

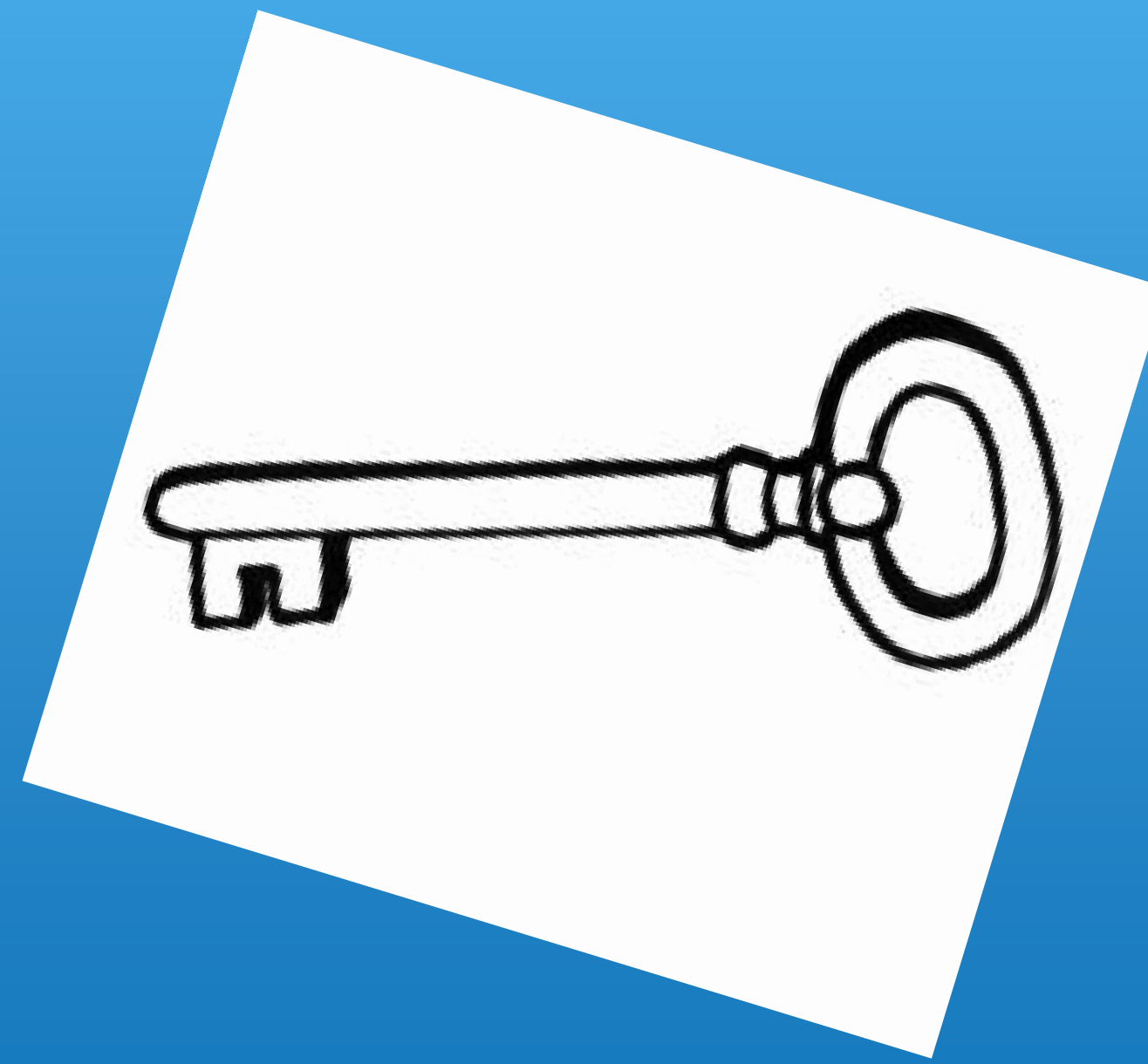


Developing Swimmers

.... Each athlete has his own “entrance door”. The task of the coach is to find the key that opens that door.

It has nothing to do with sets, sessions and load. It's strictly related with his/her essence.

walter



Generations

- X - up to 1980 resourceful, logical, good problem-solvers, committed, first contacts with technology
- Y Millennials - 1980-1995 often described “lazy”, self-confident, children of the period of well-being, curious, questioning authority. Digital born
- Z - late 90's-2000 - ambitious, multi-tasking, limited attention span, poor work ethic, poor communication (virtual communication), “all-now”. Pandemic.
- Alpha born after 2010 - ? ? ?

My job at F.I.N.

Before - no connections. Youth swimming not linked with the institution.

Approaching Coaches

Managing Swimmers

Creation of a Network

Travelling

Two way communication

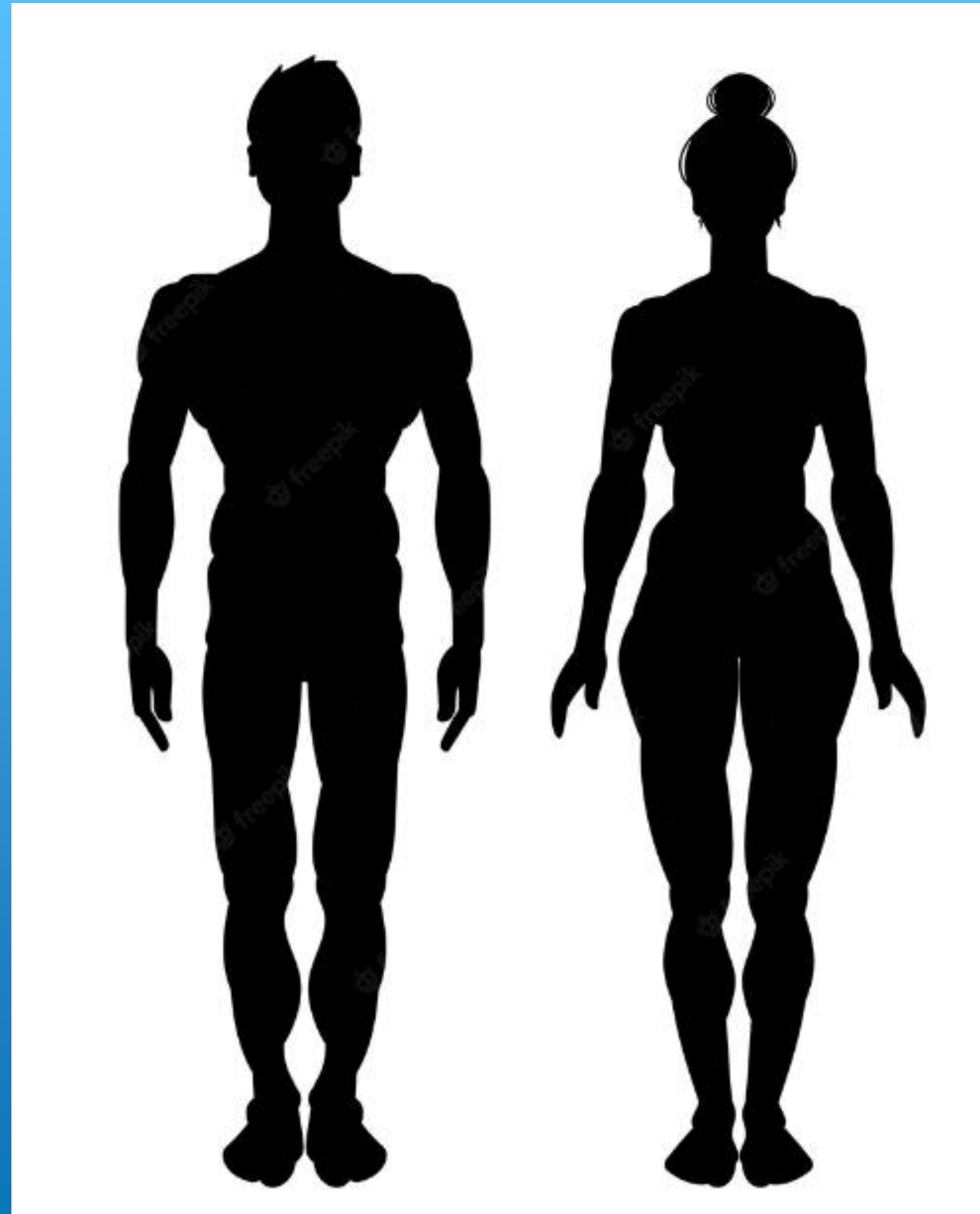


YOUTH SURVEY (1st year Junior)

Outcome season 2021-2022

Who

248 BOYS



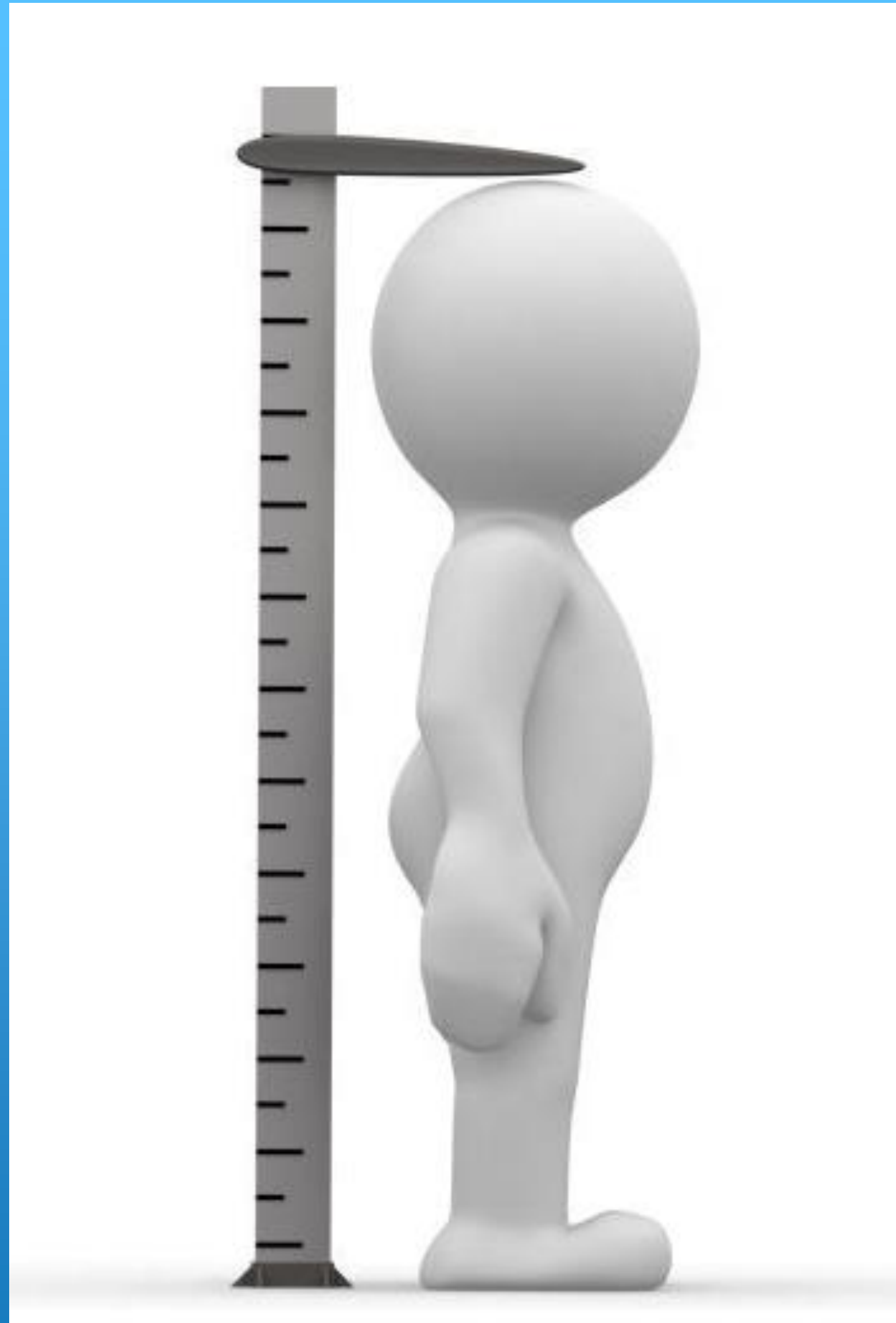
254 GIRLS

WEIGHT



GIRLS - 56

BOYS - 69



HEIGHT

GIRLS - 167 cm (164 ITA average)

BOYS - 179,8 cm (177 ITA average)

NUTRITIONIST



NO - 228

YES - 278



First contact with the water (age)

3-5 # 468

8-10 # 38

after 10 # 1

Training group units (nr)

Less than 5 - #8

5-10 - #81

10-15 - #123

15-20 - #124

More than 20 - #163

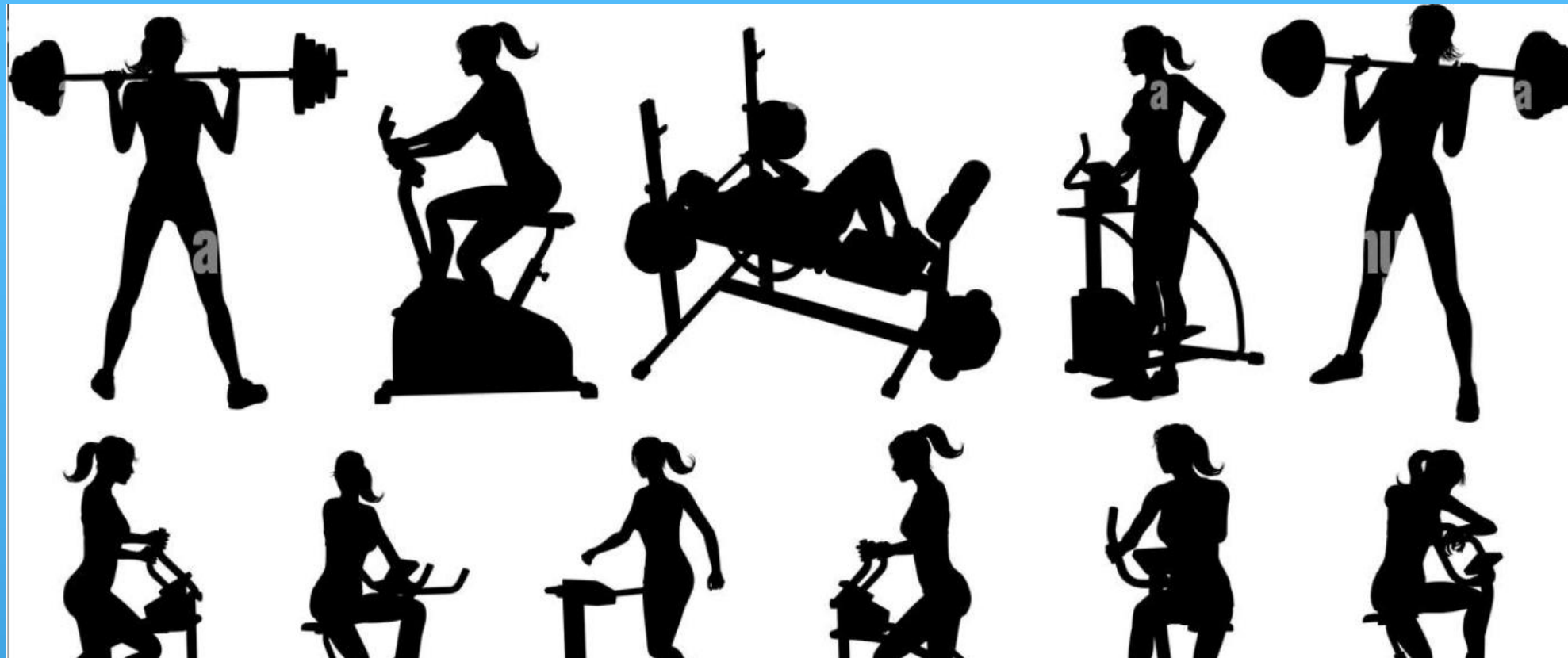
25 m POOL - 50 m POOL

Short only - #98

Long only - #56

Short/Long alternation (summer Long / indoor short) - #300

Dry land - gym



No - #38
Yes - #472

Weekly sessions #2,6

Overload
No - #213
Yes - #291

Shoulder prevention protocol

No -#51

Yes - #451

Not regularly #122

Before each session #250 (before each competition #80)

STRETCHING

No 28

Yes - 474

Occasional - 95

Often - 217

Always - 162

Pool

KM/week winter (indoor season)

Less than 30 - #111

Between 30-40 - #341

Between 40-50 - #48

More than 50 - #7

KM/week summer (outdoor, no school)

Less than 30 - #47

Betw 30-40 - #234

Betw 40-50 - #184

More than 50 - #35

Kicking %

Less than 5% - #27

5-10% - #171

More than 10% - #12

More than 20% - #75

Specific drills for START/TURNS during sessions 1 (never) - 5 (always)

1 - #10

2 - #79

3 - #182

4 - #166

5 - #57

Underwater phases focus during sessions 1 (never) a 5 (always)

1 - #3

2 - #41

3 - #132

4 - #185

5 - #143

TEST monitoring metabolic/technical parameters

More than #300 - NO

A few units using Federation's suggested TEST

Competitions as test - #35

Other test - #50

ALMOST “0”

- Blood urine test
- Regular weight and height check. Sit and reach, Arm span etc.
- Mobility test
- Kicking efficiency test
- Turns/Start time check
- Lactate production test

MOST COMMON sets



SPEED

Volume MT 300/400 (12,5-15-25)

THRESHOLD

Distance used 100. Not negligible use of the 50
Volumes around 2 km

VO2 MAX

From 300 to 2.200 mt

LACTATE

50's, 50's and 50's.

Substantially not used “hybrid” distances (75/125 ...).

100 yes but mostly splitted/broken.

Tolerance average amount of mt +/- 600

RACE PACE

Nobody - #60

Mainly -> target distance broken in 50/100

(unfortunately the time is the only considered parameter)

Large majority no care of Stroke rate/number. EP concept not yet rooted)

Widespread variations

Often used (almost **75% of the total**) pyramidal sets, descending sets starting from aerobic power to lactate tolerance.

I.E. - 50,100,200 and back or 100+50 or 200+100 etc. from aerobic power range to lactic tolerance

EP - Efficiency of propulsion

- SWOLF (stroke nr. + time) used but not so much (wolf is a score that measures swimming efficiency, and just as in golf, a lower score it better. Swolf score is obtained by adding nr. of strokes and time.
- Correlation Frequency / Speed same like above

T = 30" STROKE NR. 29, SWOLF = 59

The most difficult challenge

Bring coaches closer to a common vision, a universally valid programming, a planning and an application of loads according to the indications of the Federation

Metabolic System	Type	Code	Volume	Recovery
AE	Aerobic ENDURANCE	A1-A2	Varying	Short (5" – 10")
AE	Anaerobic THRESHOLD	B1	1500-3000	15"-20"
AN > AE	VO2 Max	B2	1000-2500	40"-1'
AN-L	LACTIC CAPACITY	C1	Max 1000	Related to distance
AN-L	PEAK LACTATE	C2	400	Full recovery
AN-AL	SPEED	C3	300-400	From 45" up depending on distance

Italian suggestions

LOW AEROBIC SETS

8/10 x 400 RECOVERY 20"/30"

20X200 RECOVERY 15 "/20"

(400 + 300 + 200 + 200 + 300 + 400) X 1/2 REC 30"/20"/15"

NOT ADVANCED ATHLETES / YOUNG OR MAINLY SPRINTERS CAN SWIM DIFFERENT DISTANCES, up to 20/30 X 100 RECOVERY 10 "

YOUNG OR MAINLY SPRINTERS CAN SWIM DIFFERENT DISTANCES 20/30 x 100 RECOVERY 10" (splitted in sets of 4/5 ...)

SOME AN THRESHOLD sets

Up to 24/30 x 100 RECOVERY 15 "

Up to 15/20 X 200 RECOVERY 20"/25 " RECOVERY

Up to 10X300 30 "

Other distances are also used like 150m for younger swimmers and/or sprinters (not easy to perform 300m on THRESHOLD). 50's are better for capacity than power, anyway they are often used.

YOUNG AND AN THRESHOLD

The main purpose is to teach them to understand/feel and keep the right pace. Physiologically few and not significant changes compared with aerobic endurance

Young - split the set in shorter blocks than those for experienced athletes. Young or mainly sprinters CAN USE DIFFERENT DISTANCES (75/150)

VO2 MAX SETS proposal

Up to 4/5/6 x 400 recovery 1'/2' according to the athlete and to its characteristics (middle distance or distance swimmer).

4/5/6 x (200 + 200) 10" interval between 200, at least 1' between set

4/5/6 x (4x100) rest 3"/5"/10"

16/20/24 x100 1'30"/1'45" (the most splitted in 4x5 or 4x4)

Quick way to set a VO2 pace on 100. (PB200 - PB100) But the following situation must be considered 48" and 1'48" = 1'00 1'55" and 55" = 1'00

ANAEROBIC TOLERANCE SETS

6/10 X 100 recovery 1'-2'-2'30"-3'

16/20/24 x50 on 1' - 1'10" - 1'15"

2/3 x(6x50) 2' 2nd 50 pace

LACTATE PEAK SETS

6x50 with dive

4x75 with dive (up to 6x75)

At the end of the set, active recovery up to 60' and then repeat the set.

Note - If after the first set a level of 16Mm of lactate was reached, this concentration will be reduced by 50% every 20'. After 1 hour the athlete will have about 2 Mm and is ready for a new set

SPEED DRILLS

VOLUME - 200/400m splitted into smaller blocks distances

10/12,5/15/25m on 2'

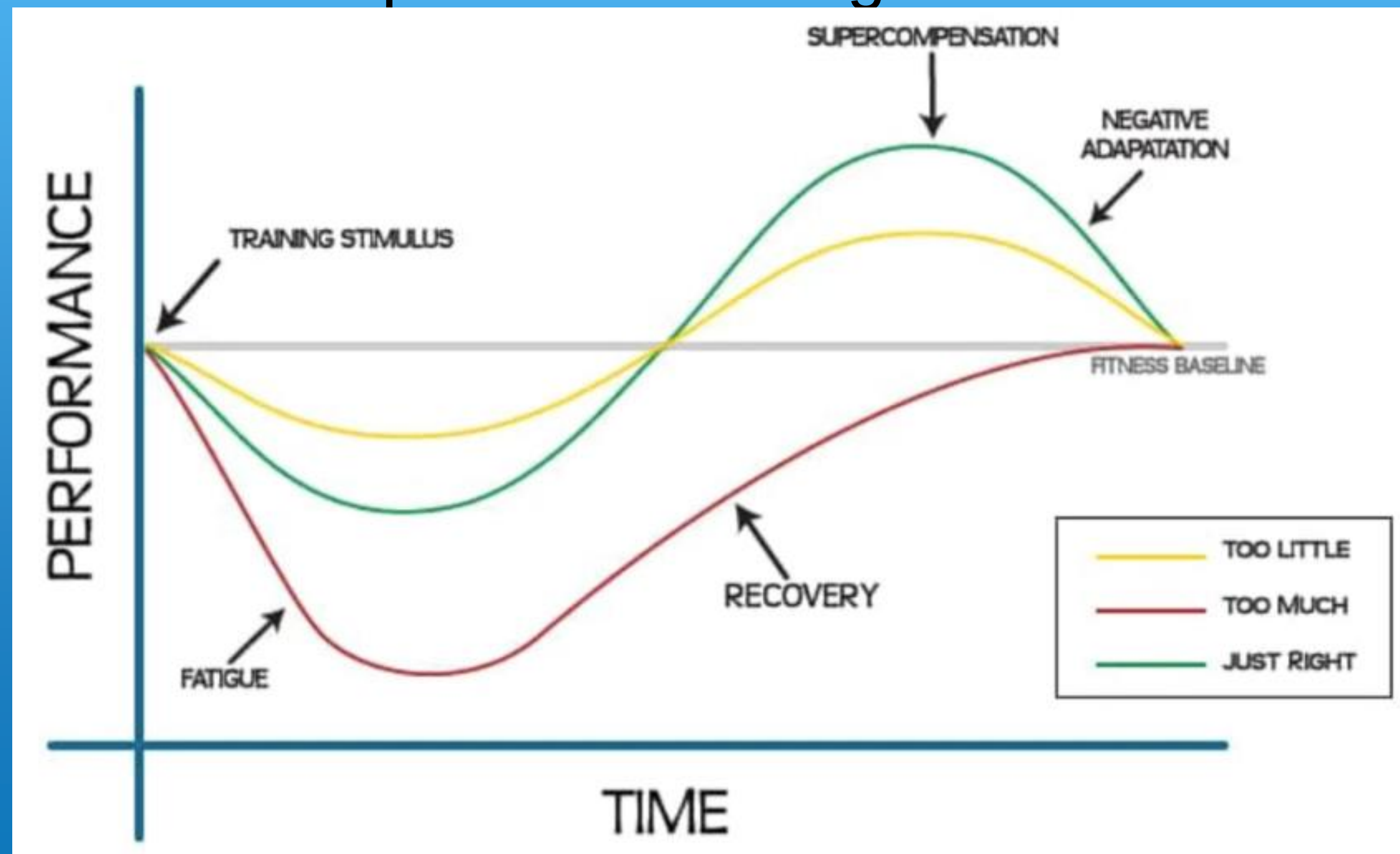
Turns - 5+5 or 5+10 or 5+15

Finish - last 15

There is no effective LOAD if RECOVERY is too short or too long

RECOVERY allows • Super compensation

Adaptation to changes/stimuli



Setting speed for

SETS of	AE END	THRESHOLD	VO2
50			
100	T 2000		200-100 400-200
200			
400			
CONTINUOUS on 100 mt		T 2000	



+

2%

-



+

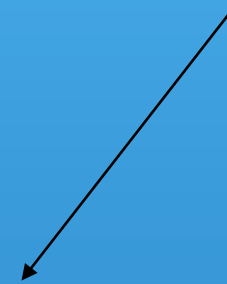
5%

-

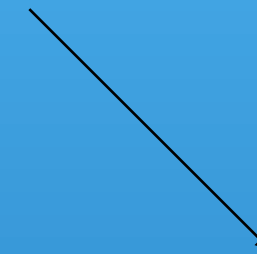
Training control

Check and regulate the training process based on pre-established objectives and criteria

Methods for the functional evaluation of the athlete



Monitoring Sest



Control Sets

Control sets starting with young swimmers

Underwater efficiency

- a) 4x15 with start checking time when head crosses 15m line (at least 2' rest)
- b) 4x15/20 with turn checking time last 10m (or last 5) plus first 10m after turn (at least 2' rest)

Testing Speed

6x25 with start on 2'/3' check-in frequency, nr. of strokes and time

Kicking efficiency

We can suggest 2 sets like below. 5' minutes active recovery between sets.

a) 100 fast T= PB on 100 + max 25" followed by 200m recovery

b) 50 fast T= PB100 / 2 + max 5" followed by 150m easy

c) 25 fast T= PB50 / 2 followed by 75m easy

1x400 6' or faster - 1x200 3' or faster

Minimal Targets

Target 100 is T(PB100) + max 25"

Target 50 is T(PB100/2 + max 5"

Target 25 is T faster than T(50)/2

NOT FOR BREASTSTROKERS

TEST for 9-11

Gliding

Gliding after turn

Gliding after dive

1x15 Sprint (head on 15)

25 Kick max (T)

4x50 descending @ 2' counting nr of strokes and T

100 IM with T each 25m + strokes' number

TEST for 11-13

Gliding

Gliding after turn

Gliding after dive

1x15 Sprint (head on 15)

50 Kick max (T)

6x50 descending on 2' counting strokes number, stroke frequency and Time.

(Stroke frequency is the extra check to observe variation during the set.

200 IM with keep T each 50 + strokes number

TEST for 13-15

Gliding

Gliding after turn

Gliding after dive

1x15 Sprint (head on 15)

75 Kick max (T) - compare T with PB100

8x50 descending 1'45"/2' monitoring stroke number, T, stroke frequency, heartbeat

T200 IM split times stroke nr and frequency

JUNIORES

Keeping what above

50's are 6x50 descending @ 2' and 6x50 come back

3x(5x100) lactate production check

5x300 for middle distance swimmers.

Monitoring sets

SPRINTERS (50-100)

3x(5x100) at the beginning of the period

16x50 (1'15") SF and Stroke number (every 3 weeks)

6x50 (2') – come back of 100 - SF and Stroke Number (each month)

3x50 with dive – full recovery

SPRINTERS (100-200)

5x200 step test (twice each macrocycle)

8x100 1'30"/1'40" - V02 Max (SF – HB – LACT)

KITAJIMA set 50-100-50 (every 3 weeks) (50 @1' - 100 @2' - 50)

12x50 (1'15"/1'30") SF and Stroke Numbers (every 3 weeks)

6x50 build up @2'

MIDDLE DISTANCE SWIMMERS (400 up)

5x300 build up (twice in a macrocycle) Target Time T300 = PB400 - PB100

20x100 1'45" - V02 Max (SF – HB – LACT)

RED
Write the
datas
Time in seconds
Stroke
frequency
Heart Rate at
the end

Test 3x5x100 1'30" - Andatura Crescente									
NAME					PLACE				
						Stroke	FREE		
Data						Stile	crawl		
	AE END SET 1			AE THR SET 2		VO2 max SET 3			
	Time	Sf		Time	Sf	Time	Sf		
	sec	cidli/s		sec	cidli/s	sec	cidli/s		
I	66,2	46,3		63,3	48,9	61,5	52,6		
II	65,8	46,1		63,6	48,4	62,1	52,6		
III	65,5	46,4		63,4	49,2	62,1	51,8		
IV	65,5	46,6		63,7	48,8	62,5	51,1		
V	65,2	41,6		63,5	49,2	62,6	51,7		
media	65,6			63,5		62,2			
		45,4			48,9		52,0		
vel (m/s)	1,52			1,57		1,61			
Ds (m/ciclo)	1,89			1,82		1,75			
HR (puls/min)	144			162		180			
Lactate (mM)	1,6			4,0		8,6			
PACE PREDICTION									
	lactate	Intensity	Speed		HB	SF	DS		
	mmol/l		m/sec		b/min	cycl/min	m/cycl		
	2	A2	1,53		147	46,0	1,88	Aerobic endurance	
	4	B1	1,57		162	48,9	1,82	Anaerobic threshold	
	8	B2	1,60		178	51,6	1,75	VO2 max	
Sets of:		AE END		AN THRESH		VO2			
50 m		31,8		31,0		30,1			
100 m	1	05,8		1 04,1		1 02,6			
150 m	1	39,8		1 37,2		1 35,0			
200 m	2	13,8		2 10,2		2 07,5			
continuo		34,0		33,1		32,5			

2nd 50

name					place											
	Time (s)	Fq (cycle/min)			T20 (s)	DS	Stroke Nr	index SIS (Nm/k/ciclo)	SWOLF simple	SWOLF adapted	TIME of real swimming	Real distance covered	Swimming speed	Time of push off	Push-off Distance	Push-off Speed
		1° 25	2° 25	average												
1° 50	31,5	46,5	45,5	46,0	14,2	1,84	43	3,64	74,5	71,0	28,0	39,5	1,41	3,5	10,5	3,04
2° 50	31,3	43,6	45,9	44,8	14,5	1,85	45	3,52	76,3	75,2	30,2	41,6	1,38	1,1	8,4	7,41
3° 50	31,0	47,0	46,1	46,6	13,3	1,94	45	4,38	76,0	74,0	29,0	43,6	1,50	2,0	6,4	3,20
4° 50	30,4	47,1	46,6	46,9	13,1	1,96	44	4,56	74,4	72,2	28,2	43,0	1,53	2,2	7,0	3,14
5° 50	30,6	47,6	46,9	47,3	13,3	1,91	44	4,32	74,6	71,9	27,9	42,0	1,50	2,7	8,0	3,00
6° 50	30,5	49,2	46,0	47,6	13,2	1,91	43	4,38	73,5	70,1	27,1	41,1	1,52	3,4	8,9	2,63
media	30,9	46,8	46,2	46,5	13,6	1,90	44	4,13	74,9	72,4	28,4	41,8	1,47	2,5	8,2	3,74
The sheet calculates the average values relating to: frequency of the stroke cycle (Sf) in the 50 meters; distance per stroke cycle (Ds), calculated on the average speed in 20 central meters (real swimming speed); efficiency index SIS (squared speed * Ds) which expresses the external mechanical work per cycle per unit of drag coefficient (the higher the SIS index the greater the efficiency); simple SWOLF index, given by (no strokes + t in seconds); correct SWOLF index, calculated from $(1 / Sf + 1) \cdot \text{number of strokes}$ (the lower the SWOLF indices, the higher the efficiency). The values of the various indices are comparable to each other on condition that the lengths of the underwater phase after the push off are always the same																
tempo 50 (s)		32	34	36	38											
Ideal nr. of strokes on 50		43	41	39	37	The ideal number of strokes represents the objective to be achieved. Stroke cycle has to be as close as possible to the race one (to be applied during aerobic series)										
		41	39	37	35											

Test 6x50 build up 1' -

Name

Place	FIN
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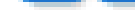
	Time (s)	FQ			T20 (s)	DS	Stroke Nr	SIS Index	SWOLF	SWOLF adpted
		1° 25	2° 25	Average						
1° 50	38,0	28,0	27,4	27,7	15,5	2,79	35	4,65	73,0	72,9
2° 50	36,3	30,2	31,0	30,6	14,8	2,65	37	4,84	73,3	73,3
3° 50	34,1	35,6	36,0	35,8	14,2	2,36	40	4,68	74,1	73,5
4° 50	31,9	42,3	43,2	42,8	13,5	2,08	43	4,56	74,9	73,2
5° 50	30,2	47,6	48,3	48,0	13,1	1,91	45	4,45	75,2	73,2
6° 50	28,5	52,2	53,5	52,9	12,7	1,79	48	4,43	76,5	75,2
improved efficiency values (compare to faster paces values)								4,84	73,0	72,9

The sheet calculates the average values relating to: frequency of the stroke cycle (S_f) in the 50 meters; distance per stroke cycle (D_s), calculated on the average speed in 20 central meters (real swimming speed); efficiency index SIS (squared speed * D_s) which expresses the external mechanical work per cycle per unit of drag coefficient (the higher the SIS index the greater the efficiency); simple SWOLF index, given by (no strokes + t in seconds); correct SWOLF index, calculated from $(1 / S_f + 1) * \text{number of strokes}$ (the lower the SWOLF indices, the higher the efficiency). The values of the various indices are comparable to each other on condition that the lengths of the underwater phase after the push off are always the same

[illegible]

Test 5x300 SL Incrementali

NOME COGNOME (Società)

Luogo, data - vasca 50 m 

[illegible]

Previsional Pace on different zones

Target Time Rek 400 - Rek 10

lactate	intensity	speed	HR	Sf	Ds					
mmol/l		m/sec	b/min	cycl/min	ml/cycl					
2	A2	1,50	145	37,2	2,32	Aerobic endurance indicator				
4	B1	1,60	175	41,6	2,22	Anaerobic threshold indicator				
8	B2	1,75	200	36,0	2,80	Max vo2 indicator				
Sets of		AE END		THRESH		VO2				
50 m		31,3		29,4		26,8				
100 m	1	05,4	1	01,2	0	56,0				
150 m	1	39,5	1	33,1	1	25,1				
200 m	2	13,6	2	04,9	1	54,3				
300 m	3	21,7	3	08,6	2	52,7				
<i>continuo</i>		34,1		31,8		29,2				

Test 50-100-50



Name _____ Place _____

3 x (1x50 on 1' + 1x100 on 2' + 1x50)

	time	Sf (cicli/min)			DS m/cycle	Nr of strokes	Nr of str second 50	SIS	SWOLF
		1st part	2 part	Average					
1° 50	29,3	47,0	43,0	45,0	2,28	33		6,63	62,3
2° 100	61,8	44,0	41,0	42,5	2,28	32	35	5,98	64,4
3° 50	28,7	49,0	42,0	45,5	2,30	34		6,97	62,7
total	119,8			44,3	2,29			6,53	63,1
1° 50	29,1	44,0	44,0	44,0	2,34	34		6,92	63,1
2° 100	62,2	44,0	40,5	42,3	2,28	34	35	5,90	65,6
3° 50	29,1	45,5	45,5	45,5	2,27	35		6,69	64,1
total	120,4			43,9	2,30			6,50	64,3
1° 50	29,3	44,0	44,0	44,0	2,33	34		6,78	63,3
2° 100	62,4	44,0	41,0	42,5	2,26	32	36	5,81	65,2
3° 50	29,1	45,5	45,5	45,5	2,27	34		6,69	63,1
total	120,8			44,0	2,29			6,43	63,9

The datas regarding Time, average frequency in 1° and in 2° 25 (or 50) mt and number of strokes per 50 meters or 100 meters must be entered in the sheet.

The sheet calculates the average values for the stroke frequency in the 50 meters, the average distance per stroke cycle (which is overestimated because it is calculated on the average speed in the 50 meters and not on the actual swimming speed) and the SIS efficiency index (product of squared speed for distance per cycle) expressing external mechanical work per cycle per unit of drag coefficient. The values are comparable as long as the underwater phases are the same in the various test

The recovery between one repetition and the other can be varied depending on the address you want to give to the exercise or in relation to the characteristics of the athlete. The exercise also turns out very useful for a correct management of the distance indicating how to manage the three parts of the distance.

HYPOXIA

Some examples to be included in workouts

4 to 8x25 rest 1' hypoxia "1" breathing once on 25 and switching to hypoxia "0" , From 4 to 8x25 free @ 1' in "hypoxia 1". Later switch between "hypoxia 0" and "hypoxia 1".

4x50 free rest 1' changing the number of breaths during the 50 meters: once each 25, initially breathe once every 25, then 0 breathe the first 25 and only 1 the second 25

3x100 free rest 1' changing breathing pattern each 25mt (3-5-7) rest 1' (I.E. 25 breath 3, 25 breath 5, 25 breath 3 and 25 breath 7)

8x25 underwater dolphin kick rest 1'

4x50 push-off 15mt underwater dolphin kick

Remember that hypoxia training is physiologically stressful, so the advice is to insert it carefully during your weekly workouts

Ref: Martin A. Cohn, Horst Baier, Adam Wanner:

More hypoxic

For 50mt events (free)

4/8 x 25 @1' - breathing 1 at the beginning, and then hypoxic

6x50 @2' variations hypoxic 1, hypoxic 3, hypoxic

For 100 events (free)

4x100 @2' breathing 4 or 6 or 8

10x100 @1'30" breathing 4 or 6 6x200 @3' breathing 4 or 6 / otherwise 5 or 7

6x100 @2' breathing 2 the first 50 and 4 or 6 the second 50

4x200 @3' breathing 2 the first 50, breathing 4 the 100 in the middle, and 6 the last 50

Underwater for Back and Fly (Breast double underwater stroke)

8x25 @1' underwater kicking fly

4/6x50 @2' underwater 15mt kicking fly each one

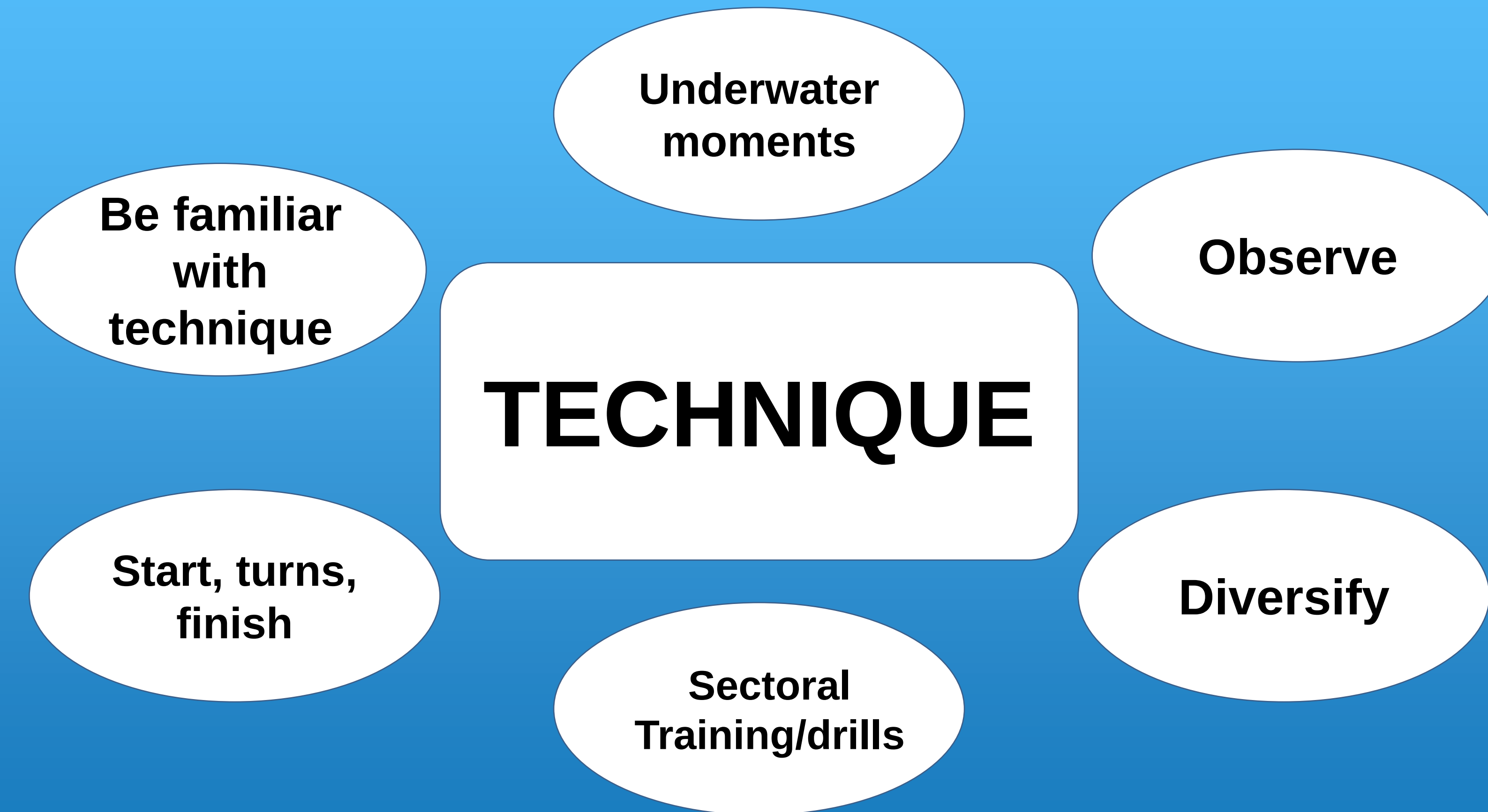
4x100 @3' underwater 15mt kicking fly each 50

3x200 @5' underwater 15mt kicking fly each 50

Walter Adapted from Maglischo



TECHNICAL/METHODOLOGICAL **PROJECT**



PHYSICAL PROJECT

SWIMMER

```
graph TD; SWIMMER((SWIMMER)) --- A([Endurance, Strenght, Speed]); SWIMMER --- B([joint mobility flexibility]); SWIMMER --- C([Prevention]); SWIMMER --- D([Core stability, posture]);
```

**Endurance,
Strenght,
Speed**

**joint mobility
flexibility**

Prevention

**Core stability,
posture**

PSYCHOLOGICAL PROJECT



Frequency & Times

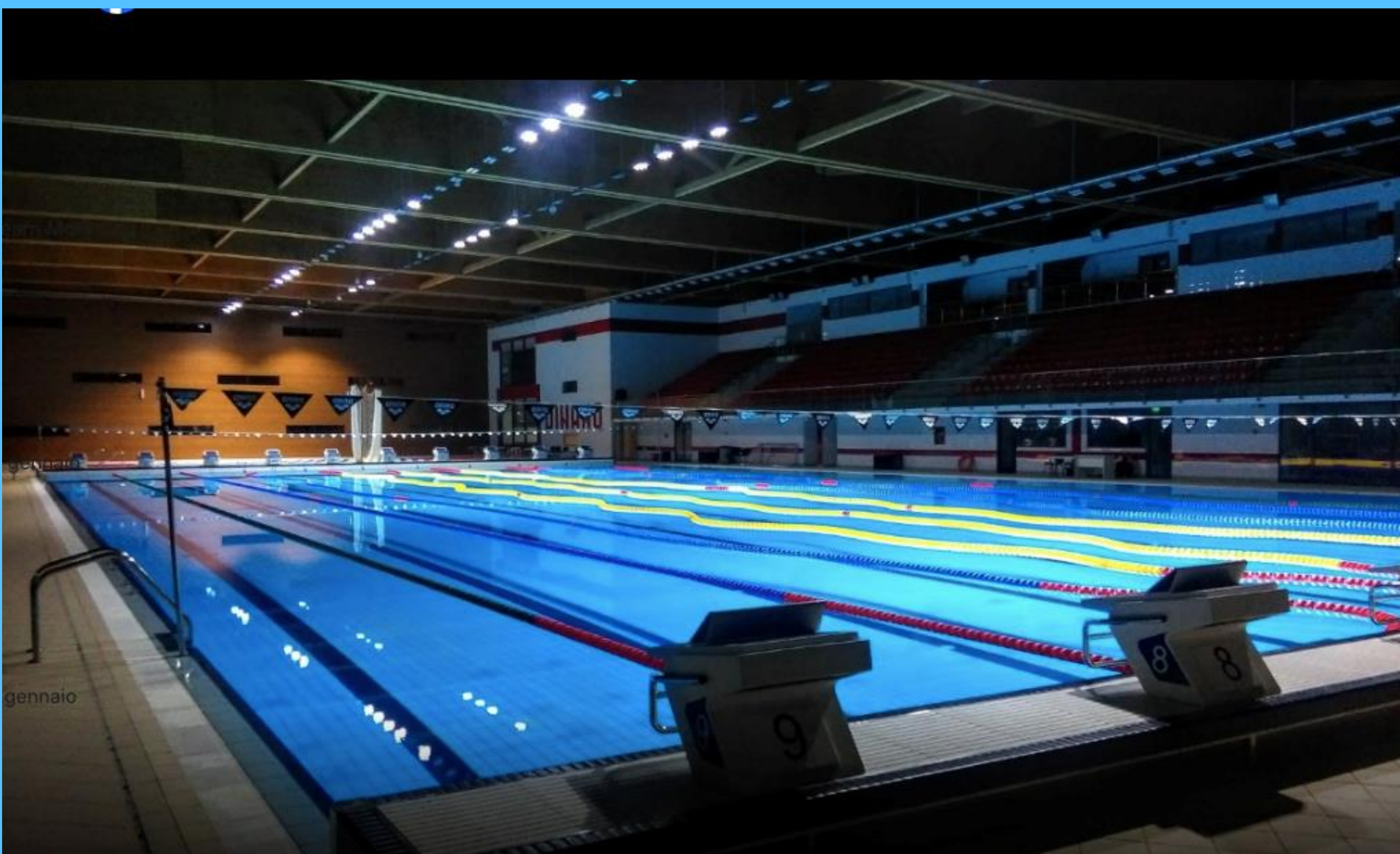
Stroke Frequency

M	FREE	BACK	BREAST	FLY
50	58/65	58/62	60/68	60/65
100	48/55	46/51	48/55	50/55
200	43/50	41/48	40/48	46/54
400	40/45			
800	38/43			
1500	38/43			

Turn - Finish (times)

	Last 5 Turn	First 5 Turn	Finish 5m
100 FR	2.6/2.9	1.5/1.7	2.4/2.6
100 FR	3.0/3.30	1.7/1.9	2.9/3.2
100 BR	2.9/3.1	2.3/2.6	3.0/3.4
100 BR	3.2/3.5	3.0/3.2	3.4/3.7
100 BA	3.0/3.5	1.5/1.7	2.8/3.1
100 BA	3.4/3.7	1.8/2.0	3.0/3.3
100 FL	2.7/3.0	2.3/2.5	2.8/3.1
100 FL	3.0/3.2	2.6/2.8	3.2/3.4





Ciao



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