Swim Training Zone Terminology

Zone Description*	Other or Pace Description	Polar Zones; %HR Peak	*Beats Below Max HR*	*Beats in 10"*	Effort**		Key Energy Source***
A1	Skills and Drills, at very low intensity	Blue; 60-70	*80 to 60*	*~20-24*	1-2	Very easy to easy	Aerobic: fat
A2	Longer volume of continuous flow without much rest. Consider technical variables and even splits.****	Green; 70-80	*60 to 40*	*~24-26*	2-4	Easy to somewhat hard	Aerobic: fat and carbohydrate
A3		Orange; 80-85	*40 to 30*	*~26-28*	4-5	Somewhat hard to hard	Aerobic: fat and carbohydrate
Threshold	~2000-m pace; maximal sustainable pace for longer duration	Orange to Red; 85-92	*30 to 20*	*~28-30*	5-6	Hard +	Aerobic and Anaerobic: carbohydrate
Endurance-Intensive Efforts	~400-m pace in longer duration efforts with medium to low rest	Red; 92+	*20 - 0*	*30+*	7-10	Very hard to maximal	Aerobic and Anaerobic: carbohydrate
High-Intensity Efforts	200 pace or faster	Observe technical and tactical variables, and level of effort and recovery, instead of Heart Rate.****			Maximal Technical Proficiency		Aerobic and Anaerobic: carbohydrate
Explosive Efforts	~6-s efforts at 50 pace and faster, with long passive rest				Maximal Technical Proficiency at maximum or near maximum effort		Phosphagen and Anaerobic: carbohydrate

*The relationship between swim speed and underlying physiology is individual. Also, race-specific training is not a training zone. Physiologically, race-specific work for sprint swimmers would be categorized high-intensity, while for middle-distance swimmers it could be high-intensity or endurance-intensive dependent on the set, and for distance and open-water swimmers, it will be endurance-intensive and/or threshold.

**The numbers 1-10 with according effort descriptions are an adaption to Borg's category-ratio scale anchored at the number 10, which represents maximal intensity. This scale is shown on the next page.

***Greg Shaw et al 2014. *Nutrition for Swimming*. International Journal of Sports Nutrition and Exercise Metabolism.

****Consider important technical and tactical variables in any work. This relates to **training quality**: *how* do the swimmers execute the work?

June 2024 – Tom Vandenbogaerde, Performance Scientist Coach, tvandenbogaerde@csipacific.ca

Borg's 0-10 RPE scale

0	Rest
1	Very, very easy
2	Easy
3	Moderate
4	Somewhat Hard
5	Hard (heavy)
6	
7	Very Hard
8	
9	
10	Maximal

Swim Training Zone Terminology

A1	This A1 training zone constitutes skill-based training at very low intensity. Empirical evidence shows that practicing and rehearsing moving through the water efficiently at low intensities is an integral part of developing into a great swimmer. We have not witnessed efficiency at high speed or high effort if it is not practiced and evident at low intensities. **Example**: 12x25m, as 6x25 sculling exercises then 6x25 single arm drill with fins for balance, low intensity, concentrate on accelerating hand speed through to the back of the stroke.
A2	This A2 training zone constitutes aerobic work at lower intensities. In heart rate terms, this represents ~50 to 40 beats below max; in Rating of Perceived Exertion, this is 'Easy to Somewhat Hard'. **Example**: 3000m as 3x (5x200 freestyle even split at 50 BBM, work on stroke count and perfect turns with 6 underwater kicks off each wall; 15" rest between repetitions); set 1 as swim, set 2 with pads, set 3 with fins.
A3	This A3 training zone constitutes aerobic work that is 'Somewhat Hard to Hard', at relatively low heart rates, ~40 to 30 beats below max. **Examples**: • distance group, 4800m as 6 x 800 even split, controlled at low HR, with 30" rest in between the repetitions; • middle distance group, 4000m as 2x (6 x 300 even split, controlled at low HR, with 30" rest in between the repetitions; 200 choice after each 6x300) • Sprint group 3200m as 16 x 200, 4x swim, 4x pads, 4x free-back swim, 4x swim fins; great technical execution at intensity 'Somewhat Hard to Hard', keep HR ~40-30 BBM, with 30" rest in between reps).
Threshold	With threshold, we mean the maximum pace that a swimmer can maintain for longer distances/repetitions. We should be able to see even splits and even pace through the set. **Example**: 4000m as *4x (6x100 threshold on 1:20 + 400 threshold on 6:00)*. This threshold-pace cue translates to fast swimming, though at a sustainable pace and with good technique.
Endurance-Intensive Efforts	With Endurance-Intensive efforts, we mean ~400-m pace in longer duration efforts with medium to low rest. This type of exercise provides a high training load, and usually warrants a relatively longer recovery time in the subsequent period following. **Examples:** *30 x 100-m freestyle repetitions fastest average on a 1:40 cycle; 5 x 400-m repetitions at best-average speed, try to achieve PB +15" for all reps.*

The colors above relate to the Polar HR Zones. The colors on the next page, for high-intensity efforts and explosive efforts, are just for looks and do not relate to HR Zones.
Always consider the important technical and tactical variables. In aerobic work, for example, key monitoring variables may include good streamlining off walls, stroke counts, and even-paced split-times. **Speed efficiency** is key across all intensities, and especially in endurance-intensive and high-intensity work. Important monitoring variables in this work include under-water work, breathing patterns, head down finishes, stroke counts, and the combination of stroke rate and time - a higher stroke rate needs to represent a faster time, otherwise there is spinning.

June 2024 – Tom Vandenbogaerde, Performance Scientist Coach, tvandenbogaerde@csipacific.ca

High-Intensity Efforts	High-Intensity training consists of ~25 to 100-m repetitions swam very fast, generally 200 pace or faster. The training sets can be manipulated through changing the total number of repetitions, the rest-interval, the distance of each repetition and the stroke rate. **Examples:** • *4 x 25-m dive fastest pace followed by 4x35-m dive fastest pace* with appropriate passive rest in between repetitions • *10 x 50-m butterfly at 100-m race-pace stroke rate*, swam as fast as possible on a 2-min cycle. The total volume of the set, 500 m, is relatively high for 100-m pace intensity, which requires fast swimming and fast recovery to achieve 100-m pace and execution in all repetitions.
Explosive Efforts	Explosive speed work consists of ~10 to 20-m repetitions at very fast speeds with relatively long rest. This work is aimed at developing and fine-tuning technical speed skills. **Example:** *4 x 15-m sprint dives* on a 2-min cycle.

Race-Specific Work

Race-Specific training is <u>not</u> a training zone. Physiologically, race-specific work for sprint swimmers would be categorized high-intensity, while for middle-distance swimmers it could be high-intensity or endurance-intensive dependent on the set, and for distance and open-water swimmers, it will be endurance-intensive and/or threshold.

Training the specificity of competing in a certain event is clearly important, not only for developing the necessary physiological capacities, but also the technical skills, the mental skills, the pacing, and the maintenance of great technique under fatigue.

Examples:

- For 100-m specialists: 2x (60-m dive at 100 front-speed execution, followed by a 50-m push effort at execution of the second lap of the race), with ~40 s between the 60-m dive and the 50-m push efforts, and appropriate recovery and re-activation between the two sets.
- For a 200-m middle-distance swimmer: 2x(75-m dive at 200-m get-out pace swim easy through to the 100-m mark, ~ 10 s rest, 3x50-m push efforts at 200 pace with ~20 s rest in between), with appropriate recovery and reactivation between the two sets.
- For a 1500-m swimmer: 30 x 100-m on a 1:30-cycle at 1500-m race-pace or faster.

Coaches and athletes also often **use minor domestic and international competitions** for training purposes, to practice very specifically for competition and to fine-tune racing skills, including the mental component.