The following summaries are taken from a selection of recent journals indexed in the LSMI database. A full listing is published monthly in *Sports Medicine Bulletin*.

Copies of the complete articles are available (price 15 pence per sheet subject to copyright law) from the Library, LSMI, c/o Medical College of St Bartholomew’s Hospital, Charterhouse Square, London EC1M 6BQ, telephone: 071-251 0583).

Excess postexercise oxygen consumption (EPOC), which elevates metabolism after exercise, is frequently used in the press to enhance the attractiveness of exercise as a weight reduction modality. C.J. Gore and R.T. Withers address this issue in *Effect of exercise intensity and duration on post exercise metabolism Journal of Applied Physiology* 1990, 68(6), 2362–8.

The magnitude of the EPOC following exercise at varying intensities and durations was measured. The results of this study indicated that there was no significant increase in metabolism after exercise intensities of less than 55% VO2 max and durations of less than 3 hours. Therefore, the authors suggest, exercise must be performed above a critical intensity and duration threshold before EPOC comprises a significant component of energy expenditure.

Although bicycling is popular among people of all ages, the risk of injury appears to be highest amongst children. R. Cushman et al. investigated the magnitude of the problem in a two year study in a children’s hospital emergency department. (Bicycle-related injuries: a survey in a pediatric emergency department Canadian Medical Association Journal 1990, 143(2), 108–112). Boys with a mean age of 9.4 years accounted for 70% of the patients representing a pattern typical of childhood injuries. Seventeen per cent of the 568 children seen were admitted to hospital; the most common reason for admission was due to head and skull injuries (49%). Typically, it is not the foolhardy adolescent, rather the young inexperienced rider who is being seen in emergency departments. This is highlighted by the fact that 60% of the accidents were attributable to carelessness or poor bicycle control; mechanical failure and environmental hazards were minor factors. These facts underscore the need for effective prevention programmes and campaigns in bicycle safety.

*Are your patients exercising too much?* And if they are, how much is too much and how dangerous is such activity? These questions are explored by Valerie DeBenedette in *The Physician and Sportsmedicine* 1990, 18(8), 119–122. Exercise extremists can be described as those individuals who work out 2 to 3 hours per day, display lack of attention to family or work and may consider exercise to be more important than anything else in life. Some people exercise to extreme because they mistakenly believe it is good for them or the proper way to exercise. Many are recent converts to exercise. While the link between too much exercise and injury is known, less is understood about whether there is a link between excessive exercise and mortality. Although appropriate standards for the maximum amount of exercise are a long way off, physicians can intervene with patients by issuing guidelines such as limiting mileage, advising individuals to switch sports or choose alternative activities.

Robin Northcote (Sport for all, danger for some Performance 1990, 3, 6–7) addresses the risks of sudden death during exercise. Sudden death in women is virtually unknown with regard to vigorous exercise. However, in men, the majority who die during exercise are between the ages of 40 and 55 years and exhibit a high frequency of coronary artery disease risk factors, especially cigarette smoking and hypertension. They also exhibit symptoms such as chest pain, breathlessness, and fatigue prior to participation in sport. Many seem to deny these warning symptoms and do not seek medical advice. In the younger age group, particularly under 25 years, death is primarily due to structural cardiovascular abnormalities such as hypertrophic cardiomyopathy and congenital heart disease. Often those who are most at risk of dying during exercise are also most liable to benefit from exercise. Identification of those at risk is most important. A Canadian protocol for effective screening using a three tier strategy is outlined.

With advances in sport science has come the knowledge of undesirability of excess body fat, especially with regard to specific sports. Unfortunately, there are also many misconceptions related to the composition of the human body. Considerable variation exists between the sexes as to presence of body fat, its distribution, and the effect growth, development and training may have on an individual. In addition, there are a variety of techniques used for measuring body fat, all subject to criticism. To date, a consensus has not been reached by scientists as to the most appropriate technique. Two recent articles (J.R. Whitehead. A study of the measurement variation among different skinfold calipers Physical Education Association of Great Britain and Northern Ireland Research Supplement 1990, 7, 10–14 and A. Hill. Body composition assessment in sport and exercise Sport Health 1990, 8(2), 27) have looked at the reliability and use of skin calipers which measure skinfold thickness at various sites for the determination of body fatness. In the article by Whitehead, measurement variation among five different skinfolds calipers was investigated. None of the calipers examined conformed precisely to the ideal standard cited in the literature and all were somewhat at odds with manufacturers’ technical information. Of those tested, the Harpenden and Lange were the most precisely engineered; the Harpenden remains the ‘gold standard’ instrument. Because inaccuracies or inconsistencies of assessment can have far reaching implications, practitioners should be cautious not only about measurement variation among calip-
ers, but proper handling and measuring techniques.

In 1963, Balke established a basis for the 12 minute run as a measure of maximal aerobic power. His investigation showed that a best effort level run of 12 minutes required a VO2max measured during a constant speed, graded walk test. However, in a further analysis of the 12 minute run prediction of maximal aerobic power (M.C. McCutcheon et al. Research Quarterly for Exercise and Sport 1990, 61(3), 280–83) the authors examined the relationship between VO2max prediction from the 12 minute track run with the VO2max measured during a graded treadmill run. It was concluded that the 12 minute track run VO2 prediction systematically underestimates VO2max measured with a graded treadmill run protocol.

The possibility of injury to the growth plate cartilage of young athletes has evoked considerable concern from the medical community. In a literature review (Growth plate injury and bone growth: an update Pediatric Sportsmedicine 1990, 1990, 2(4), 209–29) Dennis Caine reveals an accumulating body of evidence which demonstrates these injuries may be more prevalent than formerly believed. Skeletal complication resulting from these injuries may include progressive bone shortening, progressive deformity, joint incongruity and arthritic sequelae. It is emphasised that back pain or pain around a joint in young athletes may be symptomatic of significant growth plate changes that require accurate diagnosis, adequate treatment and specific recommendations about return to activity. Suggestions are given for prevention of growth plate injuries.

A review of the Mechanisms of peripheral fatigue (Medicine and Science in Sport and Exercise 1990, 22(4), 444–9) is presented by Donald Kirkendall. There are numerous definitions of fatigue, but simply stated it can be defined as the failure to maintain force or an expected power output. All too often a single factor is described as the cause of fatigue when actually fatigue is most likely a combination of factors which contribute to the sequence of events that results in decreased performance. Peripheral sites and processes include the motor neurone, neuromuscular junction, sacro-lemal membrane, excitation–contraction coupling, accumulation of metabolites or depletion of fuels.

Research suggests that physical activity increases bone density, especially at sites of maximum stress. Conversely, amenorrhea may reduce bone mineral density, especially in the lumbar spine. The possible interactions of these effects were the subject of a recent study at the British Olympic Medical Centre (R.L. Wolman et al. Menstrual state and exercise as determinants of spinal trabecular bone density in female athletes British Medical Journal 1990, 301(6751), 516–8). The results indicate that in elite weight female rowers, the effect of intensive exercise on the lumbar spine partially compensates for the adverse effect of amenorrhea on spinal trabecular bone density. Nineteen rowers, 18 runners and nine dancers, of whom 25 were amenorrheic and eumenorrheic, were tested. Computed tomography revealed mean trabecular bone mineral density to be significantly lower in the amenorrheic than the eumenorrheic athletes and significantly lower in the non-rowers than the rowers. However, there was no significant interaction between the effects of sport and menstrual state on bone mineral density, suggesting that these effects act independently of each other.

Plica syndrome of the knee is caused when plicae (bands or pleats of synovial tissue) are aggravated by over-use or trauma. Symptoms include popping, clicking, effusion, swelling, pain, weakness and a feeling of knee instability. A recent questionnaire survey of 66 patients with plica syndrome revealed non-surgical management reduced symptoms in the majority of patients within 6 weeks; if it was not successful, however, surgical intervention was an appropriate alternative. (M.D. Calvé et al. Managing plica syndrome of the knee The Physician and Sportsmedicine 1990, 18(7), 64–74). Relief of symptoms following resection and in the absence of concomitant lesions, further validates the theory that plicae can cause internal knee derangement.

A recent paper by J.M. Davis et al. provides further evidence to challenge two commonly held beliefs concerning replenishment of body fluids with carbohydrate containing beverages during prolonged exercise (Fluid and carbohydrate type and concentration American Journal of Clinical Nutrition 1990, 51(6), 1054–7). For many years it has been thought that 1) consumption of drinks containing >2.5% carbohydrate may compromise fluid replacement by decreasing gastric emptying rate and 2) maltodextrin (glucose polymer) solutions may deliver more carbohydrate without affecting fluid replenishment. This study compared plasma D2O accumulation profiles of water and four D2O labelled carbohydrate electrolyte beverages in carbohydrate type and concentration. Carbohydrate electrolyte beverages with >2.5% and ≤10% carbohydrate did not seem to enter the vascular system more slowly than water and thus should not compromise fluid replenishment. Furthermore, moderately concentrated solutions of maltodextrins and simple sugars are made available for dilution in body fluids at relatively equal rates. Maltodextrins may thus not offer extra advantages for the athlete.

The ankle sprain is the commonest musculoskeletal sports injury and is reviewed in Diagnosis and treatment of ankle sprains (A.C. Hergenroeder, American Journal of Diseases of Children 1990, 144(7), 809–14). Eighty five per cent of ankle sprains are inversion injuries; the force of the inversion determines the severity of injury and may result in one, two or three ligaments being torn. Eversion sprains tend to be more severe with a higher rate of fractures and other injuries. Most ankle injuries involve ligaments alone, but more complicated injuries may include osteochondral fractures of the talus, avulsion fractures of the tibia, fibula, talus and fifth metatarsal epiphysial injuries, talofibular syndesmosis injuries or peroneal tendon subluxation. The authors review the principles of examination, treatment and rehabilitation.

Zinc is an important trace element and it acts as a cofactor for several enzymes. Intensive training increases the sweat loss and urinary excretion of zinc and may thus result in deficiency. Several studies have shown altered zinc status in the athlete. These results are supported by a recent study which measured serum zinc four times in six young male athletes during a 9 month sporting season in relation to 11 other parameters (F. Couzy, P. Lafargue, and C.Y. Guexennec, Zinc metabolism in the athlete: influence of training, nutrition and other factors International Journal of Sports Medicine 1990, 11(4), 263–6). A significant decrease in serum zinc was observed after 5 months of intensive training. This cannot be explained by changes in dietary habits, plasma protein concentrations, hormonal changes nor by the existence of minor infections or inflammatory pathologies. However, this phenomenon (which is probably explained by an increase in zinc losses) remains limited provided an adequate diet is consumed.
Rest in underperforming elite competitors: Y. Koutedakis et al.

2. Fender, L.K. Athlete burnout: Potential for research and intervention strategies *Sport Psychologist* 1989, **3** (1), 63–71
10. Kono, I., Kitao, H., Matsuda, M., Haga, S., Fukushima, H. and Kashiwagi, H. Weight reduction in athletes may adversely affect the phagocytic function *Physic Sportsmed* 1988, **18** (7), 56–65
18. Frazier, S.E. Mood state profiles of chronic exercisers with different abilities *Int J Sport Psychol* 1988, **19** (1), 65–71
20. Crampton, J. and Fox, J. Regeneration vs burnout: Prevention better than cure *Sports Coach* 1987, April/June, 7–11
24. Parker, J. Wiping your swimmers out *Swim Techn* 1989, **26** (1), 10–16

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**Announcement**

All readers should note that, since 21 January, the editorial office of the British Journal of Sports Medicine has a new address. All correspondence should now be addressed to:

The British Journal of Sports Medicine
Butterworth–Heinemann Ltd.
59/60 Grosvenor Street
London W1X 9DA
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We also have new telephone and fax numbers:
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Correspondents who have written to our previous address in Guildford, Surrey, should not, however, be concerned. Butterworth–Heinemann Ltd. still has an office there and all mail will be quickly rerouted.
promulgated and encouraged when players are young. Junior clubs and schools should insist that all young rugby players use mouthguards when participating in contact sports.

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The authors wish to thank Stewarts-Melville Rugby Club for their very great cooperation in this study.

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Athletic heart syndrome: Y.S.A. Lo and M.K. Chin

corroborate the diagnosis of hypertrophic cardiomyopathy.

With the increasing awareness of the importance of and necessity for regular exercise in many Asian countries in the last decade, it is important that physicians be aware that ventricular hypertrophy is part and parcel of the athletic heart syndrome, and that otherwise healthy endurance-trained athletes should not be inappropriately labelled as having cardiac pathology.

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