



# COACHING FORUM FET IL

SPEED ABILITY

KLUBHUS FET IL, 22.09.2021

## Agenda

1. Abilities in Sport (general).
2. Speed or Velocity or Acceleration, Fast or agile – Gamespeed.
3. Speed Anatomy.
4. Gamespeed development.
5. Training structure.
6. Extra benefits

### **1. Abilities in Sport (general)**

In human life, we use our body for every activity. Simple activities like breathing and thinking are done automatically. And although they seem effortless, they are burdened with a high physiological cost. During more difficult movements, the activities are still undergoing mechanisms that we do not control: engaging more muscles, activating energy systems, biochemical activation (enzymes and hormones), etc. Even though we do not counter them, we definitely have an influence on their course.

In a word, they can be improved so that the **activities performed are more economical** (use less energy, run faster, cause less debt and less damage) and **effective** (move around, perform everyday activities). What makes a fit person is very useful in sports, where these qualities are developed to an extraordinary level.

**For instance:** when the body is very tired tries to stop the effort to protect itself. Produce a lactic acid which forces the muscles to stop (cannot continue the work anymore). But if you bring the body to that feeling many times it will tolerate this amount of the lactate acid. Even more, body will learn to accept even more!! After the training body can tolerate even 25mmol lactate in the blood which is a killer amount for the person who doesn't train at all!

Each person has a certain basic level of all of these qualities: **strength, endurance, speed, and coordination**. The level that is needed to function in the world, in everyday life or at work.

Athletes, depending on the requirements of the sport they practice, develop individual features to meet the requirements. And here comes the stairs. Because:

- you cannot develop only one motor (physical) trait. Even if you focus on one, it will still affect the others.
- it is very difficult to find the right proportions, and it is very individual. That is why many teams, apart from group training, introduce individual training for their players (which in High Performance training might be even 50-60%! of total training).

It has always been known that a tall and large person is not so dynamic, agile. Or skinny and small player will not make a big career as a pivot in handball. In sport, speed is very connected to the strength. As stronger and bigger (it doesn't matter if it is muscle or fat) athlete is – as his stamina level is lower. But athlete still can be very endure and very dynamic and powerful in same time. Some of the best long-distance runners can kick on the end like sprinters! Of course, it needs other strength training, and the body needs well management (coordination). Speed, strength, and endurance are managed by the brain, which sends **a signal** to the muscles to bend, to work, to produce more power. In very short moment body analyze the position, angles, forces, resistance, voices, smells, pictures (opponents, structure, ball, facility etc) and response for that signal by bringing an action. That is **coordination**.

If the way from the brain to the body takes long time, or the reaction takes long time, or signal is superfast, reaction is super-fast but wrong, or good but muscles are too tight – you can not be dynamic, agile. You cannot handle the situation. In sport it is not acceptable, that is why athletes need to develop each skill, even if their event needs only one in most. For example: chess players build their endurance by many miles run, or marathoners do the speed training, or long-distance swimmers do the weight lifting training.

THIS DEFINITION CLOSES SPEED TO THE PHYSIOLOGY AND ANATOMY THAT IS COMMON TO **EVERY HUMAN BEING**. ON THIS BASIS, THE METHODOLOGY OF TRAINING AND SPEED DEVELOPMENT WAS CREATED, WHICH IS ALSO COMMON TO **EVERY SPORT** (THE TOOLS ARE DIFFERENT, ADEQUATE TO THE SPECIFICITY OF THE SPORT).

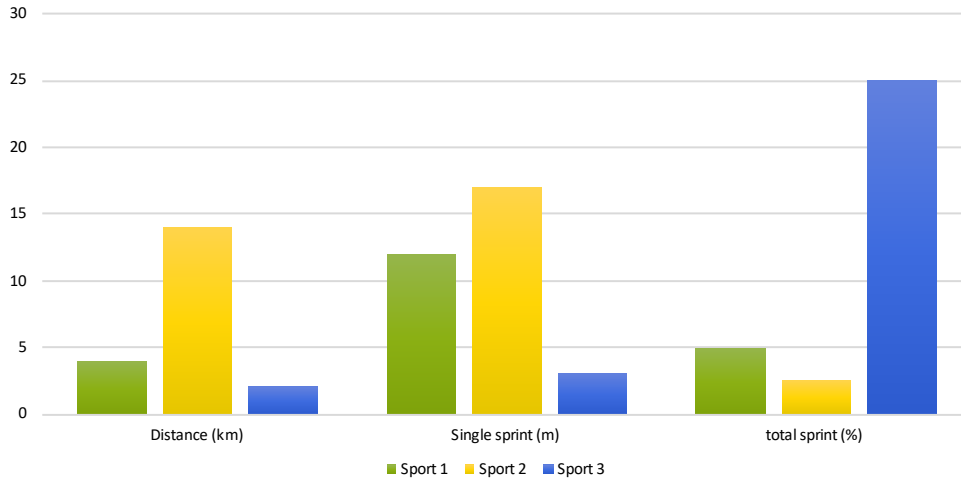
- If two people lift a body weighing 100kg, we say they are equally strong.
- If they raise them one meter high, they will do the same job.
- And if one of them lifts this weight in 1 second and the other in 2 seconds, what is the difference between the work done by these people?
- Which person is stronger, which person is faster?
- Bolid 1 and Fiat.

The cars comparison shows the meaning of the speed.

- Lets say we have two cars, with max speed of 300km per hour. They are same fast. But one of them can reach that speed in 10sec another in 12 sec. So, are they really same fast?
- Both can be driven 100km per hour (for one this is a max speed, for another one – not even a half of max speed). But Fiat will need 12sec to achieve that velocity, and Formula 1 only 2sec.
- In this example Audi RS6 can drive up to 300km/h, and Tesla only 200km/h. But Tesla can reach 100km in 2.7 sec, and Audi in 3.6. Who is faster then?

If we take under consideration only the speed (max effort) in the sport this is how it looks:

## SPEED NUMBERS



Where the **GREEN** – handball, **Yellow** – football, **Blue** – tennis.

## NUMBERS SOCCER



# 2.4% of the total distance, approx. **300m** m of which approx. **180 m** with the ball at the leg.  
*Distance covered is much less, just to make sure players can perform **fast movements** for almost **21%** of the total distance covered."*

## NUMBERS SOCCER

- **80%** of goals scored after **short duration attacks** , and players touched the ball a maximum of **3 or 4 times** .
- Most goals are scored from **penalty zone (80-90proc)**. 64% of possessions within that zone derived from ball possession of between **0.5-2.5 seconds** Almost 50% attempts from penalty zone were from possessions of less than **one second**.
- player covers an average distance of 12 to 14 km, with **ca.1km** at velocity greater than 19.8 km/h (High-speed running) and about **250-300m** at velocity greater than 25.2 km/h (**sprinting**).
- it is very interesting that high -intensity activities cover only ca.**10%** of the total distance covered. However, the key moments of the match happen **in these activities**.
- A higher frequency of goals was also noticed during the **last 10 to 15 minutes** of the first and second part of the game, which coincides with the periods in which due to **fatigue there is a decrease in high -intensity activities**.

## NUMBERS HANDBALL

- *"In more than 60% of the occurrences, the time between maximal intensity activities was 30 seconds,*
- *52.4% of the recovery periods were fulfilled by low intensity activities (32.2 +/- 19.33% walking; 8.6 +/- 16.68% sideways medium-intensity movement; 7.3 +/- 9.29% jogging; 4.3 +/- 8.77% backwards movement).*
- *However, in almost half of the recovery time, the players were standing still (44.92%/03%).*

Classification: walking: 1.05 meters/second, slow running: 4.0 m/s, fast running: 4.5 m/s and sprinting: > 6 m/s)

*"Time-motion analysis showed that during the average 73 minutes of match time, 825 activity changes were performed at 6 seconds intervals*

*"They performed av 38 (+-6) high-speed runs, with an average duration of 2 (+/- 0.6 seconds.)" av 12m.*

| Position          | Mean (Average) Distance covered (+ and- 1 standard deviation) |
|-------------------|---|
| Wing              | 3710.6m (+/- 210.2 m)   |
| Backcourt players | 2839.9m (+/- 150.6 m)   |
| Pivot             | 2786.9m (+/- 238.8 m)   |
| Goalkeeper        | 2058.1m (+/- 90.2 m)  |
|                   | Percentage of total distance covered                          |
| Intensity Level   |   |
| Walking           | 34.3% (+/- 4.9%)  |
| Slow Running      | 44.7% (+/- 5.1%)  |
| Fast Running      | 17.9% (+/- 3.5%)  |
| Sprinting         | 3% (+/- 2.2%)/ ca 200m  |

When we analyze single player on every position, we realize that his speed might be crucial (if the opponent has much lower level of speed) or not useful if his team mates\ speed level is lower than opponents. Because some of the action might be individual, but most of them are very team action (chain reaction, structure, moving the whole line, tactic).

## PLAYER'S SPEED = TEAM SPEED

To start measuring the speed, let's first determine what a slow and fast action looks like. Take Manchester City's 44-pass goal against Manchester United back in November 2018.

This move took City **one minute and 55 seconds** from start to finish. They moved the ball a total distance of **699 metres**, for a territorial gain of just 42 metres (how far the ball was actually moved up the field).

Taking the territorial gain and the total duration of the passing sequence, the direct speed (how fast the ball moved upfield) can be calculated. This City goal, while aesthetically pleasing, clocking up just **0.38 m/s**. Is it slow or fast goal?

Here is Leicester's fourth goal against Aston Villa in the 4 -1 drubbing back in December:

With Ricardo Pereira (21) picking up the loose ball and sending it long, Dennis Praet picks up the loose header from Villa's Douglas Luiz and sends Jamie Vardy on his way.

- <https://www.youtube.com/watch?v=3jFnh1V26fs>
- min 13.00

But is the running speed of individuals or the whole team structure the only kind speed we are looking for in team sports?

## SPORT AS ABILITIES COCKTAIL

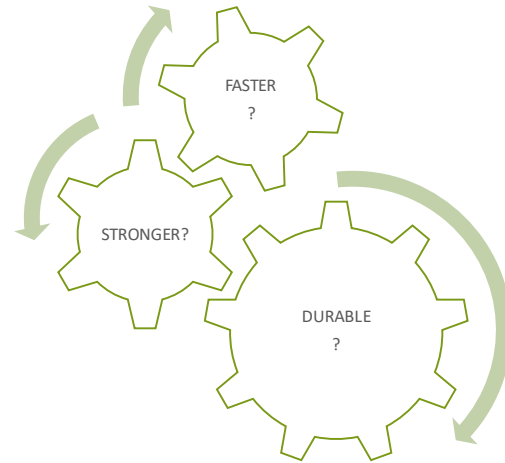
- COORDINATION, STRENGTH, SPEED, ENDURANCE
- endurance is about repeating also very fast movements many times,
- Using the body = muscles contraction = move. Doing some work - you use the strength to do it (kW). Is it already strength? How you call it when if we do it very fast? It is speed?
- Action (X) = COORDINATION (X1) + STRENGTH (X2) + SPEED (X3) + ENDURANCE (X4)
- Speed is to **complete a given movement task in the shortest time.**



So, the action performance is depended not only to the speed but all skills. That is why it is highly related to the proper development of **all body**.

## CHALLENGE

- 400M RACE (SPRINT? )
- 300M POINT
- MAX SPEED IS SAME
- MAX POWER IS THE SAME
- WHO IS GOING TO WIN ?
- LET'S CHANGE THE MAX FACTORS



To show you the correlation just imagine the situation on the track, where are two athletes of max speed of 11sec/100m are competing in sprint event (so is it all about speed we could say). They are reaching 300m split point exactly in the same time. Who is going to win? Perhaps the one who can maintain longer (stamina?). But if the level of the endurance is also same? The one who is stronger could win, by making one step harder which makes a difference. But if the difference might be made from many factors: you can be less endure but have much more power and still can win. Even if you are not same fast on 100m, but your endurance is better you can win the race. SO everything is connected, everything means. Speed is not everything to win the match.

But it is **CRUSIAL!!**

# GAMESPEED



## 2. Speed or Velocity or Acceleration, Fast or agile – Gamespeed (complex speed)

It is obvious that in competition, where a physical feature is significantly dominant, its higher level determines the sports result. If someone is much faster than the rest, he will most likely be the king of sprint. However, you can compensate for the loss in speed with a great start, technique or strategy. In team games, if there is an advantage in some ability **of the majority of players** over their opponents, victory is determined. But even an advantage in some ability of just **one player**, if this fact is skillfully used, is an advantage in team games. The advantage in the shot power or sprint time will be useless if the player does not develop the ability to use this ability adequately to the situation and the environment. Each motor trait is a mixture of other qualities in different proportions. After all, endurance is about repeating also very fast movements many times, it is about doing some work, so you use strength to do it. Also speed is a composed of many factors. There are several aspects of speed: power, acceleration, and velocity, dynamic, agility. They result from coordination but also from strength. And that is the very holistic, it is related to so many aspects of human body and biology.

The simplest definition of **speed** is to **complete a given movement task in the shortest time.**

Speed consists of components such as **reaction time**, which is the amount of time that elapses from the moment you make your decision to move until the moment you initiate it, e.g. reacting to the loss of the ball on the pitch and jumping to the opponent, i.e. making a decision at the right time.

Another component is the **time of straight movement**, i.e. the time that elapses from the moment of starting the movement to its end and depends on its complexity, the level of muscle strength, the ability to generate power and the amount of resistance. The simplest example is a shot for a basket or a shot on goal.

The last component of speed is the maximum number of movements you can make in a given time, i.e. **the frequency** of movements. This component depends on the mobility of your nervous system, the composition of your muscle fibers, and is of low level of training.



This definition closes speed to the physiology and anatomy that is common to **every human being**. On this basis, the methodology of training and speed development was created, which is also common to **every sport** (the tools are different, adequate to the specificity of the sport).

### Fast or agile – Gamespeed



Speed in team games such as soccer or handball is more complex than in athletics due to the high volatility of the conditions in which players compete and the need to handle the ball. Therefore, when talking about speed in team games, you need to take into account such aspects as:

- speed of perception (nervous system, eye, ear, sense of touch )
- speed of prediction (subliminal situation analysis) (brain/IQ )
- speed of decision making (brain/IQ )
- responsiveness (nervous system, coordination, dynamic, the body / physics, conditioning)
- speed of movement **with and without** the ball (nervous system, coordination, agility, dynamic, the body / physics, conditioning)

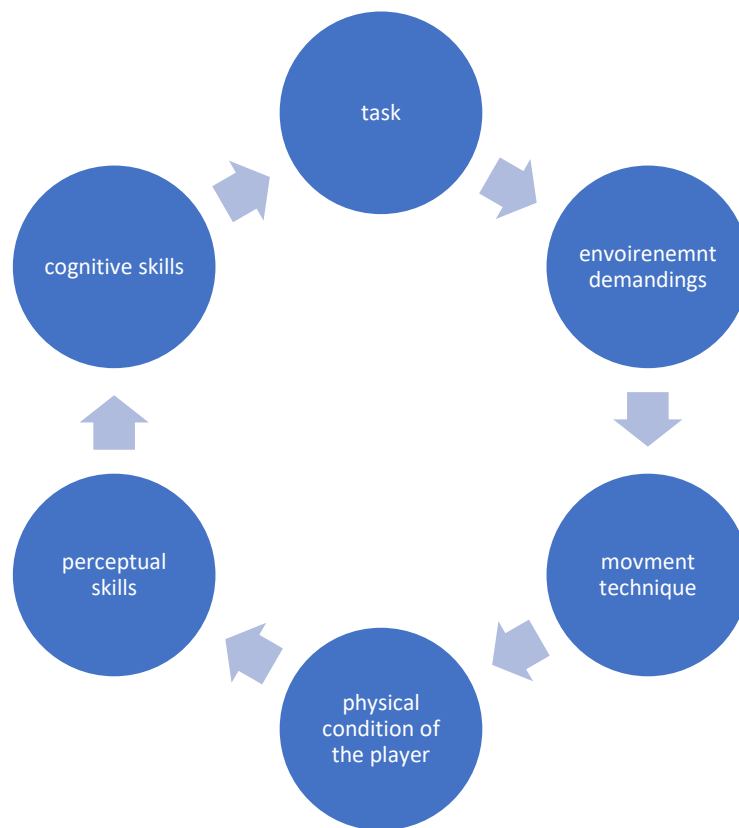
To illustrate **speed in team games**, we use the supporting terms of **dynamics** (power, strength, acceleration, frequency), **agility** (coordination, balance, strength, power) and **mobility** (flexibility, elasticity, biomechanics, forces affecting on joints/angle). To develop speed we have to train all the components, all of it!!

Nevertheless, thanks to motor training mentors such as Ian Jeffreys, we have a structured overview of the improved concept of speed training in team games.

Ian Jeffreys (a titled, outstanding trainer of physical preparation working in Great Britain, cooperates with, among others, Cardiff City players) created and disseminated the concept of "**Gamespeed**". In free translation, it is a term that defines the

**player's ability to implement specific football skills at the right pace, high efficiency and precision, and to perform field tasks controlled by changing situations and reacting to changes in the situation.**

Many factors influence your ability to function quickly while playing and training. Some we have influence, some we don't. Some are amenable to training, others are assigned in the DNA code of each of us. In the diagram below, you can see how many of the components affect a player's speed.





Example movie: The movie showing a player “dancing with the ball” between his opponents, changing the direction and speed, and frequency many times in very short time, confusing the opponents is making such a devastation so he could score.