MEDICAL CARE OF THE ATHLETE

(Part I)

by Dr. JACK E. TAUNTON

The Sports Medicine Physician plays a very important role in the success of an athlete. The care of an athlete involves a number of factors including pre-participation examination, early season strength, flexibility, aerobic and anaerobic conditioning, injury diagnosis and management plus regular monitoring programs to avoid overuse and staleness. Physiological evaluation of the athlete is also valuable in the continuing care and guidance of the athlete. It is also very valuable to the coach. Preventions is of prime importance because we know the successful athlete is the healthy athlete.

The concept that the elite athlete in the peak of cardiovascular fitness is free of disease is often false. This was brought home to us in an initial pilot project of athletic monitoring for the Sports Medicine Council of Canada. The Captain of our National Men’s Field Hockey Team experienced exercise — induced headaches and died 12 months later of a cerebral glioblastoma. A member of a provincial track team with a six-month history of elbow pain following throwing had in fact an osteoid osteoma. Of the original seventeen track and field athletes in the twelve month monitoring program, six underwent surgery during this period. One athlete suffering from chest pain, dyspnea and a large pleural effusion was diagnosed as having tuberculosis. During regular monitoring, frequent cases of iron deficiency anemia were seen. Athletes with endocrine dysfunction were also seen.

STRESS TESTING IS OF PRIME IMPORTANCE

Nicholas and Hersham (1984) have recently edited an excellent symposium on athletic profiling. Profiling studies the biophysical, biochemical and biomechanical links of the body systems. The use and study of profiling data gathered from athletes of all ages can enhance performance, increase the athletes’ enjoyment and prevent injury. Cardiovascular profiling naturally begins with a history and physical examination. A chest radiograph and ECG may be waived in some young athletes but should be included in older individuals, as should an exercise stress test on either a bicycle ergometer or a treadmill. Stress testing is of utmost importance in evaluating the athlete with chest pain, arrhythmias and hypertension. An older individual with a strong family history of sudden death or myocardial infarction should be stress tested prior to the onset of a regular exercise program. The initial recommendations were for stress testing of those over 35. However, now many are suggesting routine stress testing of those over 45 years prior to following your exercise prescription. Valvular disease and the possibility of hypertrophic stenotic lesions are best evaluated by an echocardiogram. Maximal
PULMONARY PROFILING AND MUSCULO-SKELETAL INJURIES

The study of pulmonary profiling during exercise has yielded important data in gas exchange, control of breathing and the ventilatory response to aerobic and anaerobic activities...

Pulmonary function testing is of importance in the athlete experiencing shortness of breath, post exercise cough or wheeze to rule out the possibility of exercise induced asthma (EIA). The availability of effective treatment for EIA has made it possible for the vast majority of asthmatics to participate in athletic activities. The International Olympic Committee permits the use of theophylline, sodium cromoglycate and selective beta 2-agonists for these athletes.

Hersham (1984) points out that the musculo-skeletal injury prevention profile has three components: the performance demands of the sport, the risk factor of injury and the individual musculoskeletal examination...

Nicholas (1976) has shown that knowledge of which performance demands rank heavily in a particular sport may influence accurate assessment of an individual’s ability to participate without injury. Specific strength and flexibility evaluation is of major importance. The development of the Cybex isokinetic dynamometer in 1967 enabled the examiner to control the velocity of muscular contractions while simultaneously measuring the torque generated about a joint.

RISK FACTORS AND PROPHYLAXIS

Risk factors for a particular sport have been derived from epidemiological studies of sport. Contact sports are the site of high velocity, high force, acute injuries, especially to the knee and ankle. Equipment and rule changes plus specific strengthening programs are in the realm of the sports physician in the prevention of these injuries. The most frequent injuries now seen are the low force “overuse injuries” seen in running and swimming. The most frequent injuries in running being patello femoral pain, iliotibial band syndrome, tibial stress syndrome and fractures, achilles tendinitis and plantar fasciitis. Aetiological factors include training errors, running surfaces, insufficient strength and flexibility, poor shoes and lower extremity biomechanical factors. Suprasinatus tendinitus and whipkicker’s knee are the most common afflictions in swimming.

Specific examination for these potential risk factors can be identified in the pre-season examination of the athlete, Remedial programs of strength-flexibility- protocols plus equipment or shoe change can then be made on a prophylactic basis.

For the physician dealing with the younger athlete specific medical, orthopaedic and fitness considerations should be carefully evaluated again so that intervention can be developed that will reduce the possible adverse effects of participation and secondarily improve performance. Children should not be excluded from sports unless specific risk to benefit ratios are firmly established.

In medically assessing the younger athlete, the physician may be called upon to evaluate the child with a variety of potentially limiting conditions such as acute infections, haematological disorders, asthma, heart murmurs, hypertension, epilepsy or diabetes. Each must be assessed first to ensure that the existing medical condition will not be adversely affected by participation and secondly, should any form of specific restriction be imposed. Alternative sports or playing by rule modifications is much more suitable than complete restriction from sport. The final consid-
eration is the optimization of treatment so that the child can compete with the fewest symp-
toms.

The musculoskeletal assessment in the child should include a good history and physical examination to consider congenital anomalies and sport specific problems associated with trauma or overuse. Examination of the spine should screen for scoliosis to ensure proper medical care although restrictions with sport is usually not required...

The skeletally mature athlete with a Grade 1 spondylolisthesis* can often be improved with a regime of abdominal strengthening, hamstring stretching and the use of the anti-lordotic brace. Athletes with Grade II lesions are usually restricted from aggressive skiing and contact sports.

Examination of the joints involved in the particular sport should be carefully carried out. However it is beyond the scope of this paper to detail specific traumatic and overuse problems. The knee being the most commonly injured, will be briefly discussed. Specific paediatric traumatic injuries include epiphyseal fractures of the distal femoral or proximal tibial epiphysis, osteochondritis dissecans, tears of a discoid meniscus and patellar dislocations...

Remedial programs including muscle strengthening, neoprene patellar sleeves, motion control shoes and foot orthotics should be instituted early in the athletes’ career. Traction apophysitis (Osgood-Schlatter disease) resolves well with modification of sports participation, quadriceps stretching, strength maintenance and correction of any predisposing biomechanical factors.

TOWARDS AN EFFECTIVE MONITORING PROGRAMME
Success in sports is multi-factorial, including the athletes physical capabilities modified by diet, drugs and the environment; the variables of training (intensity, time and frequency; skill; fatigue and emotional factors). As an attempt to maximize performance we have been involved in the development of a nationally based monitoring program for the Canadian athlete. This has been established by the Sport Medicine Council of Canada. For any monitoring program to be successful, whether at a local or national level, a few factors are required. First the program must
be continuous throughout the year, sport specific and individualized. It also must involve a team of the coach, athlete and medical-paramedical support staff including the physician, physiotherapist, physiologist, biomechanist in certain sports and the sport psychologist if available.

As previously mentioned all monitoring or profiling programs must start with a history. Specific documentation of past illnesses, medications, allergies and present health status is essential. The vaccination status of the athlete is important prior to travel. Information on medication taken in the past few months is particularly important if you are dealing with an elite athlete travelling to an International Games because of the consideration of inadvertent disqualification during Doping Control procedures. The physical examination should be both medical and orthopedic in nature. Specific emphasis on rehabilitation of past injuries is very important. We have found as many as 20 per cent of athletes on specific teams arrive at International Games with incomplete rehabilitation. Specific Cybex II strength testing and flexibility assessment is very important. Individuals with specific joint instability can be braced or instructions given as to taping. Individuals with lower extremity malalignment can be directed toward more appropriate footwear or possible orthotics.

J.T.

(To be continued)

* The slipping forward of a vertebra.

The second part, in the next issue of the Olympic Review will discuss various aspects of the monitoring programme.

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