

International Journal of  
**Wrestling  
Science**

Volume 11 Number 1, 2021



**INTERNATIONAL NETWORK OF WRESTLING RESEARCHERS (INWR)**

*ADVANCING OUR SPORT THROUGH KNOWLEDGE*

*FAIRE PROGRESSER NOTRE SPORT PAR LA CONNAISSANCE*

*ПРОДВИЖЕНИЕ НАШЕГО СПОРТА ЧЕРЕЗ ЗНАНИЕ*

*PROGRESO PARA NUESTRO DEPORTE MEDIANTE CONOCIMIENTO*

# International Journal of Wrestling Science

The official journal of the International Network of Wrestling Researchers (INWR)

David Curby, EdD

*Editor in Chief*

## EDITORIAL BOARD

Mario Baić, PhD, Croatia

Ioannis Barbas, PhD, Greece

Craig Horswill, PhD, USA

Fikrat Kerimov, PhD, Uzbekistan

David Lopez-Gonzalez, Mexico

Bahman Mirzaei, PhD, Iran

Boris Podlivaev, PhD, Russia

Ramazan Savranbaşı, PhD, Turkey

Yuri Shakhmuradov, PhD, Russia

Slavi Stanev, PhD, Bulgaria

Harold Tünnemann, PhD, Germany



UNITED WORLD  
WRESTLING



INTERNATIONAL NETWORK OF WRESTLING RESEARCHERS (INWR)

ADVANCING OUR SPORT THROUGH KNOWLEDGE

FAIRE PROGRESSER NOTRE SPORT PAR LA CONNAISSANCE

ПРОДВИЖЕНИЕ НАШЕГО СПОРТА ЧЕРЕЗ ЗНАНИЕ

PROGRESO PARA NUESTRO DEPORTE MEDIANTE CONOCIMIENTO

<https://unitedworldwrestling.org>

<http://inwr-wrestling.com>

Volume 11 Issue 1, 2021 International Journal of Wrestling Science is published biannually by Curby Research Group, LLC, 1719 W.60th Street, La Grange, Illinois, 60525. Print ISSN - 2161-5667, Online ISSN - 2161-3524.

Copyright© 2021 The Curby Research Group, LLC. All rights reserved. International Journal of Wrestling Science is published using the open access model. All original scientific content is available free of charge for personal use without restrictions on the journal's website at: <http://inwr-wrestling.com> International Journal of Wrestling Science provides free, immediate and permanent online access to the full text of all articles distributed under the terms of the Creative Commons Attribution Non-commercial License <http://creativecommons.org/licenses/by-nc/4.0>), which permits use, distribution, and reproduction in any medium, provided the original work is properly cited, the use is non-commercial and is otherwise in compliance with the license. The publisher assumes no responsibility for any statements of fact or opinion expressed in the published papers. The appearance of advertising in this journal does not constitute an endorsement or approval by the publisher, the editor, or the editorial board of the quality or value of the product advertised or of the claims made for it by its manufacturer.

Permissions. For further information, please contact the Editor in Chief: [davcurb@gmail.com](mailto:davcurb@gmail.com) Instructions for authors can be found online at: <http://inwr-wrestling.com/wp-content/uploads/2018/03/IJWS-Aims-Scope-and-Guidelines-for-Authors.pdf>

International Journal of Wrestling Science editors endorse the principles embodied in the Helsinki Declaration and expect that all research involving humans has been performed in accordance with these principles. All human studies must have been approved by the investigator's Institutional Review Board. A copy of the relevant documentation should be included with the manuscript. Furthermore, International Journal of Wrestling Science follows the ICMJE's Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals.

## Reviewers

Nikos Aggelousis PhD (Greece)  
Euaggelos Almpantidis PhD (Greece)  
Ramin Amirsasan PhD (Iran)  
B.J. Anderson MD (USA)  
Mario Baić PhD (Croatia)  
Tibor Barna PhD (Hungary)  
Sylvia Bakalova PhD (Bulgaria)  
Ibrahim Cicioglu PhD (Turkey)  
Eckart D. Diezemann MD (Germany)  
Milorad Dokmanac PhD (Serbia)

Ali Dolatkah PhD (Armenia)  
Sergio Dos Santos PhD (Brazil)  
Mindaugas Ežerskis PhD (Lithuania)  
Ioannis Fatouros PhD (Greece)  
Emerson Franchini PhD (Brazil)  
Jeremy Frank MD (USA)  
Bruno Hartmann PhD (Austria)  
Kazunori Iwai PhD (Japan)  
Tomas Kourtesis PhD (Greece)  
Stefan Krist PhD (Austria)  
William J. Kraemer PhD (USA)  
Takeshi Kukidome PhD (Japan)

Michel Lafon (France)  
Bianca Miarka PhD (Brazil)  
Maria Michalopoulou PhD (Greece)  
Robert A. Oppliger PhD (USA)  
Jonas Poderys PhD (Lithuania)  
Amir Rashidlamir PhD (Iran)  
William A Sands PhD (USA)  
Babak Shadgan PhD MD (Canada)  
Victor Shiyan PhD (Russia)  
Dao Chanh Thuc PhD (Vietnam)  
Mehmet Türkmen PhD (TUR)

---

# International Journal of Wrestling Science

The official journal of the International Network of Wrestling Researchers (INWR)

---

Volume 11, Number 1 2021

## TABLE OF CONTENTS

- 1-2 Editor's Comment  
*David Curby*
- 3-10 PERFORMANCE DATA ANALYSIS OLYMPIC GAMES – TOKYO 2020:  
OVERVIEW OF THE MOST IMPORTANT TECHNICAL PARAMETERS OF THE  
TOKYO OLYMPIC GAMES  
*Milorad Dokmanac*
- 11-18 DEVELOPMENT OF THE ELITE WRESTLING ATHLETE  
*Bahman Mirzaei*
- 19-24 ORTHOPEDIC EXAMINATION OF JUNIOR FEMALE WRESTLERS: A CASE STUDY  
*Podlivaev BA, Kurashvili VA, Gaiduk AA*
- Special Communications*
- 25-27 *Letters to the Editor-in-Chief*  
A LETTER FROM WRESTLING (PALI – ΠΑΛΗ) TO AN UNBORN CHILD...  
*Christos Kollias*
- 28-29 *In Memoriam*  
BORIS ANATOLYEVICH PODLIVAEV (JANUARY 18, 1946 – AUGUST 12, 2021)  
*David Curby*

# Editor's Comments

## AN INTERESTING “DOPING” DISQUALIFICATION IN THE WRESTLING COMPETITION AT THE 1968 OLYMPICS

I was reading the USA Olympic Yearbook from 1968 (1) and in the wrestling section (page 173) there was a description of the 57 kg category in Greco-Roman wrestling:

“Hristo Traykov of Bulgaria was disqualified by the International Amateur Wrestling Federation Health Commission. In his match against the American David Hazewinkel, Traykov was found with ammonia in his uniform.”

I made phone contact with Dave Hazewinkel for more information, but unfortunately, he did not remember the incident. I then emailed my colleague in Bulgaria, Dr. Sylvia Bakalova, who is a wrestling history expert. She replied that the official information is missing and that Hristo Traykov died in 2014. She spoke to Ognyn Makaveev, who is one of the managers in Bulgarian wrestling. He said that in the Olympic games in 1968, during a between period wrestling break in the match between Traykov and Hazewinkel, the towel had been soaked with ammonia, and this resulted in the disqualification.



Dave and Jim Hazewinkel were members of the 1968 and 1972 United States Greco-Roman Olympic teams and were both members of six consecutive World and Olympic teams from 1967 to 1972. Dave Hazewinkel was the first American to win two World medals in Greco-Roman wrestling, earning a bronze medal in 1969 and a silver medal in 1970. Jim Hazewinkel was also a member of the 1966 World team and his highest finish at the World Championships was fourth in 1969.

Ammonia inhalants (AI) are commonly referred to as smelling salts, ammonia capsules, and historically have been used for the prevention and treatment of fainting, dizziness, and lightheadedness. AI use is widespread by athletes as a possible means of temporarily enhancing athletic performance during training or competition. AI use is common among various athletes as a means of increasing focus or “psyching up,” and it has been speculated that AIs are most commonly used for their purported benefit of increasing muscular strength for short periods of time (2).

When inhaled, it causes a rapid and extreme irritation of the lungs, nose, and mucus membranes of the nasal cavity. This causes a concomitant rapid inhalation reflex that causes involuntary inhalation. This reflex then stimulates the muscles that control breathing to work faster, accelerating respiration and stimulating a higher degree of consciousness.

Whether AI use provides athletes with any scientifically proven ergogenic benefit cannot be answered given the lack of research examining AI use during training or competition. There is no research showing any increase in strength or athletic performance after their use (3). Research examining the safety and efficacy of AIs during training is needed and would be beneficial in establishing their potential safety and/or efficacy. Anecdotally, the use of AIs does seem to provide

athletes with increased focus and effort. The sportsmedicine and athletic training community strongly discourages their use, particularly because they can mask the symptoms of concussion.

#### References

1. United States Olympic Book 1968. Fliegner, Frederick: Ed. Published by International Olympic Editions, New York, 1969.
2. Velasquez, J. (2011). "The Use of Ammonia Inhalants Among Athletes." Strength & Conditioning Journal **33**: 33-35.
3. Herrick R and Herrick S. Allergic reaction to aromatic ammonia inhalant ampule: A case report. Am J Sports Med 11: 28, 1983.

Sincerely yours in the advancement of Wrestling,

*David Curby*

David Curby EdD  
Director of the International Network of Wrestling Researchers  
davcurb@gmail.com



# PERFORMANCE DATA ANALYSIS OLYMPIC GAMES – TOKYO 2020 OVERVIEW OF THE MOST IMPORTANT TECHNICAL PARAMETERS OF THE TOKYO OLYMPIC GAMES

Milorad Dokmanac

UWW Technical Commission

[milorad.dokmanac@unitedworldwrestling.org](mailto:milorad.dokmanac@unitedworldwrestling.org)

## INTRODUCTION

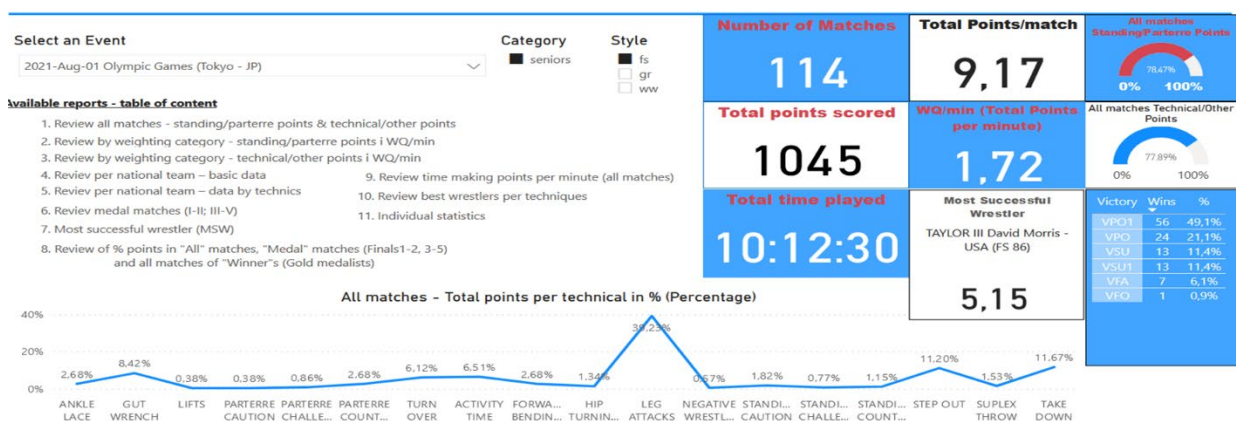
The next few pages will present the most important technical data from the Tokyo 2020 Olympic Games. All this data is available through the "performance data analysis" platform at the internet address <http://uww.io/wpar>. This analysis provides basic information about the current state of world wrestling. The disadvantage is that this type of analysis has not been done continuously in the past. A comparison with the European championship 2020 was made for the three most important data. It would be best to make a comparison of the last 3 world championships and the last Olympic games.

## Freestyle



United World Wrestling - Performance Analysis report

Interactive version of this report is available online at <http://uww.io/wpar>.

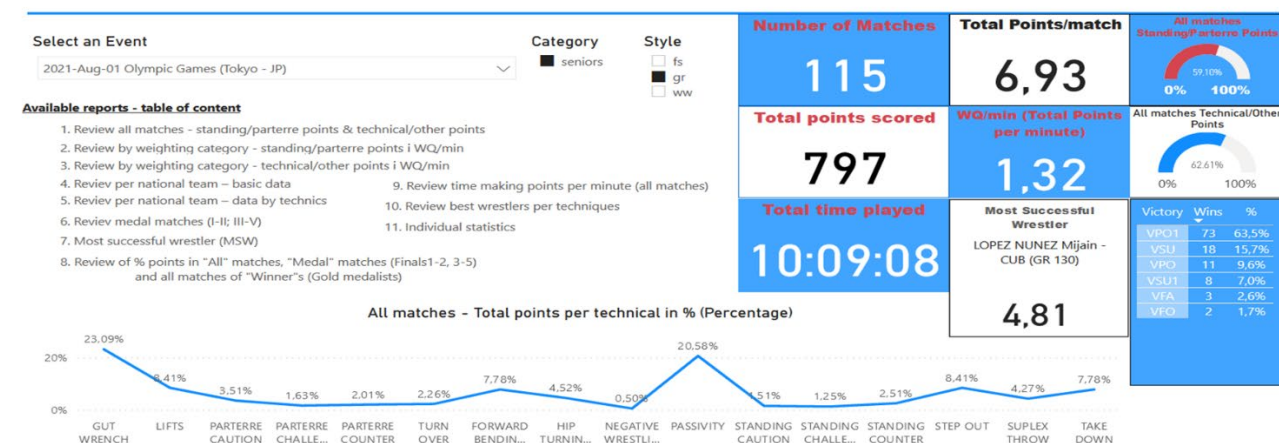


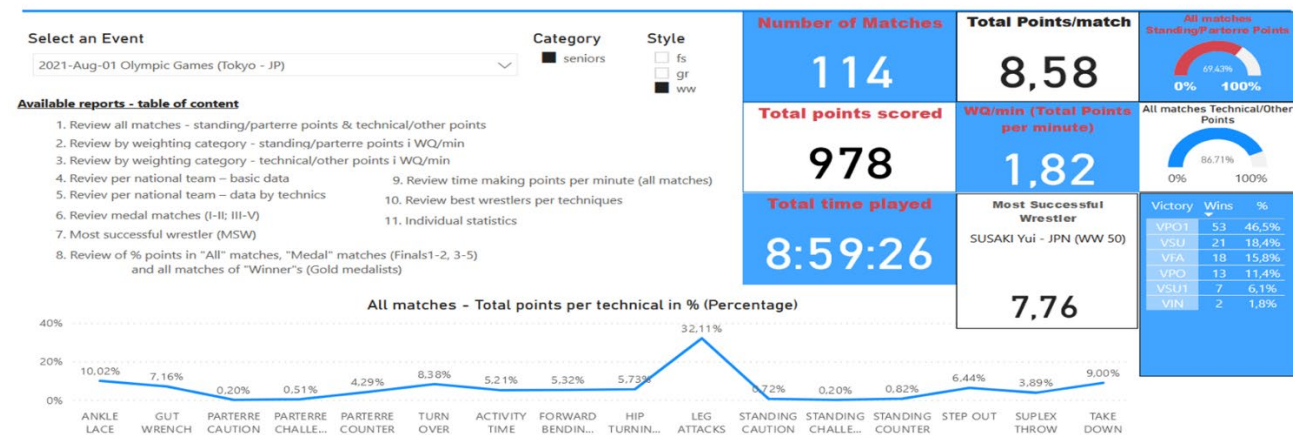
## Greco-Roman



United World Wrestling - Performance Analysis report

Interactive version of this report is available online at <http://uww.io/wpar>.





## OVERVIEW OF THE MOST IMPORTANT DATA FROM TOKYO OLYMPIC GAMES 2021 & EUROPEAN CHAMPIONSHIPS ROME 2020

### 1.1 ALL matches: STANDING/PARTIERE points in %

TOKYO Olympic Games 2021			ROME European Championship 2020		
Style	Standing	Parterre	Style	Standing	Parterre
FS	78.47	21.53	FS	75.38	24.62
GR	59.10	40.90	GR	56.87	43.13
WW	69.43	30.57	WW	68.57	31.25

Similar results are seen from OG and ECH when looking at percentage points in standing and parterre. In FS, the most points are made in standing, and in GR style, the number of points from the parterre is the highest compared to the other two styles.

### 1.2 WQ/min (Total points per minute)

TOKYO Olympic Games 2021		ROME European Championship 2020	
Style	WQ/min	Style	WQ/min
FS	1.72	FS	1.71
GR	1.27	GR	1.53
WW	1.81	WW	1.84

In GR style at the OG there are very few points per minute of the match (1.27) and significantly less than from the ECH (1.53). The best results were obtained from WW in both the OG and ECH. Anything below 1.5 points per minute of matches is considered a bad result, which means that there are not many technical points in these matches. The results in the GR style are especially bad, as there were only 797 points in 115 matches (in FS there are 1045 points).

In FS and WW, superiority is a 10-point difference and in GR style it is 8 points, which can have an impact on these results.

### 1.3 All matches: TECHNICAL/OTHER POINTS in %

TOKYO Olympic Games 2021			ROME European Championship 2020		
Style	Technical Points %	Other Points %	Style	Technical Points %	Other Points %
FS	77.89	22.11	FS	82.03	17.97
GR	62.61	37.39	GR	67.14	32.86
WW	86.71	13.29	WW	86.75	13.25

If one looks at the results from both the OG and ECH it is evident that in all three styles the results are worse. The situation is especially alarming in the GR style, where only 62.61% of points scored for wrestling techniques are observed in the Olympic Games, while 37.39% of points are awarded for passivity or other

penalties. There is also a negative tendency in FS to win less and less points from wrestling actions, and in OG, wrestlers receive over 22% of points as a gift from the judges. Only the situation in WW is very good and as many as 87% of the points are technical points.

## 2.0 OLYMPIC GAMES TOKYO 2021

### 2.1 The top three WRESTLING TECHNIQUES that are most performed in each style

	Leg Attacks	Takedown	Gut Wrench	Lifts	Ankle Lace
FS	32.23%	11.67%	8.42%	-	-
GR	-	7.78%	23.09%	8.41%	-
WW	32.11%	9.00%	-	-	10.02%

At the OG in FS and WW is the absolute dominance of wrestling technique leg attacks accounting for 1/3 of all points in these two styles.

In WW, a significant percentage of points is for the technique Ankle lace (over 10%) and in FS technique Take down exceeds 11% of all points.

In the GR style, the dominant technique is the Gut wrench with 23% of points. None of the other techniques exceed 10%.

### 2.2 Other Points by Style

	Step Out	Activity Clock	Standing Caution	Passivity	Parterre Caution	Parterre Challenge
FS	11.20%	6.51%	1.82%	-	-	-
GR	8.41%	-	-	20.58%	3.51%	-
WW	6.44%	5.21%	-	-	-	0.51%

The biggest problem in GR is the very large number of points decided by judges and not wrestlers, and it amounts to as much as 21% of all points in GR style for passivity. The second largest other points is from "step out" with 8.41% points.

In FS the largest part of other points is for Step out which amounts to 11.20% of points. Which is a rather high percentage for pushing a wrestler out of a circle.

In WW other points are very under represented compared to the other two wrestling styles (FS and GR).

### 2.3 Most points: Wrestling techniques (3 best) / by style and weight category

FS				GR				WW			
Category	Leg Attacks	Take down	Gut Wrench	Category	Gut Wrench	Lifts	Take Down	Category	Leg Attacks	Ankle Lace	Take down
57 kg	86	22	6	60 kg	32	4	26	50 kg	48	36	20
65 kg	70	20	14	67 kg	18	20	12	53 kg	56	22	14
74 kg	86	24	10	77 kg	10	27	2	57 kg	44	4	22
86 kg	72	20	20	87 kg	32	10	4	62 kg	48	8	16
97 kg	42	10	12	97 kg	40	4	14	68 kg	74	22	12
125 kg	54	26	26	130 kg	52	4	4	76 kg	44	6	4

In table 2.3, you can see which techniques are most represented in the different weight categories. These tables are of special importance for wrestling coaches. Based on this analysis, they can see which techniques are more and which are less important in relation to the weight category.



## 2.4 EFFICIENCY-WQ/min (by category)

FS		GR		WW	
Category	WQ/min	Category	WQ/min	Category	WQ/min
57 kg	1.90	60 kg	1.43	50 kg	2.69
65 kg	1.59	67 kg	1.57	53 kg	2.00
74 kg	2.01	77 kg	1.38	57 kg	1.51
86 kg	1.75	87 kg	1.25	62 kg	1.68
97 kg	1.40	97 kg	1.18	68 kg	1.82
125 kg	1.70	130 kg	1.13	76 kg	1.45
<b>Average</b>	1.72	<b>Average</b>	1.27	<b>Average</b>	1.81

Table 2.4 shows in which weight categories the most technical points were made per minute of wrestling (WQ/ min). In FS it is the weight category 74 kg (2.01). In the GR style, it is a weight category of 67 kg (1.57). In WW it is the 50 kg weight category (2.69). This category is the best of all 18 weight categories in the Olympic Games.

The weight category where the least points were made in the OG is the 130 kg in GR with a WQ / min of only of 1.13 points per minute of wrestling.

## 2.5 REVIEW BY WEIGHT CATEGORY- STANDING/PARTERRE POINTS IN %

FS			GR			WW		
Category	Standing	Parterre	Category	Standing	Parterre	Category	Standing	Parterre
57 kg	81.00	19.00	60 kg	67.38	32.62	50 kg	57.95	42.0
65 kg	80.57	19.43	67 kg	65.84	34.16	53 kg	64.20	35.80
74 kg	76.04	23.96	77 kg	53.49	46.51	57 kg	79.33	20.67
86 kg	78.82	21.18	87 kg	66.92	33.08	62 kg	69.74	30.26
97 kg	80.56	19.44	97 kg	54.84	45.16	68 kg	74.57	25.43
125 kg	73.78	26.22	130 kg	66.06	33.94	76 kg	75.00	25.00
<b>Average</b>	78.47	21.53	<b>Average</b>	59.10	40.90	<b>Average</b>	69.43	30.57

These three tables are very important for coaches. From these data, it is very clear in which categories more and in which less techniques are performed from the standing position, and in which more techniques are performed from the parterre position. Based on these data, trainers should make their training plans differently for weight categories.

## 2.6 REVIEW BY WEIGHT CATEGORY- TECHNICAL/OTHER POINTS IN %

FS			GR			WW		
Category	Technical	Other	Category	Technical	Other	Category	Technical	Other
57 kg	78.50	21.50	60 kg	67.38	32.62	50 kg	91.79	8.21
65 kg	70.86	29.14	67 kg	65.84	34.16	53 kg	88.64	11.36
74 kg	81.25	18.75	77 kg	53.49	46.51	57kg	83.33	16.67
86 kg	81.18	18.82	87 kg	66.92	33.08	62 kg	82.89	17.11
97 kg	75.00	25.00	97 kg	54.84	45.16	68 kg	89.60	10.40
125 kg	79.88	20.12	130 kg	66.06	33.94	76 kg	81.06	19.94
<b>Average</b>	77.89	22.11	<b>Average</b>	62.61	37.39	<b>Average</b>	86.71	13.29

Similar to the previous table, these are of great importance for coaches, to know in which weight categories wrestlers prefer to perform wrestling techniques, and in which categories they tactically wrestle with very few performed wrestling techniques.

There are two categories in the GR style where the number of other points (meaning for points where wrestling techniques are not performed) is almost the same as the scoring of technical points. These are in the GR style category 77 kg (46.51%) and 97 kg (45.16%). These data show that not many wrestling techniques have been seen in these weight categories, and that is certainly not attractive to spectators.

## 2.7 REVIEW BY POINTS FOR TOP NATIONAL TEAMS

### National Teams Performance - Points WIN

Team	ANKLE LACE	GUT WRENCH	LIFTS	PARTERRE CAUTION	PARTERRE CHALLENGE	PARTERRE COUNTER	TURN OVER	ACTIVITY TIME	FORWARD BENDING THROW	HIP TURNING THROW	LEG ATTACKS	NEGATIVE WRESTLING	STANDING CAUTION	STANDING CHALLENGE	STANDING COUNTER	STEP OUT	SUPLEX THROW	TAKE DOWN
USA	8	10			1	1	6	5	4		72		1		4	17		10
ROC	4	12			1	3	10	9	2		42	1	2	1		18	4	26
KAZ	6	12	4			2	4	4			28	2	2		2	6		14
IRI		10		2			2	10			28		1	1		16	4	8
IND						2	8	3	2		42		1		2	5		10

### National Teams Performance - Points LOST

Team	ANKLE LACE	GUT WRENCH	LIFTS	PARTERRE CAUTION	PARTERRE CHALLENGE	PARTERRE COUNTER	TURN OVER	ACTIVITY TIME	FORWARD BENDING THROW	HIP TURNING THROW	LEG ATTACKS	NEGATIVE WRESTLING	STANDING CAUTION	STANDING CHALLENGE	STANDING COUNTER	STEP OUT	SUPLEX THROW	TAKE DOWN
KAZ	4	2		1	1	5	6	2	4		40	1	5	1		5		4
CUB		10				2		3			20		1			5		16
IND	6	6			1	2	4	4			20		1	1		9		2
UZB	12					1	4	1	2		14			1	2	7		8
IRI		2		1		2	2	2			30		1			5		4

## GR

### National Teams Performance - Points WIN

Team	GUT WRENCH	LIFTS	PARTERRE CAUTION	PARTERRE CHALLENGE	PARTERRE COUNTER	TURN OVER	FORWARD BENDING THROW	HIP TURNING THROW	NEGATIVE WRESTLING	PASSIVITY	STANDING CAUTION	STANDING CHALLENGE	STANDING COUNTER	STEP OUT	SUPLEX THROW	TAKE DOWN
ROC	28	6	6	1		2	12	4		18			2	6		8
IRI	16	8	2	1		4	10		2	14	2	2	2	10	2	16
CUB	14	4					6		2	11			2	11		8
GER	12	12	2	2	2				10	2	1	2	2	3		2
UKR	6	8		1		2	4	4		10		1	2	1		6

### National Teams Performance - Points LOST

Team	GUT WRENCH	LIFTS	PARTERRE CAUTION	PARTERRE CHALLENGE	PARTERRE COUNTER	TURN OVER	FORWARD BENDING THROW	HIP TURNING THROW	NEGATIVE WRESTLING	PASSIVITY	STANDING CAUTION	STANDING CHALLENGE	STANDING COUNTER	STEP OUT	SUPLEX THROW	TAKE DOWN
IRI	14	9	4	3		2	4		10	4			2	7		2
EGY	6					2	8	4		6	2	4	4	5		8
TUN	12	16	2	1				4		4					4	2
ARM		2	8	1		2		8		9	2	1	2	3		2
ALG	18	4			2					7				3		4

## WW

### National Teams Performance - Points WIN

Team	ANKLE LACE	GUT WRENCH	PARTERRE CAUTION	PARTERRE CHALLENGE	PARTERRE COUNTER	TURN OVER	ACTIVITY TIME	FORWARD BENDING THROW	HIP TURNING THROW	LEG ATTACKS	STANDING CAUTION	STANDING CHALLENGE	STANDING COUNTER	STEP OUT	SUPLEX THROW	TAKE DOWN
JPN	28	12				8	10	4	6	38		1		11	4	20
USA	24	2	1	1	6	10	4	2		64	1		2	5		18
CHN	6	6			3	10	4		4	26				3	8	2
KGZ				1		12	3	16		32				2		6
MGL	18	4	1		3	2	1	4	8	14				1	12	2

### National Teams Performance - Points LOST

Team	ANKLE LACE	GUT WRENCH	PARTERRE CAUTION	PARTERRE CHALLENGE	PARTERRE COUNTER	TURN OVER	ACTIVITY TIME	FORWARD BENDING THROW	HIP TURNING THROW	LEG ATTACKS	STANDING CAUTION	STANDING CHALLENGE	STANDING COUNTER	STEP OUT	SUPLEX THROW	TAKE DOWN
MGL	2	16			2	6	2	8	2	32	3	1	2	13		14
ROC	4	8			6		5	16		24	1		2	5	16	4
CHN	12	2	1	1	4	4	5	10		30		1		4		2
UKR	6				4	12	1	4		22				1		6
USA	2	8			5	4	6		8	10				1	4	6

These three tables show where the points are won and lost are of great importance for all national wrestling coaches. From these tables, it can be clearly seen in which segments of technique their wrestlers were good and in which they were bad. Also, these tables can serve all coaches to be able to make a quality report on the championships where all the data on the performance of their national team is recorded.

## 2.8 REVIEW 3 ELEMENTS WITH THE MOST POINTS IN 3 PHASES OF THE COMPETITION- ALL MATCHES, MEDAL MATCHES, ALL MATCHES WINNERS

### TECHNICAL POINTS

<b>FS</b>	<b>Leg Attack</b>	<b>Takedown</b>	<b>Gut Wrench</b>
ALL MATCHES	39.23%	11.20%	8.42%
MEDAL MATCHES	38.03%	19.90%	2.82%
ALL MATCH WINNERS	42.06%	11.16%	7.73%
<b>GR</b>	<b>Gut Wrench</b>	<b>Lifts</b>	<b>Takedowns</b>
ALL MATCHES	20.58%	8.41%	7.78%
MEDAL MATCHES	21.14%	12.98%	4.58%
ALL MATCH WINNERS	21.05%	9.21	11.84%
<b>WW</b>	<b>Leg Attacks</b>	<b>Ankle Lace</b>	<b>Takedown</b>
ALL MATCHES	32.11%	10.02%	9.00%
MEDAL MATCHES	30.00%	17.14%	14.29%
ALL MATCH WINNERS	36.36%	16.27%	11.48%

### OTHER POINTS

<b>FS</b>	<b>Step Out</b>	<b>Activity Clock</b>
All Matches	11.20%	6.51%
Medal Matches	16.90%	9.15%
All Match Winners	11.16%	4.72%
<b>GR</b>	<b>Passivity</b>	<b>Step Out</b>
All Matches	20.56%	8.41%
Medal Matches	22.14%	9.92%
All Match Winners	21.05%	11.84%
<b>WW</b>	<b>Activity Clock</b>	<b>Step Out</b>
All Matches	5.21%	6.44%
Medal Matches	4.49%	4.29%
All Match Winners	7.66%	3.35%

Considering the results from the previous tables, scientists can make numerous scientific papers with different types of correlations between points won or lost at, different stages of the competition. They are not the same data for all matches from data for matches for medals or only matches that the winners had. In addition to scientists, coaches are the ones who need to draw certain conclusions from these data and prepare various types of tactics depending on the stage of the competition and whether it is a qualifying match or a medal match. As an example, we can take the results of other points in FS, where in medal matches as many as 16.90% of points were won due to the opponents exit from the mat and significantly differ from other matches in other phases of the competition at the Olympic Games.

## 2.9 MOST SUCCESSFUL WRESTLERS (MSW) FROM TOKYO OLYMPIC GAMES - FIRST 3 PLACES

<b>FS</b>				<b>GR</b>				<b>WW</b>			
Wrestler	Cat. Kg	Team	MSW Index	Wrestler	Cat. Kg	Team	MSW Index	Wrestler	Cat. Kg	Team	MSW Index
Taylor, D.	86	USA	5.15	Lopez, M.	130	CUB	4.81	Susaki, Y.	50	JPN	7.76
Sidakov, Z.	74	ROC	4.76	Geraii, M.	67	IRI	3.81	Mensa-Stock, T.	68	USA	4.55
Stevesson, G.	125	USA	4.25	Orta, M.	60	CUB	3.70	Mukaïda, M.	53	JPN	4.15

This should become the practice of declaring the most successful wrestler in every style at every championship. It is necessary to point out who is the most successful (most successful wrestler) of the 6 champions from the Olympic Games, or of the 10 champions from the World Championships. This is important for several reasons. If the most successful wrestlers are announced and rewarded, it will significantly increase the attractiveness, because the best wrestlers will always strive to make as many technical points as possible, or to win by technical superiority and not be satisfied with a minimal victory in the match. If the most successful wrestlers are proclaimed, it will mean a lot for all media to be able to present the heroes of the mat in a much more objective and efficient way.

## INDEX FORMULA FOR MOST SUCCESSFUL WRESTLER (IMS)

$$IMS = (WQ/minW - WQ/minL) + (CPW/NM - CPL/NM)$$

### Where:

IMS – Index most successful (wrestlers)

WQ/minW– Number of (+) points scored per 1 minute

WQ/minL – Number lost (-) points per 1 minute

CPW – Classification points WIN (+)

CPL – Classification points lost (-)

NM – Number of matches

At the Olympic Games in Tokyo MSW (Most successful wrestlers) were: FS – David TAYLOR, {USA} winner of the 86 kg category; GR – Milian LOPEZ (CUB) winner in 130 kg category (none of his opponents scored any technical points in 4 matches) and WW – Yui SUSAKI (JPN) the winner in the 50 kg category, who had a total technical score of 41-0.

## 2.10 REVIEW OF ALL MATCHES WITH RECORDED POINTS AND TIME OF EXECUTION

FS		GR		WW	
Time	Points	Time	Points	Time	Points
00:00-01:00	83	00:00-01:00	49	00:00-01:00	141
01:00-02:00	194	01:00-02:00	281	01:00-02:00	201
02:00-03:00	229	02:00-03:00	92	02:00-03:00	191
03:00-04:00	163	03:00-04:00	160	03:00-04:00	130
04:00-05:00	186	04:00-05:00	132	04:00-05:00	147
05:00-06:00	190	05:00-06:00	83	05:00-06:00	168
Total points	1045	Total points	797	Total points	978

This is of great importance for coaches to have an overview of when and in which minutes more points are made and in which fewer points. Based on these data, coaches should make a plan of preparation for the competition, taking into account the time parameters shown. From these tables it can be seen that in FS the most points are in the 3rd minute of the fight, and in GR and WW in the second minute of the fight.

## 2.11 REVIEW OF BEST WRESTLER SCORING WITH TOP 3 TECHNIQUES

FS		
Technique	Wrestler	Points
Leg Attack	Kumar, R. (IND) 57 kg	30
Takedown	Niyazbekov, D. (KAZ) 65 kg	12
Ankle Lace	Gilman, T. (USA) 57 kg	8

GR		
Technique	Wrestler	Points
Gut Wrench	Kayaalp, R. (TUR) 130 kg	14
	Michalik, T. (POL) 85 kg	14
Lifts	Staebler, F. (GER) 67 kg	12
Takedown	Saravi, M. (IRI) 97 kg	10

WW		
Technique	Wrestler	Points
Leg Attacks	Mensa-Stock, T. (USA) 68 kg	20
Ankle Lace	Hildebrandt, S. (USA) 55 kg	18
Takedown	Kawai, Y. (JPN) 62 kg	14

These data are of great importance for both wrestlers and the media. After the end of the championship, it remains for the media to be able to write about the wrestling and to analyze the championship from several angles, and to represent not only the medal winners, but also specialists in certain wrestling techniques.

## 2.12 INDIVIDUAL PERFORMANCE FOR ALL WRESTLERS - POINTS WON AND LOST FROM ALL TECHNIQUES

This is one of the most important analyses of all that has been presented. In table 2.12 one sees all the wrestlers who performed at the Olympic Games, (290) with all of the techniques with which they won points and of all the techniques with which they lost points.

This review is of great importance for all coaches to have an overview of their wrestler's techniques in one place.

### An example: JAPAN National Women's Team

		Individual Performance - Points WIN											
Team		ANKLE LACE	GUT WRENCH	TURN OVER	ACTIVITY TIME	FORWARD BENDING THROW	HIP TURNING THROW	LEG ATTACKS	STANDING CHALLENGE	STEP OUT	SUPLEX THROW	TAKE DOWN	Total
☐	<b>JPN</b>	<b>28</b>	<b>12</b>	<b>8</b>	<b>10</b>	<b>4</b>	<b>6</b>	<b>38</b>	<b>1</b>	<b>11</b>	<b>4</b>	<b>20</b>	<b>142</b>
	DOSHO Sara					4		2	1				7
	KAWAI Risako		2	2	3					1		14	22
	KAWAI Yukako	8			3			12		2		2	27
	MINAGAWA SUZUKI Hiroe			2	2			2		6			12
	MUKAIDA Mayu	8	8		1		2	12		2			33
	SUSAKI Yui	12	2	4	1		4	10			4	4	41
	<b>Total</b>	<b>28</b>	<b>12</b>	<b>8</b>	<b>10</b>	<b>4</b>	<b>6</b>	<b>38</b>	<b>1</b>	<b>11</b>	<b>4</b>	<b>20</b>	<b>142</b>

		Individual Performance - Points LOST							
Team		ANKLE LACE	GUT WRENCH	PARTERRE CAUTION	ACTIVITY TIME	LEG ATTACKS	STEP OUT	Total	
☐	<b>JPN</b>	<b>6</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>24</b>	<b>1</b>	<b>38</b>	
	DOSHO Sara	6				8		14	
	KAWAI Risako				1	2		3	
	KAWAI Yukako				2	4	1	7	
	MINAGAWA SUZUKI Hiroe				1	4		5	
	MUKAIDA Mayu		2	1		6		9	
	<b>Total</b>	<b>6</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>24</b>	<b>1</b>	<b>38</b>	

# DEVELOPMENT OF THE ELITE WRESTLING ATHLETE

Bahman Mirzaei

Dept. Head of Exercise Physiology,  
Faculty of P.E. & Sport Sciences,  
University of Guilan, Rasht, Iran

mirzaei@fila-wrestling.com

## INTRODUCTION

There is not a simple singular uniform approach to the topic such as the “Development of the Elite Wrestling Athlete” because of many cultural differences among countries. So, the way to success is not the same for all wrestlers.

Wrestlers’ development model from novice to elite level is a long-term process with different systems among countries. In the most countries, the systems are based upon club development with a primary singular coach involved in the young athlete’s development, focusing on the international styles of Freestyle and Greco-Roman Wrestling. Whereas, in the USA it is based upon folkstyle wrestling within the school system, from middle school to the university level with a multitude of coaches involved.

Mirzaei et al. (2013) in a comparative study of starting age of training, training background, sport achievement and performance consistency of 800 elite wrestlers in the seven world famous countries including: Russia, Iran, USA, Cuba, Turkey, Georgia and Ukraine who won medals in international competitions since 1960s reported that there are significant differences between all above-mentioned variables among top wrestling countries (3).

These days, the advancement of the science and technology has made it possible for many countries to invest in training successful athletes to succeed in international sporting events. One of the most remarkable among these investments is in talent selection. Being talented is a way to succeed in sports. Therefore, talent selection is very important for the identification of future champions.

Reaching the top level and becoming a national team member will occur only in a very small percentage of those athletes that start into the sport of wrestling. So, it is important to be able to identify those talented wrestlers as early as possible and nurture and encourage them in their development. Most sport clubs, coaches and professional teams use talent tests to identify talented athletes. The concept of talent in sports can be defined as all of the characteristics such as genetic factors, intrinsic physical and physiological capacity, psychological strengths, mental toughness or “grit” and high performance that are thought to be effective for a person to succeed in sports (1).

## TALENT IDENTIFICATION

There are two well-known main methods applied for talent selection in sports, namely Natural Selection and Scientific Selection. Natural selection means someone chooses a sport randomly based on an athlete’s tendency toward that sport without any scientific test or particular guidance of athlete’s family or a sports teacher. The scientific selection directs the person to the most appropriate sport by using various scientific tests in order to identify talent. To detect young athletes with potential for success in Olympic sports talent identification (TID) programs are designed. According to TID program, talent selection is generally applied regardless of potential and maturation processes of athletes, but the advantages of anthropometric, aerobic and anaerobic power depend on a certain maturation process in athletes. When performing skill identification and development programs in the field, coaches should assess athletes according to their preadolescence and postpubertal periods. Furthermore, physical and physiological characteristics, anthropometric structure, somatotype characteristics, and psychological factors are reported to be important parameters in determining the talented athletes (1).

In some countries where wrestling is a successful sport, it is very important to determine their champion athlete candidates by early scientific tests and lead them to the specific training programs. That’s why many developed countries such as the USA, UK, China, Russia and Germany have used a variety of tests to direct the athlete candidates to a sport discipline in which they can be more successful.

Studies conducted on wrestlers demonstrate that tests such as 800 m running, 30 m running, flexibility, mental tests are applied to determine the talent of the athletes. Also other tests such as finger and hand grip strength, standing long jump, medicine ball throw, active leap, anaerobic power, 20m sprint run, pro-agility quickness and 20m shuttle run tests are performed for children in the age group of 9-14 (1).

Based on studies, wrestling coaches use talent test methods to determine the basic motoric characteristics. In addition, technical characteristics, physical structure and tendency to wrestling have been observed in talent identification. Recently the use of genes has been one of the most considerable developments in talent identification. Many studies suggest that genetic tests should be used in talent selection. By the help of this method, physiological and anatomical aspects of individuals can be determined, so they can be directed to a certain sport. Physiological characteristics such as aerobic capacity, strength, endurance, types of muscle fibers, cardiac size and lactate threshold are affected by genetic factors(1).

The primary way to achieve to one's ultimate performance capacity such as techniques, practices and behavior is training, but also the environment, heredity and their interaction can affect it. We know that some rare athletes reach high enough to performance capacity which it called "Golden Status" and it is also known that there are some athletes who possess the necessary capacity, but they never reach it. The coach should help the athlete to reach to their ideal performance capacity. In fact, all should be satisfied and proud regardless of the medals and matches outcome. The question is that; what is the best way to develop a wrestler? A comprehensive training model which is an athlete centered approach that is concerned with a maximization of potential throughout the lifespan is Long-Term Athlete Development (LTAD) (2).

LTAD integrates preparation over an entire career or lifetime, individual development as well as development as an athlete. Therefore, it takes the periodization concept (the integration of competition, training, recovery, nutrition, and other elements of preparation to create a long-term training plan) to the next level. LTAD model should enhance wrestling as an experience and a sport for all participants by consisting of guidelines which athletes, coaches and parents should be flexible with. The development of sound physical literacy skills that learned and trained during "sensitive periods of a trainability" is a key for an athlete to reach his/her full potential. The "S's" (stamina, strength, speed, skill and suppleness) of LTAD must introduced in an appropriate time. Peak Height Velocity (PHV), the maximum rate of growth is the main point for sensitive periods of trainability. It is essential that S's training introduction should base on developmental age, not chronological age. Development occurs at different times for different young athletes, but if the sensitive periods of development missed, the athlete may not develop to full potential or the path of progress may be more difficult (4).

Coaches can help athletes of any ages to participate and achieve their aspirations more effectively by understanding the 10 Key Factors of LTAD. The 10 key factors of LTAD are as follows:

1. **The FUNDamentals:** Basic physical literacy is the foundation for later athletic success. Developing a wide range of movement at the early time of life may be better for a top-level athlete in the future.
2. **Specialization:** Pre-mature specialization may lead to a lack of skill development, overuse injuries, early burnout and retirement from sport and physical activities. So, it is necessary to pay attention to broad-based skills and abilities at first.
3. **Developmental Age:** Young athletes are divided into three categories in range of physical, mental, cognitive and emotional qualities; early, average or late maturers. Athletic training should be based on developmental age, not chronological age. Some coaches pay special attention to early maturers while the late maturer may have the greater potential to become a top athlete. In fact, early physical maturity does not mean that the athlete is mentally prepared for the challenges.
4. **Trainability:** This concept related to the ability of an athlete to train at different stages of growth and maturation. Each of the "S's" of Stamina, Strength, Speed, Skill and Suppleness occur at different and special times. For example, stamina and strength trainability is linked to developmental age, while the others are linked to chronological age.
5. **Physical, Cognitive, Mental and Emotional Development:** Over-emphasis on physical training and winning at any stage may not equip the athlete for all challenges or for life outside sport. Thus, character, ethics and so on should be objectives for every program.
6. **Periodization:** Periodization is the organization of training program by manipulating modality, volume, intensity, frequency, recovery and competition periods of training over a long term. LTAD periodizes training program by focusing on life-long development.
7. **Competition Calendar Planning:** LTAD needs an optimal sport-specific competition calendar that requires for all stages. It may create logistic challenges, but it is essential to LTAD.
8. **The 10-Year Rule:** Research has shown that a talented athlete needs at least 10 years and 10,000 hours of training to reach elite levels. It is easy to skip long-term development in the effort to attain short-term results, but it is not constant.

9. **System Alignment and Integration:** LTAD focuses on all wrestling leaders and organizations. The best results can only be achieved when all organizations work together in an integrated and coordinated way to support athlete success.
10. **Continuous Improvement:** Sport is continuously evolving. LTAD will constantly enrich our understanding to adapt to new progressions (4).

The optimal development of those five skills cannot occur without; Structure/Stature (body type and growth), psychology, Sustenance (adequate nutrition and rest), Schooling (or Stress), and Sociocultural factors;

**Structure/stature:** Following the stature is a guideline to planning the sensitive periods of physical (endurance, strength, speed and flexibility) and skill development.

**Psychology:** Planning, implementing and refining of mental strategies will have a large impact on performances. Consequently, the mental training is important in all stages of LTAD to deal with success or failure which can keep the athlete in sport and physical activity in general.

**Sustenance:** Sustenance is a broad range of components which involve nutrition, hydration, rest, sleep and regeneration. These components are needed to apply to training (life) plans depending on the stages of LTAD. The coach or parents must monitor recovery through the identification of fatigue to achieve proper sustenance and recovery.

**Schooling (or Stress):** The demands of school must be considered for young athletes designing programs. It means that the program should include school academic loads, duties and other stresses. It is the same for mature athletes by training camps and competition tours. Overstress must be monitored carefully in all stages.

**Sociocultural:** Sport planning is not just simply commuting between the hotel room and gymnasium, it includes ethnicity awareness and national diversity (4).

The LTAD model divides athlete development into a series of stages. The stages of wrestling's LTAD model are:

#### 1) Active Start- ages 0-6 (M&W)

##### The Participant

- From age 0 to 6 years old, a child is a "learning machine" full of curiosity and always on the move. Brain connections are being made and the body is growing rapidly.
- The child has a short attention span and needs lots of variety and frequent breaks.
- Social play with other children develops gradually, but the child loves to imitate and play with parents.
- Limited ability to grasp concepts like sport rules but lots of imagination to create their own games.

##### The Coach

- Parents, family, and teachers are the "coaches" at this stage.
- Allow lots of room for exploration and risk-taking in a safe environment.
- Promote physical activity and healthy eating as a family activity. Role modeling is very important.
- Provide short-duration, rapidly changing activities with lots of breaks. Let the child's attention span and interest dictate the activity.

##### Development

- The child is building the foundation for future success in skill development and creating neural connections across multiple pathways in the brain particularly when rhythmic activities are used.
- Physical activity enhances development of brain function, coordination, social skills, gross motor skills, emotional development, leadership and imagination. It helps children to build confidence and develop positive self-esteem.
- Activity also helps builds strong bones and muscles, improves flexibility, develops good posture, improves fitness, promotes a health body weight, reduces stress and improves sleep.

##### The Program

- Daily activity: minimum 30 minutes/day for toddlers and 60 minutes/day for preschoolers.
- FUN activities on land, in water and air, and sliding on snow and ice.
- Encourage running, with stops, starts and changes in direction.
- Catching and throwing games using a wide range of soft objects, and balls of different sizes. Start with two hands then progress to using left and right hands to catch and throw.
- Balance, jump, slither like a snake, and roll like a rolling pin. Use hands, feet and other body parts to balance, push and jump. Ride a tricycle or bike.
- Allow non-aggressive tumbling and "play-wrestling" as long as you can see smiles and hear laughter(4).



## **2) FUNdamentals- ages 6-9 (M) and 6-8 (W)**

### **The Participant**

- From age 6 to 9 years old, a child learns to participate in group activities. He/she expects to be directed by parents, teachers or coaches and loves to follow, but due to short attention span and judgmental nature, can quickly become frustrated or lose interest.
- He/she likes to show off skills and be the center of attention. Participation in sport can be a source of pride as long as success is praised and reinforced.

### **The Coach**

- Parents, family, and teachers are the early “coaches”. Later, in structured sport programs, coaches should direct Community Sport- Initiation.
- Approach: structured play in fun, safe environments and a minimal emphasis on competition.
- Focus on building-blocks of later performance: ABC’S (Agility, Balance, Coordination, Speed) through a wide range of fun activities.

### **Development**

- The first period of accelerated adaptation to speed occurs at age 6-8 for girls and age 7-9 for boys.
- Suppleness (flexibility) is also very trainable.
- Anaerobic capacity is low, as is ability to regulate temperature in extreme hot or cold environments.
- Attention span is short: children are enthusiastic and want to be in action.
- Skill learning is through verbal, visual, and physical means. Demonstrations and guided trial works are better than explanation alone.
- Strong sense of fairness emerges. Children understand basic sport rules, ethics and concepts.

### **The Program**

- Daily activity: unstructured play daily plus a minimum 30 minutes/day, 5x/week of structured activity including school PE.
- Multiple, fun sport activities on land, in water and air, and sliding on snow and ice.
- Use of modified sports and equipment to ensure the child can control the game.
- Consolidate fundamental movement skills and begin to apply in sport settings. Emphasize catching, throwing, hitting, running and other games.
- Work on speed (linear, lateral, multi-directional, arm/ hand, leg/foot, etc.) with activities under 5 seconds long.
- Develop strength through games using own body weight, medicine ball, Swiss ball, etc.
- Wrestling-related activities: let the athlete experiment with concepts of balance, center of gravity, leverage and strength in games. Allow non-aggressive tumbling and “play-wrestling”. Judo lessons to experience a basic combat sport utilizing similar principles (4).

## **3) Learning to Wrestle- ages 10-12**

### **The Athlete**

- Entering organized wrestling for the first time.
- May be interested due to participation in school, participation of parent or family member, or other reasons.
- May be apprehensive, curious to “see how he/she does” ...needs encouragement and reinforcement through success.
- May be entering at Kids Division if age 10-12 but if he/ she is entering the sport later, may be 12-16 or older. All novices entering the sport enter at Learn to Wrestle.

### **The Coach**

- Community Sport- Initiation coach if new wrestler is age 10-12 and entering via club stream.
- May be Competition-Introduction coach if athlete is age 12 or older, or entering through high school stream.
- Approach: Use games-based training- allow the athlete to experiment with concepts of balance, center of gravity, leverage and strength in games and simple simulations.
- Use games to develop multiple competencies (e.g. skills, speed and stamina) but avoid complex tactics, highly repetitive drills, and high intensity physical training.

## Development

- Optimal period for Skill development is age 8-11 in girls, 9-12 in boys. Fine motor and coordinated movements can develop quickly. The emphasis is on transferring
- fundamental movement skills to fundamental sport skills, and building sport skills.
- Prior windows were Speed and Suppleness: continue to build on motor speed and flexibility through a variety of activities.
- Strength is developed through own body weight activities, medicine balls, etc.
- Stamina is developed through games and relays.
- Abstract thinking and attention span are still developing. Lengthy explanations and complex concepts are difficult to grasp.
- At this age children are becoming more self-aware and self-conscious. Peer approval is important. They may like to be part of a team and “show off” their success and skills to peers.

## The Program

- Overall: Athlete should be involved in multiple other sport/physical activities for multi-lateral development
- Wrestling-specific program: 2 - 6+ weeks, 1 – 3x/week. Seasonal program coordinated with those of other sports.
- Physical: Develop ABC'S: Agility, Balance, Coordination and Speed
- Technical: Learn basic concepts of take-downs and parterre actions
- Tactical: Thinking of how to get an advantage
- Psychological: Develop passion for wrestling as individual/ combative sport, through fun, success mastering basics.
- Theoretical: Basic rules of wrestling.
- Life skills: Cooperation, sport personship.
- Competition: “Festival” environment, modified rules/ match conditions – 1+ events per year(4).

## 4) Formalize Training- ages 12-16

### The Athlete

- Has made a commitment to participate in organized wrestling.
- Is prepared to train hard and compete.
- Is likely experiencing many life challenges in adolescence, including school, family and work, which may detract from commitment to sport. Growth spurt may also lead to temporary loss of performance.
- Wants to feel successful and accepted.
- Has learned basics of the sport in the Learn to Wrestle stage.

### The Coach

- Competition-Introduction coach working in a club or high school environment.
- Approach: Introduce a more structured, higher volume program. Use games and decision-based training to develop multiple competencies (e.g. skills, speed, and stamina). Expect the athlete to learn through experimenting and thinking, not just repetition. Emphasize building a strong foundation of core wrestling skills.
- Avoid “cutting” athletes especially late-matures. Build every athlete for the next stage or the next sport.
- Reinforce athlete's feeling of competence and success through progressive exposure to competition. Avoid temptation to push too hard, too soon, especially with early-maturing athletes.

## Development

- Rapid physical, mental and emotional changes in this phase.
- Optimal period for stamina begins at growth spurt: usually age 11-15 in girls, 12-16 in boys. Make aerobic training a priority after the growth spurt while maintaining or further developing levels of skill, speed, strength, and flexibility.
- Emphasize flexibility training given the rapid growth of bones, tendons, ligaments, and muscles.
- There are 2 periods of accelerated adaptation to strength training for females: the first occurs immediately after PHV and the second begins with the onset of menarche. For males, there is 1 period and it begins 12 to 18 months after PHV.
- Abstract thinking and future-planning skills develop later in the stage.
- Adolescents are highly influenced by their peers and want to be independent and make their own decisions.

## **The Program**

- Overall: The athlete should continue involvement in other sport/physical activities focusing on 2 main sports.
- Wrestling-specific program: 8 – 12+ weeks, 2 – 4x/week. Periodized seasonal program coordinated with other sports.
- Physical: Consolidate ABC'S: Agility, Balance, Coordination and Speed. Introduce off-mat training including strength training.
- Technical: Consolidate core skills through repetition. Introduce new skills regularly.
- Tactical: Introduce tactical principles: action, reaction, deception.
- Psychological: Foster combative mentality and perseverance.
- Theoretical: Language, protocol, structure and history of wrestling
- Life skills: Respect for sport, opponent, self.
- Competition: Regional and Provincial competition; introduce National later in stage. Build success through selected competitive experience. 10-20 matches/year(4).

## **5) Training to compete- ages 17-20**

### **The Athlete**

- Is serious about organized wrestling and pursuing excellence.
- Is prepared to train hard and focus on competitive success.
- Is likely experiencing life challenges in balancing school, family, personal relationships and work, which may detract from commitment to sport.
- Self-image becomes defined, includes sport as a major element in identity.
- Looking ahead to next steps in sport success e.g. college, national team but may be frustrated by injury or other priorities.
- Needs to build a support network including family, coach, sport science and health care to sustain sport career.

### **The Coach**

- Competition-Development coach working in a club or college/university environment.
- Approach: Introduce a year-round, high-volume and intensity program. Decision-based training is used to transfer skills and fitness to competitive situations. Use competition simulations and training competitions to build competition skills. Insist the athlete learn through experimentation and analysis.
- Reinforce feeling of competence and success through progressive exposure to competition. Avoid overreaching, over-training and over-competing to protect against injury.

### **Development**

- Major opportunity for strength and power development.
- Maintain or further develop skill, speed, stamina and flexibility.
- Capacity for significant increase in volume and intensity of training.
- Abstract thinking and goal-setting skills well-developed; can think ahead tactically, and in terms of personal development.
- Strong sense of independence and wants to make own decisions, yet continues to desire external support and identity with peer group.

### **The Program**

- Overall: Specialize in maximum two sports and move to year-round, high volume and intensity training. Focus on volume.
- Wrestling-specific program: 30+ weeks, 5 – 8x/week. Periodized annual program with single or double peaks. Introduce tapering/peaking strategies.
- Physical: Optimize strength, speed and power. Build maximal capacity.
- Technical: Master core skills and develop variations in competitive situations.
- Tactical: Develop personal strategy/tactics based on individual strengths.
- Psychological: Plant seeds of peak performance: goalsetting, desire, sacrifice.
- Theoretical: Understand basis of athletic performance.
- Life skills: Develop independence.
- Competition: Provincial, national Games. Intro to international and Junior Worlds. 30+ matches/year(4).

## **6) Training for Peak Performance- ages +21**

### **The Athlete**

- Totally committed to pursuing excellence in wrestling.
- Has been focused on competitive success and training hard for 7+ years. Is mastering all aspects of wrestling and life as a high-performance athlete.
- Has an active support network including family, coach, sport science and health care to help sustain sport career. Is learning to manage stress, injury, and maintaining peak performance while balancing life demands.
- Is increasingly seen as a role model and is in demand to appear or coach at various events.

### **The Coach**

- Competition-High Performance coach working in a club, college/university or national team environment.
- Approach: Provides support, technical analysis and outside perspective to an established high-performance athlete. Seeks competition opportunities and engages additional specialized expertise to fine-tune athletic performance.
- Build independence through athlete's participation in planning decisions and own control of day-to-day training.
- Monitor carefully to avoid over-reaching, overtraining and over competing and protect against injury.

### **Development**

- Maintain or further develop skill, strength, speed, power, stamina and flexibility.
- Care must be taken to optimize volume and intensity of training to maintain peak performance while avoiding injury. Consider individual variation in ability to cope with training volume, recovery needed, etc.
- Abstract thinking and goal-setting skills fully developed. Able to analyze situations quickly and adapt or innovate.
- Is independent and self-directed, yet needs strong support to enable full focus on demands of sport.

### **The Program**

- Overall: Analyze, monitor and perfect performance. Focus on quality.
- Wrestling-specific program: Year-round, 9 – 12x/week. Periodized annual program with multiple peaks.
- Physical: Optimize all physical qualities with emphasis on recovery.
- Technical: Perfecting strengths in simulated or modeled competitions. Innovating skills.
- Tactical: Study opponents while refining own actions and reactions. Innovating tactics.
- Psychological: Prepare for the unexpected and overcome adversity.
- Theoretical: Understand and refine personal problem solving, choices, decisions.
- Life skills: Becoming self-directed and in control at all times
- Competition: National, international, Worlds and major Games. 15+ selected quality matches per year.
- Participation in high intensity training camps, national team program, performance testing (4).

## **7) Active for Life- Enter at any age**

### **The Athlete**

- This athlete may be younger, moving out of Learning to Wrestle or Formalized Training stages and seeking ongoing participation in the sport, or ending a high-performance career in wrestling.
- Wants to maintain physical fitness and enjoy the fun of sport, in either a competitive or non-competitive setting.
- Is leading a busy life including school or work, and family. Sport is not top-priority.
- Has a lot to offer wrestling, whether as a participant, coach, official, or leader.

### **The Coach**

- If the participant wants to continue competing, the coach may be a Competition-Introduction coach working in a club environment.
- Approach: A structured, but lower-volume program. Give the participant opportunities to learn and grow through designing and leading activities and experimenting with other disciplines. Emphasize maintaining fitness through regular activity.
- Encourage the participant to try coaching, officiating or other leadership roles in the sport Offer support and encouragement.

## Development

- After age 25+/- some physical abilities decline gradually but can be maintained with training. This is often compensated for by superior tactical sense and mental strength.
- Development as a coach, a mentor, an organizer is just beginning – supporting life-long learning should be a goal of every sport organization.

## The Program

- Overall: Athlete should continue involvement in other sport/physical activities focusing on several enjoyed sports.
- Wrestling-specific program: Seasonal program as desired by athlete, coordinated with other sport activities.
- Physical: Maintain key physical abilities.
- Technical: Maintain and refine core skills. Provide opportunities to learn new skills.
- Tactical: Maintain personal strategy/tactics based on individual strengths.
- Psychological: Mentally stronger for life- employ the lessons of sport and life.
- Theoretical: Life-long learning.
- Life skills: Reflecting on the experience of sport and finding ways to give back.
- Competition: As desired- regional, provincial or national competition(4).

Developing wrestling skills depends on recognizing the success demands such as; split-second reactions and near-automatic decision-making: attack, defend, react and counter. There are two subsets here: 1) the ability to execute skills to perfection. 2) the ability to read the situation and make the right decisions. The best success in teaching both skills and decision-making to athletes in all stages of LTAD is affected by Decision Training (DT), combined with a games approach to practice. Decision Training is a coaching method based on providing feedback by the coach when the athlete falls outside pre-determined limits while he/she employs in a competition-simulation situation. Games Training, Games Sense or Teaching Games is a series of game activities that design by a coach to teach technical and tactical skills which are related to DT accordingly. Games-Based Training is more fun than traditional drills, while it causes superior results for decision-making. These concepts underline the coaches role in appropriate programs, optimal coaching and competition calendars in wrestling (4).

## REFERENCES:

1. KAYNAR Ö, BİLİCİ MF. Analysis of the talent selection in Turkish wrestling. *International Journal of Sport Culture and Science*. 2017;5(4):347-55.
2. Curby D. Sunrise to Sunset–Growth, Development & Maturational Issues in the Lifespan of the Wrestler. *International Journal of Wrestling Science*. 2013;3(2):58-67.
3. Mirzaei B, Ramzani Nejad R, Ghahramani Moghadam M, Ghiasvand K. Comparative study of starting age of training, training background, sport achievement and performance consistency of Iranian elite wrestlers and six other countries. 21th international congress on P.E.and sport (ICPES) 2013.
4. WCL. Wrestling Canada Lutte LTAD Manual. URL:<https://wrestling.ca/programs/long-term-athlete-development/>. 2010.

# ORTHOPEDIC EXAMINATION OF JUNIOR FEMALE WRESTLERS: A CASE STUDY

Podlivaev BA<sup>1</sup>, Kurashvili VA<sup>1</sup>, Gaiduk AA<sup>2</sup>

1 - Federal center for training sports reserve, Moscow, Russia

2 - Saint Petersburg State Pediatric Medical University, Saint Petersburg, Russia

Corresponding author: Vladimir Kurashvili, MD Federal center for training sports reserve, Moscow, Russia  
[kurashvili\\_va@fcpsr.ru](mailto:kurashvili_va@fcpsr.ru)

## ABSTRACT

**Background:** The aim of this study was to investigate the possible influence of female wrestling on the musculoskeletal system of junior female wrestlers. **Method:** The study involved 16 freestyle junior female wrestlers. Orthopedic examination was carried out by optical topography Formetric 4D measurements. **Results:** Of the 16 subjects of the sample, 12 children were orthopedically normal, 3 patients had false scoliosis and 1 has adolescent idiopathic scoliosis (AIS). The results obtained revealed that contralateral side of deviation of the curve of the spine in subjects with scoliosis is statistically significant ( $p = 0.002$ ). Furthermore, the relationship between lower midline and contralateral side of deviation of the curve of the spine in patients with false scoliosis is statistically significant ( $p = 0.003$ ). **Conclusions:** The Formetric 4D provides a safe method to monitor and track the progression of postural deformities in young athletes. It can be reliably used in the surveillance of patients with AIS.

**Keywords:** adolescent idiopathic scoliosis, surface topography, Formetric 4D

## INTRODUCTION

Previous studies have reported sports participation as a possible risk factor for adolescent idiopathic scoliosis (AIS) development. Scoliotic spinal deformity is the most serious orthopedic pathology seen in children and adolescent athletes [1, 2]. The US Scoliosis Research Society has recommended annual screening of all children aged 10-14 years. The American Academy of Orthopaedic Surgeons has recommended screening girls at 11 and 13 years and screening boys at age 13 or 14 years. The American Academy of Paediatrics has recommended annual scoliosis screening with the forward bending test at routine health supervision visits [3, 4, 5, 6].

Excessive physical activity during training in children's sports is one of the factors in the increase in the incidence of diseases among athletes. In youth sports, a specific pathology is overstrain of the musculoskeletal system, which, as a rule, is the result of the combined effects of forced training loads, muscle fatigue, and adverse environmental effects [8]. Sport and exercise are stressful by their nature, and over-stressful activity may produce injury. The lumbar spine is subjected to considerable stress during many athletic endeavors; therefore, abnormalities involving this region may cause injuries and pain among athletes because of the unique demands of the related sport [7]. In this case, chronic overstrain, stress and microtrauma occur, which disrupt the structure and function of tissues [8, 9, 10].

The early start of professional sports activity, extreme physical activity (asymmetric distribution of the load on muscle groups and joints), conditions of competitive activity (special shoes, properties of the plantar surface) form and consolidate a specific motor stereotype, which determines the conditions for the development and functioning of the musculoskeletal the athlete's apparatus. Of great importance are the various conditions of sports activity, in which diseases can develop. Adolescent idiopathic scoliosis (AIS) is a 3D spinal deformity affecting children between the ages of 10 and 14, without an identifiable etiology [11, 12].

Sports actions also include motor actions. In particular, different types of sports with repeated stresses on the spine, presenting themselves as motor engrams, can determine not only benefits deriving from muscle training, but also negative influences on the body, which affect postural structure [13,14]. In fact, in subjects who practice these sports at professional level, repeated stresses can lead to postural adaptations of the spine, both functional adaptive and dysfunctional [15].

According to epidemiological studies, 64 percent of young athletes engaged in sports that put a special strain on the back (gymnastics, athletics or weightlifting, wrestling, etc.) complain of chronic back pain, primarily in the lower back. Moreover, more than 70 percent of all medical prohibitions to engage in the above sports are due to dangerous pathological changes in the spine [16, 17, 18].

In the overwhelming majority, both pain syndromes and medical prohibitions on sports are caused by pathological changes in the spine, in relation to which sport acts, if not provoking, then at least a concomitant factor. In children and adolescents, pathologies such as scoliosis, juvenile osteochondrosis, spondylolysis and spondylolisthesis are most often detected [19, 20].

Poor posture leads to a violation of the biomechanics of the musculoskeletal system, redistributes muscle tone, which indirectly affects the further development of the child (due to the redistribution and / or asymmetry of the muscle corset, not only orthopedic, but also neurological symptoms can join). There is an opinion that in the process of development in the process of development against the background of impaired posture, asymmetry of internal organs can form, which in the future can manifest itself in a violation of the formation of the cardiovascular, respiratory, genitourinary, reproductive and other systems [21, 22].

The current literature cites several possibilities for causative mechanisms of AIS: genetics, biomechanical growth modulation, dorsal shear forces and axial rotational instability, uncoupled spinal neuro-osseous growth, postural abnormalities and hindbrain dysfunction, motor control problems, systemic melatonin-signaling pathway deficiencies, and systemic platelet calmodulin dysfunction [23].

Topographic screening of young wrestlers was carried out using surface topography (ST) in surveillance of scoliosis. ST measures local deviations of a surface from a flat plane. Applying this concept to spinal deformities, ST can non-radiographically study the 3-dimensional shape of the back. One ST system, rasterstereography, projects parallel white light lines onto a patient's back and analyzes line distortion with a camera. While radiography has long been considered the primary diagnostic tool for scoliosis, rasterstereography may possess alternative or complementary benefits in monitoring scoliosis and other diseases. Spinal deformity was assessed by the angle of lateral asymmetry. This angle is calculated from topographic data and is analogous to the X-ray Cobb angle. The topographic parameter "rotation at the apex of the scoliotic arch" was used as a criterion for the presence of structural deformities of the spine. An analysis of the sensitivity and specificity of the topographic test in detecting structural arcs equal to 10 ° according to Cobb and more showed that these characteristics, which determine the effectiveness of screening, depend on the level of the selected thresholds [23].

## SUBJECTS AND METHODS

Our study was carried out on a sample of 16 junior female wrestlers practicing freestyle wrestling and aged from 16.0 to 19.5 years. 16. All participants reported to a local research laboratory and completed an approved informed consent form before participating. The local institutional review board approved all aspects of the study. Various anthropometric measurements were taken (weight, height, circumferences) – see table 1.

Table 1. Anthropometric measurements in junior female wrestlers (n = 16).

Indicators	$\bar{X} \pm \sigma$	Validity of differences, p
Body length, cm	165.4±0.59	p < 0.002
Body weight, kg	57.4±1.02	p < 0.001
Chest circumference, cm	84.3±0.98	p < 0.001

Orthopedic examination was carried out by optical topography Formetric 4D measurements. Before being scanned, human participants completed a short medical history and a demographic questionnaire. After foot placement, the participants were asked to stand in a relaxed, natural position. In front of the participants, an adjustable fixed point was provided as a visual reference and was based on the shoulder height of the participants. Participants were instructed to focus their gaze on this fixed point during the scans to control head position. Each scan was completed in the DIERS data collection and processing software. From each of the images, 40 spine shape parameters were exported for evaluation. These parameters were sorted into three subgroups based on the clinical relatedness of the parameter. These subgroup parameters included localization and distance, trunk and pelvis imbalances, spinal reference points, spinal curve measurements, and spinal deviation. Spine shape parameters are reported in millimeters, percentage, or degrees depending on the specific parameter.

Spine shape parameter definitions adapted from DIERS formetric III 4D Manual (Created 21.06.2010, Revision grade 5) and DIERS Optical Measurement of the Spine Information for the Assessment (Version 1, Created 04.08.2009)

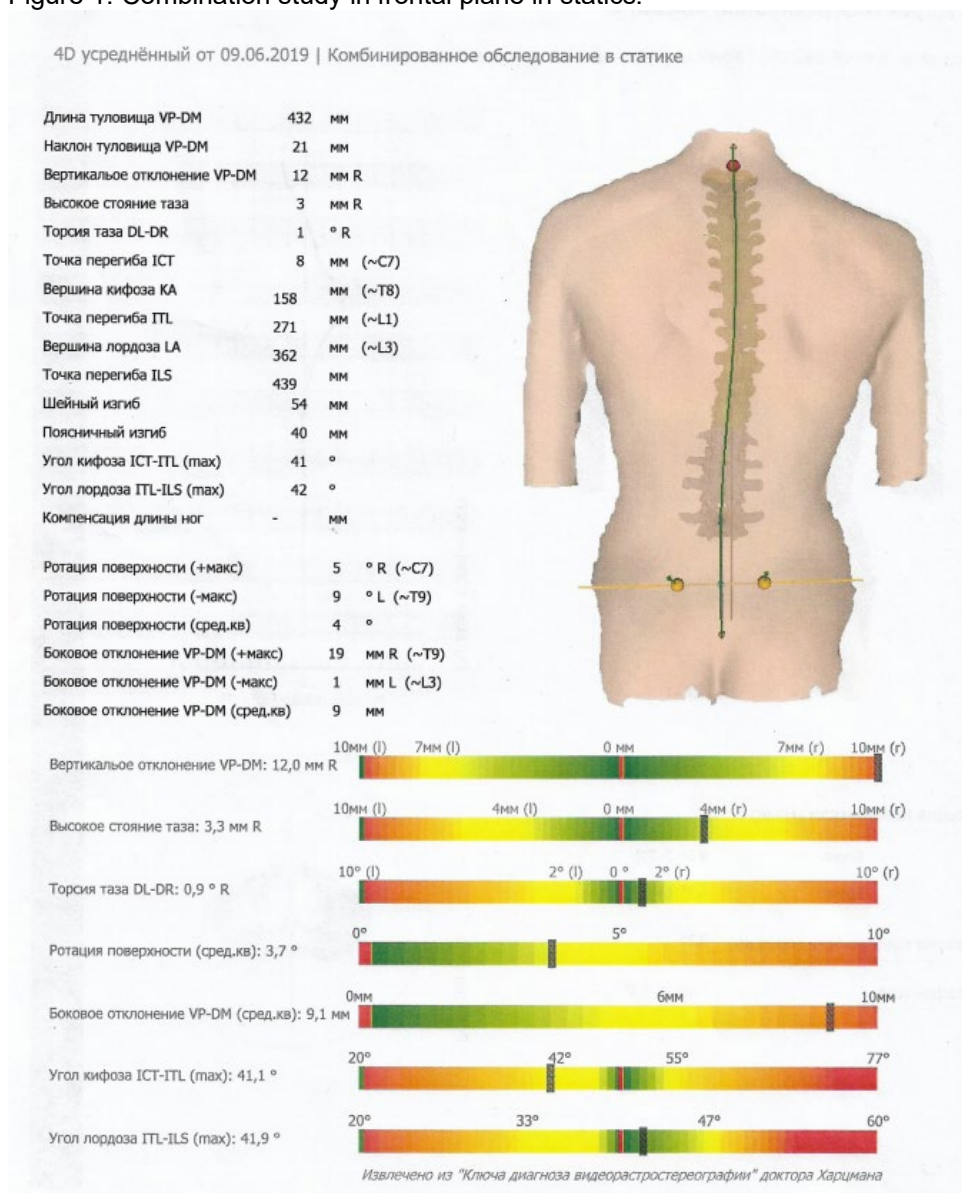
*DL* left sacral dimple, *DM* middle point between the left and right sacral dimples, *DR* right sacral dimple, *ICT* cervical-thoracic inflection point, *ILS* lumbar-sacral inflection point, *ITL* thoracic-lumbar inflection point, *KA* kyphotic apex, *LA* lordotic apex, *RMS* root mean square, *SP* sacral point, *VP* vertebral prominence.

## RESULTS

Of the 16 subjects of the sample, 12 children were orthopedically normal, 3 patients had false scoliosis and 1 scoliosis. The results obtained revealed that contralateral side of deviation of the curve of the spine in subjects with scoliosis is statistically significant ( $p = 0.002$ ). Furthermore, the relationship between lower midline and contralateral side of deviation of the curve of the spine in patients with false scoliosis is statistically significant ( $p = 0.003$ ).

For 15 athletes, there were no recommendations to stop sports. But in 1 athlete during the examination, the following deviations were revealed: Frontal plane (static): in a natural pose there is a thoracic arch with an apex at the Th9 level with a displacement to the right by 19 mm (the scoliotic Cobb angle is 19 degrees), a lumbar arch with an apex at the L3 level with an offset to the left by 1 mm (the Cobb scoliotic angle is 11 degrees), in a natural pose vertical deviation of the spine axis to the right up to 12 mm.

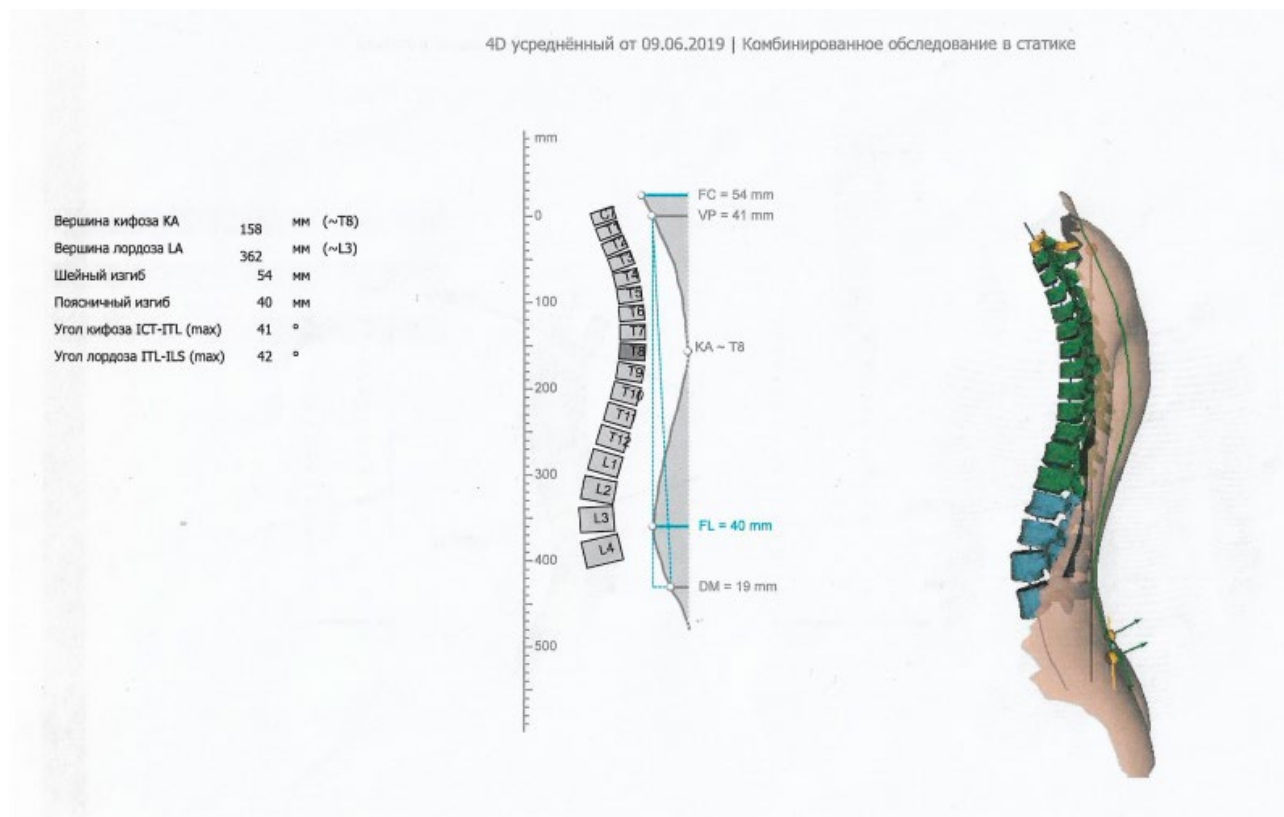
Figure 1. Combination study in frontal plane in statics.





Sagittal plane (static): in a natural position, the angle of the thoracic kyphosis is up to 41 degrees, the angle of the lumbar lordosis is 42 degrees (see fig.2).

Figure 2. Image of the spine in the sagittal plane.



Horizontal plane (statics):

In a natural position, there is a rotation of the pelvis in relation to the shoulder girdle to the right by 1.3 degrees. There is an asymmetry of the paravertebral muscles in the area of the right angle of the scapula. Maximum rotation of the surface of the trunk to the left at the level of C7, to the right at the level of Th9. The position of the pelvis in the frontal plane (statics): in a natural position, the pelvis is skewed to the left of 3 mm. Static patient posture (body weight distribution): in natural posture:

- the frontal balance of the body is slightly shifted to the right (55%);
- sagittal balance of the body - no overload in any direction
- preference for the right foot

A conditional admission was issued for 6 months, with a recommendation to learn individual physical exercises for 1 month with repeated monitoring in dynamics after 5 months.

## CONCLUSIONS

Screening with the optical topography method can detect AIS. The basic data obtained in this study can be used to help develop a strategic exercise program for improving unilateral movement and malalignment of the spine and pelvis. Formatic 4D method might be used for the evaluation of vertebral rotation in young patients with idiopathic scoliosis, with the advantage of being easily repeatable for screening and follow-up, without any risk of exposure to ionizing radiations.

Our observations show that the more technique is suitable for the screening of structural scoliosis because of its sensitivity to even small deformities and the simplicity of the technique. Implementation of objective evaluation methods of posture, such as Formatic 4D, assumes an ever-increasing value in the field of both of the clinical and the re-educative and rehabilitative practice, since it represents an evaluation method free of ionizing radiations, rapid, scientifically recognized and easily repeatable. Based on our results, it is desirable to carry out further studies that support the use of optical topography method in the evaluation of competitive athletes.

#### Author Contributions:

Conceptualization – Podlivaev BA.;

Methodology, software, validation - Kurashvili VA

Formal analysis, resources, data curation – Gaiduk AA

All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

#### REFERENCES

1. Grayevskaya N.D., Dolmatova T.I. Sports medicine. A course of lectures and practical sessions: in 2 parts. Part 1. - M.: Soviet sport, 2008. - 304 p.
2. Frank A Segreto, James C Messina, James P Doran, et al. Noncontact sports participation in adolescent idiopathic scoliosis: effects on parent-reported and patient-reported outcomes. *J Pediatr Orthop B*. 2019 Jul;28(4):356-361. doi: 10.1097/BPB.0000000000000574.
3. Screening for adolescent idiopathic scoliosis. Review article. US Preventive Services Task Force. *JAMA* 1993, 269:2667-2672.
4. Screening for adolescent idiopathic scoliosis. Policy statement. US Preventive Services Task Force. *JAMA* 1993, 269:2664-2666.
5. Richards BS, Beaty JH, Thompson GH, Willis RB: Estimating the effectiveness of screening for scoliosis. *Pediatrics* 2008, 121:1296-1297.
6. Richards BS, Vitale MG: Screening for idiopathic scoliosis in adolescents. An information statement. *J Bone Joint Surg Am* 2008, 90:195-198.
7. Elena Sinyuchkova, Boris Podlivaev, Vladimir Kurashvili, and Alexandr Kuznetsov. The role of posturography on the initial stage of sports training. *BIO Web of Conferences*. 2020. EDP Sciences. Pages 1 – 5. DOI <https://doi.org/10.1051/bioconf/20202600016>
8. Dolenko F.L. Sports and joints. - M.: Physical culture and sport, 2005. - 288 p.
9. Theodoros B Grivas, Marian H Wade, Stefano Negrini, Joseph P O'Brien, Toru Maruyama, Martha C Hawes, Manuel Rigo, Hans Rudolf Weiss, Tomasz Kotwicki, Elias S Vasiliadis, Lior Neuhaus Sulam, and Tamar Neuhaus. SOSORT consensus paper: school screening for scoliosis. Where are we today? *Scoliosis*. 2007; 2: 17. doi: 10.1186/1748-7161-2-17
10. Frank A Segreto, James C Messina, James P Doran, et al. Noncontact sports participation in adolescent idiopathic scoliosis: effects on parent-reported and patient-reported outcomes. *J Pediatr Orthop B*. 2019 Jul; 28 (4):356-361. doi: 10.1097/BPB.0000000000000574.
11. Krupatkin A.I. Clinical neuroangiophysiology of limbs. - M.: Scientific World, 2003. - 327 p.
12. WHO (World Health Organization). Young people's health—a challenge for society. Report of a study group on young people and health for all by the year 2000. 1986. [March 1, 2013].
13. Ajit Jada, Charles E. Mackel, Steven W. Hwang, et al. Evaluation and management of adolescent idiopathic scoliosis: a review. *Neurosurg Focus*. 2017 Oct;43(4):E2. DOI link: <https://doi.org/10.3171/2017.7.FOCUS17297>
14. Burwell RG: Aetiology of idiopathic scoliosis: current concepts. *Pediatr Rehabil*. 2003. 6:137–170.
15. Castelein RM, van Dieën JH, Smit TH: The role of dorsal shear forces in the pathogenesis of adolescent idiopathic scoliosis—a hypothesis. *Med Hypotheses* 65:501–508, 2005.
16. Arthur Jason De Luigi. Low back pain in the adolescent athlete. *Phys Med Rehabil Clin N Am*. 2014 Nov;25(4):763-88. doi: 10.1016/j.pmr.2014.06.004. Epub 2014 Aug 2.
17. Trainor TJ, Trainor MA. Etiology of low back pain in athletes. *Curr Sports Med Rep*. 2004 Feb;3(1):41-6. doi: 10.1249/00149619-200402000-00008.
18. Standaert CJ. Low back pain in the adolescent athlete. *Phys Med Rehabil Clin N Am*. 2008 May;19(2):287-304, ix. doi: 10.1016/j.pmr.2008.01.002.
19. Cheung JPY, Chong CHW, Cheung PWH. Underarm bracing for adolescent idiopathic scoliosis leads to flatback deformity: the role of sagittal spinopelvic parameters. *Bone Joint J*. 2019 Nov;101-B(11):1370-1378. doi: 10.1302/0301-620X.101B11.BJJ-2019-0515.R1.
20. Pesenti S, Prost S, Blondel B, Pomeroy V, et al. Curve location influences spinal balance in coronal and sagittal planes but not transversal trunk motion in adolescents with idiopathic scoliosis: a prospective observational study. *Eur Spine J*. 2020 Aug;29(8):1972-1980. doi: 10.1007/s00586-020-06361-3.
21. Jouve JL. Correlations linking static quantitative gait analysis parameters to radiographic parameters in adolescent idiopathic scoliosis. *Orthop Traumatol Surg Res*. 2019 May;105(3):541-545. doi: 10.1016/j.otsr.2018.09.024.
22. Eardley-Harris N, Munn Z, Cundy PJ, Gieroba TJ. The effectiveness of selective thoracic fusion for treating adolescent idiopathic scoliosis: a systematic review protocol. *JBIS Database System Rev Implement Rep*. 2015 Nov;13(11):4-16. doi: 10.11124/jbisr-2015-2338.

23. Frerich JM, Hertzler K, Knott P, Mardjetko S (2012) Comparison of radiographic and surface topography measurements in adolescents with idiopathic scoliosis. *Open Orthop J* 6:261–265.
24. Kotwicki T, Chowanska J, Kinel E, Czaprowski D, Tomaszewski M, Janusz P (2013) Optimal management of idiopathic scoliosis in adolescence. *Adolesc Health Med Ther* 4:59–73.

## SPECIAL COMMUNICATIONS

### Letters to the Editor-in-Chief

#### A LETTER FROM WRESTLING (PALI – ΠΑΛΗ) TO AN UNBORN CHILD...



Hello my child. I am wrestling.

I am writing this letter to you because I am pinning my hopes on you; On you, and you aren't even born yet.

Since the beginning of time, man has wrestled with elements of nature, with other people, with himself and even with God. And where is all of this primarily taking place? Within man himself, and then this takes an external form known as sports competitions.

I am not a martial art, my child. I am the means by which, man's aggression is idealized, and war is transformed into civilization.

I am the backbone of sport and, according to Wolfgang Decker: "*there are no Olympic games without wrestling*". That's why your ancestors placed me on the last day of the games in ancient Olympia, following the sacrifice of a hundred oxen on the altar which had been lit by the Olympic running champion.

I am a primordial conjunctural element, a phenomenon of the world, a tool of the Creator, created to develop bravery in every form of life by making it better and stronger. The messenger god Hermes taught me to people and his daughter was the *Palaestra* (training arena), and the ancients had placed it in the centre of their city, that is, in the centre of their social life and where philosophical Ideas circulated.

However, my child, you don't have to strike the opponent and destroy his image. There is a great art to bringing him down whilst simultaneously protecting him.

In ancient times, my child, there were two sports. Just me and running. In the era you live in, what used to be fun games are now called sports. But I am not fun anymore. I entertain people; that is, I lead their souls to great achievements, brought about by life's demands.

Uncle Socrates revealed my secret name: **PALI** which means '*passage to the truth*'. And he wasn't wrong, as with my help, whoever studies me, is led to the truth through overcoming their ignorance and misconceptions. All of your great ancestors were trained in my art, not only in my training arena but also in the arena of their military, political and philosophical battles.

Wisdom itself, my child, is borne out of the wrestling of Ideas. The greatest philosopher Socrates was, apart from being a natural wrestler in the arena of Kynosargous until the age of 60, the greatest wrestler of Ideas known to humanity. He philosophically enriched Plato, a distinguished wrestling athlete in Nemea and Pythia, who then philosophically enriched his student Aristotle, who in turn, spiritually raised Alexander the Great, which is where the ancient Greek *tetrad* is completed. What happened after this can still be felt today. But who enriched all these people? There is a huge tradition of prehistoric mythology and ancient Greek religion which is full of me – wrestling. Gods fight each other, the Centaur fights with Lapithi, Theseus fights with Kerkion, Hercules fights with Antaeus. What can this possibly mean? Let us just stop here a moment, my child.



Antaeus was King of Libya, of enormous expanses, the son of Poseidon and Earth. He was the water element which is the emotional element of man and Earth, the sacrificial, primitive, instinctive, and animalistic element in man's nature. He discharged all his powers and renewed them by stepping on Mother Earth, just by coming into contact with her. But he lacked the third part of the soul, which is the intellect. That's why, if anyone passed through his area, they were challenged to fight. He would always win and then he would kill them! As Hercules was passing by for his 11<sup>th</sup> mission - the discovery of the garden of the Hesperides – he was challenged by Antaeus and the fight began! As the son of Zeus and Alcmene, his intellect, emotion, and instinct, had developed in a balanced way, therefore he had developed in a more balanced and harmonious way. This is what Greek culture is all about – to be up against the animal imbalance and uncivilized element of human nature.

Hercules' intellect, passed down to him by his father Zeus, led him to attack Antaeus' weak spot, namely his dependence on earthly desires and primitive instincts fuelled by his contact with Mother Earth. So, as he

hoisted him into the air, Hercules cut him off from the supply of these forces and by squeezing him tight, he crushed his body and threw him to the ground, dead.

So, my child, what you should have understood from all this is that I have always existed, I continue to exist, and I will always exist! Because I am within people – I am people!

But it does, of course, depend on how I am used. Is it to humiliate other as in the case of Antaeus? Or is it to harmoniously complete our mental development by completing various missions like Hercules?

Great Homeric men such as Odysseus and Ajax were trained in my art. Later, famous Olympic champions such as Hipposthenes and his son Etimoklis (the father a 6-time Olympic champion and the son a 5-time Olympic Champion) and Milon the Crotonian, son-in-law of Pythagoras, were also trained and their compatriots even built a temple in their honour!



At the peak of the Greek-Christian civilization of Byzantium, great emperors, such as Basil the Macedonian and Justinian were raised on my principles, acquiring a reputation as great wrestlers. The high point came in the form of Digenis Akritas who chose Death as his opponent. The marble threshers symbolize the struggle of the human soul for eternity.

Great men across the length and breadth of the earth cultivated me, such as the man who reformed the United States and great politician, Abraham Lincoln. Also, the great geneticist Nobel Laureate Norman Borlaug who, according to UNESCO, was considered to be the "best man who ever lived" because he saved more than a billion people from hunger. Then there was the great Olympic champion and national hero of Iran, G. Tahkti who stood up against the Shah (king) of his country to protect the poor of his homeland, and countless others across the world.

Since the beginning of time, I have been connected to divinity through all religions, from Ancient Olympia to distant Japan. In Iran, a wrestler is called a *pechlivan* which means 'compassionate', as it is inconceivable that a wrestler is not, above all, moral.

Until recently in Greece, in over 200 festivals and in the shadow of the churches, it is through me that our saints, those great spiritual wrestlers, were honoured by opposing sin, decay and death.

I am even there during the sacrament of Christian baptism, my child! The priest covers the newly christened child with oil, the liquid of *bravery* according to Socrates, in order for the child to be able to fight against the devil, against sin and against his passions in life.



But the greatest wrestler of all, my child, is the Lord Christ himself, who defeated death for good, descending humbly and winning the world over, fighting with death, sin and all those who serve them, helping me arrive at my ultimate interpretation: the union of the Divine and of man, who through training, reaches great heights... because I have always been a *means* and never a *purpose*.

And yet nowadays, my child, I find myself neglected, discredited, and disfigured. I find myself on the shelves of international sport consumerism that is the Olympic Games. They have even disrespected my name...! Now they call me wrestling, the meaning of which I do not know. As I said, my name means passage to *the truth*, and it is only through this interpretation that I can bravely shape people. They even went so far as to discuss my expulsion from the Olympic programme and why? I am not easy on the eye, they say, after first violating all my regulations. I am the only sport in the modern history of the Olympic Games that changes my

regulations every 2-3 years! I can't be bought though - I'm expensive, as anything unique and priceless should be! I shaped Greece and have taught her to battle and carry on. And yet in Greece, I do not have a home of my own even though I have been declared a national sport- and this despite other eastern nations honouring me in whichever form I exist in their homelands ...

A modest home, that radiates my existence and my mission for all mankind, a monument of sports culture and science is what I want.

Thucydides considers me a decisive factor in the victory of the Greeks against the Persians, writing that: *"the education of the Athenians in the palaestras and in the gymnasiums was the reason behind the victory in Marathon"*.

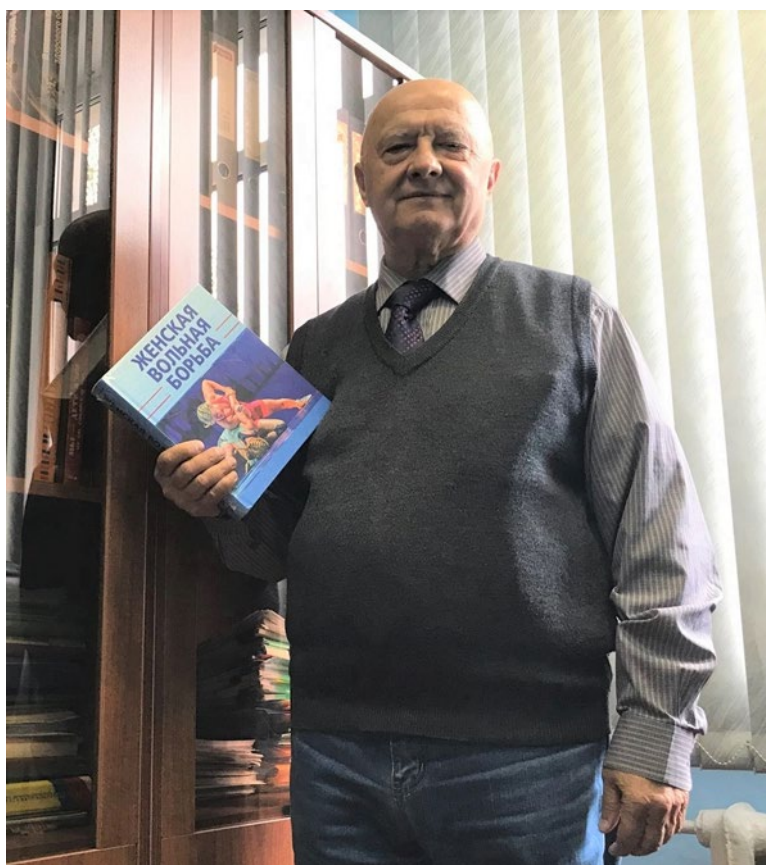
Nowadays, agents have my fate in their hands – and what do they have to offer, I wonder? Many of them have never battled in their lives and then they say they love me! Sometimes, my child, you will see agents and runners embarrassing each other, archaists gossiping in front of cameras and not because they care about me, but because they care about my association. Did you notice, my child, that Antaeus left descendants behind? However, I don't know where the offspring of Hercules went to.... I hope you are one. I will tell you the rest another time....

Rejoice and Think!

Christos Kollias  
Lecturer of Wrestling  
The School of Physical Education and Sport Science  
National and Kapodistrian University of Athens  
hrikollias@gmail.com

## *In Memoriam*

### **Boris Anatolyevich Podlivaev (January 18, 1946 – August 12, 2021)**



On August 12, 2021, **Boris Anatolyevich Podlivaev** passed away at the age of 76. Candidate of Pedagogical Sciences, Professor, Honored Teacher of the Russian State University of Physical Culture, Sports, Youth and Tourism (GTSOLIFK), Honored Coach of Russia, Honored Worker of Physical Culture and Sports of the Russian Federation. In 1980, for active participation in the preparation and holding of the opening and closing ceremonies of the Games of the XXII Olympiad, he was awarded the honorary badge "Excellence in Physical Culture". For his contribution to sports science, Boris Podlivaev was awarded the honorary badge "Honored Worker of Physical Culture".

Honored Coach of the Republic of Buryatia, Recipient of the Rayko Petrov Trophy presented by the International Network of Wrestling Researchers in 2015, and Honorary Professor of the Eurasian National University named after L.N. Gumilyov (Nur-Sultan, Kazakhstan, 2019).

The life of Boris Anatolyevich was inextricably linked with the Russian State University of Physical Culture, Sports,

Youth and Tourism (GTSOLIFK), to which he devoted more than 40 years. Most of this time he worked at the Department of Wrestling (today - the Department of Theory and Methods of Martial Arts).

Boris Anatolyevich was born and lived in the city of Podolsk near Moscow in the Krasnaya Gorka region. A graduate of the State Central Order of Lenin Institute of Physical Culture (1969). Where he was a student of world-famous Soviet scientists N. A. Bernstein, A. D. Novikov, V. M. Zatsiorsky, V. V. Davydov, a world-renowned theorist and practitioner of wrestling.

During the period of scientific and pedagogical activity, Boris Anatolyevich published more than 250 works on the problems of the theory and methodology of physical culture and sports training. Under his leadership, 18 Ph.D. theses were defended on the problems of the theory and methodology of wrestling, 15 videos were prepared and released with an analysis of the largest competitions in freestyle wrestling and in the technique of the strongest wrestlers in Russia.

In 2010, with the direct participation of B.A. Podlivaev the International Journal of Wrestling Science was created, of which he was a member of the editorial board. In 2019, under his editorship, In April 2019, the book "Women's Freestyle Wrestling" was published, presenting women's wrestling in all its diversity. A team of authors from various countries worked on the book for three years. The author of seven chapters out of twelve is Boris Anatolyevich. The book is unique, for the first time revealing the features of women's sports training. and in 2020, the textbook "Biomechanical Foundations of Special Physical Training of Freestyle Wrestlers" was published. . Boris Anatolyevich is also a member of the scientific commission of the international wrestling federation "United World Wrestling (UWW)".

Since 1996, Boris Anatolyevich headed the complex scientific group of the Russian national freestyle wrestling team and was one of the developers of targeted integrated programs for the preparation of Russian wrestlers for the Olympic Games 2000, 2004, 2008, 2012, 2016 and 2020.

Most recently, he had been working on a sports training program for the sport of wrestling, the discipline of freestyle wrestling and Greco-Roman wrestling, and has done a lot of work to promote and develop wrestling in sports reserve training center at the Ministry of Sports of the Russian Federation,

In an interview with Vladimir Sabadash on the occasion of his 75<sup>th</sup> birthday, he gave his opinion on several subjects.

*The general tendency for former athletes to join the team, insufficiently educated, and the practical absence of specialists, has led, unfortunately, to a gap between science and practice. And you can only help and teach those who want to learn and improve themselves. Many coaches just lack spirituality, and an understanding of the importance of self-improvement. One of the conditions for a successful transition from science to practice is the level of theoretical readiness of coaches and, accordingly, the sports readiness of scientific workers. Interpreting scientific data to the level of understanding of coaches and even more so of athletes is a difficult matter, and there are very few such specialists.*

*In my opinion, we are here to preserve and improve this world through improving ourselves. My belief in God is that God, as the Highest cosmic mind, consists of us as his particles, and we, as his particles, are able to create what we attribute to him. That is all. But for this we must believe in it, have a great goal and be ready to give everything to achieve it. This is how heroes are born - in sports, science, art. I tried to talk about this to athletes and my pupils.*

Boris Anatolyevich was a purposeful person, a kind and reliable friend. This is a great loss for the scientific and sports community. We mourn together with the family and friends of Boris Anatolyevich.



## INSTRUCTIONS FOR AUTHORS

The *International Journal of Wrestling Science* is the only journal dedicated to the study of the world's oldest sport.

The *International Journal of Wrestling Science* is a peer reviewed journal for professionals working in wrestling and wrestling sport science. Issues are published twice a year. Topics include:

- Training Science
- Physiology
- Psychology
- Sports Medicine
- Biomechanics
- Nutrition & Weight Management
- Pedagogy
- History
- Sociology
- Sports Management

The *International Journal of Wrestling Science* regularly features: Original Papers, Review Articles, Technique Analyses, Scoring Analyses, Case Studies/Profiles and Letters. The Journal publishes on behalf of the International Network of Wrestling Researchers and in association with the sport's international governing body, United World Wrestling (UWW), with its 180 national affiliates. The readership for this Journal is varied and ranges from academics to coaches and other professional practitioners from a range of disciplines and areas of application.

**Manuscript Submissions.** All manuscript submissions are subject to initial appraisal by the Editor (send to davcurb@gmail.com), and, if found suitable for further consideration, to peer review by independent, anonymous expert referees. All peer review is single blind and submission is online directly to the editor. Manuscripts will be blindly reviewed by two reviewers. Acceptance for publication will be based on quality, originality and reliability of the presented material. Whenever necessary, accepted manuscripts are returned by e-mail to the authors for corrections. After making the corrections, the authors have to resend the manuscript, to the Editor with detailed information about the alterations for each one of the reviewers' comments. Send your manuscript directly to the editor as a WORD document. Please note that International Journal of Wrestling Science uses Crossref™ to screen papers for unoriginal material. By submitting your paper to International Journal of Wrestling Science you are agreeing to this originality verification during the peer-review process. Each manuscript must be accompanied by a statement that it has not been published elsewhere and that it has not been submitted simultaneously for publication elsewhere. Authors are required to sign an agreement for the transfer of copyright to the publisher you want to reproduce any figure, table, or extract from the text of another source. This applies to direct reproduction as well as which will be sent to them after submission. All accepted manuscripts, artwork, and photographs become the property of the publisher. As an author, you are required to secure permission if "derivative reproduction" (where you have created a new figure or table which derives substantially from a copyrighted source).

**Preparation of Manuscript.** All parts of the manuscript should be typewritten, double-spaced, with margins of at least one inch on all sides. Number manuscript pages consecutively throughout the paper. Authors should also supply a shortened version of the title suitable for the running head, not exceeding 50-character spaces. Each article should be summarized in an abstract of not more than 200 words. Avoid abbreviations, diagrams, and reference to the text in the abstract.

**Article Publishing Charge.** The standard article publishing charge (APC) for this journal is US\$200. Depending on your location, these charges may be subject to local taxes. Waivers and discounts on the APC are available to support researchers in developing and emerging regions unable to pay this charge.

**Style and Format.** Manuscripts must be submitted in English and prepared in accordance with the American Psychological Association (APA) Publication Manual, 6th ed. An Abstract in English must be included. The maximum length of manuscripts is 10 pages (8.5 by 11 inches) (including tables, figures, pictures, and references). They should be 1.5 spaced, in 12-point Arial type throughout the paper, with .75 inch margins, and be written according to proper grammar, and syntax principles.

The complete manuscript must include: TITLE PAGE, with:

a) Complete title, b) names and affiliations of all authors in the order they appear, c) contact information for readers (name, institution address, e-mail). Number manuscript pages consecutively throughout the paper. Abbreviations must be defined with first use. **ABSTRACT:** (in English): Unstructured Abstract and 3-6 Key words on a separate page, following the title page. Length should be less than 250 words. **INTRODUCTION:** starting on a separate page and ending with the purpose of the study and the corresponding hypotheses. **METHODS:** which includes a) Participants, b) Instruments-Tests, c) Procedures, d) Research design, and e) Statistical analysis. **RESULTS; DISCUSSION; CONCLUSIONS; and PRACTICAL IMPLICATIONS and ADVICE FOR ATHLETES AND COACHES**

**References.** A reference list in alphabetical order should be included at the end of the paper. Footnotes are not to be used. Authors should only include references which have been published or accepted for publication. They should also check that all references are actually cited in the body of the paper e.g. (Curby & Jormand, 2015), and all citations in the paper are included in the Reference list. References, citations, and general style of manuscripts should be prepared in accordance with the American Psychological Association Publication Manual, 6th ed. All references must be alphabetized by the first author's surname. Titles in sentence case, no capital after colon.

**Tables and Figures.** The number of tables and figures must be limited and must be explanatory, supplementary and non-repetitious of the text. A brief title is given on the top (for the tables) or on the bottom (for the figures). All tables and figures must be referenced in the text. It is forbidden to cite other authors' tables or drawings unless a copy of written permission is enclosed to the Editorial Staff of the Journal. Please supply editable files. Equations must be editable. Please use SI units (non-italicized).