

The physical background of Squash

What do we need from our body to play a better game?



Energy systems of the human body

One of the key drivers to exercise is the utilisation of energy from our body. The body has a number of systems that produces energy, each system works by converting energy to a common unit known as Adenosine Tri-phosphate (ATP).

Without getting too technical and exploring the molecular structure of ATP, all we need to know is that ATP is the energy of our cells. As we exercise, the muscles in our body contract to perform specific movements. These muscle contractions or extensions are supported by ATP, therefore as we exercise our demand for energy increases and thus ATP requirements increases. There are fundamentally three energy systems in our body that produces ATP;

- Phosphagen
- Aerobic
- Anaerobic (Glycogen Lactic-acid system)

-Phosphate energy system, used for immediate high intensity work - 0-15sec

-Anaerobic energy system, the process of releasing energy from food in the form of glucose without the presence of oxygen. - 1-3min

-Aerobic energy system, releasing energy with presence of oxygen - 3-...min



Anaerobic Energy System

Due to the nature of anaerobic exercises, often more explosive and sudden, ATP is required at a faster rate. The anaerobic system produces ATP via two different pathways:

- **Phosphocreatine:** stored within our muscles and is similar to ATP. (Quite often body builders will take some form of creatine supplement, this is where this is used)
- **Lactate Anaerobic System:** Evident when our muscles fatigue and we hear people express, 'Lactic Acid buildup' (which is the product of this pathway)

Either pathway, the anaerobic energy system cannot continue indefinitely as ATP or phosphocreatine becomes depleted or an accumulation of lactic acid builds up causing pain and fatigue.

Aerobic Energy System

As the name suggests, the Aerobic Energy System focuses on the production of ATP through the breakdown of food stores with the use of Oxygen. As we exercise the demand of energy from our muscles increase, as does the demand for oxygen. Therefore the heart pumps faster and stronger to transport oxygen through the body. This energy system breaks down carbohydrates, fatty acids and some amino acids to produce ATP. Aerobic activities are commonly lower intensity and is usually sustained over a longer period of time – therefore the Aerobic Energy System is predominate in these cases.



Basic Energy Intake

- CARBOHYDRATES 50% of the food intake,
- FAT 30% of the food intake
- PROTEIN 20% of the food intake

Also important components: minerals, vitamins, water



Starting your exercise

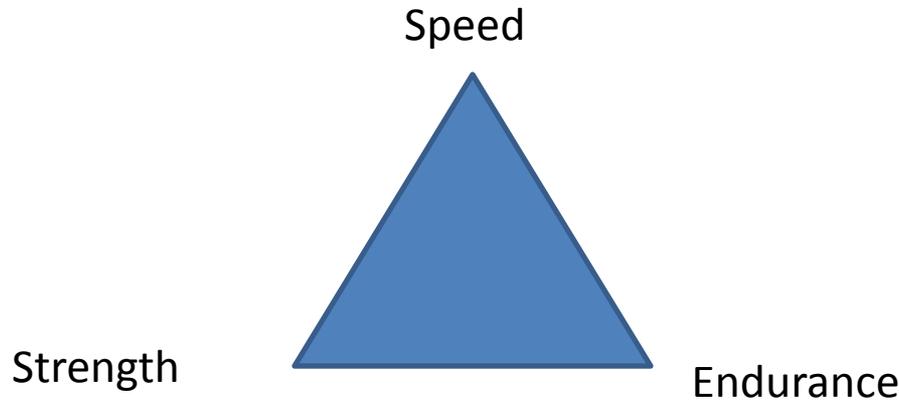
- Warm-up
- Start with easy exercise
- Use enough resting periods
- Measure your client's results and recovery
- Be flexible to replan the program based on the tests



Physical Skills

- Cardiovascular Endurance
- Stamina
- Strength
- Flexibility
- Power
- Speed
- Coordination
- Accuracy
- Agility
- Balance

- Keringési rendszer állóképessége
- Kitartás
- Erő
- Rugalmasság/hajlékonyság
- Teljesítmény
- Sebesség
- Koordináció
- Pontosság
- Ügyesség
- Egyensúly



Plan your training

COMPONENTS OF FITNESS					
Training	Strength	Speed	Power	Aerobic	Anaerobic
Long steady runs				Y	
Sprinting 10sec, long rests		Y			
Interval training 1-90 sec					Y
Interval training 1-3 min				Y	
Hill Running	Y				Y
Circuit training	Y	Y	Y		
Plyometric training	Y	Y	Y		
Light Weights	Y				
Heavy Weights	Y	Y	Y		

By Peter Hirst

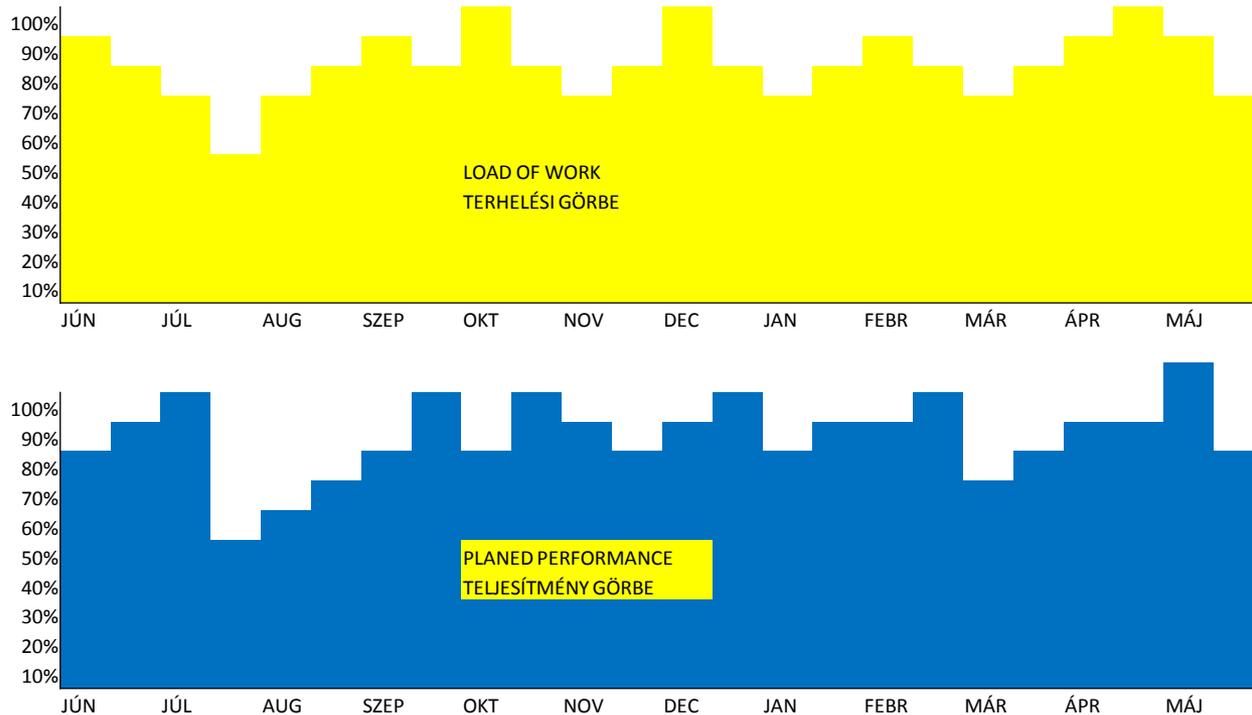


Building up your plan

Phases:

- Preparation* - pre season , when you build up skills
- Competition* – in season, when you keep up skills , less chance for serious development
- Active rest* – off season, recovery and recuperation

The MACRO-cycle, with the MESO-cycles



The MICRO-cycle

Micro-cycle	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8.00-9.00							
9.00-10.30	INDIVIDUAL/ TECH	SOLO PRACTICE RUNNING	INDIVIDUAL/TACTIC	SOLO PRACTICE SWIMMING	INDIVIDUAL/OP. SKILL	SPINNING, FITNESS TEST	Resting
11.00-12.00	LUNCH	LUNCH VIDEO ANALIZING	LUNCH	LUNCH	LUNCH	or COMPETITIVE GAME	
13.00-14.00							
14.00-15.00		GAME		GAME			
16.00-17.00	TEAM TRAINING		TEAM TRAINING		TEAM TRAINING		
17.00-18.30	STRENGTH IN GROUP		STRENGTH IN GROUP		STRENGTH IN GROUP		

- Test before plan
- Plan to be flexible
- Retest and replan if necessary
- Analyze the games and results after competition
- Refresh your client , avoid overtraining

Rules of a Fitness Test

- Must be repeatable
- Use similar circumstances
- Use easy terms of testing



Testing for Skills

Multi Skill Test:

- 6 corner run with pushup positions at the corners - 1min
- jump max height at side wall run across and jump on the other side - 1min

Speed and Agility Test:

- 16 corner challenge
- Full court running - 1min
- 10-20 or 30m running for speed testing

Plyometric Test:

- Ladder running – 1length front 1 length side running
- Split steps running on ladder
- Max horizontal jump

Strength Test:

- 5kg Medicine Ball Push or throw
- Max weight squat, or max repeat of squats with 50kg
- Max repeat of pushups
- Max repeat of V sit-ups

Endurance Test:

- 12 minutes running test (Cooper-test)
- 5minutes court sprints test

