Section A) at the end

b) Plyometric training is a specific type of training for power and speed athletes. A number of sports require some sort of power action (ie starting off blocks, jumping, hopping, throwing), hence plyometric training is suitable to many athletes. The basis of this method is the utilisation of an eccentric contraction followed by an immediate, explosive concentric contraction. Whilst all principles of training can be applied to plyometrics, the importance of specificity is unsurpassed. For example, an athlete such as a sprinter or hurdler could enhance their performance by completing plyometric exercises specific to the quadriceps, hamstrings and calves. For this purpose depth jumps, hurdling and bounding would all be appropriate. Depth jumps involve stepping from a higher height (such as a box) to the ground, followed by an explosive jump from the floor onto another box. Simply jumping over the hurdles utilises the "stretch-reflex" mechanism that is the basis for all plyometric work. Bounding involves the immediate explosive action, with as little ground contact

as possible, hence sprinters can gain improvement from plyometrics. However the benefits are not limited to lower body muscle groups. Plyometric work can be upper-body specific. For example a javelin thrower could utilise medicine ball throwing. The use of a medicine ball can be varied, as long as the exercise involves an eccentric contraction followed by a concentric contraction it is classified as plyometrics. Another example of ~~this~~ a plyometric activity specific to upper body would be the integration of claps or 'jumps' in push ups, the eccentric contraction of the bicep is followed by a powerful movement. Such activities result in the recruitment and hypertrophy of fast-twitch muscle fibres specific to the sport. Thus enhancing performance.

c) The increasing advancements in technology have been of particular importance for the training of

skills and techniques. Modern machinary has increased the ability of coaches to vary skills and drills whilst remaining sport-specific. The introduction of wind-tunnels, isokinetic weights equipment, and new forms of resistance allows a new variation in training practices. One such example is the equipment used by sprinters, now drills can be increased in intensity through the use of parachutes, sleds and weight vests. Whilst some of these methods are not extremely modern, the comfortability of these alternative methods have resulted in an increased use when training for skill and technique. The introduction of a variety of specialists, such as biomechanists, psychologists and rehabilitation experts, have resulted in professionalism. Coaches now have access to these specialists through the internet and specialist libraries, enabling coaches to make informed decisions on the most appropriate skills and drills to be performed, and providing them with a vast array to choose from

The use of wind-tunnels and indoor centres with variable temperatures has allowed coaches to simulate drills that are specific to game conditions, for example. indoor snow slopes have allowed moguls skiers to prepare for competition in a variety of places, weather irrelevant. Similarly the analysis of technique has become far less superficial. With the aid of high resolution photography and video analysis, biomechanists are able to examine the fine details of movement that are unseen to ~~the~~ the human eye. No longer is technique analysis reliant on the coach. Similarly testing for lactate levels during a training session has become a simple procedure that is efficient and does not waste training time, yet provides important feedback for the coach. The introduction of such facilities as indoor rock-climbing centres, has allowed the environment where testing is carried out to be similar to the competition environment. Electronic touchpads and timing devices have ensured the precision of the

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measurements in the test. This accuracy leads to a better chance of concise technique correction. Computer simulations and ~~videos~~ archives of previous performances have allowed coaches better access to a variety of methods to correct errors in skill. The introduction of lighter clothing and equipment that aids technique (such as graphite golf clubs), have allowed better technique with minimal instruction. Hence the use of technology in training sessions designed to improve skill has resulted in a wider range of training practices that a coach can choose to adopt. The techniques and drills that are now available allow the coach to progressively overload their athletes whilst remaining specific to improving their skills and techniques. Whilst taking away some coaching responsibilities, technology should be used in a complimentary sense and should not dominate training sessions that are designed to improve skill.

PTO →

a) There are many characteristics of an overtrained athlete; however they must not be confused with the training effect. Extreme tiredness and fatigue in major muscle groups associated with the particular exercise are one physiological effect. Drowsiness and a loss of techniques are other symptoms of an overtrained athlete. Inability to complete task requirements could be a result of overuse injuries such as stress fractures. Frequent injury or an inability to recover from previous injury are physiological characteristics of overtraining. Lower back pain and inflexibility around specific joints can be related to overtraining. A loss of endurance is a result of high fatigue, and is accompanied by overtraining. Similarly an inability to perform at a high intensity or at the same level as ~~previous~~ normal are basic characteristics or physiological symptoms of overtraining.