

Pre-competitive training and taper in elite swimmers: examples & analysis



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”Architecture” of the MC

- 1 – low aerobic and max strength block
- 2 – high a. AT/ $\dot{V}O_{2\max}$ and power block
- 3 – anaerobic block/specific strength
- 4 – quality training (race pace + HVO) and strength/power
- 5 – taper + major competition – rest, recovery, strength, power & aerobic maintenance, maximal speed development, integration of performance components,
-> **PERFORMANCE**

PRE-COMPETITIVE TRAINING BLOCK = Quality training

Is a period of race specific training, aimed to achieve transmutation of non-specific abilities and skills into specific abilities and skills, integrate them into specific functional system and thus, build up performance potential

(“Theory of functional systems” - P.K. Anokhin –
PIONEER OF FEEDBACK CONCEPT, 1935)

System building factor is specific activity itself =
“**SWIMMING AT TARGET RACE PACE** with target
stroke rate/DPS ratio and breathing patterns”

Objectives:

Maximisation (development) of race specific abilities through specific training:

- power, capacity and efficiency of dominating metabolic system(s),
- propelling force during swimming

Perfection of Technical and Tactical Skills:

- swimming technique in best stroke(s) during swimming at race velocities with competitive stroke rate (stroke count) & distance per stroke;
- technique of starts and turns

Maintenance (“retaining” training) of:

- maximal strength/power & local muscle endurance
- aerobic abilities

Problems:

It is hard (if possible at all) to achieve simultaneous peaking of all components of special working capability

We are dealing with:

- delayed and non uniformed transformation and
- transmutation of training work into physical fitness and competitive performance
- superposition of different training effects

Quality (race pace) training is the best way of integration of motor abilities & physiological systems with specific swimming skills

CONTENT OF QUALITY TRAINING =
RACE SPECIFIC TRAINING BASED ON
INDIVIDUALS' RACE MODELS :

Target distance and splits times (swimming velocities), target stroke rate (stroke count), target distance per stroke, race breathing patterns, glide distance, underwater kick distance, breakouts

SUBJECTS OF QT:

Front end speed = "FES" sets

Back end speed = "BES" sets

Top end speed = "TES" sets

"The Whole Thing" Training (race simulation)

broken sets (control of SR-SC, DPS, breath.)

Repetition training

Maximal speed = HVO (high velocity overload)

Quality of training (training velocities) is of utmost importance

□ Way 1: to reduce training regiments in order to force a swimmer to swim faster at any cost and resist to onset of fatigue (most common approach in 1970-1980s = “train hard, harder, hardest”) (?)

□ Way 2: to increase the rest intervals to give a swimmer more time for recovery and let him/her swim at higher velocity while focusing on swimming technique and proper pacing: SC(SR), D/S, breathing patterns, glide distance (underwater kick, pull-outs), even or negative splits etc.

Quality of training (training velocities) is of utmost importance

Way 1: RAPID FATIGUE ACCUMULATION

decrease of swimming velocity, technique's degradation
(Target Time at any cost!!!)

Way 2: GRADUAL FATIGUE ACCUMULATION

maintenance or increase of swimming V, controlled technical parameters and breathing patterns

RATIONAL: rather than to train fatigue - prepare to swim competitive distance or part of it at target race pace with target SC, SR, SR:D/S ratio

Psychological aspect of
race pace training:

«RACE PACE TRAINING» (FES, BES,
TES, "splits" or broken swims) mobilizes
**MENTAL VISUALISATION OF THE
ULTIMATE GOAL AND WAYS TO
ACHIEVE THAT GOAL**

QUALITY TRAINING
COACH'S TOOLBOX

QUINT ESSENCE OF TRAINING
The Mark of Mastership & Craftsmanship
of a coach

- **Front End Speed training** – training exercises performed from the dive start @ target velocity of the beginning of the race with model SC, SR/SD :
(1st 25 or 1st 50 for 100-200 races or 1st 100 m of the 400 race)

- n x 25 or 35 m, also n x 50 m (for 100-200)
n x 100 for distance swimmers («feet on the wall») @Target Pace and SR for 50, 100, 200 or 400 m

- **Back-End Speed training** – sets of the laps (“last” 35, 50 or 100 m of a distance) may be performed from push off the wall or “feet on the wall”(turn) start or from “swim” start (“by the head”) @ TT of the 2nd half of the distance with T SC, T SR/SD: finish on hand touch

- n x (“the last $\frac{1}{2}$, $\frac{1}{4}$ of the race) – from the spot, from push or turn start

- ”last” 35, 50 m for 100 & 200,
”last 50, 100 or 200 m for 400-800 events
”last” 100, 200, 300-400 for 1500 m

Training of FRONT END SPEED:

5-8 x [50 from dive, #1 stroke @50"]
[+100-150 m recovery @ 2-3']

Training of BACK END SPEED

4-8x [50+50+50 – #1stroke @ 50"]
[+150 m recovery @ 3:00]

as 50s ##1,2 – controlled fast speed +
50 #3 @ «back end pace»

Control of SR:D/S ratio, breathing

- “TOP-End Speed” training - training of the finish effort:
- – sets of the laps (“last” $\frac{1}{2}$, $\frac{1}{4}$, or $\frac{1}{8}$ m of a distance) usually from “swim” start (“by the head”) @ TT of the finishing race @ Target SR/SD:
- N («last» 25, 20, 15 for 50-200 events, last 50 for 200 events or last 100 for 800-1500 m), swam @ TT of the corresponding fraction of the 2nd part of the race (“last $\frac{1}{2}$, $\frac{1}{4}$, or $\frac{1}{8}$ of the 50, 100, 200 or 400 m race)
- Usually with breath-hold (no breathings under flags!!!)
- SR and DPS control is at utmost importance

Examples of « TOP END SPEED » sets:

Sprint after Apnea:

5-8 x 50 as [25 m kick under water (rest 10-15 s or no rest) + 25!!! With SR control and constant D/S

“Megan Quann’s set”(short course training):

4-6 [8 25 @ 60”, 55”, 50”, 45”, 40”, 35”, 30” – constant near maximal velocity, controlled breathing, race SR and D/S]

Reduced set for taper:

3-4 x [5x25! @50”,45”40”,35”]

BROKEN SWIMS / Race Simulation: «the Whole Thing training»

n x (2 x $\frac{1}{2}$ distance ri=10-30") rest 1-4' (2x50, 2x100, etc.)

n x (4 x $\frac{1}{4}$ distance ri=10-30") rest 2-4' (4x25, 4x50, 4x100)

n x (8 x $\frac{1}{8}$ distance ri=10-30") rest 4-6' (8x25, 8x50, 8x100)

n x (4 x $\frac{1}{8}$) + $\frac{1}{2}$ distance) rest = rest 3-6' (4x50 + 200)

Other combinations ($\frac{1}{2} + \frac{1}{4} + \frac{1}{4}$ or $\frac{1}{4} + \frac{1}{2} + \frac{1}{4}$

Speed (times) = as the best performance split times (or predicted TT) + target SC (SR:D/S ratio) + perfect technique

Jon Urbanek's set for
middle distance swimmers (200 m) –

4 x 200 broken swims @ 8:00 as:

50 dive on 1:30 (at 200 pace :25.5)
+ 100 push @ 2:30 (t = t mid 100 at 200 pace
:54.0)

+ 50 push @ 1:30 (at 200 back-end pace or
«as fast as you can come home» :25.5

$$\sum TT = \underline{25.5+54+25.5=1.45+3-4''=1.48-1.49}$$

(add up for 200 meters 3-4'' under goal time) =
actual TT = 1:51-1:52

Active rest recovery 2:30 Total distance = 800

KOSUGE KITAJIMA set:

1st – Macrocycle - last “200”
 $30.40+1.06.58+30.58=2.07.56$
La=12.0-11.8 HR=180
SC=15/16/16/17=64

2nd – Macrocycle – last “200”
 $29.90+1.05.53+29.46=2.04.89$
La=8.2
SC=14/13/15/15=57

3rd – Macrocycle – last “200”
 $29.22+1.02.70+28.90=2.00.82$
La=11.3/14.0 (3')
S = 15/15/17/17=64

	Paul	Andy	Marc	Ed	Jo	Jaime
pre-set La	1	1,3	1	1,3	1,2	0,8
split 50	24,6	25,1	25	25,2	31,6	34,4
#1	50,9	52	52,4	52,8	1.05.6	1.14.3
La	10,4	7,6	7,9	8,8	11,1	6,3
La recov.	9,7	12,6	7,4	8,9	8,7	3,7
split 50	24,7	24,8	25,1	25,6	31,9	34,8
#2	51,1	51,4	52,1	53,2	1.06.2	1.15.0
La	13,3	15	11,3	10,9	15,8	7,4
La recov.	12,6	15,2	13,6	9,9	10,1	4,6
split 50	24,9	25,6	24,8	25,9	32,4	35,4
#3	51,3	52,5	52,0	53,0	1.06.4	1.15.9
La	15,9	14,9	14,6	14,4	13,7	6,2
La recov.	14,2	15,4	xxx	10,8	9,8	3,8
split 50	25,2	25,6	25,1	25,5	32,6	36,0
#4	52	53,1	52,3	52,3	1.06.6	1.17.0

CLASSICAL REPEATION TRAINING

4x100 #1 stroke
from dive @10'

15.08.2000

La	08.11.2013 p.m. Short Course		Simon				
La recov	1. IM: 300+200+100+8x25 i=15"		11.95 - 26.55 - 40.91 - 55.68 butt				
La recov	3x200 @2:50 desc.1-3		12.65 - 27.19 - 42.21 - 56.13 BK				
averag	4x100 kick @1:50/ 200 drill		14.37 - 30.21 - 46.65 - 1:02.89 BR				
recovery	3x100 kick @2:00 desc.1-3/200 drill		12.07 - 25.69 - 39.62 - 52.59 free				
La recov	3x[25!/ 75~/] 100 BK easy		12.07 - 27.69 - 44.17 - 58.30 IM				
recovery	2. 5 x [100 !!! / 150 easy] @6:00						
La	3. 300 =[50 BK/50 BR]		Eric	all BR		Mattias	
recovery	12x50 @45"		14.73 - 31.61 - 48.31 - 1:05.07			12.70 - 26.75 - 41.78 - 55.68 free	
La	200 kick		14.91 - 31.40 - 48.02 - 1:04.64			14.12 - 29.70 - 46.01 - 1:01.10 BK	
	5250		14.51 - 31.17 - 47.77 - 1:03.53			12.84 - 27.09 - 41.66 - 55.25 free	
La			14.86 - 31.23 - 47.49 - 1:04.73			13.84 - 29.43 - 44.52 - 59.95 BK	
			14.84 - 31.19 - 48.08 - 1:04.08			12.57 - 27.86 - 45.86 - 59.95 IM	

TIME TRIAL

04.04.2001		TIME TRIAL					
P.P.	M.Spa.	R.Fr.	J. F.	A.B.	S.C-		
200 free	200 free	200 free	200 BK	800 free	800 free		
25,4	26,41	25,5	31,8	58,7	1.04.0		
27,8	29,99	28,8	34,57	1.59.4	2.12.6		
27,8	29,86	31,1	35,3	4.03.0	4.29.5		
27,6	28,13	30,9	34,3	6.08.0	6.45.3		
1.48.80	1.54.30	1.56.40	2.16.02	8.12.1	8.59.9		
HR= 179			HR=200	HR=193	HR=188		
	Lactate						
1 min		8,2			7,4		6,6
2 min	9,6	9,2	9,1	9,1	7,8		7,2
3 min	12,3	10,8	13,8	13,9	7,6		6,7
4 min	13,2	11,7	100 m swim	14,3	7,2		6,4
5 min	15,4	12,1		15,0	6,9		6,2
6 min	16,0	13,6	15,1	14,3			
7 min	15,3	12,4		14,3			
		Swim Down					
1000 La=2.3	1000 m La=3.4	1000 m La=4.1	800 m La=4.4	600 m La=1.2	800 m La=2.0		
	1200 m La=2.7	1300 m La=2.4	1100 m La=2.6				

SPRINT TRAINING: Race Speed & HVO – high velocity overload

- ❑ HVO – High Velocity Overload – all out sprints and/or “impuls” training
- ❑ Race Speed “Short Efforts” x 15, 20, 25, 30, 35 m
- ❑ 1) performed at utmost intensity
- ❑ 2) performed at controlled competitive pace and swimming technique – «easy & fast»
- ❑ Combine HVO + assisting/resisting training (stretch-cords, towing devices)



Theory in PRACTICE OF QT at the NEC

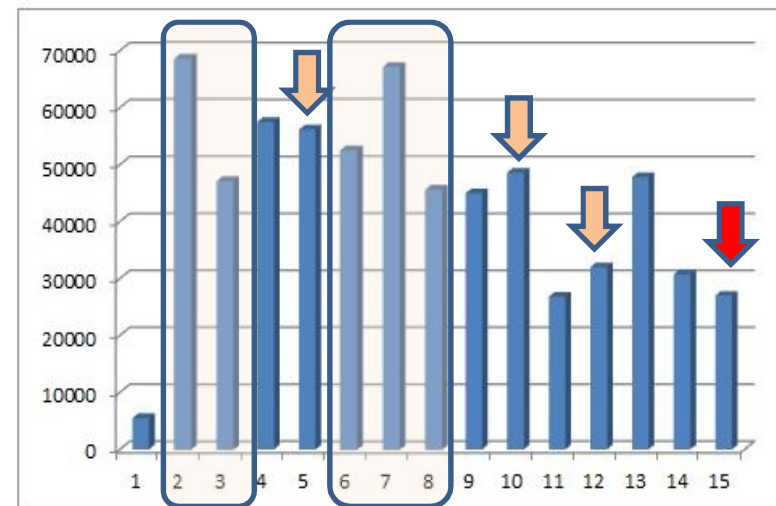
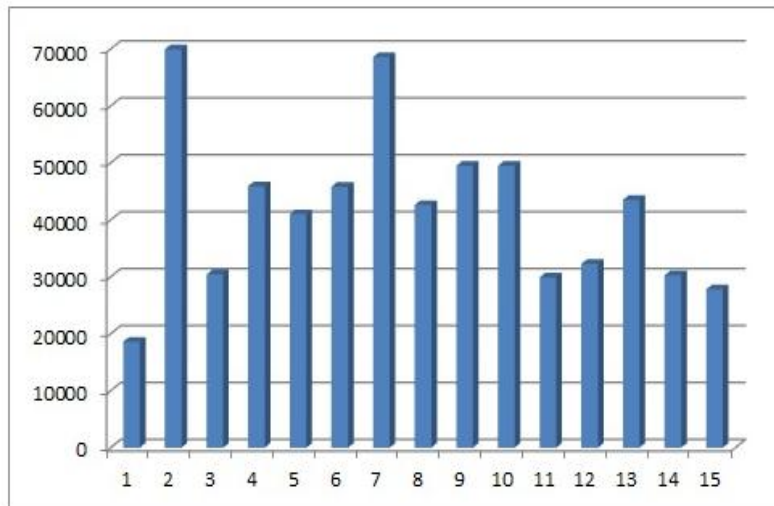
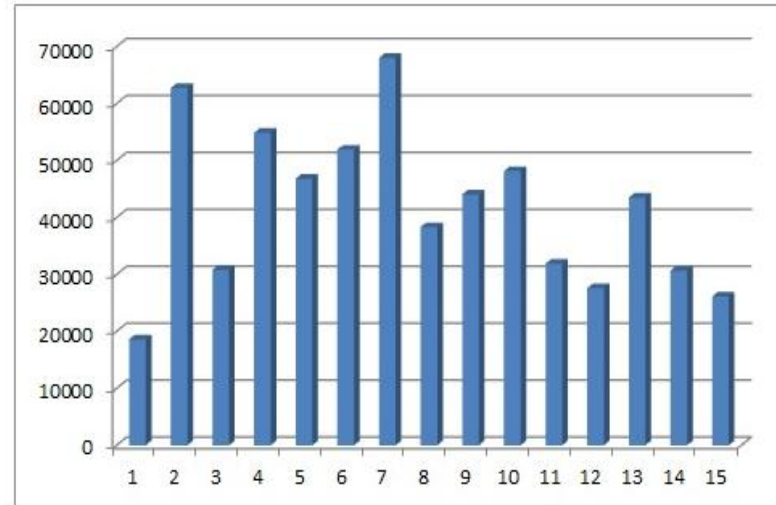
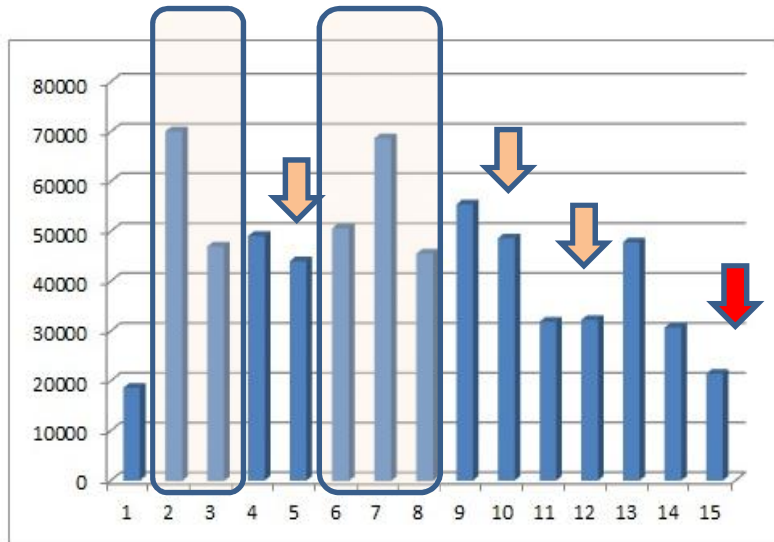
Stockholm, January-April 2014

”Architecture” of the MC-II

January-April 2014

- 1 – low aerobic and strength block
- 2 – AT/ $\text{VO}_{2 \max}$ and power block (altitude training – 19 days/**2320 m**)
- 3 – quality training (race pace + HVO + competitions) and specific strength
- 4 – taper – recovery, strength, power & aerobic maintenance, maximal speed development

Dynamics of weekly training volumes in 4 elite swimmers of NEC Stockholm - January - April 2014



TRAINING SCHEDULE OF THE NEC							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
A.M.	8:00-8:30 land work (with diving coach) 8:30-10:30 swimming	8:00-10:00 swimming 10:00-11:00 weight training	8:00-8:30 land work (with diving coach) 8:30-10:30 swimming	8:00-10:00 swimming 10:00-11:00 weight training	8:00-10:00 swimming	8:00-10:00 swimming	Day OFF
P.M.	15:00-17:00 swimming	15:00-17:00 swimming SC	OFF	15:00-17:00 swimming SC	15:00-17:00 swimming	Off	Day OFF

Monday/Wednesday a.m. - **Diving gym with diving coach**
= core body strength, plyometric , coordination





Tuesday/Thursday a.m. – **Weight training** (power and maximal strength with strength coach = whole body exercises)

Tuesday & Thursday p.m. = **Short Course training sessions**
reserved for sprint and apnea training

Land programme



Example of training week plan for QT training block

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
A.M.	Aerobic sub-threshold (La 2.5-3.0 pace)	La Threshold session (La 3.5-4.5)	 Race pace session	Light aerobic, kick set, short sprints	Aerobic sub-threshold (La 2.5-3.0 pace)	 Race pace session	Day OFF
P.M.	VO2 max session, short sprints (15-35 m laps)	 HVO, apnea (underwater kick), starts & terns	OFF	 Apnea + short set of maximal kick Broken swims = race simulation	La Threshold session (La 3.5-4.5)	Off	Day OFF

Properly sequenced and balanced workloads
 Enough rest before key sessions – quality is utmost important
 since the most valuable workloads (exercises) required fine coordination and maximal neuronal output

3-4 "mainstream" sessions a week out of 10 (each "mainstream" session requires maximum effort and perfect technique)

"Mainstream" session – race simulation

Next week after altitude camp:
short course session – super maximal velocities, starts & turns / preparation to LC sets

Broken 800 as: [200+200+100+100+100+100] as @2:30-2:30-1:20							
Simon	Mattias	Erik	Sarah	Michelle	Jessica	Linus	Jesper
2:01.84	2:02.07	2:02.78	2:08.8	2:08.8	2:20.3	2:04.9	2:04.9
1:59.35	2:01.10	2:01.10	2:08.5	2:08.5	2:20.5	2:08.5	2:06.5
59.82	1:00.20	1:00.32	1:02.0	1:03.2	1:10.3	1:03.2	1:01.8
59.33	59.92	1:00.62	1:02.5	1:03.5	1:10.3	1:07.1	1:03.0
58.57	1:00.07	1:00.07	1:02.4	1:02.9	1:09.5	1:03.9	1:02.7
56.02	59.09	59.78	1:01.6	1:02.4	1:07.8	1:04.0	1:04.0
7:56.80	8:02.45	8:04.17	8:25.9	8:29.3	9:18.7	8:31.6	8:22.9
broken 400 as :[100+200+100 @1:20/2:40]							
Simon	Mattias	Erik	Sarah	Michelle	Jessica	Linus	Jesper
57.76	57.76	57.76	1:00.3	1:00.4	1:05.9	1:00.4	1:00.4
1:58.87	2:00.97	2:01.63	2:05.3	2:09.2	2:20.9	2:07.7	2:04.9
56.02	57.73	58.39	59.8	1:00.2	1:06.9	1:00.9	1:02.9
3:52.64	3:56.46	3:57.78	4:05.4	4:09.8	4:33.7	4:09.0	4:08.22
broken 200 as: [50+100+50 @50"-1:30] br@60"-1:40							
Simon	BI Mattias	Erik BR	Sarah	Michelle	Jessica BR	Linus BR	Jesper
30.35	25.73	30.35	27.2	27.2	34.3	31.25	26.85
1:05.16	55.67	1:05.16	1:00.4	59.4	1:14.6	1:09.58	1:02.01
31.50	26.77	31.33	26.4	26.9	34.9	34.49	29.95
2:07.01	1:48.17	2:06.84	1:54.0	1:53.5	2:23.8	2:15.32	1:58.85

27 February 2014, p.m. session Short Course

2x100 broken as:[25+50+25 @30"-60"]/ 150 easy							
Simon	FI Mattias	Erik BR	Sarah fly	Michelle	Jessica BR	Linus BR	Jesper
11.86	11.47	12.9	12.2	11.86	15.0	14.31	11.7
26.48	25.75	30.9	28.6	26.88	34.9	32.65	27.7
12.32	12.06	14.1	12.7	12.20	16.4	15.60	12.2
50.66	49.28	57.9	53.5	50.84	1:06.3	1:02.56	51.6
free			fly				
11.43	11.43	13.2	12.2	11.94	15.2	14.02	11.6
24.14	24.72	30.6	29.1	26.66	35.2	32.70	26.3
11.41	11.63	14.2	13.2	12.37	16.3	15.56	12.3
46.78	47.78	58.0	54.5	50.97	1:06.7	1:02.28	50.2

Psychological tool to create a drive "I can do it! I shall do it!"

"Mainstream" session – race simulation

Long course sessions – 3 x broken 200s

as: 50+100+50 @50"-1:30/BR 60"-1:40

(focus on the "middle" 100 lap)

05.03.2014 a.m.	<u>Simon</u>	<u>Mattias</u>	<u>Jesper</u>	<u>Linus</u>	<u>Sarah</u>	<u>Michelle</u>	<u>Erik</u>	<u>Jessica</u>
1. 200 BK + 3x100 IM i=15"	Butterfly	Free	Free	IM	Free	Free	BR	BR
200 BK + 6x50 BR 3 over-1 under @60"	26.82	26.18	26.47	28.63	27.30	26.59	30.27	35.01
200 IM + 300 padd. [desc.x100] 3:27-3:43	57.80	56.89	58.75	1:08.28	58.03	59.42	1:07.72	1:17.22
4x150 kick @3:00	28.41	27.81	27.88	27.86	26.38	27.70	31.72	36.67
8x50 drill i=10"	1:53.03	1:50.88	1:53.10	2:04.77	1:51.71	1:53.71	2:09.76	2:28.90
6x50= [15!/35~]@60"	BK	BK	Free	BK	Free	Free	BR	BR
1x[25!/75~]	27.86	29.76	26.81	32.21	27.58	27.58	29.48	34.99
<u>2. dressing in racing suits:</u>	1:00.54	1:02.57	59.46	1:10.84	58.36	59.17	1:06.28	1:16.75
broken 200s	28.74	28.45 BK	27.32	34.12	26.51	27.55	31.86	35.99
3 x [50 dive+ 100 + 50]@50"-1:30/Br 60"-1:40	1:57.14	2:00.78	1:53.62	2:17.17	1:52.45	1:54.30	2:07.62	2:27.73
[200 recovery	Free	Free	Free	Free	Free	Free	BR	BR
3. 16x50 =[bk/br/bk/free]x4 @60"	25.00	25.77	26.44	27.71	26.92	27.38	29.30	34.48
400 kick	55.28	55.87	58.45	1:01.67	58.82	59.13	1:06.43	1:16.28
5300	26.15	25.72	27.40	29.21	26.60	27.54	32.35	36.35
	1:46.43	1:47.36	1:52.29	1:58.59	1:52.34	1:54.05	2:08.08	2:27.11

COMPETITIONS AS METHOD OF SPECIFIC FUNCTIONAL AND SKILL TRAINING - Amiens meet – no taper

10.03.2014 p.m.				11.03.2014 a.m.			
1. 2x150 free @2:15 +6x50 kick fly on BK fins @50"				1. 400 padd. DPS		Last 50	
2x150 BK @2:30 + 6x50 fly-bk-br @55"				5x100 IM @1:40	Simon	Mattias	Erik
2x150 roll IM @2:20 + 6x50 free @50"				8x50 drill #1 i=10"	24.76	26.16	27.09
4x100= [50 BR 3-1/ 50 free]@1:40				5x100 kick @2:00 desc.			
2. 8x100 @1:25				5x[15!/35~]/50 easy @60"	Last 50		
400 padd. @5:15				2. 40x50 @50" desc.x10	Sarah	Michelle	Jesper
6x100 @1:25/ BR 5x100 @2:00				300 BK/BR/free	26.55	26.95	27.75
400 padd. @5:15				3. 200 kick @4:00			
4x100 IM @1:45				5x[35! Kick on BK fins/65~]@2:00			
3. kick: 2x200 @3:45 + 6x50 (25 under/25 BK)@60"				400 swim down			
100 recovery				5400			
5600							
11.03.2014 p.m. SC				12.03.2014 a.m.			
1. 300 free				1. 300 =[3/5/7 x 50]			
4x75 BK @1:15				300 BK + 4x100 reversed IM @1:40			
3x200 IM @3:10				6x50 BR =[50 3 over-1 under/ 50= 3 fast/3 long]@60"			
8x25 kick under @40"				3x200 padd. @3:00 [desc.1-3]	Michelle	Simon fly	Jesper
5x100 IM @1:40				200 drill	29.98	29.72	29.89
4x150= [15!/135 steady]@2:10				3x[25! Dive / 75 easy] progress	28.93	29.34	29.73
8x50 free @45"				kick: 200+150+100+3x50 @4'/3'/2'/1'	28.45	27.52	29.43
2. [4 x[25! Kick/sw/sw/padd /25~] x 2				10x50 drill			
[200 BK easy]				2. 3x [50! From the middle/ 50 recovery]			
[50! Padd./fins]				200 BK	Mattias BK	Sarah fly	Erik
[300 free recovery]				3. 12x50 easy @50"	32.26	31.2	34.5
3. 10x50 kick fins @50"				200 kick	32.06	31.1	34.3
3x200 fins/padd. @2:30				4800	31.85	31.1	34.2
5100							
				13 March - Travel to Amiens	Swim in local pool 2000 m		
				14. 15, 16 - competitions in Amiens (long Course)			

COMPETITIONS AS METHOD OF SPECIFIC FUNCTIONAL AND SKILL TRAINING

3 days event – every day every swimmer participate
 minimum in 2 events x 2 races = 4 races
 4 races x 3 days = 12 races

AMIENS INTERNATIONAL "SILVER LANES" 2014 March 14-16

Day 1.		Sarah		Simon	
Mattias	200 BK	50 free	100 butt	100 butt	200 BK
24.47	2:04.73	24.99	58.26	55.72	2:05.63
24.24	2:02.71	24.82	56.53		

WB1

AMIENS INTERNATIONAL "SILVER LANES" 2014 March 14-16

Day 2.		Michelle		Mattias		Sarah		Erik	
Erik	100 BR	50 free	200 BK	100 BK	200 free	200 free	50 fly	200 BR	400 IM
24.43	1:03.61	27.12	2:16.85	57.48	1:52.84	1:59.67	26.28	2:17.26	4:31.31
24.68	1:02.95	25.85							

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Day 3

Mattias		Sarah		Erik	
400 free	100 free	100 free	400 free	200 IM	400 free
4:00.52	51.69	55.92	4:14.17	2:07.96	4:08.54
4:01.20	51.63	53.65	4:06.04	2:05.49	
Simon		Michelle		Jessica	
200 fly	200 IM	400 free	50 BK	100 free	200 IM
2:03.17	2:06.21	4:14.61	29.97	55.86	2:24.86
1:58.67	2:01.21	4:16.72	29.75	54.73	59.85
					32.88
					32.83

"Mainstream" session

Next week after Amiens – "IMPULS TRAINING" –
activation of maximal number of muscles

19.03.2014 a.m.					
1. 500 padd. 3/5/3/7....					
12x50 fly/bk-bk/br-br/free@50"					
5x100 kick fly on BK desc.1-5 @2:00					
12x50 drill i=10"		Best 300			
6x[15! Dive/35~]		Simon	Mattias	Michelle	Sarah Erik
2. 5x300 [desc.1-5] @4:15		3:04.3	3:11.4	3:22.6	3:20.6 3:17.3
200 drill		<u>Activation of maximal number of muscles</u>			
3. 4x[25!= 15 max kick head over + 10!!! Max swim/25 easy]@70"					
100 recovery					
4x[25!= 15 max kick head over + 10!!! Max swim/25 easy]@70"					
100 recovery					
2x[25!= 15 max kick head over + 10!!! Max swim/25 easy]@70"					
4. 300= bk/br/free x50					
200 kick					
5600					

”Mainstream” session – race pace

Next week after Amiens:
 closer to the main event of the MC = shorter the laps and
 less rounds in sets

	Simon			Mattias			Erik		
	BR	BK	Free	BK	BK	Free	BR	BR	BR
	12.71	12.71	10.82	12.90	13.29	11.26	12.86	12.88	12.49
20.03.2014 p.m. Short Course	13.93	13.09	11.43	13.62	14.62	11.77	14.01	14.10	14.43
1. 3x[25! Dive/75 easy] desc.1-3	14.13	12.73	11.53	13.51	13.73	12.10	14.13	13.94	14.31
5x100 IM @1:30	28.47	26.16	24.05	29.02	28.62	25.22	28.47	28.76	29.74
8x50 drill i=10"	30.22	26.87	24.79	30.58	29.24	25.99	29.82	30.33	31.62
15x50 kick [desc.1-5/6-10/11-15]	46.37	40.49	37.48	44.36	44.07	39.29	46.97	46.06	47.29
200 drill	(28.88)	(26.82)	(25.02)	(29.49)	(29.32)	(25.79)	(28.89)	(29.40)	(29.99)
2. 3 x [3x25 @40" 1st dive/75 ~]									
[2x50 @60" 1st dive/100~]	Michelle			Sarah			Jessica		
[1x75! Dive/ 125 recovery]	free	BK	Free	Fly	Free	free	BR	BR	BR
3. 30x50 free (10x50"/20x45")	11.71	13.29	11.71	12.00	11.22	11.45	15.05	14.67	14.85
Sarah 1500 = 18.53.0	12.30	13.19	12.05	13.52	12.29	13.10	16.26	16.50	16.55
5250	12.22	13.22	12.15	12.89	12.02	13.02	16.23	16.38	16.34
	26.18	28.74	25.81	26.72	26.76	24.79	33.74	33.61	33.41
	26.80	29.49	26.14	29.47	27.96	26.88	36.11	35.49	35.45
	40.22	44.31	39.93	46.49	42.57	44.89	52.45	52.32	52.22
	(26.53)	(29.32)	(26.46)	(28.36)	(27.14)	(28.11)	(34.14)	(33.45)	(33.29)

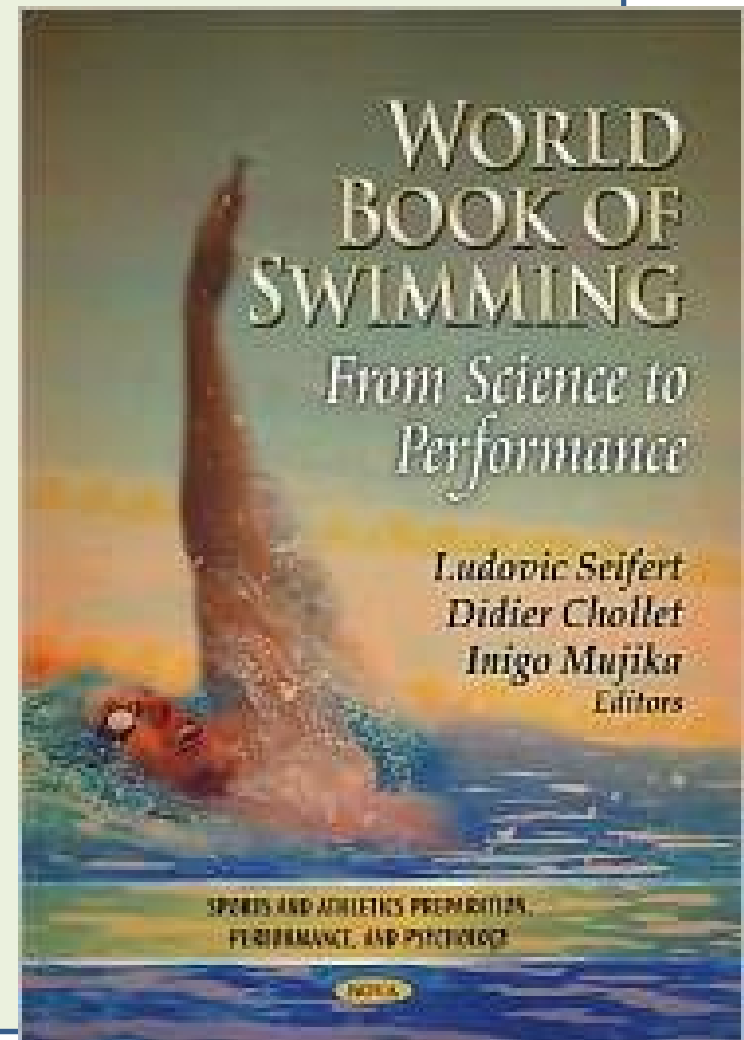
TAPER & COMPETITIONS - COMPETITIVE BLOCK (REALISATION MESOCYCLE)

THE TAPER: PHYSIOLOGY, PERFORMANCE, AND PLANNING

David B. Pyne¹ and Iñigo Mujika²

¹ Australian Institute of Sport, Australia

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Basque Country



GENERAL PURPOSES OF THE TAPER:

- to achieve supercompensation of motor abilities and energy stores through active recovery and workload decrease,
- to convert improvements in motor abilities, non-specific and specific working capability, technical and tactical skills into highest race pace and competitive performance

TAPER & COMPETITIONS –

COMPETITIVE BLOCK (REALISATION MESOCYCLE) usually lasts 3-1,5 weeks before the major event of the MC or season

Objectives:

To develop maximal racing speed

To maintain functional condition

To "polish" swimming technique at maximal speed, starts and turns

To finalize racing tactics

To maintain specific pulling strength (2 times a week)

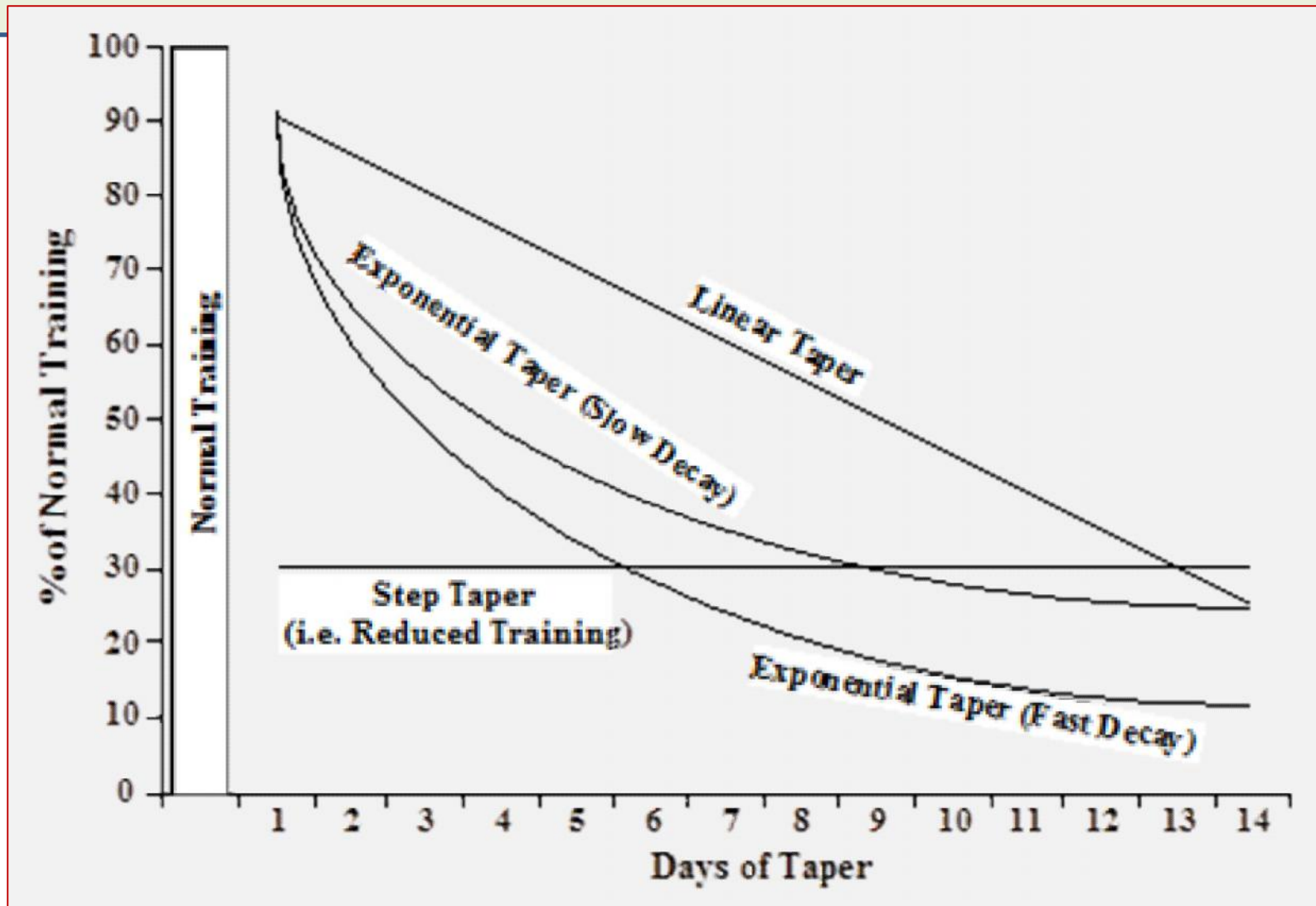
To provide swimmers with physical and mental rest

STRATEGIES FOR TAPER

Mujika, Padilla, 2003, Pyne, Mujika, 2010:

1. Linear Taper
2. Exponential Taper with "slow decay"
3. Exponential Taper with "fast decay"
4. Step-Taper ("Drop-Taper" – American College Style Taper)

Mujika, I. and Padilla, S. (2003). Scientific bases for pre-competition tapering strategies. *Med Sci Sports Exerc*, 35, 1182-1187.



STRATEGIES FOR TAPER

- 1. Linear Taper** – 2 sessions dropped every week in the last 2 weeks
- 2. Exponential Taper with "slow decay"** keeps the same number of sessions, but volume reduced by 40-60%
- 3. Exponential Taper with "fast decay"** – 3-4 sessions are dropped during the 1st week of taper (volume decrease during the 1st week = 60-70%)
- 4. Step-Taper ("Drop-Taper" – American College Style Taper)**

Key points (Pyne, Mujika et al., 2013):

- During the taper period, a training load peak in the first week associated with a slow decay design led to higher performances
- Over the course of the swimmers' athletic careers, better performances were obtained with an increase in training load during the overload period followed by a sharper decrease in the taper period

CONTENT OF TRAINING DURING TAPER

Progressive reduction of training workload

Skills and Drills

Short sets of sprint efforts (using full stroke, kicking and pulling), starts and turns with racing speed

Mini race-pace sets with conscious control of optimal distance per stroke/stroke rate ratio

Low aerobic swimming - "short sets" of slow interval or middle distance (200-400 m) swimming

Stretching, massage/relaxation, mental visualization of the race and will power exercises are important part of tapering

Sauna may be used but not later than 6-7 days before the race

**RECOMMENDED CONTENT OF TRAINING
DURING TAPER (not a "drop taper")**

Decrease of training volume while maintaining the same frequency of sessions (keep "doubles" ALAP, especially for females)

Later time for a.m. session for longer sleep

Last 2-4 days – may be single sessions

Strength and power land work usually stops 5-6 days before major event (some swimmers keep maintenance until 3-4 days before the race)

PHYSIOLOGICAL CHANGES DURING TAPER

Reduction in workload and rest during 2-3 week of taper result in:

- increase of maximal strength and power in swimmers by 15-25% (neuro-muscular adaptation)
- increase of total metabolic power
- decrease in oxygen cost of swimming by 5-8% due to biomechanical economicity
- changes in hormonal profile of individuals (possible) – increase in testosterone, HgH

The magnitude of increase depends on age and gender.

Individual response to taper also varies significantly

PSYCHOLOGICAL CHANGES DURING TAPER

Positive changes in athlete's mood state induced by reduction of fatigue and improvements in training performance

Better perception of effort and movements' control

Optimal level of aggression

THE ROLE OF THE COACH DURING TAPER

Create positive atmosphere in training group or team during final preparation

Give swimmers highly positive **FEEDBACK** concerning improved components of the performance

Keep friendly communication with all swimmers

Amphasize the strong abilities and skills in individuals

Manipulate training stimuli in order to achive positive psychological reaction and facilitate confidence

Avoide negative reactions and assessments

Taper plan for breaststroke swimmers of the Russian National Team – preparation towards Euro SC 2009

23 November 7 December 2009. Coach – Andrei VORONTSOV, swimmers: GEYBEL S., DEEVA D., CHAUNA.

DAY	Mon. – 23.11.2009		Tue. – 24.11.2009		Wed. – 25.11.2009		Thu. – 26.11.2009		Fri. – 27.11.2009		Sat. – 28.11.2009		Sun. – 29.11.2009		TOTAL Volume
	Content.	Volume Km	Content.	Volume Km	Content.	Volume Km	Content.	Volume Km	Content.	Volume Km	Content.	Volume Km	Content.	Volume Km	
1st session	Arrival		A-2 + kick set	4,400-4,800	Video session	2,000	A2 + starts & turns	4,000-5,500	SP-3 + skills	4,000	TIME TR. 100 IM + 2x50	3,500	VIDEO	2,200	40,250 km
Gym Hours, min			Flex. & power	30 min	Circuit training	30 min	Flexibil. & coordin.	30 min	Flexibil. & coordin.	30 min	Flexibil.	30 min	VIDEO		Land 4,5 h
2nd session	A-2 Skills	4,200	SP-3 + skills	4,250	E-2	4,500-4,700	Front end speed	4,000-5,000	SP-2	4,000-4,200	Rest, sauna				
Gym Hours, min	Core body strength	30 min	Strength mainten.	30 min	Core body	30 min	Flexibil.	30 min	Core body	30 min					
DAY	-30.11.2009		01.12.2009		-02.12.2009		-03.12.2009		-04.12.2009		-05.12.2009		-06.12.2009		Отчёт за неделю
	Content.	Volume Km	Content.	Volume Km	Content.	Volume Km	Content.	Volume Km	Content.	Volume Km	Content.	Volume Km	Content.	Volume Km	
1st session	A2 + starts & turns	4,000	A-2 + kick set	4,000	REST		Getting Uniform		SP-3 + skills	3,500	A-2 + kick set	3,300	VIDEO		34,550 km.
Gym Hours, min	Flexibil. + power	30 min	Strength mainten.	30 min				30 min	Flexibil. & coordin.	30 min	Strength mainten.	30 min			Land 3,5 h
2nd session	Backend pace	4,000	E-2 mainten.	4,000	TT 3x50+ 2x50	3,200	Front end speed	3,500	E-2 mainten.	3,500	SP-3 + skills	2,200	SP-3 + skills	2,400	3 days before Champions hips
Gym Hours, min	Pilates Master class	60 min	Core body	30 min	Flexibil.	30 min	Flexibil.	30 min	Core body	30 min	Flexibil./Coord.	30 min			

**Example of BACK END SPEED training:
sprint group of the Russian National Team
(Date: 30.07.2010 = 9 days before EURO LC)**

2x[100 m non-stop from push start as:

**Split target: 1st 50 m from push TT 29.00 feet on the wall
2nd 50 m from push TT under 25.00]**

**E.L. 1) 27.79+24.55=52.34
 2) 27.82+24.49=52.32**

**A.G. 1) 27.92+24.93=52.85
 2) 27.72+24.69=52.41**

**V.P. ♀ 2x400 non-stop (preparation towards 200 m free) as
[50=37, 50=30, 50=37, 50=30, 50=37, 50=30, 50=37,
50=29.5]**

1) fast 50s 29.6-29.7-29.8-29.3

2) fast 50s 30.2-29.7-29.6-29.4

(start/finish – feet on the wall, last 50 m finish - hand touch)

PRACTICAL "TAPER" (NEC)

Starting with reversed days count (how many days left to the Major Event of the MC)

24	25	26	27	28	29	30
<i>17</i>	<i>16</i>	<i>15</i>	<i>14</i>	<i>13</i>	<i>12</i>	<i>11</i>
31	1	2	3	4	5	6
<i>10</i>	<i>9</i>	<i>8</i>	<i>7</i>	<i>6</i>	<i>5</i>	<i>4</i>
7	8	9	10	11	12	13
<i>3</i>	<i>2</i>	<i>1</i>				

Group deviation between coaches – more individual event specific taper (2-3 weeks before major events)

10 days before				10 days before			
				Michelle/Simon			
1. 300 free = 3/5/7 x50		Simon	Michell	Jennie	1. 10x50 free @50"		Michelle
8x50 drill BK @60"		28.97 fly	29.92	36.15	200 IM+200 BR+200 BK i=20"		1:20.64
3x100 IM @1:40		28.51 BK	29.09	36.80	16x50=[50=15!/35~/50 drill]@60"		(40.22)
8x50 kick @60"		26.80 fr	27.63	35.46	5x100 kick @2:00 desc.1-5	BK:	free
2. 3x50 drill/ 50= 400 pace @60/70"					200 drill		12.96 11.90
3x50 drill/ 50= 200 pace @60/70"		9:18.21	9:25.90	4:49.44	2. 6x[25! Dive/75~]		13.02 11.69
3x50 drill/ 50= 200 pace @60/70"	(4:44.67)	(4:44.67)		2:24.68	12x50 bk/free/br/free @60"		13.03 11.81
200= 50 BK/50 free		19.95	23.53	21.53	3800		
3. 800 negative / Jennie 400 free		19.90	22.51	21.58	<u>Jennie</u>		
200 BK/free /300 Br/free		18.62	20.23	21.85	10x50 free @50"		<u>Jennie</u>
200 kick		18.47	19.40	21.68	200 BK+200 BR 3 over-1 under+200 IM i=20"		kick:
4. 4x[35! Kick fly on BK under/65 swim]@3:00					8x50 pBR-k free fins @50"		1:26.12
Jennie BR from dive 4x35!					5x100 kick @2:00		
200 swim down					200 drill		
4200 Jennie 3900					2200		
8 days before				8 days before			
				Short Course			Michelle
1. 4x100 =BK/IM/free/IM i=15"				1. 200 free @3:00+3x100 IM @1:30			kick
6x50 drill BK/6x50 kick fly on BK @60"				8x50 kick fly on BK @60" desc.1-4/5-8			35.01
6x50 drill free/6x50 kick free @60"				8x50 drill BK			32.58
300+2x150+3x100 @4:00/2:00/1:20				4x50 drill free +6x25 as 12.5!/12.5 easy @35"			
300= drill BK/free	Michelle			4x50 drill free +3x50 as 15!/35 easy @60"			
2. 3x[15! Dive/35~]	3:35.27			100 BK easy			
2x[25! turn/75~]	1:45.12	11.73-11.72		2. broken 200: as [50 dive @60"+100 push @1:30+50 finish]			
1x[35! Dive/65~]	1:45.21	17.71		150 recovery			
3. 200 BK/200 free/200 kick	1:09.12			broken 100 BK: as [25 dive @30"+50 push @60"+25 finish]			
3850	1:09.11			150 recovery	free 200	BK 100	50 free
	1:09.56			50 dive free !	26.87	14.01	25.99
				150 recovery	57.53	29.90	(12.57)
				3. 8x50 BK @60"/ 8x25 kick @35"	27.11	13.68	
				3500	1:51.51	57.59	

5 days before			5 days before		
1. 6x50 =[25 x fly/bk-bk/br-br/free]			1. 4x50 drill BK +200 BK		Michelle
200+3x100 "3:00-1:30			4x50 drill IM +200 IM		28.71
10x50 kick @65"	Simon fly	Michelle	4x50 drill BR +200 BR [Michelle BK		28.42
12x50 drill i=10"	10.78	11.83	8x50 free [50 drill/50 DPS]		26.71
2. 3x[15! Dive/35~]	16.08	17.68	kick: 4x50+2x100+4x50 @1'-2'-1'		
200 BK			200 drill		Simon BK
2x[35!dive/65~]			2. 3x[50! Push/ 150~]		29.23
3. 500 swim down choice			200 swim down		28.45
2950			3200		28.23
4 days			4 days		Michelle
1. 400 free			1. 3x200 pull i=20"		1:03.82
3x100 BK +200 IM i=15"			8x50 kick		29.41
10x50 kick "60"			5x[50 drill/50=15!/35~]		1:02.84
8x50 drill			200 BK		27.89
2. 5x[25! Race pace/75~]			2. 3x[100@1:30		Simon
300 swim down			[50! Race pace/150 recovery]		1:05.68
2600			200/800 swim down		25.16 fly
			2800/3000 Simon		xxx
					29.50 Br
					1:03.02
					23.73 fr

Outcome of performance of NEC swimmers in MC-II

Week -5: National GP-1 – no special targets for swimmers

Week -10 – National GP-2 = 1 world best time, 3 PB (14-15 days after descent from altitude) = 3-4 races for every swimmer in 2 days

Week -12 – Amiens Cup = 3 National Records, 2 World best times, 5 results inside World 20 ranking (21-24 days after descent from altitude) = 2-3 events x 2 swims every day x 3 days = 8-12 races in 3 days

Week -15 – Endhoven Cup (European Champs selection event) = 6 National Records, 2 World best times, 5 results inside 20 World best times, 8 PB (48-51 days after descent from altitude) = 3-4 events for every swimmer = 6-8 races in 4 days

[Sarah Sjöström shatters the world record on 50m butterfly.mp4](#)



Thank You, QUESTIONES ?
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