

# Guidelines in creating swim exercises for Aerobic capacity and Anaerobic capacity

When we talk about swimming training exercises there are two things that we affect depending on the sets that we use.

One is Capacity and the other is Power. Capacity is often described as a “build-up phase” and power as “fine tuning phase”.

When we talk about capacity, we can work on Aerobic capacity (AEC) and Anaerobic capacity (ANC). This type of training is used to build the “engine” that we want the swimmer to develop.

On the other hand, we have power training which is used to improve competition performance and maximize uptake from the capacities. There we differ Aerobic power and anaerobic power training.

Therefore, we can differ 4 main classes that with can affect with training:

Aerobic capacity – AEC

Anaerobic capacity – (ANC)

Aerobic power (AEP)

Anaerobic power (ANP)

In these 4 main classes we have different subcategories which can use to develop capacities or power.

# Subcategories of 4 Classes

Definitions of subcategories of the 4 training exercise classes		
AEC (min 3/5 slow)	REC	warming-up, cooling-down, easy-swims, short and easy training unit (max 45min)
	AEC1	long extensive swim sets ←La2
	AEC2 = AEC(anc)	long extensive swim sets + short intensive fractions (intervals; max 100m)
	AEC3 = AEC(aep)	long easy swim sets (subjective feeling) but with some risk of "hidden intensity" by: medley, fly, breaststroke, long fractions at moderate intensity, progressive sets, ...
ANC	ANC	short fraction (max 50m), from nearly max to max (25m if low ANC, young swimmers, ...)
	ANC SP	sprints of 10 to 20sec
	ANC ALSP	sprints of less than 10sec
AEP	AEP	mainly long fractions (at least 200m) at high "tempi" and short rest
	AEP comp	competition races of at least 400m
ANP	ANP	short fractions at max-speed and very short rest or short race distances and long rest
	ANP comp	competition races not longer than 200m

J. Olbrecht, 2012

Before being able to affect the competition performance swimmers firstly must have a strong capacity. AEC can never be too high, and it lays the basis for swimmers conditioning for long distance swimmers, as well as sprint swimmers. In this document we will focus on capacity development.

In the chart above there 3 different ways to effect AEC.

## AEC1

To develop a good AEC coach can use the AEC1 type of a set which has the highest probability that the AEC will be developed due to overall low intensity. The sets are done at a low speed with correct technique.

A few examples of AEC1 swim sets depending on the swimmers age and AEC, ANC level.

Age group: 10-14

AEC: Low

ANC: Low

3x200 IM 30'' rest

1. Kick (no board kick on back or side)
2. Drill
3. Swim (switch technique at 25s)

2x500 1' rest  
100 swim/100/drill/50DPS

Age group: 10-14  
AEC: Mid  
ANC: Mid

6 rounds

200 FR/BA easy 10'' rest  
2x100 FR/BA easy 10''  
Rest 30''

## AEC2

One of the effective ways is using AEC2 type of training which will develop AEC but will have an impact on ANC as well. This type of training involves long parts of low pace swimming with spikes of maximum intervals. The volume and intensity of the sets is defined in concern with the swimmers age and level. For younger swimmers there should be overall lower volume and shorter maximum intensive spikes. When putting together AEC2 session, the relation between low volume and high volume should be at 60% to 40% percent in favour of low volume swimming, but preferable even lower for high intensity part. Aiming for 1/3 of the high intensity part of the session is a good guide line in creation the exercises of this type.

A few examples of AEC2 swim sets depending on the swimmers age and AEC, ANC level.

Age group: 10-14  
AEC: Low  
ANC: Low

3x(4x100) @2'  
1x IM fast 5-10 turns in-out  
3x freestyle easy (correct technique)

Age group: 10-14

AEC: Mid

ANC: Mid

Backstroke/Freestyle

4x100 @1.30

4x50 prog. 1-4 @50

4x100 @1.25

2x (3x50) prog 1-3 @50

4x100 @1.20

## AEC3

A coach can decide to use AEC3 swim set to develop AEC, but using this kind of set there is a risk of dipping into the power area. These exercises can consist medley sets, fly, breaststroke sets, progressive sets, "fartlek sets". The coach should be aware of the overall volume of the set, since this type of session can easily turn to power session, and maybe that's not what they aim for.

A few examples of AEC3 swim sets depending on the swimmers age and AEC, ANC level.

Age group: 10-14

AEC: Low

ANC: Low

3x50 prog. 1-3 to max @1.30

200 easy

50 accelerate

100 easy

3x50 prog. 1-3 to max @1.30

250 easy

Age group: 10-14

AEC: Mid

ANC: Mid

15x100

1x Freestyle 200 pace @2'

4x Freestyle easy @1.45

1x Backstroke 200 pace @2'

4x Backstroke easy @1.45

4x Freestyle progressive 1-5 (last 200 pace) @2'

## ANC

Anaerobic capacity training will help athletes break down of carbohydrates anaerobically. This type of training is mainly used in the base part of the season, for building up the "engine". This type of sessions must be done before doing anaerobic power sessions. The coaches can use three types of session to develop Anaerobic capacity depending on the age and ANC level, and those are ANC, ANCsp, ANCalsp.

For young swimmers with low ANC it's best to stick to short intervals (25s) with a total volume of 100-250m. The rest:work ratio must be at least 3:1. For ANC its best to use passive rest (no warm down in between).

Example of ANCalsp swim sets depending on the swimmers age and AEC, ANC level.

Age group: 10-14

AEC: Low

ANC: Low

4x25: 12,5 max no breath

4x25: 10 max UW

4x50 (2xBackstroke 2xFree): 20EZ-5max-10ez-5max-10ez

Age group: 10-14

AEC: Mid

ANC: Mid

14x50 @1.30

3x (25 acc.+25 ez)

3x (10 max+30 ez+10 max)

3x (10 kick fly UW max+40 free)

3x (20ez+10 max+20 ez)

3x (25 max+25ez)

Example of ANCsp swim set depending on the swimmers age and AEC, ANC level.

Age group: 10-14

AEC: Low

ANC: Low

8x15 MAX (from the push) @2'

Age group: 10-14

AEC: Mid

ANC: Mid

6x15 max @1'

4x25 max @1.30

2x30 max@1.45

1x50 max

Example of ANC swim set depending on the swimmers age and AEC, ANC level.

Age group: 10-14

AEC: Low

ANC: Low

3 rounds (break between sets 2')

50 max@1.45  
2x25 @35

Age group: 10-14  
AEC: Mid  
ANC: Mid

2 rounds

50 max  
50ez @3'  
3x50 max @1'20  
350 EZ