CHAPTER 05

Knowledge Review

Q1: What are the main areas of focus in the field of sports injuries?

A1:

The 4 main areas of sports injury management are: aetiology [causes]; assessment and diagnosis; treatment and rehabilitation; prevention.

Q2: What is the difference between intrinsic and extrinsic injuries? Provide an example of each.

A2:

Intrinsic causes of injury are those of an, individual, anatomical or pathological nature [eg. straining a muscle by overstretching beyond your normal range of flexibility]. Extrinsic causes of injury are those resulting from external factors, such as training errors, inappropriate equipment and the nature of competition [eg. stress fracture of the tibia resulting from excessive running in poor quality footwear].

Q3: List 10 important factors in the prevention of sports injuries.

A3:

There are many factors to consider in the prevention of sports injuries, these include:

1. Age of the exerciser [children and the older-age groups tend to be more vulnerable].
2. Gender of the exerciser.
3. Medical conditions that may be aggravated by inappropriate exercise.

4. Having a history of previous injuries.
5. Being aware of fitness levels and the type of training normally undertaken.
6. Being aware of postural or other biomechanical problems.
7. Careful structuring of exercise sessions.
8. Encouragement of good nutritional status.
9. Making sure exercisers are not under the influence of alcohol or recreational drugs.
10. Not exercising in the presence of pain.
11. Avoidance of controversial exercises.
12. Providing appropriate exercise variations for beginners, intermediates and advanced.
13. Fitness testing helps to monitor ability and plan appropriate exercise.
14. The exercise environment must be known to be safe.
15. Exercise equipment must be adequate, appropriate, inspected and maintained.
16. Avoiding unnecessary or excessive repetition during exercise.
17. Continual observation and coaching of the participants.
18. Awareness of signs that exercise should stop.
19. Aware of the signs of general over-exercising.
20. Avoiding exercise when feeling unwell.
21. Encouraging sport specific skills training.
22. Encouraging can element of cross-training.
23. Adherence to both establishment and competition rules.
24. Encouraging appropriate pre-season training.

25. Employing sports psychology when appropriate.
26. Encourage exercisers to use sports therapy regularly.

Q4: Describe the typical signs and symptoms of i] a 2nd degree muscle strain ii] a 3rd degree ligament sprain

A4:

i] A 2nd degree muscle strain is a moderate partial tearing of muscle fibres, resulting from a forceful contraction or over-stretching. There will probably be a pronounced set of signs and symptoms, typically including: moderate pain during stretch, contraction and palpation; marked weakness; muscle spasm in the affected and adjacent muscles; swelling may be present; impaired functioning; palpable indent in the muscle tissue.

ii] A 3rd degree ligament sprain is a complete rupture or tear of the ligament, with a complete or virtual lack of continuity of the fibres. There will be severe pain at the time of injury, but later the pain may be less than that of a second degree sprain. There will also be severe loss of joint function, associated muscle spasm, marked instability, and swelling around the joint.

Q5: What is DOMS, and why might it occur?

A5:

Delayed onset muscle soreness [DOMS] is the existence of aching and soreness that can sometimes develop a day or two after strenuous physical activities. Its cause is not yet fully understood. Originally, it was thought to be more due to the accumulation of metabolic products such as lactic acid, however recent research suggests that it is more likely to result from the

normal adaptation of tissues to the demands placed upon them, ie. micro-trauma in the affected tissues, muscle spasm [which may house some damaged fibres] and the associated increase in compartmental pressure.

Q6: Briefly describe the 3 stages of soft-tissue injury healing.

A6:

THE 3 STAGES OF SOFT-TISSUE INJURY HEALING

1. Acute inflammatory phase [the acute stage]. This phase is the body's initial reaction to injury. Typically producing redness, swelling, warmth, pain and resulting in impaired function, it lasts for the first 3 to 5 days following the trauma.
2. Cellular proliferation phase [the early repair stage]: This phase of healing, where new tissue is laid down at the injury site, typically lasts for around 2 to 5 weeks, following on from the inflammatory phase.
3. Remodelling phase [the consolidation or maturation stage]: This final phase, where the new tissue gains its strength through structural organization, usually continues for several months.

Q7: What factors influence the healing of injuries?

A7:

The healing of injuries depends upon a variety of factors:

1. The size, severity, tissue type and location of the injury directly influences the degree of physiological response.
2. The quality of initial [first-aid] treatment.
3. Gaining medical assessment if necessary.

4. Gaining appropriate advice [eg. early rest; reduced activities; immobilization].
5. The individual's general state of health.
6. The individual's age [younger people tend to heal more quickly than old].
7. Whether the doctor prescribes anti-inflammatory medications or pain relief.
8. Whether the injured individual adheres to the advice they have been given.
9. The quality of post-acute treatment provided by the physiotherapist, osteopath, chiropractor or sports therapist.
10. The quality of [post-medical] rehabilitation provided by the sports therapist.
11. The existence of formal liaison between the involved practitioners.
12. The appropriate choice of treatment modalities and progressive remedial exercise strategies.
13. Analyzing the cause [aetiology] of the injury.
14. Prevention of further problems.

Q8: List 10 possible injury complications.

A8:

Injury complications can include:

1. A slow resolution of symptoms
2. Ongoing pain and discomfort
3. Frustration, anxiety, depression

4. Biomechanical problems
5. Excessive scarring
6. Excessive adhesion formation
7. Joint laxity
8. Restricted joint mobility
9. Weakness
10. Reduced proprioception
11. Increased vulnerability to further problems
12. Chronic inflammation
13. Chronic pain
14. Infection
15. Delayed, non-union or malunion of fractures
16. Deformity
17. Early on-set or worsening osteoarthritis
18. Soft-tissue shortening and contracture
19. Irreparable nerve damage
20. Unresolved paralysis
21. Myositis ossificans
22. Reflex Sympathetic Dystrophy [RSD]
23. Enforced retirement from sports
24. Enforced changes to work activities

Q9: List some common injuries that occur in distance running, tennis and swimming.

A9:

- Distance running: thigh and calf strains; Achilles tendonitis; ilio-tibial band friction syndrome; patellar tendonitis; patello-femoral syndrome; tibial periostitis; femoral, tibial and metatarsal stress fractures; sesamoiditis; plantar fascitis; ankle sprains; back pain. Distance running involves a great deal of repetitive pounding. It is crucial to correct any biomechanical problems, to choose appropriate running surfaces, and to wear suitable running shoes.
- Tennis: lateral or medial epicondylitis [tennis elbow]; shoulder strains, sprains, impingements, bursitis and tendonitis; calf strains [tennis leg]; upper extremity nerve entrapment; abdominal muscle strains; ankle and knee sprains; back and knee pain. Emphasis must be placed upon good technique and appropriate equipment. In squash there is a greater chance of impacting injury with the opponent or court wall. Collisions can occur in doubles games in badminton or tennis. Amateur racquet sports players sometimes need reminding to fitness train in preparation for their sport.
- Swimming: Shoulder strains, impingements and bursitis; neck, back and knee pain. Good technique is crucial to avoiding overuse injury.

Q10: What are the main aims of first-aid?

A10:

The main aims of first-aid are:

1. To preserve life
2. To protect the casualty from further harm
3. To relieve pain

4. To call for medical assistance

Q11: Describe the fundamental principles involved in the immediate first-aid response to an emergency.

A11:

The fundamental principles of emergency first-aid are to:

1. Quickly assess the general situation and make the area safe for yourself and others.
2. Keep calm. Tap and ask, clearly and loudly, if the casualty is okay. Inform them that you are there to help, and that you are a qualified first-aider.
3. Call for emergency medical help if there is any likelihood that it is needed.
4. Perform a primary survey [Airway; Breathing; Circulation], and provide appropriate treatment [eg. rescue breathing; CPR; recovery position] if necessary. If available, use protection such as latex gloves or resuscitation mask.
5. Check for and control any serious bleeding [eg. elevate limbs; direct pressure over the wound; pressure point proximal to the wound].
6. Do not move the casualty unless they are in immediate danger.
7. Check for signs of shock, and provide appropriate treatment.
8. Stay with the casualty and continue to provide treatment and reassurance until assistance arrives.
9. Performing a quick top to toe assessment is important, so as to check that nothing has been missed.

10. Clean the incident area if unsafe or contaminated.
11. If the incident occurs at a place of work [or sports centre], the details must be recorded.
12. First-aid kits need replenishing after use.

Q12: What questions could be asked of an injured player on-field?

A12:

Useful questions to ask at the scene of possible sports injury include:

1. What happened?
2. Did you feel anything unusual at the time of injury?
3. What position were you in?
4. How did you land or fall?
5. Where does it hurt now?
6. Does it hurt when you move?
7. Does it hurt anywhere else?
8. Do you feel any other sensations?
9. Have you ever injured this area before?
10. Do you have any medical conditions?

Questioning techniques that help to assess the injured player's mental functioning may also be useful:

11. What day is it today?
12. Who are your opponents today?
13. What is the score?
14. Where are you in the league at the moment?

Q13: Describe a basic strategy for managing a mild calf strain, from the acute stage through to a return to sport.

A13:

The way in which a minor soft-tissue sports injury is treated and managed will depend upon a selection of factors, these include: who the injured person is; the environment in which the injury occurred [eg. on-field; in the gym; at home]; the therapists skill in performing assessment and treatment; the equipment available; the compliance of the player/athlete.

The typical approach to an acute calf strain would be RICES [rest, ice, compression, elevation, support]. The player will be encouraged to continue with this strategy for around 24-48 hours. The injury will be ideally re-assessed before any remedial treatments or exercises are provided. Early treatment methods might include: carefully applied massage techniques [effleurage; petrissage; stroking] above and around the injury site; pulsed ultrasound; sports massage to other areas. Early recommendations might include: strapping to support and restrict movements of the calf and ankle; avoid all running and jumping exercises; mobility/flexibility exercises within a comfortable range; adapt normal fitness training to concentrate on upper body. Progression, in terms of treatment might include: direct fiction massage to injury site; transverse longitudinal and transverse stroking; NMT [neuromuscular technique]; MET [muscle energy technique]; continuous ultrasound; thermal therapy [infra-red; moist heat; paraffin wax bath]; audiosonic; G5; percussor. Remedial exercises might include: developmental stretching to ankle and knee flexors; isometric and isotonic plantarflexion;

aquatic exercise; progress from open-chain exercises [resistance band] to bilateral and unilateral closed chain exercise [calf raises; squats]; proprioceptive exercises [fitness ball; wobble board; rebounder]; muscular endurance training; cardio-vascular training; power training; skills and sports-specific training. The player should not progress from one level of exercise to the next until pain, movement or strength allows. A return to full sporting activity would ideally follow a thorough process of rehabilitation and a fitness test.