

TRAINING CLASSIFICATIONS AND TRAINING ZONES



OVERVIEW

TRAINING ZONE	CLASSIFICATION NAME	ABBREVIATION
ZONE 1	Aerobic low intensity	A ₁
	Aerobic maintenance/development	A ₂
ZONE 2	Anaerobic threshold	AT
ZONE 3	Aerobic overload	V _{O₂}
ZONE 4	Lactate production	LP
	Lactate tolerance	LT
ZONE 5	Sprinting ATP-PC	Speed

A1: AEROBIC LOW INTENSITY

- **Low Intensity training level**
- **Purpose of training:**
 - 1.) Base conditioning
 - 2.) Technical/skill based training
 - 3.) Warm-up and warm-down
 - 4.) Recovery
- **Physiological actions:**
 - 1.) Predominantly fat metabolism
 - 2.) Largely slow-twitch fibre recruitment

A1: MEASUREMENT DETAILS

Heart Rate HR (BBM)	> 50
Lactate levels LA ⁴ (mM)	< 2
Rated Perceived exertion RPE (scale 6-20)	< 9

A2: AEROBIC MAINTENANCE/ DEVELOPMENT

- Base aerobic training
- Purpose of training:
 - 1.) Maintenance training sustains cardio-respiratory fitness
 - 2.) Development training improves cardio-respiratory fitness
- Physiological actions
 - 1.) Improves overall efficiency of the aerobic system
 - 2.) Enhances lactate removal

A2: MEASUREMENT DETAILS

Heart Rate HR (BBM)	40-50
Lactate levels LA ⁴ (mM)	2-4
Rated Perceived exertion RPE (scale 6-20)	10-12

A2: EXAMPLE SETS

- 1) 4 x 800 FC + 30 Rest (HR = 50 BBM)
- 2) 8 x 400 IM Drill/Swim + 30 Rest (HR = 50 BBM)
- 3) 1500/ 800/ 400/ 200/ 100 + 30 Rest (HR = 50/40 BBM) * Effort remains constant, speed increases slightly
- 4) 2500m Swim or 30 minutes swim (HR = 50/40 BBM)
- 5) 10 x 300 as 1 Swim/ 1 Kick/ 1 Pull (HR = 50/40 BBM)
- 6) 3 x [400/ 300/ 200/ 100] F/C or IM (HR = 50 BBM)
- 7) 24 X 100 FC/IM @ 1.30/1.40 (HR = 40 BBM)

CONSIDERATIONS FOR AEROBIC TRAINING

- Aerobic sets should last a minimum of 30 minutes (excluding rest periods) for effective development of the aerobic system.
- Aerobic training constitutes a large proportion of overall training and should always be swam with good technical skill and stroke efficiency.
- Aerobic training should be mentally challenging as well as physically challenging. Swimmers should be challenged to improve on stroke count, technical skill and underwater phases throughout sets in order to develop increased levels of stroke efficiency.

AT: ANAEROBIC THRESHOLD

- Anaerobic threshold training is the maximum level of intensity at which an athlete can maintain constant workload by delivering oxygen to the working muscles at the maximum rate without producing excess acidity that will inhibit performance.
- Maximal Lactate Steady State where Lactate production = Lactate removal
- **Purpose of training**
 - 1.) Optimal intensity for development of aerobic capacity

AT: MEASUREMENT DETAILS

Heart Rate HR (BBM)	20-30
Lactate levels LA ⁴ (mM)	3-6
Rated Perceived exertion RPE (scale 6-20)	14-15

AT: EXAMPLE SETS

- 1) 24 x 100 FC/IM @ 1.20/1.30 (HR = 20/30 BBM)
- 2) 6 x 400 @5.20 (HR = 30 BBM)
- 3) 12 x 200 No.1 stroke + 20s rest (HR = 20/30 BBM)
- 4) 2000m even pace 100's FC (HR = 30 BBM)
- 5) 3 x [2 x 100 @ 1:20; 2 x 200 @ 2:40; 2 x 100 @ 1:15]
(HR = 30/30/20 BBM)
- 6) 3 x [2 x 300 FC @ 4.00; 6 x 50 @ 35) (HR = 20
BBM)

CONSIDERATIONS FOR AT TRAINING

- Extremely demanding training, must be followed by a suitable swim down
- Heart rate must be maintained at the required level of 20-30 BBM for the entire set- too low and overload will not be reached, too high and lactate will build in the active muscles and inhibit performance (usually results in the swimmer failing to complete the set)
- Technique and stroke efficiency should not be compromised- swimmer must maintain a technical focus in addition to work rate.

VO₂ : AEROBIC OVERLOAD

- Very high intensity training
- This type of training includes Heart Rate and V_{crit} sets
- **Purpose of training:**
 - 1.) Improves VO₂max and aerobic power
- **Physiological actions:**
 - 1.) Effective Vo₂ training will improve the rate of oxygen delivery to the working muscles

VO₂: MEASUREMENT DETAILS

Heart Rate HR (BBM)	5-20
Lactate levels LA ⁴ (mM)	6-12
Rated Perceived exertion RPE (scale 6-20)	17-19

VO2: EXAMPLE SETS

- 1) 20 x 100 No. 1 stroke @ 2.00 (HR = 5 to 15 BBM)
- 2) 8 x 200 No.1 @ 4.00 (HR = 5 to 15 BBM)
- 3) 24 x 75 as 5 Max, 1 Steady @ 1.30 (HR = 5 to 15 BBM)
- 4) 3 x [3 x 100: 2 x 75 (+ 25 Steady); 4 x 50] (HR = 5 to 15 BBM)
- 5) 12 x 150 No 1/ FC / No 1 @ 2.45 (HR = 5 to 15 BBM)
- 6) 4 x [200 @ 3:30 (800 pace); 2 x 100 @ 2:00 (400 pace)
4 x 50 @ 1.00 (200 pace)]
- 7) 12 x [100 No.1 swim @ 2.00 (pb +10); 75 No.1 kick @
1.45 (100 pb)]

CONSIDERATIONS FOR VO_2 TRAINING

- Training distance should be between 1500m and 3000m depending on the type of swimmer
- Correct intensity must be maintained for the entire total distance designed to be swum at VO_2 . For example, a set of 20 x 100 with the first 5 reducing to max will result in 1500m being swum at VO_2 and not 2000m. This must be considered when designing the set.
- Maintenance of technique and skill can prove difficult to many swimmers while training at this intensity. However a technical focus must be maintained to encourage good form in the closing stages of races when the body is placed under similar stresses.

LP: LACTATE PRODUCTION

- High intensity training
- Training intensity results in the maximal speed of lactate build up
- This type of training includes Race Pace training
- **Purpose of training:**
 - 1.) Improve anaerobic power
- **Physiological action:**
 - 1.) Enhances rate of glycolytic energy production

LP: MEASUREMENT DETAILS

Heart Rate HR (BBM)	5-15
Lactate levels LA ⁴ (mM)	8-15
Rated Perceived exertion RPE (scale 6-20)	17-19

LP: EXAMPLE SETS

- 1) 8 x 50 #1 stroke on 4:00 Max Effort & Speed
- 2) 12 x 75 on 4:00 - 1 Max, 1 Easy Max Speed for 75
- 3) 25/ 50/ 75/ 100/ 75/ 50/ 25 Max Effort & Speed
@ 1.00/ 2.00/ 3.00/4.00/3.00/2.00/1.00
- 4) 5 x [2 x 50 Max + 100 easy] Use Speed Charts
- 5) 3 x [75/ 25 (+100 Easy) Target 100 PB or Faster
50/ 50 (200 Easy) target 100pb or faster]

LT: LACTATE TOLERANCE

- High intensity work with medium rest
- **Purpose of training:**
 - 1.) To train the body to cope with elevated lactate levels in the muscles
- **Physiological actions:**
 - 1.) Improve lactate buffering (neutralising acidity)
 - 2.) Improve the ability to tolerate lactate/ acidity in the muscle (mental and physical response)

LT: MEASUREMENT DETAILS

Heart Rate HR (BBM)	0-10
Lactate levels LA ⁴ (mM)	12-20
Rated Perceived exertion RPE (scale 6-20)	19-20

LT: EXAMPLE SETS

- 1) 5 x 100 #1 stroke @ 4:00 Max Effort
- 2) 4 x 150 @ 5:00 Max Effort
- 3) 8 x 75 @ 3:00 Aim for 100 Pace (75m split)
- 4) 3 x [25/ 50/ 75/ 100] Max Effort
- 5) 4 x [4 x 50 Max Effort @ 1.45; 100 Easy;
2 x 100 @ 1.30 (50 BBM)]

CONSIDERATIONS FOR RACE PACE / ANAEROBIC TRAINING

- Race pace training is not simply about swimming the desired overall time for set distances. It is important that the correct times are swum in the correct manner:
 - 1.) Stroke rate/length during race pace sets should directly relate to actual or desired stroke rate/length swum during competition.
 - 2.) Swimmers should be encouraged to focus on each individual split time instead of simply overall time in order to develop effective race strategies.

SPEED: SPRINTING ATP-PC

- High intensity, short duration, long rest repeats
- **Purpose of training:**
 - 1.) Improve basic speed/power
- **Physiological actions:**
 - 1.) Improves alactic energy production (ATP-PC)
 - 2.) Improves neuromuscular coordination
 - 3.) Encourages fast-twitch muscle fiber recruitment

SPEED: MEASUREMENT DETAILS

Heart Rate HR (BBM)	n/a
Lactate levels LA ⁴ (mM)	n/a
Rated Perceived exertion RPE (scale 6-20)	n/a

- Timed set distances (10m, 15m, 20m, 25m)
- Use of speed charts

SPEED: EXAMPLE SETS

- 1) 10 x 25 Max (+ 25 easy) @ 2:00 Max Speed
- 2) 3 x [4 x 25 as 12½ Max 12½ easy] Max Speed
- 3) 4 x [15/20/25/30 Sprints] Use Speed Charts
- 4) Dive starts to 15/ 20/ 25/ 30m Race Speed +
Fast Turns from 10m In to 10m Out
- 5) 3 x [Broken 100]: 30/40/30 Faster than Race

100

PLANNING THE PROGRAMME

Trying to incorporate all of the training zones into a weekly plan can be challenging. When coaches design each weekly plan we must consider:

- The requirements and stage of LTAD of your swimmers
- The phase of training within the macro-cycle
- The amount of training time available
- Proximity of high intensity sets to each other

SNAP SHOT WEEKLY PLAN

	MON	TUES	WED	THUR	FRI	SAT	SUN
A.M	A2 FC + FLY KICK	REST	A1 FC/BK + A2 FC + A1 #1 DRILLS	REST	A1 + A2 FC /BR + FLY KICK	A1/A2 + VO2 SWIM #1 + A1	REST
	5000m		5000m		5000m	6000m	
P.M	VO2 KICK + A1	A2 IM + RACE PACE + A1	A2 FC/#1 + A2 FLY + SPEED	AT #1 + A2 KICK + A1 DRILLS	A2 FC/IM + RACE PACE + A1	REST	REST
	5000m	6000m	6000m	6500m	5500m		

TODAY'S SESSION

- Warm up A1:
4 x [200 fc @ 3.30; 2 x 50 #1 drill @ 1.00]
- Pre-set A2:
3 x [2 x 100 IM @ 1.45; 300 fc @ 4.30]
- Main set VO₂:
22 x 100 @ 2.15 as: 4 at pb + 15s (AT) 18 max (VO₂)
- Recovery/swim down A1:
3 x [100 bk @ 2.00; 2 x 50 as 25 streamlined kick 25 fc @ 1.00]