

Science of Wrestling



Annual Research Review 2007

David Curby

Preface

This annual publication is dedicated to the pursuit and use of the knowledge surrounding the noble and timeless sport of wrestling. Each year, an annotated bibliography of the scientific research, published in English, during the year in review, will be compiled and shared with those who work in the wrestling community. It is my hope that this work will spark further research, along with helping to educate those who are in a position to apply this knowledge. I am proud to be affiliated with this great sport.

Thanks to our national governing body - USA Wrestling. Thanks to the National Coaching Staff for the support that they have given to me. Mitch Hull, Dave Bennett, Steve Fraser, Momir Petkovic, Ike Anderson, Terry Steiner, Kevin Jackson and Anatoly Petrosyan always respond to my questions. I am grateful for the chance to work with Ivan Ivanov and Jim Gruenwald and their outstanding wrestlers at the USOEC in Marquette, Michigan. Thanks to my wife Lynne and family, who have been a big part of my work in the sport, and have patiently supported me. Larry Slater has provided the action photographs found throughout this document. Three of these are found on the cover showing three American medalists from the 2007 World Championships in Baku, Azerbaijan. In the top photo is Brad Vering, GR World Silver Medalist at 84 kg; next is Daniel Cormier, FS World Bronze medalist at 96 kg; and Katie Downing, World Bronze Medalist at 67 kg.

2007 was another exciting year in wrestling. Some great research was published and I commend the sport scientists cited in this publication. I want to draw your attention to the opportunities for collaboration among the researchers involved with all combative sports. In this issue there are several outstanding articles pertaining to judo, whose findings can be easily extended to wrestling. Towards that end, I call your attention to the article describing the formation of a special interest group for Combative Sports within the American College of Sports Medicine. Finally, congratulations to the USA Greco-Roman Wrestling Team – Senior World Champions!

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Annotated Bibliography of Wrestling References for 2007

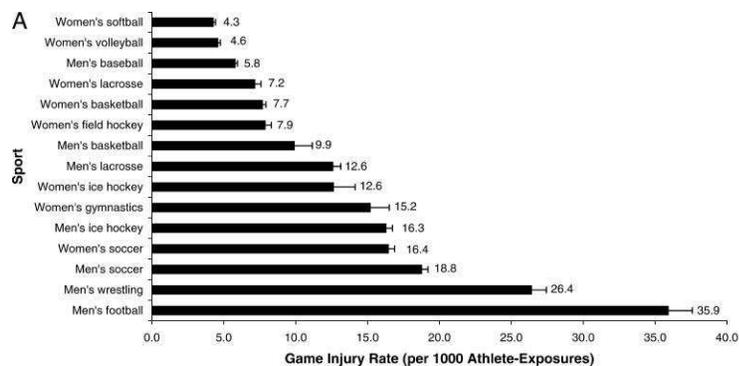
Agel, J., Ransone, J., Dick, R., Oppliger R.A., & Marshall, S. W. (2007). Descriptive epidemiology of collegiate men's wrestling injuries: National Collegiate Athletic Association Injury Surveillance System, 1988-1989 through 2003-2004. *J Athl Train*, 42, 303-310.

Keywords: competition/Environment/epidemiology/hygiene/Infection/injuries prevention/NCAA/practice/rules/Skin infections/Weight Loss

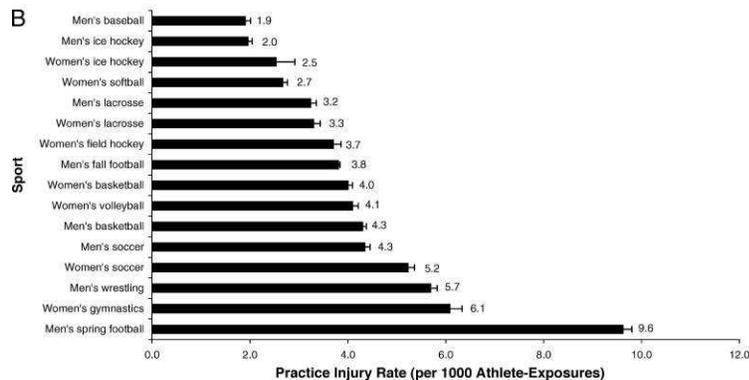
Abstract: **OBJECTIVE:** To review 16 years of National Collegiate Athletic Association (NCAA) injury surveillance data for men's wrestling and identify potential areas for injury prevention initiatives. **BACKGROUND:** From 1988-1989 through 2003-2004, 17% of NCAA schools sponsoring varsity men's wrestling programs participated in annual Injury Surveillance System (ISS) data collection. **MAIN RESULTS:** Patterns of injury were consistent with the person-to-person, combative contact between wrestlers. The musculoskeletal system and head were the most vulnerable areas during competitions; skin infections are a continuing concern in the practice environment. The incidence of injuries in practices exhibited no significant increase over time, a positive trend that may be consistent with the influence of the recent NCAA weight management rules. **RECOMMENDATIONS:** Expansion of the present ISS to include indirect causes of injury, such as weight loss practices, would strengthen the analysis of data. Efforts by referees to be vigilant for potentially dangerous holds and by athletic trainers to improve wrestler and mat hygiene should be continued.

Editor's Note: Methods of charting weight loss in order to include as a variable in the research of injuries is a difficult task. Entry of a daily weight, and the amount over the weigh-in weight, is what is needed, but athlete compliance could be a problem.

Hootman, JM, R. Dick, J. Agel, (2007) Epidemiology of Collegiate Injuries for 15 Sports: Summary and Recommendations for Injury Prevention Initiatives. *Journal of Athletic Training*, 42(2):311-319.



Overall (A) game and (B) practice injury rates for 15 sports, National Collegiate Athletic Association, 1988-1989 to 2003-2004. Although data for 15 total sports are presented, fall and spring football are reported separately for practices; because no "official games" are played during spring football, only fall football is listed for games.



Editor's Note: I include only the these charts from this article. Our injury rate for both competition and practice is among the highest. Injury rate in matches was over four times higher than practice.

Anderson, B. J. (2007). Skin infections in Minnesota high school state tournament wrestlers: 1997-2006. *Clin J Sport Med*, 17, 478-480.

Keywords: Infection/Skin infections/Dermatology

Abstract: OBJECTIVE: To evaluate the clinical diagnostic skills of healthcare providers treating skin infections in Minnesota high school wrestlers. DESIGN AND SETTING: Collected data from the Minnesota State Wrestling 3-class tournament over a 10-year period from 1997 through 2006. PATIENTS: Male wrestlers 13 to 18 years of age who have qualified by placing first or second in their section tournaments. INTERVENTIONS: On-site physicians screen athletes that have suspicious lesions and review those who have already been seen by their local healthcare providers. Athletes are allowed to compete if their lesions are considered noninfectious. MAIN OUTCOME MEASUREMENTS: After review of the data, a distinct difference was noted with the number of skin infections seen in the larger schools compared to the smaller ones. Review of the Minnesota Medical Association's data base for available healthcare providers was correlated with the communities these infected wrestlers were from. RESULTS: Each of the 3 classes had 238 participants each year. A total of 299 skin infections were recorded over this 10-year period. Analysis of class comparison and number of skin infections reveals a significant difference, with class A (smaller schools) having 81 infections compared to class AAA (larger schools) having 119, $P = 0.0076$. Comparison of healthcare providers finds a distinct difference with the smaller communities having 1.5 providers per town compared with larger schools having 66.4 providers per town. CONCLUSION: Continuity, not availability, of healthcare is necessary to properly control skin infections in high school wrestling.



Editor's Note: Dr. B.J. Anderson presently serves as team physician for the NCAA Division III National Champions Augsburg College wrestling team. Since 1996 he has served as tournament physician for Freestyle wrestling at the USA Wrestling Jr. National tournament in Fargo, N.D. He is also the medical advisor for MN/USA Wrestling and presently serves on the MSHSL Medical Advisory Committee and the NFHS Medical Advisory Committee. He presently works at Boynton Health Service through the University of Minnesota, in Minneapolis in primary care. He has produced an informative CD for coaches, trainers, and others involved with the health of wrestlers.

<http://thematdoc.com/index.html>

Balch, M.J. and D. Scott. Contrary to Popular Belief, Refs are People Too! Personality and Perceptions of Officials. *J sport behavior* 30 (1):3-21, 2007.

Keywords: psychology/referees/competition

Abstract: Study 1 investigated the personality characteristics of volleyball, hockey, and wrestling officials and compared the domain scores to a contrast group of non-officials and to the norms of the NEO Five-Factor Inventory (NEO-FFI). Results showed that there were no differences among these groups on any of the five factors. Officials reported average ratings on all domains, except for an above average score on Extraversion. Study 2 used a modified version of the NEO-FFI in order to investigate athletes' and fans' perceptions of officials. Results showed that athletes rated officials significantly less favorably on all domains of personality. The discrepancies between officials' self-report ratings and athletes' perceptions of officials suggests that poor treatment of officials may be due to pervasive negative attitudes towards officials outside of the sporting context.

Editor's Note: Referees/Officials are an important segment of our sport and need to be recruited, trained and maintained. Research is sparse, but this study indicates that referees are held in a negative light. We must address these negative attitudes and address misconceptions to reduce the high rates of turnover among referees. I believe that training and mentoring of young officials needs to be improved.

Bereket-Yucel, S. (2007). Risk of Hepatitis B Infections in Olympic Wrestling. *Br J Sports Med*, 41(5), 306-310.

Keywords: bleeding/blood/Hepatitis B/Infection/ /Risk/ /Sweating

Abstract: The main purpose of this study was to investigate the prevalence of the hepatitis B virus (HBV) and occult

HBV infection (OC-HBV) in Turkish Olympic wrestlers. The second purpose of this study was to examine the relationship between HBV DNA values in sweat and blood. A total of 70 male Olympic wrestlers were recruited as the study sample. As a result of the standard monoclonal antibody-based hepatitis B surface antigen (HBsAg) detection, none of the Olympic wrestlers carried HBsAg in this study. On the other hand, according to real time polymerase chain reaction (PCR) for serum HBV DNA detection in this study, 13% of the wrestlers has OC-HBV infection. 11% of the participants has HBV DNA in their sweat. In addition, there was a significant relationship between HBV DNA values in the blood and sweat of the wrestlers ($r= 0.52, p<0.01$). The results proposed that other than bleeding wounds and mucous membranes, sweating could be another way of transmitting the HBV infections in contact sports. The HBV test should be done and each wrestler should be vaccinated at the beginning of his career.

Editor's Note: The possibility of transmission of hepatitis B through sweat is an ominous finding. The vaccination of children in the US is now well established, however, I have my doubts regarding the ability of FILA to make it a requirement for international competitors.

Bianco, M., Fabbriatore, C., Sanna, M., Fabiano, C., Palmieri, V., & Zepilli, P. (2007). Elite athletes: is survival shortened in boxers? *Int J Sports Med*, 28, 697-702.

Keywords: Life Expectancy/long term effects

Abstract: Moderate exercise and intense physical training are associated with increased life expectancy (LE). Boxing is characterized by intentional and repetitive head blows, sometimes causing brain injury, possibly reducing LE. We examined a sample of male athletes born between 1860 and 1930 selected from the international "hall of fame" inductees in baseball (n = 154), ice hockey (n = 130), tennis (n = 83), football (n = 81), boxing (n = 81), track and field (n = 59), basketball (n = 58), swimming (n = 37) and wrestling (n = 32). In boxing, we analyzed the number of disputed bouts/rounds and career records. Sports were also analyzed according to physiological demand and occurrence and kind of contact (intentional, unintentional). The Kaplan-Meier product limit method was used to compare survival curves (significance: $p \leq 0.05$). Median LE of the samples was 76.0 yrs and no differences were observed in different sports, although it was lower in boxers (73.0 yrs) and higher in tennis players (79.0 yrs). Sports of different physiological demand were similar in respect to LE. No differences in LE were found related to occurrence and kind of impact. Similar LE was found in boxers of different weight or career records. In conclusion, this study indicates that LE in top-level athletes is unaffected by the type of discipline, and not related to physiological demand and intentional contact.

Editor's Note: Wrestler's (n=32) life expectancy was 77 years, just above the median value of 76 for the entire group of athletes. It is hard to determine the effects of any selection bias. These athletes were some of the very best from each sport discipline. Could it be that these better athletes were not subject to as much wear and tear because of their superior talent?

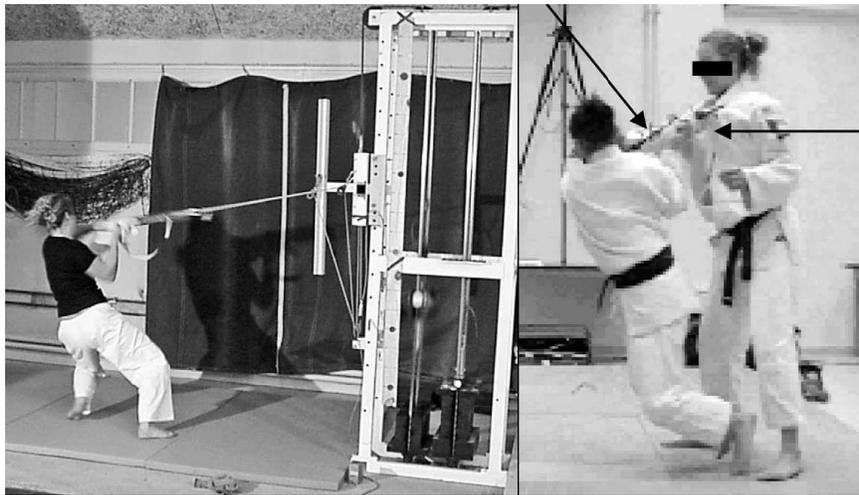


In March, I was with some American Greco-Roman wrestlers training at an Olympic Training Center in Frankfurt-Oder, Germany. We went to the Alten Museum in Berlin and had the good fortune to see a special exhibit, on loan from Rome, called "Der Boxer" featuring the famous sculpture pictured here. I was inspired by this weary and battered ancient Greek athlete!

Blais, L., Trilles, F., & Lacouture, P. (2007). Validation of a specific machine to the strength training of judokas. *J Strength Cond Res*, 21, 409-412.

Keywords: strength/strength training/testing/technique

Abstract: With regard to judo players, like all sport activities, strength training can be divided into general and specific strength training. The specific exercises must correspond with the competitive movement. In addition, in terms of structure, they must correspond with regard to the strength time sequence, and they may be executed with overload. With respect to these important elements, we have envisaged the use of a judo-specific machine. The purpose of this study was to validate this judo-specific machine with regard to the strength training of judokas. To that end, we have measured the maximal pulling forces applied at each hand of judokas ($n = 18$), playing with the judo-specific machine and with a real partner. A significant difference was found between the maximal pulling forces (F collar and F sleeve) obtained utilizing the judo-specific machine (from $4.9 \pm 0.4 \text{ N.kg}^{-1}$ to $6.4 \pm 0.3 \text{ N.kg}^{-1}$ for F collar; from $4.8 \pm 0.2 \text{ N.kg}^{-1}$ to $6.3 \pm 0.3 \text{ N.kg}^{-1}$ for F sleeve) and performing with a partner ($2.7 \pm 0.2 \text{ N.kg}^{-1}$ for F collar; $2.5 \pm 0.3 \text{ N.kg}^{-1}$ for F sleeve). This can be explained by the fact that the partner opposes a low resistance during the judo-throwing technique in comparison with the judo-specific machine. These results show that the judo-specific machine might be used by the judokas to execute specific exercises with overload.



Editor's Note: *These are excellent examples of developing sport-specific training and testing methods for the difficult to test combative sports! While the grasping techniques differ between judo and wrestling, the actual throws are quite similar. (see Calmet research in this review)*

Bledsoe, C. J., Smith, A. E., Lacy, D. B., Mayhew, J. L., Koch, A. J., Roberts, S., & Schutter, D. (2007). Assessment of urine specific gravity across a season in college wrestlers. *Med Sci Sports Exerc*, 39, S212.

Keywords: Dehydration/hydration/refractometer/urine specific gravity

Abstract: NCAA regulations require college wrestlers to undergo urine specific gravity testing (Usg) at the beginning of the competitive season. Each wrestler must be below the NCAA hydration standard of 1.020 g/dL in order to be allowed to compete. However, no evaluation of this standard across a season has been done. **PURPOSE:** To assess the variations in Usg measurement across a competitive season. **METHODS:** NCAA Division II wrestlers ($n = 14$) were evaluated once per month from October through February on a randomly chosen day for body mass, Usg, and urine osmolality (OSM). Usg was determined using a handheld refractometer and dipsticks (Urispec 11-way TM). OSM was determined using the Advanced TM Micro Osmometer (model 3300). **RESULTS:** A Usg method x trial repeated measures ANOVA revealed no significant difference in Usg across the five months but the dipstick method was significantly lower than the refractometer at all points. OSM was also not significantly different across the five months. Although OSM was significantly correlated with both refractometer Usg ($r = 0.68$ to 0.98) and dipstick Usg ($r = 0.47$ to 0.82), the values showed more variability than previously reported. Of the wrestlers studied, 86% had Usg values over 1.020 g/dL during the first three months, which decreased to 71% in the last two months. Three wrestlers (21%) were consistently above this standard at each measurement period. If a 1.029 g/dL standard was used for dehydration, 43% of the wrestlers were dehydrated during the first three months, 31% during the last two months, and none were consistently above that standard at each measurement period. Using the NCAA standard, the dipstick

method would have indicated that 43% of the wrestlers were dehydrated in the early season, which dropped to 21% during the late season. Only one wrestler (7%) had a consistently high measurement by the dipstick method.

CONCLUSION: When hydration measurements were randomly assessed across a wrestling season, a large portion of college wrestlers could be classified as dehydrated using the NCAA standard. The dipstick method tended to consistently underestimate the refractometer technique in the determination of hydration.

Editor's Note: While wrestlers are required to certify in a hydrated state, dehydration is still often utilized to make weight. This is a "hole" in the wrestling weight control system.

Calmet M. (2007) Developing ecological research in judo. *Percept Mot Skills* 105 (2):646-648.

Discussions and exchanges identify axes of research. From an example in physiology and perspectives in biomechanics, experimental judo situations nearer real ones may yield complementary data from applied and laboratory research. Experimental research limits and its statements about data are easily comprehensible (2). One must design some research which can be "ecological", or nearer actual situations. To compare aerobic energy expenditure and cardioventilatory responses in judo, this researcher's proposal was a match wherein *tori* could attack and *uke* had only to defend himself against *tori*'s attacks. This guaranteed protection of both judoka and of costly equipment (Cosmed K2 telemetric gas exchanges analyzer). Such a match without uncertainties of partner's actions, consequently with less energy consumption, was not retained for the experimentation. The ecological situation was to adapt a *kakari geiko* (1), a conventional exercise of judo, in which actions of partners are different, but with opposition: each could score points. *Tori*, wearing a mask (Fig. 1) and carrying equipment to record data under his judogi, applied the rules of judo in a standing up match (Fig. 2). *Uke* could score points practicing Turkish wrestling (Fig. 3; one scores a point by lifting the opponent) or sumo without throws (one scores a point 1 when one pushes the opponent out of limits). Such a match, with attacks, defenses, feints, and counter attacks for *tori* and *uke*, is possible without damage to equipment or judoka. To study some of *tori*'s supports one could proceed in the same way, with the same kind of *kakari geiko*, using some sensors sensitive to pressure fixed with an adhesive strip to judoka's feet and covered with a sock. Wires are fixed on the leg, passed up the back, out under the collar and up to a swivel to a computer. A video camera records the match to give *a posteriori* sense to the supports (attacks or defenses). To relate *uke*'s experiences and measure behavior, researchers and trainers can develop protocols to study judoka's balance where exposed to varied pushing or pulling actions on different platforms. One must circumvent limits of such research, such as distance from the neurological medical sciences (a physiologist thinks bottom up) and training (a physician or trainer thinks top down) (2) to generate publishable findings. A complementary approach for trainers and researchers may transform collaboration and research if such proposals are formulated.

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Cosmed K2 equipment

Tori carrying equipment throws uke

Uke lifts tori

Editor's Note: Combative sports all pose challenges to researchers who want to make physiological measurements during live action. The miniaturization of monitors, along with the creativity of the researcher, makes more applications possible. I can envision the application of the process employed in his research during drilling of specific techniques where the face is not involved, e.g. the reverse lift.

Choate, N., Forster, C., Almquist, J., Olsen, C., & Poth, M. (2007). The prevalence of overweight in participants in high school extramural sports. *J Adolesc Health*, 40, 283-285.

Keywords: Body Mass Index/Health/Obesity/weight classes

Abstract: This study examines the body mass index (BMI) percentiles for age of 3970 male high school athletes. Overall, boys participating in sports had BMI percentiles similar to the general population. However, the prevalence of overweight in boys playing certain sports, particularly football, but also wrestling and crew, was higher than the general population.



Editor's Note: BMI is a poor indicator of over weight vs. over fat. It does not account for muscularity. Football and wrestling, two very popular sports, allow for participation and success of boys of large mass that may be obese. That these athletes can participate in these sports should not be an indictment of these sports. Coaches must be aware of the safety issues posed by obese athletes, such as heat issues, and also use their influence to help them to move towards a healthier level of body fat.

Wrestling participation did not contribute to the high levels of endomorphy of these youngsters!

Clark R.R., Sullivan JC, Bartok, C. J., & Carrel, A. L. (2007). DXA provides a valid minimum weight in wrestlers. *Med Sci Sports Exerc.* 39, 2069-2075.

Keywords: body density/body fat/fat-free mass/hydrostatic weighing/residual lung volume/skinfolds/weight classes
Abstract: PURPOSE: To cross-validate the DXA prediction of minimum weight (MW) in high school wrestlers, using a criterion-referenced analysis. The goal was to independently evaluate whether DXA provided a MW within acceptable limits for the sport of wrestling. Secondly, the DXA prediction error was compared against the currently approved skinfold (SF) method. METHODS: Criterion MW was calculated by hydrostatic weighing (HW) with measured residual lung volume. Whole-body scans were performed with a Norland XR-36 bone densitometer. All skinfolds were taken by the same experienced measurer. The subject's body density was computed by Lohman and was converted to percent body fat, using the equation of Brozek et al. The measured fat-free mass was used to calculate each wrestler's MW at 7% body fat. Subjects were 94 Wisconsin high school wrestlers (mean (SD): age = 15.1 yr (1.2), height = 170.3 cm (7.1), weight = 63.2 kg (9.6). RESULTS: There was no significant difference in mean MW from DXA (60.6 kg (9.0)) and the HW criterion (59.8 kg (9.0)). The correlation was strong ($r = 0.98$), and the regression for the relationship between HW and DXA ($y = 0.976 \times \text{DXA} + 0.698 \text{ kg}$) did not significantly deviate from the line of identity. A low standard error of estimate (SEE) of 1.7 kg and a pure error (PE) of 1.9 kg were found, with residuals ranging from -3.94 to 2.88 kg. This PE was similar to the SF method (2.1 kg) in the sample. Bland-Altman analysis showed no systematic bias in the prediction of MW across weight classes. CONCLUSION: We conclude that DXA provided a valid prediction of MW in this sample of high school wrestlers.

Editor's Note: DXA (Previously called DEXA Dual Energy X-Ray Absorptiometry) utilizes expensive technology (units cost \$85,000 and up) and most often used to perform whole body scans. While it can be used to assess body composition, it is primarily a research tool in this regard. DXA is most widely used test to measure bone mineral density. Traditional, body composition assessment techniques involved dividing the body into two compartments: fat mass and fat free mass. DXA divides the body into three compartments: fat mass, bone mass, and



lean mass. You lie down on an open “table” for approximately 8 minutes while your body is scanned. DXA uses X-rays to assess bone mineral density. However, the radiation dose is approximately 1/10th that of a standard chest X-ray. Some people feel that DXA is the new “gold standard” for body composition work, replacing hydrostatic weighing.

Hedayati, M. T., Afshar, P., Shokohi, T., & Aghili, R. (2007). A study on tinea gladiatorum in young wrestlers and dermatophytes contamination of wrestling mats from Sari-Iran. *Br J Sports Med*, 41, 332-334.

Keywords: hygiene/mats/Tinea/Trichophyton

Abstract: OBJECTIVE: For the first time we studied the prevalence of tinea gladiatorum among young wrestlers and dermatophytes contamination of wrestling mats from Sari city the capital of Mazandaran, a northern Province of Iran.

DESIGN: We examined 324 wrestlers (age range 9-20 years) from 7 active clubs in Sari city and obtained skin scrapings from 135 of suspected wrestlers to tinea gladiatorum. The scraped skin samples were evaluated with potassium hydroxide examination. Pleated carpet sterile fragments (5x5 cm) were used for survey of wrestling mats contamination. Sabouraud's dextrose agar with and without chloramphenicol and cyclohexamide (SC and SCC) was used to culture scrapings and wrestling mats samples. The dermatophytes were identified by routine laboratory techniques. RESULTS: Our study showed that of the 324 wrestlers, 65 (20.1%), presented tinea gladiatorum. The most lesions have been on the trunk and head. All of wrestling mats samples was positive for dermatophyte.

Trichophyton tonsurans (T. tonsurans) was isolated from all of scrapings and wrestling mats samples.

CONCLUSION: Considering that the isolation of many number colonies of T. tonsurans from all of wrestling mats and from involved wrestlers to tinea gladiatorum as the only dermatophytes species, we think the contamination of wrestling mat to T. tonsurans has a crucial role to catch tinea gladiatorum among wrestlers.

Notes: School of Medicine, Mazandaran University of Medical Sciences, Iran

Editor's Note: There are conflicting findings in studies attempting to culture dermatophytes from mat surfaces. Most studies seem to point in the direction of athlete to athlete contact in the transmission of tinea gladiatorum, and have not been able to grow cultures from mat swabs.

Judelson, D., Maresh, C., Farrell, M., Yamamoto, L., Armstrong, L., Kraemer W.J, Volek JS, Spiering, B., Casa, D., & Anderson, J. (2007). Effect of hydration state on strength, power, and resistance exercise performance. *Med Sci Sports Exerc*, 39, 1817-1824.

Keywords: Body Water/Dehydration/endurance/hydration/hydration status/hypohydration /power/strength /Stress/Temperature/total body water/Water/training/Nervous System /body fat/testing

Abstract: PURPOSE: Although many studies have attempted to examine the effect of hypohydration on strength, power, and high-intensity endurance, few have successfully isolated changes in total body water from other variables that alter performance (e.g., increased core temperature), and none have documented the influence of hypohydration on an isotonic, multiset, multirepetition exercise bout typical of resistance exercise training. Further, no investigations document the effect of hypohydration on the ability of the central nervous system to stimulate the musculature, despite numerous scientists suggesting this possibility. The purposes of this study were to examine the isolated effect of hydration state on 1) strength, power, and the performance of acute resistance exercise, and 2) central activation ratio (CAR). METHODS: Seven healthy resistance-trained males (age = 23 +/- 4 yr, body mass = 87.8 +/- 6.8 kg, body fat = 11.5 +/- 5.2%) completed three resistance exercise bouts in different hydration states: euhydrated (EU), hypohydrated by approximately 2.5% body mass (HY25), and hypohydrated by approximately 5.0% body mass (HY50). Investigators manipulated hydration status via exercise-heat stress and controlled fluid intake 1 d preceding testing. RESULTS: Body mass decreased 2.4 +/- 0.4 and 4.8 +/- 0.4% during HY25 and HY50, respectively. No significant differences existed among trials in vertical jump height, peak lower-body power (assessed via jump squat), or peak lower-body force (assessed via isometric back squat). CAR tended to decrease as hypohydration increased (EU = 95.6 +/- 4.9%, HY25 = 94.0 +/- 3.1%, HY50 = 92.5 +/- 5.1%; P = 0.075, eta(p)(2) = 0.41). When evaluated as a function of the percentage of total work completed during a six-set back squat protocol, hypohydration significantly decreased resistance exercise performance during sets 2-3 and 2-5 for HY25 and HY50, respectively. CONCLUSION: These data indicate that hypohydration attenuates resistance exercise performance; the role of central drive as the causative mechanism driving these responses merits further research.

Editor's Note: CAR, or Central Activation Ratio is an important investigation variable. It is the technique of superimposing electrical stimulation during a maximal effort voluntary contraction, termed burst interpolation, is

commonly used to assess the level of motor unit activation (or the degree of central inhibition) of a muscle. The ratio of the force exerted by the subject leading up to the electrical stimulation to the peak force after the stimulation is termed the central activation ratio. This study does an excellent job at identifying the many variables that may be in play in weight loss.

Karli, U., Guvenc, A., Aslan, A., Hazir, T., & Acikada, C. (2007). Influence of Ramadan fasting on anaerobic performance and recovery following short time high intensity exercise. *J Sport Sci Med*, 6, 490-497.

Keywords: anaerobic power/balance/blood/Body Composition/body fat/Body Mass Index/Body Water/Body Weight/caloric intake/cardiovascular/Fasting/Heart/Heart Rate/lactate/metabolism/power/recovery/Rest/Stress/total body water/Water

Abstract: The aim of this study was to investigate the effects of Ramadan fasting on anaerobic power and capacity and the removal rate of lactate after short time high intensity exercise in power athletes. Ten male elite power athletes (2 wrestlers, 7 sprinters and 1 thrower, aged 20-24 yr, mean age 22.30 ± 1.25 yr) participated in this study. The subjects were tested three times [3 days before the beginning of Ramadan (Pre-RF), the last 3 days of Ramadan (End-RF) and the last 3 days of the 4th week after the end of Ramadan (After-RF)]. Anaerobic power and capacity were measured by using the Wingate Anaerobic Test (WAnT) at Pre-RF, End-RF and After- RF. Capillary blood samples for lactate analyses and heart rate recordings were taken at rest, immediately after WAnT and throughout the recovery period. Repeated measures of ANOVA indicated that there were no significant changes in body weight, body mass index, fat free mass, percentage of body fat, daily sleeping time and daily caloric intake associated with Ramadan fasting. No significant changes were found in total body water either, but urinary density measured at End-RF was significantly higher than After-RF. Similarity among peak HR and peak LA values at Pre-RF, End- RF and After-RF demonstrated that cardiovascular and metabolic stress caused by WAnT was not affected by Ramadan fasting. In addition, no influence of Ramadan fasting on anaerobic power and capacity and removal rate of LA from blood following high intensity exercise was observed. The results of this study revealed that if strength-power training is performed regularly and daily food intake, body fluid balance and daily sleeping time are maintained as before Ramadan, Ramadan fasting will not have adverse effects on body composition, anaerobic power and capacity, and LA metabolism during and after high intensity exercise in power athletes.

Editor's Note: Ramadan fasting is an important part of the training and competition calendar for many wrestlers. Many wrestling powers are countries with a predominantly Muslim population. When looking at the team results from the 2007 World Freestyle Wrestling Championships, one finds three Muslim countries in the top-ten: Turkey (2nd), Iran (5th) and Uzbekistan (9th). The results from the 2007 Greco-Roman World Championships list Iran (3rd) and Azerbaijan (5th) in the top-ten.

Keller, B., Coelho, R., Okazaki, F., & Santos, S. (2007). The effect of precompetitive and postcompetitive climate on salivary cortisol and stress levels among top -ranking Brazilian wrestlers. *Journal of Sport and Exercise Psychology*, 29, S20-S21.

Keywords: Stress/cortisol/competition

Abstract: The article presents a summary of a study examining the affect of top-ranking Brazilian wrestlers' emotional state before and after competition on their stress and salivary cortisol levels. The subjects were male wrestlers, between 18-30 years old, who had Olympic Wrestling experience, and practiced a specific amount of time each week. The Physiological Stress Reaction, the Perceived Stress Inventory, and the salivary cortisol were used to collect the data. ANOVA was used to analyze the data.

Editor's Note: The search continues for markers of stress! No associations were found between the self-report inventories and salivary cortisol levels.

Kordi, R., Mansournia, M. A., Nourian, R. A., & Wallace, W. A. (2007). Cauliflower ear and skin infections among wrestlers in Tehran. *J Sports Science and Medicine*, 6, 39-44.

Keywords: cauliflower ear/Ear/Infection/injuries/Skin infections

Abstract: The purpose of the study was to describe the magnitude of the selected sports medicine problems (i.e. cauliflower ear and skin infections) among wrestlers in Tehran. A number of 411 wrestlers were randomly selected from wrestling clubs in Tehran employing cluster sample setting method. The participants were interviewed using a

specially designed and validated questionnaire. Nearly half of the participants (44%) had "cauliflower ears". Only 23% of these participants had received any kind of treatment for their acute ear haematomas that are known to result in "cauliflower ears". The prevalence of reported hearing loss among participants with cauliflower ears (11.5%, 95%CI: 6.9 to 16.2) was significantly more than this prevalence among those participants without cauliflower ears (1.8%, 95%CI: 0.1 to 3.5) ($p < 0.05$). More than half of the participants (52%) had skin infection diagnosed by a physician during the previous year. This study has identified evidence of an increase in hearing loss as a possible side effect of either cauliflower ear or ear injury in wrestling in Iran. There has been an outbreak of ringworm and there is a significant potential for an outbreak of impetigo among wrestlers in Tehran.

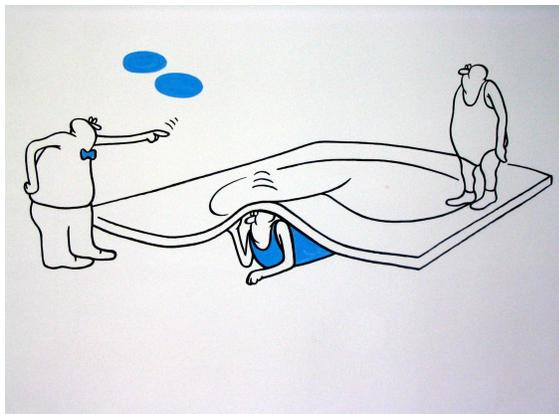
Editor's Note: These health issues are present in all wrestling communities and must be properly managed to help promote the sport. Hearing loss as a result of cauliflower ear is something that I have not seen reported in the literature.

Kristiansen, E., Roberts, G. C., & Abrahamsen, F. E. (2007). Achievement involvement and stress coping in elite wrestling. *Scand J Med Sci Sports*, (07 Jun 2007 OnlineEarlyArticles)doi:10.1111/j.1600-0838.2007.00646.x

Keywords: Age/competition/experience/Female/Male/Motivation/Perception/strategy/Stress

Abstract: The present study explored the relationship between task involvement and coping with stress in elite competition. Participants were 82 elite wrestlers, both male ($n=60$) and female ($n=22$), from four different European countries, age 16-37. The data for the study were gathered over an 18-month period, and both qualitative in-depth interviews ($n=6$) and quantitative approaches were used. The quantitative study measured motivation from an achievement goal theory perspective: achievement goal orientation [Perception of Success Questionnaire], perceptions of the motivational climate [Perceived Motivational Climate in Sport Questionnaire] and coping strategies (Brief COPE). The qualitative part explored motivation and coping in depth. As expected, task involved wrestlers coped better in competitive situations due to their use of more adaptive coping strategies. The wrestlers' experiences seemingly make them prefer to stay task involved and use adaptive coping strategies (both problem-focused and emotion-focused strategies) in competition.

Notes: Norwegian University of Sport Science, Oslo, Norway



Editor's Note: This is a very interesting study with some information which can be used by coaches. Some athletes are not able to perform to their full potential when it is needed the most. This is often the result of the stress of the competition. Athletes are sometimes vague in describing how they cope with stress, because some athletes are not aware of their coping efforts. This study is valuable, in part, because it includes some very elite wrestlers (World and Olympic medalists), as well as the detailed interview techniques used.

A definition of "task-involved" athlete is necessary. The focus is one of demonstrating mastery of tasks, and perceptions of ability are self-referenced. Dichotomies and polar opposites are common in psychology, and in this case, the opposite of the more successful task-involved athlete, is the "ego-involved" athlete. This athlete is preoccupied with the end result of winning, and demonstrating superior ability to others. Self-perceptions of ability and performance are norm-referenced (looking outward towards the rest of the population).

Kubo, J., Ohta, A., Takahashi, H., Kukidome, T., & Funato, K. (2007). The Development of Trunk Muscles in Male Wrestlers Assessed by Magnetic Resonance Imaging. *J Strength Cond Res*, 21, 1251-1254.

Keywords: Magnetic Resonance Imaging/Muscles/strength/trunk

Abstract: The development of trunk muscles in male wrestlers assessed by magnetic resonance imaging. *J. Strength Cond. Res.* 21(4):1251-1254. 2007.-The purpose of this study was to compare the development of trunk musculature among Elite, Sub-elite, and Elite junior wrestlers. The performance level of these groups, ordered highest to lowest, is as follows: Elite ($n = 20$), Sub-elite ($n = 25$), and Elite junior ($n = 39$). A magnetic resonance imaging device was used to measure the cross-sectional area (CSA) of the trunk muscles. The whole trunk muscle cross-sectional area

(t-MCSA) of the Elite group was significantly larger than that of the Elite junior group ($p < 0.05$). The rectus abdominis muscle CSA of the Elite group was significantly larger than that of the Elite junior group ($p < 0.01$). The psoas major muscle CSA of the Elite group was significantly larger than that of the Elite junior group ($p < 0.05$). There were no significant differences in the CSA of any of the trunk muscles between the Elite and Sub-elite groups. In conclusion, compared with Elite junior wrestlers, it is conceivable that a greater CSA of trunk flexors of Elite wrestlers is one factor which supports increased performance.

Editor's Note: The importance of core training now is being acknowledged in many sports. It has always been emphasized in wrestling. MRI offers researchers the opportunity to study the dimensions of soft tissues, in this case the cross-sectional area (CSA) of the muscles of the trunk. CSA is generally correlated with strength, however strength was not assessed in this study.

Leyk, D., Gorges, W., Ridder, D., Wunderlich, M., Ruther, T., Sievert, A., & Essfeld, D. (2007). Hand-grip strength of young men, women and highly trained female athletes. *Eur J Appl Physiol*, 99, 415-421.

Keywords: women/gender/grip strength/strength/training

Abstract: Hand-grip strength has been identified as one limiting factor for manual lifting and carrying loads. To obtain epidemiologically relevant hand-grip strength data for pre-employment screening, we determined maximal isometric hand-grip strength in 1,654 healthy men and 533 healthy women aged 20-25 years. Moreover, to assess the potential margins for improvement in hand-grip strength of women by training, we studied 60 highly trained elite female athletes from sports known to require high hand-grip forces (judo, handball). Maximal isometric hand-grip force was recorded over 15 s using a handheld hand-grip ergometer. Biometric parameters included lean body mass (LBM) and hand dimensions. Mean maximal hand-grip strength showed the expected clear difference between men (541 N) and women (329 N). Less expected was the gender related distribution of hand-grip strength: 90% of females produced less force than 95% of males. Though female athletes were significantly stronger (444 N) than their untrained female counterparts, this value corresponded to only the 25th percentile of the male subjects. Hand-grip strength was linearly correlated with LBM. Furthermore, both relative hand-grip strength parameters ($F(\max)/\text{body weight}$ and $F(\max)/\text{LBM}$) did not show any correlation to hand dimensions. The present findings show that the differences in hand-grip strength of men and women are larger than previously reported. An appreciable difference still remains when using lean body mass as reference. The results of female national elite athletes even indicate that the strength level attainable by extremely high training will rarely surpass the 50th percentile of untrained or not specifically trained men.

Editor's Note: I was surprised at the size of the gap between the female athletes and the untrained men. We need to duplicate his work with female wrestlers and further examine the trainability of grip strength, especially where there has been a program utilizing specific grip training. Will these gaps persist? The strength gap between men and women has been shown to be greatest in the upper body. I am also be interested in the neck strength comparison between male and female wrestlers and have begun to investigate these levels with a Nicholas Manual Muscle Tester.

Messner, M. A. & Solomon, N. M. (2007). Social Justice and Men's Interests-The Case of Title IX. *Journal of Sport & Social Issues*, 31, 162-178.

Keywords: gender/Title IX/women/Education

Abstract: Men's superordinate status sets the stage for them to understand their interests as opposed to those of women. But hierarchies among men complicate this. Through an examination of the narratives by critics of Title IX at the U.S. Secretary of Education's 2002 hearings on Title IX, the authors argue that subordinated groups of men within sports (i.e., those in vulnerable "nonrevenue" sports like wrestling, tennis, and gymnastics) tend to articulate their interests as congruent with men in central, privileged sports (football and basketball). But this articulation of men's interests does not take the form of antiwoman backlash. The critics tell stories of individual men who are victimized by the "unintended consequences" of liberal state policies-stories that rest on an essentialist assumption that men are naturally more interested in sports than are women. The critics' language of bureaucratic victimization of individual men-especially as symbolized by the threatened "walk-on"-may find especially fertile ground among young white males, who face a world destabilized by feminism, gay and lesbian liberation, the civil rights movement, and shifts in the economy.

Editor's Note: Yes, there is sociology in wrestling science! Are men and women equally interested in athletic participation? Empirical evidence from athletic/intramural participation would say no, however, one may assert that with equal nurturing and opportunity, they would be the same. This makes arguing the "essentialist assumption that men are naturally more interested in sports than are women," very difficult. Messner makes some assertions regarding men's sports which do not ring true to me. In describing this as a men against women struggle for power, he states that "...men in marginal sports often have very different experiences of sport; some of them are overtly insulted-even assaulted-by boys and men in the central sports, being placed in subordinate that are coded as feminine." I have never encountered a football player who did not have respect for wrestlers. Wrestlers are held in high regard by football players. As a person who does not read a great amount of social science research, it seems to me that these authors approach their study with a great amount of bias.

Mochida, N., Umeda, T., Yamamoto, Y., Kojima, A., Sugawara, K., & Nakaji, S. (2007). The main neutrophil and neutrophil-related functions may compensate for each other following exercise-a finding from training in university judoists. *Luminescence*, 22, 20-28.

Keywords: immune system/neutrophils

Abstract: In order to clarify the relationship between exercise and neutrophil function, we measured three major neutrophil and neutrophil-related functions, viz. the reactive oxygen species (ROS) production capability and phagocytic activity (PA) of neutrophils and serum opsonic activity (SOA), simultaneously before and after a unified loading exercise under three different sets of conditions. Thirteen female collegiate judoists were examined with a unified exercise loading (2 h) immediately before and after a 64 day training period. Immediately thereafter, the athletes took part in a 6 day intensified training camp, following which the same exercise loading was repeated. Responses from circulating neutrophils were estimated by comparing the two sets of values obtained before and after the two instances of exercise loading. The parameters assessed included neutrophil count, SOA, PA and ROS production capability. ROS production increased after the exercise loading performed immediately before and after the 64 day training period just before the camp, ($p < 0.01$) but decreased following the exercise loading performed after the camp ($p < 0.05$). This suggested depressed bacteriocidal capability of the circulating neutrophils. PA decreased after the exercise loading sessions imposed prior to and after the 64 day training period ($p < 0.01$) but did not change in the loading session after the camp. No changes were seen in SOA produced with the loading exercise either before the 64 day exercise period or before the camp, but increased significantly following the post-camp session ($p < 0.05$). In conclusion, athletic training-induced changes in immune functional activities of neutrophils, such as ROS production and PA, and neutrophil-related factors, such as SOA, may compensate for each other to maintain the overall integrity of the neutrophil immune function.

Editor's Note: While training may cause changes in specific neutrophil functions, these changes may compensate for each other with no net effect on immune status. (see Yaegaki study in this review)

Mochizuki, T., Kawasaki, M., Tanabe, H., Anzawa, K., Ishizaki, H., & Choi, J. S. (2007). Molecular epidemiology of trichophyton tonsurans isolated in Japan using RFLP analysis of non-transcribed spacer regions of ribosomal RNA genes. *Jpn J Infect Dis*, 60, 188-192.

Keywords: epidemiology/Trichophyton/analysis/dermatology/Tinea

Abstract: Trichophyton tonsurans has been reported to be the causative agent of an epidemic of tinea corporis and tinea capitis among Japanese judoists and wrestlers. A molecular method using restriction enzyme analysis of PCR-amplified fragments targeting the non-transcribed spacer (NTS) region of ribosomal RNA genes in fungal nuclei was applied to a total of 232 strains of T. tonsurans isolated in Japan. Six molecular types, i.e., NTS types I, II, III, IV, V, and VI, were clearly detected in restriction analysis of fragments digested with MvaI and AvaI together. Of the 232 strains, 199 were classified as NTS I, 21 as NTS II, 7 as NTS III, 3 as NTS IV, 1 as type V, and 1 as type VI. Whereas the NTS I strains were found nationwide, most of the NTS II and NTS III strains were limited to central Japan. Of 164 strains isolated from judoists, 160 were classified as NTS I, which suggests that the majority of the cases were caused by a clonal lineage. On the other hand, the 48 strains isolated from wrestlers showed more variety, with 27 strains classified as NTS I, 17 as NTS II, and 4 as NTS III. We concluded that the epidemic was caused by at least three lineages of T. tonsurans. NTS VI strains, the major molecular type among sporadically isolated strains, were not observed among the epidemic strains, and strains of this type did not contribute to the present epidemic.

Editor's Note: This very technical and specialized research has no immediate relevance to wrestling, however this type of work allows researchers to track an epidemic because of the different strains of this organism.

Oliver, S., Laing, S., Wilson, S., Bilzon, J., & Walsh, N. (2007). Endurance running performance after 48 h of restricted fluid and/or energy intake. *Med Sci Sports Exerc*, 39, 316-322.

Keywords: Dehydration/endurance/Energy Intake/hypohydration/Water

Abstract: PURPOSE: To determine the effect of a 48-h period of either fluid restriction (FR), energy restriction (ER), or fluid and energy restriction (F + ER) on 30-min treadmill time trial (TT) performance in temperate conditions. METHODS: Thirteen males participated in four randomized 48-h trials (mean +/- SD: age, 21 +/- 3 yr; VO₂max 50.9 +/- 4.3 mL x kg⁻¹ x min⁻¹). Control (CON) participants received their estimated energy (2903 +/- 199 kcal x d⁻¹) and water (3912 +/- 500 mL x d⁻¹) requirements. For FR, participants received their energy requirements and 193 +/- 50 mL x d⁻¹ water to drink, and for ER, participants received their water requirements and 290 +/- 20 kcal x d⁻¹. F + ER was a combination of FR and ER. After 48 h, participants performed a 30-min treadmill TT in temperate conditions (19.7 +/- 0.6 degrees C). A separate investigation (N = 10) showed the TT to be highly reproducible (CV 1.6%). RESULTS: Body mass loss (BML) was 0.6 +/- 0.4% (CON), 3.2 +/- 0.5% (FR), 3.4 +/- 0.3% (ER), and 3.6 +/- 0.3% (F + ER). Compared with CON (6295 +/- 513 m), less distance was completed on ER (10.3%) and F + ER (15.0%: P < 0.01). Although less distance was completed on FR (2.8%), this was not significantly different from CON. CONCLUSIONS: These results show a detrimental effect of a 48-h period of ER but no significant effect of FR on 30-min treadmill TT performance in temperate conditions. Therefore, these results do not support the popular contention that modest hypohydration (2-3% BML) significantly impairs endurance performance in temperate conditions.

Editor's Note: Many wrestlers dehydrate in order to make weight and attempt to rehydrate prior to competition. We know that they do not have the time to fully rehydrate, yet they still function at a high (optimal?) level. This study may help us to better understand how this is accomplished.

Pappas, E. (2007). Boxing, wrestling, and martial arts related injuries treated in emergency departments in the United States, 2002-2005. *J Sports Science and Medicine*, 6, 58-61.

Keywords: injuries/combat sports/Dislocations/injury prevention/Fractures

Abstract: The incidence of injury in combat sports has not been adequately reported although it is important to identify the nature and frequency of injuries prior to the implementation of prevention programs. This study compared injury rates treated in Hospital Emergency Departments between different combat sports of boxing, wrestling, and martial arts. A secondary objective described anatomic region and diagnosis of these injuries. Data were obtained on all boxing, wrestling, and martial arts-related injuries that were in the National Electronic Injury Surveillance System database and resulted in Emergency Department visits between 2002 and 2005. Pearson's chi-square statistics were calculated to compare injury rates for each activity accounting for complex sample design. Martial arts had lower injury rates compared to boxing and wrestling for all diagnoses (p < 0.001). Boxing had lower injury rates compared to wrestling for strains/sprains and dislocations. Boxing and wrestling had similar injury rates for concussions. Injury prevention efforts should consider the distribution of injuries and concentrate on preventing strains/sprains in wrestling, concussions in boxing and wrestling, and fractures for all three activities. The findings of the present study do not provide evidence that combat sports have alarmingly high rates of injuries resulting in emergency department visits.

Rahmani-Nia, F., Mirzaei, B., & Nuri, R. (2007). Physiological profile of elite Iranian junior Greco-Roman wrestlers. *International Journal of Fitness*, 3, 49-54.

Keywords: agility/Body Composition/Body Weight/endurance/flexibility/grip/grip strength/muscular endurance/Oxygen Consumption/speed/strength/tests

Abstract: The purpose of this study was to describe the physiological profile of elite Iranian junior Greco-Roman wrestlers. Seventy one elite wrestlers (aged 19.7±0.8 years), who participated in Iran national training camps were selected for this study periodically. The physiological profile included body weight, maximal oxygen consumption (Bruce protocol), muscular endurance and strength (pull-ups, push-ups, grip strength, bench press, squat and bent-knee sit-ups tests), speed (40yd running), agility(4 x 9 m running) and body composition (7sites skinfold).Major Results (mean ± SD) are as follow: body weight (kg)77.4 ± 19.5, flexibility (cm) 40.95 ± 5.25, maximal oxygen

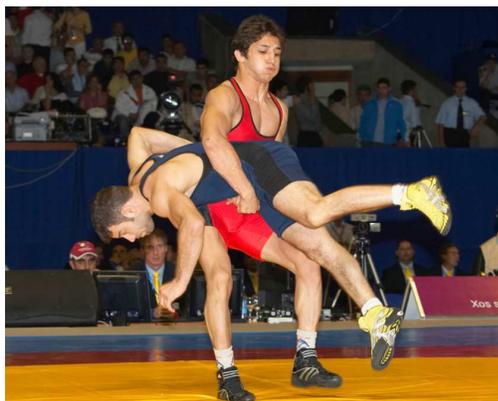
consumption($\text{ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$) 50 ± 4.75 , bench press ($\text{W}\cdot\text{kg}^{-1}$) 1.47 ± 0.18 , squat ($\text{W}\cdot\text{kg}^{-1}$) 1.76 ± 0.22 , push ups (n) 66.7 ± 8.4 , pull ups (n) 31.4 ± 11 , grip strength ($\text{W}\cdot\text{kg}^{-1}$) 0.89 ± 0.14 , bent - knee sit - ups (n) 67 ± 6.6 , speed (s) 5.1 ± 0.23 , agility (s) 8.9 ± 0.7 and BF (%) 10.8 ± 4.1 . The present study provides baseline physiological data which have been used in the prescription of individual training programs for these athletes. This information is also available to the coaches and contributes to the strategy for individual matches.

Body fat, flexibility, agility, speed and maximal oxygen uptake (Mean \pm SD)

Variables	n	Body fat (%)	Sit and reach (cm)	4 \times 9 m running (s)	40 yd running (s)	VO ₂ max ($\text{ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$)
Subjects						
50 kg	9	6.9 ± 1.9	41.2 ± 6.9	9.15 ± 0.2	5.2 ± 0.3	51.7 ± 3
55 kg	9	9 ± 1.2	41.7 ± 2	8.63 ± 0.5	5.1 ± 0.1	53 ± 4.4
60 kg	10	10.4 ± 2.4	38.7 ± 7	8.59 ± 0.58	5.2 ± 0.31	51.7 ± 4
66 kg	11	9.7 ± 2.2	41.9 ± 4.8	8.68 ± 1.1	5.14 ± 0.24	51.2 ± 3.7
74 kg	6	10.3 ± 2.4	41.5 ± 4	9.17 ± 0.42	5.03 ± 0.1	51.2 ± 3
84 kg	11	10.1 ± 2.6	43.2 ± 6.3	9.12 ± 0.62	5.11 ± 0.15	50.7 ± 2.9
96 kg	9	11.9 ± 2.1	40.6 ± 2.6	9.03 ± 0.42	5.29 ± 0.26	46.2 ± 2.2
120 kg	6	20.1 ± 6	38.3 ± 6.4	9.27 ± 0.57	5.35 ± 0.17	40.5 ± 2

Muscular endurance and strength (Mean \pm SD)

Variables	n	Situps (n / min)	Pushups (n / min)	Pullups (n)	Squat 1RM ($\text{W}\cdot\text{kg}^{-1}$)	Bench press 1RM ($\text{W}\cdot\text{kg}^{-1}$)	Grip strength ($\text{W}\cdot\text{kg}^{-1}$)
Subjects							
50 kg	9	66 ± 4	59 ± 5	46 ± 13	1.9 ± 0.15	1.4 ± 0.1	0.95 ± 0.11
55 kg	9	70 ± 4	70 ± 7	35 ± 7	1.9 ± 0.1	1.56 ± 0.11	0.96 ± 0.15
60 kg	10	68 ± 4	69 ± 9	37 ± 15	1.85 ± 0.17	1.6 ± 0.26	0.9 ± 0.19
66 kg	11	65 ± 6	70 ± 7	29 ± 11	1.83 ± 0.2	1.52 ± 0.16	0.89 ± 0.11
74 kg	6	73 ± 5	66 ± 7	34 ± 8	1.65 ± 0.16	1.4 ± 0.16	0.85 ± 0.13
84 kg	11	64 ± 12	69 ± 5	29 ± 12	1.7 ± 0.2	1.47 ± 0.1	0.91 ± 0.13
96 kg	9	68 ± 7	70 ± 6	22 ± 3	1.71 ± 0.16	1.34 ± 0.13	0.9 ± 0.11
120 kg	6	61 ± 4	53 ± 5	17 ± 7	1.38 ± 0.1	1.27 ± 0.1	0.74 ± 0.05



Editor's Note: Great recent successes of Iran's young wrestlers certainly demonstrates that they are physically prepared. It is interesting to see the data presented by weight class. The lifting data are presented relative to the amount of body weight lifted. I am currently collaborating with Dr. Mirzaei to develop a test battery for modern Greco-Roman wrestlers.

(left) Hamid Soryan Reihanpour of Iran-In 2005 he won both the Junior and Senior Greco-Roman World Championships in the 55 kg class.

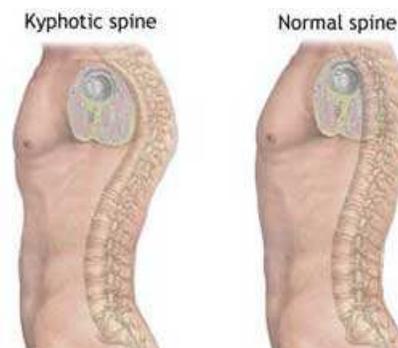
Rajabi, R., Doherty, P., Goodarzi, M., & Hemayattalab, R. (2007). Comparison of thoracic kyphosis in two groups of elite Greco-Roman and free style wrestlers and a group of non-athletic subjects. *Br J Sports Med*, July.

Keywords: injuries/long term effects/Spine

Abstract: BACKGROUND: Free style and Greco-Roman are two types of wrestling that place the spine of athletes in different positions. Theoretically it can be argued that this can lead to adverse effects on the spine and might be an important factor associated with changes in kyphosis degree. OBJECTIVES: The aim of this study was to investigate whether the extent of the thoracic kyphosis differs in two groups of elite wrestlers and a group of non-athletic participants. METHODS: Sixty elite Iranian male wrestlers consisting of 30 free style (age 23.5 ± 2.8 years; height 176 ± 7.1 ; weight 77.8 ± 16.1), 30 Greco-Roman style (aged 23.9 ± 2.9 ; height 176 ± 4 ; weight 80.1 ± 11.1) and

30 non-athletes male (age 23.3 +/- 2.1; height 175 +/-8; weight 75.2 +/-6.7) were recruited. All wrestlers competed at international level with the Iranian national team or Iranian student national team. Each selected wrestler had to meet a minimum criterion of 5 years wrestling. The degree of kyphosis was measured using a modified Electrogoniometer. **RESULTS:** Mean kyphosis was 30 degrees +/-3.8 degrees , 24.3 degrees +/-3.7 degrees and 27.4 degrees +/-3.2 degrees for the free style, Greco-Roman style and non-athlete groups respectively. A significant difference was found in mean of kyphosis between all groups ($p<0.05$) with free-style being the highest and Greco-Roman the lowest. **CONCLUSIONS:** The degree of kyphosis was highest in free-style wrestling, followed by non-athletes and then free-style wrestlers. The extent of kyphosis was not influenced by years of training or age of starting wrestling. The implications are that the extent of kyphosis, albeit different between wrestling styles, is not associated with training and duration of competition.

Editor's Note: *Kyphosis is a posterior convex angulation of the spine when evaluated from the side. Kyphotic changes in the spine may be a precursor to arthritic changes in later life. I am interested to find out whether a corrective, or muscle balancing program might be developed to offset these changes in freestyle wrestlers. Dr.Rajabi told me, "I personally think that apart from all the benefits that sport have for people, in some cases the effects of sport on athletes, especially elite athletes, might be negative. There are many papers on anatomical and postural maladaptation in the body of athletes and its effect on the later life of these people has not been studied extensively. Currently we are doing another research on the effect of competitive wrestling on the shoulder girdle and the scapula position in different styles of wrestling."*



Roberts, J. W. (2007). Effectiveness of physician observation in determining minimum weight classifications for Pennsylvania high school wrestlers. *Med Sci Sports Exerc*, 39, S403.

Keywords: Body Composition/hydrostatic weighing/weight classes/weight control plans

Abstract: **PURPOSE:** To determine the effectiveness of the previously used practice of physician observation for placing Pennsylvania high school wrestlers in minimum weight classifications. **METHODS:** A total of 23 male wrestlers (age 16.0+/-1.3yr) from Northwestern PA, underwent the experimental procedures of body composition assessment using physician observation (PO) to determine official weight classifications. Then the subjects were tested via skinfold assessment (SF), bioelectrical impedance analysis (BIA), and hydrostatic weighing (HW) with urinalysis using specific gravity to determine minimum weight class. Height, body mass and body mass index (BMI; kg/m²) were also determined. **RESULTS:** BIA follow-up testing of 23 subjects revealed that 10 official placements in weight classes were correct. Of the 13 others, there was an average placement error of 1.61 weight classes. Skinfold testing indicated 9 wrestlers had appropriate placements with the other 14 subjects being placed an average of 1.5 classifications off. Hydrostatic weighing resulted in 12 wrestlers being assigned to the same (or higher) weight class as the official measurements. Eleven wrestlers were off an average of 1.82 weight classes via hydrostatic weighing. In addition, 4 subjects HW results were significantly higher than BIA and SF. These 4 subjects were included in the 12 that were equal to the official placements but it is likely that at least one of them would have been misplaced.

CONCLUSIONS: The former guidelines for determining minimum weight classifications the allowed the use of physician observation in Pennsylvania were ineffective.

Editor's Note: *This study provides more evidence for the efficacy of the body composition-based westling weight control plans.*

Sbriccolli, P., Bazzucchi, I., Di Mario, A., Marzattinocci, G., & Felici, F. (2007). Assessment of maximal cardiorespiratory performance and muscle power in the Italian Olympic judoka. *J Strength Cond Res*, 21, 738-744.

Keywords: blood/women/Heart/Heart Rate/lactate/muscle/power/strength/tests/training/Wingate test

Abstract: The main purposes of this study were to describe the cardiorespiratory fitness and lower limbs maximal muscle power of a selected group of Olympic Italian male (M) and female (F) judokas. Eleven subjects (6 M, 5 F)

underwent 3 different tests. The VO₂max and ventilatory threshold (VT; V-slope method) were assessed during a graded maximal treadmill test. Lower limbs muscle peak power (PP) and mean power (MP) were determined during a 30-second Wingate test (WIN). Post-WIN blood lactate peak was also measured. Subjects were tested also during a 5-minute combat test (CT), during which blood lactate and heart rate (HR) were monitored. VO₂max (mean +/- SD) was 47.3 +/- 10.9 and 52.9 +/- 4.4 ml x kg⁻¹ x min⁻¹ for M and F judokas, respectively. The VT corresponded to 80.8% (M) and 86.5% (F) of VO₂max. Both PP and MP, measured during the WIN, were significantly higher (p < 0.05) in M than in F judokas (PP: 12.1 +/- 2.4 vs. 9.5 +/- 1.1 W x kg⁻¹; MP: 5.4 +/- 1.1 W x kg⁻¹; F: 4.3 +/- 0.5 W x kg⁻¹). Post WIN blood lactate peak was 6.9 +/- 2.8 mmol x l⁻¹ and 6.1 +/- 1.8 mmol x l⁻¹ for M and F judokas, respectively (not significant). During the CT blood lactate peak was 9.9 +/- 3.0 mmol x l⁻¹ (M) and 9.2 +/- 2.0 mmol x l⁻¹ (F); these values being significantly higher than those obtained after the WIN (p < 0.05). In conclusion, Italian Olympic judokas showed high levels of muscle power but accompanied by a moderate engagement of the aerobic metabolic pathway, which is well in accordance with the characteristics of judo. Having these results in top-level athletes may represent a useful contribution to the work of coaches and trainers in optimizing training programs for the achievement of the best performance of the judoka.

Editor's Note: *Among the various tests, the combat test is of interest. An attempt was made to standardize the demands of the sport with a 5 minute bout with 2 different opponents. Standardizing the physical demand during combative sports is always difficult because of the varying ability level of opponents. Heart rate data was collected throughout the combat test. We need to do similar work with wrestlers. The first task is to assess the viability of HR testing during live wrestling. I will be contacting Polar™ to discuss the best methods to keep electrodes in place, along with the placement of the receiver. I suggest that test variables be expressed relative to body weight as well, since the weight-class nature of the sport.*

Senchina, D. S., Hallam, J. E., Shah, N. B., Sanderson, C. R., & Kohut, M. L. (2007). Elite college wrestlers' immune response to *In Vitro Echinacea* stimulation changes over the course of intense preseason training. *Med Sci Sports Exerc.* 39, S462.

Keywords: immune system/supplements

Abstract: Intense exercise is associated with alterations of immune function both *in vitro* and *in vivo*. College and professional athletes are increasingly turning to herbal medicines such as *Echinacea* spp. to offset effects due to intense exercise such as occurs during preseason training. **PURPOSE:** To better understand how immune response to *Echinacea* extracts changes over the course of preseason training in elite athletes. **METHODS:** Blood was sampled from eight college wrestlers at three time points: before preseason training (Pre), after 1 day of preseason training (Day 1), and after 15 days of preseason training (Day 15). Immediately prior to both the Day 1 and Day 15 samples, subjects participated in an intense 2 h+ bout of combined aerobic/anaerobic training, whereas the Pre sample was taken at rest. At each time point, peripheral blood mononuclear cells (PBMC) were isolated and cultured *in vitro* with ethanol tinctures from two species of *Echinacea*, *E. pallida* (PAL) or *E. simulata* (SIM), or vehicle control (CON). *In vitro* PBMC production of TNF and IL-1 β was assayed using ELISA after 24 and 48 h culture, respectively. *In vitro* PBMC proliferation after 72 h culture was measured using a formazine salt assay. **RESULTS:** TNF production was suppressed at Days 1 and 15 compared to Pre condition, and SIM treatment increased TNF compared to CON or PAL treatment (significant time, treatment, time x treatment effects, all p=0.001). IL-1 β was not altered by exercise condition, but SIM treatment elicited greater IL-1 β production than CON or PAL treatment (p<0.001). PBMC proliferation was lower at Pre condition compared to Days 1 and 15, and SIM treatment elicited greater proliferation compared to CON or PAL treatment (significant time, treatment, time x treatment effects, all p=0.049). **CONCLUSIONS:** PBMC cytokine production and proliferative response to *Echinacea* stimulation change over the course of intense preseason training and are contingent on both the training itself and species of *Echinacea* chosen.

Editor's Note: *It is good to see that the claims for many of these supplements is being scientifically studied. The fact that different species of the supplement elicit different responses underscores the fact that consumers are often at the mercy of the manufacturers-echinacea is echinacea, right? Studies have shown that the amounts, as well as the ingredients themselves are often incorrectly listed on the labels. I would also remind athletes that they are responsible for what goes into their body, and be very careful that what you think you are taking is what you are actually ingesting.*

Tagami, K., Kudidome, T., Kamiharma, T., & Ichiman, Y. (2007). Two outbreaks of systemic lymphadenitis with fever among contact sports players following wound infection. *Bulletin of Institute of Health & Sport Sciences, University of Tsukuba*, 29, 67-69.

Keywords: Infection/MRSA/Staphylococcus aureus

Abstract: Two outbreaks of systemic lymphadenitis with fever, following wound infections of Staphylococcus aureus occurred in a football and a wrestling team were described. Occurrence (number and percentage) of the symptoms was recorded on the reported day and the symptoms of the football (n = 64), wrestling (n = 19), baseball (n = 91) and tennis (n = 35) team were surveyed and recorded three every tenth successive days before and after the reported day. The outbreak in football was completely blunted by a 5 days 2.0 mg/l chlorine-disinfected hot bathing after their training and by renewals to their laundered underwear and bedclothes.

Editor's Note: MRSA is not just an American problem!

Vardar, S. A., Tezel, S., Ozturk, L., & Kaya, O. (2007). The relationship between body composition and anaerobic performance of elite young wrestlers. *J Sports Science and Medicine*, 6, 34-38.

Keywords: anaerobic power/Body Composition/Female/gender/power/Wingate test

Abstract: The purpose of the present study was to investigate the relationship between body composition and anaerobic performance in young elite wrestlers. Method: Eight female (age = 16.2 ± 1.1 yrs) and 8 male (age = 17.3 ± 0.9 yrs) wrestlers from the Turkish cadet and junior national team participated in this study. Fat free mass (FFM) and percent fat mass (%FM) were carried out through electric bioimpedance. Anaerobic performance was assessed by the Wingate test (load was calculated as 0.090 kg x kg⁻¹ body mass). FFM was greater in male wrestlers [65.4 ± 12.3 (kg)] than female wrestlers (45.1 ± 4.6 (kg) p < 0.01). %FM was lower in male wrestlers (9.7 ± 6.3) than female wrestlers (18.5 ± 2.8; p < 0.01). Peak power was significantly higher in male wrestlers than female wrestlers (8.5 ± 1.0 W·kg⁻¹ vs. 6.8 ± 0.6 W·kg⁻¹; p < 0.01). Mean power was significantly correlated with FFM in both genders (r = 0.73 p < 0.05 in female; r = 0.90 p < 0.05 in male). No relationship was obtained between anaerobic parameters and %FM. In conclusion, our result demonstrated no association between anaerobic parameters and %FM. Wrestlers and their coaches should take into account FFM rather than %FM for higher anaerobic performance.

Editor's Note: Muscles are the engine that drives wrestlers!

Yaegaki, M., Umeda, T., Takahasi, I., Sugawara, N., Shimaya, S., Tanabe, M., Kojima, A., Mochida, N., Yamamoto, Y., & Nakaji, S. (2007). Change in the capability of reactive oxygen species production by neutrophils following weight reduction in female judoists. *Br J Sports Med*, 41, 322-327.

Keywords: women/immune system/Immunoglobulins/Infection/neutrophils

Abstract: OBJECTIVE: Athletes undergoing weight reduction are recognised as being more prone to infection. Few studies exist for athletes on the weight reduction-mediated changes in neutrophil function and related activities such as reactive oxygen species (ROS) production capability, phagocytic activity (PA) and serum opsonic activity (SOA). METHODS: 16 Japanese female university judoists were examined in the early morning of the first day (pre-values) and the last day (post-values) of a 20-day pre-competition training period. Of the 16 subjects, 8 needed to reduce weight (WR group) and the other 8 did not (control group). The parameters assessed were the neutrophil count, serum immunoglobulins and complements, myogenic enzymes, ROS production capability, PA and SOA. RESULTS: Comparing the post-values with the pre-values, ROS production significantly increased in both groups (p < 0.01 for both). PA significantly decreased in the WR group (p < 0.05); it also decreased in the control group but the decrease was not significant. SOA significantly increased in the control group (p < 0.05), but showed no significant change in the WR group. CONCLUSIONS: The changes in the WR group were probably a direct consequence of the weight-reduction regimen coupled with the exercise regimen, suggesting that neutrophil parameters (ROS production, PA and SOA) had tended to deviate from their typical compensatory changes to maintain immune system homeostasis.

Notes: Department of Social Medicine, Hirosaki University School of Medicine, Zaifu-cho, Hirosaki, Aomori, Japan.

Editor's Note: There is a great body of research generated by people interested in judo, and other combative sports, that should not be ignored by those of us in wrestling. The weight loss to "make weight" is the wild card when investigating judo athletes and wrestlers, and other weight class athletes. The type of weight loss can also be a factor. The role of exercise in the functioning of the immune system is complicated, yet researchers have found

that there are compensatory changes among the three main neutrophil functions. So while one function goes down, the other two increase, thus maintaining immune system homeostasis. Weight loss, coupled with training upsets this mechanism.

Yard, E. E., Collins, C. L., Dick, R. W., & Comstock, R. D. (Epub 2007 Oct 11). An epidemiologic comparison of high school and college wrestling injuries. *Am J Sports Med* 2008 36(1):57-64.

Keywords: Cartilage/Elbow/epidemiology/Infection/injuries/Skin infections

Abstract: BACKGROUND: Wrestling holds worldwide popularity, and large numbers of United States high school and college males participate. However, the sport's arduous nature results in high injury rates. HYPOTHESIS: Wrestling injury rates and patterns will differ between high school and college practice and match exposures. STUDY DESIGN: Descriptive epidemiology study. METHODS: Wrestling-related injury data were collected during the 2005-2006 academic year from 74 nationally representative high schools via High School Reporting Information Online (RIO) and from 15 Division I, II, and III colleges via the National Collegiate Athletic Association Injury Surveillance System. RESULTS: Certified athletic trainers reported 387 injuries among participating high school wrestlers during 166 279 athlete-exposures, for an injury rate of 2.33 injuries per 1000 athlete-exposures. Nationally, high school wrestlers sustained an estimated 99 676 injuries and 8741 skin infections during the 2005-2006 season. In college, 258 injuries occurred among participating wrestlers during 35 599 athlete-exposures, for an injury rate of 7.25 injuries per 1000 athlete-exposures. The injury rate per 1000 athlete-exposures was higher in college than high school (rate ratio [RR] = 3.11, 95% confidence interval [CI]: 2.66-3.64) and was higher in matches than in practice in high school (RR = 2.12, 95% CI: 1.73-2.59) and college (RR = 5.07, 95% CI: 3.96-6.50). Diagnoses in greater proportions of college wrestlers included lacerations (injury proportion ratio [IPR] = 5.98, 95% CI: 2.27-15.74) and cartilage injuries (IPR = 2.69, 95% CI: 1.26-5.74). Body parts injured in greater proportions of high school wrestlers included elbow (IPR = 3.90, 95% CI: 1.66-9.14) and hand (IPR = 2.59, 95% CI: 1.21-5.54). Almost half of all injured high school (44.9%) and college (42.6%) wrestlers resumed wrestling within <1 week. Skin infections represented 8.5% and 20.9% of all reported high school and college events, respectively, and frequently affected the head/face/neck (50.0%). CONCLUSIONS: Rates and patterns of wrestling injury differ between high school and college and between practice and matches.

Editor's Note: A groundbreaking and valuable study! This is the first nationally representative research to compare US high school and college wrestling injuries. Findings include the facts that the injury rate was 3 times higher in college wrestling, and that the match injury rate was 2 and 5 times higher than the practice rates in high school and college wrestling, respectively. College wrestlers sustained a larger proportion of knee injuries. Yard mentions that it has been hypothesized that a gradual degeneration of knee tissue may be a factor. I would speculate that a higher level of defense in the college wrestlers leads to fighting a takedown attempt for a longer period and may lead to injury. Elbow injuries are higher in high-schoolers. This highlights the need for coaches to teach learning how to fall and also not expose the elbows in a hyperextended manner.

Yard, E. E. & Comstock, R. D. (2007) Dec 7 [Epub ahead of print]. A comparison of pediatric freestyle and Greco-Roman wrestling injuries sustained during a 2006 US national tournament. *Scand J Med Sci Sports*,

Keywords: Elbow/epidemiology/injuries/Knee Injuries/rules

Abstract: The purpose of this study was to compare the epidemiology of freestyle and Greco-Roman wrestling injuries sustained during a 2006 United States (US) national tournament. A prospective injury surveillance study was conducted at the US 2006 ASICS/Vaughan Cadet and Junior National Championships. There were 83 freestyle- and 55 Greco-Roman-related injuries sustained, with the rate of injury per 1000 athlete-matches higher in freestyle (7.0) compared with Greco-Roman (4.6) wrestling [Rate ratio (RR)=1.51, 95% confidence interval (CI): 1.07-2.12]. Compared with Greco-Roman wrestling, there was a greater proportion of knee injuries in freestyle wrestling [injury proportion ratio (IPR)=4.17, 95% CI: 1.30-13.41]. In Greco-Roman wrestling, there were greater proportions of elbow (IPR=9.11, 95% CI: 1.13-73.59) and head/face/neck (IPR=1.72, 95% CI: 1.10-2.67) injuries and a greater proportion of concussions (IPR=1.95, 95% CI: 0.92-4.12), although the latter was statistically insignificant. Greco-Roman wrestlers sustained a greater proportion of injuries from being driven into the mat (IPR=2.97, 95% CI: 1.72-5.14). There were no statistically significant differences in injury outcome by wrestling style. The differing injury rates and patterns of injury between freestyle and Greco-Roman wrestling are likely due to the different rules between these styles that allow lower leg attacks in freestyle wrestling and encourage the use of throws in Greco-Roman wrestling.

Editor's Note: The observation that there is a higher injury rate in freestyle is somewhat clouded by the fact that many of the athletes at the Cadet and Junior Nationals wrestle both styles. Greco-Roman is contested first, followed by freestyle. The overall fatigue from this demanding competition may make the athletes more susceptible to injury during the freestyle competition.

Summary of FILA Advanced School for Coaches Greco-Roman Wrestling 22-25 November 2007- Almaty (KAZ)

Opening of the clinic by Director of the Coaches Department. – Daulet Turlykhanov (World Champion, Asian Champion, World Cup and Olympic Silver Medalist). There were 107 coaches enrolled.



David Curby and Andy Seras were sent by USA Wrestling to attend this clinic. It was very well organized. The following is our summary report. The translations for some lectures were a bit difficult to understand. We have distilled them down to the most salient points.



Rules application in Greco-Roman wrestling. – M Saletnig

It was ironic that in light of the overwhelming dissatisfaction expressed to Mr. Saletnig regarding the new rules, he chose to focus on the fact that coaches were doing a poor job teaching the basic high bridge which is required to perform a correct gut wrench. He warned that roll throughs across the shoulders would be scored 2-2.

Analysis of the evolution of the Greco-Roman wrestling on a statistical basis and through DVD of the 2006-2007 World Championships. – Prof. Dr. Harold Tunneemann (Germany)

More countries are having success-28 countries placed an athlete-this is a positive for the growth of the sport.

Luck vs talent? (coin flip?) – fewer repeat champs.

Very few repeat champs

Have adapted defense to lift – there are fewer lifts

Preparation psychology of the athletes in the combat sports. – A. Radionov (Russia)

Discussed several types of athletes (gambler, killer, slogger) and what is needed by each from his coach.

Know your athletes-What is important to them eg. religion, wife.

Admire your athletes, treat your athletes well, treat them as a hero, touch them, tell them good things.

Solve mistakes in a calm situation, not right after competition. Develop a ritualized warmup that ignites the appropriate level of emotion. Shape and recall the feelings of success

Athlete is too calm-demand a result and create aggression

Athlete is too excited-use common sense reasoning-discuss something technical regarding the upcoming match.

Psychological Training-to maximize physical potential.

Preparedness-peak during competition; maximal mobilization of physical and psychic powers to perform in specific competition.

Psychic Stability-constant readiness, regardless of conditions.

Physical preparation in Greco-roman wrestling – G.Vershinin (Russia)

Patience is needed in physical preparation. There must be no rush to extreme training loads. Praised American physical preparation. General guidelines for training proportions:

Preparatory Period: Physical Preparation 50% Special Preparation 50%

Transitional Period: Physical Preparation 40% Special Preparation 60%

Competition Period: Physical Preparation 10%-20% Special Preparation 80%-90%

Russian Greco-Roman National Team Lifting Standards

(G.Vershinin)

	55 kg	60 kg	66 kg	74 kg	84 kg	96 kg	120 kg
Snatch (1 rep max)	75	80	85	95	100	105	115
Clean (1 rep max)	95	100	110	120	130	145	155
Squat (1 rep max)	100	115	130	150	160	180	200
Pullups (max reps)	40	40	40	35	35	30	30
Kettle bell presses							
24 kg	30	40	50	60	60	70	80
32 kg	12	20	30	40	50	60	70

Training in Greco-Roman wrestling – S. Kazarian

Radically changed preparation in light of the new rules.

↑ explosiveness

↑ special strength and capabilities

↑ psychological pressure (1 day competition)

Use shorter time for attack and counter-attack

Give sparring partner specific tasks

Increase intensity of circuit training

Reduce time of control tests with dummies

Run no more than 3-4 km

8-10 20-30 m sprints

Restoration exercised between bouts

Management of the athletes during the competitions - G. Sapunov (Russia)

New rules pose a tremendous psychological load-potential for 6 matches in a day

(18 x on top & 18 x on bottom)

15 minute recovery

Coach must create a feeling of trust, being friendly and individualized in his approach to each athlete. There should be the development of a feeling that you believe in him and he in you. He can go to you for help.

Weight loss in the process of preparation for major competitions – R Kazakov (Russia)

Emphasized losing fat early in the process. Closer to competition, have tea just before training. Eat some natural, high energy foods like walnuts, raisins, apricots, and honey. Children can cut a maximum of 1 kg! Physical training is much more important for youth.

Objectives of the teams doctor – E. Diezemann MD (Germany)

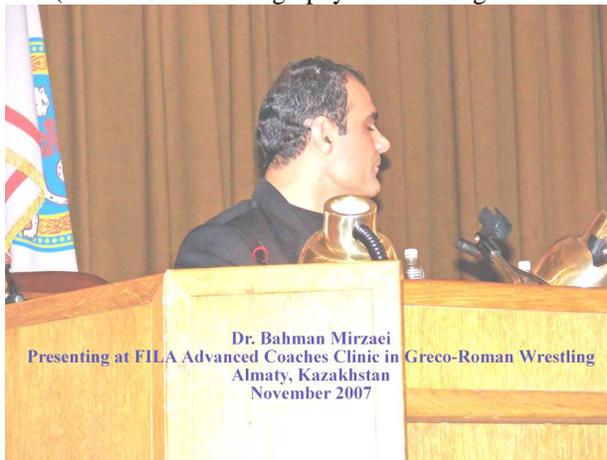
Stressed developmental training in issues which create muscle imbalances-described exercises for the following problem areas: posterior leg, anterior leg, anterior chest, hip (lunge), and shoulder/neck .

Problems and Solutions of Planning and Periodization Strategies in the Physical, Technical, and Tactical Components of Training in Wrestling - Ramazan Savranbaşı, PhD (Turkey)

I have included this excellent paper in its entirety in this review. It has some very practical and sport specific training suggestions for the new structure of international competitions.

Physiological Profile of Elite Junior Iranian Greco-Roman Wrestlers – Bahman Mirzaei (Iran)

(see results in Bibliography of Wrestling Research Section of his review)



Discussion of “New Rules” – G. Sapunov

There was a great deal of dissatisfaction regarding the new rules. Sapunov said it was discrimination against Russian athletes. He likened it to changing soccer rules so that they went against the Brazilians. Must let wrestlers show their skills. Heinz Osterman (coach of the great W. Dietrich) said that the best Greco-Roman wrestling was seen between 1975 and 1985. Sapunov suggested that a draft of new rules should be applied in Junior World competition so that there can be some data for the conference in Beijing.

- Technique Sessions –**
- G. Sapunov**
 - R. Kazakov**
 - N. Davidyan**
 - Y. Melnichenko**
 - A.G. Vershinin**





Advanced School For Coaches Greco-Roman Wrestling
22nd-25th November, 2007– Almaty (KAZ)

PROBLEMS AND SOLUTIONS OF PLANNING AND PERIODISATION STRATEGIES IN THE PHYSICAL, TECHNICAL AND TACTICAL COMPONENTS OF TRAININGS IN WRESTLING

Assist. Prof. Ramazan Savranbaşı (PhD)

Department of Kinesiology and Training Sciences, Celal Bayar University, Manisa-Turkey

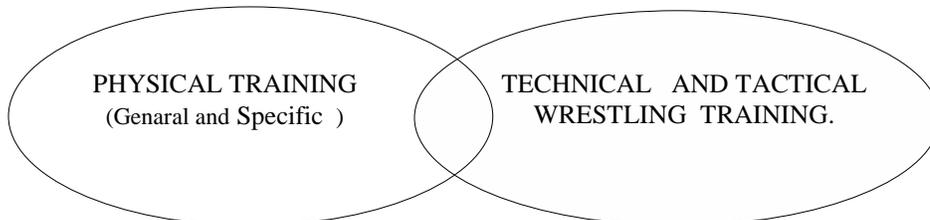
Wrestling has different features and is difficult to classify in a specific sport category. It can be described as an individual, combat, technical, or power sport. Wrestling incorporates groups of many different characteristics, which put extra work on trainers and wrestlers to reach their peak performance.

The modern theory and methodology of wrestling training is based on centuries old fundamental knowledge. Physical, technical and tactical components of training planning are not a novelty; they have been used for centuries. That's why retrospective evaluation of methods of training can not be degraded. On the other hand, when we compare the ancient to today's training programme, differences come from two main areas.. Those are the dramatic progress in sport science and the evolving rules of wrestling.

Within the last 30 years, changes which that took place in wrestling have been related with the fundamental rules of the game. On the other hand, FILA has been restructuring those rules just to make wrestling quicker, more popular and attractive. The changing rules have not only altered the basic structure of the game but also the physical, technical and tactical preparation and periodization of wrestling. The purpose of this presentation is to explain specific mistakes made by trainers and enlighten them about the periodization of training along with the changing rules.

THE STRUCTURE AND CONTENT OF TRAINING IN MODERN WRESTLING

Figure 1.



The structure of training in modern wrestling is presented in Figure 1. As it is shown in the figure, the structure of training is divided into two main components which are directly linking to each other. Physical training constitutes a base for technical and tactical training.

Physical training is versatile due to the characteristics of the wrestling. It has to be considered as one of the most, important ingredients in training required to achieve high performance. Strength, speed, flexibility, and endurance

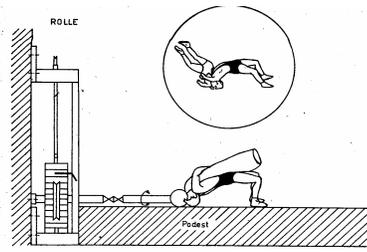


Fig. 3. MILO, Olympic champion in Ancient Greece

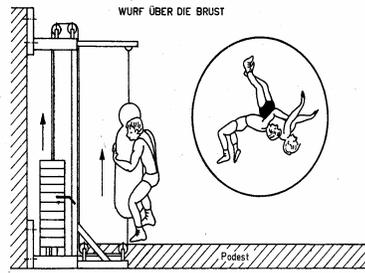
THE ABC OF WRESTLING

training have been part of the physical preparation throughout history. Since strength and strength endurance are vital parts of wrestling; even nowadays, those biomotor abilities attract all attention.

In wrestling, the best way to develop strength is during wrestling itself. If the athlete makes only wrestling training, his strength will also developed. However, this method of training is not enough to accomplish training goals anymore. That's why additional training methods, like resistance training, are being used by trainers. Nowadays, new equipment has been invented specific to wrestling. Other developments in sports science, especially in the area of exercise physiology, nutrition and training theory, give great contribution to strength development in wrestling.



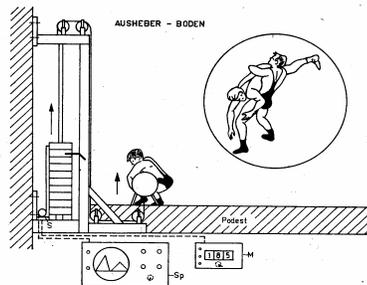
Schema 22 Spezielles Herkulesgerät (Station: Rolle)



Ringen

Walter Gain, Dr. Jürgen Hartmann,
Dr. Harold Tunnemann. 1980

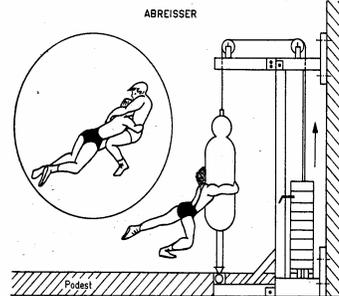
Schema 20
Spezielles Herkules-
gerät (Station: Wurf
über die Brust)



Schema 23
Spezielles Herkulesgerät (Station: Wurf mit umge-
kehrtem Umfassen des Rumpfes)

S - Speedograph
Sp - Speicherszilogroph
M - Maximalwertpeicher

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Schema 21
Spezielles Herkulesgerät
(Station: Abreißer)

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Throughout history, different methods have been used to develop strength in wrestling. In the past, trainers used exercises selected from wrestling to improve strength. Traditional coaches used the exercise selected from wrestling to improve strength. Those coaches objected to resistance exercise with machines.

Long and short distance running are the main focus of the physical preparation phase in order to develop speed and aerobic endurance. On the other hand, the same discrepancy is present as in strength training.

First of all, what do we understand about the technical and tactical concepts of training? These concepts involve the teaching of wrestling technique and improvement of this technique in competition environments. The characteristics of wrestling, which has dozens of holding techniques, make technical and tactical training very fertile. Thus, periodization of those training factors also requires delicate planning.

PERIODIZATION AND ANNUAL PLANNING IN WRESTLING

According the classical approach, planning in wrestling can be annual; and multiannually for 1, 4, 6, and 8 years. In the past, FILA experts (R. Petrov - Bul, A. Novikov - Rus, I. Corneanu - Rom) advised this classical planning and this was applied. The goals of the annual plan are set according to abilities of the wrestler. Without any goals, the achievement of the planning is impossible and knotty.

The second phase of annual planning is to divide the year into functional parts called periods. Periodization consists of a preparation, competition, and transition phases. Yearly planning of the countries and number of those phases are prepared according to the yearly FILA's yearly calendar.

That's why proper periodization depends on two important factors. Which are the aims of the age groups (cadet, junior, senior) and FILA's competition calendar. At the present time, periodization options are arranged from 1 to 4. These options could change according to FILA's competition calendar and coach's and athlete's wishes.

The third step is the division of each period (preparation, competition, and transition) into physical, technical and tactical training components. Then those components are placed into a weekly programme as days, hours, kg, etc. It constitutes the core of the periodization strategy. The coach displays his knowledge and ability in this crucial stage.

ORGANIZATION OF THE PERIODS' CONTENT AND SCOPE

The content of periods (preparation, competition, and transition) should be arranged according to their specificity. The level of the wrestlers is determinative for the scope of the periods. These two main principles taken into account, and evaluating the level of the wrestler from physical, technical, and tactical perspectives, and according to the training goals, weekly training days, hours, and methods are installed. All these should be based on the physiological fundamentals of wrestling. On the other hand, the natural characteristics of wrestling should not be ignored. Technical and tactical and physiological bases of the up to date wrestling rules should be correctly perceived.

PREPARATION PERIOD

In modern wrestling training, physical, technical, and tactical components are indispensable parts of the preparation and competition periods. The main objectives of the preparation phase are to increase the athlete's physiological potential and to develop biomotor abilities (strength, endurance, speed and flexibility) to the highest standards with exercise involving no wrestling. Physical training that has the major part in the preparation period could be quantified easily in terms of intensity and volume, which would allow evaluating progress, thus minimizing mistakes. The main question is to determine the ratio of physical training to the technical and tactical one. No doubt the fundamental characteristic of the preparation period is the higher part of the former.

During the preparation or competition periods, the ratio of physical and technical or tactical training depends on the athlete's age group (cadet, junior, and senior) and level.

Strength, speed, endurance and flexibility are the main parts of the physical training during the preparation period. General (70%) and specific (30%) exercises should be based on the nature of the wrestling.

Strength training, which is the most basic part of the physical preparation, takes the main part of the weekly programming. Generally strength goes along with wrestling. It should be repeated three times in a weekly programme, every other day. One should be very careful while preferring the maximal strength and strength endurance training in wrestling. Weight categories are a handicap in wrestling. Excessive hypertrophy increases the body mass of the wrestler needlessly and effects joint mobility negatively. That's why strength training intensity in wrestling should be arranged somewhere between submaximal and maximal loads, preferring low repetition numbers.

For the cadet and junior, prospective increase of the biomotor abilities is the main purpose of the physical training during preparation phase. This type of training is the main part of the preparation phase. Also, methods and equipments of age groups' strength training are different than that of seniors. Volume and intensity of training should be chosen properly in order to avoid any detrimental affect to their anatomic development. Early and heavy loads could be more harmful than beneficial. Unfortunately, some ambitious trainers and wrestlers eager to win sooner make those types of training mistakes.

Another most common mistake in the preparation period is to use the senior's technical and tactical training models in detriment of the physical training for juniors in order to reach early success. On the other hand, this type of success is not long lasting.

COMPETITION PERIOD

Efficiency of the competition period depends on the quality of the preparation period. All the physical, technical and tactical defects of the previous year should be corrected. The biomotor abilities that are developed throughout the preparation period should be combined with technical and tactical wrestling training. On the other hand, biomotor

abilities which are developed during the preparation period should be preserved too. Otherwise they are easily lost. In order to preserve developed biomotor abilities; they should be repeated at least twice weekly. Some trainers overemphasize technical and tactical training and neglect strength, strength endurance and speed training during the competition period. This type of attitude especially hinders the prospective development of young wrestlers.

The strength that has been developed during the preparation period should be preserved by training twice a week during the competition period. But some conservative trainers avoid strength training throughout the competition period. Maintaining strength requires a lower volume of training compared with endurance training. Nowadays, explosive strength plays an important role during the hold up techniques.

Without a doubt, training in the competition period prepares the wrestler to the physical, technical, tactical and psychological conditions of the competition. That's why the volume of technical and tactical training is higher than physical training. There are different types of the technical and tactical trainings. These are competition model wrestling training, control competitions, technical-tactical models, technical-tactical holds and combination trainings. Especially, competition model wrestling and combination type of training should take a part in the weekly program three times a week as morning and afternoon trainings. Unfortunately, compared to the physical training, the quantification of intensity (kg/min/sec) of the technical and tactical training are relative and difficult to measure. But, heart rate monitoring and blood lactate measurements are important scientific parameters to help control and developed training. On the other hand, without a doubt experience, observation and intuition of the trainer play an important role in the control of the training.

TRAINING APPROACHES IN CONTEMPORARY WRESTLING

The radical rule changes in recent years plays a determining role in shaping the characteristics and dimensions of wrestling, which has its impact in training contents too. Adaptation of the athletes and trainers comes naturally. The training reflects the new approaches. As a result, a new generation of more athletic and powerful wrestlers, has emerged. On the other hand, technical and tactical repertoire has been diminished. Only a limited number of techniques are presented in competition. Because of the drawing of lots, chance became a determining factor for the success of wrestlers with similar capacities. This factor can not be improved by preparation or training, whereas strength or technical elements of wrestling could be improved by carefully planned training periods. Because of the drawing of lots especially in Greco-Roman wrestling, medalist athletes have been changing continuously. Today's medal winner wrestler could be eliminated in the next year. The World championship medalists in the Greco-Roman style for the last two years are presented in Table 1. The table can be analyzed from different perspectives. Of course rules are the same for the all wrestlers, but, the chance factor may not be the same for all of them!

Table 1.

World Championship Greco-Roman Seniors 2006 Guangzhou (CHN)				
World Championship Greco-Roman Seniors 2007 Baku (AZE)				
Weight	Gold	Silver	Bronze	Year
55 kg	Soryan Reihanpour Hamid (IRN)	Bayramov Rovshan (AZE)	Durlacher L (USA) / Park Eun C (KOR)	2006
	Soryan Reihanpour Hamid (IRN)	Park Eun Chul (KOR)	Mankiev N / Fris K (SCG)	2007
60 kg	Warren Joseph (USA)	Bedinadze David (GEO)	Emik B (TUR) / Djaste V (RUS)	2006
	Bedinadze David (GEO)	Sasamoto Makato (JPN)	Jung JH (KOR) / Diaconu E (ROM)	2007
66 kg	Li Yanyan (CHN)	Bagaliev Kanatbek (KGZ)	Kovalenko S (RUS) / Lester JH (USA)	2006
	Mansurov Farid (AZE)	Guenot Steve (FRA)	Gergov N (BUL) / Lester JH (USA)	2007
74 kg	Shatskikh Vladimir (UKR)	Yli-Hannuksela Marko (FIN)	Madsen OM (NOR) / Kvirkevelia M (GEO)	2006
	Yanakiyev Yavor (BUL)	Madsen Overgaard Mark (NOR)	Guenot C (FRA) / Venckaitis (EST)	2007
84 kg	Abd El Fatah Mohamad (EGY)	Avluca Nazmi (TUR)	Mishin A (RUS) / Tahmasabi HS (IRN)	2006
	Mishin Alexej (RUS)	Vering Bradley (USA)	Khasaia B (GEO) / Tahmasabi HS (IRN)	2007
96 kg	Nabi Heiki (EST)	Svec Marek (CZE)	Dinchev K (BUL) / Yerlikaya H (TUR)	2006
	Nozadze Ramaz (GEO)	Ezerskis Mindaugas (LTU)	Svec Marek (CZE) / Rezaei G (IRN)	2007
120 kg	Baroev Khassan (RUS)	Lopez Nunez Mijain (CUB)	Guzel İ (TUR) / Artyoukin S (BLR)	2006
	Lopez Nunez Mijain (CUB)	Baroev Khassan (RUS)	Beyers DD (USA) / Patrikeev Y (ARM)	2007

The main changes in wrestling rules in the recent years can be given as follows:

- Number and weights of categories
- Pairing and elimination system (for repechage and bronze medal matches)
- Competition programme (single day tournament)
- Duration of competition $(2 \times 2) + 2 = 6$ min
- The recovery period between two competitions (minimum 15 min)
- Objection during competition (from monitoring)
- No injury time restriction
- Passivity
- If first minute of a period passes without points, coin toss and ordered hold (reverse waistlock) for maximum 30 sec.
- Scoring of the techniques. Giving point to mat desertion
- Definition of winning according to periods.
- Changes in wrestling apparel (tight and closed trunks, no-lace shoes)

All the abovementioned rule changes results in radical changes in wrestling. On the other hand rule changes given below directly affected physical, technical and tactical training:

- Duration of competition $[1 \text{ min} + (30 \text{ sec} + 30 \text{ sec})] + [1 \text{ min} + (30 \text{ sec} + 30 \text{ sec})] + [1 \text{ min} + (30 \text{ sec} + 30 \text{ sec})] = 6$ min
- Competition programme (single day tournament)
- If first minute of a period passes without points, coin toss and ordered hold (reverse waistlock) for maximum 30 sec.
- The recovery period between two competitions (minimum 15 min)

The abovementioned rule changes prominences the importance of strength in wrestling, which is the determining factor of performance. Other elements that prominences are **gut wrench**, **reverse waistlock**, and **souplé**. Those are the techniques using large muscle mass and require a high level of strength.

That technical-tactical picture constitutes the fundamentals of wrestling. Trainings depend on these two bases. On the other hand, some trainers emphasize strength training and others rely more on the technical and tactical elements of the game, not being able to reach the optimum ratio. If strength training is exaggerated, that would effect technical and tactical elements of the wrestling negatively. Both parameters should be considered together and have no superiority. Both parameters should be placed appropriately during the macro and micro cycles of the preparation and competition periods.

Table 2

100 m Running Men (9,87 sec)	1.Day	12:10	Heats
8 hours rest before the quarter-final	1.Day	20:15	Quarter-Final
	2.Day	20:10	Semi-Final
	3.Day		Rest
26 hours rest before the final	4.Day	22:20	Final
800 m Running Men	1.Day	19:40	Heats
24 hours rest before the semi-final	2.Day	20:05	Semi-Final
	3.Day		Rest
24 hours rest before the final	4.Day	19:55	Final
1500 m Running Men (3:34,77 min)	1.Day	11:25	Heats
	2.Day		Rest
33 hours rest before the semi-final	3.Day	20:40	Semi-Final
	4.Day		Rest
25 hours rest before the final	5.Day	22:05	Final

Because of the rule of the single day tournament, a wrestler who is heading for the gold should have 4-5 consecutive matches during the morning session and a final match during the afternoon session. Other way around, if the wrestler

loses the match during first round of elimination, he may have 3-4 matches during the afternoon session of repechage for bronze medal. Because of the call-up rule, the wrestler will play the next match in 15 minutes. The athlete, who is heading for the final, would be wrestling for a total of 20-30 min. During the World Championship in Athletics in Osaka, 2007 (Table 2) athletes who participated in the 1500m race ran a total of 10-11 min in 3 days, with 24 hours of recovery period. These indicators explain the high performance demands of wrestling. That's why if the wrestler is supposed to make 5-6 matches a day, he should be trained accordingly.

The rules of competition program should be applied to training. Competition model wrestling training and control competitions which are the fundamental trainings and strategy of the competition period should take place in the programme three times a week, every other day as day and afternoon trainings. The day and timing of the training should be arranged according to the competition.

Control competitions loads can be planned as follows:

Model 1:

[1 min + (30 sec + 30 sec)] x 3 = 6 min x 3 times in morning training (pause: 30 min for each 6 min combats or according to the wrestler's levels

[1 min + (30 sec + 30 sec)] x 3 = 6 min x 3 times in afternoon training (pause: 30 min for each 6 min combats or according to the wrestler's levels (43)

Model 2:

[1 min + (30 sec + 30 sec)] x 3 = 6 min x 4 times in morning training (pause: 30 min for each 6 min combats or according to the wrestler's levels

[1 min + (30 sec + 30 sec)] x 3 = 6 min x 2 times in afternoon training (pause: 30 min for each 6 min combats or according to the wrestler's levels (44)

Model 3:

[1 min + (30 sec + 30 sec)] x 3 = 6 min x 5 times in morning training (pause: 30 min for each 6 min combats or according to the wrestler's levels

[1 min + (30 sec + 30 sec)] x 3 = 6 min x 1 time in afternoon training.

Each of the 30 min rests should be diminished to 15 min rests eventually.

The general content of the preparation and competition periods are similar, differences arise from the volume, intensity and frequency of the training. Some trainers use only technical and tactical training during the competition period that results with the wrestler losing the strength that had been developed during the preparation period. In the theory of training there is a saying that "if you don't use it, you will lose it!" The same saying could be used for trainers who do not spend enough time for technical and tactical training during the preparation period. As a conclusion, in order to develop a biomotor or technical-tactical ability, one should practice three times a week. If the objective is to maintain what has been acquired, two times a week is an appropriate frequency.

WHAT TRAITS ARE NECESSARY TO BECOME A GREAT GRECO-ROMAN WRESTLER? (DAVID CURBY EdD)

Developing a National Greco Roman Testing Program

In January, 2007, at the Olympic Training Center in Colorado Springs, I conducted a meeting with Steve Fraser, Momir Petkovic, Anatoly Petrosyan, Ike Anderson, Ivan Ivanov, Dr. William Sands (Director of the Athlete Recovery Center, Sport Biomechanist, and Senior Physiologist at the US Olympic Committee.), Alan Ashley-Team Leader, Acrobatic & Combat Sportfolio Performance Services and Mike Favre-USOC Strength & Conditioning for Wrestling. Our topic was the development and implementation of a testing/monitoring program for our elite GR wrestlers. I had been conducting some physiological testing of the Greco-Roman wrestlers at the USOEC in Marquette, Michigan and wanted to discuss a possible expansion of testing throughout USA Wrestling.

Why Test? The results of a standardized testing program can have help to:

- Identify the Strengths and Weaknesses of an Individual or Team
- Develop Athlete Profiles
- Isolate Specific Needs
- Monitor Development of the Athlete
- Compare to Norms
- Check Effectiveness of a Training Regimen
- Check Status of Rehabilitation
- Identify Readiness for Competition
- Identify Overtraining
- Aid in the Selection of Athletes
- Provide Motivation

Dr. Sands suggested that as a first step we gather some information by surveying our top coaches and asking for the traits that they feel are needed to reach the top in modern Greco-Roman wrestling. We could then begin to match, or develop tests, to assess these important traits and abilities.

I contacted some of our leading Greco-Roman coaches, to define the needs/traits/characteristics/attributes of a great GR wrestler, within the current rules. What makes a great wrestler in the decisive moment? I asked them to list their thoughts, between 10-20 characteristics. They could prioritize in some manner if they desired. I explained that the list can include specific physical, psychological, technical, and tactical abilities.

While I am still working on refining my test battery, I felt that the responses received were very interesting in their own right, and would like to share them. Young wrestlers are an important target audience for this article. It is interesting to note the strong commonalities shared in the responses, as well as the different insights offered by these experts. Note how often we see the word “love” mentioned. That these coaches know their business, I only have to point out the USA Team Championship in the 2007 World Championships. I want to extend a sincere thanks to them for sharing their thoughts and their time.

Steve Fraser
National Greco-Roman Head Coach
Olympic Champion

What makes a great Greco-Roman Wrestler? Here is my top 20:

1. Strong mental toughness
2. Great work ethic
3. Open minded to learning
4. Strong physically
5. Flexible
6. Fast with explosive power
7. Smart
8. Outstanding Cardio-vascular conditioning
9. Resilient both physically & mentally
10. Strong technique
11. Strong tactical skills
12. Willingness to travel and seek out good training partners
13. Strong nerve, brave
14. Healthy physically and mentally
15. Willing to overcome set backs and short term failure
16. Proper/healthy lifestyle
17. Strong will
18. Loves wrestling
19. Loves winning
20. Coach-able



* * * * *

Momir Petkovic
Assistant National Greco-Roman Coach
Olympic Champion



Physical: strong and explosive legs, very strong lower back - same with the rib cage/torso. FLEXIBLE AND ABLE TO RECOVER IN A SHORT TIME ! Endurance in the same way-able to sprint and recover fast.

Psychological: alert and ready to react any time, hungry to win, loves and enjoys every moment, to believe all the way, to the last second - showing no emotions in good or bad situations during the match – THE FOCUS MUST BE THE SAME. No tenseness or panic ever. Relaxed and ready to rule.

Technical: execution must be "INSTINCTIVE" no time to think - reaction is stronger and faster than opponent's - using every muscle at the same time during execution - from basic technique to adopting for himself techniques that are the best for him, the way he thinks, reacts, breathes, moves....

Tactical: ADAPT TO THE CIRCUMSTANCE - always dance your dance - all the time keeping him out of his comfort zone - if you sense that he is uncomfortable in some position you MUST FORCE HIM TO BE THERE ALL THE TIME !!

BEFORE ALL OF THESE, HE MUST BE IN DEEP LOVE WITH THE SPORT !!

* * * * *

Anatoly Petrosyan
USA Wrestling Greco-Roman Resident Coach

New Rules-less techniques are seen on the feet - there is not enough time to prepare and setup

*Very, very physically strong - specific strength-arm, grip, fingers. Grip/fingers must be very strong.

control arm and wrist-wear out and get him tired constantly hang on his arm and shoulder should be completely safe on feet-solid defense

As soon as there is control – go to the attack
2 on 1 is primary -100% control-arm drag-wrap around no underhook-too much risk

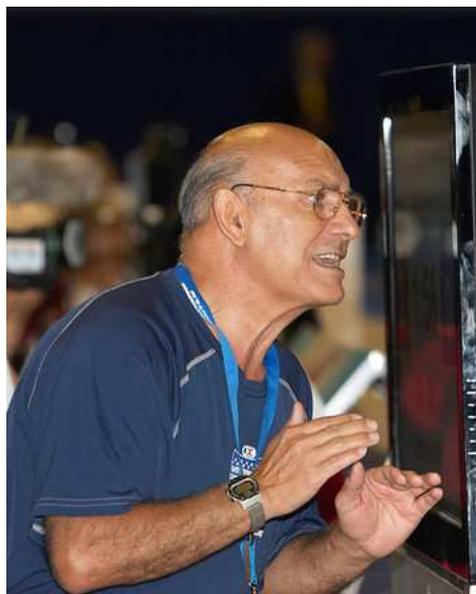
if a ferocious attack is conducted in 1st period, in the 2nd your opponent will be more open

Use special exercises-elastic bands, pull-ups, rope climb

Get opponent uncomfortable
Grasp wrist-he pulls-there is opening for attack
Get him uncomfortable-he is distracted-pushout

Par terre is obviously a huge emphasis-1 hour at a time!
Gut or lift
Get the lock-keep the lock
Must master 1 lock-no time to change lock

Confident in attacking in position
Have a plan to get to your position-transition-technique



2 on 1 is very important-if he pulls back, go to high dive
No space-be on man like glue

Must possess special strength in shoulder and rib cage in order to defend gut wrench.

* * * * *

Ike Anderson
USA Wrestling Greco-Roman Developmental Coach
Olympian



Here is what makes a great G-R Wrestler:

1. Back Step Skill
2. Bridging Skill
3. Pummeling Skill
4. Changing Level
5. Movement on the Feet
6. Movement on the Bottom
7. Low Body fat %
8. Lower Back Strength
9. Leg Strength
10. Flexibility
11. Core Strength
12. Throwing Strength
13. Balance
14. Muscular Endurance
15. Explosive Power
16. Speed
17. Quickness
18. Shoulder Strength
19. Anaerobic Power
20. Focus
21. Toughness
22. Willpower

* * * * *

Ivan Ivanov
Head Coach of the USOEC Greco-Roman Resident
Program in Marquette, Michigan. Gold level coach.
World Silver Medalist

The modern Greco Roman Wrestler needs:

- 1) Great sport specific technical & physical preparation.
- 2) Good strategies and the ability to out-smart his opponent and to manage the referee as well.
- 3) To have fun and have the desire to be on the world mat and not feel fear from opponents, referees, foreign coaches, audience, etc.

The rest of it is to have a good coach and some good luck.





Jim Gruenwald
USOEC Assistant Coach
2x Olympian

Great Athlete:

- Strong
- Quick
- Explosive
- Flexible
-
- Great Balance
- Super aerobic capacity
- Super anaerobic delivery system

Great Athletic mind:

- Technically perfect performing his go to moves (has the drive/motivation for high volume training).
- Superb grasp of tactical dynamics relating to his match (must be a student of wrestling).

Personality Traits:

- Stubborn
- Cold-blooded
- High self-esteem
- Driven

* * * * *

Jay Antonelli
Major USMC

Served as a World Team Coach for the historic 2007 U.S. World Team that won the World Team Title in Baku, Azerbaijan. Antonelli has been selected to serve as a U.S. Olympic Team Coach for Greco-Roman at the 2008 Olympics in Beijing, China, along with Rich Estrella and Steve Fraser.



To make a great GR wrestler within the current rules, I feel you need to: (in no particular order)

- Be explosive in the execution of your technique.
- Be good at getting a good lock and anticipating the whistle while starting in parterre.
- Be able to control the center of the mat.
- Have a "go-to" takedown from your feet with several options off of it.
- Have solid parterre defense with the ability to anticipate your opponent's next move.
- Be able to escape from the bottom when needed.
- Have the physical capabilities, and "lung-power" to go hard on your feet to wear down your opponent to render his parterre offense a non-factor.
- Be able to work in and control the zone on the feet and in parterre.
- Have a strong lower back to execute lifts from parterre.
- Focus on developing your core muscles to improve parterre defense.
- Be "light" on your feet.
- Have a good control tie and be able to switch off to other control ties on the feet.
- Have good balance.

- Have a strong grip.
- Have the mental toughness to grind it out and overcome adversity when needed.
- Have a good coach.
- Be able to move your opponents lock in the parterre and put pressure on it.
- Have a throw from your feet.
- Be able to get your lock in the parterre.
- Be flexible.
- Have strong legs and hips.
- Enjoy the fight.

* * * * *

Dan Chandler

State GR Coach for Minnesota and Minnesota Storm

Coach of the 2000 US Olympic Team.

3 x Olympian and 12 x National Champion.



- Tough-physically and mentally
- Sound mind and body
- Great conditioning both cardiovascular endurance and muscular endurance
- Teachable
- Humble
- Powerful
- Technical Proficiency
- Awareness of self, i.e. “what should I train through and what should I rest/rehab through?”
- Focused
- Must have an ability to adapt to circumstances

A top recruit with several years of training with our National Coaches should have what is needed at the moment. He must be properly trained technically, tactically, mentally and physically.

* * * * *

Rich Estrella

20 years as head coach of the U.S. Air Force team. World Team Coach 2005 and 2007. Estrella has been selected to serve as a U.S. Olympic Team Coach for Greco-Roman at the 2008 Olympics in Beijing, China, along with Jay Antonelli and Steve Fraser.



- Willingness to believe
- Willingness to commit
- Strong belief in one’s self
- There must be a belief in working within the system and the systematic program which has been developed.
- The wrestler must be smart enough to make changes, relocate, or change

the environment.

- The wrestler must be able to harness his emotions and channel these emotions in a positive direction.

* * * * *

Andrew Seras

Olympic Coach for the 2004 U.S. Olympic Greco-Roman team. Head coach of the 2002 World Team. Member of the 1988 U.S. Olympic Team. Won Gold medal at the 1994 World Cup.



- confident- believe you are the best
- high “wrestling IQ”
- physically strong (it comes in handy in a match)
- ability to score points from the feet
- ability to totally focus for whole match
- ability to overcome adversity (bad call, getting behind in a match, being a little sick...)
- great pummeling skills
- great cardiovascular shape
- Par terre defense expert
- great fighting spirit (never gives in)

* * * * *



Craig Horswill, PhD

**Senior Research Scientist
Gatorade Sports Science**

(Generally acknowledged to be one of the world’s foremost experts on the physiology of wrestling)

To me, the key element leading scoring in GR is having the ability to elevate the opponent's hips, basically getting his center of gravity above your own.

How is that accomplished? By having...

1. the speed to get your hips in and under, and having the power and speed to execute the lift.
2. the positioning and using the set ups to get your hips in position.
3. the muscular endurance to wear the opponent down to be able to execute points 1 or 2 above.

I think the three are in order of priority or selection. If you don't have the speed and rare power, you'll need to rely on no. 2 or 3.

Factors that influence the 3 points above:

*stature (height) of the wrestler, which determines where his center of gravity is located (also somatotype).

- *hip lifting power.
- *speed to lower his level and raise his hip level with a resistance (opponent's body)
- *tactical sense of position; balance.

Lesser but still important:

- *upper body endurance
- *back and neck strength

I'm focusing on the physical and physiological. Psychological attributes are also important. I would say that how a wrestler reacts to psychological stress or competition is a key mental factor. In other words what happens to his state anxiety and competitiveness in the face of stressful competition?



**USA WRESTLING
2007 WORLD GRECO-ROMAN CHAMPIONS!**



New American College of Sports Medicine Interest Group Formed

COMBATIVE SPORTS

Early in 2007, David Curby and Craig Horswill made an application to the ACSM for the formation of an Interest Group for Amateur Wrestling. As the largest sports medicine and exercise science organization in the world, ACSM has more than 20,000 International, National, and Regional Chapter members. The committee did not accept such a "narrow, sport specific group." However, they did successfully compromise with the broader – Combative Sports Interest Group. The focus is the health, safety and performance of athletes involved in combative sports: Salient issues will be the weight control plans used in these weight class sports, dermatological concerns, issues dealing with the advent of women's participation, and maximization of performance.

The **COMBATIVE SPORTS INTEREST GROUP** will provide a forum for the discussion and dissemination of the relevant sport science research as it pertains to the health, safety and performance of athletes participating in combative sports. These sports include the Olympic combative sports of boxing, fencing, judo, taekwondo, and wrestling, as well as other martial arts competitions.

As co-chairs, Curby and Horswill held their first meeting at the ACSM's Annual Meeting in 2007, in New Orleans, Louisiana. It was agreed that we should strive to have a session at the 2008 Annual Meeting. There was a long discussion as to the session type. It was agreed that that Curby would submit a proposal for a Tutorial Lecture on the medical risks of combative sports. Tutorial lectures provide a critical review and analysis of the current state of knowledge in a field. The lecture should familiarize attendees with the basics of a subject and progress to current issues, question, problems, and the frontier of knowledge. We were successful in having a proposal accepted for the 2008 Annual Meeting in Indianapolis, under the topical category of Epidemiology, Biostatistics & Health Promotion (epidemiology of injury and illness).

**The Combative Sports Interest Group meeting is scheduled for Thursday, May 29th
5:45 - 7:15 pm in the Indiana Convention Center, Room 206.**

The tutorial lecture: *From the Olympic Games to Mixed Martial Arts Fighting: What Are the Medical Risks Associated with Combative Sports?* It will be presented on Saturday, May 31st from 8:00 am to 8:50. Session Number: G-01 Location: Wabash 1
Speaker: Randall Wroble, MD, FACSM

This Tutorial Lecture will describe the medical risks of combative sports, beginning with the traditional Olympic combative sports of wrestling, boxing, judo, and taekwondo and continuing into the increasingly popular, but controversial, mixed martial arts fighting competitions. In addition to a description of injuries associated with these sports, the will also identify the major health issues that are "hot topics" encountered in these disciplines of combative sports. These include weight loss, gender considerations, brutality and the rules (both current and recommended) associated with injury prevention. There is a need to bring together the people who have worked within these similar sports, so as to share their common challenges to the sports

medicine community. It is also important that discussions like this will provide some professional guidance in the conduct of the newer fighting forms, as well as provide a springboard into an empirical analysis of the actual medical risks.



Dr. Randall Wroble is an Orthopaedic Surgeon at SportsMedicine Grant & Orthopaedic Associates in Columbus, Ohio and is on staff at Grant Medical Center. Dr Wroble's education has included: BA, Cornell University, Ithaca NY, 1975; MS in Chemistry, University of Colorado, Boulder CO, 1977; MD, University of Illinois, Chicago IL, 1982; Orthopaedic Residency, University of Iowa, 1982-1987; Clinical/Research Fellowship, Cincinnati Sportsmedicine/University of Cincinnati Biomechanics Lab 1988; American Board of Orthopaedic Surgeons Certification, 1990. Dr Wroble is a fellow of the American College of Sportsmedicine and a member of the American Orthopaedic Society for Sports Medicine, Arthroscopy Association of North America, and American Academy of Orthopaedic Surgeons.

Dr. Wroble has been Medical Coordinator for the Ohio State High School Wrestling Championships since 1990. He has been wrestling team physician at University of Iowa, Miami University, and Ohio University as well as for multiple high schools. He has been on the medical staff of 7 NCAA Championships. He has covered US Olympic Wrestling trials, Junior Olympics, Junior Nationals, World Cup of Wrestling, Junior World Wrestling Championships, and Senior World Championships. He has presented numerous lectures and courses on the medical aspects of wrestling. He has published over 10 papers and has written 6 book chapters on wrestling. Dr. Wroble currently serves as team physician for the Columbus Blue Jackets, Ohio University, Grove City High School, and Olentangy Liberty High School. He has worked on the medical staff of USA Wrestling and US Soccer Federation. Dr. Wroble serves the Columbus Medical Association as chair of the Sports Medicine Committee, 1992 to present; and CMA Board of Directors. Dr. Wroble serves on the Ohio State Medical Association/Ohio High School Athletic Association Joint Sports Medicine Committee, 1991 to present, currently as chair. He also serves on the OATA Physician Advisory Group. Dr. Wroble was on the Editorial Board for *Physician and Sportsmedicine* and is a reviewer for *American Journal of Sports Medicine*.



David Curby Ed.D graduated in from the University of Michigan in 1975 in Physical Education where he was Big Ten Champion and runner-up in the National Open. He is a USA Wrestling Gold Certified Coach and has worked extensively with coaching education. Dave has published research on physical self-perception, adolescent power production, testing of elite wrestlers and energy expenditure in wrestling. For the past five years, he has worked with the Greco-roman wrestlers at the US Olympic Education Center in the development of a test battery to monitor their physical development. Dave currently serves on the Sport Science Committee for USA Wrestling. He is currently the lead teacher for physical education at Niles North High School in Skokie, IL.

Dr. Craig A. Horswill, is a Senior Research Fellow at the Gatorade Sports Science Institute (GSSI) in Barrington, Illinois. Prior to joining Quaker in 1994, Dr. Horswill spent six years as a research scientist in the Division of Nutrition and Endocrinology, Department of Pediatrics, The Ohio State University and Columbus Children's Hospital, conducting research on carbohydrate and protein metabolism in children. He also spent two years on the faculty in the Human Performance Lab at Ball State University. Most of his research there involved studying the effects of diet manipulation and weight loss on high-intensity performance. While an undergraduate at Wisconsin, Dr. Horswill competed on the varsity wrestling team. As a doctoral student at the University of Illinois, he served as head wrestling coach at Champaign Central High from 1979 to 1983.

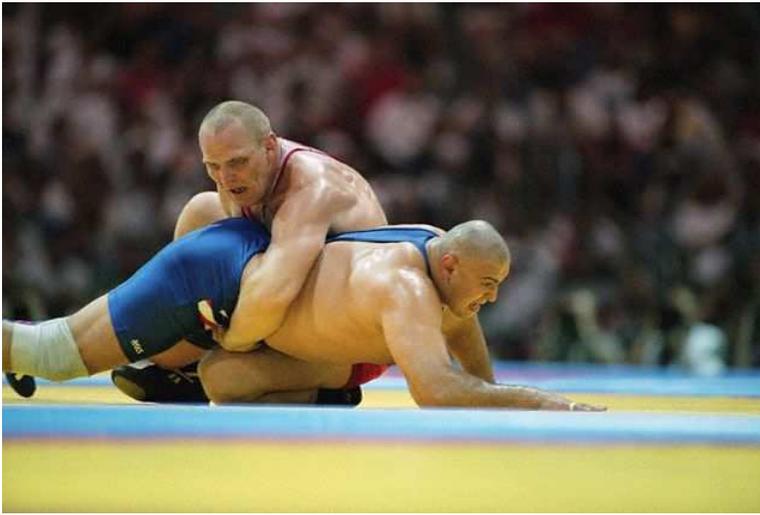


If you want to become involved, or you desire more information, contact Curby at:

davcurb@gmail.com

THE REVERSE LIFT – FROM ANCIENT GREECE TO THE PRESENT

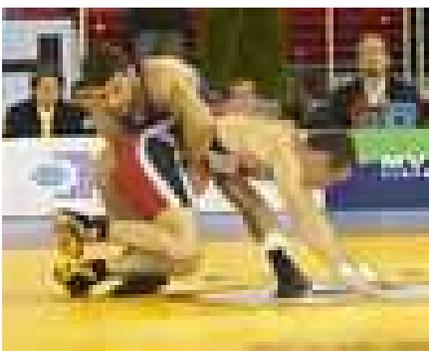
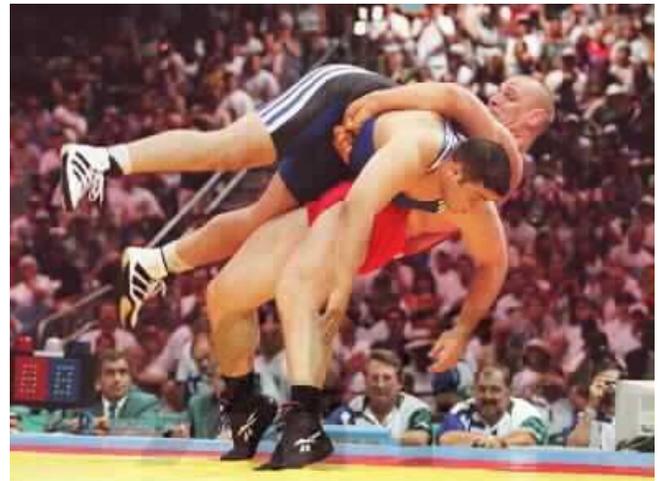
David Curby EDD



During the 80's and 90's, the Greco-roman wrestler Alexander Karelin thrilled the wrestling world, and terrorized opponents, with his execution of a throw from the reverse lift. This was done from the "par terre" position and usually began with defensive wrestler flat on the mat. A reverse lock was obtained across the back and around the waist. The attacking wrestler would maneuver himself to his feet while maintaining this grip and throw the then vulnerable wrestler to his back. The 3-time

Olympic Champion was all the more impressive as he performed this move while lifting wrestlers weighing 140 kg. He was so powerful in executing his signature technique that some opponents would choose to turn towards their backs rather than allowing themselves to be lifted from the mat and then launched, head first towards their back.

In 2005, in an effort to stimulate scoring and add more excitement to Greco-roman wrestling, FILA (Fédération Internationale des Luttes Associées-the international federation that governs the sport of wrestling), adopted radically new rules, whereby each wrestler would be given the reverse



lift lock with his opponent already on their hands and knees. This has resulted in many more spectacular reverse lift throws in competition. There have been some problems and dissatisfaction with the implementation of these new rules. These include the diminution of the importance of wrestling on the feet, and problems with actually getting into this vulnerable starting position-false starts and inconsistencies

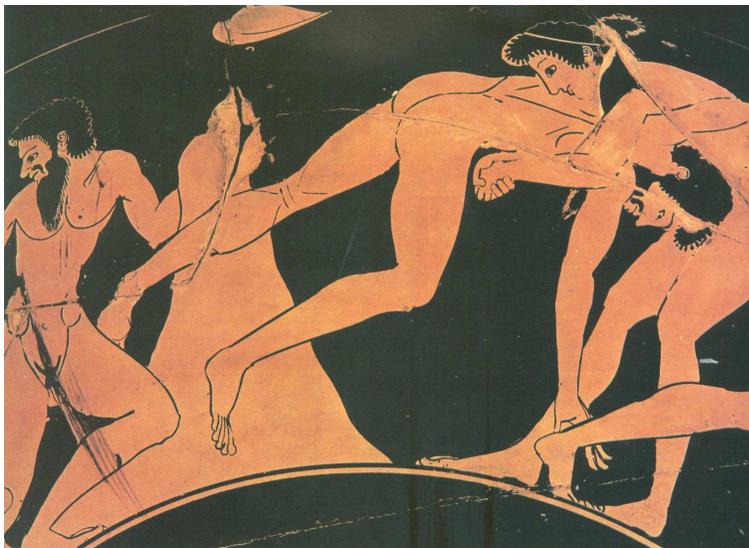
among the officials of when the starting whistle is blown.

These problems are not the topic of this paper, but rather with this seemingly new explosion and application of this "modern" technique, I have come face to face with the old axiom that there is nothing really new in this "oldest sport" of wrestling. Where can we find extensive use of this

modern technique? We find it in the rich wrestling heritage of the Ancient Greeks, over 2,500 years ago!

The Ancient Greeks held wrestling in high regard and used it as an integral part of their mythology, education, along with being a featured element of their Olympic Games. The Greeks distinguished between two forms of wrestling, “upright” wrestling where the objective was to cleanly throw your opponent to the ground, and ground wrestling, in which the struggle continued until one of the athletes acknowledged defeat. Upright, or standing wrestling, was the form included in competitions and the final event in the pentathlon. Gardiner (1955) sums up the rules as follows: 1) If a wrestler was made to fall on any part of the body, hip, back or shoulder, it was a fair fall (going to a knee probably was not included, as it was part of offensive techniques such as the “flying mare,” or arm throw). 2) If both wrestlers fell to the ground, nothing was counted. 3) Three falls were necessary to secure victory. 4) Tripping was allowed. 5) Leg holds, while allowed, were typically not used.

We have abundant examples of the techniques employed through sculpted works and paintings on vases. One hold that is prominent is that what Gardiner calls “the heave.” It is the reverse lift lock used in today’s Greco-Roman competition, but it is surprisingly applied from the feet.



The wrestler on the right turns his opponent over (London, British Museum).



The last stage of the hold called *anabastasai eis hypsos* (hold on thigh). The defeated wrestler falls on his head. (Florence, Museo Archeologico)



The beginning of the hold. The wrestler on the left is gripping his opponent by the waist, and is preparing to turn him over and throw him onto his head. This is from a vase depicting sports training. He is awaiting the command from the instructor. (Boston, Museum of Fine Arts).

Theseus battling Cercyon-Metope of the Theseum, Athens, about 440 B.C



USA World Team Trials 2006

Many questions remain to be discussed. What were the techniques and circumstances that preceded getting this unusual lock from the standing position? Was going to a knee, as depicted on

the vase from Florence, the sportsmanlike tradition to protect the defensive man from injury? Could one not grab the legs of the wrestler executing this hold as a defensive counter? Is there a wrestling rules manual from Ancient Greece out there waiting to be discovered? Of course we are discussing a span of time of almost 1,000 years. The evolution of rules in the modern times is difficult enough to follow. Will the reverse lift clinch be a fundamental aspect of the rules following the Beijing Games? Stand by as history unfolds.

REFERENCES

Gardiner, E. Norman *Athletics in the Ancient World* Oxford University Press, London, 1930

Christopoulos, G.A. (Ed) *The Olympic Games* Ekdotike Athenon, S.A. Athens, 1976.



**Bronze Figurine, Hellenic Period
National Archeological Museum, Athens, AIG 2548**



Joe Betterman throws Spenser Mango, both from the USOEC in Marquette, MI

Promotion of Wrestling

David Curby

My friend, Professor Bahman Mirzaei, University of Guilan, Iran, wrote me to tell me that he was preparing a lecture entitled "*The Profile of Wrestling Today, and for the Future.*" In his opinion, the axis of the presentation would be about repeated changes in wrestling rules, drug abuse in wrestling, promotion of coaching knowledge, and the promotion of research and science in wrestling. He asked for my opinion to the following questions as a researcher and specialist in wrestling: What are the major problems confronting today's wrestling? What is the biggest threat for wrestling? How can wrestling become more attractive? The following is my response.

I feel that a key element in answering the above questions involves bringing young wrestlers into the sport. In order to attract more athletes, there must be a positive image in the public for our sport. This public perception includes parents, and of course mothers, who are first and foremost concerned with the safety and well-being of their children. The aspect of danger must be minimized. This involves **risk reduction** and injury **prevention**. Some of this can be achieved through well-educated and professional coaches. These coaches will use progression of teaching, age appropriate activities, appropriate space and mats, proper matching of athletes, appropriate conditioning and physical preparation and progression, employing teaching techniques that develop a healthy psyche, and the teaching of safety and hygiene to the athletes are all important. Some coaches only see competitive excellence as their objective, but for the beginning athlete there are things more important than wins and losses. There are appropriate priorities for each levels of coaching. These should be thought out and identified, be based on sound coaching principles, and be applied in a balanced fashion.

Youth programs must emphasize the broader goals of physical development, increased self-confidence, and fun. If winning becomes the primary focus, young people who are not the early maturers, often drop out of the sport as they are failures. Pushing for earlier and younger championships at a national level can only add to this problem. There is the additional problem of burn-out among some athletes who compete too much and at too young an age. Avoidance of early specialization in one sport can help to can help address this phenomenon.

Wrestling must be maintained in the physical education programs for all youth. This means that the preparation programs for physical educators must also include how to teach this sport. While it is easy for even the worst physical education teacher to organize a game of basketball or soccer, wrestling demands a higher level of technical expertise for safe and satisfying instruction. The emphasis must be on the physical development, games and folk wrestling, and acquisition of technique.

As I view the sport from an American perspective, there are a number of social phenomena affecting how the sport of wrestling is received. With the rise in technology, work and play patterns have changed. There is less physical activity. In many industrialized nations we are seeing our youngsters grow fatter and a rise in obesity in all segments of the population. The extreme demands of wrestling when viewed against this backdrop of a "softer" youth, make it harder to recruit. It seems ironic that for a long time the major negative associated with wrestling

has been that of excessive weight loss, but in today's world, the weight control aspects of wrestling and the wrestler's drive toward leanness can be used as a positive. Such an approach would emphasize the benefits of maintaining a healthy/optimal body composition, without the employment of dangerous rapid weight loss techniques.

Another positive promotional tool that should be emphasized is that there is a place for all sizes and body builds in wrestling. Many popular sports such as American football and basketball generally require either great mass or height. An average body build of 5'9" and 170 pounds is considered small by the standards of these sports.

Going back to the possible barriers to the recruitment of young wrestlers, I would also include cauliflower ear and skin infections. First for cauliflower ear - Many people outside the sport, such as mothers, view this permanent disfigurement as an indicator of the brutal nature of the sport. This is a conundrum, since the wrestlers themselves view it as a "badge of honor." This is the paradox of our sport, as what repels some is what attracts others!

While some dermatological concerns, such as tinea corporis, can be dismissed as more or less a nuisance, some can have more serious complications. In fact, with the rise of MRSA infections in the athletic population, hygiene and sanitation must be a primary concern for the coach.

Well-educated and ethical coaches often hold the key as to how the public perceives these issues. They are important role models, along with the older, successful wrestlers, who ultimately attract athletes to our sport.

Wrestling is very popular in Iran!

