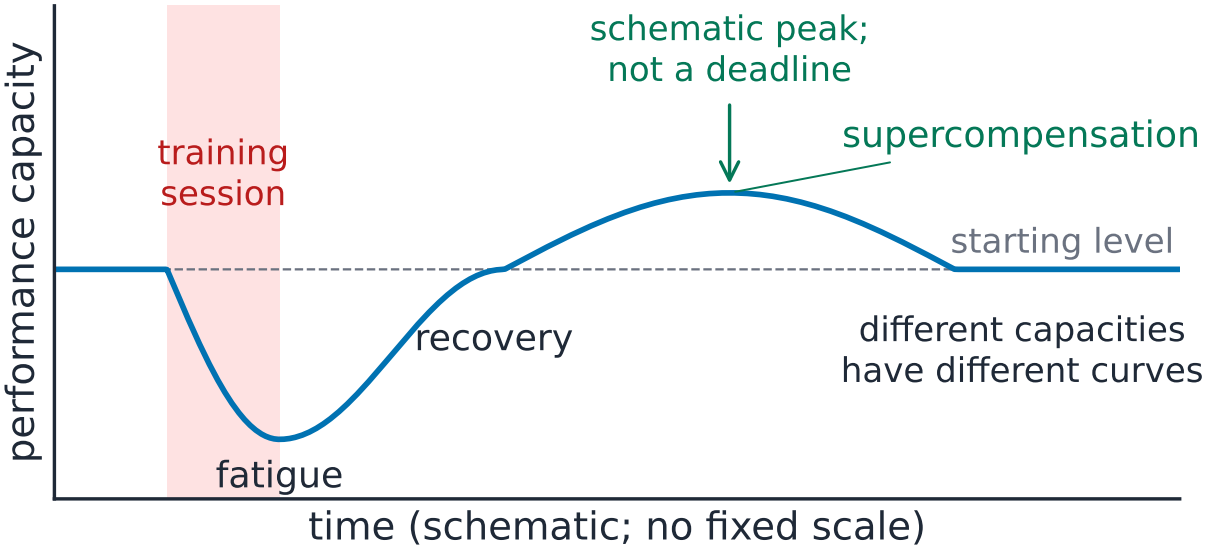
Exercise walk-through

3.1
Acute responses, fatigue and recovery

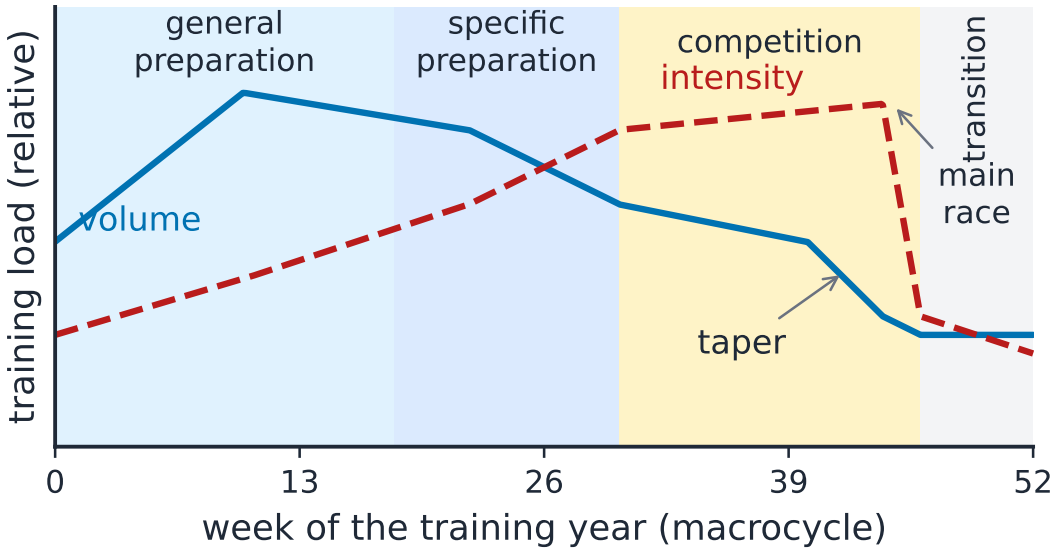
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Supercompensation



A model curve is not an individual training timetable.

A periodised year



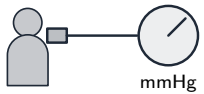
> Plan load around aims and monitor the response.

Overtraining

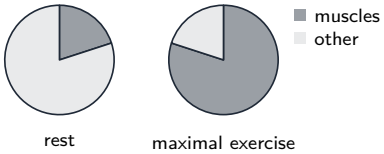
Concept	Interpretation
Functional overreaching	Short-term reduction with recovery
Maladaptive underperformance	Review load, health and recovery context
Session RPE	A monitoring proxy, not an injury threshold

Exercises 2.1·2.2

2.1 State what happens to systolic and diastolic blood pressure during a steady run. [2]

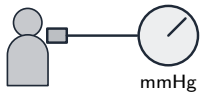


2.2 Explain how blood flow is redistributed during exercise. [3]



Exercises 2.1·2.2

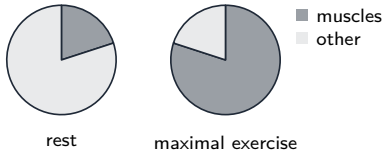
2.1 State what happens to systolic and diastolic blood pressure during a steady run. [2]



2.1

systolic pressure rises; diastolic pressure stays about the same (or falls slightly)

2.2 Explain how blood flow is redistributed during exercise. [3]



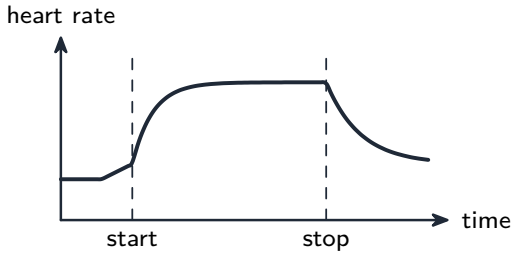
2.2

arterioles supplying working muscles dilate (vasodilation); arterioles supplying the gut and kidneys constrict (vasoconstriction); so a much larger share of a larger cardiac output goes to the muscles, up to about 80%

Exercise 3.1 (a)

3.1 The graph shows a student's heart rate before, during and after a 10-minute run at a steady pace.

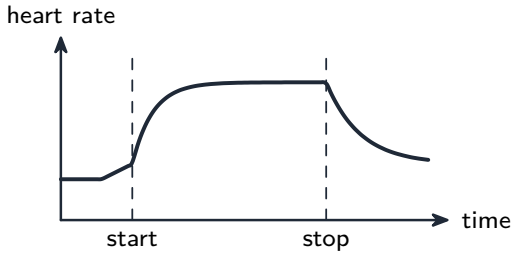
(a) Describe the changes in heart rate from before the run until the end of the run. [3]



Exercise 3.1 (a)

3.1 The graph shows a student's heart rate before, during and after a 10-minute run at a steady pace.

(a) Describe the changes in heart rate from before the run until the end of the run. [3]



(a) heart rate rises slightly before the start (anticipatory rise); it rises quickly in the first minutes; then it levels off at a steady state

Exercise 3.1 (b)

3.1 The graph shows a student's heart rate before, during and after a 10-minute run at a steady pace.

(b) State what happens to heart rate when the run stops. [1]

Exercise 3.1 (b)

3.1 The graph shows a student's heart rate before, during and after a 10-minute run at a steady pace.

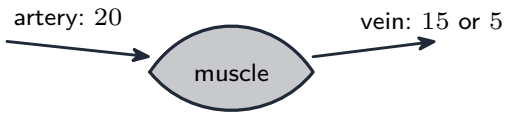
(b) State what happens to heart rate when the run stops. [1]

(b) it falls quickly at first and then more slowly back towards resting level

Exercise 3.2 (a)

3.2 Arterial blood holds about 20 ml O_2 per 100 ml. Venous blood leaving a muscle holds 15 ml O_2 per 100 ml at rest and 5 ml O_2 per 100 ml in hard exercise.

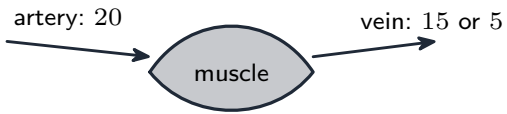
(a) Calculate the arteriovenous oxygen difference at rest and in exercise. [2]



Exercise 3.2 (a)

3.2 Arterial blood holds about 20 ml O_2 per 100 ml. Venous blood leaving a muscle holds 15 ml O_2 per 100 ml at rest and 5 ml O_2 per 100 ml in hard exercise.

(a) Calculate the arteriovenous oxygen difference at rest and in exercise. [2]



(a) rest: $20 - 15 = \mathbf{5}$ ml per 100 ml; exercise: $20 - 5 = \mathbf{15}$ ml per 100 ml

Exercise 3.2 (b)

3.2 Arterial blood holds about 20 ml O_2 per 100 ml. Venous blood leaving a muscle holds 15 ml O_2 per 100 ml at rest and 5 ml O_2 per 100 ml in hard exercise.

(b) Explain why the difference increases in exercise. [3]

Exercise 3.2 (b)

3.2 Arterial blood holds about 20 ml O_2 per 100 ml. Venous blood leaving a muscle holds 15 ml O_2 per 100 ml at rest and 5 ml O_2 per 100 ml in hard exercise.

(b) Explain why the difference increases in exercise. [3]

(b) working muscles use more oxygen, so the oxygen level in the muscle falls and the gradient rises; higher temperature, CO_2 and acidity make haemoglobin release more oxygen (Bohr shift); more capillaries open, giving more surface area and slower flow past the fibres