injuries caused by overuse. They are repetitive strain injuries which affect the outside and the inside of the elbow respectively.

**Tennis elbow** (lateral epicondylitis) is a very common strain injury of the tendon and/or muscles of the back of a person’s forearm on the knuckle side. It affects the extension of their wrist and fingers. These muscles merge into a single tendon, the ‘common extensor tendon’, which attaches to the outside of the elbow.

**Golfer’s elbow** (medial epicondylitis) is a less common strain injury which affects the tendon and/or muscles in the front of the person’s forearm on the palm side. It
affects the flexing of their wrist and fingers. Most of these muscles merge into a single tendon, the ‘common flexor tendon’, which attaches to the inside of the elbow.

**Cause and risk factors**

- When a person’s muscles and/or common extensor and flexor tendons are overworked, they become irritated and may develop tiny tears.

- **Inflammation** - When the suffix ‘itis’ is used, this indicates inflammation. In tennis and golfer’s elbow, the inflammation is around the lateral or medial epicondyle. However, lateral and medial epicondylitis are confusing conditions with some debate around the presence of inflammation.

- **Collagen breakdown** - The collagen strands that make up a person’s tendon run parallel to one another and have a high tensile strength. This means they can withstand a lot of force from both ends of the tendon.

- **Overuse of the muscles and tendon through repetitive movements or increased tension through gripping can lead to a breakdown in the collagen. In an acute injury this will lead to an inflammatory response.**

- **Wear and tear** - Some research suggests the damage is wear and tear at a cellular level within the tendon. This can be degenerative, resulting in an abnormal arrangement of the collagen strands.

- **Instead of producing an inflammatory response, ‘fibroblast’ cells are produced, leading to weakened collagen which breaks down easily and forms scar tissue. This is believed to happen when the tendon tries to repair small tears.**

**Scar tissue** - Repeated strain and overuse prevent the tendon from healing and eventually it will stop trying to heal, leaving weak and painful scar tissue prone to injury.

Some clinicians refer to this condition as tendinosis - chronic degeneration without inflammation. Or they call it tendinopathy - something wrong with the tendon - instead of tendonitis - inflammation of the tendon.

**Activities that cause tennis elbow** - Although tennis elbow is common amongst tennis players, around 95% of people with tennis elbow do not actually play tennis. It is a common condition in people aged 35-50 from overuse and repetitive movements of the wrist or excessive gripping. **Activities which may lead to overuse and strain include:**

- Using a computer and mouse
- Painting and decorating
- Plumbing
• Gardening
• Using hand tools
• Chopping vegetables
• Writing
• Excessive gripping such as picking up heavy objects
• Racket sports where the tension becomes too much for the muscle and tendo

**Activities that cause golfer’s elbow** - Golfer’s elbow is much less common than tennis elbow and is usually seen in people aged 40-50. As with tennis elbow you do not need to play golf to have the condition. Any repetitive wrist activity or excessive gripping may lead to golfer’s elbow symptoms.

**Signs and symptoms**

Pain is a common symptom for both tennis and golfer’s elbow. This is most often felt where the tendon inserts into the lateral or medial epicondyle. However, pain can also be felt in the muscles of the forearm and in the wrist.

If someone feels a hot, sharp pain close to the elbow, this may indicate a more classic ‘tendinopathy’. If they feel a dull pain around the elbow and forearm, this may indicate more of a muscular involvement.

Other signs and symptoms include muscles in the forearm feeling sore and tight and wrist and elbow movement may feel stiffer than usual. They may also have a lack of strength in the wrist and forearm.

**Aggravation of symptoms**

Symptoms will be aggravated in tennis elbow by activities that extend the wrist and bend it back or by holding something with a stiff wrist or straight elbow and gripping hard.

Symptoms will be aggravated in golfer’s elbow by activities that flex the wrist and bend it forward or by gripping hard. Activities described earlier in the previous screen will also aggravate the condition.

**Fitness Pilates exercise considerations for tennis and golfer’s elbow**

As with any injury or medical condition, each client should be considered individually for Fitness Pilates exercises.

**Acute or chronic symptoms** - You will need to consider whether your client’s condition is acute or chronic. Their symptoms may range from mild (little pain or limitation) to severe (painful, weak and limited movement). You should also consider the irritability of symptoms - that is, how easily their symptoms can be aggravated.
Client information - If your client has had the condition officially diagnosed then they should be able to pass this information on to you. If they have seen a physiotherapist they will have been given advice and a specific exercise programme.

Remember, you are not prescribing exercises for their condition. You are using all the information available to you to help you recognise which Fitness Pilates exercises may need to be modified, adapted or avoided altogether.

Avoiding aggravation - As a rule, you should encourage your client to rest from and avoid aggravating activities to prevent further damage to the tissue and help their recovery.

This may mean your clients should avoid activities involving repeated and/or forced wrist movements such as extension, flexion and pronation, locked (stiff) elbows and gripping.

Adapting exercises - Exercises such as press ups, the full Leg Pull/ Plank (straight arms) Calf Stretch and in some cases 4-Point Kneeling will need to be adapted so as not to aggravate the joints of the elbow and wrist.

Adaptations include performing a bent elbow leg pull rather than using straight arms, and prone swimming rather than 4-Point Kneeling.

The use of hand weights should also be considered - either avoid using weights during a class, or reduce the weight and repetitions.

Alternative exercise - You may have to give your client an alternative exercise if you are unable to adapt the exercise suitably.

Depending on the severity and stage of the condition, your client may have a stretching and strengthening programme recommended by their physiotherapist. They may be able to perform some of these exercises as an alternative during the class.
Hypermobility

What is joint hypermobility?

Joint hypermobility is the term used to describe increased mobility and range of movement in a joint. People with joint hypermobility have an unusually large range of movement (ROM) in their joints. Hypermobility is not rare - it’s estimated to affect one in five people. It may affect only a few joints or can be spread throughout the body. Joint hypermobility is most common in children and females. When people get older it tends to lessen as their joints get stiffer. Many people with joint hypermobility have no symptoms or medical consequences and carry on as normal without the need for any medical intervention or support. For some people it can be advantageous, for examples for dancers, gymnasts and athletes.

Causes of joint hypermobility

Joint hypermobility is caused by defects in the protein of connective tissue that give the body its strength.

This defect can affect any connective tissue in the body and in particular the collagen in tissues such as ligaments and tendons. The defect makes the ligaments and tendons more ‘stretchy’ and this in turn makes the joints they connect to and support, more lax.

Around 75% of people with joint hypermobility have inherited the condition.
Signs and symptoms of joint hypermobility

People with hypermobile joints lack strength and stability compared with people with non-hypermobile joints. Increased ROM and lack of support means people can bend and twist joints more than usual, putting them at risk of injury or partial and full dislocation.

**Slow injury recovery** - Injury recovery can be slower for people with joint hypermobility. In some cases the injury may not fully recover due to repeated micro-trauma. This means the person is at risk of the injury happening again.

**Poor posture** - Muscles tire more easily in hypermobile joints as they have to work harder to support the joint. Hypermobile people often dislike sustained postures and have poor postural alignment as they tend to rest at the end of the joint range. Although they will be able to adopt a good standing or sitting position at first, they will not be able to hold it for long.

**Poor proprioception** - Poor proprioception can be considered both a cause and symptom of joint hypermobility. Proprioceptive sense refers to the sensory input and feedback that tells us about movement and body position. Its receptors are located within our muscles, joints, ligaments, tendons, and connective tissues.

If people aren’t certain where their joint is within a space, it may lead to them overstretching. Equally, if people have overstretched structures within a joint, it can then lead to poor proprioception.

**Joint stiffness** - People may suffer from joint stiffness - which may seem unusual, given the increased range of movement in joint hypermobility. However, it’s often subjective and therefore stiff compared with someone’s ‘normal’ feeling.

Stiffness may be caused by a tight muscle or a muscle spasm - possibly due to overusing global muscles or by a build-up of fluid in the joint as it tries to repair damage.

**Bracing** - ‘Bracing’ is a term given to breath-holding. It is a common symptom of joint hypermobility where people try to use breathing to help stabilise themselves and produce more power.

**Other symptoms include:**

- Pain (this can be acute and specific, or chronic and widespread)
- Clicking in the joints
- Fatigue
• Thin and/or stretchy skin
• Digestive problems such as irritable bowel syndrome and constipation

**Varying symptoms** - For people who are symptomatic, the type and severity of the symptoms can vary from person to person - even from day to day for the same person.

Many people with joint hypermobility do not experience any of the symptoms we have mentioned here. If symptoms are present alongside joint hypermobility then it is known as Joint Hypermobility Syndrome.

**Fitness Pilates exercise considerations for joint hypermobility**

Fitness Pilates & Pilates are considered a very good method of exercise for joint hypermobility. This is because medical recommendations for treatment and management of the condition closely relate to the principles and fundamentals of Pilates.

However, there are a number of factors to consider when dealing with a client who is hypermobile -

**Posture** - Educating your client about good postural alignment, such as neutral spine and scapular placement, is important. Also emphasise neutral pelvic placement in static positions such as lying supine, prone, standing, sitting, box position, side lying. Your goal is to help them build up endurance in sustained postures.

**Contraction** - Start with low level isometric holds which are 20-30% maximum voluntary contraction (MVC) repeated with a rest in-between. This could be, for example, up to 6 repetitions of a two to three breath hold with a two to three breath relaxation. Build this up slowly to a longer single hold of 8-10 breaths.

**Prevent bracing** - Use lateral thoracic breathing to prevent your client from holding their breath and bracing. Just get them to breathe normally and not put too much focus on breath.

**Strength and stability** - Use exercises that strengthen your client’s core muscles such as TVA, lumbar multifidus and pelvic floor muscles. Also strengthen their peripheral joint stabilising muscles. Focus on giving your client closed chain exercises and ensure they have good stability and endurance before moving them onto open chain exercises. It is important for your client to gain strength and stability in the trunk before adding in exercises for their peripheral joints.

**Progressive exercise programme** - A progressive exercise programme would usually start with inner range stabilising exercises, then move to inner range exercises and finally the client’s normal range of movement. It’s important to ensure your client’s joints are stable before using strengthening exercises in their mid-range (the
strongest ROM) and finally strengthening at their end of range (EOR). EOR is the most vulnerable range for your client.

**Proprioception** - Hypermobile clients often have poor balance. Your client may not have very good body awareness or be aware of reaching EOR. They need to know when to stop - for example, to avoid over stretching or working within too big a ROM. Remember that closed chain exercises will help improve their proprioception. Work in closed chain before moving to open chain - for example, use a ball under your client’s foot for a single leg Slide/ stretch as opposed to their leg being free in space.

**Control and precision** - Focus on control and precision of movement to help correct muscle activation for your client.

**Go slow and repeat** - You may need to allow more rest in-between reps, sets and exercises and you should avoid joint ‘locking’ positions such as in the knee and elbow. Progress slowly with your client. Give them lots of repetition and visual cueing to help their sensory feedback.

**Pain-free ROM** - Make sure your client is exercising in a pain-free ROM. You will need to distinguish between ‘exercise and training’ pain and an aggravating pain. Stop the exercise if it’s painful for your client and consider that exercise to be unsuitable for that client at that point in time. It’s important to stretch, but do not overstretch.

**Beighton Score for Hypermobility**

This scale is often used by GP’s and Physiotherapists - remember we should not be diagnosing the condition but it’s important to be aware of this scale when dealing with clients who have been diagnosed.
Note movements 2-5 are done on both sides of the body.

A score of 3 would indicate mild hypermobility whereas a score of 9 would indicate extreme hypermobility

Your Notes:
Back Pain

Lower back pain is considered to be the most widely experienced health complaint in the world.

Severity: Lower back pain is the leading cause of disability in the world with 80% of the population having an episode of back pain at some point in their lifetime and 35% of the population suffering from it at any one time.

The price of back pain: Each year one-third of the UK adult population is affected by lower back pain. It’s the second biggest reason for sick days and costs the UK £3.8 billion per annum.

Of those suffering back pain, approximately 20% will consult their GP. Although most cases aren’t serious and will resolve spontaneously within a few weeks, it is estimated that the total yearly healthcare cost of lower back pain is around £12.3 billion.

Chronic back pain: Between 15 percent and 45 percent of the population will develop chronic pain, which is pain persisting for more than three months.

For those people, back pain can have an adverse effect on their quality of life and social relationships

Risk factors associated with low back pain

Risk factors can be categorized into non-modifiable and modifiable factors. However, it should be appreciated that back pain is multifactorial, and in most cases it cannot be attributed to the presence of one single factor, but is most likely caused by multiple risk factors.

Non-Modifiable risk factors include -

• Increasing age
• Number of children
• Previous episodes of low back pain
• A major scoliosis (Haldeman, 2005)

Modifiable risk factors include -

• Lack of Fitness/ Physical activity (Balague, 1999)
• Smoking (Power et al, 2001)
• Obesity (Fransen et al, 2002)
• Physical Trauma (Harkness et al, 2003)
• Awkward Posture at work (Hoogendoorm et al, 2000)
• Frequent bending and twisting (Van den Heuvel et al, 2004)
• Heavy lifting, repetitive lifting (Harkness et al 2003)
• Jarring, gripping, vibratio, repetitive actions (Levangie, 1999)
• Prolonged sitting and prolonged standing (Thorbjornsson et al 2000)

**Key Factors to consider**

**Age**

Beyond 30 years of age there is a decrease in the size and quality of collagen fibres within the musculoskeletal system. Consequently, muscles, ligaments and cartilage are more prone to injury (Jackson, 1999)

**Misaligned Bones & Joints**

Lower back injury and pain can significantly affect an individual’s ability to perform simple daily activities and when we can address their functional ability, we can then see if problems with posture or lifestyle habits are actually causing dysfunction which then as a result is causing the pain.

Misalignment in bones and joints places increased stress on the tissues surrounding the joints. Muscle imbalance occurs when a particular muscle shortens & then its antagonist is over stretched and lengthened, the reason for this can be overload, misuse, disuse & trauma. When this happens neither the agonist nor the antagonist will perform functionally or biomechanically very well!

This will then result on other muscles compensating and also displacement on bones due to the different pull they are receiving from the muscles and then affecting joint movement so all of this needs to be taken in to consideration in order not to result in further or deeper pain.

**Excessive body weight**

This results in a greater compressive force on joints, leading to a greater potential for damage to these joints and their surrounding soft tissues

**Diet**

When people think about ways to manage back pain, nutrition is not the first thing that comes to mind. But what you eat impacts your back health. “Nourishing your body with foods that reduce inflammation can really help you feel better much
sooner,” says Amy Jamieson-Petonic, RD, director of wellness coaching at the Cleveland Clinic. Once again, good nutrition to the rescue!

We usually think of inflammation as swelling — as in, you twist your ankle and it becomes swollen and it hurts. Inflammation is actually one of your body’s defence mechanisms to protect from infection and foreign substances. However, sometimes the protective response becomes chronic and, for one reason or another, is triggered when there are no infections to fight off. For example, foods high in saturated fats, trans fats, simple sugars and white flour actually trigger inflammation throughout our bodies through a complex series of biochemical and hormonal processes. Left unchecked, inflammation runs rampant through your body, causing all kinds of problems — including arthritis (an inflammation of your joints) and, believe it or not, low back pain.

**Sudden start of hard exercise.**

This particularly applies to individuals who have been inactive and then suddenly prescribed a vigorous programme of exercise.

**Diagnosis:**

Although back pain is very common, it can be difficult to diagnose and treat due to the many possible sources of pain.

We’ll look at some of the common types of lower back pain and the exercise considerations for the Fitness Pilates instructor. However, it’s important to appreciate that being a Fitness Pilates instructor does not qualify you to diagnose lower back pain. Its assessment and diagnosis should be carried out by an appropriate health professional such as a GP or chartered physiotherapist.

**Your Notes:**
Anatomy of the Spine

Before we begin to look at the various conditions that can affect the back, let’s remind ourselves of the anatomy of the spine.

The vertebral column is made up of 33 vertebrae of which 24 are moveable. It is divided up into regions with 7 vertebrae in the cervical spine, 12 in the thoracic spine and 5 in the lumbar spine.

Below this are 5 fused vertebrae that form the sacrum and 4 fused vertebrae that form the coccyx.

The vertebrae increase in size from the cervical region to the lumbar region. This is because greater loads are supported by the lower back.

Structure: Although slight variations exist, the vertebrae from C-2 to L-5 have a similar structure. This includes a bony block projecting anteriorly, known as the body, an opening for the spinal cord to pass through known as the vertebral foramen, transverse processes projecting out laterally to each side, and a spinous process projecting posteriorly.
Curves of the spine: A healthy spine has four curves. The curves of the vertebral column increase its strength, help to maintain balance in the upright position, absorb shock from walking and help to protect the vertebral column from fracture.

When all the curves are balanced your weight is evenly distributed through the spine and its associated structures, such as ligaments and discs. This basic or ideal alignment is referred to as ‘neutral spine’.

Neutral spine: Neutral spine position is the strongest and most energy-efficient position for the body to stay upright against the force of gravity and to withstand all the other forces that are applied to the spine during the various activities of life, work and exercise. It’s been estimated that a spine in ‘neutral’ is approximately 30% stronger than a flexed spine.

It’s for these reasons that such great emphasis is placed on maintaining a neutral spine.

The 33 vertebrae of the spine are linked together by joints and ligaments into what are called spinal segments. Two neighbouring vertebrae are attached by joints and ligaments and make up a spinal segment. There are three joints in a spinal segment known collectively as the articulating triad. These consist of the intervertebral disc and the two facet joints.

Intervertebral disc: The intervertebral disc forms the joint between the bodies of the vertebrae.

Facet joints: The two facet joints are small stabilising joints located between and behind adjacent vertebrae. They’re formed by the inferior articular processes on either side of the upper vertebrae coming together with the superior articular processes on either side of the lower vertebrae.

Role of facet joints: Facet joints are synovial joints that help support the weight of the spine, the body and any load carried. They help control movement between individual vertebrae by directing the plane of motion at each vertebral segment which is dependent on their angle and orientation.

Spinal movements: Throughout the spine and as movement takes place, the angles and orientations of the facet joints differ. As you’ve just learnt, this alters the
movements possible in that area of the spine. For example, when the lumbar spine is
extended no rotation is available due to the close packing of the facet joints.
However, as flexion increases, the facet joints open up to allow an increase in the
range.

The vertebral column contains 24 intervertebral discs which lie between adjacent
vertebrae. The role of the discs is to form strong joints, permit movement and absorb
shock. Due to their shape, they are also primarily responsible for the various curves
found in the spine.

**Annulus fibrosus:** Each disc has an outer fibrous ring consisting of fibrocartilage
called the annulus fibrosus.

**Nucleus pulposus:** The nucleus pulposus is an inner, soft, pulpy, highly elastic,
hydrophilic substance.

**Hyaline cartilage:** On each end are tough cartilage end plates made from hyaline
cartilage.

**Size and thickness:** The discs increase in size as they descend the spine to
accommodate the greater weight they are subjected to. The lumbar discs have an
average thickness of 10 mm, which is twice that of the cervical discs.

**Spinal flexibility:** The amount of flexibility in a particular spinal segment is
determined by the size and shape of the disc and by the resistance to motion of the
soft tissue, such as ligaments and muscles that support the spinal joints.

**Compressed discs:** When the discs are compressed due to an increase in weight on
the spine, they flatten, broaden and bulge from their intervertebral spaces. When the
spine is extended the nucleus pulposus moves anteriorly thereby increasing the
tension in the anterior part of the annulus. When the spine is flexed the nucleus
pulposus is forced towards the posterior of the disc, stretching the posterior fibres.

The pressure inside a disc varies according to the position of the body and external
stress.

For example, if the pressure at the third lumbar disc for a 70 kg standing subject is
said to be 100%, supine lying reduces the pressure to 25%. The pressure increases
dramatically as the lumbar spine is flexed with the sitting posture increasing the disc
pressure to 140%.
If the stress placed on the discs is very great or of a long duration, a certain amount of fluid will be squeezed out of the disc causing a reduction in height. Losses in sitting height over a day of up to 19 mm have been recorded, with 54% of this loss occurring in the first 30 minutes after getting up in the morning. But don’t worry - the fluid returns into the discs during the night when you are lying down. However, as we age the discs do shrink, resulting in a reduction in height.

**Ligaments of the spine**

Typically, ligaments connect bone to bone. In the spine, ligaments connect the vertebrae to each other. There are two primary ligament systems in the spine:

- The intrasegmental system
- The intersegmental system

The intrasegmental system holds individual vertebrae together. The intersegmental system holds many vertebrae together. Combined with the tendons and muscles, the system of ligaments in the vertebral column plays an essential role in stabilising the vertebral column at rest and controlling the range of motion during movement, and so helps reduce the risk of injury.

The role of the ligaments is most significant when the spine moves out of neutral towards its end range of motion in extension, flexion, lateral flexion and rotation.
Lower Back Pain

At the end of the patient assessment the client would be diagnosed using the ‘diagnostic triage system’.

The three categories: The categories are:

1. Non-specific back pain where there is no need for specialist referral.
2. Nerve root pain which is suggestive of nerve root compression. In this case there is no need for specialist referral if symptoms are resolving in the first four weeks and
3. Specific back pain which is a red flag for possible serious spinal pathology. This requires immediate referral to a specialist

Non-specific back pain: The term non-specific is used when the cause of pain is unclear or when no known disease or pathological cause is detected.

Non-specific back pain is sometimes referred to as simple back pain or simple mechanical back pain. Pain is referred to as mechanical when it changes with, and can be relieved by, movement.

Root nerve pain: Nerve root pain is pain produced by the compression or irritation of a spinal nerve root as it exits the spine. It’s also known as a ‘trapped nerve’.

Pain will be felt along the course of the nerve and is usually one sided. It may radiate as far as the foot and there may be altered sensation. The leg pain felt is usually worse than the back pain. Further investigation may be required if there’s no significant improvement in symptoms within the first four weeks.
Specific back pain: Lower back pain is referred to as being specific when a known disease or pathological cause can be identified. These include trauma such as a car accident or a fall, osteoporosis and associated fractures, vertebral infection, tumour or metastasis and inflammatory disorders, such as arthritis. It’s estimated that only 10% of lower back pain has a specific cause, with most cases being non-specific.

So let’s start with Non Specific Back Pain

This will probably be the majority of your participants who come to your Fitness Pilates classes.

Non-specific lower back pain is also called mechanical back pain and although it’s very difficult to diagnose an exact cause, it will involve structures in the lower back such as the ligaments, muscles and tendons, the joints between the vertebrae, and the intervertebral discs.

The mechanical pain in the lower back is produced by the deformation of tissues containing nociceptors. These nociceptors are sensory nerve endings that send signals to the brain in response to actual or potential damage - in this case, in response to the change in size or shape of the tissue by forces such as compression, strain or sprain. Pain is therefore usually the result of a minor strain, sprain or irritated nerve. Clients with mechanical pain are usually in good health and tend to find their pain is aggravated or relieved by certain postures or movement.

Risk factors

A number of factors have been identified that are likely to increase the risk of developing non-specific lower back pain.

• Bad technique: Bending awkwardly or pushing or pulling incorrectly.
• Loaded movements: Lifting or carrying heavy loads and movements involving twisting and overreaching.
• Poor posture: Poor posture, especially in sustained positions such as slouching in a chair, sitting at work and when driving.
• Repetitive movements: Repetitive activities which may occur at work, when playing sport or, for example, during a bout of DIY.
• Obesity: Obesity is a common risk factor because being overweight puts extra strain on the spine and surrounding tissues.
• Pregnancy: During pregnancy, the lower back is put under strain due to the extra weight and because the pelvis naturally tilts anteriorly, increasing the lordotic curve, as the body regains balance.
• Smoking and medication: Smoking and long-term use of medications such as corticosteroids can weaken bone and cause tissue damage.
• Stress and depression: Stress and depression are also linked with lower back pain.

The course of lower back pain can consist of up to three phases.

• The acute phase - lasting for less than six weeks
• The sub-acute phase - lasting for between six and twelve weeks
• The chronic phase - lasting longer than twelve weeks

Approximately 90% of people are expected to become pain-free, or have a dramatic reduction in symptoms, during the acute phase and in most cases symptoms will resolve in around six weeks. Only 10% will continue into the chronic phase.

Treatment

As you’ve seen, the symptoms and severity of back pain will differ from person to person, so there are a number of treatment options available that could include pain relief, physiotherapy, and exercise and lifestyle changes.

Strengthen, mobilise and stretch: Exercises should focus on:

• Strengthening the core muscles that stabilise and support the pelvis and lumbar spine
• Mobilising areas of stiffness
• Stretching muscles which are likely to have become tight or will become tight as a result of the condition and
• Encouraging good postural alignment and correct technique

Listen to their body: The severity of symptoms will vary from person to person. If a client is experiencing an episode of pain then they should be encouraged to listen to their body. It’s their responsibility to inform you of their pain and it’s your responsibility to modify and adapt exercises to allow them to have a painless movement experience.

Adapt and use props: Adapt exercises where needed and remember some clients may not be able to get into the position you’re asking them to, so you’ll need to modify it using a Pilates pillow, yoga block, towel or other prop.
Progress carefully: Exercises should only be progressed if a client can perform the movement without any pain and only when they have mastered the lower levels of exercises with correct technique.

Types of exercise

Exercise plays an important role in treating lower back pain.

Although there is conflicting research about the impact of exercise on lower back pain and which type of exercise and functional activity is best it is agreed that keeping active will reduce pain and improve function.

Exercise that includes strengthening and stretching appear to be the best type of exercise for helping with lower back pain.

Strengthening exercises

Traditionally, exercise programmes aimed at prevention and rehabilitation of lower back pain have only focused on improving static spinal stability through exercises such as abdominal bracing. However, because the position of the spine changes with movement, we need to address both the stabilisers and the mobilisers.

Stabilisers and mobilisers: Deep spinal stability is provided by the core muscles including the transversus abdominis, co-contracting with the pelvic floor and lumbar multifidus in particular. Together they contribute to intra-abdominal pressure along with the thoracolumbar fascia.

With these stabilisers providing intervertebral control and deep stability, the superficial mobilisers, which include the rectus abdominis and external obliques, can perform safe and effective movement in exercise like the Curl Up.

Programming effectively: An effective prevention and rehabilitation programme should be designed to take into account three phases:

• Phase 1 - Learning voluntary control of the deep stabilisers
• Phase 2 - Building stability control
• Phase 3 - Mastering ‘reduced attention’
Your client may be at any of these phases and the length of time they spend at each one will depend on their condition and attitude. Be patient as it may take several weeks or months to move through the phases.

**Phase 1:** Phase one involves learning voluntary control of the deep stabilisers, for example being able to engage the core muscles in static positions such as when standing, sitting, in the supine set-up, 4-point kneeling, prone or when side-lying.

Consider the fundamental Pilates exercise at this stage and encourage good postural alignment paying particular attention to neutral spine. When clients are able to isolate and activate their core muscles they need to practise keeping them engaged while breathing. This can be difficult for some clients so, again, be patient.

**Phase 2:** Phase two focuses on building stability control by adding simple movements of the arms or legs to further challenge core stability.

It involves keeping the pelvis and lower back stable while performing some of the fundamental level exercises such as the supine Single Leg Tap Down, Marching, Single Leg Slides, Single Knee Drop, One Leg Circle, Toy Soldier, Arm Pull Over and lower levels of Swimming.

**Progressing phase 2:** Clients should not be encouraged to progress until they have built up the strength and stability to perform the exercises while maintaining good posture, with the core muscles isolated and without the superficial muscles helping out.

When this has been achieved, start adding in trunk movements such as the Curl Up, which can be progressed to exercises such as The Hundred, Scissors and One Leg Stretch. Add in fundamental levels of prone lying and side lying exercises and progress slowly through the levels.

**Phase 3:** Phase three is known as ‘reduced attention’. This is more functional for daily activities and promotes calling upon the stabilising muscles when they are needed and relaxing them when they’re not, for example as should take place during the normal daily tasks of lifting and carrying.

**Additional exercises:** Additional exercises that will help to strengthen the glutes and hips could also include:

- Glute Bracing
- Swim Leg
- Hip Abduction and Adduction
- Shoulder Bridge
- Clam
• Side-Lying Series

Stretching and mobility

Flexibility and mobility are key factors in the management and prevention of lower back pain and consideration should be given to the muscles affecting the mobility of the lower back and the pelvis. These include the lower back extensors, gluteals, piriformis and the hip flexors, specifically the psoas.

Pilates exercises that are suitable to promote lumbar mobility include Pelvic Tilts progressing into Shoulder Bridge, controlled Hip Rolls and the Cat Stretch.

Cervical spine

So far, we’ve focused on simple lower back pain. However, the same principles should be applied to the equivalent cervical conditions. That is you need to consider strengthening and mobilising the neck.

Strengthen and mobilise the neck: You need to consider strengthening and mobilising the neck. Focus on correcting any postural abnormalities such as neck alignment and muscle imbalances. Particularly work to strengthen the deep neck flexors and shoulder stabilisers.

Improve strength: A useful exercise to isolate the deep neck stabilisers and improve cervical strength is the Head Nod in supine or 4-point kneeling.

As the neck stabilisers get stronger clients can perform isometric neck strengthening exercises and Pilates exercises where the head is unsupported but moving in line with the spine so there is no actual neck movement such as in The Spine Twist.

Isotonic neck strengthening exercises can then be added that include flexion, extension, rotation and side flexion either standing or against gravity. These exercises also encourage mobility and good postural alignment.
Improve mobility: Good posture and cervical alignment should be achieved before performing mobility exercises. Movement of the head and neck in all planes, such as flexion and extension, rotation and side flexion, should be performed in a pain-free range of movement.

Modify uncomfortable exercises: You will need to modify or adapt exercises which are likely to be difficult for your clients or that cause them discomfort. This would include exercises that require the head to be held in an unsupported position such as in Curl Ups, Swimming on hands and knees and Side Bend and exercises that may put the neck in an uncomfortable position such as those in the Roll Over Series or in shoulder stand positions.

Watch for Pain: If a client experiences any symptoms, particularly pain, paraesthesia or muscle weakness you should refer them for a medical opinion.

Scatica, Herniated Disc and Piriformis Syndrome

What is sciatica?
Sciatica is a relatively common condition, but the term ‘sciatica’ is often used, somewhat confusingly, to describe a symptom or symptoms rather than an actual diagnosis.

**A major nerve**

The sciatic nerve is the longest nerve in the body and one of five major nerves in the hip region.

**Location**

The sciatic nerve originates from the fourth lumbar vertebra to the third sacral vertebra. It leaves the pelvis and passes through the greater sciatic foramen deep in the buttock, below the piriformis muscle.

It continues down the back of the thigh and splits into two terminal branches into the lower limb and foot.

Sciatic pain can be felt anywhere along the path of the sciatic nerve, or branches of the nerve

**Signs and symptoms of sciatica**

Signs and symptoms of sciatica can vary in nature and severity. Generally, pain may be felt from the lower back, down the back of the thigh and lower limb to as far down as the foot, depending on where the sciatic nerve is being compressed.

**Leg pain** - Symptoms will normally affect only one side of the body with the leg pain being worse than any back pain.

**Buttock pain** - Buttock pain is usually worse on sitting and clients may experience a sharp, shooting pain which is more noticeable when standing up. Some clients may experience tingling, pins and needles, a burning sensation or numbness along the course of the nerve.
Difficulty in moving

Some clients experience weakness or a feeling of heaviness in the affected leg or foot, making it difficult to move.

Causes of sciatica

Symptoms of sciatica occur when the sciatic nerve root is irritated or compressed as it exits the spine between the fourth lumbar and third sacral vertebrae. This is most commonly due to a herniated or ‘slipped’ disc, or less commonly when the sciatic nerve itself is compressed.

Other than a herniated disc, irritation or compression may be due to degenerative disc disease, spinal stenosis, spondylolisthesis and piriformis syndrome.

Clients experiencing any of the symptoms of sciatica should be checked out by a GP or physiotherapist.

Treatment of sciatica

Treatment of sciatica will depend on the cause of the symptoms. Acute episodes of sciatica generally resolve in a few weeks with conservative, non-surgical, treatment.

Conservative treatment

Conservative treatment aims to reduce inflammation and irritation of the nerve. This may be achieved through non-steroidal anti-inflammatory drugs such as Ibuprofen, and over-the-counter pain relief such as Paracetamol. Stronger pain relief and muscle relaxants may be prescribed by a GP if necessary.

Physiotherapy

Physiotherapy will include exercise therapy to manage symptoms and stretch and strengthen the lower back.
Exercise programmes

In cases where symptoms have continued for more than six weeks, clients may need to follow an exercise programme prescribed by their GP or physiotherapist in order to manage symptoms and avoid future episodes.

Surgery

If conservative treatment is unsuccessful then surgery may be required. Surgical options include:

• Discectomy
• Laminectomy
• Spinal fusion

Your Notes:
Disc herniation

Let’s now look in a little more detail at the most common cause of sciatica. Many people have heard the term ‘slipped disc’, but this is a somewhat misleading lay term as the disc does not actually ‘slip’, but instead it herniates.

Description

A disc herniation occurs when the softer centre of the disc, the nucleus pulposus, protrudes through the annulus fibrosis, the tougher exterior of the disc.

Occurrence

It is more common in the lumbar than the cervical spine and can occur in any direction. However, most disc herniations occur in a posterior direction towards the spinal column and nerves as the posterior portion of the annulus is the thinnest part.

Acute pain

Severe, acute pain can result from pressure exerted on spinal nerves. In the case of the sciatic nerve, it will cause the symptoms of sciatica.

Stages of herniation

There are four stages of a disc herniation.

1. The first stage is degeneration which involves age-related changes that weaken the disc. However, it remains intact.

2. Degeneration is followed by protrusion, sometimes referred to as a bulge or prolapse. As the annulus begins to tear, the nucleus pulposus pushes into the annulus, changing the form of the disc. There is likely to be some pressing against the nerves.
3. The third stage is extrusion. This occurs when the fibres of the annulus fibrosis rupture and the nucleus pulposus breaks through but remains intact with the disc.

4. The fourth and final stage is referred to as sequestration. At this point the nucleus pulposus not only squeezes through the annulus fibrosis but gets separated from the main disc.

**Signs and symptoms of herniation**

Signs and symptoms of herniation can vary greatly depending on its area and size. If there is no pressure against the nerves, as might be the case in the initial degenerative stage, then there may be localised aching or pain or no pain at all.

**What are the symptoms if there is pressure?**

If there is pressure against a nerve, depending on where the disc is herniated there may be pins and needles, electric shock type pain, numbness or weakness in the arms or legs.

**Where do most disc herniations occur?**

Disc herniations most commonly occur between the fourth and fifth lumbar vertebrae and the fifth lumbar and first sacral vertebrae as this is the area of the spine that takes most of the body weight.

**Can herniations occur in any direction?**

Yes. Disc herniation is more common in the lumbar than the cervical spine and can occur in any direction. However, it is most likely to occur in a posteriolateral direction producing unilateral symptoms.

**Causes**

A number of factors increase the risk of a disc herniation.

**Strengthen and mobilise the neck**

The water content and elasticity of our discs helps to maintain their flexibility but as we get older, this reduces, making them more susceptible to rupture.

**Occupation**

Certain types of occupation or lifestyle activities that include heavy lifting, or prolonged sitting, such as desk jobs and driving, can be increased risk factors.

**Rotation and flexion**

Combined movements of rotation and flexion stretch all of the annular fibres at the same time, making the disc more prone to injury.
Health choices

Health choices such as smoking or being overweight are also contributory factors.

Traumatic injury

Traumatic injury or a history of back injury may cause tiny tears or cracks in the outer layer (annulus or capsule) of the disc.

Vigorous exercise

Years of vigorous exercise and exercises such as weight lifting can increase the wear and tear of the disc. Very common in Fitness instructors.

Most people with disc herniation will recover within 4-6 weeks and may not seek medical attention. Those that do seek medical help will be given a thorough assessment by a health professional. Special tests will be performed to detect a herniation, test muscle strength, sensation and reflexes. If the symptoms do not settle or if there is a need for further investigation an MRI and/or CT scan may be performed.

Treatment of disc herniation

Treatment of herniation will depend on the severity of the symptoms.

Rest - Initially clients will be advised to rest from aggravating activities, such as prolonged sitting, bending, lifting and reaching. Symptoms generally settle within a few days as the protrusion retreats.

Medication - If the pain is severe, complete rest may be required initially. However, once symptoms have settled people are encouraged to keep moving and perform gentle exercise. The GP may prescribe stronger pain relief such as codeine if the pain is severe.

Discectomy - If the symptoms are severe or long lasting a discectomy may be performed to remove the section of disc that is bulging.

Muscle relaxants - Muscle relaxants such as Diazepam may also be prescribed in cases with severe muscle spasm and stiffness.

Physiotherapy and exercise programmes - Physiotherapy treatment and exercise programming can help relieve symptoms.
Piriformis syndrome

Piriformis syndrome is the name given to conditions involving the piriformis muscle. In a very small number of people the sciatic nerve passes through the piriformis rather than underneath it on its course through the pelvis. The sciatic nerve can be impinged by the piriformis muscle and the piriformis muscle itself can be strained.

Signs and symptoms

Sciatica symptoms such as pain and tingling in the buttock and radiating down the leg can be caused if the sciatic nerve is compressed by the piriformis.

The piriformis may be strained due to tightening or shortening of the muscle as a result of trauma or overuse. The symptoms in this instance tend to be deep aching in the buttock aggravated by sitting or walking upstairs.

Description and function

The piriformis is a short, flat band of muscle involved in lateral rotation of the femur from the anatomical position and abduction in a seated position, as when someone
gets out of a car. It also stabilises the pelvis when rotating the trunk or if you are trying to maintain balance while standing on a moving train or bus, for instance.

**Causes and risk factors**

The piriformis is used heavily in everyday activities so it’s not surprising it can be easily irritated. Long-distance running and walking, running uphill, poor biomechanics, poor posture, sitting for long periods, bed rest and direct trauma can cause the piriformis muscle to become tight or irritated.

**Diagnosis**

There are no special tests to diagnose for piriformis syndrome. During assessment the GP or physiotherapist will rule out other reasons for the symptoms.Palpating the piriformis and testing the range of movement and pain response to muscle testing can also help make a diagnosis.

**Treatment**

Treatment generally includes stretching exercises for the piriformis and other tight muscles such as the gluteals and hamstrings. A physiotherapist will use soft tissue techniques such as massage and stretching.

**Exercise for sciatica caused by disc herniation**

You can discuss with your client the exercises to avoid, those that will help centralise the symptoms and those you would recommend as symptoms settle.

**Exercises to avoid**

Until your client’s symptoms have resolved, the following Pilates exercises should be avoided:

- Roll Down
- Spine Stretch
- Saw
- Roll Up and any version of rolling including Rolling Back
- Crab
- Seal
- Open Leg Rocker
- Any Glute Bracing which will aggravate the Sciatic

**Exercises that centralise symptoms**

Pilates exercises encouraging lumbar extension include:
• Half or Full Cobra
• Cat Stretch in extension only

If it is uncomfortable for a client to lie prone they may do standing lumbar extension exercises.

**Exercises once symptoms settle**

As symptoms settle and centralise the emphasis is on strengthening the core and lower back muscles and stretching tight structures with exercises such as:

• Swan Dive
• Swimming
• Single then double knee folds
• Shoulder Bridge
• Pelvic tilts to gently stretch and mobilise the lower back, as long as they do not exacerbate symptoms
• Gluteal and hamstring stretches

**Exercise for sciatica caused by spinal stenosis**

Exercises for sciatica caused by spinal stenosis are those that encourage opening the passageway through which the spinal cord passes, thereby relieving impingement or irritation. These exercises focus on stretching the lower back extensors and strengthening the spine flexors.

**Suitable Pilates exercises include:**

• Child’s Pose
• Knees to Chest Stretch
• Cat Stretch in flexion
• Curl Ups and spinal flexion exercises such as The Hundred
• One Leg Stretch
• Double Leg Stretch
• Scissors
• Roll Up

**Exercises for piriformis syndrome**
The main consideration of exercises for piriformis syndrome is to stretch the piriformis muscle to relieve pain along the sciatic nerve. There are a number of ways to stretch the piriformis including:

- Prone lying glute stretch
- Supine glute stretch
- Supine lying opposite knee to chest and shoulder

**Prevention and management**

In order to prevent another episode of sciatica-related problems, clients will benefit from keeping the lower back and abdominal muscles strong and the lower back supple. This can be achieved through regular exercise such as Pilates. Maintaining a good posture, changing position regularly, lifting and carrying correctly and maintaining a healthy weight & diet will also help.

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**Osteoporosis**

Osteoporosis is a condition that affects the bones. It causes them to become weak and fragile and more likely to fracture from a minor fall or, in serious cases, from a simple action such as a sneeze.

**How common is it?** Approximately three million people in the UK are thought to have osteoporosis, and there are over 230,000 fractures every year as a result.

**How serious is it?** Osteoporosis can be life-threatening. There are 89,000 hip fractures every year in the UK. Ten percent of patients die within one month of their injury. Thirty percent die within a year. The vast majority of these broken bones will have been the result of a fall.

**Does it affect both men and women to the same extent?** No, osteoporosis is more common in women than men. One in two women and one in five men will suffer a fracture at some point after the age of 50, mainly because of poor bone health. The disease is therefore more commonly associated with post-menopausal women, but can also affect men, younger women and children.
**Osteopenia and osteoporosis**

**Normal circumstances:** In normal circumstances, there is a balance between the rate at which new bone is laid down, known as deposition, and the rate at which normal breakdown or resorption, of bone occurs.

**Osteopenia:** As people grow older, this balance between the rate of bone deposition and bone resorption starts to tip.

Beginning in middle age, existing bone cells are reabsorbed by the body faster than new bone is made. Bones naturally become thinner and there is an overall reduction in bone mass which is referred to as ‘osteopenia’.

**Diagnosing osteopenia:** Osteopenia is diagnosed by performing a DEXA scan which is a special x-ray that measures bone mineral density.

Technically osteopenia is defined as a bone mineral density between 1 and 2.5 standard deviations below the mean density for young adults.

The ‘mean density’ here refers to the average bone mass density measurement for young adults and is the figure for which there is no osteopenia. The ‘standard deviation’ is a measure of how far a person’s bone mass density deviates from this ideal figure. The greater the deviation, the more severe the osteopenia.
Osteoporosis: Once low bone mass becomes severe enough to result in fractures from minimal trauma, such as a fall from standing height, it then becomes defined as osteoporosis.

Osteoporosis is literally a condition of porous bones and the deterioration of the structure of the bone. It involves a more severe loss of bone mass than associated with osteopenia.

**Treatment and management of osteoporosis**

Treatment involves a number of options depending on individual circumstances. These include:

- Prescription medication or injection to inhibit osteoclasts which are responsible for breaking down old bone
- Hormone replacement therapy
- Reducing lifestyle factors that may contribute to a reduction in bone density, such as smoking
- Consuming sufficient amounts of calcium and vitamin D and
- Performing appropriate exercise

As prevention is better than cure, it's preferable for a client to consume a diet with adequate calcium and to participate in appropriate exercise during their early years to maximise bone density, rather than having to take medication and supplements when they are older. Unfortunately, dairy products in the UK today have very limited Calcium in them so it is vital that client’s diets include a wide variety of green leafy vegetables.

**Exercise and osteoporosis**

The higher the loss of bone density, the higher the risk of spontaneous vertebral fractures so as a Pilates instructor you need to understand the degree of your client’s bone density loss and what this means for them

**Benefits of exercise:** Exercise is important in the prevention and management of osteoporosis. Regular exercise will help to:

- Increase muscle strength
- Improve balance
Recovering from a joint replacement

Full recovery from a joint replacement operation varies from person to person. Clients generally need crutches or other support for up to six weeks to help them walk. Normally, a physiotherapist gives the client advice and exercises before they leave hospital. This is based on the particular type of surgery performed and the protocols used.

After leaving hospital clients need to regain movement and improve their strength. They may attend a regular exercise session as an outpatient or be given a home exercise programme delivered by a physiotherapist. It can take up to three months before clients can resume normal activities and up to one year to feel fully active again.

Fitness Pilates exercise considerations

The rehabilitation process depends on the individual client and the type of joint replacement. Different surgical procedures have differences in their rehabilitation protocols and one client may respond and recover very differently from another, even if they have had the same type of operation.

Following health professional guidance

As a Fitness Pilates instructor, you’ll need to follow the guidance of your client’s physiotherapist or surgeon. This will change during their recovery as your client regains movement and strength. The health professional should provide information on your client’s needs, their restrictions and their recommended range of movement.

Previous Fitness Pilates experience

Although you should consider if your client has previous Fitness Pilates experience or is a complete beginner, it is more important to adapt and modify exercises based on your client’s uniqueness and their post-operative timeline. Depending on the client and your experience as an instructor it may be more suitable to see them on a one-to-one basis rather than in a mixed class.

Specific precautions for hip arthroplasty

Unless otherwise directed by your client’s physiotherapist or surgeon the following information gives precautions and exercise recommendations for posterior and anterior, direct lateral and anterolateral surgical procedures at various post-operative timelines.

Let’s start by considering the first six weeks after an operation. It is unlikely you will see a client within this period as the list of things they cannot do will prevent them from being able to get onto the floor. It usually takes a minimum of six weeks for initial healing to take place.
The first six weeks

You should therefore note that in this immediate post-operative period there are several things your client should not do with their newly operated leg.

Do not:

• Allow the leg to cross the midline of the body, this means adducting the leg beyond neutral
• Internally or externally rotate the leg
• Cross the knees when sitting
• Allow the hip to be flexed beyond 90 degrees (for instance sitting in a low chair or anything that brings the knees closer to the chest or the chest closer to the knees)

Performing these movements may increase the risk of dislocating or damaging the new joint.

From six weeks to six months and beyond

It usually takes about three months for a hip replacement to heal fully. The following guidelines are for up to one year, but remember there may be variations depending on the type of surgery, the surgeon’s post-op protocols and the individual. Do not push clients. Ensure they exercise as tolerated - meaning within their limit of pain and range of movement.

Crossing the midline (as in adduction past neutral) should be limited to no more than 20 degrees for up to six months and then as tolerated.

From six weeks to six months and beyond - rotation

Internal rotation should be limited to no more than 20 degrees with the knee flexed for up to six months and then 30 degrees for beyond. External rotation should be no more than 30 degrees with the hip flexed but avoid a combination of external rotation and extension of the hip.

Extremes of internal and external rotation in a weight bearing position should be avoided such as twisting with the feet on the ground to turn around and face a different direction.

From six weeks to six months and beyond - hip flexion

Hip flexion can be increased to 90 and 100 degrees for up to three months. Then progress to 110 degrees by six months and 115 degrees from six months and beyond, as tolerated.
Remember, that patients with moderate to severe arthritis will still have a limited range of movement. Please note that clients may still struggle to get onto the floor for up to three months. If you are seeing a client on a one-to-one basis they may be able to exercise in a sitting position or on a raised platform.

**Clients able to attend a class**

If you have a client who is three months or more post-op and is able to get on and off the floor then they are likely to be sufficiently able to attend a class. If this is the case then you can progress through the Pilates mat exercises as normal. Make sure you follow the guidance given in this lesson and that of the physiotherapist or surgeon.

**Suggested exercises - six weeks to three months**

The Pilates exercises Straight Leg Lower and Hip Abduction and Adduction are suggestions for the period six weeks to three months. Also suitable are the fundamental levels of the following:

- The Hundred (starting from feet flat and progressing)
- One Leg Circle (remembering allowed degrees of movement)
- One Leg Stretch / One Leg Slide
- Scissors (bearing in mind amount of hip flexion allowed)
- Half Roll Up (when able to increase hip angle)
- Spine Stretch (sitting on a block)
- Swan Dive (for mobility and strength)
- Shoulder Bridge
- Thread Like a needle

**Suggested exercises - three to six months**

You can follow all the previous exercises and progress through fundamental to improver levels where appropriate. In addition:

- Spine Twist
- Side Kick and Side Lying Series
- Swimming
- Push Up
- Full Roll Up (assisted with ball or band)
• Teaser / V Sit
• Side lying open door

Suggested exercises - six months and beyond - You can follow all the previous exercises and progress through fundamental to improver levels where appropriate. Please note that the hip replacement guidelines and exercise suggestions given in this lesson may well differ from the guidelines given by the physiotherapist or surgeon. Remember you will need to modify, adapt and progress the exercises based on the individual client and the health professionals’ guidance.

Knee replacement guidelines

Knee replacement operations generally take about six weeks for the initial healing to take place with healing continuing for up to three months. As with hip replacements recovery can be different between one person and the next. Certainly the range of movement your client had pre-op will determine the amount they regain post-op. If they had very poor mobility before the operation they may struggle to get full mobility after it.

The first six weeks

It is unlikely you will see a client within the first six weeks of their operation. Clients will be given rehabilitation exercises from their physiotherapist based on the surgeon’s protocols and these should be taken into account. From six weeks on, unless otherwise stated by the health professional, your clients should be able to move their knee as tolerated.

The main contraindication is not to pivot on planted feet into extreme ranges of internal and external rotation, especially when moving in the direction of the operated leg. For example, do not twist to the right on a right knee replacement. Pick up the feet and take small steps to turn around.

From six weeks to three months

Unless otherwise directed by your client’s physiotherapist or surgeon the following are exercise suggestions from six weeks to three months:

• Quad setting
• Glute Bracing with Swim leg

Start with fundamental levels of:

• One Leg Circle
• One Leg Slide/ stretch
• Tap Downs
• Spine Stretch
• Swan Dive
• Shoulder Bridge
• Clam and Side Lying Series
• Single knee drop

**Suggested exercises - three months to six months**

You can follow all the previous exercises and progress through fundamental to improver levels where appropriate. Remember that some clients may have difficulty kneeling for some time after the operation. You can also use:

• Spine Twist
• Swimming (can be done kneeling)
• Half Roll Back (using ball or bands)
• Rolling Back
• Knee Rolling

**Suggested exercises - six months and beyond**

You can follow all the previous exercises and progress through fundamental to improver levels where appropriate. In addition:

• Leg Pull/ Plank
• Push Up

Please note that the knee replacement guidelines and exercise suggestions given in this section may well differ from the guidelines given by the physiotherapist or surgeon. Remember, you will need to modify, adapt and progress the exercises based on the individual client and the health professionals’ guidance.
In This section we will be looking at some common conditions and injuries that you are likely to come across in your career as a Fitness Pilates instructor including trochanteric bursitis of the hip, meniscal tears and ligament injuries in the knee.

The hip joint

Hip pain in adults is normally due to osteoarthritis. If stiffness is the predominant symptom, then it is more likely to be from rheumatoid arthritis, psoriatic arthritis or ankylosing spondylitis.

Other causes of hip pain are Paget’s disease and malignancy in the pelvis. Hip pain can also be referred from the lumbar spine. Postural faults associated with hip pain include lordosis, kyphosis, scoliosis and swayback.
Referred hip pain: Clients with hip pain may report pain in the groin, outside and front of the thigh and the buttocks. Confusingly, pain in these areas may be referred from the lumbar spine and pain from hip conditions can refer to the front of the knee and the lumbar spine. It is therefore essential clients are assessed by an appropriate health professional such as a G.P or Physiotherapist for correct diagnosis.

Knee conditions: A number of conditions can affect the knee including arthritis, tendinitis, bursitis, injury due to trauma such as dislocation, meniscal tears, ligament sprains and muscles strains, patellofemoral syndrome and iliotibial band syndrome.

Tronchanteric bursitis

Trochanteric bursitis is the most common soft tissue condition affecting the hip. It relates to pain originating from inflammation of the trochanteric bursa and is often
referred to as ‘Greater Trochanteric Pain Syndrome’ (GTPS). GTPS can also relate to pain coming from other soft tissues around the greater trochanter such as other bursa or a gluteal muscle strain, usually involving the gluteus medius.

Clients may complain of an aching pain on the outside of the hip with pain on palpation of the greater trochanter. These are signs and symptoms of GTPS.

**Causes:** GTPS is commonly associated with arthritic conditions, fibromyalgia and leg length discrepancies. It appears to be more common in women than men and between the ages of 40 and 60. Other causes include falling on the greater trochanter and friction of the Iliotibial Band (ITB), especially in athletes.

Friction occurs as the ITB moves forwards and backwards over the greater trochanter during hip flexion and extension. Irritation can occur if the ITB is tight.

**Other causes:** GTPS can be caused by activities which tax the ITB or alter the tilt of the pelvis such as runners with biomechanical faults, running on a banked surface or increased supination. These are also causes of irritation to the bursa via the ITB. Mechanical faults, including poor lumbar and pelvic mobility and stability, and tight muscles around the hip, such as the hip flexors and abductors, are also potential causes of GTPS.

**Diagnosis:** Accurate diagnosis of trochanteric bursitis can sometimes be difficult due to the other structures in the hip around the greater trochanter which can also cause pain. However, a diagnosis can be made based on examining the patient’s history thoroughly, specific symptoms such as palpation around the area of the bursa and by performing specific physical tests. MRI imaging and CT scans may be used to confirm diagnosis.

**Treatment:** Treatment of trochanteric bursitis focuses on reducing inflammation either through oral anti-inflammatory medication or a corticosteroid injection. Until the inflammation settles, clients are advised to avoid aggravating activities including excessive walking and painful positions such as lying on the affected side. Physiotherapists use techniques such as massage, ultrasound and acupuncture to treat the condition. They will also correct any postural faults and prescribe stretching and strengthening exercises to address the potential cause. In particular this will include exercises to stretch and strengthen the gluteus medius and stretch the ITB.

**Fitness Pilates exercise considerations**

The main consideration in your Pilates class for clients with trochanteric bursitis is likely to be their limitations because of pain. Lying on the affected side could be painful and so side lying exercises will be uncomfortable. Exercises such as the side kick and side lying series may require a pillow or towel under the hip for cushioning.

**Comfort:** If your client is lying on the affected side it may be more comfortable to have the hip and knee bent at 90 degrees. If your client lies on the unaffected side
they may need to reduce the lever length of the affected leg by bending the knee and hip to 90 degrees. It will also be more comfortable to have a pillow between the floor and knee of the affected leg when doing the lower leg lift, and between the knees for the Clam.

**Building core strength:** Clients with trochanteric bursitis will benefit from building core strength.

This should be followed by exercises that will:

- Help with hip and lower back strengthening and stretching
- Strengthen the hip abductors, particularly the gluteus medius
- Stretch the ITB and gluteus medius

An all round view is to promote core and lumbar strength and stability, lumbar mobility and general hip strength, which makes Fitness Pilates an ideal method of exercise.

**Suggested exercises:** Exercises to include are: Tap Downs, 1 leg stretch, double leg stretch, 1 leg circle, scissors, Half & Full roll up, Clam and side lying series, Glute Bracing & Swim Leg, spine stretch, saw, swan dive, swimming, roll down, pelvic tilts, shoulder bridge, cat stretch, spine stretch, roll over, jack knife, leg pull prone and supine, teaser, ITB stretch, hip flexor stretch and rolling like a ball. Other rolling exercises will depend on whether your client finds getting into the start position painful. If so then do not do these.

**Strengthening and stretching:** In addition, include abductor strengthening and stretching exercises for the gluteus medius in particular. Exercises include the side lying series and Clam and traditional glut stretches, and the prone lying glute stretch.

**Exercises which may cause discomfort** are those with repeated or extreme hip flexion and extension, such as side kick and the side lying series and scissors with straight legs. If a client feels any pain, then adapt the exercise by reducing the range of movement or give an alternative exercise.

**Postural imbalance:** You should also help the client address any individual postural imbalances. As always, start at the fundamental levels and progress when the client has mastered the technique of the lower levels and as long as the exercise is pain free.
Meniscal tears

Your notes:
The next condition you’ll need to consider is meniscal tears. Tears are generally classed as minor, moderate or severe depending on how big the tear is. There are various types of tear that can occur to the meniscus.

These include:

- Longitudinal
- Degenerative
- Flap
- Bucket Handle
- Parrot’s beak

**Signs and symptoms for minor and partial tears:**

Symptoms for meniscal tears vary depending on the size of the tear. Minor tears give some pain and slight swelling and may repair within 2-3 weeks. Partial tears can cause pain in the centre or side of the knee and swelling is likely to get worse over a few days. Walking is usually fine but the swelling can make the knee feel stiff and affect how much it can bend. Like a minor tear, symptoms of a partial tear may go in a few weeks but are likely to return with overuse or if the knee is twisted. If untreated it may come and go over the years.

**Severe meniscal tears:** With severe meniscal tears, the knee may catch or lock if pieces of the torn meniscus have moved into the joint space. Clients can have difficulty straightening the knee or may feel as though the knee gives way. Swelling may be immediate following an injury or come on within a few days.
Causes and diagnosis: Meniscus tears are either the result of a traumatic injury or are gradual due to age related wear and tear in the entire joint. Injury occurs most commonly when the knee is flexed and twisted, especially when the foot is anchored.

Diagnosis by a G.P or Physiotherapist takes the full history into account including information regarding any injury. A physical examination is required and specific to check stability and range of movement to determine if the pain is coming from the meniscus. An x-ray or an MRI, in more severe cases, shows the location and extent of the tear.

Treatment: Treatment of a meniscal tear depends on the location, type and severity of the tear as well as the client’s age and activity level. Conservative treatment may include initial rest from aggravating activity, ice and elevation to reduce swelling. The use of an elastic bandage and physiotherapy can keep the joint mobile and the quadriceps active. If surgery is required, it might be possible to repair the damage otherwise the damaged part or all of the meniscus will be removed. Recovery time very much depends on the type of surgery.

Fitness Pilates exercise considerations

A conservative rehabilitation exercise programme should focus on strength and flexibility of the knee and leg.

Modify exercises: If the client is recovering from meniscal surgery they will have been given guidelines on what they should and should not do as well as a rehabilitation exercise programme. As a Pilates instructor you should consider these guidelines and adapt and modify exercises accordingly.

Key exercises: Key exercises include quad setting, hip abduction and adduction, inner thigh squeeze, Glute Squeeze, swim leg and hamstring curls.

Other Fitness Pilates exercises: include 1 leg stretch or single leg slide, Single Leg Tap downs and scissors with straight leg, double leg stretch, shoulder bridge, Knee...
Drop, swimming, side kick and the side lying series. Standing exercises such as squats and ski-squats can also be incorporated.

**Pain free exercises:** Exercises should be performed in a pain free range of movement and modified or adapted to suit the individual client.

**Your Notes:**

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**Ligament injuries**

There are four main ligaments in the knee that can be damaged.

These are the

- Anterior cruciate ligament (ACL)
- Posterior cruciate ligament (PCL)
- Lateral collateral ligament (LCL)
- Medical collateral ligament (MCL)

If a ligament is injured or torn it is referred to as a sprain. Sprains or tears are graded -1 is mild, 2 is moderate and 3 is severe. Because ligament injuries normally occur as the result of an accident or injury more than one ligament may be damaged.

For instance an injury to the ACL will more than likely involve the MCL also.

**Signs and symptoms:**

Knee ligament injuries can produce the following signs and symptoms:

- Sudden and severe pain
• Swelling
• Difficulty to weight bear
• A feeling of instability or the joint feels loose
• A loud pop or snap may be heard during injury

**Cause and risk factors:** Ligament sprains are usually the result of an injury and are common in sports such as football, rugby, basketball, ski-ing and gymnastics, as well as other sports. Injury usually occurs by either a direct hit to the outside of the knee, twisting the knee when the foot is fixed on the ground, a sudden change in direction whilst running, stopping suddenly or jumping and landing on a bent knee.

**Treatment:**

Mild to moderate ligament tears may heal in time with appropriate rest and conservative treatment, following the principles of P.R.I.C.E. - protecting the joint and ligament from further injury. Appropriate rest may include reducing the amount of weight the client can put through the leg and possibly using crutches. Ice can help reduce swelling and inflammation. A compression bandage and elevating the knee will also help to reduce swelling. Conservative treatment will also include the use of NSAIDs and mobility, stretching and strengthening exercises.

**Surgery:** If the ligament tear is severe surgery may be required. Although collateral ligaments usually heal with conservative treatment, surgery may be required to repair the ligament. The ACL and PCL cannot be repaired if they are completely torn or stretched beyond their limits. In these cases reconstructive surgery is required. An ACL reconstruction uses a piece of either a hamstring tendon, or the patellar tendon of the same leg.

**Recovery:** Recovery from a ligament tear depends upon the extent of the tear, whether surgery is required and the individual client. Full recovery from ACL surgery can take from nine to twelve months. The rehabilitation process for collateral ligament injuries will depend on the severity of the tear. A progressive exercise rehabilitation programme for a mild to moderate injury may take up to six weeks whereas a moderate to severe injury may take up to twelve weeks.

**Rehabilitation:** The rehabilitation process and exercise programme for ACL and PCL injuries depends upon the type of surgery and if any other ligaments are damaged. A progressive exercise rehabilitation programme can take up to 12 months. Rehabilitation exercises focus on restoring movement, strengthening of the knee and hip, proprioception and balance. For athletes, the latter stages will also include sport specific drills with the aim of returning the athlete to their sport.

**Pilates exercise considerations**
Exercise plays a vital role in the rehabilitation of ligament injuries and the rehabilitation process can be long and complex.

**Follow guidance:** Because ligament injuries are often caused by an accident or injury, clients see a health professional for treatment and advice. You must follow the guidance of the health professional which relates to the severity of the injury and the stage the client is at in their rehabilitation programme.

**Collateral ligament sprains:** Clients with collateral ligament sprains will benefit from Fitness Pilates exercises that strengthen the knee in the sagittal plane, as well as strengthening the hip joint and improving balance. In the early stages of rehabilitation your clients should avoid twisting the knee, especially when the foot is fixed on the ground. The knee should be kept aligned - don't let the knees drop in or out during an exercise such as the shoulder bridge.

**Rehabilitation programmes:** Clients following ACL or PCL reconstruction should consult their health professional before taking part in your Pilates class. Guidance will depend on what stage they are at in their rehabilitation process. As a Pilates instructor you will need to modify and adapt exercises in line with the guidance given.

**Core stability:** Modern day rehabilitation programmes incorporate a core stability element as well as leg strengthening and balance. Pilates is therefore an ideal form of exercise to incorporate in the rehabilitation programme.

**Suggested exercises:** Specific Pilates exercises to strengthen the knee and hip include:

- Quad setting,
- Tap Downs,
- 1 leg stretch/ single leg slide
- one leg circle,
- double leg stretch,
- spine stretch,
- saw, swan dive,
- shoulder bridge,
- side lying series,
- inner thigh squeeze and Glute Bracing with swim leg,
- spine twist,
• swimming,
• Knee drop and Knee Rolling
• leg pull/ Full Plank
• push up.

Contraindications: There are no specific recommended contraindications with any of the original Fitness Pilates mat exercises. You will have to follow the guidelines given by the health professional, consider the stage of the rehabilitation process and the individual client and their limitations to adapt and modify the exercises to ensure they are appropriate.

Additional considerations: Exercises should be carried out in a pain free range of movement and modified or adapted for clients who do not have full range of movement. Props can be used to aid knee alignment and remember you’ll need to be patient, especially with clients recovering from surgery and assist them with progressing slowly.
Tips and advice for some common problems

You may come across clients who are unable to adopt positions you require them to be in for a certain exercise. This may be due to pain or a reduced range of movement in a joint, or both. The most likely reasons will probably be due to arthritis or bony deformities such as bunions.

Wrists

Problem

Clients may suffer wrist pain or an inability to place their hands correctly in 4-Point Kneeling, Box position or Table Top. This includes ¾ and full Leg Pull (Plank and push-up) positions.

In the 4-Point Kneeling position the client is asked to place their knees below their hips with hands (wrist and heel of the hand) below the shoulders. This may be painful or difficult due to reduced wrist extension.

Tips

1. Move the hands slightly further forward to reduce the angle of wrist extension. Not too far forward though, as ideally the weight of the body needs to transfer from the shoulder, down the arm and through the heel of the hand in a vertical line.

2. Make a fist so the wrist is ‘straight’ and lean on the knuckles.

3. Place a yoga block under the heels of the hands.

4. Use a hand-weight (one that won’t roll away). Grasp the hand weight in a similar fashion to making a fist as above.

5. Ensure correct technique - body weight should be evenly distributed through the 4 points of contact (2 knees and 2 hands), not leaning forwards over the hands. If in ¾ or full Leg Pull position the client should still try not to lean too far forwards over the hands and try to keep some weight back over the knees or toes.

6. Reduce reps/breaths.

7. Take more rest breaks.

8. Adapt by reducing from ¾ or full Leg Pull position, to 4-Point-Kneeling or ¾ respectively.
9. If it is still too painful then suggest an alternative version of the same exercise such as prone lying swimming, or give an alternative exercise altogether

Foot cramp - prone

Problem

Foot cramps can sometimes occur when clients are in 4-Point Kneeling, Box or Table Top positions or when lying prone.

Tips

1. Tuck the toes under
2. In prone lying, try placing rolled towels under the ankles to raise the height of the lower leg. Note that if this is too high then the knee will be placed into flexion and therefore a small raise should be placed under the thighs, just above the knees to try and keep the ankle, knee and hip in better alignment without creating an anterior pelvic tilt and allowing the muscles to be used correctly.

Foot cramp - side lying or supine

Problem

Cramping may also occur when pointing the toes in supine or side lying. This often happens when clients are ‘over pointing’ their toes such as when lengthening the leg and pointing during Single Leg Stretch or the Side Kick.

Tips

1. Point the toes but try and ‘relax’ and not force them
2. Focus more on flexing at the ankle rather than flexing the ‘toes’ - planter flex but don’t ‘scrunch’ the toes
3. Simply don’t point the toes - focus on length from the thighs
Pain and or/reduced range of movement in the toes

Problem
Some clients find it too painful or are unable to ‘tuck’ the toes under or to put any pressure on them. This causes problems for instance when rolling down and walking out into a full push-up. They may simply not have the movement in the big toe due to arthritis or a bunion or other foot condition.

Tips
1. Adapt the exercise and advise the client to do it ‘as best their body will allow’
2. Change the exercise to avoid the painful or difficult position/movement altogether
3. Place a block, cushion or small rolled up towel under the ankle/foot in kneeling position to raise the foot and take pressure off the toes

Note - if it’s a fused joint or just won’t move, you can’t make it move!

Benign postural positional vertigo (BPPV)
You may come across clients with benign postural positional vertigo. This is a condition of the inner ear causing short and intense episodes of dizziness, usually when moving the head in certain directions. It is different for each individual.

Problem
The client may suffer intense episodes of dizziness which is unpleasant for the individual, affects balance and can make them feel sick. It can last a few days or a few weeks.

Tip
It will depend on the individual person and how they personally deal with the condition. Some people will not come to class because the constant changing of position will bring on dizziness, whereas others will come to class and be ‘careful’.
1. Avoid lots of changes of position
2. Move slowly from one position to another - give them extra time to do this

3. Avoid moving the head in the direction that produces/aggravates symptoms (the client will know)

4. Avoid exercises like Standing Roll Down, complete version of the push-up and any of the rolling exercises

5. Avoid some exercises that may cause problems include Curl-Ups and any side lying position on the affected side

6. A client may not be able to lie on their side for the Side Kick for example, but may be able to tolerate a side kneeling position
Assessment

So now you have fully read and comprehended this in-depth manual & you have completed your live contact day, you are now ready to complete your assessment to gain the full certification in Advanced Fitness Pilates for Orthopaedic Conditions.

We want you to create your own health consultation form giving in-depth information on each client’s condition, your own template for your 2 session plans including all the criteria listed & write your evaluation on each session plan to justify why you have given the exercises you have.

Please send a copy of your open book exam plus your case study on two contrasting Orthopaedic clients to -

Kelly Reed-Banks
12 Hawthorn Way
Burwell
Cambs
CB25 0DQ
Or email - kelly@choreographytogo.com

If you have any questions regarding the assessment criteria, please email Kelly or book in a 10min skype or telephone call to help assist you in completion of your certification.

We hope you have enjoyed completing this advanced CPD course to support your and wish you all the very best with your future in teaching Advanced Fitness Pilates for Orthopaedic Conditions