CHAPTER 08

Knowledge Review

Q1: What is flexibility?

A1:

Flexibility can be defined by the range of motion an individual demonstrates at a joint or series of joints, it can also be described as the ease of adaptation into altered [stretched] positions, and therefore it is often associated with the amount or quality of extensibility in the soft-tissues [muscles, tendons, fascia, skin]. Flexibility may also be explained in terms of the individuals mobility or suppleness, and the associated pliability, extensibility, elasticity, malleability or plasticity of their soft-tissues. Correspondingly, terms such as stiffness, rigidity, immobility, restriction, tightness or tension all relate to situations where mobility or flexibility is impaired. The degree of flexibility an individual has can be measured, and is gauged against accepted norms.

Q2: What factors can affect an individual's flexibility?

A2:

Factors affecting flexibility include: the type of joint[s] involved; the elasticity of muscles, tendons, fascia, skin and ligaments; the muscle mass; the amount of body fat; the clients body type; the clients ability to relax; the clients body temperature; the clients age; the clients gender; the clients history of injuries, pathologies, postural and biomechanical deviations; the environmental temperature; the time of day; the clients general fitness level; the clients normal fitness training routine; the clients occupation.

Q3: Briefly describe the various forms of flexibility training.

A3:

Flexibility may be trained in a multitude of ways. Active stretching is where the particular stretches are performed solely by the athlete, which involves the contraction of agonist and synergist muscles in order to cause a stretching of their antagonistic muscles. Passive stretching is where techniques are performed for the athlete by the therapist or partner, and there is little or no effort on the part of the athlete. Using a stretch station in a gym, or assuming a position of stretch by holding the body part themselves are other examples of passive stretching. Dynamic flexibility training involves rhythmically moving muscles and joints through their easy ranges, gradually increasing the available range, without force, and is often used as part of the warm-up process. Static stretching is simply stretching and then holding the position, whether actively or passively performed. Ballistic stretching is also dynamic and rhythmic, but tends to be more aggressive, involving a bouncing or rebounding momentum into stretch positions. Preparatory stretching is performed before full activity is undertaken. It is customary to warm-up and gently mobilize before preparatory stretches are employed. Preparatory stretches are commonly held for around 10-15 seconds at a time, and often not to the extreme ranges of motion or to the point of pain. Developmental stretching is used to relax muscles, decrease tightness and increase the normal extensibility. It is performed slowly, the stretch is eased into and developed as relaxation occurs, and typically lasts for around 15-30 seconds at a time, often repeated a few times during one session for any problematic regions. It is normal to expect gradual improvements over a period of weeks

for tightened muscles. Maintenance stretching is basically a routine approach to helping keep muscles and joints in good working order and helping recovery from hard training. It is common to stretch all major muscle groups during a maintenance session, but probably with extra emphasis on the main muscles used in particular sports. Maintenance stretches are typically held for 15-30 seconds. Remedial stretching involves re-educating muscles fibres and joints, treating injuries, addressing muscle tightness and imbalance. Remedial stretching is typically combined with many of the massage techniques, soft-tissue release, neuro-muscular and muscle energy techniques and thermal therapies. There are some practitioners who will employ pre-heat, massage, or even ice prior to providing remedial stretching techniques.

Q4: What are the advantages of performing passive stretching for clients?

A4:

The advantages of the therapist performing passive stretching include:

1. Client should be more relaxed.
2. More variations and alternative positions are possible.
3. The client can be supported and stabilized.
4. Clients response can be observed.
5. Client feedback can be gained.
6. Stretches can be fine-tuned.
7. The therapist can select most appropriate stretches.
8. Therapist can apply most appropriate duration, intensity and frequency.

9. Therapist should understand the expected range of motion, and have an awareness of which structures are involved and the concepts of ease-bind and restriction barrier.

Q5: Describe the important safety issues relating to passive stretching.

A5:

Important safety issues relating to passive stretching include:

1. Assessment of the region first
2. Discussing the objectives with client
3. Explaining the procedures to client
4. Encouraging relaxation and smooth breathing
5. Not stretching acute injury or inflammation
6. Not routinely stretching hypermobile joints
7. Localizing and if appropriate stabilizing the region to be stretched
8. Developing awareness of the normal range of movement expected for each individual client
9. Beginning within safe and easy ranges of movement
10. Keeping mind on job and observing the clients response
11. Gaining feedback from the client during the stretch
12. Taking care to use correct positioning, leverage and force
13. Taking care to not place inappropriate stresses to joints, ligaments, tendons, intervertebral discs or meniscal cartilages
14. Remembering that cold muscles respond less well to stretching
15. Working with the basic principles of intensity, duration and frequency in mind

16. Not causing undue pain during stretching [mild discomfort can be acceptable for more athletic clients]
17. Not overstretching

Q6: What are deep friction techniques, and how should they be performed?

A6:

Deep friction is a classic manual therapy technique. It involves very localized, deep, short, repeated transverse stroking, performed across a specific site of soft-tissue injury. It is also known as transverse friction, cross-fibre friction, or deep tissue massage. Once a problem area has been identified and declared fit to receive deep friction, the client should be positioned appropriately. As a general rule, the more superficial the lesion, the more likely that the tissues should be placed on a slight stretch. Deeper muscular lesions are often put into a position of relaxation [shortened] so that the therapist can access fibres more easily. Tendon lesions are often placed into a slight stretched position. The amount of pressure and intensity that the therapist offers must be tolerable to the client. Deep friction techniques do not usually require lubrication as the control and localization will be better. Normally there will be little movement over the skin [or over other tissues superficial to the lesion] by the therapist's hand or arm, and the skin will move with the hand or arm as the affected tissues underneath receive treatment. The range of frictional movement is normally less than 2cm. The speed of movement is not rapid, it merely needs to be sufficiently rhythmic to perform the desired action in as short amount of time as is possible. Applications of deep repeated friction,

within the realms of client tolerance, for 1-3 minutes should provide sufficient manipulation of the affected fibres, and if repeated two or three times per week should encourage optimal recovery, especially when combined with other relevant sports therapy methods. The most common approach to applying deep friction is with reinforced thumbs [the treating thumb is strengthened and guided by the therapist's other thumb]. Reinforced fingers, knuckles, the ulna border of the forearm, and the olecranon process of the elbow can also be used. There are instances where a pincer-like grip technique can be employed, and this approach uses the fingers and thumb of one hand. Ice applications are sometimes used immediately prior to deep friction techniques, which can help to numb the tissues so that deep work can be performed more comfortably. Using ice after treatment can help control the degree of any new inflammatory reactions occurring in the region as a result of the treatment. The therapist may additionally recommend and demonstrate self-friction massage techniques for their clients.

Q7: What are the main indications for friction techniques?

A7:

The main indications for friction techniques are to encourage optimal repair and normalization of injured soft tissues [muscles, tendons, ligaments], attending to disorganized scar tissue and adhesions/fibrosis, and aligning fibres longitudinally.

Q8: What are the main safety issues relating to the use of friction techniques?

A8:

The main safety issues relating to deep friction techniques include:

1. Treatments must be localized to the lesion
2. Therapist must be aware of possible contra-indications
3. Not to be used on acute injuries
4. Not to be used when unsure of the nature of the problem
5. Not to be overly heavy
6. Therapist must work within the client's tolerance
7. Where the affected lesion is close to bone, the therapist should avoid compression
8. The therapist must avoid deep pressure into possible endangerment sites
9. Not to overtreat
10. The therapist must take care to perform with good technique, not unduly stressing their own hands
11. The therapist must remember that older, younger, frail and unwell people tend to tolerate less well heavier, deeper, intense and prolonged techniques, and also be aware that RoM is likely to be less for older than younger people.

Q9: Describe the soft tissue release technique.

A9:

Soft tissue release [STR] is a combination of stretching and deep friction. STR can be used to locally stretch lesions both transversely and longitudinally. The stretching is usually passive, but active stretches can also be usefully

employed. The main advantage of STR is that by employing the leverage of a stretch, the therapist's deep contact point onto the problem site does not move, and as the joint is mobilized, the affected muscle, tendon, fascia and skin below the contact point receives a short localized stretching [frictioning]. If the movement is rotational, then the resultant frictioning is transverse [cross-fibre], if the movement is lengthening, then the effect is one of a localized longitudinal stretching. Deep pressure should always be applied gradually, and the therapist should be aware to angle pressure away from any bony prominences. Passive STR requires that the therapist develops a certain dexterity in being able to both apply a specific pressure into the affected tissue with one hand or arm, whilst at the same time stretching the related region with the other hand. Asking the client to actively move the region has particular advantages: the therapist can focus on applying the specific pressure; it is less tiring for the therapist; the client can control the amount of movement involved; there is a degree of reciprocal inhibition. If the depth and intensity of the technique is reduced, usually with a broader contact area, and possibly a greater range of motion employed, then STR can also be used as an advanced form of passive [or passive-active] stretching, in such applications, the end point of the stretch may be held for a few seconds.

Q10:Describe how you would provide: i] passive stretching to the hip flexors; ii] deep friction technique for a calf strain; iii] STR for the pectoralis major muscle.

A10:

i] Passive stretching to the hip flexors can be approached in several ways. Firstly, the therapist should assess the clients current range of movement into

hip extension. Muscles involved in the stretch may include the psoas, iliacus, rectus femoris, tensor fascia lata and upper adductors. The client could be positioned prone, where the clients affected thigh is lifted [possibly combined with knee flexion] into extension. The sacral area can be stabilized by the therapists other hand. Alternatively, the client could lie supine at an angle on the couch, with the affected limb hanging down off the couch and the contra-lateral limb partially flexed at the hip and knee and supported by the therapist. The therapist should place pressure onto the thigh of the hanging limb. Another approach could have the client lying on their side, with contra-lateral limb lowest and flexed for stability.

ii] Deep friction technique for a calf strain could involve the client lying prone, with knee partially flexed [supported by therapists hands or resting on a cushion or bolster] so as to shorten [relax] the muscle. The therapist can then apply tolerable, deep, short, repeated transverse frictional movements directly onto the injury site using either reinforced thumbs or fingers.

iii] STR for the pectoralis major muscle could involve the client lying supine at the edge of the couch. The therapist can then take the arm [partially flexed at the elbow] into varying degrees of abduction with one hand, whilst their other hand applies a pressure or pincer-grip into the affected tissues. The arm is then taken into further variations of flexion, extension, horizontal abduction and rotation so as to affect the injury site with localized friction [STR].