



**Periodization of training in sports**

# Introduction

Training theory

Exercise physiology

Sport psychology

Sport injuries



Nutrition

Equipment

Biomechanics

Talent identification

Pediatric physiology

Sociology

# Introduction

- The definition of training
- The variety of adaptations occurs after different moods of training.
- Flexibility training adaptation
- Aerobic adaptation
- Anaerobic adaptation





**What's your idea about the time of recovery?**



**What's the limiting factor in short to long activities?**



**What's the physiological determinants of performance (endurance)?**

## What's your idea about the time of recovery?

- Heart rate and blood pressure will return to baseline values in the hour following exercise.
- After intensive aerobic exercise, 10–48 hours are required for the body to replenish glycogen stores depending on intensity and duration of exercise, whereas 5–24 hours would usually be needed for glycogen replenishment after anaerobic exercise (Koutedakis & Sharp)
- Following resistance training 24–36 hours are required for the muscle to be completely normalized (Virus)
- Recovery of the nervous system, depending on the severity of the stimuli, may take up to 48 hours (McArdle et al).



## What's the limiting factor in short to long activities?

Degree of exercise (example)	ATP & CP	Muscle Glycogen	Liver Glycogen	Fat Stores	pH
Light (marathon)	1	5	4-5	2-3	1
Moderate (1500-m run)	1-2	3	2	1-2	2-3
Heavy (400-m run)	3	3	1	1	3-4
Very intense (discus)	2-3	1	1	1	1
Very Intense, repeated	4-5	4-5	1-2	1-2	4-5

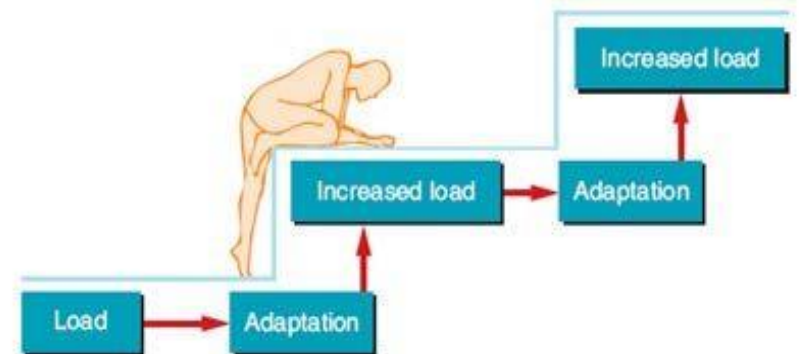
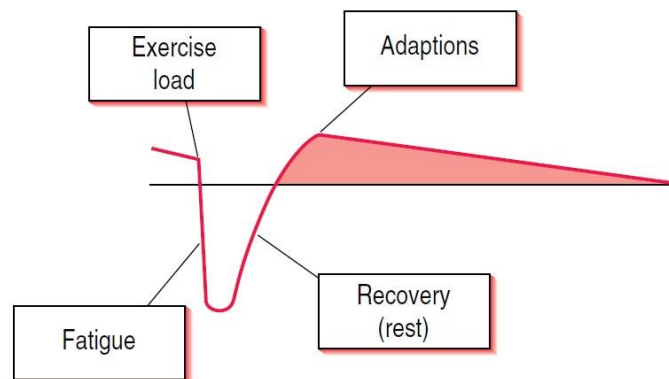
NOTE: 1 = least probable limiting factor; 5 = most probable limiting factor

# What's the physiological determinants of performance (endurance)?

- Physiological determinants of endurance performance:
  - ✓  $\text{VO}_2\text{max}$
  - ✓  $v\text{VO}_2\text{max}$
  - ✓  $T_{\text{max}}$
  - ✓ Time achieve  $\text{VO}_2\text{max}$
  - ✓ Lactate threshold
  - ✓  $v\text{AT}$
  - ✓ Running economy
  - ✓ Time achieve LT
  - ✓ Fractional utilization
  - ✓ Fuel supply
  - ✓  $V\Delta 50$

# Introduction

- The principals of overload
- The principals of progressive overload
- The principals of specificity
- The principals of variety
- The principals of reversibility
- The principals of individual differences
- The principals of warm up and cool down





# Introduction

- in training periodization there is a hierarchy of terms :

**Macrocycle**

**Period**

**Phase**

**Mesocycle**

**Microcycle**

**Session**

**Unit**

# Fitness components



## HEALTH-RELATED FITNESS COMPONENTS



### CARDIOVASCULAR ENDURANCE

Your body's ability to deliver oxygen to working muscles during exercise.



### MUSCULAR ENDURANCE

Your muscles' ability to exert force repeatedly or for an extended period of time.



### MUSCULAR STRENGTH

Your muscles' ability to exert a maximum amount of force in one effort.



### FLEXIBILITY

Your muscles and joints' ability to move through their full range of motion.



### BODY COMPOSITION

Your body's ratio of lean muscle to stored fat.



## SKILL-RELATED FITNESS COMPONENTS



### SPEED

The ability to perform actions or cover distance quickly.



### POWER

The ability to combine both speed and force in movements and actions.



### AGILITY

The ability to quickly change direction without losing speed or power.



### BALANCE

The ability to stabilize the body both in movement and when maintaining stillness.



### COORDINATION

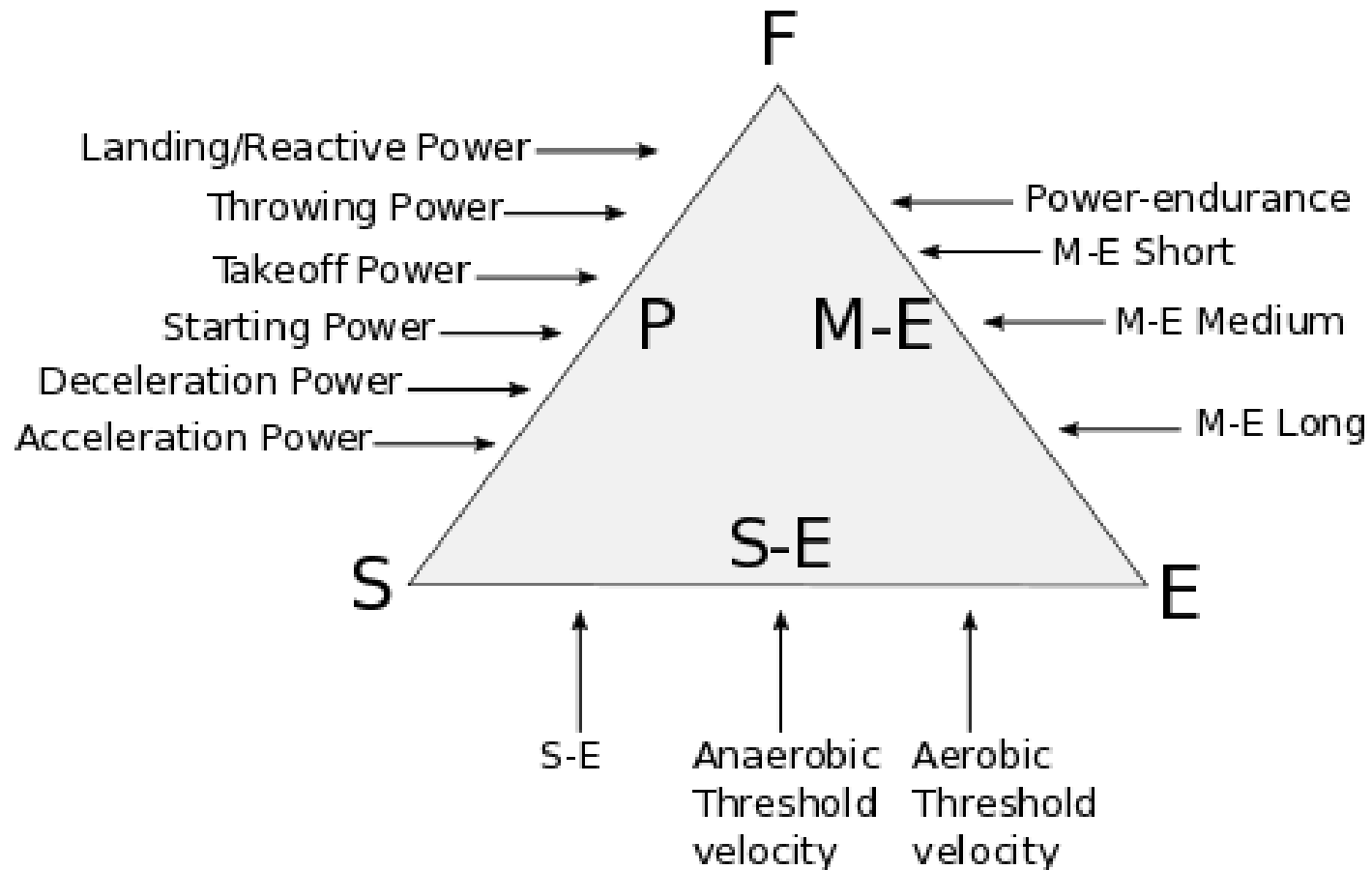
The ability to use your senses in combination with your actions when in movement.



### REACTION TIME

The ability to respond quickly to what you feel, see or hear.

# Fitness components



# Session

**Coordination/ Technique**



```
graph TD; A[Coordination/ Technique] --> B[Speed / Power / Max strength]; B --> C[Speed endurance / Strength endurance]; C --> D[Conditioning]; D --> E[General endurance];
```

**Speed / Power / Max strength**

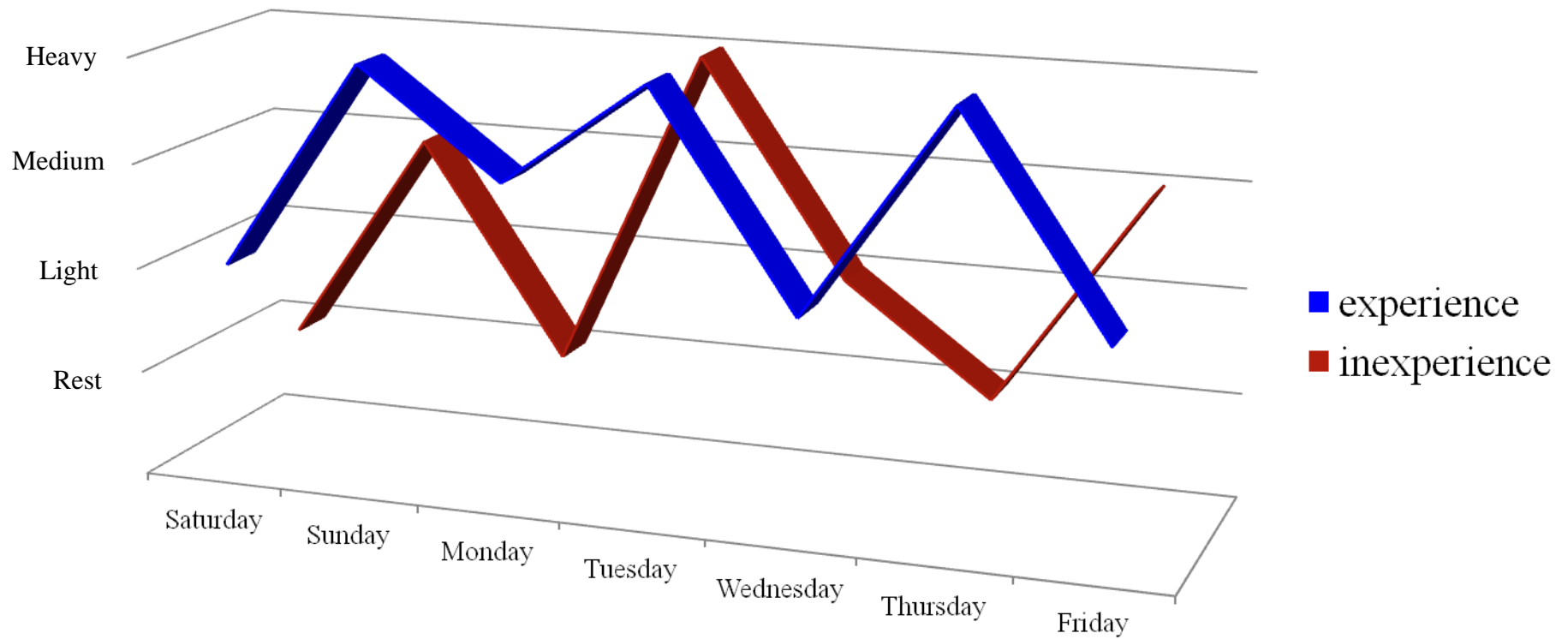
**Speed endurance / Strength endurance**

**Conditioning**

**General endurance**

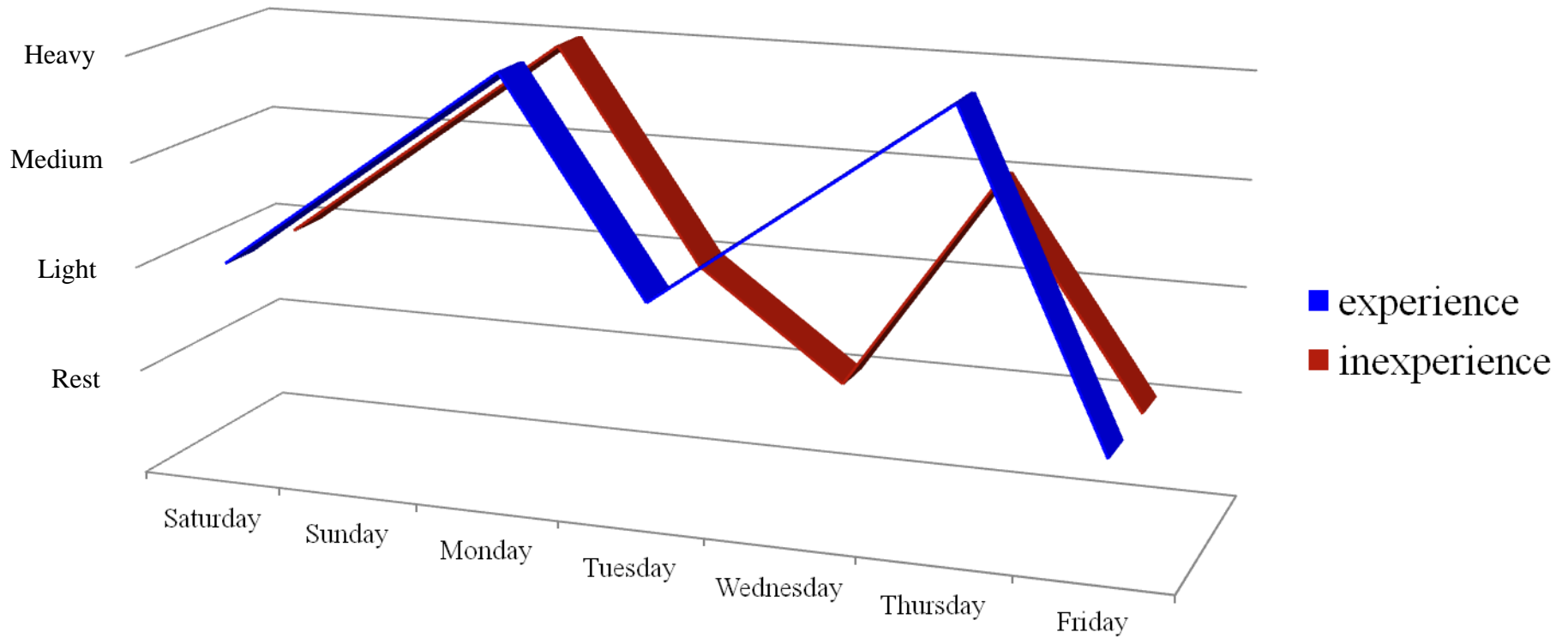
# Training periodization

## Microcycle – general preparation



# Training periodization

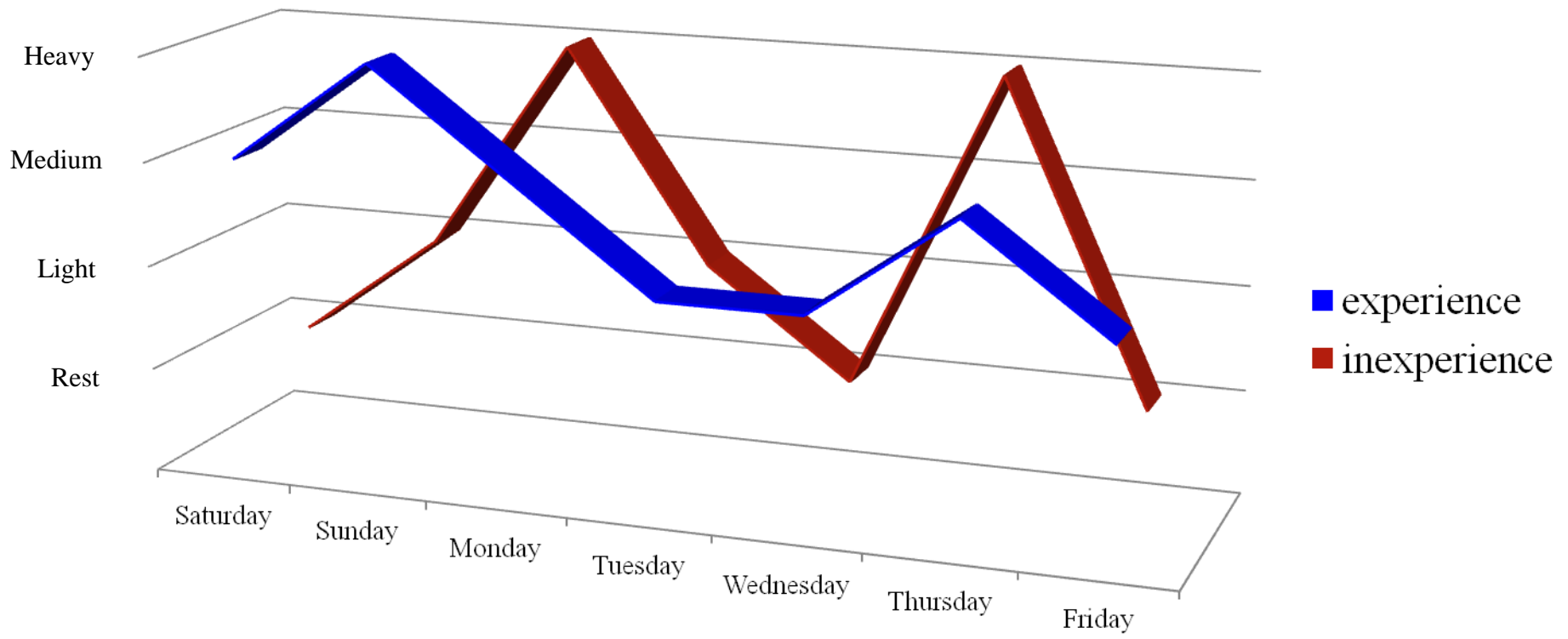
## Microcycle – specific preparation





# Training periodization

## Microcycle - competition



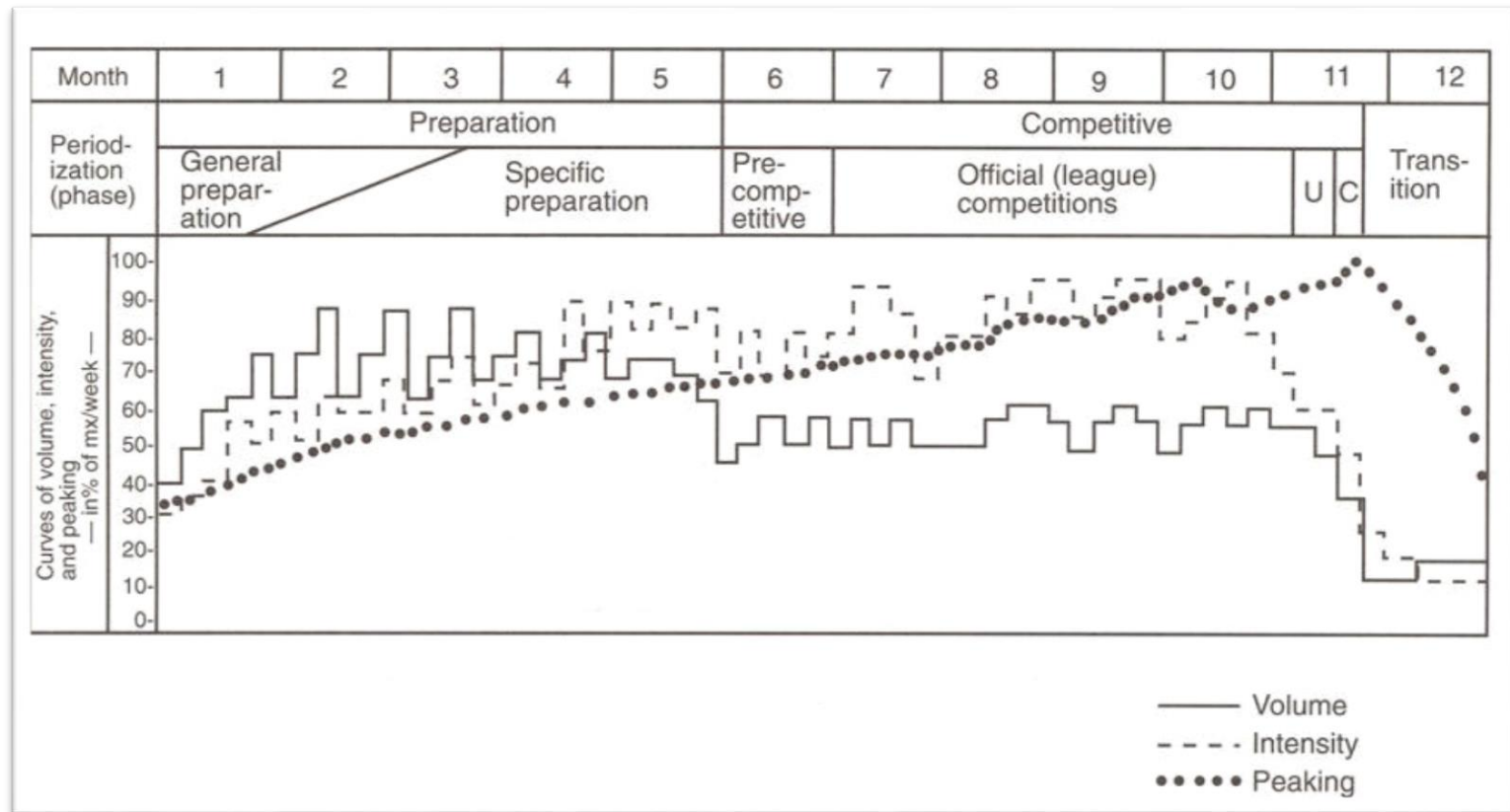
# Training periodization

## Mesocycle – phase – period - macrocycle

	Preparation						Competition				Tran	
	General			Specific			Pre	Main		tran		
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Stamina	75	55	30	25	20	20	15	15	15	15	15	-
Strength	20	20	35	35	35	15	15	10	15	15	15	-
Speed	-	10	15	20	25	40	35	20	15	15	15	-
Skill	-	10	10	10	10	20	30	50	50	50	50	-
Flexibility	5	5	10	10	10	5	5	5	5	5	5	-

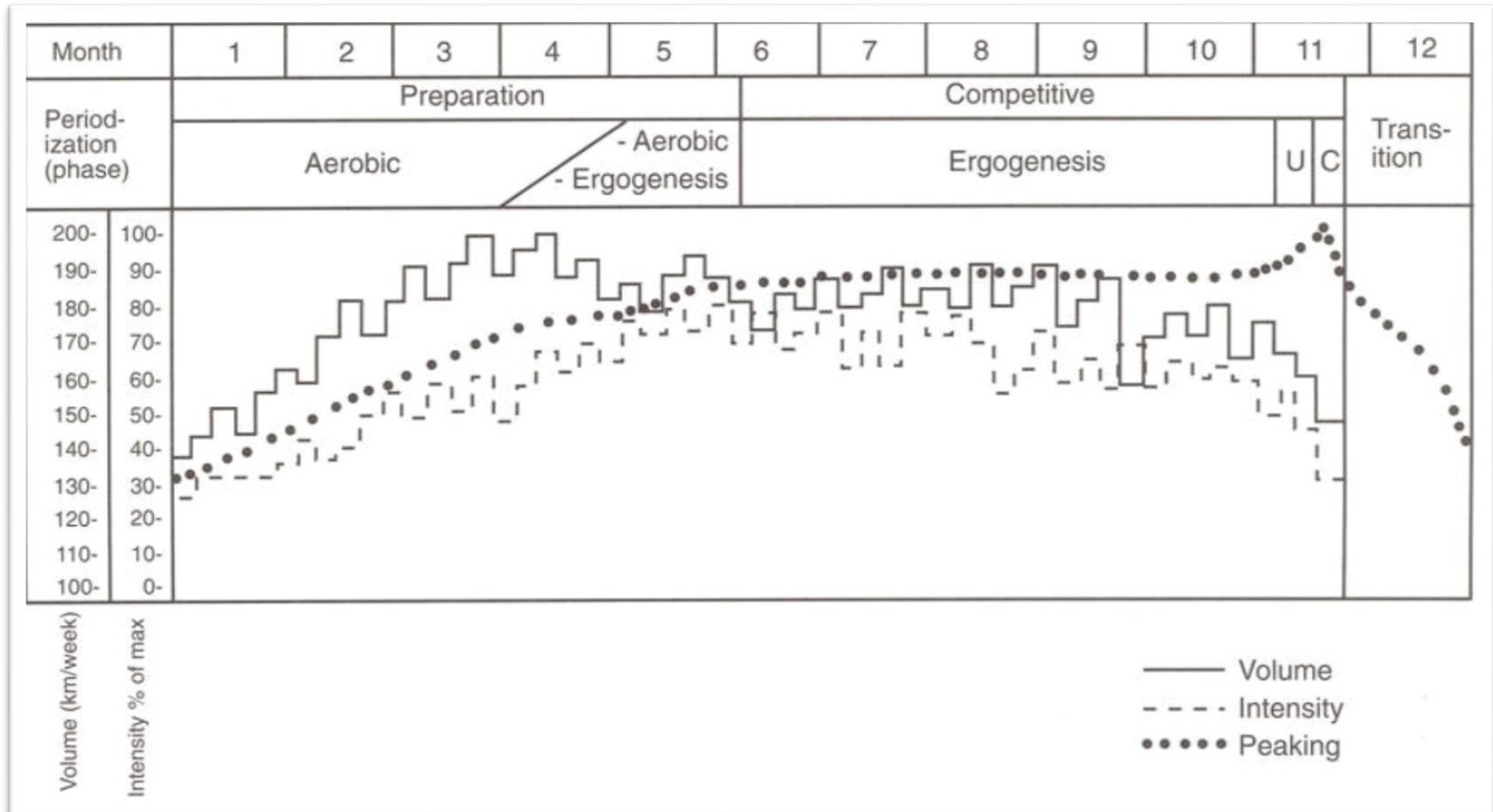
# Annual Training Periodization

## Monocycle – speed and power sports



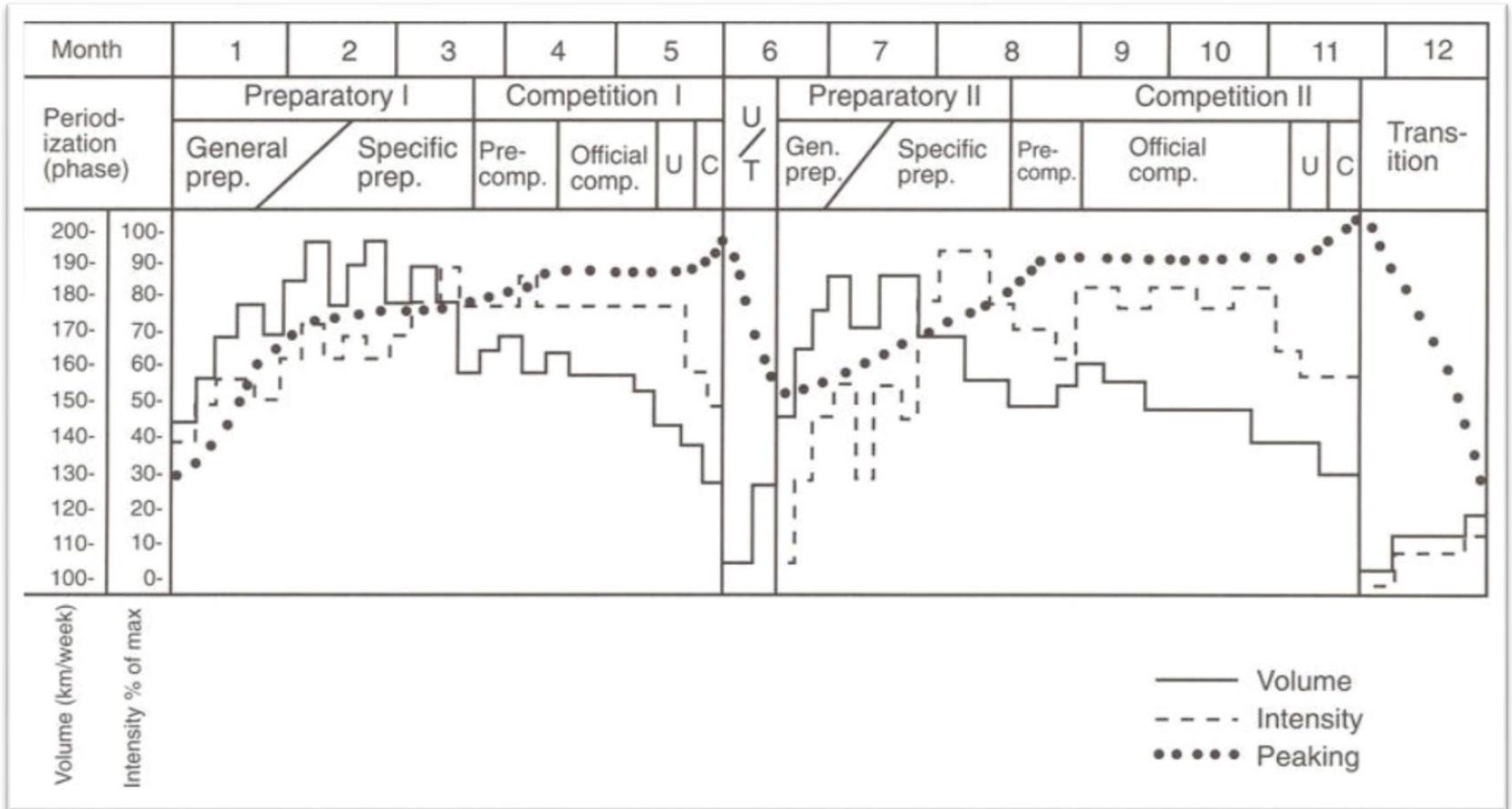
# Annual Training Periodization

## Monocycle – endurance sports



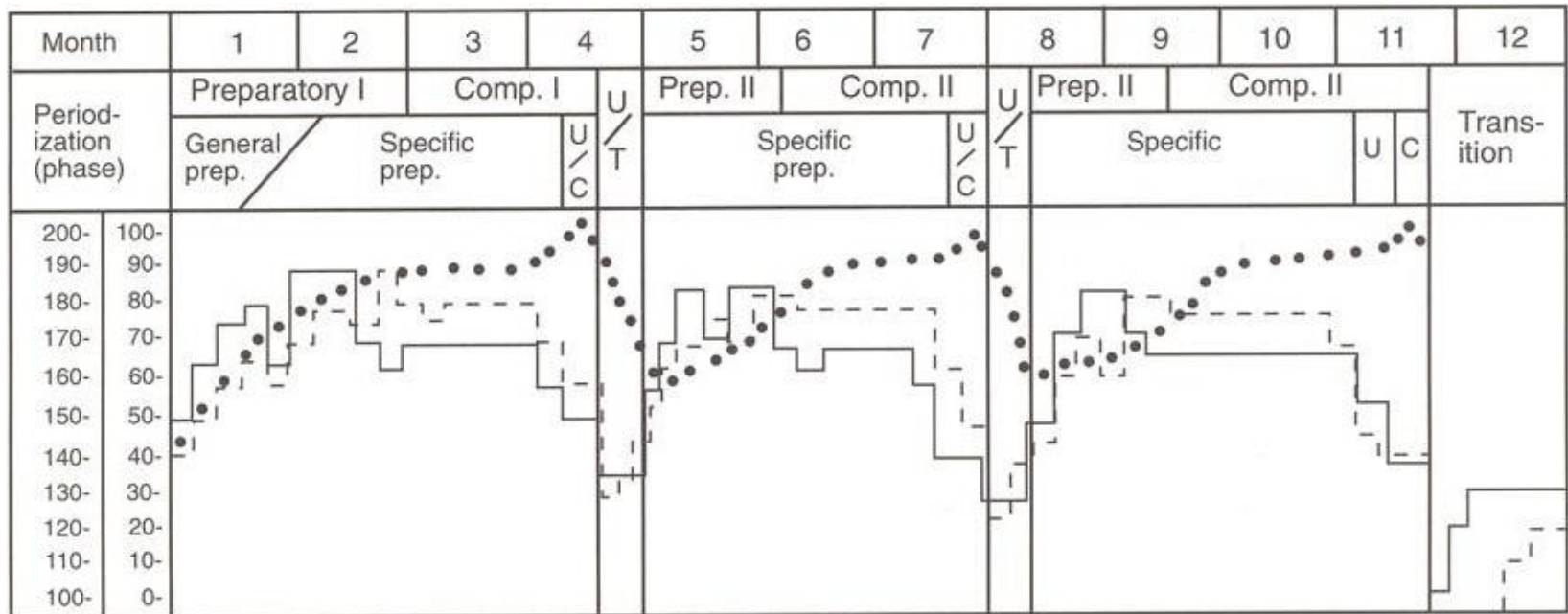
# Annual Training Periodization

## bicycle – speed and power sports



# Annual Training Periodization

## tricycle



Volume (km/week)

Intensity % of max

— Volume  
 - - - Intensity  
 ••••• Peaking



Thank you