



CITYU SCOPE

RUNNING CLASS

2017-2018

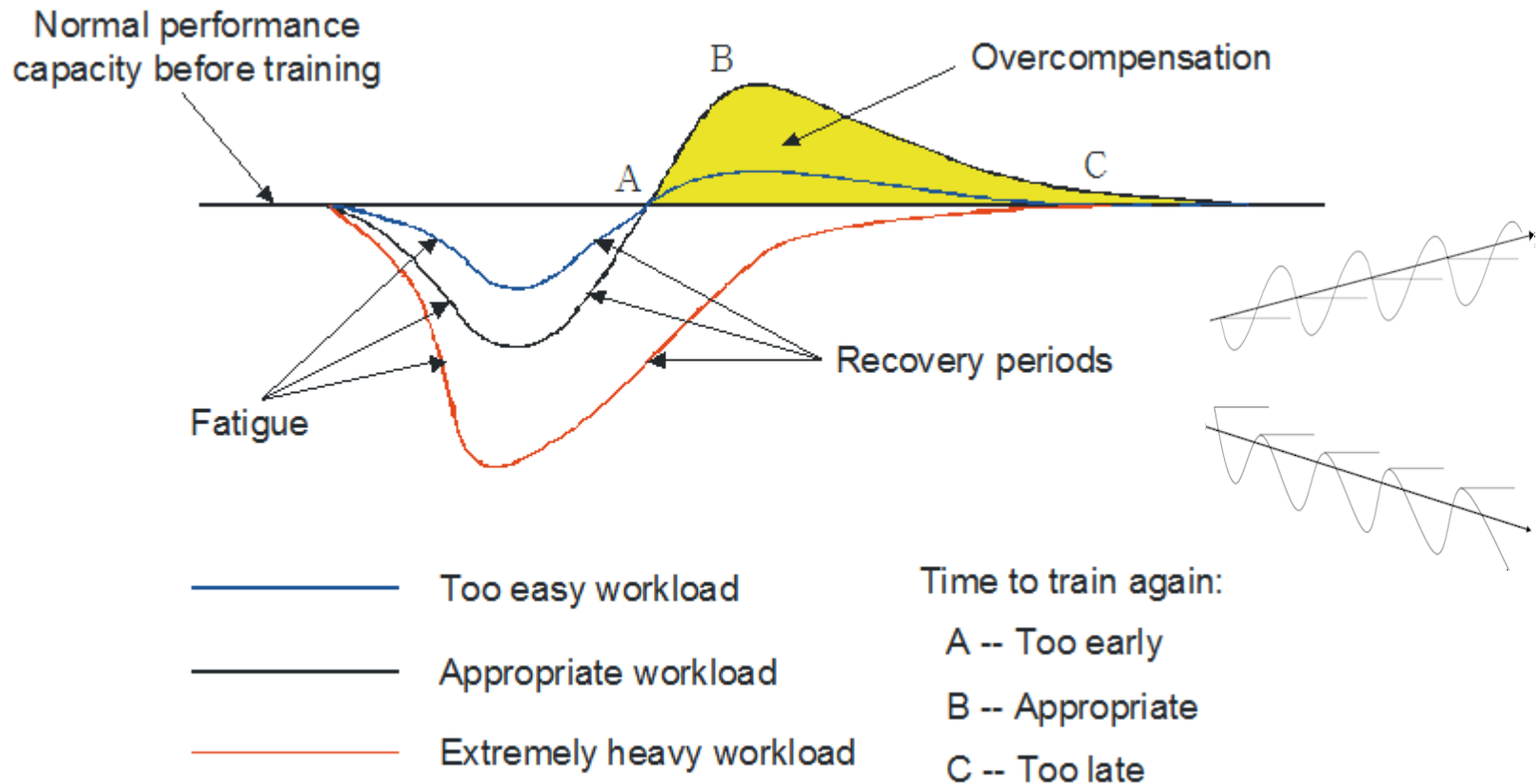
Coach: Wong Tak Shing

Principle of Progressive Overload

- Once the athlete has **adapted** to a workload of the training program, the workload should be **increased**.
- The workload should be increased **progressively throughout** the training program whenever the condition of the athlete has been improved so that the workload is always **near to** the **maximal** fitness capacity of the athlete.



Principle of Progressive Overload



Training Methods

- **Continuous Running Training**
- **Interval Training**
- Fartlek
- Hill running
- Time trial
- ...



Continuous Running Training

Fox, Bowers, & Foss (1993)

1. Continuous Slow-Running Training

- Generally, athletes should cover from **2 to 5 times** of their race distance at a pace that can bring their **heart rate** to **80 to 85%** of the **HR_{max}** (i.e., maximal heart rate).
- Use as **foundation training** before moving up to **continuous fast-running training**, or as easy running sessions on **recovery days**.



$$\text{HR}_{\text{max}} = 220 - \text{age}$$

Continuous Running Training

Fox, Bowers, & Foss (1993)

2. Continuous Fast-Running Training

- The intensity of the run should bring the athlete's **heart rate** to **85 to 95%** of the **HR_{max}**.
- **Simulates** the **race situation better** than **continuous slow-running training**.



Interval Running Training

- Refers to a series of **repeated** bouts of **runs alternated** with periods of **recovery**.
 - e.g. 1, 20 x 200 m, 60 s each, jog 1 min between each.
 - e.g. 2, 8 x 1000 m, 5 min each, jog 3-4 min between each.
- The **intensity** or speed of the runs is usually **greater** or **faster** than that can be done **continuously** for the whole training session.
- The recovery periods are usually occupied by light or mild exercise (e.g., walking or jogging) rather than complete rest.
- **Advantage:** **quantity** of the runs can be increased while **quality** can be maintained.

Interval Running Training

Åstrand et al. (1960)



	Workload	Work	Rest	Total Time	Blood Lactate Concentration	Feeling of Subject
Continuously	350W	-	-	9 min	16.5 mM	Exhausted
Intermittently		3 min	3 min	30 min	13.2 mM	Exhausted
		30 s	30 s	30 min	2.2 mM	Not too tired

Interval Running Training

Christensen et al. (1960)

- Running on a **treadmill** at a speed of **20 km/h** (i.e., **2:06** marathon time)
 - The subject could only run continuously for **4 min** (covering a distance of about **1300 m**)
 - The blood lactic acid level at the end of the test was **16.5 mM**.
- When the activity was conducted as alternating periods of 10-s run and 5-s rest
 - the subject completed **20 minutes** of running at **20 Km/hr** in a **30-min** period (covering a distance of **6670 m**) without undue fatigue.
 - The blood lactic acid level at the end of the test was only **4.8 mM**.

Interval Running Training

Sharkey (1986)

- Approximately **equal work** and **rest** intervals between **2 to 5 min** seemed to produce the greatest **aerobic** improvements.
- Shorter work intervals (e.g., 15 s) with a **work-rest ratio** of **1:1** are also effective in developing the **aerobic** system.
- For **anaerobic** training, the **maximum** duration for any work interval **should not** exceed **90 s**, or the body might switch to the aerobic system to support the ongoing activity.

Training for Health and Fitness

USDHHS (2008) and WHO (2012)

- **For Health Benefits**

- **Adults** should do at least 150 minutes (2 hours and 30 minutes) a week of **moderate**-intensity, or **75 minutes** (1 hour and 15 minutes) a week of **vigorous**-intensity **aerobic** physical activity, or an **equivalent combination** of **moderate**- and **vigorous**-intensity **aerobic** activity.
- Aerobic activity should be performed in episodes of at least 10 minutes, and preferably, it should be spread throughout the week.

Training for Health and Fitness

USDHHS (2008) and WHO (2012)

- **For Additional and More Extensive Health Benefits**
 - **Adults** should increase their **aerobic** physical activity to **300 minutes** (5 hours) a week of **moderate**-intensity, or **150 minutes** a week of **vigorous**-intensity **aerobic** physical activity, or an **equivalent combination** of **moderate**- and **vigorous**-intensity activity.
 - **Additional** health benefits are gained by engaging in physical activity **beyond** this amount.

Training for Health and Fitness

USDHHS (2008) and WHO (2012)

- **Moderate-intensity**

- At **3 to 5.9 METs** (i.e., 3 to 5.9 times the intensity of rest).
- About **5 or 6** on a scale of **0 to 10** relative to an individual's personal capacity, where 0 is the level of effort of sitting, and 10 is maximal effort.
- **2.5 mph** or **4 km/h** (3 METs) or faster.

Training for Health and Fitness

USDHHS (2008) and WHO (2012)

- **Vigorous-intensity**
 - **6 METs or above** (i.e., 6 or more times the intensity of rest).
 - About **7 or 8** on a scale of **0 to 10** relative to an individual's personal capacity.
 - **4 mph** or **6.4 km/h** (6 METs) or faster.
 - 1 minute of vigorous-intensity activity counts the same as 2 minutes of moderate-intensity activity.

Ainsworth, Haskell, & Leon et al. (2011)

The compendium of physical activities (體力活動綱要)

Speed				Intensity
mph	min/mile	min/km	min/400 m	MET
4	15	9:19	3:43	6.0
5	12	7:27	2:59	8.3
5.2	11.5	7:09	2:51	9.0
6	10	6:13	2:29	9.8
6.7	9	5:36	2:14	10.5

Ainsworth, Haskell, & Leon et al. (2011)

The compendium of physical activities (體力活動綱要)

Speed				Intensity
mph	min/mile	min/km	min/400 m	MET
7	8.5	5:17	2:07	11.0
7.5	8	4:58	1:59	11.5
8	7.5	4:40	1:52	11.8
8.6	7	4:21	1:44	12.3
9	6.5	4:02	1:37	12.8

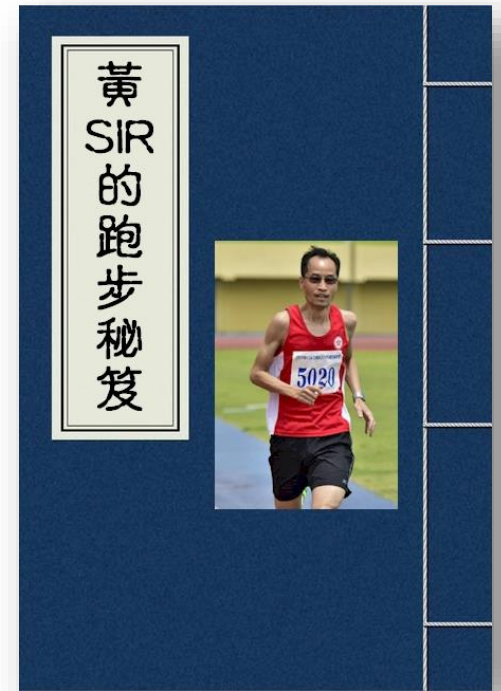
Ainsworth, Haskell, & Leon et al. (2011)

The compendium of physical activities (體力活動綱要)

Speed				Intensity
mph	min/mile	min/km	min/400 m	MET
10	6	3:44	1:29	14.5
11	5.5	3:25	1:22	16.0
12	5	3:06	1:15	19.0
13	4.6	2:52	1:09	19.8
14	4.3	2:40	1:04	23.0

Wong-Sir's Comments on Training for Race Performance

- **No** definite answer from **authorities**
- Take part in a race for the first time
 - **Goal: Finish** the race
- Take part in the race again
 - **Goal: PB** or **medal**
- **Pace judgement** is extremely important



Wong-Sir's Comments on Training for Race Performance

Pace Running

- Run at a **steady pace** as much as possible.
 - Newton's 1st and 2nd laws of motion
- Most of the runs should be conducted at **race pace** or **slightly faster** than **race pace**.
 - To facilitate **Transfer of Learning**

Constant Speed Tables for Selected Distances

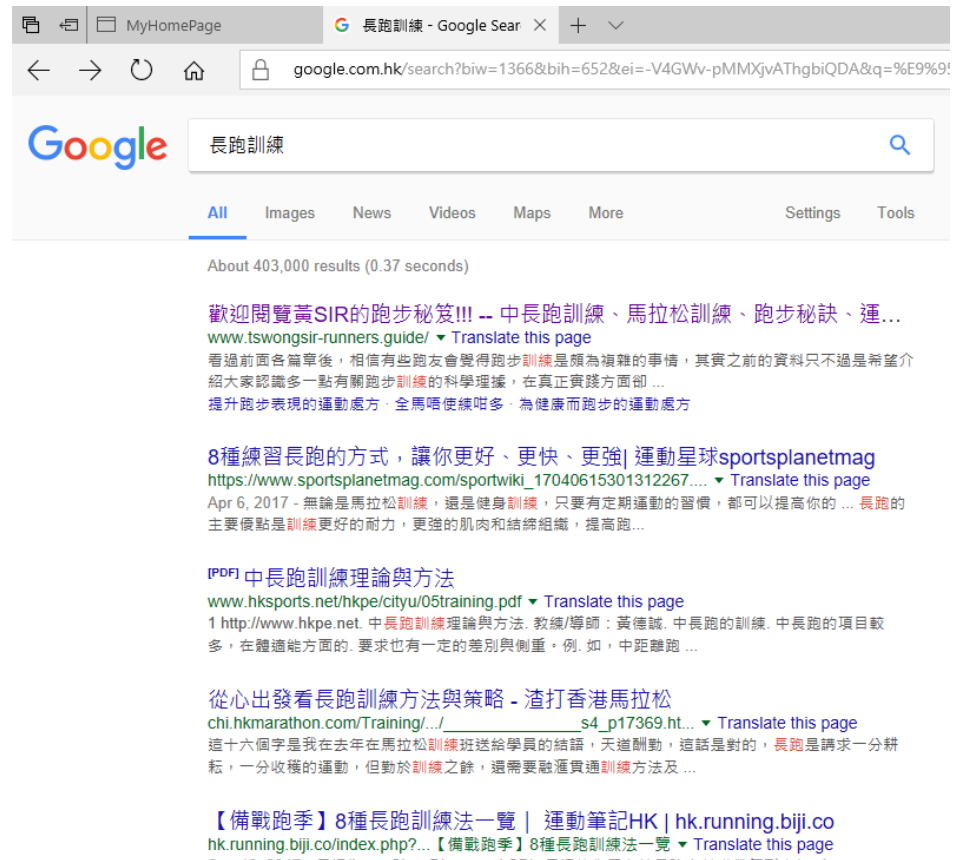
100 m	200 m	300 m	400 m	600 m	800 m	1000 m	1200 m	1500 m	1 Mile	2000 m	3000 m	4000 m	5000 m	10000 m	H-Mar	Marathon
0:00:15	0:00:30	0:00:45	0:01:00	0:01:30	0:02:00	0:02:30	0:03:00	0:03:45	0:04:01	0:05:00	0:07:30	0:10:00	0:12:30	0:25:00	0:52:45	1:45:29
0:00:16	0:00:32	0:00:48	0:01:04	0:01:36	0:02:08	0:02:40	0:03:12	0:04:00	0:04:17	0:05:20	0:08:00	0:10:40	0:13:20	0:26:40	0:56:16	1:52:31
0:00:17	0:00:34	0:00:51	0:01:08	0:01:42	0:02:16	0:02:50	0:03:24	0:04:15	0:04:34	0:05:40	0:08:30	0:11:20	0:14:10	0:28:20	0:59:47	1:59:33
0:00:18	0:00:36	0:00:54	0:01:12	0:01:48	0:02:24	0:03:00	0:03:36	0:04:30	0:04:50	0:06:00	0:09:00	0:12:00	0:15:00	0:30:00	1:03:18	2:06:35
0:00:19	0:00:38	0:00:57	0:01:16	0:01:54	0:02:32	0:03:10	0:03:48	0:04:45	0:05:06	0:06:20	0:09:30	0:12:40	0:15:50	0:31:40	1:06:49	2:13:37
0:00:20	0:00:40	0:01:00	0:01:20	0:02:00	0:02:40	0:03:20	0:04:00	0:05:00	0:05:22	0:06:40	0:10:00	0:13:20	0:16:40	0:33:20	1:10:19	2:20:39
0:00:21	0:00:42	0:01:03	0:01:24	0:02:06	0:02:48	0:03:30	0:04:12	0:05:15	0:05:38	0:07:00	0:10:30	0:14:00	0:17:30	0:35:00	1:13:50	2:27:41
0:00:22	0:00:44	0:01:06	0:01:28	0:02:12	0:02:56	0:03:40	0:04:24	0:05:30	0:05:54	0:07:20	0:11:00	0:14:40	0:18:20	0:36:40	1:17:21	2:34:43
0:00:23	0:00:46	0:01:09	0:01:32	0:02:18	0:03:04	0:03:50	0:04:36	0:05:45	0:06:10	0:07:40	0:11:30	0:15:20	0:19:10	0:38:20	1:20:52	2:41:45
0:00:24	0:00:48	0:01:12	0:01:36	0:02:24	0:03:12	0:04:00	0:04:48	0:06:00	0:06:26	0:08:00	0:12:00	0:16:00	0:20:00	0:40:00	1:24:23	2:48:47
0:00:25	0:00:50	0:01:15	0:01:40	0:02:30	0:03:20	0:04:10	0:05:00	0:06:15	0:06:42	0:08:20	0:12:30	0:16:40	0:20:50	0:41:40	1:27:54	2:55:49
0:00:26	0:00:52	0:01:18	0:01:44	0:02:36	0:03:28	0:04:20	0:05:12	0:06:30	0:06:58	0:08:40	0:13:00	0:17:20	0:21:40	0:43:20	1:31:25	3:02:51
0:00:27	0:00:54	0:01:21	0:01:48	0:02:42	0:03:36	0:04:30	0:05:24	0:06:45	0:07:14	0:09:00	0:13:30	0:18:00	0:22:30	0:45:00	1:34:56	3:09:53
0:00:28	0:00:56	0:01:24	0:01:52	0:02:48	0:03:44	0:04:40	0:05:36	0:07:00	0:07:31	0:09:20	0:14:00	0:18:40	0:23:20	0:46:40	1:38:27	3:16:55
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0:00:31	0:01:02	0:01:33	0:02:04	0:03:06	0:04:08	0:05:10	0:06:12	0:07:45	0:08:19	0:10:20	0:15:30	0:20:40	0:25:50	0:51:40	1:49:00	3:38:00
0:00:32	0:01:04	0:01:36	0:02:08	0:03:12	0:04:16	0:05:20	0:06:24	0:08:00	0:08:35	0:10:40	0:16:00	0:21:20	0:26:40	0:53:20	1:52:31	3:45:02
0:00:33	0:01:06	0:01:39	0:02:12	0:03:18	0:04:24	0:05:30	0:06:36	0:08:15	0:08:51	0:11:00	0:16:30	0:22:00	0:27:30	0:55:00	1:56:02	3:52:04
0:00:34	0:01:08	0:01:42	0:02:16	0:03:24	0:04:32	0:05:40	0:06:48	0:08:30	0:09:07	0:11:20	0:17:00	0:22:40	0:28:20	0:56:40	1:59:33	3:59:06
0:00:35	0:01:10	0:01:45	0:02:20	0:03:30	0:04:40	0:05:50	0:07:00	0:08:45	0:09:23	0:11:40	0:17:30	0:23:20	0:29:10	0:58:20	2:03:04	4:06:08
0:00:36	0:01:12	0:01:48	0:02:24	0:03:36	0:04:48	0:06:00	0:07:12	0:09:00	0:09:39	0:12:00	0:18:00	0:24:00	0:30:00	1:00:00	2:06:35	4:13:10
0:00:37	0:01:14	0:01:51	0:02:28	0:03:42	0:04:56	0:06:10	0:07:24	0:09:15	0:09:55	0:12:20	0:18:30	0:24:40	0:30:50	1:01:40	2:10:06	4:20:12
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0:00:39	0:01:18	0:01:57	0:02:36	0:03:54	0:05:12	0:06:30	0:07:48	0:09:45	0:10:28	0:13:00	0:19:30	0:26:00	0:32:30	1:05:00	2:17:08	4:34:16
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Running Training Q&A

長跑訓練

Q & A

Want to know more...



<http://www.tswongsir-runners.guide>