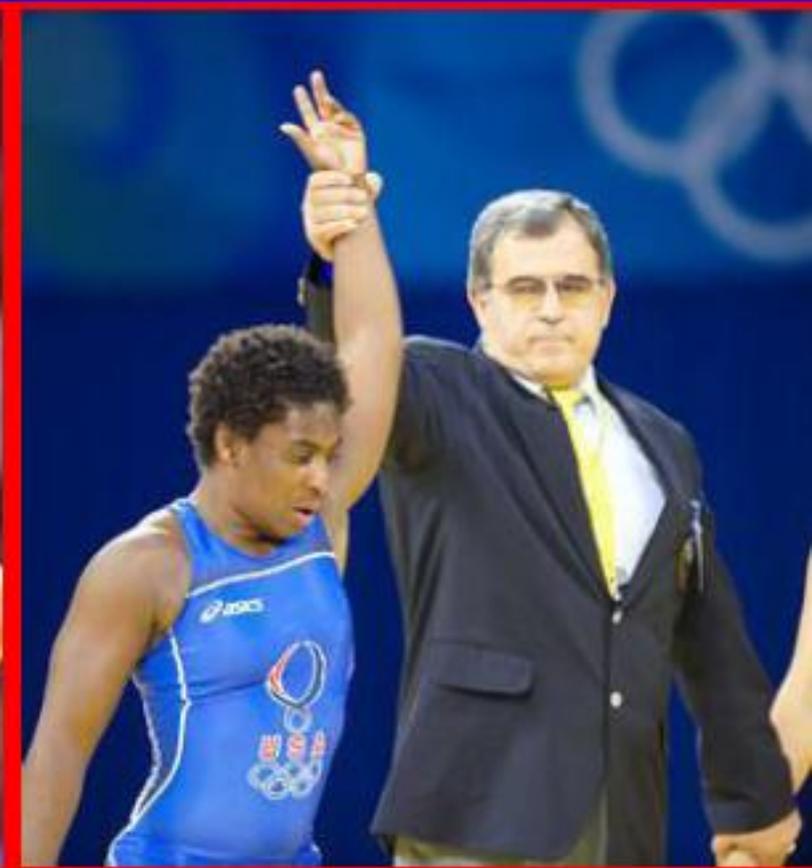
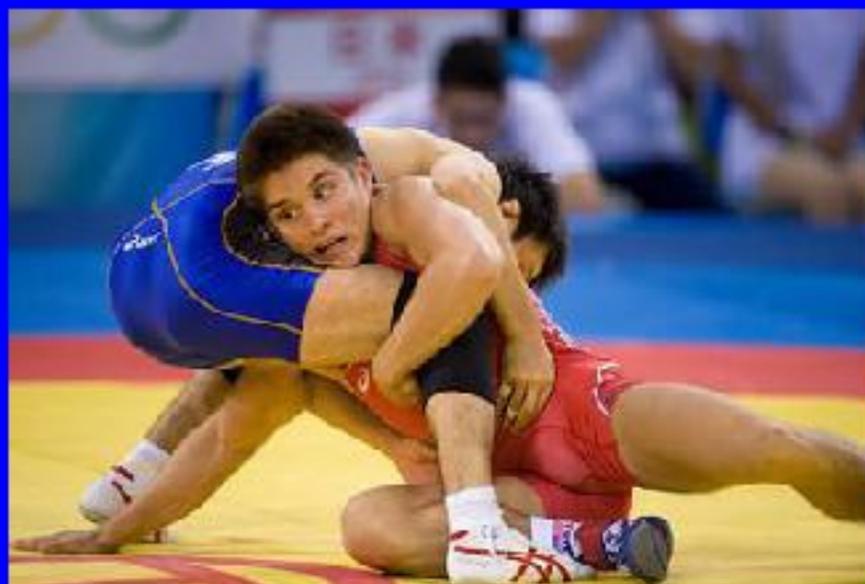


Science of Wrestling



Annual Research Review 2008

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. Rich Bender, Mitch Hull, Dave Bennett, Steve Fraser, Momir Petkovic, Ike Anderson, Terry Steiner, and Anatoly Petrosyan always respond to my questions. Congratulations to Zeke Jones, as he assumes his new position of National freestyle coach. 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 my children Nicholas, Jacob and Courtney, who have been a big part of my work in the sport, and have patiently supported me. Larry Slater has provided most of the action photographs found throughout this document. On the cover are his pictures of noteworthy American wrestlers from 2008. These are Henry Cejudo (Olympic freestyle Gold at 55 kg), Clarissa Chun (World Championship Gold at 48 kg), Randi Miller (Olympic Bronze at 63 kg), and Adam Wheeler (Olympic Greco-Roman Bronze at 96 kg).

2008 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 wrestling. Towards that end, please go to the article describing the formation of an International Network of Wrestling Researchers. Please register!

Please visit my website at www.curbywrestling.com for the previous three years of this review. At my site there I have sections for Sport Science and Testing of Athletes containing many articles of interest for the sport scientists and coaches in wrestling. The Sport Science section contains the Reviews of Wrestling Research that have been published since 2005, and also a wrestling bibliography of over 2,200 articles relating to wrestling sport science research that I have collected in my office. Please visit!

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Annotated Bibliography of Wrestling Research in 2008

Adams, B. (2008). Skin infections in athletes. *Dermatol Nurs* 20, 39-44.

Abstract: Athletes represent a unique group of dermatologic patients. Intense and close contact with others' skin primarily places the athlete at risk for infection. Failure to acknowledge the role of sports participation in the genesis of skin infections leads to delayed diagnoses, inappropriate therapy, and subsequent epidemics. Simple prevention measures curb epidemics and allow teams to practice and compete without disruption.

Keywords: dermatology/Infection/practice/Risk/Skin/Skin infections/prevention/hygiene

Editor's Note: Dr. Brian Adams continues his fine work in sports dermatology. His book, *Sports Dermatology*, Springer, 2006, is an excellent reference for the physician working with wrestling, as well as all athletic trainers.

Ahmadi H, Shirani S, Yazdanifard P. (2008) Aortic dissection type I in a weightlifter with hypertension: A case report. *Cases J.* 1(1):99.

Abstract: Acute aortic dissection can occur at the time of intense physical exertion in strength-trained athletes like weightlifters, bodybuilders, throwers, and wrestlers. Rapid rise in blood pressure and history of hypertension are the most common causes of aortic dissection in athletes. It is a very tragic event because of its high mortality rate of about 32% in young patients. We report a case of aortic dissection in a young weightlifter with an extensive intimal tear of the aorta, from the sinus of Valsalva to the abdominal aorta. Associate Professor of cardiovascular and thoracic surgery, Tehran Heart Center, North Kargar Street, Tehran, Iran. dr.ahmadi2006@yahoo.com.

Editor's Note: Predisposing factors for this tear in the aorta, listed in this article include hypertension, congenital cardiovascular disease, supralvalvular aortic stenosis, connective tissue disorders, and fibromuscular dysplasia. The authors encourage the screening of athletes for predisposing factors including echocardiography and blood pressure monitoring while weight lifting. I asked Dr. Ahmadi about his experience with wrestlers presenting with aortic dissection, and he stated that he has encountered one such case.

Amtmann, J. A., Amtmann, K. A., & Spath, W. K. (2008). Lactate and Rate of Perceived Exertion Responses of Athletes Training for and Competing in a Mixed Martial Arts Event. *J Strength Cond Res*, 22, 645-647.

Keywords: conditioning/Exertion/interval training/lactate/strength

Abstract: Lactate and rate of perceived exertion (RPE) was monitored in 6 male subjects training for and competing in a mixed martial arts event held in Butte, Montana, to determine 1) the metabolic demands of the sport and 2) the effectiveness of the prebout interval training programs chosen to help prepare the competitors for this event. The training lactate measurements ranged from 8.1 to 19.7 mmol•L⁻¹, and the training RPE levels ranged from 15 to 19 on Borg's Category Scale of perceived exertion, the scores of which ranged from 6 to 20. The postbout lactate measurements ranged from 10.2 to 20.7 mmol•L⁻¹, and the post-bout RPE measurements ranged from 13 to 19. Of the 4 subjects that had both training and postbout lactate measurements, 3 had obtained lactate levels during training that exceeded lactate levels immediately after the bout. This indicated that, when using lactate measurements as a benchmark, the conditioning training was effective for these 3 athletes. When we used RPE scores as a benchmark, the conditioning was effective for all 4 subjects because all subjects reached 18-19 during their training, which was at least as high as their reported post-bout RPE levels.

Editor's Note: I include this study since as there are many wrestlers engage in MMA. The lactate values are similar to values obtained from Olympic wrestlers.

Anderson, C., Sforzo, G., & Sigg, J. (2008). The effects of combining elastic and free weight resistance on strength and power in athletes. *J Strength Cond Res*, 22, 567-574.

Keywords: power/strength/training/adaptation

Abstract: This study was undertaken to determine whether combined elastic and free weight resistance (CR) provides different strength and power adaptations than free weight resistance (FWR) training alone. Forty-four young (age 20

+/- 1 years), resistance-trained (4 +/- 2 years' experience) subjects were recruited from men's basketball and wrestling teams and women's basketball and hockey teams at Cornell University. Subjects were stratified according to team, then randomly assigned to the control (C; n = 21) or experimental group (E; n = 23). Before and after 7 weeks of resistance training, subjects were tested for lean body mass, 1 repetition maximum back squat and bench press, and peak and average power. Both C and E groups performed identical workouts except that E used CR (i.e., elastic resistance) for the back squat and bench press, whereas the C group used FWR alone. CR was performed using an elastic bungee cord attached to a standard barbell loaded with plates. Elastic tension was accounted for in an attempt to equalize the total work done by each group. Statistical analyses revealed significant ($P < 0.05$) between-group differences after training. Compared with C, improvement for E was nearly three times greater for back squat (16.47 +/- 5.67 vs. 6.84 +/- 4.42 kg increase), two times greater for bench press (6.68 +/- 3.41 vs. 3.34 +/- 2.67 kg increase), and nearly three times greater for average power (68.55 +/- 84.35 vs. 23.66 +/- 40.56 watt increase). Training with CR may be better than FWR alone for developing lower and upper body strength, and lower body power in resistance-trained individuals. Long-term effects are unclear, but CR training makes a meaningful contribution in the short term to performance adaptations of experienced athletes.



Editor's Note: *When I first saw the title, I assumed that the elastic training was of the kind often employed by wrestlers. The picture to the left is of Alexander Karelin using stretch cords in his training. However, the elastic bands were in fact bungee cords used with the weights that provided an increased resistance in both the eccentric and concentric phases of the lift. I do not know if the contractile characteristics are the same, but it reminds me of accommodating resistance methods such as Nautilus and adding chains to bars. Very interesting!*

Boden, B. P. & Jarvis, C. (2008). Spinal injuries in sports. *Neurol Clin*, 26, 63-78.
 Keywords: Cervical spine/Head/injuries/Quadriplegia/Spinal Cord/Spinal Cord Injuries/Spinal Injuries/Spine
 Abstract: Athletic competition has long been a known source of spinal injuries. Approximately 8.7% of all new cases of spinal cord injuries in the United States are related to sports activities. The sports activities that have the highest risk of catastrophic spinal injuries are football, ice hockey, wrestling, diving, skiing, snowboarding, rugby, and cheerleading. Axial compression forces to the top of the head can lead to cervical fracture and quadriplegia in any sport. It is critical for any medical personnel responsible for athletes in team sports to have a plan for stabilization and transfer of an athlete who sustains a cervical spine injury.

Editor's Note: *Dr. Boden is on the cutting edge of spinal injuries in sports. Wrestling provides the potential for catastrophic injuries and those involved in our sport must always put a premium on their prevention. (see Kordi article and McGinnis case study in this bibliography)*

Buford, T. W., Smith, D. B., O'Brien, M. S., Warren, A. J., & Rossi, S.J. (2008). Seasonal Changes of Body Mass, Body Composition, and Muscular Performance in Collegiate Wrestlers. *International Journal of Sports Physiology & Performance*, 3, 176-184.
 Keywords: Body Composition/competition/endurance/Fatigue/muscle/ /season/strength/testing/Torque/training
 Abstract: Purpose: The purpose of the present investigation was to examine the physiological response of collegiate wrestlers to their competitive season. Methods: Eleven Division I collegiate wrestlers (mean ± SD; 19.45 ± 1.13 y) volunteered and completed 4 testing sessions throughout the course of the collegiate wrestling season. Testing sessions were conducted pre-, mid-, and postseason, as well as before the national tournament. Testing consisted of weigh-in, skinfold body composition testing, and a 50-rep concentric, isokinetic leg extension muscle endurance test (180°/s). Muscular performance variables measured included peak torque, peak torque at fatigue, percent decline, and peak torque/body mass ratio. Results: A significant increase ($P < .05$) of 2.9% was observed for body mass between

midseason and postseason (2.38 kg). From pre- to postseason, a mean increase of 3.8% (3.1 kg) was observed for body mass. An increase ($P < .05$) in BF% of 2.9% was observed between prenationals and postseason. No significant differences ($P > .05$) were observed between consecutive time points for quadriceps peak torque; however, there was a significant increase ($P < .05$) between preseason and prenationals (23.39 N·m). Peak torque at fatigue was greater ($P < .05$) at midseason than preseason, representing an increase of 9.82 N·m. Between midseason and prenationals testing, we observed an 11% increase ($P < .05$) in %DCLN. Finally, we noted an increase ($P < .05$) from 0.6 to 0.69 in peak torque/body mass ratio between preseason and prenationals. Conclusions: Our results indicate that while force values seem to suffer at midseason, the wrestlers compensated and were strongest just before their national competition.



Editor's Note: *Wrestlers need to employ methods that will maximize their strength, power, and fatigue resistance when it counts the most – prior to the biggest meets of the year. The plan implemented at Oklahoma State using high intensity circuit training prior to Nationals seems to be yielding the desired results. A possible confounding situation surrounding the body mass variables in this study is the NCAA weight certification procedures. The preseason weights were lower than mid-season. The manner in which wrestlers make their “scratch” certification weight requires that the athlete be hydrated. During this phase body mass, both muscle and fat is reduced. Subsequent weight loss for competition utilizes dehydration. This aspect requires further investigation.*

Camic, C., Mielke, M., Hendrix, C., Zuniga, J., Johnson, G., & Housh, T. (2008). Cross-cultural Validation Of Isokinetic Peak Torque Prediction Equations On Young American Wrestlers. *Med Sci Sports Exerc*, 40, S462.

Keywords: isokinetic/Torque/testing/youth/profiles

Abstract: **PURPOSE:** To determine the validity of fat-free weight equations derived on Saudi children and adolescents for predicting isokinetic peak torque in young American wrestlers. **METHODS:** One-hundred and eight males (x age \pm SD= 11.3 \pm 1.5y) volunteered to perform isokinetic leg extensions at 180 and 300°·s⁻¹ on a Cybex II dynamometer to measure isokinetic peak torque (Nm) and underwater weighing to determine fat-free weight (FFW). Predicted peak torque values at 180 and 300°·s⁻¹ were also calculated from FFW using the following formulas: EQ1: Extension Peak Torque at 180°·s⁻¹ = 3.3(FFW) - 54.4 EQ2: Extension Peak Torque at 300°·s⁻¹ = 2.4(FFW) - 38.5 The validity of EQ1 and EQ2 were determined by examining the constant error (CE), r, standard error of estimate (SEE), and total error (TE) values. **RESULTS:** There were significant ($p < 0.05$) mean differences (CE) between the measured peak torque ($x \pm$ SD: 180°·s⁻¹ = 54.9 \pm 2.2 Nm; 300°·s⁻¹ = 35.8 \pm 1.5 Nm) and predicted peak torque (180°·s⁻¹ = 62.0 \pm 3.0 Nm; 300°·s⁻¹ = 46.2 \pm 2.2 Nm) at 180 and 300°·s⁻¹. The CE, SEE, and TE values at 180°·s⁻¹ were 7.1, 8.9, and 14.9 Nm, respectively. The CE, SEE, and TE values at 300°·s⁻¹ were 10.4, 6.3, and 14.4 Nm, respectively. In addition, measured peak torque and predicted peak torque were correlated at $r = 0.92$ for both 180 and 300°·s⁻¹.

CONCLUSIONS: Although measured peak torque and predicted peak torque were highly correlated at both 180 and 300°·s⁻¹, the TE values associated with EQ1 and EQ2 ranged from 27 to 40% of the mean measured peak torque values. Thus, EQ1 and EQ2 that were derived on Saudi children and adolescents resulted in error values that were too large to be used to predict isokinetic peak torque in young American wrestlers.

Einstein, E., Sinha, S., & Brickman, K. (2008). Fluconazole as a Prophylactic Measure for Tinea Gladitorum in High School Wrestlers. *Clinical journal of sport medicine*, 18, 184.

Keywords: Fluconazole/Tinea

Abstract presented summarized the effective prophylactic use of fluconazole over a ten year period. Participants (373) in the study were given 100 mg on 3 consecutive days during the first week of practice, and again at six weeks into the season. 75% of the participants had reported previous fungal infections. Over the course of the period only 13 infections were found (3.5%) with no reported side-effects.

University of Toledo Medical Center, Toledo, Ohio.

Editor's Note: *There seems to be a growing body of evidence supporting the efficacy and safety in the prophylactic use of fluconazole with wrestlers.*

Ežerskis, M. & Poderys, J. (2008). Dynamics of muscle performance and cardiovascular changes under influence of concentrated speed and power training loads in cohort of Lithuanian elite wrestlers during preparation to world championship. *Education-Physical Training- Sport (Lithuania)* 34-39.

Keywords: adaptation/anaerobic capacity/cardiovascular/power/recovery/speed/tests/training/training load

Abstract: Recovery after heavy training loads is an essential part of the training process and long-term adaptation depends on this much. The aim of this study was to assess the peculiarities in the changes of muscular performance and cardiovascular changes under the influence of concentrated speed and power training loads in cohort of Lithuanian elite wrestlers during the preparation to world championship. Seven elite wrestlers, all members of the Lithuanian national team, taking part in the training camp before the participation in the world championship, took part in the study. Muscle performance abilities were assessed by registering relative power (W / kg) during the vertical jumps. Functional state of cardiovascular system and peculiarities of recovery were assessed by registering dynamics of 12-leads ECG and measuring of ABP during the Rouflier exercise test. The results obtained during the study showed increase of muscular performance and faster mobilization of cardiovascular system when the heavy training loads of speed and power character were used during the training camp. Better relative power of muscles and better anaerobic capacity were obtained by all participants of the study. However, economy of cardiovascular reaction to dosed exercise test was observed as well. The results of the study confirmed the hypothesis that characteristic feature of recovery after physical loads was an adequate sequence in recovery of cardiovascular system indices. The indices outlining features in ratio between regulatory and supplying systems recovered first, then the recovery of regulatory systems occurred and the slowest recovery was of the indices of supplying systems.

Editor's Note: Heart rate variability (HRV) is a measure of the beat-to-beat variations in heart rate. The use of its many parameters has exploded in recent years, both in heart disease and the assessment of cardiovascular response in athletes. It is usually calculated by analyzing a time series of beat-to-beat intervals from the ECG. While the rhythmic beating of the heart at rest was once believed to be monotonously regular, we now know that the rhythm of a healthy heart under resting conditions is actually surprisingly irregular. These moment-to-moment variations in heart rate are easily overlooked when average heart rate is calculated. The autonomic nervous system is the portion of the nervous system that controls the body's visceral functions, including action of the heart. Originally, HRV was assessed manually from calculation of the mean R-R interval and its standard deviation measured on short-term (e.g., 5 minute) electrocardiograms. The smaller the standard deviation in R-R intervals, the lower is the HRV. There are many different types of arithmetic manipulations of R-R intervals have been used in the literature to represent HRV. Examples include: the standard deviations of the normal mean R-R interval obtained from successive 5-minute periods over 24-hour Holter recordings (called the SDANN index); the number of instances per hour in which two consecutive R-R intervals differ by more than 50 msec over 24-hours (called the pNN50 index); the root-mean square of the difference of successive R-R intervals (the rMSSD index); the difference between the shortest R-R interval during inspiration and the longest during expiration (called the MAX-MIN, or peak-valley quantification of HRV); and the base of the triangular area under the main peak of the R-R interval frequency distribution diagram obtained from 24-hour recording. Reductions in HRV have been reported to be associated with various pathologic conditions.

Dr. Poderys has used a ratio between the JT and RR intervals, along with an equation using these values that yields what he terms "velocity of adaptation." These parameters are then used to evaluate the athlete's response to the training load when used following a Rouflier Test (30 squats in 45 sec).

One final important note is that Mindaugas Ežerskis is completing his doctoral studies while also performing as an elite wrestler for Lithuania. He placed 7th in the Beijing Olympics in Greco-Roman at 96 kg!

Feden, J. P., Higgs, J. D., Doperak, J., & Anish, E. (2008). The Effectiveness of Valacyclovir Prophylaxis for Herpes Gladiatorum in Collegiate Wrestlers. *Clinical journal of sport medicine*, 18, 193.

Keywords: dermatology/skin infection/herpes/herpes gladiatorum/valacyclovir

The abstract presented described a retrospective comparison between two Division 1 wrestling programs. The practice time lost due to herpes gladiatorum by the team receiving prophylactic treatment of valacyclovir was significantly lower than the team not receiving the prophylaxis. Further work investigating the cost effectiveness of this approach are recommended. University of Pittsburgh Medical Center

Editor's Note: More evidence for the safe prophylactic use of drug therapy in managing herpes gladiatorum in wrestlers.

Franchini E, Sterkowicz S, Meira CM, Gomes FR, Tani G. (2008) Technical variation in a sample of high level judo players. *Percept Mot Skills* 106(3):859-69.

Keywords: technique/technique analysis

Technical actions performed by two groups of judokas who won medals at World Championships and Olympic Games during the period 1995-2001 were analyzed. In the Super Elite group (n = 17) were the best athletes in each weight category. The Elite group (n = 16) were medal winners who were not champions and did not win more than three medals. Super Elite judokas used a greater number of throwing techniques which resulted in scores, even when expressed relative to the total number of matches performed, and these techniques were applied in more directions than those of Elite judokas. Further, the number of different throwing techniques and the variability of directions in which techniques were applied were significantly correlated with number of wins and the number of points and ippon scored. Thus, a greater number of throwing techniques and use of directions for attack seem to be important in increasing unpredictability during judo matches.

Martial Arts and Combat Sports Research Group, School of Physical Education and Sport, University of São Paulo, Av. Prof. Mello Moraes 65, Cidade Universitária, 05508-900 São Paul/SP, Brazil. efranchini@usp.br

Editor's Note: We can learn from such a technical analysis as done in the sport of judo!

Fujihiro, M. (2008). [The part of a hospital dermatologist. Prevention of Trichophyton tonsurans infection] [Article in Japanese]. *Nippon Ishinkin Gakkai Zasshi*, 49, 191-195.

Keywords: dermatology/Skin Infection/Tinea/Trichophyton

Abstract: Trichophyton tonsurans infection was found first in autumn 2000 in Gifu prefecture and spread rapidly in the Tokai region. Not only direct KOH examination but also culture is necessary to diagnose this disease. In order to collect a specimen, I recommend cellophane adhesive tape. During the past 5 years, dermatologists in the Tokai area have sent me specimens in an envelope for mycological examination. Hyphae were found in all 75 cases in the scales examined. Fungal culture revealed 61 cases to be T. tonsurans infection; the male : female ratio was 54 : 7. By age distribution, high school students accounted for 46 (75%), elderly patients 9 (15%) and lower age 6 (10%). Judo players accounted for 32 (52%), wrestlers for 24 (39%) and others for 5 (8%). Most had lesions on the face, neck, head or arm. One wrestler had a nail involvement. In some specimens from tinea corporis, hyphae in the hair shaft were observed. This sort of tinea epidemic probably occurs more often than is reported. Therefore we have begun to cooperate with a medical department member of the Gifu Judo Society to prevent the spread of T. tonsurans infection.

Gierczyk, D. & Sadowski, J. (2008). The influence of coordination training on the index level of coordination motor abilities in Greco-Roman wrestlers aged 13-14. *Education-Physical Training-Sport*, 70, 27-33.

Keywords: balance/coordination/Motor Learning/motor ability/Puberty/skill/training

Abstract: Wrestling belongs to the group of sports disciplines with complex movement activities in which an essential role is played by coordination motor abilities (CMA). A high level of coordination improvement since the earliest years positively influences the process of learning new movements as well as enables to make a more effective use of technical and tactical skills during a sports fight. Therefore, the formation of coordination abilities since the earliest years is the condition of training young wrestlers effectively. The aim of this study was to show the influence of coordination training on the changes in coordination motor abilities (CMA) in Greco-Roman wrestlers aged 13-14. Boys practising Greco-Roman wrestling (n = 32) in the Student Sports Club UKS "Dwójka" in Radom took part in the research. They were divided into two groups that were at the same sports level: the experimental one (n = 16) and the control one (n = 16). As for those groups, no significant differences concerning somatic features (body mass, height and slenderness indices) were noticed at the beginning and at the end of the experiment, which excluded the influence of puberty on the obtained experiment results. Seven CMA (kinesthetic differentiation, rhythmization, time-space orientation, movement combining, motor adjustment, speed of reaction, balance) were evaluated on the basis of 14 indices. For that reason sports-motor tests of various authors were applied. The tests were first checked in the context of reliability and accuracy. The basic research method was a six-month pedagogical experiment. It involved implementing a larger number of means of different coordination complexity (low, medium, high) in the training of the experimental group. The control group took part only in the classical wrestling training. The experiment included 84 training sessions. The applied means equally influenced all examined coordination abilities. The total volume of such exercises in both groups was the same. It was observed that sports men undergoing coordination training obtained higher values of the examined indices of CMA than those from the control group ($p < 0.05$). The highest significant increase was noted in the case of rhythmization, maintain body balance, and motor adjustment. The

increase ranged from 12.6% to 27.5%. The lowest increase was noticed in the case of movement combining kinesthetic differentiation and time-space orientation. In this case the increase ranged from between 4.7% and 7.3%. Statistically significant differences in CMA the experimental group and the control group were observed after the experiment ($p < 0.05$). Jozef Pilsudski Academy of Physical Education in Warsaw, Poland.

Editor's Note: The special coordination program employed is of interest to me. It was not explained in much detail in the article, and I have asked Dr. Gierczuk to share it with me. These findings support the feelings of many that general physical preparation must make up a large portion of youth sports training.

Halloran, L. (2008). Wrestling injuries. *Orthop Nurs*, 27, 189-192.

Keywords: Health/injuries/Risk

Abstract: The sport of wrestling has a history dating back to ancient times as one of the original Olympic sports. It particularly appeals to adolescents as equally matched opponents engage in competition. There can be no argument that participation in sports helps promote a physically active lifestyle. However, despite the documented health benefits of increased physical activity, those who participate in athletics are at risk for sports-related injuries. This article will discuss wrestling injuries and recommend prevention strategies to keep athletes safe.

Notes: Laurel Halloran, PhD, APRN, Professor, Western Connecticut State University, Newtown.

Herman, S. & Smith, D. (2008). Four-week dynamic stretching warm-up intervention elicits longer-term performance benefits. *J Strength Cond Res*, 22, 1286-1297.

Keywords: agility/endurance/flexibility/muscular endurance/power/speed/stretching/training/warm up

Abstract: The purpose of this study was to determine whether a dynamic-stretching warm-up (DWU) intervention performed daily over 4 weeks positively influenced power, speed, agility, endurance, flexibility, and strength performance measures in collegiate wrestlers when compared to a static-stretching warm-up (SWU) intervention. Twenty-four male National Collegiate Athletic Association Division I wrestlers were randomly assigned to complete either a 4-week treatment condition (DWU) ($n = 11$) or an active control condition (SWU) ($n = 13$) prior to their daily preseason practices. Anthropometric and performance measures were conducted before and after the 4-week experimental period (i.e., DWU or SWU). Measures included peak torque of the quadriceps and hamstrings, medicine ball underhand throw, 300-yd shuttle, pull-ups, push-ups, sit-ups, broad jump, 600-m run, sit-and-reach test, and trunk extension test. Wrestlers completing the 4-week DWU intervention had several performance improvements, including increases in quadriceps peak torque (11%), broad jump (4%), underhand medicine ball throw (4%), sit-ups (11%), and push-ups (3%). A decrease in the average time to completion of the 300-yd shuttle (-2%) and the 600-m run (-2.4%) was suggestive of enhanced muscular strength, endurance, agility, and anaerobic capacity in the DWU group. In contrast to the DWU intervention, there was no observed improvement in the SWU group for peak torque of the quadriceps, broad jump, 300-yd shuttle run, medicine ball underhand throw for distance, sit-ups, push-ups, or 600-m run, and decrements in some performance measures occurred. The findings suggest that incorporation of this specific 4-week DWU intervention into the daily preseason training regimen of wrestlers produced longer-term or sustained power, strength, muscular endurance, anaerobic capacity, and agility performance enhancements.

Editor's Note: Recently, we have begun to see a shift away from static towards more dynamic stretching warmups. See Diezemann article in this review.

Iwai, K., Okada, T., Nakazato, K., Fujimoto, H., Yamamoto, Y., & Nakajima, H. (2008). Sport-specific characteristics of trunk muscles in collegiate wrestlers and judokas. *J Strength Cond Res*, 22, 350-358.

Keywords: Magnetic Resonance Imaging/power/strength/Torque/trunk/Muscles/muscle/practice/training/technique

Abstract: This study evaluated the sport-specific characteristics of the cross-sectional areas (CSAs) of trunk muscles and trunk muscle strength in wrestlers and judokas. We also examined whether their trunk muscles and muscle strength depended on athletic performance levels in each sport. The subjects comprised 14 male collegiate wrestlers and 14 judokas. Magnetic resonance imaging was used to assess the trunk muscle CSAs at the L3-4 level parallel to the lumbar disc space. A Biodex System3 was used to measure isokinetic trunk flexor and extensor muscle strength of peak torque, work, average torque, and average power. The absolute and relative CSAs of the trunk muscles in the wrestlers and judokas were significantly different (rectus abdominis: wrestling > judo, $P < 0.05$; obliques: wrestling < judo, $P < 0.05$; quadratus lumborum: wrestling < judo, $P < 0.01$). We confirmed that the absolute and relative trunk

extensor and flexor strength of peak torque, work, and average torque were significantly higher in the collegiate wrestlers than in judokas. On athletic performance, the tendency of the CSAs and muscular strength of trunk muscles was not consistent with athletic performance levels in each sport. Our findings indicated that the sport-specific characteristics of the CSAs of the trunk muscles and trunk muscle strength obviously differed between the 2 similar sports. Athletes should practice the sport-specific training of trunk muscles and develop sport specificity in their sports. Particularly, wrestlers have to train in trunk flexion and extension motions, and judokas need to strengthen trunk rotation and lateral flexion motions. This information will be available for athletes as well as strength and technical training coaches in wrestling, judo, and the other sports.

Karila, T., Sarkkinen, P., Marttinen, M., Seppälä, T., Mero, A., & Tallroth, K. (2008). Rapid Weight Loss Decreases Serum Testosterone. *Int J Sports Med* 29(11):872-7.

Keywords: blood/Body Composition/Body Weight/Creatinine/Dehydration/electrolytes/Hematocrit/ hemoglobin/Risk/ Testosterone/Weight Loss

Abstract: To investigate the effects of a rapid weight reduction program under authentic pre-competition conditions, eighteen elite wrestlers were studied with dual-energy X-ray absorptiometry (DXA) before and after two to three weeks' weight reduction regimens. In order to establish the degree of dehydration and hormonal status, blood samples were collected to obtain blood chemistry, electrolytes and endocrinological parameters after both DXA measurements. The mean weight loss was 8.2 +/- 2.3 % and it was constituted by the mean reductions of fat mass of 16 +/- 6.9 % ($p \leq 0.001$) and lean body mass of 7.9 +/- 2.5 %. The rapid weight reduction caused significant dehydration which was noticed as increased blood hemoglobin (7.8 +/- 5.9 %, $p \leq 0.001$), hematocrit (11.3 +/- 6.8 %, $p \leq 0.001$), and serum creatinine (35 +/- 23 %, $p \leq 0.001$). There was a significant decrease in serum testosterone (63 +/- 33 %, $p \leq 0.001$) and luteinizing hormone (54 +/- 47 %, $p \leq 0.001$) concentrations. A reduced body weight correlated with decreased serum testosterone concentration ($r = 0.53$, $p \leq 0.024$). Serum sex hormone binding globulin concentration increased significantly (40 +/- 21 %, $p \leq 0.001$). The results suggest that even short-term weight reduction may have marked effects on body composition, blood chemistry and hormonal parameters. It may constitute a possible health risk at least in a growing adolescent athlete.

Editor's Note: *This is a very interesting study for wrestling. It utilized elite wrestlers under authentic conditions (National Championships) of making weight. Dr. Karila informed me that the endocrinological parameters were done on the morning of weigh-in, and those for body composition (DEXA) and dehydration just prior to weigh-in. Nemet and Roemmich have each commented that these health risks are quickly reversed during the "off season" however, efforts must be made to make sure that youth wrestling does not extend the competitive season to that of being "year round!"*

Klentou, P., Muir, C., Cieslak, T., Remple, K., Ludwa, I., & Corbett, L. (2008). Water Cutting, stress and salivary immunoglobulins in elite wrestlers. *Med Sci Sports Exerc*, 40, S388-S389.

Keywords: competition/cortisol/Dehydration/Hormones/Immunoglobulins/Saliva/Stress/Testosterone/Water/Weight Loss

Abstract: Intense training has been associated with increased stress and immune suppression in athletes. Testosterone (T) and cortisol (C) have been reported to suppress immunity while their ratio (T/C) has been used as an indicator of training induced stress. **PURPOSE:** The aim of this study was to determine if intense training coupled with dehydration methods implemented to lose weight prior to competition had an effect on the variability of stress hormones resulting in a suppression of salivary immunoglobulins in elite wrestlers. The hypothesis was that the variability (measured by %CV) of testosterone (T), cortisol (C) or T/C ratio might relate to salivary immunoglobulin counts. **METHODS:** Eleven elite wrestlers (21.3 ± 1.7 years of age) volunteered to participate in the study and were placed in either the experimental (WC; n=5) or the control (CO; n=6) group based on whether they were subjected to water cutting in preparation for an upcoming competition. Saliva samples were obtained at rest and 1-hr post-training over a two-week preparation cycle leading to competition. Resting samples were also obtained one day and two weeks following the competition. Saliva samples were assayed (ELISA) for T, C, and total antibody concentrations of both IgA and IgG classes. **RESULTS:** WC significantly decreased weight over the course of the study by 4.6 ± 1.4 kg. The 2-way repeated measures ANOVA revealed no significant day by group effects or interaction for resting antibody counts, T, C and T/C. Further pair-wise analysis showed significant post-training increases in IgA (2.2 ± 0.3 to 2.4 ± 0.3 ng/mL), IgG (1.2 ± 0.3 to 1.4 ± 0.4 ng/mL), T (283.8 ± 94.4 to 317.5 ± 92.4 pg/mL) and C (4.0 ± 1.6 to 4.8 ± 2.0 ng/mL) while a 9% decrease was found in post-training T/C. These post-training increases in T and C were higher in

WC (19 and 28% for T and C, respectively) than CO (7 and 13% for T and C, respectively). The variability of post training T/C was related to both immunoglobulins at rest and after training indicating that higher the variability of T/C response, the lower the IgA and IgG. **CONCLUSIONS:** Rapid weight loss by prolonged dehydration seems to result in higher stress hormone variability in elite wrestlers. The continuous changing of the metabolic state of stress hormones might be a maladaptive response while a steady T/C ratio might enhance immunity in elite athletes.

Editor's Note: *The stress produced by weight cutting is certainly substantial. That these procedures are repeated throughout a season merits further tracking, perhaps throughout a season. See abstract for Ross, et al.*

Kordi, R., Akbarnejad, A., & Wallace, A. (2008). Catastrophic Injuries in the Olympic styles of wrestling in Iran. *Br J Sports Med*, July 4.



Keywords: catastrophic injuries/neck/spine/injuries/Risk
Abstract: **OBJECTIVES:** To develop a profile of direct catastrophic injuries in international styles of wrestling and to describe possible risk factors. **DESIGN:** Survey and retrospective review **SETTING:** Catastrophic injuries which occurred in wrestling clubs in Iran from July 1998 to June 2005 were identified by contacting several sources. The cases were retrospectively reviewed. **RESULTS:** The injuries included were 29 direct injuries (fatalities: 12, non-fatal: 11, and serious: 6). The injury rate was: 1.99 direct catastrophic injuries /100,000 wrestlers/year. The majority of direct injuries occurred during training sessions, with a trend toward more injuries in the low- and middle-weight classes and those who were competing at

high performance and experience levels. The takedown position, especially for the attacking wrestler who faces a counter attack, was the most common activity at the time of injury. A list of risk factors was suggested of which 'performing the wrestling maneuver incorrectly', 'inappropriate management of the injury', 'lack of the coach supervision', 'mat problems' and 'lack of restraining the wrestlers in a precarious position' were the most common risk factors. **CONCLUSIONS:** Catastrophic wrestling injuries are rare and preventable. Coaches have an essential role in the prevention of these injuries.

Editor's Note: *I include a picture from the study. The "crotch lift" was involved in 5 cases of catastrophic injury. The picture is described as utilizing incorrect technique of driving the opponent's head forward and down, as opposed to the proper technique of lifting and going back to the mat. Some of the contributing factors include: incorrect injury management (moving the injured wrestler), performing the hold incorrectly, inappropriate matching of wrestlers, wrestler inexperience, inappropriate mat surface, crowded mat surface and coach inexperience.*

Kukidome, T., Shirai, K., Kubo, J., Nakashima, Y., Yanagisawa, O., Homma, T., & Aizawa, K. (2008). MRI evaluation of body composition changes in wrestlers undergoing rapid weight loss. *Br J Sports Med*, 42(10):514-8
Keywords: Body Composition/body fat/Body Water/Body Weight/hydration/Magnetic Resonance Imaging/muscle/rehydration/Water/Weight Loss

Abstract: Purpose: Changes in body composition of college wrestlers undergoing rapid weight reduction were evaluated over time using magnetic resonance imaging (MRI). **METHODS:** We evaluated 12 wrestlers (male, 18-22 years of age) who participated in Japan's 2005 intercollegiate wrestling tournament. For this study, MRI (of the right femoral region and the trunk), as well as measurements of body weight, body fat percentage and body water content, were performed one month and one week prior to the weigh-in, on the day of the weigh-in, on the day of the match (after the match), and one week after the weigh-in. A survey of food and fluid intake was also conducted. **RESULTS:** Several variables were significantly lower on the day of the weigh-in than one month prior: body weight ($p<0.01$, -7.3%); body fat ($p<0.05$); body water content ($p<0.01$); trunk cross-section ($p<0.05$), including separate measurements of trunk viscera, trunk muscle, and trunk fat; quadriceps muscle; lower subcutaneous; and food intake ($p<0.01$). At one week after the match, all metrics had recovered to their levels measured one month before the weigh-in. Certain variables that were highly sensitive to hydration recovered more rapidly: they had reached their

initial levels when measured immediately after the match. **CONCLUSION:** Rapid weight reduction reduced the wrestlers' cross-sectional areas of muscle and fat tissues, which tended to recover through rehydration after the weigh-in. These results suggest that rapid weight reduction of wrestlers induced changes in different regions of the body.

Editor's Note: *The information gained from MRI allows us see exactly where the loss of body mass is occurring during the "making weight" process. While many coaches think that losses stem primarily from fat stores, the amount of muscle mass can be significant. This research can help to document this process.*

Liaugminas, A., Liaugminas, S., Ivaškiene, V., & Raškevičius, K. (2008). The efficiency of the throws over the back, performed by the Greco-Roman wrestling team members of the Lithuanian Academy of Physical Education. *Education. Physical Training. Sport* 47-51.

Keywords: back arch throws/technique/training/techni

Abstract: The objective of the research was to estimate one of the most common actions of LAPE greco-roman wrestlers, performed in the stance during the competitions - the efficiency of the throws over the back. 10 elite greco-roman wrestlers took part in the research (2 members of the Lithuanian National Team, 2 candidates to the National Team and 61 place winners in the high schools). Educational observation and the registration of the performed actions were done in 2005-2007 during 6 competitions (2 championships of the Lithuanian high schools, 2 international R. Bagdonas Tournaments, 2 Lithuanian Championships). During these competitions wrestlers performed or tried to perform 346 throws over the back. The efficiency of the actions was evaluated by the formula of A. Novikovas approved in 1976. This index is the criteria, which defines the efficiency of the wrestlers' offensive actions and the level of mastership of the sportsmen. The index of the strongest wrestlers of the world is 0.55-0.60. If it is good, it reaches 0.5-0.54, and satisfactory - 0.4-0.49. The information gathered shows that the greco-roman wrestlers generally perform throws over the back by grasping adverse hand and the waist - 166 (51.2 %). Quite rarely the throws are performed by grasping the rival in a different way - 2.4%. All the evaluated throws over the back numbered 158 (45.6%), and all the real attempts, that were not evaluated - 188 (54.4%). In comparison with the best wrestlers of the world the efficiency index of the throws over the back of the LAPE greco-roman wrestlers was satisfactory (0.45%). We would recommend to pay attention to the preparatory technical-tactical actions, dodge, seeking to implement actions planned beforehand.

Editor's Note: *I will try to get information regarding the exact procedures for calculating this technical efficiency. More of Novikov's outstanding work needs to be translated into English.*

McInnis, K. & O'Conner, K. (2008). Neck Injury-Wrestling. *Med Sci Sports Exerc.*, 40, S152.

Keywords: Cervical spine/Head/injuries/Neck/Neck Injuries/rehabilitation/Spinal Injuries/Spine

Abstract: **HISTORY:** 15-year-old wrestler was thrown down on the mat, landing on his head with his neck in hyperflexion. No LOC. He had severe posterior neck pain, could not move his extremities and had no sensation below his nipple line. Imaging studies revealed fracture/dislocation of C5/C6 with spinal cord compression. He was started on the spinal cord injury steroid protocol and underwent surgical C5-C6 reduction with anterior and posterior vertebral fusion. Postoperatively, he regained lower extremity movement and continued to have neurological recovery throughout his acute care course. He was transferred to a rehabilitation hospital one week after the injury.

PHYSICAL EXAMINATION: Mental status intact. Aspen cervical collar in place. Motor exam: B/L Elbow flexors 5/5; Wrist extensors L 5/5, R 4/5; B/L Elbow extensors 5/5; Finger flexors L 2/5, R 0/5; Finger abductors L 1/5, R 0/5; Hip flexors L 5/5, R 4/5; B/L Knee extensors 5/5; B/L Ankle dorsiflexors 4/5; Ankle plantarflexors L 5/5, R 4/5.

Voluntary anal contraction intact. Sensation: light touch impaired L3-S2 B/L. Pinpoint intact on R, impaired T4-S2 on L. Anal sensation intact. Reflexes absent in UEs and LEs. Bulbocavernosus reflex present. **DIFFERENTIAL**

DIAGNOSIS: 1. Incomplete spinal cord injury syndrome 2. Complete spinal cord injury **TESTS AND RESULTS:**

Postoperative cervical spine anterior-posterior and lateral radiographs:

- Anterior and posterior spinal fusion of C5/C6, no malalignment Cervical spine CT:

- Linear lucencies superior and inferior to the C5-C6 interbody fusion graft.

FINAL/WORKING DIAGNOSIS: Central Cord Syndrome, C6 American Spinal Injury Association (ASIA) D Tetraplegia

TREATMENT AND OUTCOMES:

1. Medical management: DVT prophylaxis, skin protection, pain control, treatment of neurogenic bowel and bladder.

2. Daily physical therapy. Independence with ambulation greater than 1,000 feet; able to negotiate stairs; independent

transfers.

3. Daily occupational therapy. Independence with activities of daily living.
4. Discharged home after one-month rehabilitation course. Neck brace discontinued. Outpatient PT/OT. Advanced to ASIA Impairment Scale Level E.
5. Returned to school the following academic year.
6. Wishes to return to wrestling against medical advice.

Michael, J., Müller, L., Schikora, N., Eysel, P., & König, D. (2008). [Injuries to the upper limbs in competitive wrestlers.] [Article in German]. *Sportverletz Sportschaden*, 22, 89-92.

Keywords: Arm/injuries

Abstract: Great variety of tackling and defense in wrestling in standing position and on the floor cannot be compared to other kind of sports. High demand to motoric characteristics and tournament specific mobility is required. However wrestling in Germany belongs to a fringe sport there is an increase of professionalism. This leads to a sufficient and high-demanded supervision. Aim of this retrospective study was to evaluate sport injuries using a questionnaire and to figure out a correlation between kind and frequency of sport injuries of different body regions. 163 questionnaires out of 200 had been evaluated. In the region of the upper limb injuries had been found in 23 %. The injury rate was higher in the athletes wrestling in the 2nd league. Wrestling is a technically and tactically ambitious sport. Injuries should be evaluated very careful to minimize the risk changing tactics and training methods.

Miksaneck T. (2008). Back on the mat. *Am Fam Physician*, 77, 782.

Keywords: injuries/illness/mononucleosis

Allowing ill or injured student athletes to resume participation in sports can be a dilemma for physicians. Pressure from parents, coaches, and competitors to clear athletes to return to competition can make a physician's job difficult. Supportive coaches and understanding parents make a big difference. For an athlete recovering from mononucleosis, wrestling is a potentially dangerous sport. Before releasing CS. back to practice and competition, ultrasonography of the spleen documented the absence of splenomegaly and provided peace of mind for his parents and physician. Young athletes tend to be quite resilient. A positive attitude goes a long way.

Mudry and W. Pirsig. Auricular hematoma and cauliflower deformation of the ear: From art to medicine. *Otol Neurotol* Epub ahead of print (Sept 11), 2008.

Keywords: auricular hematoma; cauliflower ear; ear; injuries; hematoma

Auricular hematoma and cauliflower deformation of the ear are unique in several respects. Knowledge about it began, in antiquity, through artists, particularly Greek and Roman, and then Japanese in the 18th century with their representation of cauliflower deformation of the ear on sculptures and paintings of pugilists and wrestlers. It is only in the 19th century that physicians began to make substantive progress in understanding this abnormality. It was first thought to be associated with mental disease, but by the beginning of the 20th century, its etiology was recognized as being caused by trauma and was then named auricular hematoma. The second step in the understanding of this affliction was the observation that auricular hematoma progresses toward cauliflower deformation of the ear, which was named cauliflower ear. Recognition of this evolution led to the development of therapies. During the second half of the 20th century, different treatments were developed. They included various hematoma drainage techniques with special bandages to prevent hematoma recurrence and ensuing progression to cauliflower ear. In summary, cauliflower deformation of the ear is an old artistic affliction that has only recently received medical attention.

Editor's Note: This medical-historical review was very interesting. Although I must admit, the fact that cauliflower ear was long held to be associated with insanity was a bit unsettling! It turns out that this was explained as a result of these patients being treated violently while in asylums, as well as the inmates banging their heads against the wall.

As a former University of Michigan wrestler, it is incumbent upon me to mention the role of the famous coach, Cliff Keen, and his role in developing the popular headgear that can prevent "auricular hematoma." In the 1950's, Cliff experimented in his basement with various methods. He obtained patents on his design and the rest is history, as his company Cliff Keen Athletics continues on under the direction of his son, James Keen. The NCAA required the use of headgear (earguards) in the 1969-70 season.



- Wrestling Coach, University of Michigan, 1925-1970.
- 13 Big Ten Championships
- Coach - 1948 Olympic Team
- First President, National Wrestling Coaches Association
- Charter Member, National Wrestling Hall of Fame

"I believe that wrestling plays a highly educational part in the development of a boy. The fundamental that every successful wrestler must acquire, and which has great carry-over value after his student days, is self-discipline. From self-discipline stems self-confidence and belief in one's self. What greater lesson can a sport or a coach impart?"

Cliff Keen

Ngai, K. M., Levy, F., & Hsu, E. B. (2008). Injury trends in sanctioned mixed martial arts competition: a 5-year review from 2002 to 2007. *Br J Sports Med*, 42, 686-689.

Keywords: combat sports/competition/Concussion/injuries/lacerations/Martial Arts/participation/Risk

Abstract: BACKGROUND: Professional mixed martial arts (MMA) competition is a full-contact sport that has risen rapidly in popularity in recent years. However, there is limited information regarding the incidence of competition injuries after sanctioning by an athletic commission. METHODS: We conducted a retrospective cohort study to examine MMA injury patterns during a 5 year period after sanctioning in the state of Nevada. Data from all regulated MMA competitions during the study period from March 2002 to September 2007 (1270 fight exposures) was obtained. Injury odds ratios were calculated by conditional logistic regression on match outcome, age, weight, and fight experience, using a pair-matched case-control design (n = 464) and by multiple logistic regression on match outcome, age, fight experience, weight, combat minutes, and scheduled rounds. RESULTS: During the 635 professional MMA matches, 300 of the 1270 athletes sustained documented injuries with an injury rate of 23.6 per 100 fight participations. Most common reported injuries were lacerations and upper limb injuries. Severe concussion rate was 15.4 per 1000 athlete exposures, or 3% of all matches. No deaths or critical sports-related injuries resulted from any of the regulated matches during the study period. Age, weight and fight experience did not statistically increase the likelihood of injuries after controlling for other covariates. CONCLUSIONS: Injury rates in regulated professional MMA competition are similar to other combat sports; the overall risk of critical sports-related injury seems to be low. Additional study is warranted to achieve a better understanding of injury trends and ways to further lower injury risk in MMA.

Petering, R. & Webb, C. (2008). Hypertensive Wrestler: An Abnormal Presentation. *Clinical journal of sport medicine*, 18, 213.

Keywords: Blood Pressure/Hypertension

Rechel, J. A. & Yard, E. E. (2008). An epidemiologic comparison of high school sports injuries sustained in practice and competition. *J Athl Train*, 43, 197-204.

Keywords: competition/concussion/injuries/practice

Abstract: CONTEXT: More than 7 million US high school students play sports. OBJECTIVE: To compare practice and competition injury rates and patterns in 5 boys' sports (football, soccer, basketball, wrestling, and baseball) and 4 girls' sports (soccer, volleyball, basketball, and softball) during the 2005-2006 school year. DESIGN: Prospective injury surveillance study. SETTING: Injury data were collected from 100 nationally representative United States high schools via High School RIO (Reporting Information Online). PATIENTS OR OTHER PARTICIPANTS: Athletes from participating high schools injured while participating in a school-sanctioned practice or competition in one of the above sports. MAIN OUTCOME MEASURE(S): Practice and competition injury rates, body site, diagnosis, and severity. RESULTS: High school athletes participating in these 9 sports at participating schools sustained 4350 injuries during the 2005-2006 school year, which corresponds to an estimated 1 442 533 injuries nationally. The rate of injury per 1000 athlete-exposures was higher in competition (4.63) than in practice (1.69) (rate ratio [RR] = 2.73, 95% confidence interval [CI] = 2.58, 2.90). Of all sports, football had the highest competition (12.09) and practice

(2.54) injury rates per 1000 athlete-exposures. Compared with injuries sustained during practice, higher proportions of competition injuries were head/face/neck injuries (proportion ratio [PR] = 1.61, 95% CI = 1.34, 1.94), particularly in boys' soccer (PR = 7.74, 95% CI = 2.53, 23.65) and girls' basketball (PR = 6.03, 95% CI = 2.39, 15.22). Competition injuries were more likely to be concussions (PR = 2.02, 95% CI = 1.56, 2.62), especially in boys' soccer (PR = 6.94, 95% CI = 2.01, 23.95) and girls' basketball (PR = 5.83, 95% CI = 2.06, 16.49). Higher proportions of competition injuries caused the athlete to miss more than 3 weeks of play (PR = 1.28, 95% CI = 1.08, 1.52), particularly in baseball (PR = 3.47, 95% CI = 1.48, 8.11) and volleyball (PR = 2.88, 95% CI = 1.01, 8.24). **CONCLUSIONS:** Rates and patterns of high school sport injuries differed between practice and competition. Providing athletic trainers with this information is a crucial step in developing the targeted, evidence-based interventions required to effectively reduce injury rates among the millions of high school student-athletes.

Editor's Note: *This study utilizes reports by athletic trainers, affiliated with the National Athletic Trainers' Association, to the Research Institute at Nationwide Children's Hospital, Columbus, OH. This on-line high school athletic injury surveillance system has been providing some important findings for this age group. Confirming other studies, the overall rate of injury per 1000 athlete exposures was 4.63 in competition and 1.69 for practice. For wrestling these rates were 3.93 for competition and 2.04 for practice. The ratio between competition and practice rates was also listed. This ratio was 2.73 overall, and for wrestling was 1.93. This was the lowest value for the five men's sports. This means that there was the smallest difference between practice and competition injury rates in wrestling. This is interesting in light of comments generally made about wrestling training – that it always maintains a rather high level of intensity in all practices. These data seem to support that generalization.*

Rossi, S. J. & Dodson, D. (2008). The Effect of a Competitive Wrestling Season on Salivary Cortisol and Recovery-Stress Scores. *Med Sci Sports Exerc*, 40, S392.

Keywords: analysis/competition/cortisol/overtraining/practice/recovery/Rest/Saliva/season/Stress/training

Abstract: Strenuous exercise training and competition without adequate rest and recovery may lead to decreases in performance and symptoms of overtraining. Alterations in cortisol concentrations and recovery-stress scores have been suggested as possible physiological and psychological predictors of overtraining. **PURPOSE:** The aim of the present study was to observe the influence of a competitive collegiate wrestling season on salivary cortisol concentration and Recovery-Stress for Athletics (RESTQ-Sport) scores and their association. **METHODS:** Salivary cortisol and RESTQ-Sport scores were collected during a competitive season from ten NCAA Division II varsity wrestlers. Once per week for 12 weeks subjects provided timed, un-stimulated saliva samples and completed the RESTQ-Sport before practice. Subjects were instructed on the proper technique for answering the questionnaire at each collection time point. Saliva samples were placed on ice until centrifugation and then stored at -20°C until analysis. **RESULTS:** Repeated measures ANOVA revealed significant difference in mean salivary cortisol ($F(11, 99) = 16.127; p < 0.01$) over the season, with the highest concentration at time point one and declining over subsequent time points. Significant differences were observed in mean scores of general stress ($F(11, 99) = 2.763; p < 0.01$), general recovery ($F(11, 99) = 5.628; p < 0.01$), sport specific stress ($F(11, 99) = 2.174; p < 0.05$), and sport specific recovery ($F(11, 99) = 1.931; p < 0.05$) over the season. The recovery-stress scores did not follow a specific pattern varying throughout the season. In addition, non-significant correlation coefficients were calculated between salivary cortisol concentration and general stress ($r = 0.248, p = 0.490$), general recovery ($r = 0.159, p = 0.661$), sport specific stress ($r = 0.153, p = 0.673$), and sport specific recovery ($r = -0.119, p = 0.744$). **CONCLUSION:** These data indicate that a competitive collegiate wrestling season significantly influences salivary cortisol concentration along with RESTQ scores; however, it appears these changes are independent and unrelated.

Editor's Note: *see abstract for Klentou, et al.*

Sakamoto, S., Midorikawa, T., Torii, S., & Kondoh, M. (2008). The Characteristic Of Sumo Wrestlers In University Concerning Lipid Metabolism And Obese Type. *Med Sci Sports Exerc*, 40, S276-S277.

Keywords: blood/Body Composition/DEXA/Insulin/Lipids/metabolism/Obesity/serum lipids/sumo/Body Weight/weight

Abstract: **PURPOSE:** To examine the relationship between the area of visceral fat and lipid metabolism regarding Sumo Wrestlers (SW) in university. **METHODS:** Subjects were 19 male SW (age 19.7 ± 0.9). In fasting state early morning blood sampling were performed to determine levels of serum lipids, lipid metabolism related enzymes (LME), and insulin (IRI). We measured body composition (BC) by body measurement and DEXA, and carried out MRI to measure the area of visceral fat (AVF) and subcutaneous fat (ASF) on the navel level. To measure maximal

lipid oxidation rate (MLOR), exercise tolerance tests were carried out including respiratory gas analysis. We classified 2 groups by the difference of AVF/ASF ratio. Its ratio was lower 0.4 in one group and higher than 0.4 in the other group. And we studied several data between 2 groups. Statistical significance ($p < 0.05$) of between-group differences was assessed by non-paired t-test. **RESULTS:** The results of the SW's BC were as follows: height (Ht) 176.3 ± 7.4 cm; body weight (BW) 120.1 ± 19.2 kg; BMI 38.8 ± 7.0 kg/m²; %FAT 29.3 ± 5.7 %; waist circumference (WC) 116.1 ± 14.1 cm; waist/height (W/Ht) ratio 0.66 ± 0.09 . We found out that all of them had over 100 cm² visceral fats on MRI. These revealed that they were obese due to visceral fat. In addition we compared several data between AVF/ASF ratio lower group (9) and higher group (6): Ht (lower group 175.9 ± 9.1 , higher group 175.7 ± 5.4 cm); BW (126.9 ± 13.7 , 127.1 ± 18.2 kg); WC (121.3 ± 10.4 , 121.3 ± 10.4 cm); W/Ht ratio (0.69 ± 0.08 , 0.69 ± 0.06); %FAT (30.9 ± 4.8 , 31.4 ± 5.2 %); MLOR (767.9 ± 143.7 , 707.3 ± 56.7 mg/min); T-Chol (173.5 ± 39.7 , 182.4 ± 30.4 mg/dl); HDL-cholesterol (45.8 ± 14.8 , 42.6 ± 3.9 mg/dl); TG (90.6 ± 32.5 , 125.8 ± 22.4 mg/dl, $p < 0.05$); IRI (12.4 ± 3.8 , 17.5 ± 9.0 microIU/dl); LPL level (48.8 ± 10.4 , 34.4 ± 8.7 ng/ml, $p < 0.05$); LCAT (98.2 ± 20.0 , 111.5 ± 23.0 nmol/ml/hr); AVF (137.9 ± 37.5 , 221.0 ± 47.1 cm², $p < 0.05$); ASF (505.5 ± 122.1 , 449.3 ± 124.3 cm²). **CONCLUSIONS:** These facts implied that SW surveyed might have an abnormal lipid metabolism. AVF/ASF ratio higher group demonstrated higher level of TG, LPL and AVF than its ratio lower group, but did not always show same tendency concerning waist circumference and W/Ht ratio. Therefore we concluded that it is more useful to evaluate visceral type obesity by MRI.

Schiller, J. & Ebersson, C. (2008). Spinal deformity and athletics. *Sports Med Arthrosc*, 16, 26-31.

Keywords: Age/competition/injuries/participation/Physical Therapy/Spine/therapy

Abstract: Exercise and athletic competition for the young individual has become increasingly more important in society. Scoliosis and Scheuermann kyphosis are spinal deformities prevalent in up to 2% to 3% and 7% of the population respectively, requiring nonoperative and occasionally operative treatment. Curve progression and patient physiologic age dictate treatment regimens. Bracing and physical therapy is the mainstay for nonoperative treatment, whereas soft tissue releases and fusion with instrumentation are used for operative correction. Athletic activity and sports participation is usually allowed for patients undergoing nonoperative treatment. Return to sport after surgical correction is variable, often decided by the treating surgeon, and based on the level of fusion and sporting activity. Although most treating surgeons promote some form of activity regardless of treatment modality chosen, caution should be taken when deciding on participation in collision activities such as football and wrestling.

Sisjord, M. K. & Kristiansen, E. (2008). Serious Athletes or Media Clowns? Female and Male Wrestlers' Perceptions of Media Constructions. *Sociology of sport journal*, 25, 350-368.

Keywords: analysis/Attention/Female/gender/Perception/psychology/sociology

Abstract: The present study explores Norwegian female and male elite wrestlers' perceptions of media coverage of wrestling and of themselves as athletes. In-depth interviews were conducted with four female and four male elite wrestlers. Data analysis revealed that the wrestlers experienced media attention as limited and gender stereotyped, with a dominant focus on hegemonic masculinity. In addition, the wrestlers perceived that media coverage distorted their sport performance by focusing on sensational aspects and scandals rather than on actual performances and results. Some of the athletes' descriptions of representations in the sports media and commercial television illustrated that, in their perception, they were viewed more as media clowns than as serious athletes.



Editor's Note: In general, it would seem that the media seems to focus on the extreme, the unusual, and of course, the bizarre. Those of us involved in wrestling can try to educate the media, so that the focus can be on the athlete's achievements. These researchers seem to blur the lines between legitimate sport and that of professional wrestling, which for most of us involved in the sport are as far apart as night and day. Their obsession with such topics as "hegemonic masculinity," makes reading this article rather difficult, if one is not engaged in the battles of class and gender warfare. I agree that the fascination on the extremes of the sport,

such as weight-cutting, can be exaggerated and brought to center stage, rather than focusing on the athlete. This was the case with a Chicago Sun-Times article covering hometown wrestler TC Dantzler, which dwelled on his struggle to make weight, to which the author attributed his poor results. I like to hold up the extreme achievements of athletes such as Patricia Miranda, who not only has won world and Olympic medals, but has compiled outstanding academic credentials including Phi Beta Kappa at Stanford and a Juris Doctorate from Yale.

Steerman, J., Reeder, M., Udermann, B., Pettitt, R., & Murray, S. (2008). Avulsion fracture of the iliac crest apophysis in a collegiate wrestler. *Clin J Sport Med*, 18, 102-103.

Keywords: avulsion fracture/hip/injuries

Sun, J., Zhao, Y., Peng, Z., Shen, Z., & Xu, X. (2008). Main Opponent of Chinese Woman Wrestling Team at 29th Olympic Game--The Characteristic Analysis of Skill and Tactics of Japanese Woman Wrestling Team. *Journal of Tianjin Institute of Physical Education/Tianjin Tiyu Xueyuan Xuebao*, 23, 182-184.

Keywords: analysis/competition/experience/Olympics/tactics/team/women

Abstract: The Japanese woman wrestling team is strongest team in the world. Through observation, video, statistics, comparative analyzing and expert interviews we studied the skill and tactics of Olympic wrestlers of the Japanese woman wrestling team. The purpose was to provide a few references and suggestion for the Chinese woman wrestling team in preparing the competition in 2008 Beijing Olympic Game. The result indicated that the standing technique action of Japanese woman wrestling team was mainly carrying one leg and a pair of legs; Holding in self arms shouldering neck keeping self position was weak; par terre position offence and defense ability was weaker; Be outstanding in applying to tactics using to attack score and forcing to be out of bound tactics; At the same time, due to rich experience, the wrestler has higher ability and tenacious will of tactics quality.



Editor's Note: I include a picture if Kaori Icho, one of Japan's female superstars. Five World Championships and Two Olympic Golds!

Timpmann, S., Oopik, V., Paasuke, M., Medijainen, L., & Ereline, J. (2008). Acute effects of self-selected regimen of rapid body mass loss in combat sports athletes. *J Sports Science and Medicine*, 7, 210-217.

Keywords: Ammonia/Glucose/lactate/Nutrition/urea/Weight Loss/muscle/combat sports/Torque/Knee/speed/blood

Abstract: The purpose of the study was to assess the acute effects of the self-selected regimen of rapid body mass loss (RBML) on muscle performance and metabolic response to exercise in combat sports athletes. Seventeen male athletes (20.8 ± 1.0 years; mean ± SD) reduced their body mass by 5.1 ± 1.1% within 3 days. The RBML was achieved by a gradual reduction of energy and fluid intake and mild sauna procedures. A battery of tests was performed before (Test 1) and immediately after (Test 2) RBML. The test battery included the measurement of the peak torque of knee extensors for three different speeds, assessment of total work (W_{tot}) performed during a 3-min intermittent intensity knee extension exercise and measurements of blood metabolites (ammonia, lactate, glucose and urea). Absolute peak torque was lower in Test 2 compared with Test 1 at angular velocities of 1.57 rad·s⁻¹ (218.6 ± 40.9 vs. 234.4 ± 42.2 N·m; p = 0.013) and 3.14 rad·s⁻¹ (100.3 ± 27.8 vs. 111.7 ± 26.2 N·m; p = 0.008). The peak torque in relation to body mass remained unchanged for any speed. Absolute W_{tot} was lower in Test 2 compared with Test 1 (6359 ± 2326 vs. 7452 ± 3080 J; p = 0.003) as well as W_{tot} in relation to body mass (89.1 ± 29.9 vs. 98.6 ± 36.4 J·kg⁻¹; p = 0.034), respectively. As a result of RBML, plasma urea concentration increased from 4.9 to 5.9 mmol·l⁻¹ (p = 0.003). The concentration of ammonia in a post-test sample in Test 2 tended to be higher in comparison with Test 1 (80.9 ± 29.1 vs. 67.6 ± 26.5 mmol·l⁻¹; p = 0.082). The plasma lactate and glucose responses to exercise were similar in Test 1 and Test

2. We conclude that the self-selected regimen of RBML impairs muscle performance in 3-min intermittent intensity exercise and induces an increase in blood urea concentration in experienced male combat sports athletes.
Notes: vahur.oopik@ut.ee

Unverzagt, C., Schuemann, T., & Mathison, J. (2008). Differential diagnosis of a sports hernia in a high-school athlete. *J Orthop Sports Phys Ther*, 38, 63-70.

Keywords: hernia/hip/injuries/sports hernia

Abstract: **STUDY DESIGN:** Resident's case problem. **BACKGROUND:** Chronic anterior hip and groin pain is a growing concern among high-performance athletes. This manuscript enforces the need for physical therapists to remain current with its complex differential diagnosis, as it can be debilitating for the athlete and equally frustrating for the sports medicine team. This resident's case problem details the account of an 18-year-old high-school wrestler who presented to the high-school sports medicine team without physician referral. His chief complaint was chronic right anterior hip and groin pain, which had been variable in frequency and intensity for 3 years. **DIAGNOSIS:** A screening examination for serious underlying pathology was negative. After physical examination, it was determined that this individual had signs and symptoms consistent with a sports hernia. He was referred to a general surgeon who diagnosed him with a symptomatic inguinal hernia and later performed laparoscopic evaluation and treatment. The patient had a moderate-size indirect inguinal hernia sac, which was carefully dissected away from the remaining contents of the spermatic cord and was repaired with a Parietex mesh. At a 2-week postoperation follow-up, the patient was asymptomatic and cleared to return to wrestling and baseball without limitations. **DISCUSSION:** This resident's case problem demonstrates the debilitating and often elusive nature of a sports hernia. It suggests that the diagnosis is not well understood and emphasizes the importance of a robust medical foundation for each member of the sports medicine team conducting athletic evaluations.

Editor's Note: *Here is some background from David R. Farley, M.D., General Surgery, Mayo Clinic, Rochester, Minn. A hernia, strictly speaking, is an abnormal protrusion from one part of the body into another. For example, one of the most common types -- an inguinal hernia -- occurs when soft tissue (usually, part of the intestine) bulges through a weak point or opening in the muscle of the lower abdomen. In the misnamed "sports hernia," however, there is usually no bulge. Occurring in the same general area -- the groin -- as that of an inguinal hernia, a sports hernia is a tear, strain, or weakness in one of the three muscles or the fascia ("gristle" that attaches muscle to bone) of the abdominal wall. Sports hernias are thought to result from extreme, forceful and repeated twisting-and-turning movements, as in serious levels of play in sports such as soccer, hockey and tennis. As such, it is an affliction of professional athletes and is very rare among, say, two-mile joggers. Actually, it is even rare among heavy-duty athletes.*

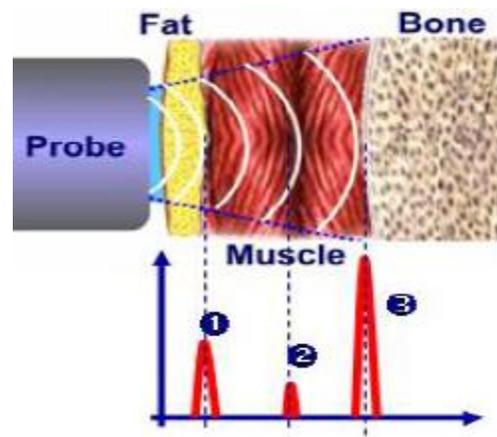
Utter, A. & Hager, M. (2008). Evaluation of ultrasound in assessing body composition of high school wrestlers. *Med Sci Sports Exerc*, 40, 943-949.

Keywords: BIA/Body Composition/body density/body fat/hydration/hydrostatic weighing/skinfolds/urine specific gravity

Abstract: **PURPOSE:** To evaluate the accuracy of ultrasound (ULTRA) in assessing fat-free mass (FFM) in comparison with hydrostatic weighing (HW) and skinfolds (SK) in high school wrestlers in a hydrated state. **METHODS:** Body composition was determined by ULTRA, HW, and three-site SK in 70 high school wrestlers (mean +/- SD: age, 15.5 +/- 1.5; height, 1.60 +/- 0.08 m; body mass, 65.8 +/- 12.7 kg). For all methods, body density (Db) was converted to percent body fat (%BF) using the Brozek equation. Hydration state was quantified by evaluating urine specific gravity. **RESULTS:** There were no significant differences for estimated FFM between ULTRA (57.2 +/- 9.7 kg) and HW (57.0 +/- 9.9 kg); however, SK (54.9 +/- 8.8 kg) were significantly different from HW. The standard errors of estimate for FFM with HW as the reference method were 2.40 kg for ULTRA and 2.74 kg for SK. Significant correlations were found for FFM between HW and ULTRA ($r = 0.97$, $P < 0.001$) and between HW and SK ($r = 0.96$, $P < 0.001$). A systematic bias was found for SK, as the difference between SK and HW significantly correlated with the FFM average of the two methods ($r = -0.38$, $P < 0.001$). This systematic bias was not found for ULTRA ($r = -0.07$). **CONCLUSIONS:** This study demonstrates that ULTRA provides similar estimates of FFM when compared with HW in a heterogeneous high school wrestling population during a hydrated state. ULTRA should be considered as an alternative field-based method of estimating the FFM of high school wrestlers.

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Editor's Note: I have had the pleasure of testing a BodyMetrix unit provided by Luiz Da Silva, Ph.D, of IntelaMetrix Inc. from Livermore, CA. ldasilva@intelamatrix.com www.intelamatrix.com



It is quite easy to use. While it does not require the training of calipers and skinfold methodology, it does require the proper location of the measurement site. It will be interesting to see if the standard errors indicate that it is superior to BIA in wrestling populations.

T. Walton and M Helstein. (2008) Triumph of Backlash: Wrestling Community and the "Problem" of Title IX. *Sociology sport j* 25 (3), 369-386.

Keywords: Sociology/women/TitleIX

Attempts to unify and mobilize the U.S.collegiate wrestling community to "save" it from decline frames Title IX as the main "problem" to overcome. The logic of a community of identification at work in this strategy limits the interventions that can be made for wrestling while enabling corporate men's sport to remain the hegemonic form of U.S. collegiate athletics. We explicate and critique the varied articulations of wrestling as a community of identification following Helstein's (2005) call to deconstruct assumptions of unified sporting communities and to consider communities of articulation. We illustrate how communities of identification necessarily fail and how moving toward communities of articulation offers an intervention that enables a reframing of the relationship between Title IX and collegiate wrestling that could motivate meaningful change.

Editors Note: An interesting article. It provides those of us in wrestling a different perspective, or way of looking at things. It does seem, however, seem that any questions or criticism regarding the effects of Title IX, are immediately dismissed.

Wang, J., Zhou, C., & Sheng, Z. (2008). The Influence of Psychological Intervention on the Pre-game Mental State of Elite Greco-Roman Wrestlers. *J Tianjin Inst Phys Educ/Tianjin Tiyu Xueyuan Xuebao*, 23, 217-221.

Keywords: Anxiety/Cognition/Fatigue/psychology/China

Abstract: We choose 17 wrestlers as the objects who take part in the 10th National Games, and we take 3 month psychological intervention before the game. We choose anxiety, psychological fatigue and mood state as the assessment indexes. The result showed that the index of psychological fatigue of the intervention group is dramatically lower than the control group; represent at the wrestlers' achievement and negative evaluate indexes; more stable mood state, represent at TMD, nervous, rage, depression and fluster; less cognition anxiety level compared to the control group. The level of psychological fatigue enforce after the experiment, represent at the achievement; The mood state is more stable after the experiment, represent at TMD, nervous, rage, fatigue and depression; The self-confidence is higher after the experiment. The wrestlers' psychological fatigue, mood state and sport anxiety improve dramatically after Individualized studied.

Yan, Z. (2008) Research on the Origin and Development of Sumo Wrestling. *Journal of Chengdu Sport University*, 34, 42-45.

Keywords: folk wrestling/history/sumo/Universities/Back/Sports/China/experience

Abstract: Through reviewing relevant literature, logical analysis...etc, the thesis writers explore the origin, evolution and development of Sumo wrestling and expound Sumo wrestling's origin in China and origin and development in Japan, which can provide references and experiences for China to understand and bring back Sumo wrestling.



Zhang, X. (2008). A Study of Characteristics of Biochemical and Physiological Index of Elite Chinese Woman Wrestlers before Competitions. *Journal of Beijing Sport University*, 31, 477-482.

Keywords: Ammonia/blood/China/competition/conditioning/cortisol/Lactic Acid/Testosterone/training/women

Abstract: The article studies the characteristics of the physiological and biochemical indexes of elite Chinese women wrestlers prior to major tournaments. It includes an in-depth analysis of the wrestlers' cortisol, testosterone, blood ammonia, hematuria and blood lactic acid levels, as well as a discussion on the issues' implications for sports science.



Medical & Anti-Doping
Report of the
GRECOROMAN, FREE STYLE & FEMALE WRESTLING
2008 BEIJING OLYMPIC GAMES
Beijing China
12-21 August 2008



Qualified athletes from 51 countries including 139 Greco-Roman (GR), 139 Free Style (FS) and 66 Female (FS) wrestlers participated in 2008 Beijing Olympic Games in all weight categories. I was appointed as the official FILA Doctor of the games. My colleagues Dr. Feldman and Dr. Chahi, members of FILA medical, prevention and anti-doping committee, assisted me during the games.

I arrived in Beijing on August 09 and arranged a meeting with medical service manager, Dr. Huang and doping control manager, Dr. Xufeng to discuss about the procedures and necessary coordination. After the meeting, venue medical office, stations, mats, weight control hall and doping control office were inspected. Medical team of the organizing committee was responsible for pre-participation medical examination of wrestlers as well as providing medical coverage during the competitions. Doping control team was responsible for notifying the selected athletes, taking and transferring the samples to the Beijing accredited doping control laboratory under the IOC supervision. All athletes were placed in Olympic village, 30-minute drive far from the wrestling venue, the China Agricultural Gymnasium.



Medical Examination

According to the FILA Health regulations, all the participant wrestlers underwent a preparticipation medical examination.

Medical examinations were performed by the medical team of the organizing committee under direct supervision of the official FILA doctor on August 11-13 for GR, 15-16 for FW & 18- 20 for FS.

There were three equipped stations for medical examinations next to the weigh in hall. All medical examiners were trained to check up the athletes

according to FILA health regulations including controlling the vital signs and hair and skin inspection. No serious case was found during the examinations. Many

wrestlers from different countries didn't have their medical certificate which is necessary for completion the medical examination procedure according to the articles 7-9 of the "FILA Health Regulations". It is something that FILA should pay enough attention since it is in contrast to the FILA Health Regulations. In my opinion, FILA should take this matter seriously and prevent participation of the wrestlers who do not observe the rules or FILA Health Regulations should be modified.



First Aid & Medical Service

To provide medical coverage during the competitions, there was a medical team established by the organizing committee. Two equipped stations with qualified medical personnel were placed beside the mats. Most of the injuries were mild and treated by team doctors. No serious injury occurred and no competition was discontinued because of injury.

Recorded injuries are listed in the table 1. In Average the rate of injuries during the wrestling events of 2008 Beijing Olympic Games was 9.3%.

Out of 32 recorded injuries, five injuries (15.6%) classified as moderate in severity and the rest (84.4%) were mild. No severe injury was happened (table 2).



Table 1 - Type and number of injuries

Type of Injury	Place	GR	FW	FS	Total
Laceration	Head	3		2	5
	Eyebrow	1	1	2	4
	Ear			2	2
	Face		2	2	4
	Lip		1	2	3
	Chin	1		1	2
	Hands			1	1
Bleeding	Nose	2		2	4
Muscle strain	Hamstring	1			1
Ligament Strain	Elbow	1			1
	Knee	1			1
	Ankle	1			1
	Hands/Fingers				
Total Injuries		13	5	14	32
Injury Rate		9.35%	7.57%	10.07%	9.3%

One wrestler (Daniel Cormier, FS, 96 kg, USA) couldn't participate in the competitions due to renal disease. This condition was documented officially by the USA team manager and approved by the FILA doctor.

Table 2 - Severity of injuries

Severity of Injury	Definition	GR	FW	FS	Total	
Mild	Treated on the mat	10	5	12	27	84.37%
Moderate	Transferred to the venue clinic	3		2	5	15.63%
Severe	Transferred to the hospital	0	0	0	0	0

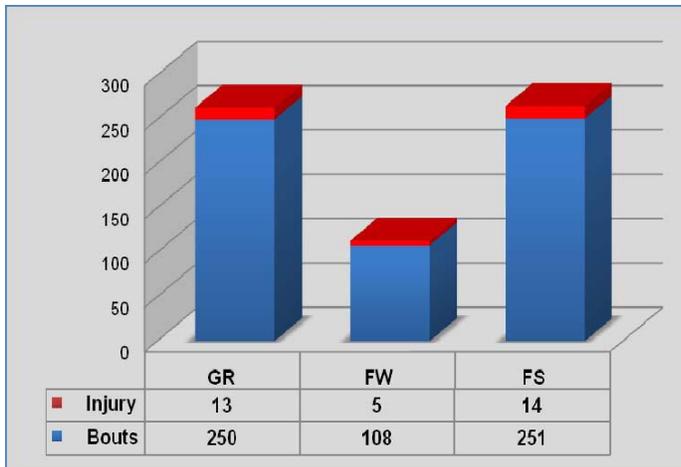


Figure 1- Injury rate per bout in each wrestling style during 2008 Beijing Olympic Games

Greco-Roman

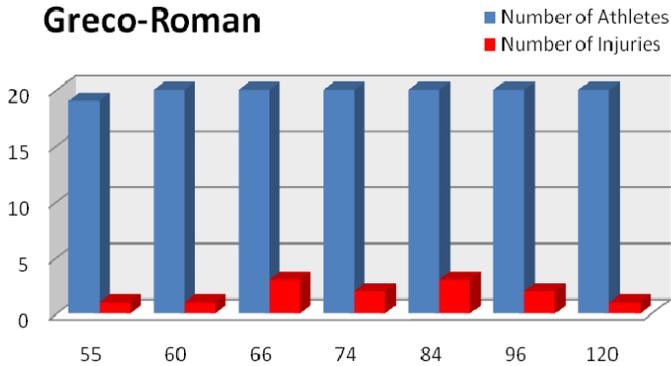
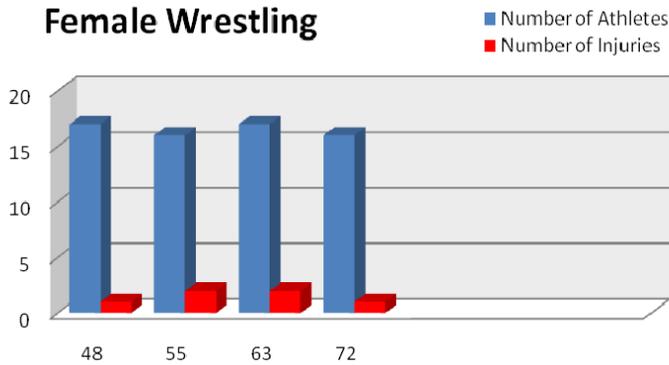
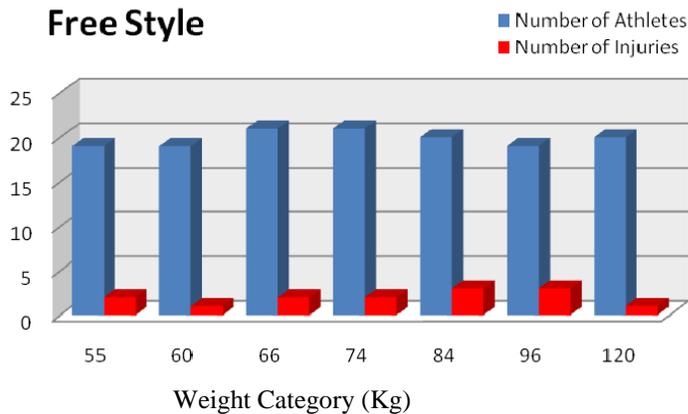


Figure 2 – Injury rate per athlete in each weight category of wrestling styles during 2008 Beijing Olympic Games

Female Wrestling



Free Style



In comparison to 2004 Athens Olympic Games, the rate and severity of injuries in all wrestling styles showed a very significant reduction (table 2). Statistical analysis of the collected data during 2004 Athens and 2008 Beijing Olympic Games demonstrates a huge decline in injury rate (9.3% in Beijing versus 46.26% in Athens).

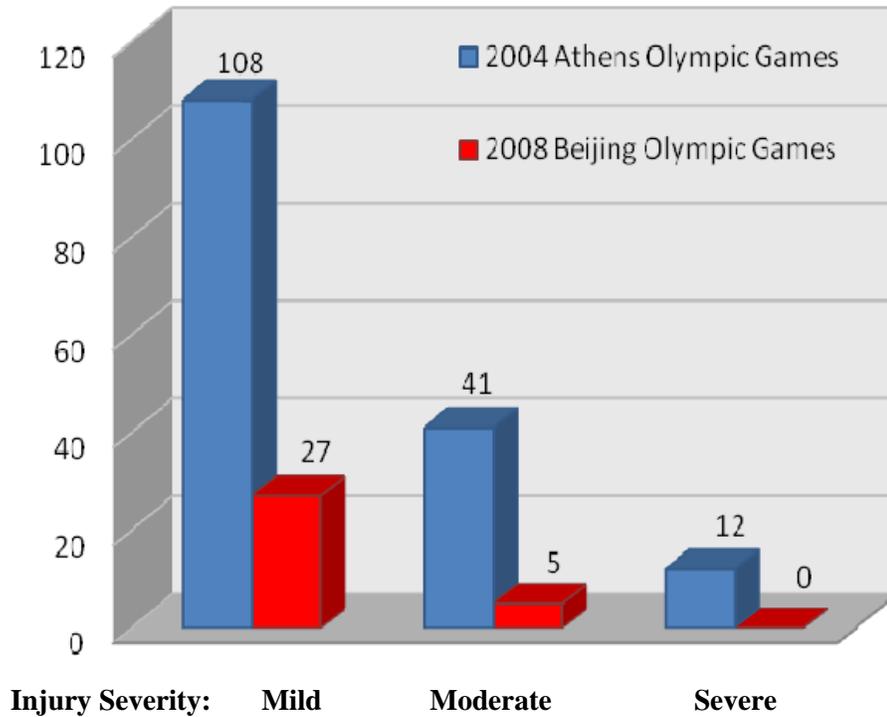


Figure 3- Comparison of number and severity of injuries between 2004 Athens and 2008 Beijing Olympic Games

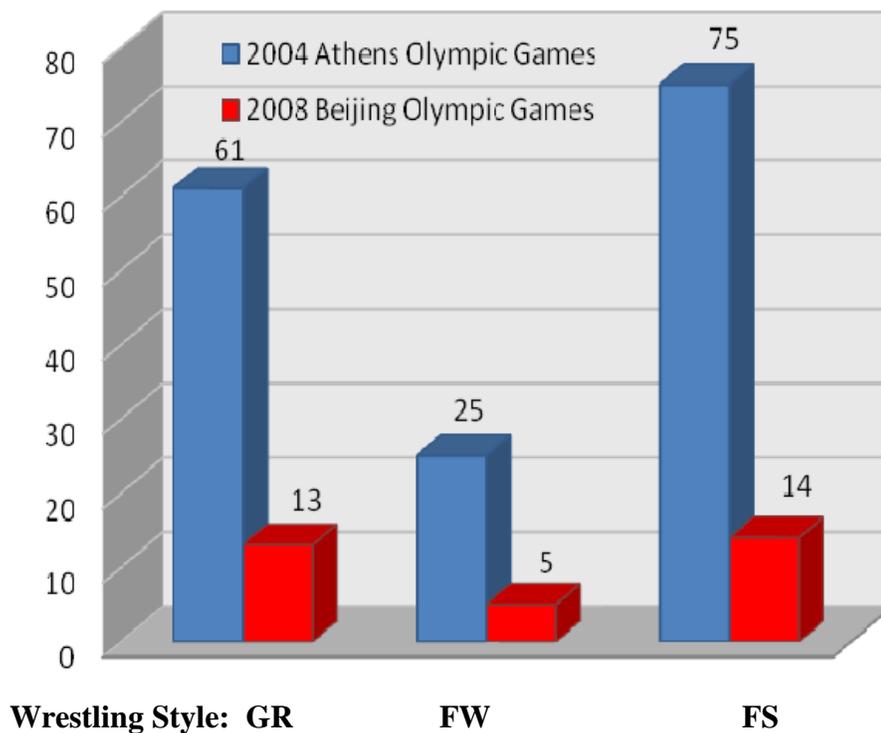


Figure 4- Comparison of number of injuries in each wrestling style between 2004 Athens and 2008 Beijing Olympic Games

This very considerable reduction in number and severity of injuries from 2004 Athens Olympic Games to 2008 Beijing Olympic Games is very important and needs further analysis and discussion. However, it seems that modification of wrestling rules, better education of athletes and coaches and a serious fight against doping in wrestling during the recent years have had a great influence on prevention of injuries in wrestling competitions of 2008 Beijing Olympic Games. This experience can potentially become a model for a successful planning of an international sport federation for prevention of sport injuries.

Doping Control

Doping control team was in charge of taking and transferring the samples to the Accredited Anti-Doping laboratory of the Beijing, under supervision of IOC. According to FILA Anti-Doping Code, all gold, silver and bronze medallists plus three randomly selected athletes in each weight category were notified for doping control and provided samples. All the taken samples were urine and no blood sample was taken. Total number of tested wrestlers was 126. No refusal or misbehaviour is reported. Doping control procedure and chain of custody was carefully controlled and was satisfactory. BOGOC didn't issue a specific copy of athletes doping control form for international federations.



In summary, medical coverage and doping control program of 2008 Beijing Olympic Games were satisfactory and proper. At the end, I would like to appreciate all efforts, attention and supports of president Martinetti, and Mr. Dusson, general secretary of FILA, during the recent years which enabled us to experience a safer Olympic Games with fewer injuries. Also I need to value the directions of Dr. Tavakol, president of FILA medical, prevention and anti-doping committee, and to thank my colleagues Dr. Feldman and Dr. Chahi for their tremendous efforts and assistance during the games. I respect and acknowledge the efforts of the organizing committee of wrestling competitions of 2008 Beijing Olympic Games.

Dr. Babak Shadgan

A handwritten signature in black ink that reads 'Shadgan'.

September 22, 2008

FILA Doctor, 2008 Beijing Olympic Games

Editor's Note: Thank you to Dr. Shadgan for this outstanding report. It is certainly unequivocally clear from the data presented that there was, indeed, a very dramatic decrease in the number and the severity of injuries which occurred in 2008, in contrast to the data from the 2004 Olympic Games in Athens. I have no doubt that the decreased numbers are statistically significant. However, there is no evidence that these decreases are the result of changes in wrestling rules, improved education of athletes and coaches, or more vigilant Doping control measures. The rule changes, which were implemented after the 2004 Olympic Games, do not specifically seem to point towards a decrease in injury rate and severity. As a matter of fact, some feared a rise in injuries in Greco-Roman following the adoption of the reverse-lift clinch. Between 2004 and 2008, there were not any new or different educational programs which were offered to athletes and coaches in an effort to decrease injury rate and severity. There were no significant modifications in Doping control between 2004 and 2008, which might explain the dramatic decline in injury rate and severity. So while the reduction is indeed welcomed, attributing it to a specific factor is at this point speculation. Due to this report, we now will have baseline data for future comparative studies.



**Advanced School for Coaches Greco-Roman Wrestling
13nd-16th November, 2008–Hennef (GERMANY)**

THE ADAPTATION OF INTERNATIONAL PREPARATORY TOURNAMENTS INTO THE YEARLY PLANNING IN WRESTLING

Assist. Prof. Ramazan Savranbaşı (PhD)

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

The main purpose of this study is to explain adaptation of international preparatory tournaments of national Olympic wrestlers in to the yearly planning (micro and macro planning). FILA was founded at the beginning of the 20th century, in 1912. International wrestler's union (Internationaler Ring Verband) was organized the first two World Championships in Helsinki (1921) and Stockholm (1922) respectively. During the sixties FILA made great progression. One of the important improvements was the publication of the FILA bulletin. Since then, it has been still publishing. Nowadays, via internet, this bulletin is more easy to reach.

As it was in all sportive events, the main target of the preparation is success in competition. Naturally, FILA's competition calendar was the determent of the annual and Olympic planning of the preparation. That's why this calendar should be perceived as international template by international federation and coaches. As it was shown in the Table 1 FILA 2009 Calendar involves total of 103 organizations. Those are 17 world and continent championships, 3 world cup, 3 games championships, 78 preparatory tournaments, 2 golden grand prix.

Table 1. 2009 Competition Calendar of FILA

2009 Competition Calendar of FILA	Continental and World Championships	World Cups	Games	Golden Grand Prix	International Competitions	Total
Numbers of Competition	17	3	3	2	78	103

The yearly goals are set according to athletes' conditions and abilities, if the goals had not been predetermined, Annual planning becomes complicated and unsuccessful. One of the important aspects of the annual planning which coaches should pay attention is competition calendar. Competition calendar should be matched with the yearly training periodization. Coaches do not have any initiation for the competition calendar that is prepared by FILA. They only have chance to chose appropriate competitions of 78 international tournaments that fits in to their yearly programming.

INTERNATIONAL PREPARATION TOURNAMENTS

Last 30 year, the numbers of completions in all styles and age groups that are placed in FILA calendar are increasing drastically. That helps improvements of the wrestling. Nowadays, associative preparation camps are organized right before the international preparatory tournaments. Those camps contribute some of the developing countries and help to raise the new stars in wrestling. The USA, CUBA, JAPAN, EYPT, TURKEY are the countries which get benefits out of this camps. Also FILA encourage some of the countries like Turkey, Senegal, USA, France, Finland, Japan, Spain and Italy to have associative camping centre. Then, it approves their convenience.

Most of the preparatory tournaments are organized by the assertive countries that would like to be successful. When we looked at the FILA calendar, the countries that are organized the tournaments are shown in Table 2. Countries which organized the tournaments could participate those competitions with high numbers of young and inexperienced wrestlers. International game experience is the key parameter for the higher performance. Table 2 reflects the fact. The same concept is true for the countries that participate those tournaments frequently. As it was said by the old fashioned trainers; one competition is equal to dozens of training. Or none of the training could replace the place of preliminary competition. Of course those saying are precious. On the other hand the most important thing is to choose the right competition at the right time. Planning of the preliminary tournament is one of the important missions of the coaches. It also helps to promote wrestling in countries that organized the tournaments.

Table 2 The countries that organized the most of the preparation tournaments

RUS	TUR	USA	IRN	FIN	CAN	EGYP	BUL	FRA	POL
9	5	5	5	3	3	3	3	3	3

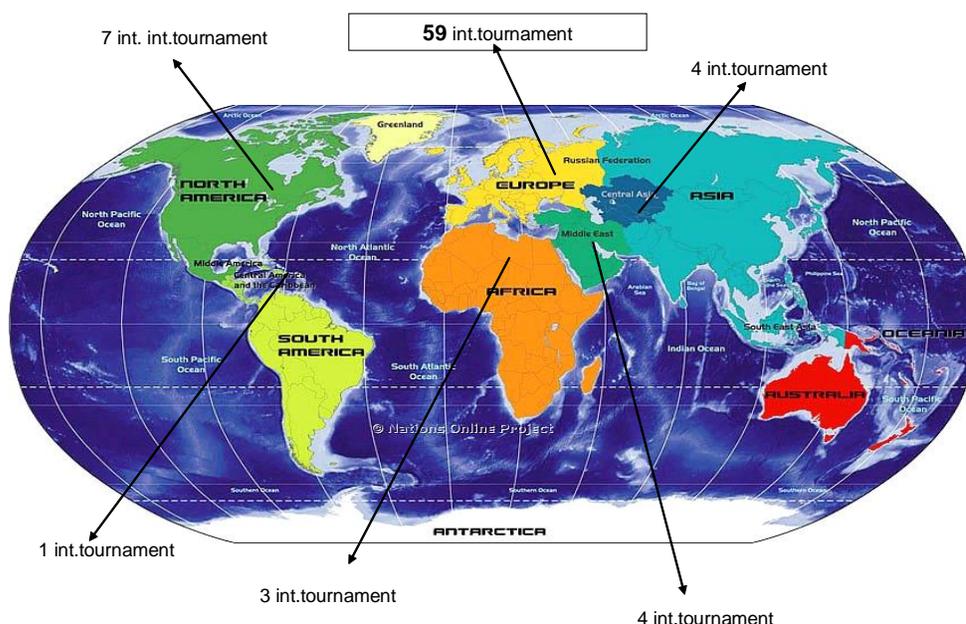
According to FILA calendar in all styles of wrestling and age groups;
Greco-Roman senior (29), junior (12), cadet (10)
Free style senior (35), junior (10), cadet (6)
Free style women senior (27), junior (9), cadet (5) total of 144 tournament were organized.

Table 3. The number of tournaments according to the wrestling styles and age groups.

2009 Calendar FILA	Greco-Roman Senior	Greco-Roman Junior	Greco-Roman Cadet	Free Style Senior	Free Style Junior	Free Style Cadet	Free Style Women Senior	Free Style Women Junior	Free Style Women Cadet
Numbers of International Preparation Tournaments	29	12	10	35	11	6	27	9	5

When we look at the world wide, 59 of the FILA tournaments were taken place in Europe. The reason of the condensity is prevalence and advancement of the wrestling.

Figure 1. International Tournaments according to the continent



DISTRIBUTION OF THE FILA INTERNATIONAL TOURNAMENTS IN 2009

When we analyzed the International tournaments of FILA according to the age groups or wrestling styles, Greco Roman, free styles (men and women) tournaments mostly are held in January, February and March. Especially in February all three age category have the same intensity. This intensity is not coincidental. Tournament between the continents (Europe, Asia, Pan-American, Africa) and world cup are held right after the February.

In senior category (Greco Roman, Free Style (men and women) between the intercontinental tournaments and world cup, the number of tournaments decreases in half. When we analyze tournaments is in October and November, the number is increase. Those tournaments were placed at the beginning of the preparation period. Those tournaments name as a preparatory tournaments which are organized right after world championship. The purposes of these tournaments are to gain experience and determination of the incomplete parts for the young wrestlers who can be only the second best.

In junior Category as it is in seniors, Tournaments are taken place in March, April and May, right before the intercontinental championships. In juniors there is approximately one month period between intercontinental and world tournaments. That's why at that time there is no tournament.

In cadets, tournaments are taken placed especially in April, May and June intensely. In general tournaments as it is in other categories are held in some where close to championships.

THE PURPOSE OF THE INTERNATIONAL PREPARATION TOURNAMENTS

Annual planning is organized by dividing the year in to different training periods such as preparation, competition and transition periods. Then those parts could be divided in to macro and micro cycles. With in the periodization, preparation tournaments should be chosen according to national teams' goals, conditions and potentials. In this planning and programming the most authorized person is trainer. That's why, calendar of FILA should be carefully evaluated by the trainer. Criteria for preparation tournaments should be set.

As it was in whole sports branches, control is inevitable. Nowadays, control of preparation could be done with variety of ways like laboratory or field tests. On the other hand the natural and specific way of controlling the preparation is preparatory tournaments. Even some of the test like urine or blood test should be done during those tournaments. The purpose of these tournaments for young and cadet are mostly future oriented. On the other hand, it is additional and controllable training load for seniors. Winning and losing of those tournaments should not be exaggerated by the manager of the countries. The only purpose of preliminary tournament is preparation.

International preparatory tournaments are not only the way of controlling wrestler's preparation, but also that participate the psychological and physiological improvements of the wrestlers. Athletic structure of the wrestling which is technical, tactical and combat makes it mandatory. In brief the purpose of the international tournaments are;

- Improvements of the experiences of high level national wrestlers.
- Train wrestlers in intensity above the training levels.
- Get the rivals known
- Controlling the improvements of the wrestlers in competition conditions.
- Preparation and motivation of the 2nd, 3rd and 4th best wrestlers of the national team. Keep them dynamic.
- According to tournament results determination of the national team in some of the weight category.
- Trials of the wrestler in different weight category.

WHAT SHOULD BE THE CRITERIA TO CHOOSE THE INTERNATIONAL PREPARATION TOURNAMENTS?

-
- Level of the tournament
- Quality of the wrestlers who participate the tournaments
- Yearly feasibility of the tournament (date of the tournament)
- Organization quality of the tournament
- Geographic feasibility of the tournament (distance, climate, transportation)

WHAT SHOULD BE THE CRITERIA TO SELECT WRESTLERS FOR THE INTERNATIONAL PREPARATION TOURNAMENTS?

- Age and developmental level of the wrestler
- The goal of the wrestler
- Training level of the wrestler.

HOW MANY PREPARTION TOURNAMENTS SHOULD BE ATTENDED?

Participation to international preparation tournaments should be evaluated according to Olympic periodization for the seniors. Young promising or alternative wrestlers (2nd, 3rd or 4th class) should be attending 1 or 2 tournaments in preparatory phase. During competition period according to Olympic planning 4 or 5 tournaments would be better for them to participate. Table 4 showed the preparatory tournaments that wrestlers could participate during Olympic planning.

Champion wrestlers, who got the gold medal during world or Olympic championships, usually avoid preparatory tournaments. That could be interpreted that they are avoiding from injuries, or decoding by the prospective opponents. On the other hand they usually attend to Grand prix tournaments with the prize. That pattern could be logical on the other hand missing celebrity wrestlers in those tournaments will result lost of spectators.

Table 4. **International Preparatory Tournaments for four years.**

	Number of International Preparatory Tournament
I.Year	
Preparatory period	1 - 2
Competitive period	4 - 5
Transitory period	-
II. Year	
Preparatory period	1 - 2
Competitive period	4 - 5
Transitory period	-
III.Year	
Preparatory period	1 - 2
Competitive period	3 - 4
Transitory period	-
Preparatory period	1 - 2
Competitive period	2 - 3
Transitory period	-
IV.Year	
Preparatory period	1 - 2
Competitive period	2 - 3
Transitory period	-
Preparatory period	-
Competitive period	1 - 2
Transitory period	-

TRAINING PROGRAMS FOR THE WRESTLERS WHO PARTICIPATE INTERNATIONAL PREPARATORY TOURNAMENTS

Selecting preparatory tournaments are important but programming the micro cycle that involve this type of tournaments is significant. Generally human organism would adapt the load and show adaptation after 6-8

repetition. Practical point of view, during 2 weeks competition period, competition type of loading could be applied 6-8 times. In fourteen days competition period, first week; 4 times, second week; 3 times competition type of loading could be used. Macro purposes of the training period should not be forgotten. Those goals should be in the programme at least 2 times a week. The loading profile of the first week should be higher than the second week. In weekly loading competition day should be taken in to consideration and full day loading rule (at least 5 games in a day) should be applied. Loading principle should be according to weight classification and appropriate day of the competition according to weight classification like Saturday or Sunday. After tournament at least 2 to 3 days full recovery are recommended. Table 5 indicates 2 weeks micro cycle of the wrestlers who participate in international preparation tournaments.

Table 5 Two weeks example of a model micro cycles of the wrestlers who participate international preparation tournaments.

Days	Training type week I.			Training type week II.		
	Morning	Afternoon		Morning	Afternoon	
Monday	Rest	Rest		Rest	Rest	
Tuesday	GGP	TTP		GGP	TTP	
Wednesday	CMT (A&B)	CMT		GGP	Rest	
Thursday	Rest	GGP		Rest (A&B)	CMT	
Friday	GGP	Rest		Rest	Rest	
Saturday	CMT (A group)	CMT		CMT (A group)	CMT	
Sunday	CMT (B group)	CMT		CMT (B Group)	CMT	

G P P: general physical preparation TTP: technico- tactical preparation CMT: competition model wrestling training

A group: 55 kg, 66 kg, 84 kg, 120 kg

B group: 60 kg, 74 kg, 96kg,

None of the programme will work 100 % as it was planned. Because of social and economic reasons, injuries and illnesses, the plan could be interrupted. On the other hand, we try to solve the problem with the help of sports science and experience. According to our experience and observations even in the ideal plan, 10-20% changes are acceptable. As a result, planning is inevitable but, changes could be done according to the outcome of the application.

Analysis of the 2008 Olympic Greco-Roman Wrestling Competition

**DAVID CURBY
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JANUARY 2, 2009

BACKGROUND

This report summarizes some of the findings from an analysis of the scoring characteristics of the Greco-Roman wrestling at the Beijing Olympic Games. Greco-Roman wrestling has been a part of the modern Olympic Games since their inception in 1896. International competition is overseen by the International Federation of Associated Wrestling Styles (FILA). 166 National Federations belong to FILA. Greco-Roman wrestling is one of the two main forms of international wrestling and does not allow for holds to be taken below the waist. According to the ranking of the last World Cup of Greco-Roman wrestling, the leading countries in this style are: Russia, Hungary, Iran, Georgia, Korea and the United States. Other top wrestling nations include Cuba, Sweden, Ukraine, Azerbaijan, Armenia and Egypt. Countries must qualify their athletes for Olympic competition and the 139 allotted spots in 7 weight classes. Nineteen countries won medals in Beijing.

The rules of competition in international competition have evolved since 1896. The most striking developments during this period have been the implementation of weight classes and a shortening of the time of the match. In 1896 there was only one class with no weight restrictions, and the matches had no time limits. Wrestling continued until one of the contestants was thrown. Weight classes were adopted and the time of the bout was limited. Points were awarded so that a winner could be determined if no wrestler was able to secure a fall. If no fall occurred, the wrestler who ended the match with the greater number of points was declared the winner.

There have been various adjustments throughout the modern era, however, the changes adopted in 2005 were among the most drastic during this evolution. The number of weight categories has varied, reaching its pinnacle of 10 at the 1972 Olympics in Munich and maintaining 10 classes through the 1996 Atlanta Olympics. In the 2000 Games in Sydney, the IOC lowered the number of weight classes to 8. Again in Athens, wrestling suffered another reduction to the seven categories currently used. More importantly, following the Athens Games wrestling was being considered by the IOC for either another reduction in the number of weight classes or a possible elimination of one of the men's disciplines. Facing these distinct possibilities, wrestling needed to make drastic changes in the rules. Part of those changes required making Greco-Roman and freestyle more distinct.

In 2005 FILA introduced substantive changes to both styles. The GR modifications centered around a shorter timeframe construct, forced parterre wrestling in which a designated wrestler was given an advantages lock and a scoring system governed by the winning of individual periods

rather than a greater number of cumulative points. These include a scoring system governed by the winning of periods, rather than by the greater number of cumulative points; a shorter time period in which to gain a takedown; and a forced parterre for each period.

At its inception, the forced parterre clinch served to promote action and spectacular throws. Casual spectators, avid wrestling fans and expert wrestlers all witnessed the increased excitement and action. Some criticized the activity as narrow, but none could deny the excitement and number of reverse bodylocks successfully performed in the World Championships in Hungary. Also, the winning of the best of three periods in lieu of cumulative points, added an element of urgency as each period drew to a close. What many experienced wrestlers and coaches feared was a diminution of activity as the wrestlers and coaches developed more effective counters to the forced parterre position. As our experience has taught us, a wrestler's sole mission and focus, as it should be, is to win. In order to be successful, wrestlers will seek the techniques, tactics and strategies that provide them the best chance of winning with the least amount of risk.

Unfortunately, in Beijing the fears of some appeared to have materialized. The wrestlers and coaches have effectively learned to avoid or counter the reverse bodylock. The prevailing strategy in any contested match appeared to be: avoid risk at all cost. In the standing position that meant bury your head and/or grasp your opponent's fingers, rendering any offense futile. In the parterre position that meant crawl into the zone while controlling your opponent's hands, which also curtailed wrestling. There was nothing in our rules or at least the way they were enforced by the officials that compelled the wrestlers to actively wrestle. In the one rare case where a passivity point [open] was awarded, the athlete sought arbitration. Even the casual observer could sense the element of luck in the matches.

This analysis was undertaken to identify the scoring characteristics of these rules on the highest stage since their implementation – the Beijing Olympic Games of 2008. This can provide information to the coaches as to how the champions are winning, and also present facts to FILA regarding possible rules changes that may be considered. There has been criticism of these rules for a variety of reasons.

Discussions among coaches often center around two main areas: 1) A diminution or loss of wrestling skills in the standing position; and 2) The role of luck in the determination of a winner in the event of a tie in score at the end of the period. Since the wrestler scoring the last point in a 1-1 period is the winner, the flip or draw that determines position following a scoreless 1st minute, is of great importance.

The specific questions to be answered were: 1) What is the nature of scoring in the first minute of each period when wrestlers are on their feet? 2) What is the nature of scoring on the mat (parterre)? 3) Does the "luck" involved in the ball draw seem to play an inordinate role in the determination of the winner of each period?

METHODS

All 164 matches from the Greco-Roman competition in the Beijing Games were analyzed. A spreadsheet was produced to record the information that was deemed important and during the

viewing of each match. The data was then entered into an Excel Spreadsheet for sorting and analysis.

RESULTS

Of the 164 matches, 3 were completed in 1 period, 97 were completed in 2 periods, and 63 were completed in 3 periods. There were 6 falls. There were 29 periods which were ended in a technical fall (nine because of a 5 point throw). There were 1,371 total points scored, averaging 8.4 per match. Examined by period, this breaks down as follows: 1st period – 595 points and an average of 3.6 per match; 2nd period – 584 points, averaging 3.6 per match; and the 3rd period – 197 points, averaging 3.1 points per match.

If one looks at only the points actively earned by the wrestler (subtracting cautions and points for not being turned), this category of technique points totals 804 for the tournament. This averages to 4.9 technique points per match.

Scoring in the first minute of each period was rather low. Of the 388 periods on the feet, there was scoring in only 71 (18.4%). There was no scoring in 82% of these periods. This resulted in 315 draws for the ball. The period by period breakdown for 1st minute scoring is shown in Table 1.

Table 1. Scoring in 1st Minute of Period

Period	1	2	3	Totals
Number of Bouts	164	161	63	388
Bouts with Scoring	24	37	10	71
%	14.7	23.1	15.9	18.3
Points Scored	49	74	18	141

The takedown techniques that were successfully used in the Games are listed in Table 2.

Table 2. Successful Takedown Techniques Used in Beijing Olympics

Takedown Technique	Number from 1st min	Number from Parterre Periods	Totals
Pushouts	20	11	31
Arm Drag	10		10
Snap Down	8	2	10
High Dive	5	1	6
Counter to TD	5	2	7
Arm Throw (3 pts)	3	3	6
Arm Throw (1pt)		1	1
Front Headlock	2		2
Body lock (3 pts)	2	2	4
Body lock (1 pt)	2		2
Head Shuck	2	2	4
Arm Spin	1		1
Head Lock (3pts)	1		1
Hip Toss (3 pts)	1		1
Whipover arm	1		1
Slide By	1		1
Underhook-Off Balance (3pts)	1		1
Misc.Takedowns	3		3
Totals	68	24	92

COMMENTARY:

- 1. EQUAL TIME, ONE MINUTE EACH, IS ALLOTTED FOR BOTH STANDING AND PARTERRE WRESTLING. YET, OF THE 804 TECHNICAL POINTS, ONLY 141 OR LESS THAN 18% WERE SCORED IN THE FIRST MINUTE OF WRESTLING. ADDITIONALLY, ONLY 13 OF THE 92 RECORDED TAKEDOWNS SCORED GREATER THAN 1 POINT.**
- 2. THERE WERE 68 TAKEDOWNS SUCCESSFULLY EXECUTED IN THE 1ST MINUTE OF THE 388 PERIODS. TWENTY WERE PUSHOUTS AND TEN WERE ARM DRAGS [44%]. ONLY SEVEN WERE 3 POINT MANEUVERS.**
- 3. IN 315 OF THE 388 OR 82% OF THE PERIODS WRESTLED, A BALL HAD TO BE DRAWN TO DETERMINE THE PARTERRE POSITION.**

CONCLUSIONS:

- 1. IN BEIJING, THE LEVEL OF SCORING IN THE 1ST MINUTE OF WRESTLING IN EACH PERIOD WAS INSUFFICIENT.**

- 2. THE AMOUNT OF TIME SPECTATORS SPEND WAITING FOR THE BALL TO BE DRAWN IS CONTROVERSIAL AND DETRIMENTAL TO THE ATTRACTIVENESS OF THE SPORT.**

POINTS OF DISCUSSION:

- 1. WILL INCREASING THE AMOUNT OF TIME DEVOTED TO WRESTLING ON THE FEET PROPORTIONATELY INCREASE SPECTACULAR WRESTLING?**
- 2. WILL INITIATING CONSEQUENCES THAT COMPEL WRESTLERS TO KEEP THEIR HEADS UP AND NOT GRASP THE FINGERS OF THEIR OPPONENTS PROMOTE MORE SCORING IN THE STANDING POSITION?**
- 3. SHOULD THE CONSEQUENCE PROVIDE PREFERENCE OF CHOICE IN PARTERRE, HENCE REDUCING THE NUMBER OF TIMES BALL ARE DRAWN WHILE ENCOURAGING AND REWARDING MORE ACTION?**
- 4. SHOULD THERE BE ONLY ONE 30 SECOND PARTERRE POSITION IN EACH PERIOD?**

Table 3 lists the parterre techniques used and their frequency. The initial clinch grip is termed a low clinch. Maintaining this lock at the armpit level of the defensive wrestler is termed a high clinch. Being out in front of the defensive wrestler with the lock over the head and one arm is termed the front head and arm. The gut wrench is broken down into some of its basic forms. Successful counter techniques whereby the defensive wrestler scored against the offensive wrestler's move are combined in one value. Likewise, reversals by the defensive wrestler, whether resulting in 1 or 2 points, are combined in one value. Escapes were recorded as the active intent of the defensive wrestler to successfully get away. Crawl outs are the movements of the defensive wrestler to get out of bounds while successfully defending an offensive parterre technique.

Table 3. Successful Parterre Techniques Used in Beijing Olympics

from Low Clinch	(52 total)	#	
	1 pt	8	
	2 pt	15	
	3 pt	17	
	5 pt	7	
	Drive over to back -2 pts	5	
from High Clinch	(38 total)		
	1 pt	4	
	2 pt	28	
	3 pt	6	
Front Head & Arm	(12 total)		
	2 pt	7	
	3 pt	5	
Gut Wrench	(109 total)		
	Standard	18 for 1 pt	48 for 2 pts
	Trapped Arm Gut		15 for 2 pts
	Straddle Lift to Gut	1 for 1 pt	6 for 2 pts
	Lift to Gut	3 for 1 pt	4 for 2 pts
	High Gut	1 for 1 pt	9 for 2 pts
Lifts	(31 total)		
	5 pt	2	
	3 pt	18	
	1 pt	11	
Counters (includes all point		18	
Reversals (both 1 and 2 pt)		52	
Escapes		132	
Crawlouts		57	

There were 28 cautions given by the referees. These are summarized in Table 4. The cautions for violating the start for the clinch can be controversial. The number of “attentions” given was viewed to be 139.

Table 4. Cautions Issued

Starting Position	13
Legs	6
Fleeing the mat	4
Butting	2
Passivity (open)	2
Fingers	1

There were numerous periods ending in a score of 1-1, meaning that the winner was that person who defended last. This score also means that the period was won without a successful offensive point being earned. These situations are listed below:

1st Period	37
2nd Period	41
<u>3rd Period</u>	<u>25</u>
Total	104 (370 total parterre periods*)

(*This value is less than 388 to account for falls or technical falls occurring in the 1st minute of each period.)

There are several cases of bout winners who were out-scored by their opponents, if one looks at the total points scored for the entire match.

Of the 317 ball draws, following a scoreless 1st minute, the winner of the draw won 62% of the time (198 winners and 119 losers). The traditional statistical method to establish whether results of this type are the result of chance, or because of a systematic bias, is to employ a Chi-Square “Goodness of Fit” Test. This was done with these data with the following results:

Observed Frequency Win	198	Expected Frequency Win	158.5
Observed Frequency Lose	119	Expected Frequency Lose	158.5

Df = 1

Chi-square=19.2 (corrected for continuity) P=.00001

This means that there is a 1 in 10,000 probability that these results are the result of chance. There is a strong bias operating in favor of the wrestler winning the ball draw or flip.

COMMENTARY:

- 1. 57 TIMES, OR IN 15% OF THE PERIODS, THE BOTTOM WRESTLER SUCCESSFULLY CRAWLED OUT OF BOUNDS. YET ONLY IN TWO CASES WERE CAUTIONS AWARDED FOR FLEEING THE MAT.**
- 2. THE MOST COMMONLY USED OFFENSIVE TURN WAS THE GUT-WRENCH [109].**
- 3. THE REVERSE BODYLOCK FROM THE ORIGINAL STARTING POSITION WAS THE SECOND MOST POPULAR TECHNIQUE AND STILL ACCOUNTS FOR THE GREATEST PORTION OF 5 AND 3 POINT MANEUVERS. SEVEN OF THE NINE 5 POINT SCORES WERE REVERSE BODYLOCKS.**
- 4. ONLY 2 CAUTIONS WERE AWARDED FOR NOT OPENING. ONE RESULTED IN ARBITRATION.**
- 5. 27% OF ALL OF THE PERIODS ENDED WITH A 1-1 SCORE AND THERE WERE 13 BOUTS THAT HAD 1-1 SCORES FOR ALL THREE PERIODS.**
- 6. WRESTLING MAY BE THE ONLY OLYMPIC SPORT WHERE YOU CAN WIN WITHOUT SCORING. CAN ONE IMAGINE THE WINNER OF A 0-0 SOCCER**

MATCH BEING THE TEAM THAT BLOCKED THE LAST SCORING ATTEMPT?

- 7. IN 198 OF THE 388 PERIODS WRESTLED IN BEIJING, THE WRESTLER WHO WON THE DRAW WON THE PERIOD.**
- 8. THERE WERE SEVERAL OCCASIONS WHERE THE ONLY TECHNICAL POINTS IN THE MATCH WERE SCORED BY THE LOSING WRESTLER.**

CONCLUSIONS:

- 1. PARTERRE WRESTLING DICTATES THE RESULTS OF MOST MATCHES.**
- 2. THE NUMBER OF WRESTLERS CRAWLOUT [57] WAS GREATER THAN THE TOTAL NUMBER OF REVERSE BODYLOCKS AND REQUIRES ATTENTION.**
- 3. 27% OF THE PERIODS ENDING WITHOUT A SUCCESSFUL OFFENSIVE POINT BEING SCORED, INDICIATING THE LEVEL OF LUCK, OR ROLE THE “BALL DRAW” CURRENTLY PLAYS IN THE FINAL MATCH OUTCOME. IF THIS CONTINUES IT POSES A SERIOUS RISK TO THE POPULARITY OF THE GRECO-ROMAN DISCIPLINE.**
- 4. THERE IS A NEED TO DEVISE A SYSTEM WHERE MORE IF NOT ALL OF THE WINNING WRESTLERS DO SO BY SCORING, NOT BY BEING THE LAST TO PREVENT SCORING.**
- 5. WINNING THE DRAW ACCOUNTED FOR 62% OF THE WINNERS IN BEIJING.**
- 6. SPECTATORS CANNOT RECONCILE THE SITUATION WHEN THE ONLY TECHNICAL POINTS SCORED ARE SCORED BY THE LOSING WRESTLER.**

POINTS OF DISSCUSSION:

- 1. SHOULD THE TOP WRESTLER BE GIVEN THE OPTION TO CHOOSE HIS LOCK IN THE PARTERRE POSITION?**
- 2. WILL MAKING IT A PENALTY IF THE BOTTOM WRESTLER TOUCHES THE TOP WRESTLER’S HANDS, PROMOTE ACTION AND INCREASE SCORING IN THE PARTERRE POSITION?**
- 3. SHOULD THE BOTTOM WRESTLER BE PROHIBITED WITH CONSEQUENCE FROM ENTERING THE ZONE ON HIS OWN VOLITION?**
- 4. SHOULD THE TOP WRESTLER BE PROVIDED WITH AN ADVANTAGE THAT IMPROVES OR ASSURES HE SCORES, AS DONE IN THE FREESTYLE CLINCH?**

SUMMARY

Wrestling on the feet has most certainly been de-valued with the new rules. In theory, the amount of time devoted to wrestling on the feet and that to wrestling in parterre are equal. However, only 141 of the 1,371 total match points were scored in the 1st minute segments of the periods. This is only 10% of the scoring. Of the 92 listed takedowns, only 13 were for more than 1 point.

It is difficult to compare the rates of scoring, since the new rules changed some fundamental concepts. First and foremost is the structure which forces parterre action and rewards the defensive wrestler's ability to withstand being turned for 30 seconds. This will occur during each of the periods and guarantees a minimum total score of 2 points per period. The awarding of defensive points has also contributed to an interesting situation whereby a competitor can, with the help of the ball draw, win by going totally defensive. In most sports, going totally defensive can give a result no better than a tie, but with the current wrestling rules, it is possible to gain a win.

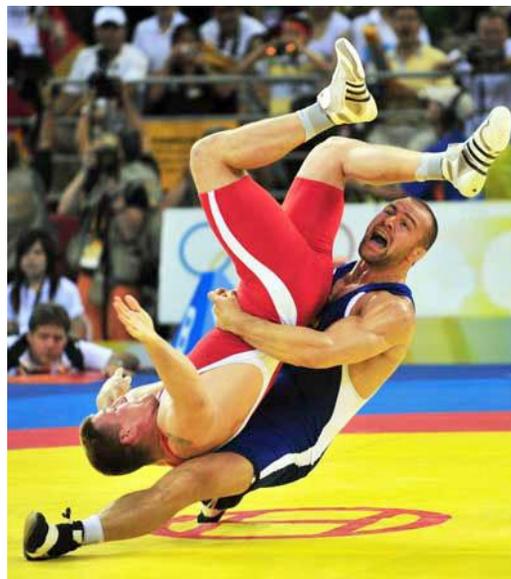
Finally, the competitive separation between winners and losers, is dependant, in large degree on the winning of the ball draw. This is not a satisfactory situation for fair competition.

The Greco-Roman discipline is at a crossroad and faces serious challenges. If we continue on our current course and the results in London are similar to Beijing there is a grave danger of peril. All involved parties should consider constructive changes that address the issues facing the sport of Greco-Roman wrestling.

Please contact David Curby with your questions and comments at: davcurb@gmail.com

Addendum

While there seem to be some problems with the rules, many great athletes competed on the mats in Beijing. The champion at 96 kg from Russia was completely dominant and demonstrated exciting technique, especially from the mat. Aslanbek Khushstov, (right) in five matches, outscored his opponents 41-0, scoring three five-point throws and one fall. It is interesting, that despite his dominance, Khushtov did not score any takedowns in any of his first periods (he had one takedown in the tournament from a pushout). Islam-Beka Albiev (bottom left) 60kg (RUS) in his four matches, outscored his opponents 36-0. Manuchar Kvirkhelia 74 kg (GEO) in four matches had two five-point throws and a three point body lock throw takedown that ended in a fall (bottom right).



Exercise Programme for Muscle Recovery After Training



FREESTYLE AND GRECO-ROMAN WRESTLING
Istanbul (TUR) and Hennef (GER)
November 2008

**EXERCISE PROGRAMME
FOR MUSCLE RECOVERY
AFTER TRAINING**

Dr. med. Eckart D. Diezemann
Member of the FILA Medical, Prevention
and Anti-Doping Department

Dr. Eckart D. Diezemann 11/2008 Folie 1

Stretching increases the mobility: The muscle isn't stretched by stretching. Stretching changes pain perception. This improves mobility and in addition, consolidates the tissue.

Stretching increases performance: This statement is too simple. Stretching at the wrong time using the wrong technique can produce negative effects. First, we should know in which kind of sport and when we can stretch. Directly before competition stretching makes sense in Gymnastics or ballet. Stretching (static stretching primarily) in direct preparation for wrestling competition (explosive a. speed strength) cannot be recommended. It results in decline in performance. Practical examinations show this-USA sprinters ran worse times if they stretched directly before the start, but, subjectively they felt better. **Result:** The necessary mobility must be developed in training units of its own. Short dynamic stretching is recommended before the bout. The muscles subjected to stretching in competition should however be slightly stretched.

Stretching prevents injuries: The practice seems clear. The scientific evidence isn't clear yet.

Stretching prevents and relieves aching muscles: Stretching doesn't influence the development of aching muscles.

Stretching promotes regeneration: Stretching (static stretching primarily) directly after the load doesn't influence regeneration. Static stretching prevents lactate reduction. Therefore, regeneration by running immediately after competition and then stretching.

Stretching increases the stretching resistance: The increased stretching resistance is connected to improved mobility and tearing resistance. Sporting loads are tolerated better.

ADVANCED SCHOOL FOR COACHES

Aspects for including stretching in the daily training process

All stretching methods increase mobility

Related to the development of maximum mobility, the following effectiveness order arises for stretching methods:

1. **Contract-Relax-Agonist Contract (CR-AC)**
2. **Agonist Contract and stretching (AC)**
3. **Contract Relax(CR), Contract-Hold-Relax-Stretch(CHRS)
Agonist Contract and stretching (AC)**
4. **Static Stretching (SS)**

Dr. Eckart D. Diezemann 11/2008 Folie 19

ADVANCED SCHOOL FOR COACHES

Aspects for including stretching in the daily training process

2. **Dynamic Stretching (DS)** is especially suitable:



Increasing and maintaining mobility
Joint control close to the mobility limit
Warm up effects
Strengthening effects
Regenerative effects

Dr. Eckart D. Diezemann 11/2008 Folie 21

ADVANCED SCHOOL FOR COACHES

Aspects for including stretching in the daily training process

3. **Contract Relax(CR), Contract-Hold-Relax-Stretch(CHRS)**
is particularly suitable:



Increasing and maintaining mobility
Warm up effects
Strengthening effects
Joint control close to the mobility limit

Contract Relax(CR), Contract-Hold-Relax-Stretch(CHRS)
isn't suitable:



Regenerative effects

Dr. Eckart D. Diezemann 11/2008 Folie 22

ADVANCED SCHOOL FOR COACHES

Aspects for including stretching in the daily training process

4. **Agonist Contract and stretching (AC)** is especially suitable:



- Increasing and maintaining mobility
- Joint control close to the mobility limit
- Warm up effects
- Strengthening effects

Agonist Contract and stretching (AC) isn't suitable:



- Regenerative effects

Dr. Eckart D. Diezemann 11/2008 Folie 23

ADVANCED SCHOOL FOR COACHES

Aspects for including stretching in the daily training process

5. **Contract-Relax-Agonist Contract (CR-AC)** is especially suitable:



- Increasing and maintaining mobility
- Joint control close to the mobility limit
- Warm up effects
- Strengthening effects

Contract-Relax-Agonist Contract (CR-AC) isn't suitable:



- Regenerative effects

Dr. Eckart D. Diezemann 11/2008 Folie 24

ADVANCED SCHOOL FOR COACHES

Summary for daily practice

Stretching in explosive and speed strength disciplines:

Only in training

Static stretching primarily not in direct competition preparation since it leads to decline in performance

Result:

Developing basic mobility in training

The muscles which are responsible for strength and elasticity

should not be stretched before competition

Before competition only dynamic stretching

Dr. Eckart D. Diezemann 11/2008 Folie 28



INTERNATIONAL NETWORK OF WRESTLING RESEARCHERS (INWR)

The genesis of this proposal stems from conversations with several colleagues from around the world (Turkey, Iran, Hungary, Sweden, Germany, Greece, Bulgaria and the USA) regarding the support such an organization can provide our sport, as well as collegial support and camaraderie in our work that relates to wrestling. My correspondence with a researcher in judo, Dr. Michel Calmet of France (<http://www.apc-scolaire.fr>) began in 2007, and it was a critical event, as he described the recent formation of the International Association of Judo Researchers (<http://www.judoresearch.org/>). I am proposing the formation of a similar organization for those of us working in wrestling.

Aims and Objectives:

The aims of the International Network of Wrestling Researchers (INWR) are to "Facilitate the development of wrestling through international and intercultural understanding and cooperation; and to support wrestling-related research and education."

Proposed Objectives are:

- Identify Wrestling Researchers and scientists around the world.
- Create opportunities for researchers connect and share ideas through a communication network.
- To bring these researchers together.
- To provide researchers with opportunities for publications and presentations.
- To improve the availability of research related sources.
- To improve the quality of wrestling-related research through providing education and scholarships.
- To encourage and support wrestling-related educational activities.
- To support and facilitate wrestling teaching and coaching methods.
- To work collaboratively and explore partnerships with other organizations and programs who can benefit from the intellectual resources of this organization.
- Providing a discussion forum to enable communication between all those who use an official website.
- Encourage and support wrestling related activities between students and researchers.
- Another purpose will is to create a database of wrestling-related research articles for open access. There is currently limited access to places where students can search for scientific or scholarly articles of wrestling. The continuation of this resource would be a plus for the development and expansion of wrestling around the world. It would also be a valuable

resource providing important, practical information to teachers, coaches, referees, officials, athletes, and administrators.

Registration will occur via a website (temporarily located at curbywrestling.com) and interested individuals will be required to complete an application form containing personal experiences and interests. We need to identify the pool of interested people around the world. An initial task is to establish at least one contact person in each country that has national wrestling governing body. I am sharing this proposal with my network of contacts throughout the world, and would hope that they, in turn share with their colleagues and other appropriate scholars.

Membership is open to persons who have a major academic qualification in a wrestling related discipline or other related academic disciplines, and who show evidence of interest in wrestling related sport science research. We will encourage the registration of student members. Undergraduate and graduate students who are studying or carrying out research in the area of wrestling research or related disciplines are also encouraged to register.

Please complete the following information request and return to Dr. David Curby at:

davcurb@gmail.com

Name:

Email:

Institution/Organization:

Mailing Address

Country:

Current Areas of Interest:

Completed Wrestling Research:

(If possible attach your picture)

PLEASE SHARE WITH COLLEAGUES WHO SHOULD BE ON OUR MAILING LIST!

