

Artikel über medizinische Aspekte des Crosslaufs / Articles focussing on medical aspects of cross-country running

Adams, I.C. (SIRC 171241; IAT: Microfiche 111973)

A comparison of eleven- and twelve-year-old males' cross-country running performance (Ein Vergleich elf- und zwölfjähriger Jungen hinsichtlich ihrer Crosslauf-Leistung)

J. of human Mov. Stud., Edinburgh (U.K.) 11 (1985), 2, pp. 69-73

Cross-country running performance was compared between 60 eleven-year old boys and 60 twelve-year old boys. The boys were tested 3 times with 7 days passing between test dates. The twelve-year old boys were found to be significantly more developed in their cross-country running performance than were the eleven-year olds. These results are discussed in light of previous laboratory research findings.

Adrian, Marlene J.; Anjos, Luiz Antonio dos (BISp 880332490; SIRC 206384)

Comparison of physical characteristics between young female baseball players and crosscountry runners

(Vergleich körperlicher Charakteristika junger Basketballerinnen und Crossläuferinnen)

In: Adrian, Marlene J. (Hrsg.): Sports women. Basel u.a.: Karger 1987, pp. 30-39, ISBN 3-8055-4501-0 = Medicine and sport science, Vol. 24

Ziel der Untersuchung war es, eventuell bestehende Unterschiede zwischen jungen Basketballerinnen und Crossläuferinnen zu bestimmen. Verf. untersuchten Mädchen im Alter von 15-17 Jahren, insgesamt 80 Basketballerinnen (B) und 38 Crossläuferinnen (Q). Gemessen wurden die Körpergröße, Gewicht, Hautfaldendicke, die Greifkraft beider Hände, der Haltungsaufbau und die Fußabdrücke. Die Werte wurden miteinander und mit denen der Literatur verglichen. Die Haltungsanalyse ergab beeindruckende Unterschiede. Nur 2 der B hatten Probleme, bei 32,5 der Q war eine Schulter tiefer als die andere. Q hatten einen höheren Prozentsatz an Abnormitäten bei den Fußabdrücken als B. Q waren leichter als B. B waren größer als Q. B hatten größere Werte an Körperfett als Q. B hatten größere Greifkraft als Q. Kolb
The purpose of this research was to determine if differences existed between young girls who participated in a basketball sports camp and those who participated in a cross-country sports camp. Postural analysis of videotapes showed an impressive difference between girls of the two sports. Less than 2% of the basketball girls had any problems whereas 32.5% of the cross-country girls had one shoulder lower than the other. Although this simple exam is not definitive for the diagnosis of scoliosis, it is evident that a large number of the cross-country girls displayed some form of functional or structural scoliosis. It is speculated that the above difference in posture in the two groups of girls is due to the lack of exercise of the upper body and back muscles in the cross-country girls. Cross-country girls also tended to present a higher percentage of abnormalities in their feet than did basketball girls. The anomalies tended to occur more frequently in the right foot of girls from both sports. The most frequently observed abnormality in both sports was missing toes. In cross-country girls at least one toe was missing in 47.5 and 40.0% (right and left foot respectively) of the analyzed footprints. In basketball girls 27.0% of the right foot and 27.2% of the left foot had at least one missing toe in the footprints. Missing toe is caused by the deformity of the toe, lack of use of the toe, and/or possible tightness of the shoe. There is no apparent reason for the higher percentage of missing toes in cross-country girls. The anatomical anomalies identified in this study should be of concern to those coaching, teaching, and training these girls. It is recommended, therefore, that footprints data be collected and interpreted for young athletes. The question might be raised as to the reasons for the higher incidence of anomalies among the cross-country than the basketball subjects. Are cross-country programmes more strenuous, causing overuse syndromes among girls at an early age? Do less fit girls gravitate toward cross-country and have fit girls gravitated toward basketball in the United States? Profiling needs to become a working concept in sports programmes for youth.

Albanese, L. (BISp 9212061153)

La sindrome del seno del tarso nel cross

(Tarsal syndrome in cross-country runners / Tarsalsyndrom bei Crossläufern)

Med. dello Sport, Turin 44 (1991), 2, pp. 175-177

On the basis of a specific case the author presents a study of a fairly frequent syndrome though not well known to the sports physician. Important concepts concern the physiology of deambulation regarding sub-astragal joint, more particularly the tarsus sinus. Indications are given as to the therapy that in the authors experience has solved the troublesome symptomatology that sometimes seriously limits joining in a much loved sport. Verf.-Referat

Anjos, L.A.; Adrian, M.J. (SIRC 373088)

**Características físicas e desempenho em certos testes físicos de jovens atletas de corrida
(Physiological and performance profile in some tests of young cross-country athletes /
Physiologisches und Leistungsprofil junger Crossläufer auf der Basis von Testergebnissen)**

Revista Kinesis, Santa Maria, RS (Brazil) 4 (1988), 2, pp. 207-219

The participants of a youth cross-country summer camp were profiled using simple, easy to use measurements. The population comprised 81 boys and 40 girls between the ages of 13 to 19 years. The variables measured were: skinfold thickness (subscapular and triceps), height, weight, handgrip strength, and time to run three miles.

Berg, Kris; Latin, Richard W.; Hendricks, Tim (BISp 951113694)

**Physiological and physical performance changes in female runners during one year of training
(Änderungen der physiologischen und sportlichen Leistungsdaten von Läuferinnen im Verlauf eines Trainingsjahres)**

Sports Med. Training & Rehab., Berkshire, 5 (1994), 4, pp. 311-319

Seven female members of a university cross-country and track team (mean age, height, and weight were 19.4 years, 160 cm, and 52.7 kg, respectively) were physiologically monitored through 1 year of training and competition. Laboratory assessment included measurement of maximal oxygen uptake (VO₂max), ventilation threshold (VT), running economy, percent body fat, elapsed time to exhaustion at VO₂max on a treadmill run, and peak grade (PG) reached on a treadmill test. Physical performance was based on elapsed time for completing the same 5 km cross-country course at the identical time each year. A statistically significant change was noted in only two variables: elapsed time of treadmill running at VO₂max (p=0.03) and 5 km run time (p=0.04). Two variables were significantly related to 5 km run performance: PG (r=-0.925) and speed at VT (r =-0.829). The relationship of VO₂max and run time was not significant (r=-0.287, p>0.05). The change in only one variable, percent body fat, was significantly related to change in run time (r=-0.82). It was concluded that a change in VO₂max, VT, and running economy is not required in order for running performance to improve. Performance in running 5 km was strongly related to speed at VT and PG achieved at VO₂max, whereas improvement in performance was best explained by decreased body fat. Verf.-Referat

Bergen-Cico, D.K. (SIRC 323382)

Assessment of the anthropometric and dietary differences among oligo/amenorrheic, prepubescent, and eumenorrheic adolescent cross country runners

(Bestimmung der anthropometrischen und ernährungsbezogenen Unterschiede zwischen oligo-/amenorrhoeischen, präpubeszenten und eumenorrhoeischen Crossläuferinnen)

Ann Arbor (Mich.): University Microfilms International, 1992, 2 microfiches (141 fr.)

Boennec, P.; Prevost, M.; Ginet, L. (SIRC 082547)

**Somatotype de sportif de haut niveau. Resultats dans huit disciplines differentes
(Somatotype of elite athletes. Results from eight different sports / Somatotyp von Spitzensportlern.
Ergebnisse von acht unterschiedlichen Sportarten)**

Med. du Sport, Paris 54 (September 1980), 5, pp. 309-318

Two hundred and twenty-one high level athletes from eight sports (rowing, basketball, cross-country running, cycling, soccer, weightlifting, rugby, and yachting) were examined to determine their body type. The authors found that the high level athletes were largely ecto- or endomesomorph with predominantly developed osteomuscular systems. The weightlifters had the most mesomorph while the cross-country runners had the fewest.

Brown, C.H.; Harrower, J.R.; Deeter, M.F. (SIRC 042366; SIRC 027836)

**Effects of cross-country running on pre-adolescent girls
(Auswirkungen des Crosslaufs auf präadoleszente Mädchen)**

Med. & Sci. in Sports, 4 (Spring 1972), pp. 1-5

Bulbulian, Ronald; Wilcox, Anthony R.; Darabos, Barbara L. (BISp 870429099; SIRC 179790; IAT: Microfiche 116888)

**Anaerobic contribution to distance running performance of trained cross-country athletes
(Der anaerobe Beitrag zur Langstrecken-Laufleistung trainierter Crossläufer)**

Med. and Sci. in Sports Exerc., Madison (Wisc.) 18 (1986), 1, pp. 107-113

Recent reports have suggested that running economy (RE) defined as oxygen consumption at standardized treadmill speeds may be an important determinant for successful distance running performance. The purpose of this study was to examine the additional role, if any, played by anaerobic factors in distance running performance. Highly trained male cross-country runners (N = 12) were administered a battery of standardized aerobic and anaerobic laboratory evaluations. Maximal oxygen uptake (VO₂max) and RE (ml/kg) were measured using open circuit spirometry during treadmill exercise. RE was measured at 241 and 295 m/min, and ventilatory threshold (Tvent) was determined and verified using a number of non-invasive

ventilatory measures (V_e , V_e/VO_2 , $V_e(VCO_2)$, VCO_2 , $FeCO_2$). Anaerobic measures included the Margaria power test and the Monod critical power test to determine anaerobic work capacity (AWC). The data were subjected to a SAS-STEPWISE analysis which combines stepwise addition and backward elimination and were used to predict performance time in a 8.05-km (5-mile) cross-country race in which all the runners participated. The subjects averaged 26.21 min for the 8.05 km run, with 72.1 ml/kg/min for the VO_2 max with a Tvent at 60.4 ml/kg/min (84 VO_2 max). AWC (Monod) was 17400 Joules with a range of 8,000-28,400 Joules. The STEPWISE procedure reveals that AWC contributes significantly to a 3 variable model predicting race performance ($R^2 = 0.76$). AWC accounts for 58 of total shared variance with VO_2 max and an indirect measure of Tvent accounting for the remaining 17. The results of this study underline the importance of a multifactorial approach to predicting race performance and the contribution of anaerobic systems to success in cross-country race performance. Verf.-Referat

Butts, Nancy Kay (SIRC 110232)

***Physiological profiles of high school female cross country runners
(Physiologische Profile von High-School-Crossläuferinnen)***

Res. quart. for Exerc. & Sport, Reston (Va.) 53 (March 1982), 1, pp. 8-14

Body composition, physiological responses to maximal treadmill running, and ratings of perceived exertion were evaluated in high school female cross-country runners. These young runners were characterized by a low percentage body fat ($X=15.4\%$) and a VO_2 max of 50 ml/kg/min. A low relationship was observed between the numerous variables and running performance indicating that factors other than those investigated are more important determinants of performance.

Butts, Nancy Kay (BISp 830318324; SIRC 116960)

***Physiological profile of high school female cross-country runners
(Physiologisches Profil von jugendlichen Cross-Country-Läuferinnen)***

Physician Sports Med., Minneapolis (Minn.) 10 (1982), 11, pp. 103-111

Height, weight, body density, percent body fat, lean body weight, selected skinfolds, girths, and somatotypes were determined for 72 high school female cross-country runners. The mean body fat (15.3) was lower than the values typically reported for the female nonathlete in this age-group. This low percent body fat was reflected in the relatively low endomorph component of the total group. The average somatotype of these runners (2.8-3.2-4.0) support the general concept that distance runners of various ages tend to be more linear and leaner than their nonrunning counterparts. Verf.-Referat

Butts, N.K.; Tucker, M.; Smith, R. (SIRC 278119)

***Maximal responses to treadmill and deep water running in high school female cross country runners
(Maximale Reaktion auf Laufbahn- und Aquajogging-Belastungen bei High-School-Crossläuferinnen)***

Res. quart. for Exerc. & Sport, Reston (Va.) 62 (June 1991), 2, pp. 236-239

Constable, S.H.; Buono, M.J.; Stanforth, P.R.; Rotkis, T.C.; Morton, A.R.; Wilmore, J.H. (SIRC 136097)

***Maximal exercise and residual lung volume: considerations for body composition analysis
(Maximalbelastungen und Residualvolumen: Überlegungen zur Analyse der Körperzusammensetzung)***

Can. J. of appl. Sport Sci., Vanier 8 (September 1983), 3, pp. 189-192

Residual lung volume and total lung capacity of 11 female cross-country runners were assessed before and after treadmill exercise. Results indicate increases in both variables observed.

Corry, I.; Powers, N. (BISp 830418786; SIRC 118367)

***Maximal aerobic power measurement in runners and swimmers
(Messung der maximalen aeroben Kapazität bei Läufern und Schwimmern)***

Brit. J. Sports Med., Loughborough 16 (1982), 3, pp. 154-160

Five cross-country runners and five competitive swimmers performed a pulling exercise with elastic shock cords and a treadmill run to exhaustion. The mean VO_2 max related to lean body mass of the runners was significantly higher than the swimmers on the treadmill while, on the pulling test, the mean VO_2 max of the swimmers was significantly higher than the runners. The maximum heart rates achieved pulling were 95% of the running maximum by runners and 96% by swimmers with no significant difference between them. Their mean oxygen pulse was almost the same for maximal running but the swimmers had a significantly higher oxygen pulse than the runners for maximal pulling. The swimmers could reach about 79% of their running VO_2 max by pulling while the runners used 53% of their running VO_2 max. Verf.-Referat

Creagh, U.; Reilly, T.; Nevill, A.M. (SIRC 460959)

***Heart rate response to "off-road" running events in female athletes
(Herzfrequenzreaktion bei Querfeldeinlaufbelastungen bei Sportlerinnen)***

Brit. J. of Sports Med., Oxford (England) 32 (March 1998), 1, pp. 34-38

Cunningham, L.N. (SIRC 272262)

**Physiologic comparison of adolescent female and male cross-country runners
(Physiologischer Vergleich zwischen jugendlichen Crossläuferinnen und Crossläufern)**

Pediatr. Exerc. Sci., Champaign (Ill.) 2 (November 1990), 4, pp. 313-321

To compare the physiologic differences between adolescent male and female cross-country runners, 12 male and 12 female high school nonelite distance runners who had competed successfully at the All State 5-km championship cross-country meet were tested in the laboratory. Data were analyzed in relation to maximal oxygen consumption (VO₂max), ventilatory threshold (VT), and running economy (RE). Male runners were taller, heavier, had less body fat, and ran faster by 2 minutes and 18 seconds than female runners. Running economy was similar between gender. VO₂ at a 215 m/min pace was 46.7 ml/kg/min for male runners and 47.8 ml/kg/min for female runners. At the VT, males demonstrated a higher VO₂ and treadmill velocity than females. Heart rate, percent HR_{max}, and percent VO₂max at the VT were not different between gender. Males demonstrated a higher VO₂max of 74.6 versus 66.1 ml/kg/min than female runners. The fractional utilization of VO₂ at race pace was not different between males (90 percent) and females (91 percent). In conclusion, the primary physiologic determinant for performance differences between nonelite, competitive male and female adolescent distance runners is associated with VO₂max.

Dahle, L.K.; Müller, M.; Delitto, A.; Diamond, J.E. (SIRC 282470)

**Visual assessment of foot type and relationship of foot type to lower extremity injury
(Visuelle Bestimmung des Fußtyps und der Beziehung des Fußtyps zu Verletzungen der unteren Extremitäten)**

J. of orthop. & Sports phys. Ther., Baltimore (Md.) 14 (August 1991), 2, pp. 70-74

The purpose of this study was 1) to establish the interrater reliability of classifying foot type by visual appraisal and 2) to determine any relationship between foot type and subsequent knee pain or ankle sprains. Seventy-seven athletes were evaluated by three trained physical therapists to determine interrater reliability of a visual appraisal to identify foot type. Feet were classified according to operational definitions, and specific criteria had to be met for the foot to be classified as supinated, pronated, or neutral. Questionnaires concerning knee pain were completed at the beginning of the season, and incidence of ankle sprain was followed throughout the football and cross-country seasons for 55 athletes. The Kappa value for interrater reliability for visually assessing foot type was .72. There was a significant relationship between foot type and knee pain ($\chi^2=4.45$, $N=55$, $df=2$, p is less than .05). There was no relationship between foot type and incidence of ankle sprain. These results indicate that 1) physical therapists trained in the procedure can reliably use visual appraisal to classify foot type, and 2) athletes with excessively pronated or supinated foot types may be more susceptible to knee pain than athletes with neutral foot types.

DeMaere, J.M.; Ruby, B.C. (BISp 971228586; SIRC 450484)

**Effects of deep water and treadmill running on oxygen uptake and energy expenditure in seasonally trained cross country runners
(Auswirkungen von Lauftraining in tiefem Wasser und auf dem Laufband auf die Sauerstoffaufnahme und den Energieverbrauch von Crossläufern während der Wettkampfperiode)**

J. of Sports Med. & phys. Fitness, Turin, 37 (1997), 3, pp. 175-181

Objective: The purpose of this study was to physiologically compare submaximal intensity deep water running (DWR) and treadmill running (TMR) exercise in trained athletes. Experimental design: Pre-test, post-test, 2x2 factorial design. Setting: Treadmill exercise tests occurred in the Human Performance Laboratory. DWR trials took place in the deep end of the University pool. Participants: Seasonally trained college-aged male cross-country runners (N=8). Subjects completed a treadmill maximal oxygen consumption (VO₂max) test, followed by a submaximal treadmill and deep water run at heart rates equivalent to 60% and 80% treadmill VO₂max. Measures: Oxygen consumption (VO₂), ventilation (VE_{stpd}), rates of perceived exertion (RPE), energy expenditure (kcal/min), respiratory exchange ratio (RER), fat and carbohydrate oxidation (g/min) were measured during two 5 minute steady state stages for both trials. Results: The trial by intensity interaction for VE_{stpd} was significant, demonstrating greater ventilation during DWR as compared to TMR at 80% VO₂max. The main effect of trial demonstrated that significantly higher RER and carbohydrate oxidation, and lower fat oxidation occurred during DWR as compared to TMR. VO₂, RPE, and energy expenditure did not differ significantly between trials. Conclusions: DWR is a comparable form of submaximal intensity exercise as TMR in well-trained athletes. DWR does, however, maintain unique properties that differs it from TMR. Therefore, the concept of training specificity should be further considered when prescribing DWR and using it as an enhancement tool or substitute for dry land running. Verf.-Referat

Doyle, R. (SIRC 295262)

Relationship among calcium intake, secondary amenorrhea and stress fractures in female college cross country/track athletes

(Beziehung zwischen Kalziumeinnahme, sekundärer Amenorrhoe und Ermüdungsfrakturen bei Crossläuferinnen/Leichtathletinnen)

University Microfilms International, Ann Arbor (Mich.), 1987, 2 microfiches (97 fr.)

Fernhall, B.; Kohrt, W.; Burkett, L.N.; Walters, S. (BISp 970826687; SIRC 392364)

Relationship between the lactate threshold and cross-country run performance in high school male and female runners

(Beziehung zwischen der Laktatschwelle und der Leistung im Geländelauf bei Läufern und Läuferinnen im High-School-Sport)

Pediatr. Exerc. Sci., Champaign (Ill.), 8 (1996), 1, pp. 37-47

This study evaluated the relationship between run performance, lactate threshold (LT), VO₂max, and running economy in adolescent boys (n=11) and girls (n=10). Subjects completed laboratory tests to establish VO₂max, LT, and running economy. The race performance was the finish time from a cross-country meet. The boys exhibited higher VO₂max (67.7 vs. 54.6 ml/kg/min) and VO₂ at LT (61.7 vs. 48.4 ml/kg/min) compared with the girls (p .05), but there was no difference in running economy, peak lactate, or the % VO₂max at LT (p>.05). VO₂max (r=-.70) and VO₂ at LT (r=-.74) were significantly correlated to performance for the boys, but running economy was not (r=.10). For the girls, VO₂max (r=-.90), VO₂ at LT (r=-.77), and running economy (r=-.86) were all significantly related to performance. LT was important for cross-country run performance. However, VO₂max was an equally strong or better predictor than either LT or running economy. Verf.-Referat

Flynn, M.G.; Pizza, F.X.; Boone, J.B.; Andres, F.F.; Michaud, T.A.; Rodriguez Zayas, J.R. (SIRC 359778)

Indices of training stress during competitive running and swimming seasons

(Indizes der Trainingsbelastung während der Wettkampfsaison von Läufern und Schwimmern)

Int. J. of Sports Med., Stuttgart 15 (January 1994), 1, pp. 21-26

Eight male cross-country runners and 5 male swimmers were tested 4 times during their collegiate seasons. Each trial corresponded to a different training load. The runners' trials were conducted before the start of organized practice (RT1), after 3 wk of increased training (RT2), 3 wk prior to the conference championship (pre-taper, RT3), and 4 d after the conference championship (post-taper, RT4). The swimmers' trials were conducted after the first 9 wk of training (ST1), after completing 2 wk of hard training (ST2), after an additional 6 wk of training (pre-taper, ST3) and during a wk following the conference championship (post-taper, ST4). Venous blood samples, heart rate (HR) and blood pressure (BP) were obtained after 15 min supine rest (0700h). Serum was analyzed for cortisol (C), total testosterone (TT), free testosterone (FT), and creatine kinase (CK). Blood samples (lactate), HR and RPE were obtained during a fixed velocity run (75 percent preseason VO₂max) and blood samples and RPE following a 365.8 m swim (90 percent preseason VO₂max). The runners then completed a "performance run" to exhaustion (110 percent preseason VO₂max) and the swimmers completed maximal 22.9 and 365.8 m swims. Serum CK, C, TT, FT, and the TT:C and FT:C ratios were not significantly different among trials for the runners. Serum TT and FT were significantly lower for the swimmers at ST2 (TT 16.7 plus/minus 2.5; FT 85.3 plus/minus 8.5) compared to ST1 (TT 30.3 plus/minus 2.8; FT 130.2 plus/minus 20.9) whereas, C, TT:C or FT:C were not significantly altered. Serum CK was significantly elevated for swimmers at ST2 (135.3 plus/minus 20.9) and ST3 (101.7 plus/minus 16.7) compared to ST1 (54.12 plus/minus 8.2). Performance capacity in 365.8 m and 232.9 m swims was significantly reduced at ST2 and returned to pre-season times at ST4. Resting HR and BP were not significantly altered for either swimmers or runners. In conclusion, C, FT:C and TT:C were not influenced by changes in training volume/intensity in swimmers or in runners. Serum TT and FT were significantly reduced and CK significantly elevated when training was substantially increased for a short time period for the swimmers (ST2). Changes in TT, FT, and CK were concomitant with decreased performance and increased global mood state. Furthermore, TT and FT were increased, and CK decreased, when swim training volume was reduced (ST4). Therefore, TT, FT and CK may be effective markers for monitoring overtraining in athletes.

Frederickson, L.A. (SIRC 111177)

Effects of training on the iron status of young women cross country runners

(Auswirkungen des Trainings auf den Eisenstatus junger Crossläuferinnen)

Eugene (Ore.): Microform Publications, University of Oregon, 1981, 2 microfiches

Frederickson, L.A.; Puhl, J.L.; Runyan, W.S. (SIRC 142277)

Effects of training on indices of iron status of young female cross-country runners

(Auswirkungen des Trainings auf den Eisenstatus junger Crossläuferinnen)

Med. & Sci. in Sports & Exerc., Indianapolis 15 (1983), 4, pp. 271-276

Hemoglobin concentration and packed red cell volume declined significantly during the first week of training.

A significant increase in total iron-binding capacity and free erythrocyte porphyrin concentration occurred in the first week of detraining. The authors suggest that training may impose significant demands on the iron stores of female athletes and therefore a prudent course of action would be to monitor the iron and hematological status of such women.

Grimby, G.; Renstrom, P.; Saltin, B. (SIRC 006885)

Heart lung function and blood lipids in middle aged cross-country runners
(Herz-Lungen-Funktion und Blutlipide bei Crossläufern im mittleren Lebensalter)
Lakartidningen 72 (29 January 1975), 5, pp. 361-363

Hartung, G.H. (SIRC 012860)

Electrographic changes following a season of cross-country running (Abstract)
(Elektrographische Veränderungen im Anschluß an eine Crosslauf-Saison (Zusammenfassung))
Med. & Sci. in Sports, 8 (Spring 1976), 1, p. 50

Helzlsouer, K.J.; Hayden, F.G.; Rogol, A.D. (SIRC 128319)

Severe metabolic complications in a cross-country runner with sickle cell trait
(Ernsthafte metabolische Komplikationen bei einem Crossläufer mit Sichelzellenanämie)
J. of the Amer. Med. Assoc. 249 (11 February 1983), 6, pp. 777-779

Herbertsson, P.; Fagher, B. (BISp 9111051611; SIRC 276002)

Effects of verapamil and atenolol on exercise tolerance in 5,000 m cross-country running: a double-blind cross-over study in normal humans
(Auswirkungen von Verapamil und Atenolol auf die Ausdauer im 5000 m-Crosslauf: eine Doppelblind-Kreuz-Studie an Normalpersonen)

J. of cardiovasc. Pharmacol., New York 16 (1990), 1, pp. 23-27

The effects on exercise tolerance of 7-day treatment with a calcium channel blocker, verapamil 160 mg twice daily (b.i.d.), and a beta1-selective blocker, atenolol 50 mg b.i.d., were compared in 10 healthy and physically active young subjects in 5,000-m cross-country running at high intensity. The study was a double-blind cross-over trial. Comparison was made with a single blind placebo as well. Performance time was measured every 1,000 m in seven 5,000-m runs, in which subjects were instructed to keep to a constant fatigue perception (Borg scale rating). Both drugs significantly ($p = 0.001$) increased the performance time over the first 1,000 m as compared with placebo. However, running time after 1,000, 2,000, and 3,000 m was prolonged significantly less ($p 0.05$) by verapamil than by atenolol. For the entire 5,000-m run, atenolol caused a significant increase ($p = 0.001$) in mean running time by 1 min 34 s (i.e., 7.5; 95 confidence interval 48 s to 2 min 21 s) as compared with placebo, whereas verapamil caused no significant change (+46 s). Verf.-Referat

Knowlton, R.G.; Miles, D.S.; Sawka, M.N.; Critz, J.B. (SIRC 053035)

Cardiorespiratory adaptations of females to cross-country training
(Kardiorespiratorische Anpassungen von Frauen an Crosslauf-Training)
J. of Sports Med. & phys. Fitness, Torino (Italy) 18 (December 1978), 4, pp. 391-398

Kranenburg, K.J.; Smith, D.J. (SIRC 398697)

Comparison of critical speed determined from track running and treadmill tests in elite runners
(Vergleich der aufgrund von Lauftests auf der Bahn und dem Laufband bestimmten kritischen Geschwindigkeit von Eliteläufern)

Med. & Sci. in Sports & Exerc., Indianapolis (Ind.) 28 (May 1996), 5, pp. 614-618

The purpose of this study was to compare critical speed determined from a field test of maximal effort runs between 3 and 15 min on a running track and a laboratory test of high-speed runs on a treadmill with a 10-km criterion performance. Nine highly trained male runners (VO_{2max} 67.7 plus/minus 4.1 ml/kg/min) participated in the study. Critical speed was determined from three maximal runs (907, 2267.5, and 4081.5 m) on a 453.5-m indoor running track and from three high speedruns on a treadmill. The treadmill speeds were individualized so that exhaustion was reached in approximately 3, 7, and 13 min. All subjects participated in a 10-km cross-country race (measured distance 9.8 km) on a flat and dry course. Track critical speed (293 m/min) was correlated ($r = 0.92$, P less than 0.001) with race speed (293 m/min), whereas treadmill critical speed (300 m/min) had the same correlation but over predicted race performance. It was concluded that although both tests were correlated with 9.8-km race performance, track-determined critical speed was easy to administer with highly trained runners and was very similar to 10-km race speed.

Krob, J. (SIRC 076426)

Shin splints: the curse of track and cross country
(Shin Splints: der Fluch des Bahn- und Crosslaufs)
First Aider 49 (January 1980), 5, pp. 1, 11-12

Kruse, S.J.; Runyan, W.S.; Puhl, J.L. (SIRC 110054)

***Erythrocyte changes during training in high school women cross-country runners
(Veränderungen der Erythrozyten während des Trainings von High-School-Crossläuferinnen)***

Res. quart. for Exerc. & Sport, Reston (Va.) 52 (December 1981), 4, pp. 484-494

Indices of red blood cell status were assessed in high school women cross-country runners during a competitive season. Indices included hemoglobin concentration, hematocrit, RBC count, osmotic fragility, and mean RBC volume. At the end of the competitive season, the only change from pre-season training was a significantly lower mean cell volume.

Lambert, G.P. (SIRC 325008)

***The relationship between physiological measurements and cross-country running performance
(Das Verhältnis zwischen physiologischen Messungen und der Crosslauf-Leistung)***

Eugene (Ore.): Microform Publications, College of Human Development and Performance, University of Oregon, 1993, 1 microfiche (89 fr.)

Lambert, G.P.; Costill, D.L. (SIRC 398593)

Submaximal blood lactate and heart rate measurements as indicators of training status in college distance runners

(Submaximale Blutlaktat- und Herzfrequenz-Meßergebnisse als Indizes des Trainingszustandes von College-Langstreckenläufern)

J. of Strength & Condit. Res., Champaign (Ill.) 10 (May 1996), 2, pp. 93-97 (<http://www.humankinetics.com/>)

Seven highly trained male college distance runners were studied throughout a competitive cross-country season. Common laboratory and field measurements were used to assess their physiological adaptation to training. They were tested before (pre), during (mid), and at the end of the competitive season (post) for peak oxygen consumption (VO₂peak), running economy (RE), fractional utilization of the aerobic capacity (percent VO₂peak), and time to exhaustion (TTE). One of 2 days prior to each scheduled competition, submaximal heart rate (HR) and submaximal blood lactate accumulation (bLa) were determined during a 1.61-km (1 mile) run on an indoor track. Five subjects ran at a 17.6-km/hr pace, which corresponded to an estimated mean (plus/minus SE) intensity of 83.1 percent (plus/minus 4.4) of preseason VO₂peak. VO₂peak, RE, percent VO₂peak, and TTE all improved significantly over the season. The field measures of HR and bLa remained unchanged during this same period. These results suggest that the field trials employing single HR and single bLa measurements (less than 80-85 percent VO₂peak) were not sensitive to changes in endurance capacity in 7 highly trained distance runners.

Lijnen, P.; Hespel, P.; Van Oppens, S.; Fiocchi, R.; Goossens, W.; Vanden Eynde, E.; Amery, A. (SIRC 185230)

***Erythrocyte 2,3-diphosphoglycerate and serum enzyme concentrations in trained and sedentary men
(Erythrozyt-2,3-Diphosphoglycerat- und Serumenzymkonzentrationen bei trainierten und untrainierten Männern)***

Med. & Sci. in Sports & Exerc., Indianapolis (Ind.) 18 (April 1986), 2, pp. 174-179

The acute effect of exercise on the intraerythrocyte 2,3-diphosphoglycerate concentration and on various serum enzymes and some related variables was investigated in 14 male athletes before and after a 50-min cross-country run and compared at rest to 15 sedentary subjects. Compared to the sedentary subjects, the athletes had higher resting levels of serum creatine phosphokinase, plasma myoglobin, and renin substrate but had a lower plasma renin activity. The red blood cell 2,3-diphosphoglycerate concentration increased after exercise in the runners and was not different at rest between the athletes and the sedentary subjects. Our data therefore suggest that the resting plasma renin activity is reduced in athletes when compared to sedentary subjects. Training seems however not to alter the resting level of 2,3-diphosphoglycerate in the red blood cells.

Loftin, Mark; Warren, Barbara; Mayhew, Jerry (BISp 9305062123; SIRC 321561)

Comparison of physiologic and performance variables in male and female cross-country runners during a competitive season

(Vergleich von physiologischen und leistungsbezogenen Daten bei Crossläufern und -läuferinnen während einer Wettkampfsaison)

Sports Med. Training Rehab., Berkshire 3 (1992), 4, pp. 281-288

Five men and five women from a university cross-country team were tested during the first 2 weeks and at the conclusion of a 7-week cross-country season. Maximal and submaximal cardiorespiratory responses, body composition, and performance variables were compared for seasonal and gender differences by analysis of variance and analysis of covariance. Male runners had significantly less body fat, more fat-free body (FFB) mass, a larger cardiorespiratory capacity, and ran more economically and faster than female runners. The difference in cardiorespiratory capacity and performance may have been due to a larger FFB

(muscularity) and the increased training volume practiced by the male runners. Several gender but no seasonal differences were observed during a running economy test (214 m/min). A difference in oxygen uptake (VO₂; ml/min/kg BW) during the running economy test between male and female runners was unexpected and may have been due to fatigue in the female runners since their late season performance relative to early season worsened by 5. A moderate negative correlation (ranging from an $r = 0.48$ to $r = -0.71$) was found between body weight (BW), FFB, or height and running economy. Consequently, as BW, FFB, or height increased, VO₂ measured in subjects running at 214 m/min decreased. Verf.-Referat

Lombardo, John A.; Bergfeld, John A.; Micheli, Lyle J. (BISp 880711511; SIRC 217956)

***Cross-country runner with pain in the dorsum of the foot
(Bericht über eine Crossläuferin mit Schmerzen im Bereich des Fußrückens)***

Physician Sports Med., Minneapolis (Minn.) 16 (1988), 3, pp. 85-88

Verf. beschreiben den Krankheitsverlauf einer Crossläuferin mit Schmerzen im Bereich des Fußrückens. Mittels Computertomographie wurde eine Streßfraktur des Kahnbeins (Os Naviculare) diagnostiziert. Die Patientin durfte den Fuß acht Wochen nicht belasten. Nach insgesamt vier Monaten Therapie konnte sie das Training wieder aufnehmen. - pri -

The case of a 19-year-old cross-country runner who complained of pain in the dorsum of her right foot is described. The pain began gradually and increased to the point that it curtailed her daily activities, including running. In the middle of the cross-country season when her condition was evaluated, her training programme consisted of practicing with the team six days a week and running individually on a local golf course five days a week. She had no history of acute injury. The patient's foot was not swollen or deformed. She was able to move her ankle through the full range of motion without discomfort. There was tenderness over the tarsal navicular joint that was not present on the contralateral side. The results of the neurovascular examination of the foot were normal. The clinical diagnosis was tarsal navicular stress fracture. The patient wore a nonweight-bearing cast for eight weeks followed by a weight-bearing cast for two weeks. She returned to running after four months.

Mayers, Nancy; Gutin, Bernhard (BISp 800210497; SIRC 067207; IAT: Microfiche 502119)

***Physiological characteristics of elite prepubertal cross-country runners
(Physiologische Eigenschaften von Cross-Spitzenläufern im vorpubertären Alter)***

Med. Sci. Sports, Madison (Wisc.) 11 (1979), 2, pp. 172-176

Eight elite cross-country runners and eight normally active boys 8-11 years of age were studied. The runners were selected on the basis of success in regional and/or national championships. Tests included submaximal and maximal treadmill runs, an anaerobic capacity bicycle test, a mile run, and various anthropometric measures. At submaximal work levels of 5, 6 and 7 mph (134, 161, and 187 meters/min) the values for heart rate (HR) and respiratory exchange ratio (R) were significantly lower for the runners than for the nonrunners. The V_{O2}max of the runners (56.6 ml/kg/min) was significantly higher than that of the non-runners (46.0 ml/kg/min). For all subjects combined, mile-run time was highly correlated with percent V_{O2}max and percent max HR at all submaximal running speeds ($r = 0.8$). The correlation coefficient between mile run time and V_{O2}max at 8 mph (213 meters/min) was $r = 0.86$, and to anaerobic capacity ($r = -0.88$). There were no significant differences between the groups in age, height, max HR, and percent body fat. Thus the runners had higher aerobic and anaerobic capacities, and greater utilization of fat as an energy substrate during submaximal work. Verf.-Referat (gekürzt)

Mazzeo, R.S.; Marshall, P. (SIRC 244447)

***Influence of plasma catecholamines on the lactate threshold during graded exercise
(Der Einfluß der Plasma-Katecholamine auf die Laktatschwelle bei stufenförmiger Belastung)***

J. of appl. Physiol., Bethesda (Md.) 67 (October 1989), 4, pp. 1319-1322 (<http://www.jap.org>)

The purpose of this study was to evaluate the relationship between plasma lactate concentration during exercise and the ventilatory threshold among elite endurance athletes. Six varsity cross-country runners and six competitive cyclists were tested using treadmill running and bicycle ergometry. No significant difference in maximal oxygen consumption was found among the cyclists during either exercise test, however among the runners, the blood lactate threshold (T_{la}) and the ventilatory threshold (T_{Ve}) appeared at a later percent of maximal oxygen consumption during treadmill running as compared with cycling. The results suggest a casual relationship between the inflection in plasma epinephrine and lactate threshold during graded exercise manipulated via training specificity.

McClay, M.H.; Appleby, D.C.; Plascak, F.D. (SIRC 294209)

***Predicting injury in young cross country runners with the self-motivation inventory
(Verletzungsprognose bei jungen Crossläufern mit Hilfe des Selbstmotivations-Inventars)***

Sports Med. Training & Rehab., New York 1 (1989), 3, pp. 191-195

Morris, A.F.; Dotson, C.; Davis, P. (BISp 9302061273)

**Heart rate responses during a 5.2 mile cross-country race
(Herzfrequenzreaktionen während eines 8,3 km langen Crossrennens)**

Track & Field quart. Rev., Kalamazoo (Mich.) 79 (1979), 3, p. 59

Messungen der Belastungsherzfrequenz (HF) bei zwei Langstrecklern während eines Crossrennens mittels eines leichten EKG-Aufzeichnungsgerätes erbrachten folgende Ergebnisse: Während der ersten 30 sec des Rennens (flacher Abschnitt) stieg die HF schnell auf 80 des Maximums an. Zwischen 40 und 120 sec erreichte die HF 90 des Maximums und blieb auf etwa dieser Höhe während des Rests des insgesamt 27 min dauernden Rennens (23-24 min). Es gab zwei Abschnitte zwischen 20 und 40 sec Länge mit niedrigerer HF (weniger als 83 des Maximums), wobei es sich hier um Bergab-Passagen handelte. Während des Aufwärmens erreichte die HF 88 des Maximums, und innerhalb von 2,5 min nach dem Rennen sank sie auf 55 des Maximums ab. Schiffer

It was the purpose of this study to monitor ECG and HR responses of collegiate cross-country runners during an actual race of 5.2 miles. Two male collegiate runners consented to participate in the race while wearing an ECG recorder. A five-lead standard ECG recording procedure was used and results fed to the miniature recorder for later readout and analysis. Results indicated that HR rose to 80% of maximum during the initial 30 seconds of the race which was over a flat portion of the course. Within the first 40 to 120 seconds HR reached 90% of maximum and remained high throughout the remainder of the 27 minute effort. This HR intensity was maintained for about 23-24 minutes. There were three short dips in the HR response each lasting about 20 to 40 seconds where HR fell to below 83% of maximum. These corresponded to several downhill respites on the course. It was also noted that HR responses reached 88% of maximum during the warmup period and quickly subsided to about 55% of maximum within 2.5 minutes post-race. From these initial case study findings, it seems feasible that HR responses may be studied during maximal running efforts of about 1/2 hour duration of cross-country men over a hilly mile course.

Mosenthal, T.M. (IAT: Microfiche 156458)

Correlations of laboratory tests to distance running performance during a cross-country track season

(Korrelation von Labortests und der Leistung im Langstreckenlauf während einer Crosslauf-Saison)

St. Cloud: St. Cloud State University, Dissertation, 1988, 95 p.

Das Anliegen der Untersuchung war es, Blutlaktat (La), Laufökonomie (RE) und maximale Sauerstoffaufnahme (VO₂max) während einer Crosslauf-Saison zu ermitteln und diese Messungen in Beziehung zu Langlaufleistung (DRP) über 5000 Meter zu setzen, um den oder die aussagefähigsten Prognoseparameter zu ermitteln. Als Probanden dienten neun Frauen der Leichtathletik-Mannschaft der St. Cloud State University. Die Frauen absolvierten vier submaximale Laufbandtests, während der Blutproben entnommen und die ausgeatmete Luft aufgefangen wurden. Die Blutproben wurden mit einem Roche # 640 Laktatanalysator untersucht. Mit dem Ametek CD-3A Kohlendioxidanalysator und dem S-3A elektrochemischen Sauerstoffanalysator wurde die Ausatemluft auf CO₂- und O₂-Konzentrationen untersucht. Die Laufökonomie wurde als VO₂ in der zweiten Stufe der Laufbandgeschwindigkeit von 3.80 m pro s berechnet. Die Probanden absolvierten auch einen Vorsaison- und Nachsaison-Laufbandtest mit maximaler Belastung, bei dem die ausgeatmete Luft aufgefangen wurde, um VO₂max zu berechnen. Im Verlauf der Saison liefen die Frauen achtmal die 5000 Meter als Wettkampf. Die Laufzeiten (m pro s) wurden von den Rennen genommen, bei denen sie am besten mit dem Laufbandwerten während der Tests übereinstimmten. Die Korrelation zwischen Laktat (in mmol pro Liter), % VO₂max oder 4 mmol pro Liter-Geschwindigkeit und DRP waren signifikant (p < 0.05). Die Laktatkonzentration der zweiten submaximalen Stufe und die 4 mmol pro Liter-Geschwindigkeit wiesen die höchste Signifikanz in der Korrelation mit DRP aus (-0.736 bzw. +0.634). VO₂max und RE wiesen keine signifikante Korrelation zu DRP auf (r = +0.441; p < 0.05 und r = 0.282; p < 0.05). Eine schrittweise multiple Regressionsanalyse unter Einbeziehung der drei Variablen zeigte, daß Laktat 2 (zweite Stufe der Laktatkonzentration) für die Prognose von DRP am geeignetsten war. Die Hinzunahme von RE und VO₂max führte zu keiner Verbesserung der Korrelation. Die submaximale Laktatkonzentration (ausgedrückt in mmol pro Liter und 4 mmol pro Liter-Geschwindigkeit) veränderte sich im Verlauf der Cross-Lauf-Saison signifikant (p < 0.05). RE und VO₂max veränderten sich im Saisonverlauf nicht signifikant (p < 0.05). Die Ergebnisse der Untersuchungen zeigen, daß der Laktatwert am geeignetsten ist, um im Langlauf die Leistung vorherzusagen, und daß mit der Verringerung der submaximalen Laktatkonzentration im Verlauf der Saison der größte Teil der Leistungsverbesserung im Langlauf erklärt werden kann.

The aim of this study was to determine the most significant parameters for predicting long-distance running performance. To this end the blood lactate concentration, running economy and maximal oxygen uptake were determined in the course of a cross-country running season and the results of these measurements were correlated with the running performance over 5000 m. The subjects of this study were nine women runners of the track and field team of St. Cloud State University. The results of the study show that the lactate value is the most suitable parameter to predict long-distance running performance and that the greatest part of the improvement of long-distance running performance in the course of a season can be explained by the reduction of the submaximal lactate concentration.

Mosenthal, T.M. (SIRC 265050)

Correlations of laboratory tests to distance running performance during a cross-country track season

(Korrelationen von Labortests zur Langstreckenleistung während einer Crosslauf- und Bahnsaison)

Eugene (Ore.): Microform Publications, College of Human Development and Performance, University of Oregon, 1990, 2 microfiches (105 fr.)

Nalder, L.J. (SIRC 005320)

Relation of carbon dioxide output, change in pH and heart rate among cross country runners at 6.5 miles per hour at 15% gradient until exhausted

(Beziehung zwischen Kohlendioxidabgabe, pH-Veränderung und Herzfrequenz von Crossläufern während eines Laufs mit einer Geschwindigkeit von etwa 10 km/h und bei einer Steigung von 15 % bis zur Erschöpfung)

Eugene (Ore.): Univ. of Oregon, 1971, 4 fiches

Newton, F.A. (SIRC 279220)

Spiked: a cross-country injury

(Spike-Verletzungen im Crosslauf)

Practitioner, London (Eng.) 233 (8 March 1989), 1464, pp. 358, 360

Nickerson, H.J.; Holubets, M.C.; Weiler, B.R., Haas, R.G.; Schwartz, S.; Ellefson, M.E. (HE75 89177828)

Causes of iron deficiency in adolescent athletes

(Ursachen von Eisenmangel bei jugendlichen Sportlern)

J. of Pediatrics 114 (April 1989), 4 Pt 1, pp. 657-663

Seventy-two high school cross-country runners were studied during the running season for possible etiologic factors associated with iron deficiency, which was defined as a serum ferritin level less than or equal to 12 ng/ml and a transferrin saturation of less than or equal to 16% occurring simultaneously. Iron deficiency was observed during the running season in 34% of female cross-country runners, compared with 8% of male runners. Increased iron losses through gastrointestinal bleeding occurred in 9 of 20 female runners; 7 of these 9 had iron deficiency. Dietary iron intake was low in both iron-deficient and iron-sufficient female runners, but dietary instruction did not increase iron intake sufficiently. Iron deficiency could not be prevented in 35% of the female runners treated with 60 mg of elemental iron daily, but adequate treatment was achieved with 180 mg. Iron losses in urine, sweat, and plasma were small and did not appear to be increased in iron-deficient runners. These findings indicate that female cross-country runners have a high incidence of iron deficiency that is associated with initially decreased iron stores and gastrointestinal bleeding.

Nickerson, H.J.; Tripp, A.D. (SIRC 128006)

Iron deficiency in adolescent cross-country runners

(Eisenmangel bei jugendlichen Crossläuferinnen)

Physician & Sports Med., Minneapolis (Minn.) 11 (June 1983), 6, pp. 60-62, 65-66

This case study of 18 female adolescent cross-country runners found 11 of the girls with ferritin values of less than 20ng ml and 2 of the girls had iron deficiency anemia. The authors present case reports of these 2 girls and found that their performance after treatment of the anemia.

Niekamp, Robert A.; Baer, Janine T. (BISp 950812394; SIRC 372026)

In-season dietary adequacy of trained male cross-country runners

(Saisonangepaßtes Ernährungsverhalten von trainierten Crossläufern)

Int. J. of Sport Nutr., Champaign (Ill.), 5 (1995), 1, pp. 45-55 (<http://www.humankinetics.com/>)

The purpose of this study was to determine the dietary adequacy of 12 collegiate cross-country runners during a competitive season. Four-day diet records were collected twice during the season and analyzed for total daily energy, macronutrients, vitamin A, vitamin C, thiamin, riboflavin, niacin, vitamin B6, folate, iron, magnesium, zinc, and calcium. Mean energy intake (3,248 +/- 590 kcal) was not significantly different from estimated mean energy expenditure (3,439 +/- 244 kcal). Week 8 mean prealbumin levels were within normal limits (26.8 +/- 2.8 mg/dl). Mean daily CHO intake was 497 +/- 134 g/day (61.2%). Three to four hours prior to competition a pre-race meal was consumed; it contained 82 +/- 47 g CHO. Postcompetition CHO intake was delayed an average 2.5 hr; at that time approximately 2.6 +/- 0.69 g CHO/kg body weight was consumed. The athletes appeared to demonstrate dietary adequacy with the exception of timing of postcompetition carbohydrate consumption. Verf.-Referat

Parks, P.S.; Read, M.H. (ME66 98025208)

Adolescent male athletes: body image, diet, and exercise

(Jugendliche männliche Sportler: Körperbild, Ernährung und sportliche Aktivität)

Adolescence 32 (Fall 1997), 127, pp. 593-602

The purpose of this study was to investigate and compare body image concerns, attitudes toward eating/weight control, and reasons for exercising between two groups of adolescent male athletes - football players (N=44) and cross-country runners (N=30). Subjects responded to surveys covering eating attitudes, weight concerns, physical traits, perceived and ideal body shape/size, and reasons for exercising. Significant differences were noted: Football players reported a more positive body image; cross-country runners indicated a greater degree of body dissatisfaction, more disordered eating patterns, and a greater degree of concern for weight control which identified this group as one in need of increased health education.

Plowman, Sharon A.; McSwegin, Patricia C. (BISp 820617129; SIRC 110311; IAT: Microfiche 704511)

The effects of iron supplementation on female cross country runners

(Wirkungen zusätzlicher Eisenzufuhr bei Querfeldeinläuferinnen)

J. Sports Med. phys. Fitness, Turin 21 (1981), 4, pp. 407-416

Eleven high school and collegiate female cross-country runners were given iron supplementation plus ascorbic acid throughout the 12 weeks of their training and competitive season. Because absorption of iron is affected by the presence of ascorbic acid, seven other female runners received ascorbic acid supplement only. Fourteen non-athletic females served as controls. The iron-supplemented group showed a significantly greater hemoglobin level at T2 than either of the other groups. Menstrual status was unaffected by and unrelated to the variables measured. Verf.-Referat

Powell, P.C.; Tucker, A. (SIRC 361991)

Iron supplementation and running performance in female cross-country runners

(Eisenzufuhr und Laufleistung von Crossläuferinnen)

Int. J. of Sports Med., Stuttgart 12 (October 1991), 5, pp. 462-467

The purpose of this study was to determine the effect of two weeks of high dosage iron supplementation on various blood iron indices and metabolic parameters in non-anemic, iron-depleted competitive female cross-country runners. The subjects were highly trained members of the Colorado State University cross-country team and were completing 40 to 50 miles of training weekly. A pretest, post-test single-blind crossover design was employed. Upon collection of baseline exercise blood and metabolic data, five subjects were randomly assigned to iron supplementation (650 mg ferrous sulfate; 130 mg elemental iron) and five subjects to placebo treatment. At two weeks the treatments were reversed. Exercise blood and metabolic data were collected at two-week intervals. Dietary iron intake was assessed using a three-day dietary survey. Dietary analysis revealed deficiencies in vitamin B-6, iron, magnesium, and zinc according to USRDA standards. Baseline blood samples revealed no deficiencies in iron storage or transport proteins. Two weeks of iron supplementation resulted in no significant increases in blood iron indices. Metabolic parameters related to running performance were also unchanged after iron supplementation. High dosage, short-term iron supplementation appears to have no effect on blood or metabolic parameters in iron-depleted but non-anemic female cross-country runners.

Prudhomme Lizotte, J.C. (SIRC 292808)

The effect of iron supplementation and dietary counselling on iron status, performance, and dietary intake in college-aged female cross country runners

(Die Auswirkung von Eisenzufuhr und Ernährungsberatung auf den Eisenstatus, die Leistung und die Nahrungszufuhr von Crossläuferinnen im College-Alter)

Ann Arbor (Mich.): University Microfilms International, 1989?, 1 microfiches (95 fr.)

Puhl, J.L.; Runyan, W.S.; Kruse, S.J. (IAT: Microfiche 704262)

Erythrocyte changes during training in high school women cross-country runners

(Erythrozyten-Veränderungen während des Trainings von High-School-Crossläuferinnen)

Res. quart. Exerc. & Sport, Washington 52 (1981), 4, pp. 484-494

Reddon, W.G. (SIRC 005575)

Pulmonary characteristics of trained university oarsmen, swimmers and cross-country track men

(Pulmonale Merkmale trainierter Hochschul-Ruderer, -Schwimmer und -Crossläufer)

Eugene (Ore.): Univ. of Oregon, 1966, 6 fiches

Reilly, T.; Foreman, T.K. (SIRC 171610)

Multiple regression of selected fitness measures on performance in cross-country running

(Multiple-Regressionsanalyse ausgewählter Fitness-Meßwerte im Verhältnis zur Crosslauf-Leistung)

Snipes J., Patiala (India) 7 (October 1984), 4, pp. 3-10

Physiological and anthropometric measurements of 19 male cross-country runners were recorded.

Correlations were established between these variables and race performance time. Multiple regression equations were derived to predict performance from the variables studies.

Renberg, O. (SIRC 130099)

Lateral knee pains in cross-country runners - conservative and surgical treatment / Laterale Kniebeschwerden bei Crossläufern - konservative und operative Behandlung

Lakartidningen 78 (June 1981), 24, pp. 2356-2357

Roberts, W.O. (SIRC 383002)

Primary amenorrhea and persistent stress fracture: a practical clinical approach. Case report (Primäre Amenorrhoe und hartnäckige Ermüdungsfraktur: ein praktischer klinischer Ansatz. Fallstudie)

Physician & Sports Med., New York 23 (September 1995), 9, pp. 33-34, 36, 39-40, 42, inside back cover
A 16-year-old cross-country runner and Nordic skier presented for a preparticipation examination with primary amenorrhea and a 3-month history of right fourth metatarsal stress fracture. The history and physical exam narrowed the cause to a hypothalamic disorder; inadequate nutrition might have played a role. The stress fracture resolved after 2 months of oral contraceptive use. The case illustrates the multifactorial nature of amenorrhea and the need for an individualized approach to diagnosis and treatment.

Rolim, R.; Santos, P. (BISp; SIRC 373599)

Stress intensity evaluation in cross country running for elite young athletes (Evaluation der Belastungsintensität beim Crosslauf junger Spitzensportler)

In: Viitasalo, J.; Kujala, U. (Eds.): The way to win: proceedings of the International Congress on Applied Research in Sports held in Helsinki, Finland, on 9-11 August 1994, Helsinki, Finnish Society for Research in Sport and Physical Education, 1995, pp. 247-250

The aim of this study was to study the effects of cross-country running (CCR) in young female athletes in an attempt to clarify and define the stress intensity and metabolic predominance in this kind of competition. The study was carried out in eight young female athletes which were selected according to their endurance running performance. The girls were 12.51 (+/- 0.38) years old, 38.6 kg of weight (+/- 4.8) and 150 cm of height (+/- 5.8). They were training three times a week in a beginners' group of middle distance runners. The research was divided into two different experimental parts: 1. Laboratory tests: determination of maximal blood lactate concentration (BL) and maximal heart rate (HR) on a treadmill, with incremental work loads, using the Bruce protocol. 2. Field tests: a) a 1500m CCR competition (the HR was monitored every 5 sec using a Sport Tester; the split times were recorded at the 500, 1000 and 1500m mark); b) a 500m CCR with the split time corresponding to the 500m time of the 1500m competition; c) a 1000m CCR with the split time corresponding to the 1000m time of the 1500m CCR competition. These three field tests were carried out in the same cross-country track, with an interval of 48 h in order to allow the recovery of muscle glycogen stores. In each test (laboratory and field tests) samples were taken from the ear lobe at 5 and 10 min recovery to determine the maximal BL using an YSI 1500 Sport analyser. The findings of the study suggest that: 1. CCR is a maximal intensity stress. 2. CCR is a very demanding discipline and should therefore be carefully used in children. 3. CCR should be introduced in children's sport activities gradually and pedagogically, taking into account the appropriate distances, profiles, surface conditions and running speed.

Ross, C.K. (SIRC 411222)

Predisposing, reinforcing, and enabling factors identified by Division I coaches of women's cross-country teams and the relationship to the perceived onset of eating disorders (Von Division-I-Trainern von weiblichen Crosslauf-Mannschaften identifizierte Anlage-, Verstärkungs- und Ermöglichungsfaktoren und die Beziehung zum wahrgenommenen Beginn von Eßstörungen)

Eugene (Ore.): Microform Publications, Int'l Inst. for Sport & Human Performance, University of Oregon, 1996, 1 microfiche (55 fr.)

The purpose of this investigation was to have coaches of women's Division I cross-country teams identify contributing factors to eating disorders and rank preventive measures in terms of their usefulness in decreasing this epidemic in women's intercollegiate athletics. A 33-question survey was mailed to all Division I coaches of women's cross-country teams. The survey was divided in three areas based on phase four of Green and Knuefer's (1991) PRECEDE-PROCEED model. The fourth phase, the educational and organizational diagnosis examines predisposing, reinforcing, and enabling factors related to a health related problem. Questions in the survey reflected these three sets of factors. The study posed three research questions. The first hypothesis examined the coaches perception of the contributing factors of eating disorders among female collegiate cross-country runners. Coaches differentially rated the predisposing, reinforcing, and enabling factors. Coaches ranked Family/Home Pressures ahead of reinforcing factors and Personal Relationship Pressures in terms of their degree of contribution to eating disorders. Coaches also identified Education/Counseling as a factor which would make the strongest impact on decreasing the

prevalence of eating disorders among female Division I cross-country athletes. The second hypothesis compared responses between male and female coaches. Female coaches rated the importance of Family/Home Pressures, Personal Relationship Pressures, Weight Concerns, and preventative measures of Education and Counseling higher than male coaches. No statistical differences were found between men's and women's perceptions of eating disorders and athletic policies. The final research question investigated the relationship between the coaches' years of experience and the number of eating disordered athletes with whom they have worked with. This study found that the longer a coach is involved with female collegiate cross-country runners, the more experience they have with eating disordered female athletes.

Rowland, T.W.; Black, S.A.; Kelleher, J.F. (ME66 87279313)

***Iron deficiency in adolescent endurance athletes
(Eisenmangel bei jugendlichen Ausdauersportlerinnen)***

J. of Adolescent Health Care 8 (July 1987), 4, pp. 322-326

Iron deficiency with or without anemia may impair athletic performance. Although previous reports suggest a high incidence of iron deficiency in adolescent athletes, the recommendations for routine screening are unclear. In this study, high school male and female cross-country runners were evaluated by determining serum ferritin, hemoglobin, and red blood cell indexes during an 11-week competitive season. At the beginning of the season one of 30 males and eight of 20 females had iron deficiency, defined as ferritin level greater than or equal to 12 ng/ml. By the end of the season four additional males and another female became iron deficient, for an overall incidence of 17% in males and 45% in females. Of the 26 runners who were evaluated throughout the season, ferritin levels fell in all nine females and 14 of 17 males. Iron-deficiency anemia was not observed in any subject. These findings suggest that nonanemic iron deficiency is common in adolescent runners. Although iron deficiency is more common in females one of every five males was iron depleted by the close of the season. Preseason screening alone is shown to be inadequate for detecting iron-deficient athletes as five runners with low ferritin levels were not identified of the initial evaluation.

Runyan, William S.; Puhl, Jacqueline (BISp 810413844; SIRC 081729; IAT: Microfiche 506909)

Relationships between selected blood indices and competitive performance in college women cross-country runners

(Beziehungen zwischen ausgewählten Blutparametern und sportlicher Leistung bei College-Crossläuferinnen)

J. Sports Med. phys. Fitness, Turin 20 (1980), 2, pp. 207-212

Selected blood indices of 14 subjects who were distributed among the first 50 finishers of the 1975 AIAW Cross-Country Championship were analyzed. The ranges for hemoglobin, hematocrit, red blood cell count, mean red blood size, mean cell hemoglobin, and mean cell hemoglobin concentration were wide and, for all but hematocrit, exceeded normal ranges for the age group in the general female population. However, the average values were within normal ranges, although all of them except for hematocrit and red blood cell count were above average normal values. None of the hematological indices correlated significantly with performance in the race and when the 14 subjects were divided into two groups of seven on the basis of their performances in the race, there were no significant differences between the two groups in any of the blood indices. The lack of a relationship between actual competitive performance and hematological indices in this study does not rule out the possibility that such a relationship might exist among groups of subjects who are less well-trained or more heterogeneous. Because oxygen delivery to the tissues is influenced by more factors than those analyzed in this study, the results also do not indicate anything about possible relationships between maximal oxygen consumption and competitive performance. Verf.-Referat

Schubiger, R.C. (SIRC 450070)

***Eating disorders in athletes: the role of coach sensitivity, family influences and recreation activities
(Eßstörungen bei Sportlern: die Rolle der Trainersensibilität, der Familieneinflüsse und der Freizeitaktivitäten)***

Eugene (Ore.): Microform Publications, Int'l Inst. for Sport & Human Performance, University of Oregon, 1997, 1 microfiche (93 fr.)

The purpose of this study was to determine if relationships existed between an athlete's propensity for eating disorders and coach's influences, role of family, and involvement in recreational activities. The literature to date, points to the rather significant role of the coach upon the athlete's level of risk for developing anorexia and/or bulimia. Three hypothesis were presented in this study. The first examined the relationship between the occurrence of eating disorders in the athlete and the level of sensitivity their coach had regarding eating disorders. The second examined the relationship between the role of the family and the athlete's likelihood for developing an eating disorder. The third hypothesized that consistent involvement in recreational activities would reduce the risk of the athlete developing anorexia and/or bulimia. Fifty-two female collegiate cross-country runners from Oregon, Idaho, and Washington were given surveys regarding their experiences as high school athletes. The researcher traveled to each of the eight campuses involved in the study to administer the surveys. The results from this study indicate that there is a significant relationship between the

role of the family and the athlete's propensity for eating disorders. Involvement in recreational activities appears to have no significant affect upon the development of anorexia and/or bulimia in the athlete. In addition, the contribution of the coach with respect to eating disorders, was not seen in the results. This result contradicts the majority of research focusing on this topic to date.

Shively, Robert A.; Grana, William A.; Ellis, Dennis (BISp 820115196)

**High school sports injuries
(Verletzungen im Highschool-Sport)**

Physician Sports Med., Minneapolis (Minn.) 9 (1981), 8, pp. 46-50

A comparison of injuries between boys and girls in eight sports (track, cross-country, swimming, tennis, volleyball, soccer, basketball, and baseball/softball) showed that there was no difference in overall or individual injury rates. The girls had a significantly greater number of knee injuries and significantly more loss of time because of ankle injury. Although these differences existed, the girls did not show any general increase in joint injury or any increase in severity of knee or other joint injury. Verf.-Referat

Sievers, G.K. (SIRC 221991)

The effectiveness of the PO₂ aerobic exerciser in simulating high altitude training at sea level in cross country runners

(Die Effektivität des PO₂ Aerobic Exercisers bei der Simulation von Höhenttraining auf Meereshöhe bei Crossläufern)

Eugene (Ore.): Microform Publications, College of Human Development and Performance, University of Oregon, 1988, 1 microfiche (79 fr.)

Skelton, M.S.; Kremer, D.E.; Swmith, E.W.; Gladden, L.B. (HE75 98227057)

Lactate influx into red blood cells from trained and untrained human subjects

(Laktateinfluß in rote Blutzellen bei trainierten und untrainierten Personen)

Med. & Sci. in Sports & Exerc., Indianapolis (Ind.) 30 (April 1998), 4, pp. 536-542

The purpose of this study was to compare the fractional contributions of the three pathways of lactate transport (band 3 system, nonionic diffusion, and monocarboxylate pathway) into red blood cells (RBC) from trained and untrained humans. Blood samples were obtained from 19 male subjects: 5 untrained, 5 aerobically-trained, 5 competitive collegiate cross-country runners, and 4 competitive collegiate sprinters. The influx of lactate into the RBC was measured by a radioactive tracer technique using (14C)lactate. Discrimination of each pathway of lactate transport was achieved by using PCMBs (1mM) to block the monocarboxylate pathway and DIDS (0.2 mM) to block the band 3 system. Nonionic diffusion was calculated as the difference between total lactate influx and the sum of band 3 and monocarboxylate lactate influx. Results: Total lactate influx into the RBC from the more aerobic individuals (trained subjects and cross-country runners) was significantly faster at 1.6 mM lactate concentration ((La)) as compared with the influx in RBC of the untrained subjects. Total influx of lactate was significantly higher in the RBC from the sprinters as compared with that in the RBC from the untrained subjects at 41 mM (La) There were no significant differences among the four groups with regard to the total influx of lactate at 4.1, 8.1, and 20 mM (La). In general, the percentage of total lactate influx accounted for by each of the three parallel pathways at 1.6, 8.1, and 41.0 mM (La) was not different among the four groups of subjects. Conclusions: Overall, the groups were more similar than different with regard to RBC lactate influx.

Smalley, K.A.; Runyan, W.S.; Puhl, J.L. (SIRC 110309; IAT: Microfiche 704509)

Effect of training on erythrocyte 2,3-diphosphoglycerate in two groups of women cross-country runners

(Auswirkungen des Trainings auf das Erythrozyten-2,3-Diphosphoglycerat in zwei Gruppen von Crossläuferinnen)

J. of Sports Med. & phys. Fitness, Torino (Italy) 21 (December 1981), 4, pp. 352-358

This study examined changes with training in certain blood constituents and maximal oxygen consumption of 11 college and 8 high school varsity female cross-country runners. Results suggest that in response to sports anemia erythrocyte 2,3-diphosphoglycerate increases. It was also found that trained subjects had elevated levels of erythrocyte 2,3-DPG. The authors discuss two possible roles for erythrocyte 2,3-DPG in regard to physical training.

Sohn, R.S.; Micheli, L.J. (HE75 85283401)

The effect of running on the pathogenesis of osteoarthritis of the hips and knees

(Die Auswirkung des Laufens auf die Pathogenese der Osteoarthritis der Hüfte und der Kniegelenke)

Clin. Orthopaedics & Related Res. 198 (September 1985), pp. 106-109

Former college varsity athletes were surveyed by questionnaire to determine if long-distance running can be implicated as a factor in the future development of osteoarthritis in the hips and knees. Subjects were divided into two groups. One group consisted of 504 former varsity cross-country runners. A control group

consisted of 287 college swimmers. Follow-up periods ranged from two to 55 years, with a mean of 25 years. In former runners there was 2% incidence of severe pain of the hips and knees. In former swimmers there was an incidence of 2.4%. Additionally, 2.1% of swimmers eventually had had a surgical procedure for relief of pain. Only 8% of runners eventually required surgery for osteoarthritis. There is no association between moderate long-distance running and the future development of osteoarthritis. Furthermore, the evidence suggests that neither heavy mileage nor the number of years running are contributory to the future development of osteoarthritis.

Sturbois, X.; De Bruyn-Prevost, P.; Van Parys, M. (IAT: Microfiche 602273)

Adaption physiologique et facteurs de risques d'un groupe d'adultes pratiquant une activité libre de cross

(Physiologic adaptations and risk factors in a group of adults doing cross-country runs during their free time / Physiologische Anpassung und Risikofaktoren bei einer Gruppe von Erwachsenen, die in ihrer Freizeit Crossläufe durchführen)

Med. du Sport, Paris 54 (1980), 6, pp. 376-378

Tanaka, J.A.; Tanaka, H.; Landis, W. (SIRC 382855)

An assessment of carbohydrate intake in collegiate distance runners

(Bestimmung der Kohlenhydratzufuhr bei College-Langstrecklern)

Int. J. of Sport Nutr., Champaign (Ill.) 5(3), Sept 1995, 206-214 (<http://www.humankinetics.com/>)

To determine the extent to which well-trained endurance athletes practice the dietary recommendations for maximizing muscle glycogen resynthesis, collegiate cross-country runners (14 males and 10 females) kept 4-day dietary and activity records during a training period and a competitive period in the regular cross-country season. The mean running mileages for men and women were 16.0 plus/minus 1.0 and 10.7 plus/minus 0.6 km/day during the competitive period, respectively. Males reported adequate energy intake in both phases, whereas females fell short of the RDA. However, the percentage of calories from carbohydrate was found to be inadequate (less than 60 percent) for male runners. Although female runners derived 65-67 percent of calories from carbohydrate, the daily amount of carbohydrate taken was insufficient (less than 10 g/kg body weight). Carbohydrate was ingested immediately postexercise approximately 50 percent of the time or less, with even far less taken in suggested quantities (approx. 1 g carbohydrate/kg body weight). There were no significant differences in dietary trends between training and competitive phases. The results suggest that these endurance athletes were not practicing the recommended feeding regimen for optimal muscle glycogen restoration.

Vellar, O.D. (ME66 68315429)

Hepatitis in cross-country runners / Hepatitis bei Crossläufern

Tidsskrift for den Norske Laegeforening 87 (November 15, 1967), 22, pp. 1903-1905

Wakat, D.K.; Sweeney, K.A.; Rogol, A.D. (SIRC 246959)

Fonction du systeme reproducteur chez des coureuses de cross-country

(Reproductive system function in women cross-country runners / Funktion des Fortpflanzungssystems bei Crossläuferinnen)

Traduction INSEP, Paris (1986), 580, pp. 1-13

Wakat, Diane K.; Sweeney, Kathleen A.; Rogol, Alan D. (BISp 830318443; SIRC 119690; IAT: Microfiche 800521)

Reproductive system function in women cross-country runners

(Funktion des Fortpflanzungssystems bei Crossläuferinnen)

Med. Sci. Sports Exercise, Madison (Wisc.) 14 (1982), 4, pp. 263-269

The incidence and etiology of altered menstrual cycle function in women engaged in endurance athletic activities were investigated by studying endocrine, anthropometric, and training parameters in 41 cross-country runners. The prevalence of altered menstrual cycle patterns was significantly higher in the subjects than in college-aged women; 49 reported normal cycles and 51 were either oligomenorrheic (46) or amenorrheic (5). No significant differences between those reporting normal menstrual cycling (N) and those reporting oligo/amenorrhea (O/A) were found in the following areas: number of miles run/week, number of years of training, age when training began, sum of skinfold thicknesses, somatotype, or postexercise levels of growth hormone, prolactin, or hematocrit. However, a difference was found in the mean age of menarche (N=12.9 +/- 0.3 yr; O/A = 14.3 +/- 0.5 yr). In addition, more O/A (68) than N (42) began training in the year of or prior to menarche. Evaluation of seven runners from one school who qualified for the national meet (1 amenorrheic, 5 oligomenorrheic, and 1 normal) revealed that the basal estrogen, progesterone, prolactin, and thyroid hormone were normal. Verf.-Referat (gekürzt)

Webb, J.L.; Proctor, A.J. (SIRC 144836)

Anthropometric, training and menstrual differences of three groups of American collegiate female runners

(Anthropometrische, trainingsbezogene und menstruelle Unterschiede zwischen drei Gruppen amerikanischer College-Läuferinnen)

J. of Sports Med. & phys. Fitness, Torino (Italy) 23 (June 1983), 2, pp. 201-209

Subjects were divided into fast, intermediate and slow groups of female cross-country runners depending on their place-finishes. The fast group had lower weights and lower fat indices. All groups reported amenorrhea with heavy training, but the fast group has a higher incidence of amenorrhea. The lower body weight and fat of this group are believed to contribute to amenorrhea.

Wilcox, A.R.; Bulbulian, R. (SIRC 167905; IAT: Microfiche 111832)

Changes in running economy relative to VO₂max during a cross-country season

(Veränderungen der Laufökonomie in Relation zur maximalen Sauerstoffaufnahme während einer Crosslauf-Saison)

J. of Sports Med. & phys. Fitness, Torino (Italy) 24 (December 1984), 4, pp. 321-326

The present investigation studied the effects of a cross-country season on these measures as well as the relationship of running economy (RE) and percent VO₂max to race performance at the beginning and the end of the season. The subjects were 7 female, university cross-country runners. It was found that an 8 week period of training for cross-country resulted in an increase in VO₂max and an improvement of percent VO₂max at 215 and 241 m/min, but was not sufficient for improving RE.

Williams, S. (SIRC 411061)

Effects of a competitive season on body composition in female intercollegiate athletes

(Auswirkungen einer Wettkampfsaison auf die Körperzusammensetzung junger College-Sportlerinnen)

Eugene (Ore.): Microform Publications, Int'l Inst. for Sport & Human Performance, University of Oregon, 1996, 1 microfiche (62 fr.)

This study was designed to compare body composition over the course of a season in several intercollegiate women's athletics teams. Four basketball (BB) players, 18 cross-country (CC) runners, 9 gymnasts (GYM), 10 swimmers (SW), and 7 volleyball (VB) players from the University of Wisconsin-La Crosse, an NCAA Division III school, volunteered for the study. Body composition was determined through hydrostatic weighing, and a questionnaire examining the desire to lose or gain weight and aerobic activity pattern was given at the beginning and end of each athletic season. Using a 2-way mixed design ANOVA with repeated measures, the statistical analysis of the body composition variables showed the GYM and SW significantly (p less than .05) decreased percent body fat over the course of their seasons. At the early season, CC runners and GYM had significantly (p less than .05) less body weight and fat weight (FW) than VB players, SW, and BB players. CC runners also had significantly (p less than .05) less fat-free weight (FFW) than all other teams. VB players had significantly (p less than .05) greater FFW than the GYM and SW, whereas the BB players only had significantly (p less than .05) greater FFW than the gymnasts. Late season differences were the same as early season differences with the exceptions that the BB players no longer had significantly (p greater than .05) greater FFW than GYM, nor significantly (p greater than .05) greater FW than the CC runners. The results of the study suggest that body composition among athletic teams varies, which may be a result of the unique training techniques and expertise required for different sports. Further research should involve the evaluation of body composition and its relation to athletes and their performance.

Yau, A.D. (SIRC 016350)

Relationship of brachial pulse wave measurements to the performance of cross country runners

(Beziehung von Armpulsmeßwerten zur Leistung von Crossläufern)

Eugene (Ore.): Univ. of Oregon, 1965, 3 fiches