ST 4 / pc 1 / Strength Training of the Spanish Basketball Team for the 6th European Basketball Championship for Young Men 2002

ORIGINAL ARTICLE

David Ribera-Nebot (2004). Strength Training of the Spanish Basketball Team for the 6th European Basketball Championship for Young Men 2002. Sporto Mokslas-Sport Science, 1(35), 55-58

SUMMARY

The Spanish Basketball Team for the 6th European Basketball Championship for Young Men 2002 had to face up to a special competitive situation: after a competitive season of approximately 10 months and a very short preparation period (3 to 4 weeks), the young players were asked to perform at a high level by playing 8 consecutive games in 10 days. With reference to the strength training preparation we applied concentrated training blocks of specific strength for fast transformation into competitive strength.

As a part of the preparation for this European Basketball Championship two basketball-specific strength tests (strength tests for fighting situations and strength tests for short movements) were performed at the beginning of the preparation (day 7 of first micro-cycle) and repeated after 20 days of training (day 5 of micro-cycle 4).

- All players (except one that did not perform the second test and most of the strength practices) experienced a very significant increase of their specific strength capacity for fighting and short movements, and very probably for running.
    - This should be understood as a consequence of both technical-tactical training and strength training.
    - Such increase is a key factor for technical performance and for peaking.
    - The improvement in number of meters was the most relevant strength factor, specially for taller players.
- The proposals of improvement are basically the applications of the initial planning and are as follows:
    - To modify the structure and introduce more rest periods in the micro-cycle 2, in order to: a) include 2 extra-strength practices on days 4 and 5 for most players; and b) increase the technical-tactical quality of the last practices of this micro-cycle.
    - To perform the second strength test on day 4 of micro-cycle 4, so as to include a full special strength practice on day 5, that will allow the increase of strength specificity and volume of this micro-cycle.
    - To include the Strength Test of Running for Basketball in the Strength controls, seeking for a more complete evaluation.
    - To include, within a very similar training volume, Speed Tests (initial and at micro-cycle 4) of selected attack and defense basketball actions in order to obtain a more accurate information of the technical improvement.

David Ribera-Nebot
Physical Conditioning Coach of the Young-Men-2002 Spanish Basketball Team
Technical Director of "Entrenament Esportiu Viasport" (Training Center)
Barcelona University

Strength Training of the Spanish Basketball Team for the 6th European Basketball Championship for Young Men 2002

INTRODUCTION

The aim of this article is to explain the most striking details of the Strength Training Preparation of the Spanish Basketball Team for the 6th European Basketball Championship for Young Men 2002.

Basketball, as many other sports in which "corporal contact" with the opponent and quick-short movements are demanded during the execution technical skills performed in a game, requires high levels of strength. The purpose of this strength training is to achieve, for each of these forms of special strength manifestation, the highest degree of specific muscular efficacy in order to be able to exceed the resistances that for such executions appear during a game. We can define strength for each group of technical skills and we can define different levels of strength that permit to approach the unspecific strength quality to the specific competitive conditions. Therefore, the player can apply all his strength to his specific technical skills. (Seirul-lo Vargas, 1990).

The Spanish Basketball Team for the 6th European Basketball Championship for Young Men 2002 had to face up to a special competitive situation: after a competitive season of approximately 10 months and a very short preparation period (3 to 4 weeks), the young players were asked to perform at a high level by playing 8 consecutive games in 10 days.

With reference to the strength training preparation we applied concentrated training blocks of specific strength for fast transformation into competitive strength. The goal was to achieve the highest degree of specific muscular efficacy in a short period. Thus, concentrated strength blocks were coordinated with technique blocks and integrated within micro-cycle structures.

STRENGTH TRAINING CONTENTS

For this preparation we defined the following 3-4 levels of strength:

- Level 1-General Strength (General Strength 1-2): consisted of multi-jumps, multi-runs, multi-throws, multi-"fights" and multi-short movements exercises for all players with movement control emphasis.

PHOTO 1. Example of Fighting Strength (Level 1).

- Level 2-Directed Strength (Special Strength 1-2): consisted of exercises for running, fight, short movements and long pass; distinguishing between interior and exterior players (point guard-small forward and power forward-center); and with the emphasis on spacial-temporal factors. The strength tests are considered Level 2-Directed Strength.

PHOTO 2. Example of Fighting Strength (Level 2).

- Level 3-Special Strength (Special Strength 3-4): consisted of a combination of 3-6 actions selected among running, fighting and short movement; distinguishing between interior and exterior players (point guard-small forward and power forward-center); and emphasizing on the decision making strategies and programming processes.

PHOTO 3. Example of Fighting Strength (Level 3).

- Speed. Speed training could be considered Level 4-Competitive Strength and consisted of selected basketball actions (runs, short movements, starting movements, “fights”, “fight” plus another action, dribbling, jump plus tip and long-short pass) performed under cognitive and coordination variations. Speed practices were independent or a part of a strength practice.

Execution conditions (“high-speed-limit” method):

a) The player performs the exercise at maximum speed as many times as possible and when he is unable to maintain a high speed, stops and takes a personal rest; during the given time he performs as many sets as possible.
b) The player performs the sequence of actions at maximum speed and takes a personal rest; during the given time he performs as many sets as possible.

STRENGTH PERIODIZATION

Strength training was organized by a progressive increase in the specificity, density and concentration of the practices.

- Micro-Cycle 1-2 (9 days): a block of 3 strength practices at day 7 of micro-cycle 1 (strength tests) and days 1 and 2 of micro-cycle 2 (general strength practices). One Speed practice at day 6 of micro-cycle 2. About 65% of "Level 1-General Strength" and 35% of "Level 2-Directed Strength".

- Micro-Cycle 3 (rest during day 1 – 3 preparatory games at days 4,5 and 7): a block of 2 strength-speed practices at days 2 and 3. A 100% of "Level 2-Directed Strength".

- Micro-Cycle4 (rest during days 1,2 and 3 – 2 preparatory games at days 5 and 7): strength tests and 1 strength-speed practice at day 5. One speed practice at day 6. About 60% of "Level 2-Directed Strength" and 40% of "Level 3-Special Strength". Two additional Directed Strength practices (focused on strength for legs) at days 1 and 2 of Micro-Cycle 4 (rest days) were planned for a center player that experienced a significant fatigue during the preparatory games.

- Micro-Cycle5 (recovery practice at day 1 – trip and activation practice at days 3 and 4 -3 championship games at days 5,6 and 7 - first phase): 1 strength-speed practice at day 2. A 100% of "Level 3-Special Strength".

- Micro-Cycle6 (5 championship games - second phase): there was no strength training.

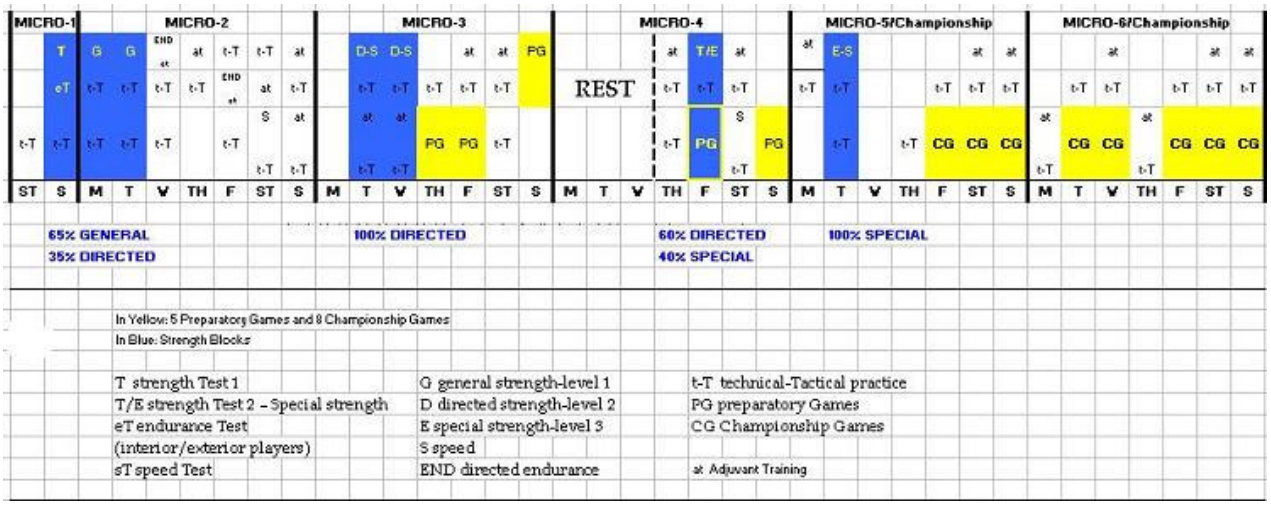


FIGURE 1. Strength Periodization.

STRENGTH CONTROL AND EVALUATION

As a part of the preparation for this European Basketball Championship, the change in the specific strength capacity was evaluated during the first 20 days (period of maximum work volume). Two basketball-specific strength tests (strength tests for fighting situations and strength tests for short movements) were performed at the beginning of the preparation (day 7 of first micro-cycle) and repeated after 20 days of training (day 5 of micro-cycle 4). A basketball-specific strength test for running was also planned, but we did not use it because of equipment problems.

- Strength Test for Running (adaptation of Seirul-lo's Test for Handball players): the player must perform one-leg alternated jumps followed by a combination of runs with 2-leg jumps on a basketball court. Total and partial times are evaluated.

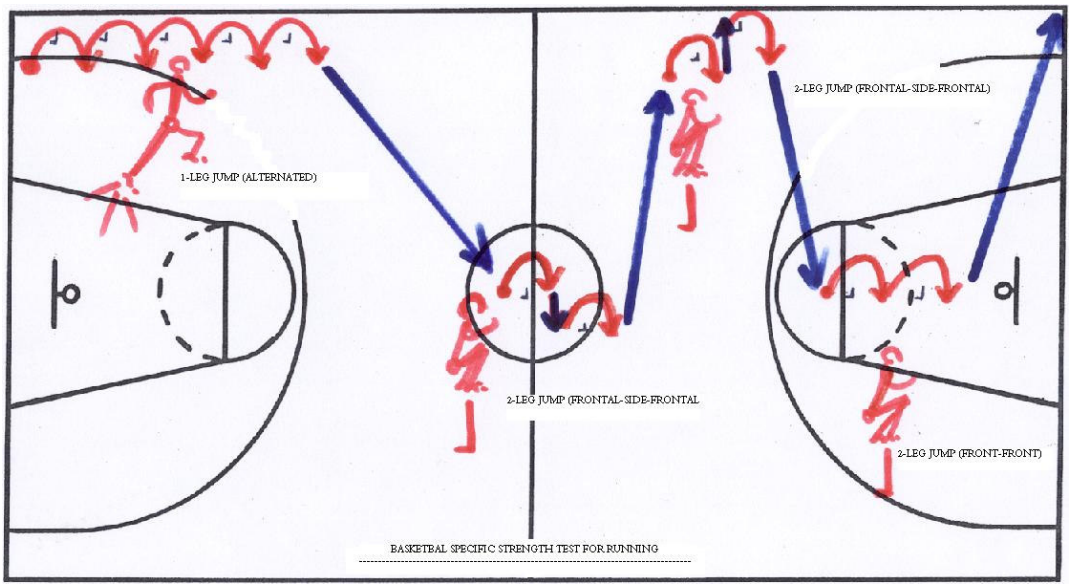


FIGURE 2. Strength Test of Running for Basketball.

- Strength Tests for “Fighting” Situations (adaptation of Seirul-lo’s Test for Handball players): a) following a triangle path (1,80 m. each side) with defense slides and frontal flexion-extension arms movements with a 15kg disc, the player has to perform as many meters and arms movements as possible during 2 sets of 30 seconds (15 seconds rest in between); b) the same than a) but the player moves a 10kg disc and performs 3 sets of 30 seconds (15 seconds rest in between). In both the number of meters and arms movements are evaluated.

PHOTO 4. Strength Test of Fighting for Basketball.

- Strength Tests for Short Movements (adaptation of Seirul-lo’s Test for Handball players): a) following an “L” path (1,80 m. each side) with forward-backward movements and defense slides holding a 10kg disc, the player has to perform as many meters as possible during 2 sets of 30 seconds (15 seconds rest in between); b) the same than a) but the player holds a 5kg disc and performs 3 sets of 30 seconds (15 seconds rest in between). The number of meters is evaluated.

PHOTO 5. Strength Test of Short Movements for Basketball.

In addition to the strength tests, other evaluations related to the strength capacity were conducted:

a) In each strength training practice the following components were evaluated: number of sets and repetitions for reference players (number of actions performed), level of specific orientation of the exercises (from general to special) and total duration.

b) In each technical-tactical practice the following related-strength components were evaluated for a reference player: the biological-conditioning load and the technical-coordination load (mainly supported by strength) of each exercise; the biological-conditioning structure and the technical-coordination structure of the whole practice.

c) The percentage of the different levels of strength in relation to the percentage of "technical" executions during the technical-tactical training (extremely relevant control).

RESULTS OF THE STRENGTH TESTS

Individual results for both tests are presented in the following table.

You can first see the number of actions and arms movements of each set of the test, and highlighted the total meters and arms movements.

T.1. juny 30 T.2. july 19		FIGTHING 15 KG														SH.MOV						
		n°despl.		mov.br.				n°despl.			mov.br.					n°despl.		10 KG	n°despl.			5 KG
		1ª	2ª	1ª	2ª	mts	a.mov	1ª	2ª	3ª	1ª	2ª	3ª	mts	a.mov	1ª	2ª	mts	1ª	2ª	3ª	mts
R.MT.	T.1.	22	17	45	27	70,2	72	25	22	21	50	43	36	122,4	129	20	20	72	22	21	20	113,4
	T.2.	28	20	39	31	86,4	70	28	27	24	55	39	38	142,2	132	25	23	86,4	27	25	26	140,4
R.M.	T.1.	24	18	45	25	75,6	70	21	17	16	52	35	26	97,2	113	22	23	81	24	22	21	120,6
	T.2.	36	32	44	25	122,4	69	42	42	33	55	37	27	210,6	119	32	25	102,6	31	25	28	151,2
A.M-	T.1.	23	15	51	26	68,4	77	26	20	21	54	37	41	120,6	132	22	21	77,4	22	23	24	124,2
	T.2.	20	28	46	20	86,4	66	35	30	27	53	25	60	165,6	138	25	24	88,2	28	25	20	131,4
R.G.	T.1.	23	22	54	34	81	88	30	26	26	64	44	46	151,2	154	22	21	77,4	27	21	24	129,6
	T.2.	26	25	70	61	91,8	131	30	27	28	57	60	63	153	180	33	30	113,4	39	35	30	187,2
JL.LL.	T.1.	14	12	41	33	46,8	74	16	13	10	50	41	46	70,2	137	23	20	77,4	21	23	24	122,4
	T.2.	26	23	46	16	88,2	62	31	27	28	58	37	31	154,8	126	31	27	104,4	33	29	27	160,2
J.G-	T.1.	23	19	48	34	75,6	82	30	23	21	58	49	42	133,2	149	22	21	77,4	24	23	22	124,2
	T.2.					0	0							0	0			0				0
J.K.	T.1.	25	21	60	28	82,8	88	26	21	20	68	40	37	120,6	145	22	22	79,2	24	24	23	127,8
	T.2.	30	28	37	27	104,4	64	28	29	28	46	31	29	153	106	26	21	84,6	34	25	25	151,2
JI.M.	T.1.	26	23	51	40	88,2	91	28	25	25	54	42	43	140,4	139	22	22	79,2	22	22	19	113,4
	T.2.	38	33	42	38	127,8	80	39	35	30	46	40	36	187,2	122			0				0
A.MR.	T.1.	24	18	50	50	75,6	100	23	19	21	76	73	68	113,4	217	22	20	75,6	22	24	23	124,2
	T.2.	24	21	65	55	81	120	28	29	25	66	59	61	147,6	186	31	26	102,6	37	32	29	176,4
G.R.	T.1.	24	19	40	33	77,4	73	25	24	24	48	38	37	131,4	123	21	21	75,6	21	21	21	113,4
	T.2.	30	25	36	33	99	69	29	25	25	50	39	41	142,2	130	27	25	93,6	28	28	26	147,6
JJ.T.	T.1.	25	23	44	34	86,4	78	26	24	24	54	48	42	133,2	144	20	20	72	22	20	20	111,6
	T.2.	33	30	36	35	113,4	71	36	30	29	52	40	36	171	128	24	23	84,6	26	26	24	136,8
F.V.	T.1.	23	18	54	38	73,8	92	26	23	20	59	40	35	124,2	134	24	23	84,6	24	19	20	113,4
	T.2.	27	25	60	50	93,6	110	29	28	24	67	58	56	145,8	181	29	25	97,2	36	32	28	172,8

TABLE 1. Results of the Strength Tests of Fighting and Short Movements for Basketball.

DISCUSSION OF RESULTS

- Strength Test for “Fighting” Situations:

15 kg option (2x30 sec)

number of meters: all players improved significantly.

number of arms movements: significant increase in 3 players, significant decrease in 4 players and non-significant decrease in 4 players.

10 kg option (3x30 sec)

number of meters: all players improved significantly.

number of arms movements: significant increase in 2 players, significant decrease in 5 players, non-significant increase in 4 players.In summary, in the strength test for fighting, the number of meters improved significantly in all players for both 15 and 10 kg options, while the arms movements decreased in about half of the players.

- Strength Tests for Short Movements:

10 kg option (2x30 sec)

number of meters: all players improved significantly.

5 kg option (3x30 sec)

number of meters: all players improved significantly.

In summary, in the strength test for short movements, the number of meters improved significantly in all players for both 10 and 5 kg options.

Thus, in all options of the two tests all players improved the meters performed, reflecting a significant increase of trunk and lower body strength for fighting and short movement situations. On the other hand, the decrease of arms movements with 15 and 10 kg in approximately half of the players is not relevant for basketball players and can be explained as a consequence of the total training and testing emphasis.

Findings also imply that in short periods of training the “high-speed-limit” method of strength training is effective for a fast transformation into competitive strength.

Further, the 2 extra-strength practices for a center player at micro-cycle 4 were useful, based on the feelings of the player during the games. Accordingly, he very significantly improved the number of meters performed in the two tests.

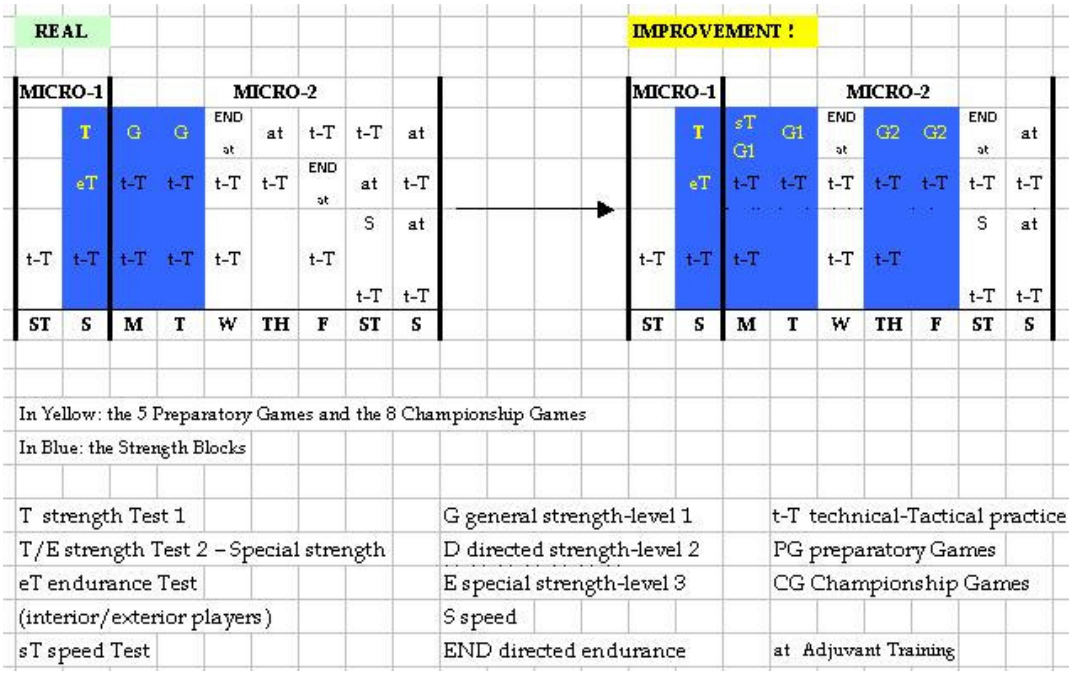
Nevertheless, if the technical training of cognitive-affective participation (for training and competitive phases) and the technical training of motor participation (coordination capacities and conditioning capacities) should be well balanced for an efficient technical improvement (Seirul-lo Vargas, 1987), it should be pointed out that a good selection of special strength capacities is the most significant conditioning factor that supports the most relevant technical executions during a game. In this regard, it can be considered adequate to have focused the special strength training and testing on the running, fighting and short movements actions.

CONCLUSIONS

- All players (except one that did not perform the second test and most of the strength practices) experienced a very significant increase of their specific strength capacity for fighting and short movements, and very probably for running.
    - This should be understood as a consequence of both technical-tactical training and strength training.
    - Such increase is a key factor for technical performance and for peaking.
    - The improvement in number of meters was the most relevant strength factor, specially for taller players.
- The positive results of the final strength tests (micro-cycle 4) were a cogent argument for deciding the application of the next special strength practices and training structure. In this regard, a non-significant increase or a decrease in the results of the tests would have changed this decision towards the application of a more general strength training and a different training structure.

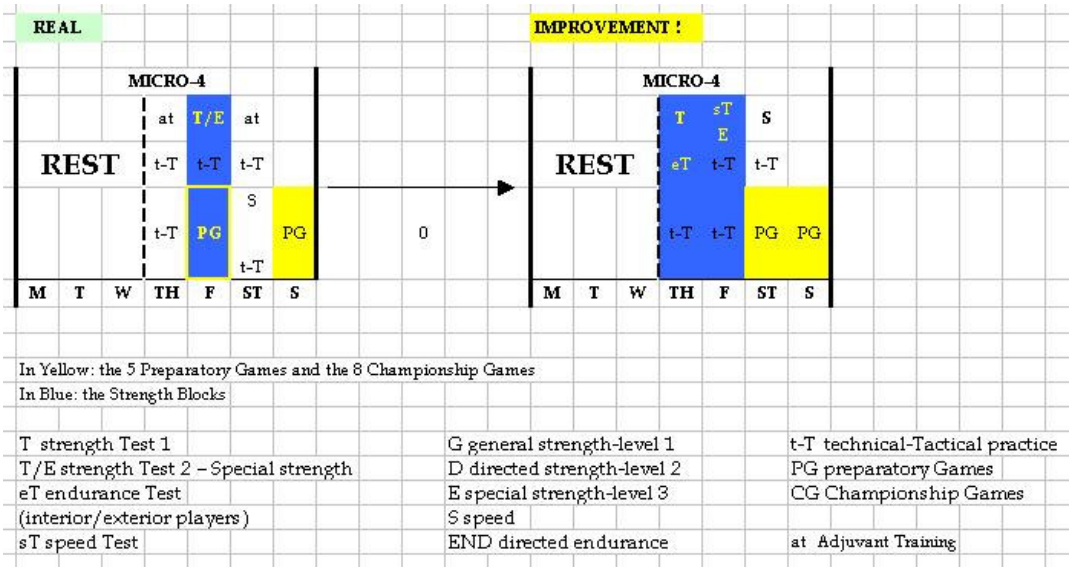
- The proposals of improvement are basically the applications of the initial planning and are as follows:
    - To modify the structure and introduce more rest periods in the micro-cycle 2, in order to: a) include 2 extra-strength practices on days 4 and 5 for most players; and b) increase the technical-tactical quality of the last practices of this micro-cycle.

FIGURE 3. Proposal of improvement 1.



- To perform the second strength test on day 4 of micro-cycle 4, so as to include a full special strength practice on day 5, that will allow the increase of strength specificity and volume of this micro-cycle.

FIGURE 4. Proposal of improvement 2.



- To include the Strength Test of Running for Basketball in the Strength controls, seeking for a more complete evaluation.
- To include, within a very similar training volume, Speed Tests (initial and at micro-cycle 4) of selected attack and defense basketball actions in order to obtain a more accurate information of the technical improvement.

- Finally, the players achieved the silver medal (heretofore, the best result ever obtained by an under-20-year-old Spanish Basketball Team in an European Basketball Championship for Young Men), although before the championship any Spanish institution was not expecting a lot. I strongly believe this factor made them develop a special motivation and mentality for such endeavour and became the most relevant factor for achieving such result.

REFERENCES

Seirul-lo Vargas, F. (1987). La Técnica y su Entrenamiento.

Apunts Medicina de l'Esport, 24 (93), 189-199.

("Technique and its Training")

Seirul-lo Vargas, F. (1990). Entrenamiento de la Fuerza en Balonmano.

Revista de Entrenamiento Deportivo, 4(6), 30-34.

("Strength Training in Handball")

Seirul-lo Vargas, F. (2003). Sistemas Dinámicos y Rendimiento en Deportes de Equipo.

1st Meeting of Complex Systems and Sport. INEFC-Barcelona.

("Complex Systems and Performance in Team Sports")

Ideas an Experiences of Francisco Seirul-lo Vargas on Sports Training:

http://www.entrenamientodeportivo.org

Article presented at the 7th International Sports Science Conference
SCIENTIFIC MANAGEMENT OF HIGH PERFORMANCE ATHLETES' TRAINING
Vilnius (Lithuania), 27-28 February 2004

KEY WORDS

Young Athletes, European Basketball Championship, Strength Training.

ACKNOWLEDGMENTS

I want to thank professor Francisco Seirul-lo Vargas for all his advice on planning this European Championship.

PHOTOS

Santi Abad (former international basketball player).

Dani Pérez (national thrower).

CONTACT

David Ribera-Nebot

www.humanmovement.com

drn@movementsciences.com