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Scouting, training and enriching children and adolescents in football

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Optimal game-plan and training for youth football

Purpose:

Presenting **methods, principles, means and steps in scouting and training** children, boys and girls in football.

Summary of topics:

Optimal game plan at youth ages

⬇

Optimal youth scouting and training program

⬇

Biological and mental development of children and adolescents in both genders

⬇

Loads, recovery and healthy lifestyle

The program is based on:

- Global models
- Training theory
- Sports science
- Sports medicine
- Conditions, tradition and possibilities in Israeli football

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1. Foreword

Nature dictates that children should be children before they become adults. If we try to change the natural order, they will reach maturity prematurely, with no essence or power"
(Jean-Jacques Rousseau).

Every boy or girl that is involved in football or sports training dreams of obtaining achievements at a high international level.

In this dream, there is an unusual ambition. It begins with the aspiration to gain participation in a national, continental and international professional team and ends with a desire for a significant international achievement. This ambition and the motivation that derives from it make the dream tremendously meaningful in the process of mental and physical education. The problem is that many young athletes, who have managed to overcome strong opponents in competitions and tough matches (world/European/national championships for youth), go through a difficult experience in when their achievements stagnate when they reach adulthood, while their younger opponents continue to achieve success in international adult championships.

A football player's career, which lasts 20-25 years on average, there are three main stages:

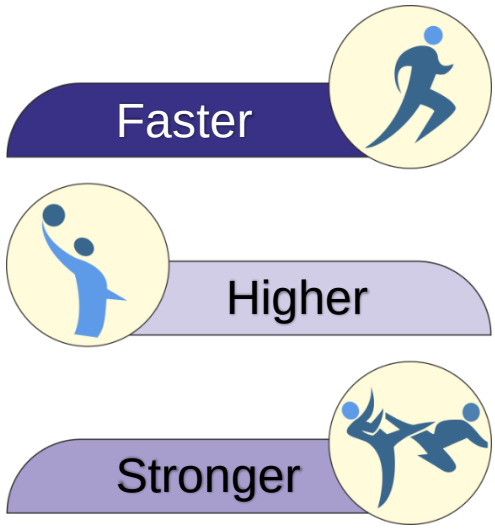
A. the training phase: lasting 10-13 years (ages 6-19), until the age when the player integrates into the adult national level.
B. The skill development stage: Lasting 4-5 years (ages 19-24), The player improves his ability and integrates at the international level.
C. Ability retention phase – several years (ages 24-36) until the end of the career.

Each of these steps is important, skipping or incorrectly performing one of them might damage, slow down and even prevent the player from reaching potential ability. This article focuses on the first stage - the training of the young player: biological development, talent scouting, causes of dropout and description of the player's training process from childhood to adolescence.

Dreams are a great start, but without focus, proper work, discipline, faith and love, the dream will not come true

High competitive professional sports

Performance of high-competitive sports is growing to be:



Professionalism, commercialization, variety of professions and the significant increase of sports events, competitions and matches make the physical and mental demands on the athlete almost inhuman.

The sport is becoming more and more like money, that passes to the dealer. Elit sports in popular professions has become a very profitable business.

Big international sports events allow only athletes who have made sports their profession to compete professionally.

Sports events in competitions, tournaments and matches have become expensive, ostentatious, effective in advertising and more profitable.

The audience demands heroes, stars with great records and dazzling abilities.

Commercial companies and businessmen sell the events as a show where the athletes star as lead actors.

As a result, the high competitive sports became captive to the media and television.

Rules and content of the events change according to the television's demand to achieve better commercialization options in contradiction to professional principles.

In several sport professions, the human body has reached its full potential

Dealing with the competitions/matches schedule is almost impossible physically, mentally and professionally. At the same time, we witness very unusual achievements, results and performances in every ability in most sports professions.

Over the past years we are witnessing a new era in the field of competitive sports, sports events are more flamboyant, expensive and profitable.

Championships events programs were changed due to commercial interests that contradict the professional principles and harm the athlete's achievements and health. The desire for better achievements and results than before has changed the world's attitude regarding the preparation of the athletes and the ways of promoting the high-competitive sport.

The changes took place in many themes: planning, peridozation, training, age layers, training methods and especially the means and conditions of training.

Modern professional and successful sport and football receives maximum promotion in most coutries. The motive could be the use of sports as a political tool. This motive was first used in Eastern countries but moved on to many countries of the world. Another motive is using sports and football as an imitation model for common sports. This is how the competitive sport should be used to improve the health of the people, even if there are doubts regarding the health benefits of elite footballers. This attitude involves increasing the social appreciation for sports and players, while highlighting them in the means of media, especially with television exposure that creates commerce and economic interest.

It can be said that modern sports in general and football in particular are enslaved to commercial interests. The media determine the value of individual players, teams and national teams. This process assume that international athletes are ready and able to compete in extremely high frequency of competitions.

Every success is just an entrance ticket to a more difficult problem (Henry Kissinger)

Information stated above results in the following developing trends:

- Elite sport is conducted in a completely professional manner.
- Number of matches-competitions and their density are increasing tremendously.
- Professional athletes must know that mediocre results cannot be marketed.

Thus, another developmental trend is required:

- Modern sports requires modern management structures.

There are two financial sources for successful sport - the state support for representation and sponsors industrial support who expect sales promotion and willing to invest their finance to link their name with the successful athlete or team.

The path to achievements, records and victories is based on well-trained talents in the most effective way. The financial means invested in sports and football should:

- Scout the talents and encourage them to choose a sports career.
- Allow the players to train with maximum loads by ensuring financial independence.
- Guarantee the talented and skilled coach a secure income that allow him to perform optimally while coaching his players.
- Funding research to improve methods and equipment in training and matches.

Professional football has a considerable weakness - they do not have an aduquate structure to **nurture the next generation**.

Any **nurturing system that is not able to take advantage of the developmental stages of youth will be proven immediately after early stages:**

- **Losing many talents**
- **Failure in reaching full extent of achievement potential**

Mental strength of a player and a team is measured during failures and recovering from them.

In modern high level of global and national football, managers of football industry must plan and promote these systems:

- Talent scouting system
- Youth care system
- Training, promoting and nurturing the coaches
- Employment conditions and special status for coaches
- Scientific sports system, integrated in the preparation of the athletes
- An integrated sports medicine system, prepares and assists the athletes
- A system with tight cooperation between coaches - scientists - doctors
- International communication for knowledge, technology and exhibit trainings and matches
- Technological system for development and construction of accessories.
- Optimal and professional game plan

In every country, football has a special status concerning budget, organization, medicine, science and management. Without this status it is impossible to demand achievements at international level.

This status is expressed by separation from the other sports in employment under special conditions, in management independence, in non-conventional medicine and science, norms of coaches employment, scientific and medical staff with professional managers (also clauses for athletes), must consider the unique requirements for non-conventional hours (weekends, evening, staying in training camps), contract’s duration is unclear mainly because of extreme professional demnads in modern football. In Israel we must be more accurate and smart dealing with training and matches processes. The minority of players, as well as the professionals and scientists, require very special conditions, planning and precision in scouting, training and matches.

Football is the most popular and widespread sport in the world. Every study concerning ranking sports according to all the possible indicators, football ranked first place far ahead of any other sport.

Globally, around 250 million people play competitive football with the participation of 320,000 professional clubs registered within 211 national football associations. Football matches have bilions spectators from all continents with an emphasis on Europe, Africa, Latin America, the Middle East and Southeast Asia. Millions are regular spectators at the stadium and billions watch the matches on television.

There is a noticeable development in women's football that is gradually reducing the gaps with the popularity of men's football.

Required abilities for achieving success in football

In recent years, football players are required to play more matches during the year, more matches in short periods of time with much higher mental and physical intensity than in the past.

During the last decades there have been significant changes in the game of football in general and professional football in particular.

International success at the international level of adult football, requires nowadays much more abilities than the 80's and 90's of the last century.

Number of matches is almost twice, while the players participate in more than one cup,it is often is not coordinated with the other schedules in terms of importance and methods of preparation.

The following table shows the number of matches in which senior players participated in European countries.

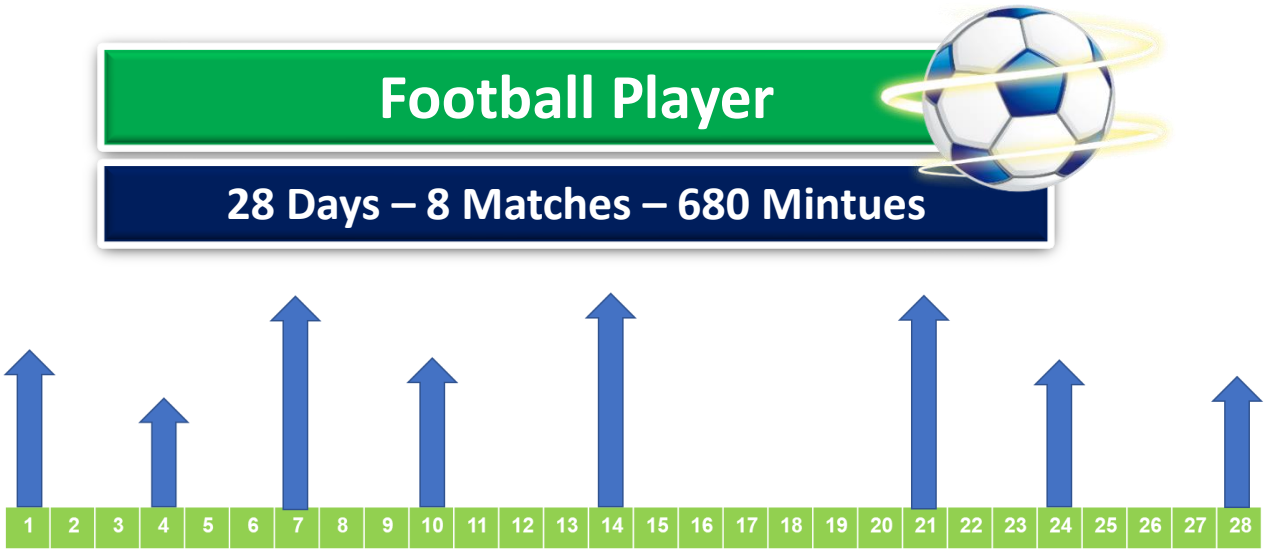
Country	80's	90's	2000	2021-22
Spain	56-40	62-56	64-56	78-70
England	52-40	64-54	70-54	84-60
Germany	52-40	60-54	70-54	72-56
France	60-40	64-54	68-52	77-70
Italy	60-40	58-46	68-52	76-60

**It's easy to believe in yourself when you're successful.
You have to do believe in yourself even when things don't work out the way you expected**

In certain cases, players participate in a phenomenal amount of matches:

A European football player may reach

60 matches - 4600-5000 minutes



In the 1980s, great players such as Beckenbauer and Pele ran 3-6 km during a match.

In recent years, goalkeepers run 4-5 km during the match and field players run an average of 11.5 km. In many cases players reach 13.5-14.5 km, in the league they may cover 300 km in 25 games. The significant changes are in the intensity and speed, which were measured 34-35 km/h. In total, a player performs 40-60 sprints resulting in 800-1200m at very high speeds. The match lasts 90 minutes while actual playing time is 55-60 minutes. Recently, “added time” changed actual playing time to 65-70. In 10 minutes, a player runs 800-1500m, half of it as aerobic activity and remaining as a high to very high intensity. 10-15% of the actions the player performs require high abilities In reaction speed, agility, running speed and explosive force. These performances are the most important and decisive in the game of football. During the match the player only touches the ball 15% of the time. On average, I takes the player 1.1-1.5 seconds to release the ball once it was received. Players’ heart rate reaches 160-170 beats per minute and lactic acid concentration is 6-10 mol/liter. The body temperature might reache 38.8-39 degrees Celsius and the players may lose 5-6 liters of fluids.

2. Football in Israel

Achievements and results

Recently, Israeli national teams and players gain success at international level competitions.

Senior team managed to qualify twice in a row to the playoff stage of the European Championship qualifiers. All youth teams qualified for the European Championships, with the highlight of reaching the finals of European Youth Championships U-19 in 2022.

Also, Israeli teams became permanent members in the group stages of the Europe. Maccabi Tel Aviv qualified twice from the group stage to the knockout rounds in the European League and the regional league. Also, Maccabi Haifa participated in the Champions League in the 2022/23 season, the first Israeli team to do so after an absence of 7 years.

Growing number Israeli players are playing abroad. As of the end of 2022, there are 34 Israeli players in Europe. Manor Solomon transferred to the English preimier league and today, Israel also has representatives in the top leagues in Germany and Spain.

Despite these improvements, we must consider the facts related to our international teams and representation

National teams

Despite the achievements of the Israeli team in recent years, since joining UEFA in 1992, team's results are not impressive.

Until the Euro 2020 qualifiers, the Israeli national team qualified only once for the playoff stage of the qualifying tournament. It was Euro 2000 qualifiers, when they finished 2nd and met Denmark for qualification battle. Differences in abilities were noticeable and the Israeli team was defeated in both games, 5:0 in Israel and 3:0 in the match in Denmark.

Gradually, the Israeli national team also dropped in the ranking over the years. After a series of qualifying tournaments in the 1990s and early 2000s in which Israel finished in third place at home, it deteriorated in the last tournaments to fourth and fifth place at group stage. While other national teams improved, the Israeli national team failed to do so and even slightly deteriorated.

Teams

Israeli teams record more appearances in European group stages in recent years due to the modification of European cups structure. The number of teams playing in group stages has gradually increased in recent years from 72 teams in 2009 to 96 teams in 2022.

This expansion helps Israeli teams to be part of the European soccer, and helps other teams from different leagues in the European middle tier to participate in advanced stages.

Simultaneously, Israeli teams often have difficulty getting through the group stage. Since the 2016/17 season, Israeli teams have qualified 10 times to group stages of the European cups. However, only 3 times they managed to qualify to the advanced stages.

There is even a larger gap when looking at the teams' results in the Champions League. Over the past decade, only two Israeli teams qualified for the group stage of the Champions League: Maccabi Tel Aviv in the 2015/16 season and Maccabi Haifa in the 2022/23 season. Although Maccabi Haifa recorded one win in their campaign, they lost the other five games and conceded an average of 3.5 goals per game. The performance of Maccabi Tel Aviv was even weaker, which has ended with 6 losses, conceded 16 goals and scored only 1 goal.

Even at the teams level, it seems that the level differences are growing. The Israeli teams, which are mostly based on local players, fail to fix the gaps from the European teams.

Players

The trend of players transferring to Europe is growing, but there are some things that indicate a decline in quality.

In the past, several Israelis played in Europe, but they played in top leagues of the continent. Today, we see quite a few players who choose to play abroad in the intermediate level leagues. In 2022/23 season there are Israeli players who play in leagues like Cyprus, Azerbaijan and Bulgaria, leagues that are not necessarily superior to the Israeli Premier League.

Also, fewer Israelis already play in leagues that are considered the five top leagues. If a decade ago we saw two or even three players playing at the same time in Spain, today there is one player in this league, Shon Weissman from Real Valladolid. Manor Solomon, who signed with the English team Fulham, is the first Israeli player to directly join a team from the first division in England in the last decade. Biram Kiel and Tomer Hamed also played in England during that time, both in the Brighton uniform, but they were bought by the team when it was playing in the second division and promoted to the English premier league.

In addition, Many Israeli players return to play in Israel after a short period, which they failed to be professionaly significant. For example, Dor Peretz and Yonatan Cohen, two dominant players in Maccabi Tel Aviv, left for Italy in the summer of 2021. Peretz signed with Venezia from the first division, played 18 games, 14 of them as a substitute and recorded 575 minutes, an average of about 32 minutes per appearance. Cohen joined Pisa from the second division, played a bit more with 25 league appearances, 14 of

them as a substitute. At the end of that single season, both chose to leave Italy and return to Maccabi Tel Aviv.

In recent years, Internationally, there is no correlation between the success of professional clubs and teams in Europe, and the senior local teams.

The Croatian national team that regularly participates in international tournaments and qualified for the World Cup finals in 2018, despite most Croatian teams, with the exception of Dinamo Zagreb, do not perform well in European cups.

On the other hand, Scotland's top teams have seen increasing success in European competitions in recent years, including two representations in the group stages of the Champions League. Despite this, the Scotland national team rarely participates in international tournaments, their only appearance in the last 20 years was at Euro 2020.

Likewise, there is no direct correlation between the most dominant players in the world, and the success of their national teams.

Mohamed Salah, one of Liverpool's leading players, rarely registers significant successes with the Egyptian national team. He qualified with Egypt only once in World Cup in 2018, apart from that, he recorded several unsuccessful tournaments in the Africa Cup.

Erling Haaland, top scorer of the Premier League in the 2022/23 season and one of the leading scorers in Germany in recent years, fails to lead the Norwegian team to an international tournament. The Norwegian national team in general has not participated in any significant international tournament since 2000.

Robert Lewandowski, the winner of the Ballon d'Or in 2021, is also unable to gain success with the Polish national team. The team does qualify for tournaments, but in the 2018 World Cup it was eliminated in the group stage and in the two subsequent tournaments, Euro 2020 and World Cup 2022, the Polish team was eliminated in the round of 16.

On the other hand, in recent decades, there have been successes for national teams with a relatively modest but yet ambitionist, motivated squad.

Complacency and euphoria are the greatest risks in sports

Achievements - Successes

- Summary and analysis of preparation methods and matches schedule at youth
- Summary and analysis of the scouting and team selection
- Summary and analysis of the match or tournament
- Summary and analysis of the direct preparations
- Summary and analysis of game loads and preparation methods in teams

Complacency and euphoria are great danger in sports

Possible reasons for weaknesses in adults vs youth

1. Multiple foreigners that limit the number of Israelis promoted to premier league
2. Military service delays the development of the young players
3. Lack of intermediate league between the youth league and the premier leagues
4. Scouting players with low potential for future success (better than others but only at a young age)
5. Reaching maximal ability at a young age due to early specialization and focus on tactics

Incorrect playing method at young ages (number, density and importance) 6

Participating in multiple frameworks without professional coordination 7

Incorrect training at a young age 8

Prolonged breaks for players who are not participating in international matches
(damaging the players who join the national team and damaging internal 9

Lack of international experience (mainly in teams' framework) 10

The process of scouting and training the young athlete

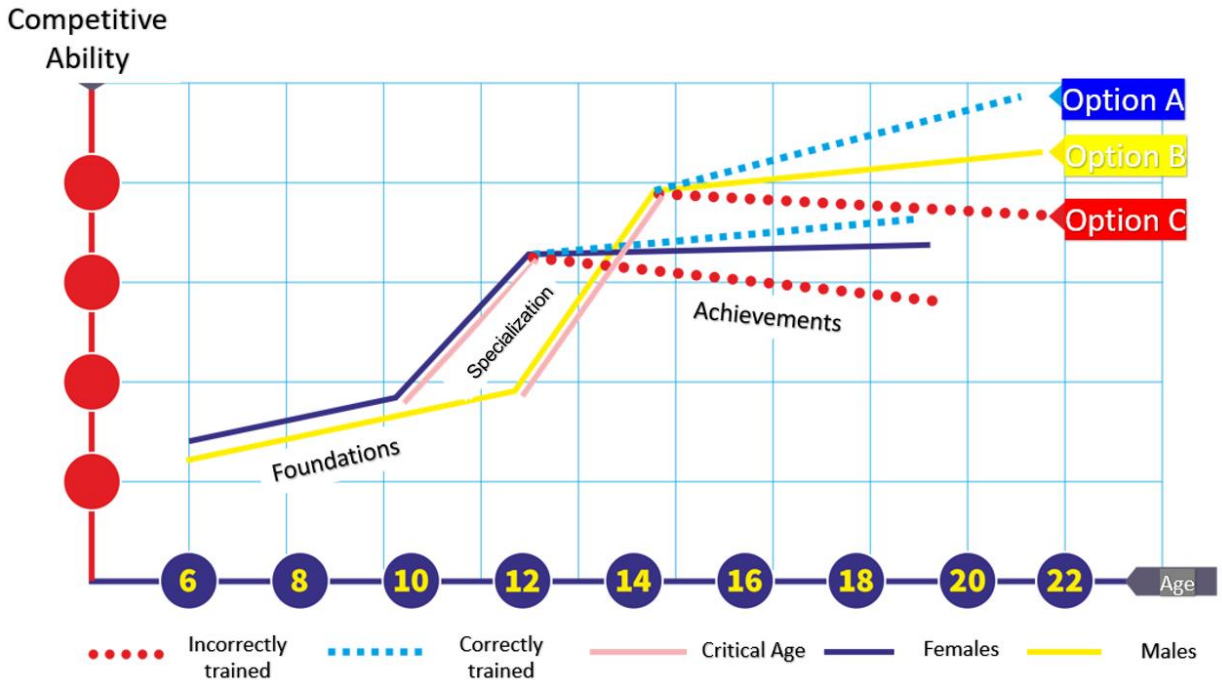
What is a correct training process?

The training of a young athlete lasts around 13 years at the ages of 6–19. The process includes three periods of training (and competitions):

- Foundations - 6–11: based on versatile training
- Specialization - 12–15: From general and versatile to specific training
- Specialization for achievements - 16–19

After the specialization for achievements period, the player starts his sports career, which may be a "competitive" (local competitions) or "achieving-representative" - career (national level or higher). This period may last 10–15 years, and its success depends a lot on previous training, at a young age.

The following diagram shows the three periods in the player's training: basics (6–11), specialization (12–15) and specialization for achievement (16–19).
The diagram demonstrates the difference between a player who underwent various training at a young age, improved his ability and also continued to improve even after the age of 18 (marked with a dashed line), compared to the athlete who did not undergo such training, and whose development was stagnated at the age of 16 (continuous line) or regressed (dots). Further explanation of diagram is given in chapter of bilogical development.



Specialization period (12-15)

After a learning a diverse base of athletic abilities, the player transition to specialization period with more specific training. The period includes physical fitness components such as strength, speed and tactical training. It is recommended to perform 9–10 hours of formal activity per week at this distribution:

- 50% - technique, tactics
- 25%–30% - general and specific physical fitness
- 10%–15% - coordination and various enrichment activities (other sports)
- 5%–10% - theoretical study (rules, technique & tactic analysis, healthy lifestyle, nutrition, etc.)

Additional 4–5 hours of non team related physical activity must be added.

Specialization for achievements period (16–19)

Volume, intensity and content of the loading:
During this period the player goes through a process of training and competitions at a competitive level (national followed by an international), which is affecting the scope and intensity of the training.

During this period, the specific training of physical fitness, technique and tactics components is crucial. The main goal of the training process is to increase the intensity and quality of the training. Meeting the goal is only possible if loading is carried out correctly, as illustrated in table 3 in the next page. The figure shows the relationship between the volume and intensity of the loading at the ages of 6-19. At 6-13, the loading should be relatively large, but at a low intensity and with short recovery. At 13-19, the athlete should already be able to work with greater intensities, but the volume should be smaller with longer recovery.

Table 3 shows that at a young age it is possible to carry out loads with large volume, low intensity and short recovery, while at an adult age the loads volume are smaller, with a high intensity and with longer recovery. In terms of the number of hours, we can certainly increase the training hours at a young age. Unfortunately, with time, physical education classes in the schools and the "street" activity have decreased significantly, so the activity can be planned according to the following principles in the next page.

Principles of loading in children and adolescents

Due to significant changes in the volume and content of youth activities, the coach needs include more enriching physical activity in the training process. The activity should include a wide variety of activities beyond the specific training that the athlete has in the team.

In the modern era there is a paradox:
Physical, mental, technical and tactical requirements in modern sports have greatly increased, but on the other hand, there is a significant decrease in physical activity at a young age, so that the athlete reaches adulthood without sufficient physical-coordinative foundations.

Children aged 8–12 can pariticipate in many hours of daily physical activity, while adults, perform high intensity specific activities with smaller volume.

Age	Loads	Volume	Intensity	Recovery
8-12	Diverse	Larger	Small	Short
13-19	Specific	Smaller	Large	long

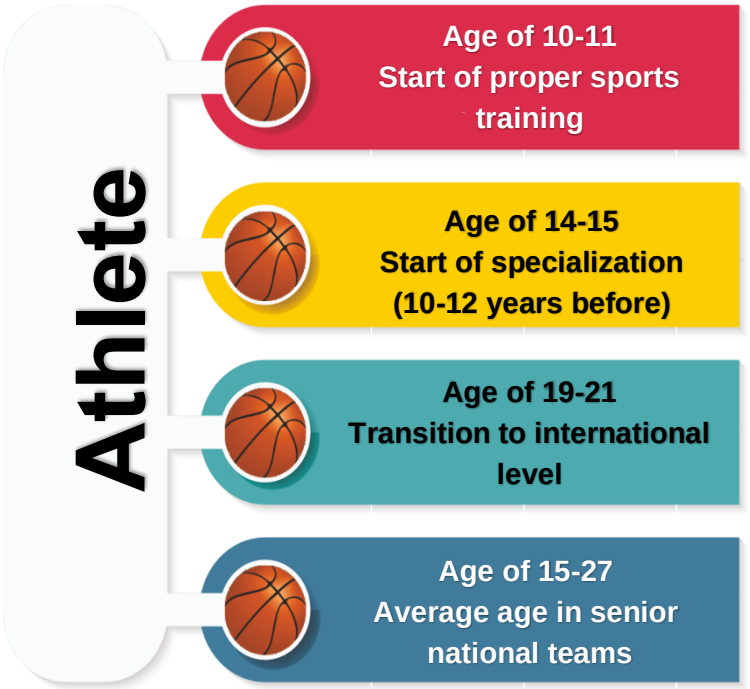
Table 3

Total Hours

Age	Weekly Hours
8	20
10	18
12	16
14	14
16	14
18+	10-14

Children's ability to perform in high intensity		
Age	**Duration of high intensity activity**	**Required recovery**
5-8	9-11m	12-14m
9-11	6-9m	2-2.5m
12-14	15-18m	5-6m

Ideal development of a competitive athlete

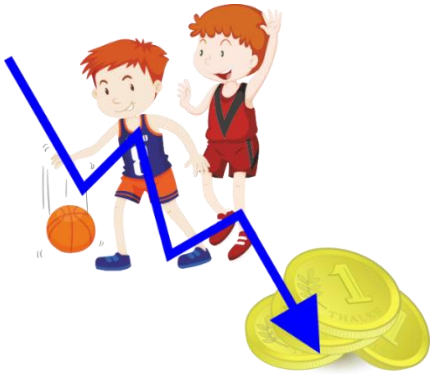


Data on young athletes

According to DOSB in Germany (2010):
In European countries, 10%–15% of youth who played sports and football, continued to adult career.
According to Management Of Israeli Sports (2015):
In Israel, out of 160,000 U-12 active children, only 40% remain at U13–14, and 50% of those, remain in U16-17.

In Israel, a relative success is observed
at the ages of 13–16,
while in adults, a large deterioration occurs.

High percentage of successful athletes have low socio-economic background



Advantages of children from the low-income status (socially or geographically):

Possible reasons for achievements stagnation and early retirement of successful and promising young athletes:

Physical activity volume in the modern era

In the modern era there is a paradox – while the requirements of physical, mental, technical and tactical performance in competitive sports have increased greatly, there is a significant decrease in the average physical activity at a young age, despite children are able to participate in many hours of various daily physical activity.

Heinz Werner, a german national football coach, presented alarming data in 2008 as part of coaches training course at Wingate College. The data came from a study conducted in the United States (2005). According to Werner, when comparing hours of daily activity between different countries and population types in the past vs modern era, nowadays a 15-year-old boy performs 15 minutes of physical-sports activity compared to 4–6 hours in the past. This minor engagement in activity is also evident when comparing to modern young boys in low income areas and countries in Africa, Asia and South America, where they are active for several hours a day.

Daily activity hours in different types of activity among 15-year-old boys and girls in different populations - nowadays vs the past:

Type / Era	Sports	Movement	Standing	Sitting	Lying
Modern era	15 minutes	1 hour	5 hours	9 hours	9 hours
In the past/ Low income areas	4-6 hours	3 hours	2 hours	6 hours	8 hours

When combining the lack of activity hours with the inappropriate activities by the coaches, it can be understood that many athletes become adults without a sufficient physical-coordinative base, which leads to difficulties in meeting the required physical loads that increase with age.

In addition, we must consider the poor coordination and physical activity in the modern era, which requires the coaches and the system to make significant improvements in enrichment and training content.

Physical activity of a 10-year-old child

From an established neighborhoods within a club	From a low-income neighborhood/ In the past
In "mom's car"	**Walks to school 2X 1–6 km per week**
Stays in class – no adequate school yard	**5-4 breaks X 10-15 minutes of playing soccer/basketball/catch 4 weekly hours**
Studying	**Escapes 1-2 hours of study a day and runs outside 6 weekly hours**
Returns home to the computer, goes 2-3 times a week to training 6-8 hours a week	**Returns home and goes out again for 3-4 hours x 6 days 20 weekly hours**
Total: 6-8 hours a week	**Total: 30 hours a week, 6 km**

Lack of youth international experience

An example:

Type of sport	19 years old Belgium athlete	19 years old Israeli athlete
Football and Basketball	100 international matches (club tournaments)	0-10 matches
Field and track	30 international competitions	1-6 international competitions
Judo	100 international battles	10-30 international battles

Additional reasons for stagnation in achievements and early retirement

A. Youth departments have constant pressure for short term success, by the coaches, parents and the entire system. The competition/matches program dictated by the association and the requirements determined by sports organizations (for example, achievements as an applying condition for Israeli Defence Force) aim to fulfiil potential abilities as soon as possible, preventing optimal development for higher achievements and results as adults.
As a result, scouting of athletes is also performed in short-term considerations. Children are selected if they are able to bring success immediately, instead of selecting children who have the potential that with a proper training process, may bring higher achievements in the long term.

B. A phenomenon **of euphoria and superlative for young individual and teams** successes. Fame and glory lead the young athlete and his environment to a "minefield" that prevents effort, struggle and motivation which are important for future success.

C. **Competitions and matches program is not coordinated** and sometimes creates a conflict between two organizations (between schools assosications or international team and the club).

Optimal situation and comparison with European countries (vs Israel)

	Age 16-19	Age 13-15
Matches per year	36-40	24-30
Club's tournaments per year	2-3 (0-1)	3-4 (0-1)
Clubs' international matches per year	4-10 (1–0)	5-2 (0)
International team matches per year	12-20 (4-6)	5-10 (0-1)
Matches period duration	10-11 Months	9-10 Months

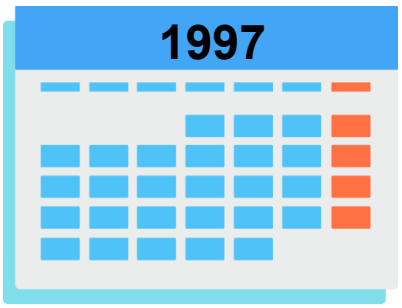
Coach's mistakes in youth traininng

- Replication of adults aspirations and targets
- Overtraining
- Overtraining specific exercises
- Emphasing a lot of tactics
- Inhibits creativity
- Wrong scouting of talented players
- Boring exercises

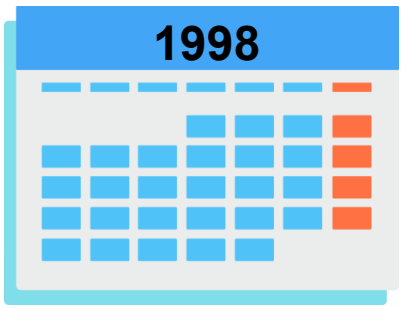
It isn't making mistakes that's critical; it's correcting them and getting on with the principal task. (Donald Rumsfeld)

Players from youth league: number of players and current leagues

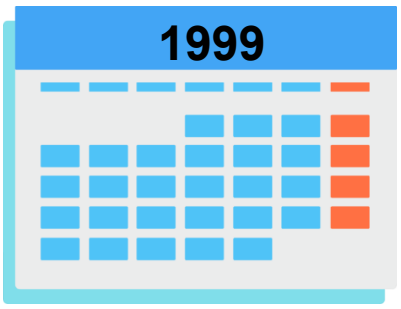
- 13 matches in the first league
- 27 matches in second league
- 80 matches in third league



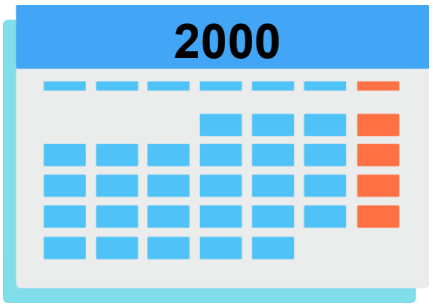
- 17 matches in the first league
- 1 in Europe
- 41 matches in second league
- 108 matches in third league



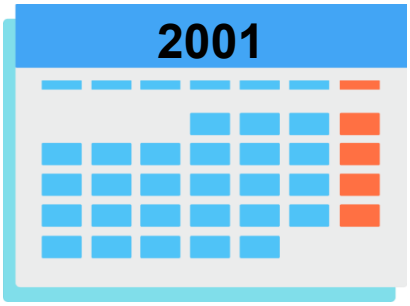
- 17 matches in the first league
- 2 in Europe
- 29 matches in second league
- 116 matches in third league



- 28 matches in the first league
- 2 in Europe
- 47 matches in second league
- 135 matches in third league



- 21 matches in the first league
- 2 in Europe
- 41 matches in second league
- 141 matches in third league

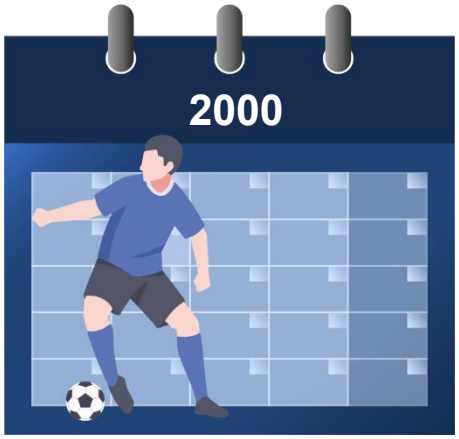


Players who played for the national

- **28 played in the junior national teams**
- **2 in all three teams, 10 in two teams**
- **16 in one team**
- **From U-17 to U-19 national team - 11 continued, 6 did not**
- **From U-19 to U-21 national team - 3 continued, 14 did not**

- **36 played in the junior national teams**
- **7 in all three teams**
- **11 in two teams**
- **18 in one team**
- **From U-17 to U-19 national team - 13 continued, 8 did not**
- **From U-19 to U-21 national team - 12 continued, 9 did not**

- **28 played in the junior national teams**
- **4 in all three teams**
- **6 in two teams**
- **18 in one team**
- **From U-17 to U-19 national team - 9 continued, 11 did not**
- **From U-19 to U-21 national team - 5 continued, 7 did not**



- **39 played in the junior national teams**
- **8 in all three teams**
- **9 in two teams**
- **22 in one team**
- **From U-17 to U-19 national team - 13 continued, 6 did not**
- **From U-19 to U-21 national team - 11 continued, 15 did not**

- **35 played in the junior national teams**
- **4 in all three teams**
- **10 in two teams**
- **21 in one team**
- **From U-17 to U-19 national team - 13 continued, 14 did not**
- **From U-19 to U-21 national team - 5 continued, 12 did not**

- **On average, 5.6 players are promoted from cadets to youth**
- **On average, 5.4 players are promoted from youth to reserves**
- **Only 18 players (born in 97, 98, 99, 2000, 2001) out of 75 (24%) played in all the youth teams.**
- **37 players (49%) among 75 players in the youth teams were only in one team. 7 players of them, reached the senior team.**

A significant part of the players of the top youth teams were scouted and nurtured in small teams

(Random sample, November 2022, Vicki Glam)

Maccabi Petah Tikva	10 out of 11 players
Maccabi Tel Aviv	9 out of 11 players
Hapoel Tel Aviv	9 out of 11 players
Maccabi Haifa	9 out of 11 players
Maccabi Netanya	10 out of 11 players

Players born in 97-2001

(Expirienced in youth national teams)

A total of 166 players played in the youth national teams:

- 25 in 3 national teams (15%)
- 46 in 2 national teams (27%)
- 95 in only one national team (57%)
- 59 players continued from U-17 to the U-19 national team (56.7%), 45 did not continue
- 36 players continued from the U-19 team to the Olympic team (38.7%), 57 did not continue

-

Prolonged participation in national teams and achievements

Current team	Tournaments participated	Year of birth	Player
Dynamo Moscow	9	200	Eden Kartzev
Hoffenheim	6	1999	Ilay Elmakayes
Celtic	6	2001	Liel Abada
Apollo Limassol	6	2001	Idan Shachar
Maccabi Tel Aviv	6	1999	Eylon Almog
Hapoel Tel Aviv	6	2001	Osher Davida
Fulham	5	1999	Manor Solomon
Hapoel Hadera	6	1998	Haviv Ohayon
Ashdod	6	2000	Mohamad Kanaan
Maccabi Petach-Tikva	6	2000	Or Blorian
Hapoel Hadera	5	2000	Tomer Machluf
Bnei Yehuda	5	1998	Itzhak Asefa
Umm el Fahm	5	1998	Anas Muhammad

Number of (registered) soccer players in each age group

2001	2000	1999	1998	1997	played in
2396	2115	1864	1935	1705	U-10
3062	3122	2845	2546	2389	U-11
3485	3302	3235	3053	2760	U-12
3819	3595	3465	3379	3060	U-13
3414	3318	3036	3080	2885	U-14
3105	3161	3133	3018	2848	U-15
2456	2334	2385	2334	2019	U-16
2269	2394	2387	2404	2220	U-19

- Dropout of 40-50% from U-19 to seniors.
- Dropout of 25-30% in U-16 transition.
- Dropout of 40-50% from U-16 to U-19.

Registered players and teams from Israeli youth divisions (2022)

Age	Teams	Players
U-8	32	820
U-9	95	2,052
U-10	185	3,695
U-11	223	4,421
U-12	204	4,300
U-13	212	4,267
U-14	158	3,388
U-15	142	3,044
U-16	108	2,223
U-19	143	3,239
Total	1502	31,723

Summary of table

- **About 35% drop out from U-16 to U-19 (from about 2,200 to about 1,500 players).**
- **About 25% drop out from U-15 to U-16 (from about 3,000 to about 2,200 players).**
- **About 30% drop out from U-13 to U-14 (from about 4,300 to about 3,400 players).**

Conclusion: it is necessary to take action in order to develop football infrastructure professionally and persistently over time. Many countries have do so, created a professional program that led to the development of football through **coaches, clubs and youth training.**

Football Association is working in this direction, with hope for success in the near future. This type of program (started in Israel in 2018) takes about 6-8 years to achieve real success.

In conclusion:
The main goal of scouting and cultivating talented athletes for future success is sometimes forgotten! As a result, wrong planning and training are chosen.

Possible solutions

Training process for young athletes includes three stages: the first stage occurs up to the age of 11, the second stage occurs at the age of 12–15 years and the third stage is from the age of 16-19.

At the first stage, various-coordinating activities in diverse sports should be increased. For example, a **football player** at these ages should engage in combat sport (judo, karate or other martial arts) and gymnastics. In some cases, the coaches fear from fatigue, therefore preventing the players from engaging in another framework. This mistake harms development and especially preventing to fulffil maximal abilities in the future. Another reason is coaches' fear of talented kids to prefer the other sport framework, as they will remain with less talented athletes. Also, situations that prevent young athletes from being active in the mornings (see below) also harm their training and development.

In this age group (up to 11), the athlete must be trained for the types of loads he will have to deal with in the future. For example, he must learn the technique of lifting weights and work with light loads and gradually proceed the next levels with abilities that will allow him to deal with development towards intense training (age 17–19). In order to deal with these tasks, it is recommended to choose physical education teachers with educational abilities, focusing on studying rather than training.

Possible training frameworks

Israeli schools curriculum allows the existence of various training frameworks:

Day boarding schools: Day boarding schools allow daily activities from noon to evening. In addition to studies, education and social and cultural activities, the children are involved in physical activity, general and specific training, and also other sports.

Morning trainings: morning trainings can be performed before school or as part of it. By doing so (especially in the second stage), it is possible to increase the volume of loads, enrich and supply the required contents for the training process.

Training camps: during vacations, training camps allow the children to study, train and participate in tactical and even social and cultural activities (lectures on healthy lifestyle for the young athlete, constitution, good citizenship and more).

These actions, together with non-obligatory competitions, matches and tournaments, make it possible to identify and scout the most talented players and help them reaching their full potential in the future.

In conclusion:
The federation, the associations and the coaches must avoid harming the young athletes with unappropriate demands. With good will and cooperation between all the parties, it is possible to fulfill the high potential, to scout and train the children in the right way in order to compete in Israeli sports and in participate in international level in the future.

Top level achievements by age and stages

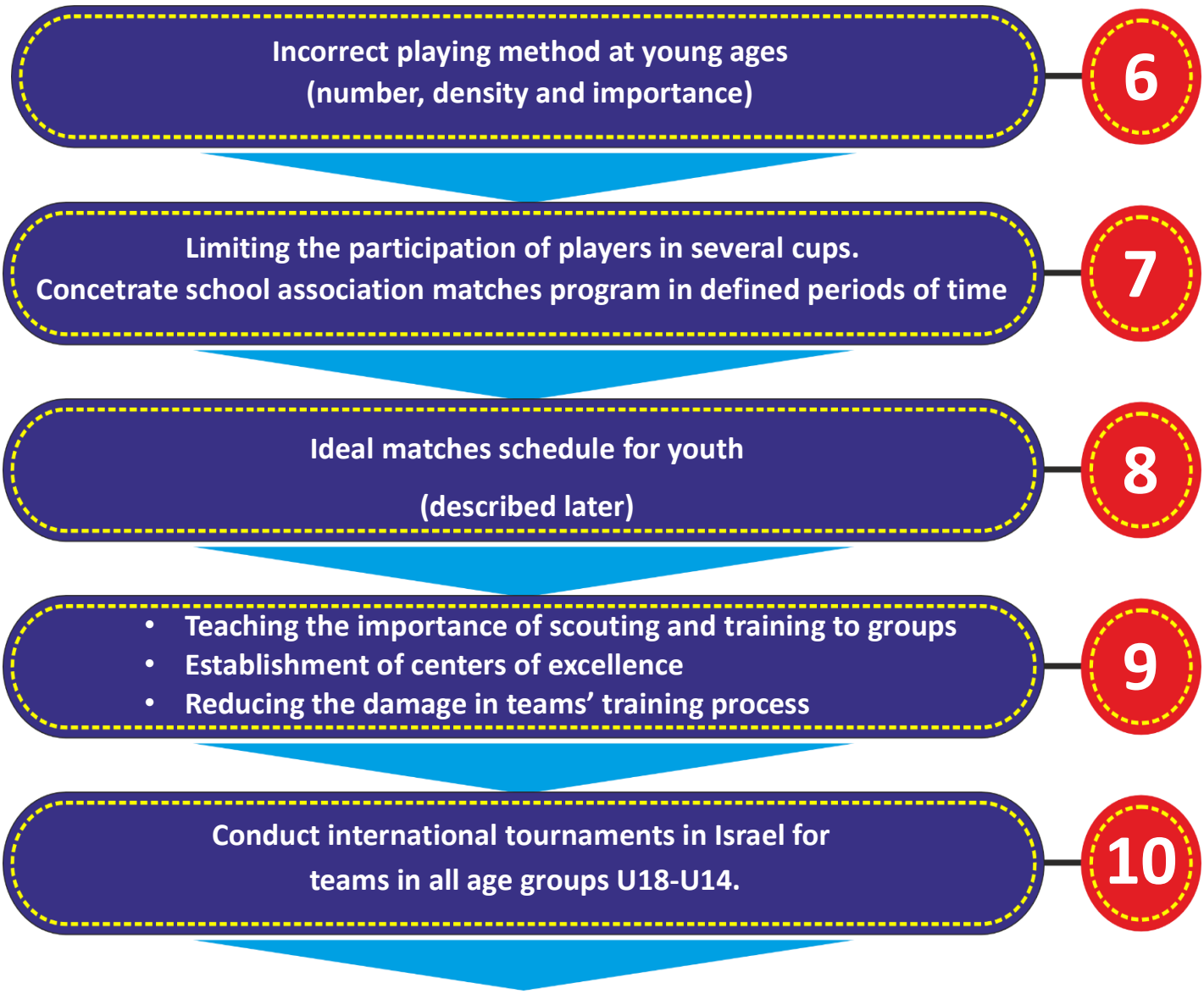
Artistic gymnastic	
Stage	**Age**
Initial basic training	5-7
Initial specialization	9-10
Transition to competitive level	14-15
Average age of winning an Olympic medal	19.9

100m Sprint	
Stage	**Age**
Average age of runners	Men: 24.2 Women: 21.8 In London: 26.4
Initial basic training	Men: 10-12 Women: 8-9
Initial specialization	Men: 14-16 Women: 12-13
Transition to competitive level	Men: 19-20 Women: 16-17

Football	
Stage	**Age**
Initial basic training	10-11
Initial specialization	14-15
Transition to competitive level	19-21
Average age in international team	26

Possible solutions for weaknesses of the Israelis national team and professional leagues

1. Reducing the number of foreigners in the professional teams
2. Specific program for unique training and matches conditions for players in military service.
3. Establishing another league in U17-U23 age groups, so that there will be two leagues (currently, there is only one league)
4. Conduction physical and coordination ability tests Simultaneously with league's matches
5. Providing incentives (for the club and the player) for successes of adult players



In high priority:
Improving status, terms of employment, training process, and further coaches qualifications.

3.Optimal game plan for youth football

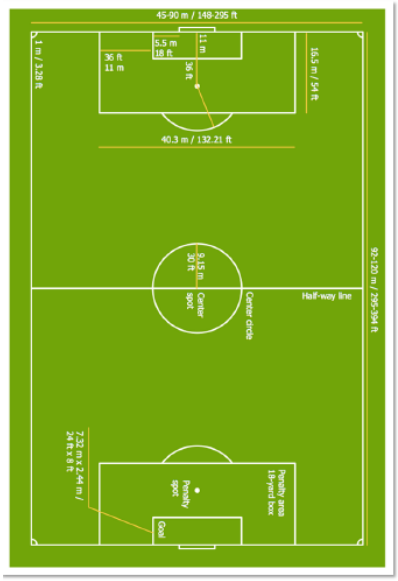
Competitions and matches play an important role in youth training. Both should be integrated into the training process to increase motivation and contribute to professional, social, educational, mental and aspects.

There are different options for competitions:

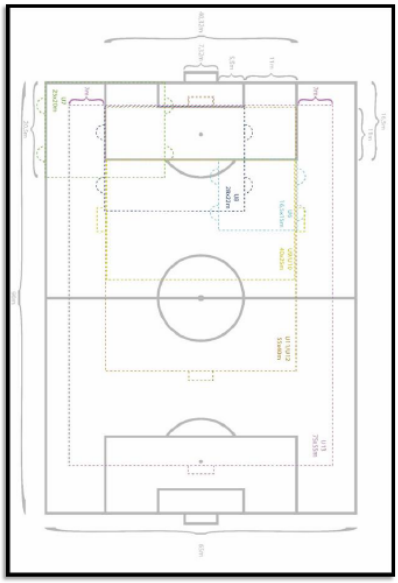
1. League matches - the league can be regional or national.
2. Tournaments with several teams. Enables greater participation and more game time for the players.
3. Festivals - a social-cultural event

At the younger ages (at least up to U12) it is recommended to combine festivals and tournaments and minimize mandatory league matches.

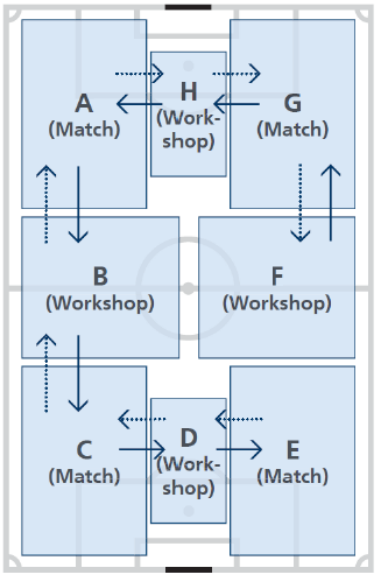
LEAGUES



TOURNAMENTS



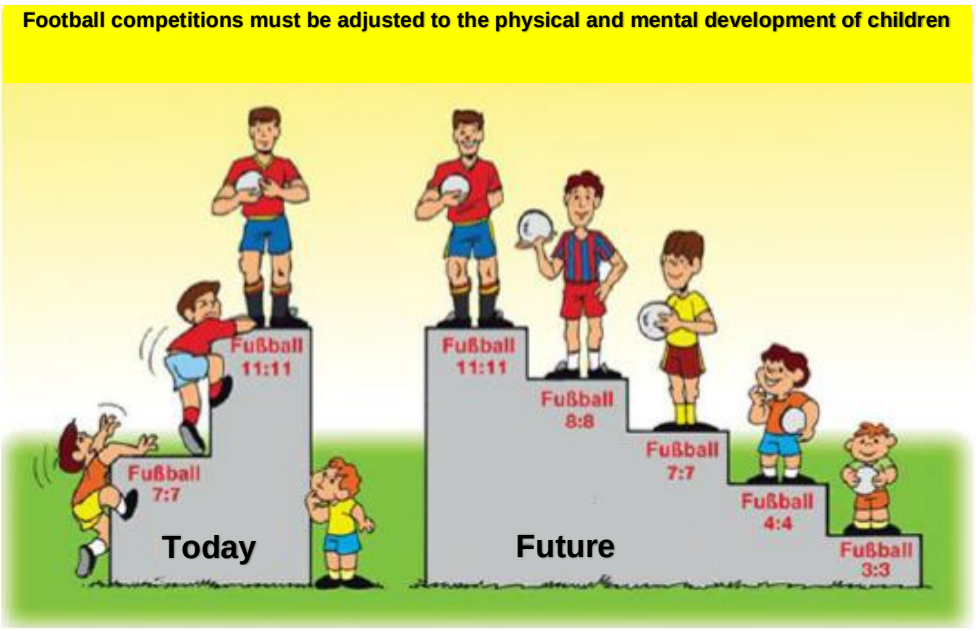
FESTIVALS



At different ages, a different approach to the competition. The youth coach does not compete, but he selects the competitors!

THE IMPORTANCE OF PROPORTION

For children, the football game should be like a shoe, neither too big nor too small



Children must progress gradually and continuously.
Step by step, less stress and more fun

KIDS' FOOTBALL IS CHANGING

An increasing number of countries are practicing smaller game formats

Question	England	Holland	Germany	Italy	France
At what age does your Association formally begin/recommend coaching children?	5 years	No official age, usually around 5 years	U 7		U 7 (40 + hours)
In your country what age do children begin playing full 11-aside competitive matches?	11 years	11 years	Mostly U15 But in some regions U13 or U11	12 -14 years 60 minute matches	U 14
What age does the Association recommend playing 11 aside?	U 11	Researching 9 v 9 for U12 and then begin 11 v 11 at U13	U 15	12 -14 years	U 14
In your country what age do players begin playing for trophies & medals?	U9	Recommend U12, but admit this is not the case.	National Competitions U15 Regionally 9/10 years old		U 12 & 13
What age does the Association recommend playing for trophies & medals?	U 11 however this has been met with opposition.	U 12	U 11 but in some regions they play earlier		U 12 & 13
Please can you tell what numbers your Association recommends for the following age groups?					
6 – 8 year olds	4 v 4 & 5 v 5 where facilities exist	4 v 4	7 v 7 but smaller allowed	5 aside	5 v 5 (U7-U9)
8 -10 year olds	7 v 7	7 v 7	7 v 7	7 aside	7 v 7 (U10-U11)
10 – 12 year olds	11 v 11 (but starting to promote 9v9)	7 v 7 (9 v 9)	7 v 7, 9 v 9	9 aside	9 v 9 (U12-U13)
12 – 14 year olds	11 v 11	11 v 11	11 v 11 but 9 v 9, 7 v 7 allowed	11 aside (30 mins each way)	11 v 11 (U14 +)

A 10-year-old is not half of a 20-year-old, he needs to participate in a format that matches his stage of development.

WHY SMALLER GAME?

7 v 7. BASIC RULES

FIFA

7 reasons to play 7-a-side

- To adapt the game to the existing fields (11-a-side).
- To have more players playing (11-a-side).
- To be an intermediate size between 5-a-side and 9-a-side.
- To introduce the concepts of position and zone.
- To develop the game among a team.
- To introduce new rules.
- To be a source of progress and development.

9 v 9. BASIC RULES

FIFA

9 reasons to play 9-a-side

- To adapt the game to the existing fields (11-a-side).
- To have more players playing (11-a-side).
- To have an intermediate size between 7-a-side and 11-a-side.
- To improve the occupation of the field.
- To have a good harmony between the lines.
- To develop the game on the wings.
- To encourage the offensive game.
- To develop the adaptation of the individuals and the team.
- Progress and development.

The Manchester United 4 v 4 Pilot Scheme

On Average 4v4 versus 8v8 had:

1. **135% more passes**
2. **260% more Scoring Attempts**
3. **500% more Goals Scored**
4. **225% more 1v1 Encounters**
5. **280% more Dribbling Skills (tricks)**

- **It is a very flexible format, pitches can be marked out with cones and you can have as many different 4v4 games as you have kids.**
- **Everyone plays**
- **Many touches of the ball**
- **The different games bring out different skills**
- **Many opportunities for everyone to score goals**
- **Lots of problem solving opportunities without coaches talking you through the game**
- **Kids are not just a defender or an attacker but a footballer and have a much better all round understanding of the game**
- **You don't even need to play another club, you can make it in-house if you have enough kids**

Actually the list is endless.

A simulation of street football!

VARIOUS MODELS WORLDWIDE

Different models and formats, same goal: More games, more decisions, more touches!

ENGLISH MODEL: 5v5-7v7-9v9-11v11

The FA Recommended Pitch Sizes							
Age grouping	Type	Recommended size **without** runoff (safety area around pitch)		Recommended size **including** runoff (safety area around pitch)		Recommended size of goal posts	
		Length x width (yards)		Length x width (yards)		Height x width (ft)	
Mini-Soccer U7/U8	5 v 5	40	30	46	36	6	12
Mini-Soccer U9/U10	7 v 7	60	40	66	46	6	12
Youth U11/U12	9 v 9	80	50	86	56	7	16
Youth U13/U14	11 v 11	90	55	96	61	7	21*
Youth U15/U16	11 v 11	100	60	106	66	8	24
Youth U17/U18	11 v 11	110	70	116	76	8	24
Over 18 (senior ages)	11 v 11	110	70	116	76	8	24

U.S. MODEL: 6v6-7v7-8v8-9v9-11v11

STAGES	AGE GROUPS	CHARACTERISTICS
INITIAL	U6	Very young players from 5 to 8 years of age love to play. Therefore, all practices should be based on fun games. Players must spend the maximum time possible in contact with the ball and experiment by themselves. For the first time the player has to build a relationship with other players. Give different responsibilities to the players in order to develop a sense of team. Basic motor skills like walking, running or jumping have to be combined with ball handling and ball control.
	U7	
	U8	
BASIC	U9	Pre-pubescent players from age 9 to 12 years have a special ability to learn. Therefore, this is the right age to work on specific soccer techniques and skills. Developing good technique is essential at this age. 1v1 and 2v1 attacking and defending situations are important to develop individual skills as well as the passing techniques to develop the necessary team game. Use small-sided games to develop basic attacking and defensive principles. Other important aspects of tactical training are possession, combination play, transition and finishing in the final third, as well as zonal defending. Players will rotate in two or three different positions to avoid early specialization. Speed, coordination, balance and agility are the main physical aspects to improve at this stage.
	U10	
	U11	
	U12	
INTERMEDIATE	U13	At this stage, training sessions are orientated more toward tactics and the player will practice in bigger spaces. Players must practice all different types of techniques at this stage. Strength and endurance should be part of the fitness training. Coaching methods have to consider and preserve players' health since they will be experiencing many changes due to puberty at this stage. Warm-ups and cool downs are essential as is dynamic flexibility. Players must develop discipline at this stage by following the instructions of the coach both during and outside training sessions.
	U14	

U.S. Soccer curriculum contains recommendations for training at all ages.

DANISH MODEL: 3v3-5v5-8v8-11v11

Year Group	Game Type	Field Size
U5, U6, and U7	3v3	13x21m
U8, U9, and U10	5v5	30x40m
U11, U12, and U13	8v8	52.5x68m
U14 and over	11v11	68x105m

Comparing data from a Danish study on actions of young soccer players:
8 x 8 vs 11 x 11 formations

U13 C	8v8					11v11					Difference		
No.Players	Minutes	Actions	Per Min.	Success	Success %	Minutes	Actions	Per Min.	Success	Success %	Actions	Per Min.	Success Act.
3 P. (03)	21	55	2,62	50	90.91	24	35	1,46	26	74.29	20	1,16	24
4 P. (04)	21	48	2,29	37	77.08	24	20	0,83	12	60.00	28	1,45	25
7 P. (07)	21	27	1,29	19	70.37	24	37	1,54	29	78.38	-10	-0,26	-10
6 P. (06)	21	34	1,62	23	67.65	24	15	0,63	9	60.00	19	0,99	14
8 P. (08)	21	52	2,48	39	75.00	24	9	0,38	6	66.67	43	2,10	33
9 P. (09)	21	54	2,57	39	72.22	24	20	0,83	18	90.00	34	1,74	21
10 P. (10)	21	30	1,43	25	83.33	24	27	1,13	22	81.48	3	0,30	3
Average		42,86	2,04	33,14			23,29	0,97	17,43		19,57	1,07	15,71

Averages demonstrate significant differences:

- **57% more actions in 8x8 formations**
- **2 actions per minute in 8x8 vs a single action in 11x11 formations**
- **92% more successful actions in 8x8 formations**

Austrian Model

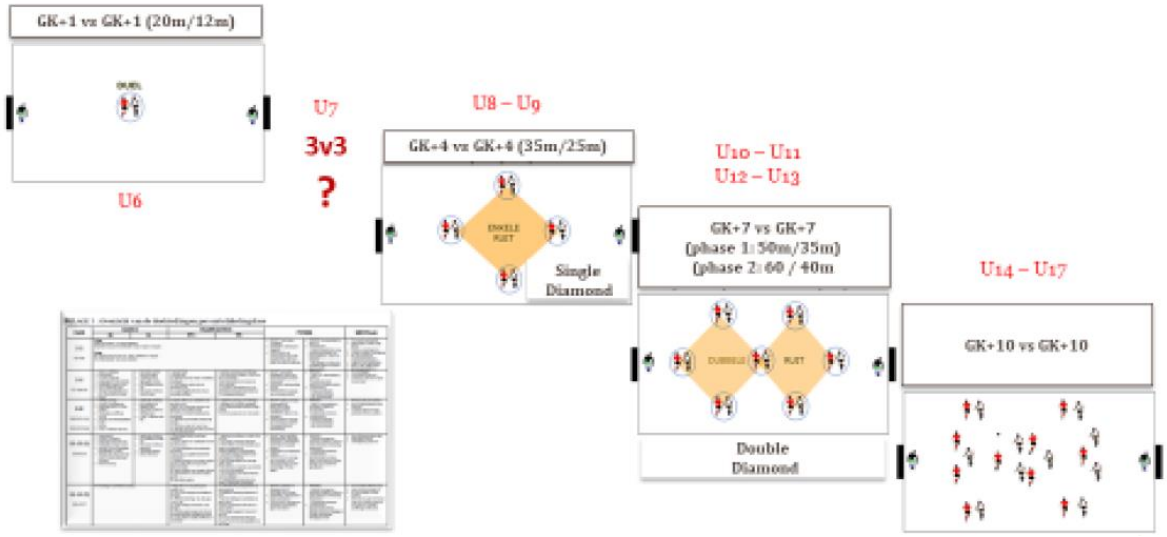
Age No. Players	U6 2v2	U7 3v3	U8 3v3	U9 5v5	U10 5v5	U11 7v7	U12 7v7	U13 9v9	U14 11v11
Ball Size	3	3	3	4	4	4	4	4	4
Field Size (meters)	16X15	25X20	29X22	40X25	40X25	55X40	55X40	75X55	100X60
Goal Size (cm)	120X80	120X80	120X80	300X160	500X200	500X200	500X200	500X200	732X244

BELGIAN MODEL: 2v2-3v3-5v5-8v8-11v11

Phase	Age	Development Vision
Phase 1	U-4/5	**Multimove School** ➢ Introduction to the ball
	U-6	➢ Phase of exploration
Phase 2	U7-U17	**Phase of personal development** ➢ Basics Basic Technique ➢ Team Tactics Functioning in a team
Phase 3	U18-U21	**Phase of postformation** ➢ Integration in senior football ➢ Perfectioning or inproving as a result of an individual oriented approach

In this model, the preferred style of play is especially taken into account.

Belgian Development Vision – Learning Plan



Data from an Israeli study during 2014-2016:

- In a 11V11 match with U12-U13 ages (second graders and sometimes first graders) it was found that many players did not touch the ball and did not perform a intensive action for 6-12 minutes.
- The 11V11 match in U12 age group was slower with less actions and touches on the ball than that of U11 (3rd graders) in a 7V7 or 8V8 match that was played on half of the field.
- At the same time, it was found that in a 7V7 or 8V8 match on half of the field, had a drastic decrease in concentration and accuracy of the players after 6-8 minutes.

DILEMMAS

How many players? What are the proportions? What are the rules? Organization?

In Conclusion

In light of the studies and models presented, during youth training, focus on the following:

less players - smaller space - simple rules - more ball contact - more social interactions - size of the goals in proportion to the size of the child - more fun - more tension - better co-operation - better outcome - better vision of game - more learning moments

Activity model for youth divisions teams in different ages

Edited by Dr. Ben-Melech Y., Austrian, Swedish, English and German staff (Sweden, November 2011)

Matches					Training						
Age	No. Players	Field size (m)	Game time (m)	Game type	Weekly units	Personal training	Training minutes	Training type and emphasis			
U8	5x5	25x25	10x4	Tournamets only				General Coordination	Technique	Physical Fitness	Tactics
U9	5x5	25x25	12x4	Regional league and Tournaments	3		75-90	45%	50%		
U10	8x8	50x50	15x2	Regional & tournaments	3-4	0-1	70-90	40%	45%	10%	5%
U11	8x8	50x50	20x3	Reginal & national & tournaments	3-4	0-1	75-90	35%	45%	10%	10%
U12	7x7	50x50	25x3	Reginal & national & tournaments	3-4	1	90	30%	45%	15%	10%
U13	9x9	70-75x50	35x2	Reginal & national & tournaments	3-4	1	90	25%	40%	25%	10%
U14	11x11	90-100x50	35x2	National & tournaments	4	1	90	20%	35%	30%	15%
U15	11x11	90-100x50	40x2	National & tournaments	4	1-2	75-90	20%	30%	35%	15%
U16	11x11	90-100x50	40x2	National & tournaments	4-5	1-2	75-90	15%	30%	35%	20%
U18	11x11	90-100x50	45x2	National & tournaments	5-6	1-2	75-90	10%	30%	30%	30%
U20	11x11	100x50	45x2	National	5-6	1-2	75-90	10%	30%	30%	30%

Recommendation for football game settings (Based on presented studies and models)

	3V3	5V5	7V7	9V9	11v11
AGE GROUPS	6Y,7Y	8Y,9Y	10Y	11Y	12Y+
BALL SIZE	3	3	4	4	5
PITCH SIZE	21x15	37x27	55x37	73x46	Normal
GOALS SIZE	3x1m	4x1,8m (hendball)	5v2m	6v2m	7x2,4m
DURATION	up to 4 goals/2x10min	Up to 6 goals/3x10min	2x20min	2x25min	2x30/2x35/2x45
FAULS	2min out	2min out	2min out	Normal	Normal
SET PIECES	However	No direct free kick	No direct free kick	Normal	Normal
FORMATION	Triangle	Rhombus+1	1-2-3-1	1-2-5-1	1-4-3-3/1-3-5-2
CHANGES	Flying	Flying	Flying	Flying	Normal
ORGANIZATION	Festivals	Festivals	Tournaments	Tournaments/mini leagues	Leagues

Despite the recommendation for a 9v9 game, It is recommended to continue playing 8V8 on a half field (laterally) also at the age of U13-14. Reccomendation dervies from lack of fileds in Israel and also to avoid reducing number of player in the transition from age 11 to 12-13.

4. Youth football training

(towards potential fullfilment as adults)

Methods and means for scouting children and youth

School tournaments and championships

School sport events (also in other sports)

In the neighborhood - community activities

in different sports and frameworks

Tests

School/neighbourhood/community tournaments

Recommended volume of training components at youth

	9-10	11-12	13-14	15-16	17-19
Weekly training units	3 (180 m)	3 (180 m)	4 (280 m)	5 (350 m)	6 (450 m)
Enrichment and personal training units	2 (90 m)	2 (90 m)	2 (90 m)	2 (100 m)	3 (150 m)
Total	5 (270 m)	5 (270 m)	6 (370 m)	7 (450 m)	9 (900 m)

Recommended distribution of training components at youth

	9-10	11-12	13-14	15-16	17-19
Games of movement, coordination and diverse activities	40% (100 m)	30% (80 m)	25% (90 m)	15% (60 m)	5% (5 m)
Strength		Body weight 5% (15 m)	Body weight, jumping, core 10% (35 m)	15% (60 m)	15% (90 m)
Speed and agility	Reaction 5% (13 m)	Reaction 5% (13 m)	Running speed 5% (15-20 m)	5% (25 m)	5% (30 m)
General endurance				5% (45 m)	5% (30 m)
Theoretical	10% (25 m)	10% (25 m)	10% (35 m)	10% (45 m)	10% (60 m)
Total (without theoretical)	45% (115 m)	40% (110 m)	40% (140 m)	45% (190 m)	35% (210 m)

Guidelines for training and cultivation of youth (U7-8)

Objectives:

- Training, enrichment and diverse cultivation of movement abilities
- Learning ball activities
- Encouraging creativity in movement with the ball while encouraging enthusiasm and joy
- Learning basic and simple rules of the game

Training composition

Ball game = 20%
General movement instruction = 30%
Simple tasks with a ball = 20%
Small games = 30%

Instructions for the coach

- Activity within small groups, during movement combined with enthusiasm and drive
- Simple tasks with a lot of playfulness and freedom
- Learning simple rules while receiving feedback from the children

Guidelines for training and cultivation of youth (U9)

Objectives:

- Fun games
- Focus on joy and life happiness
- Multiple movements
- Learning basic techniques
- Basic throws technique
- Ball games, a variety of simple ideas, perform with enthusiasm
- Emphasis on fair play

Training composition

Ball game - 35%
Basic technique combined with exercises = 20%
Diverse tasks and variety of games with a ball = 20%
Performing various movements and coordination = 25%

Instructions for the coach

- Small groups, lots of movement
- Enthusiastic games
- Movement activities with focusing on playfulness and freedom of movement
- Showing patience to the children
- Guiding simple tasks
- Developing creativity and ability to cope with game difficulties independently

Guidelines for training and cultivation of youth (U10)

Objectives:

- Fun in the ball game
- Fun in movement
- Train for basics of athletic
- Train for fundamental technique in ball game
- Learning a basic personal tactic
- Learning simple rules of movement and vision in space

Emphases & Values

- Friendship, partnership and fun

Training composition

Ball game = 15%
General coordination = 20%
basic technique exercises for children = 20%
Various tasks with a ball = 20%
Basic diverse training = 25%

Instructions for the coach

- Small groups, a lot of movement activities
- Learning technique while playing
- Showing patience! No pressure or immediate demand for performance
- Teaching personal and team tactics of ball games
- Maintaining decency, courtesy and friendship

Guidelines for training and cultivation of youth (U11-12)

Objectives:

- Combining various games and creativity
- Systematic training of basic technique and applying them in different situations
- Basics of defense technique
- Increasing athletic training (basics)
- Introducing personal and team tactical basics
- Strive for initiative and competitive qualities

Emphases & Values

- Develop habits for a active lifestyle
- Fair play and team spirit
- Dealing with winning and losing

Training composition

Ball game = 20%
Small groups games (3x3) = 20%
Systematic teaching of technique = 35%
Athletics, coordination and physical fitness = 25%

Instructions for the coach

- Teaching the technique in stages and gradually
- Pay attention to correct execution of actions
- Combine athletic and physical training in the game
- Introduce ersonal training
- Profound communication with each individual player

Guidelines for training and cultivation of youth (U13-14)

Objectives:

- Focusing on creativity and entertainment areas of the game
- Training and learning technique in a competitive manner
- Track and field athletics as an important part of training
- Learning higher defense techniques
- Learning higher personal basic tactics (defense and attack)
- Learning basic team tactics and study team tactics structure
- Focus on taking responsibility on and off the field

Emphases & Values

- Developing the ability to play and understanding the game
- Develop leadership and competitive abilities
- Social skill development
- Developing tolerance and respect for friends, coach and others
- Discipline on and off the field

Training composition

Ball game = 20%
Personal tactics = 35%
Technique = 20%
Athletics, coordination and physical fitness = 25%

Instructions for the coach

- Comment players on performance, weaknesses, advantages, improvements and more.
- Building responsibility, initiation, motivation and maintain these abilities
- Encouraging creativity and avoiding rigid tactics
- Encouraging players for variety of roles

Guidelines for training and cultivation of youth (U15-16)

Objectives:

- Strength training and technique
- Specializationing in a specific position
- Stabilization of athletic ability
- Basics for developing resistance training (free weights)
- Further development of a defense technique
- Further development of personal and team tactical abilities (defense/attack)
- Learning complex tactical structures (defense/attack). Understanding the game.
- Development of motivation and joy in the game
- Develop a more serious attitude towards training and matches.

Emphases & Values

- Education for the correct lifestyle of a player
- Education for required habits and behaviors in training and matches
- Education for discipline of a professional player

Training composition

Ball game = 15%
Group and team tactics = 20%
Personal tactics = 15%
Training for technique in a specific position = 25%
Athletics, coordination, physical fitness and strength = 25%

Instructions for the coach

- Aim for intense training and exercises with longer recovery.
- Complex training for the team, without harming the creativity of the individual.
- Teach theoretical and practical technique and tactics.
- Involve the players in understanding of teaching and training.
- Develope hierarchy within the group.
- Combine training components and enrichment activities.

Guidelines for training and cultivation of youth (U17-18)

Objectives:

- Personal preparation for physical, tactical and technical demands
- Specialize in a specific role
- Further development of a strength and athletic abilities
- Further development of personal and team tactics in defense and attack
- Stablization of tactical team structure
- Learning to understand the game
- Promoting tasks on and off the field
- Evolving and educating professionalism

Emphases & Values

- Inheriting professionalism
- Discipline
- Purposefulness in training and matches
- Responsibility and leadership

Training composition

Ball game = 20%
Technical and tactical abilities according to positions = 45%
Specific strength training = 15%
Athletics, fitness and coordination training = 20%

Instructions for the coach

- Do not neglect the development of personal abilities.
- Treating physical and mental loads of each player individually.
- Focus on competitiveness in the game.
- Neutralizing environmental loads (agents, personal problems, etc.).
- Consider loads from other activities (team, school).

Recovery and loading components for children and adults

Recommended volume for training youth components

Age	9-10	11-12	13-14	15-16	17-19
Matches	10+ 3 tournaments	15+ 2-3 tournaments	24+ 2 tournaments	24+ 2 tournaments	30+ 1-2 tournaments
Training units	3	3	4	5	5
Personal training	-	-	2	2	2-3
General enrichment	2-3	2-3	2 * 60-70 minutes	1 * 45 minutes	1 * 45 minutes
Technique	40%	40-45%	35%	35%	25%
Team & personal tactics	-	-	10%	15%	35%
Coordinative and physical training					
Movement & coordination games	35%	30%	20%	10%	5%
Strength	-	-	10%	10%	10-15%
Speed	10%	10%	10%	10%	10%
Endurance	-	-	-	5%	5%
Flexibility	-	5%	5%	5%	5%
Theoretical (education, rules, nutrition, lifestyle, mentality)	10%	10%	10%	5%	5%

Recommended volume for training youth components - ball games

Age	9-10	11-12	13-14	15-16	17-19
Matches	12 in regional league + 2-3 local tournaments	16 in regional league + 2-3 local tournaments	20 in regional league + 2 local tournaments + 1 national	24 in regional and national leagues + 2 local tournaments + 1 national	30 in regional league + 1-2 local tournaments
Training units	3	3	4	5	5
Personal training	-	-	2	2	2-3
General enrichment	2-3	2-3	2 * 60-70 minutes	1 * 45 minutes	1 * 45 minutes
Technique	40%	40%	35%	35%	25%
Team & personal tactics	-	-	10%	15%	35%
Coordinative and physical training					
Movement & coordination games	35%	25%	20%	10%	10%
Strength	-	-	10%	10%	10-15%
Speed	10%	10%	10%	10%	10%
Endurance	-	-	-	5%	5%
Flexibility	-	5%	5%	5%	5%
Theoretical (education, rules, nutrition, lifestyle, mentality)	10%	10%	10%	5%	5%

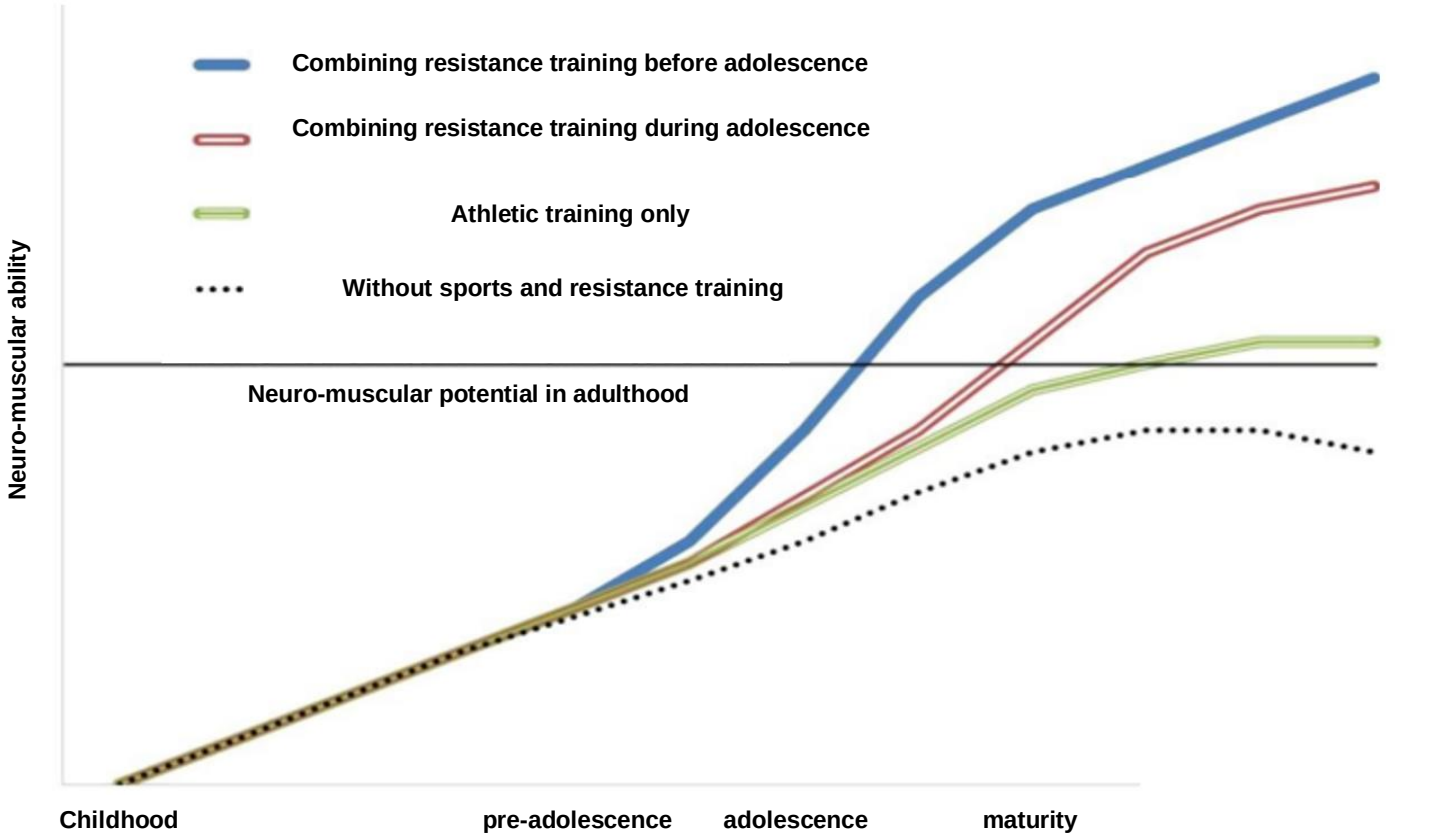
Varying loading and training content				
Age	**Loads**	**Volume&Duration**	**Intensity**	**Recovery**
8-12	Diverse	Large	Small	Short
13-19	Specific	Small	Large	Long
Children can be active longer with shorter recovery				

Volume and intensity of loading in youth	
Main goal: Future quality loading and intensity **Main problem: insufficient basis and training**	
Age	**Weekly hours**
8	**20**
10	**18**
12	**16**
14	**14**
16	**14**
18+	**10-14**

Data on loading volume and recovery in football		
Age	**משך זמן עצים אופטימלי בדקות (במהלך משחק/אימון)**	**דקות התאוששות נדרשות**
5-8	**5-7**	**1-1.5**
9-11	**6-9**	**2-2.5**
12-14	**15-18**	**5-6**

Benefits of strength training

Effect of strength training in youth



Progressive resistance training is a cornerstone of athletes physical fitness in every age

Great works are performed, not by strength, but by perseverance (Samuel Johnson)

Resistance training in youth

National Association for Strength and Conditioning Training guidelines

YOUTH RESISTANCE TRAINING: UPDATED POSITION STATEMENT PAPER FROM THE NATIONAL STRENGTH AND CONDITIONING ASSOCIATION

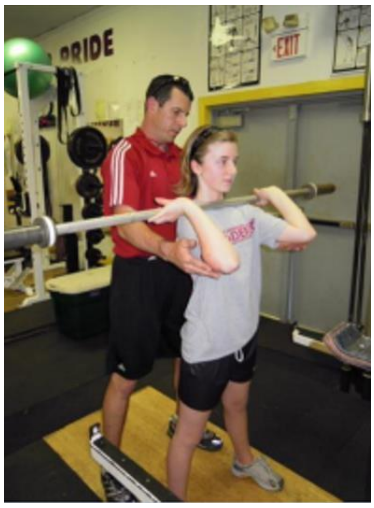
AVERY D. FAIGENBAUM,[1] WILLIAM J. KRAEMER,[2] CAMERON J. R. BLIMKIE,[3] IAN JEFFREYS,[4] LYLE J. MICHELI,[5] MIKE NITKA,[6] AND THOMAS W. ROWLAND[7]

Physical fitness pyramid in youth

Resistance training guidelines for young athletes:

(Faigenbaum et al., JSCR, 2009)

- Qualified training! (in USA - unique certificate)
- Strength training: 1–3 sets / 6–15 repetitions
- Start with 1 workout a week, then increase to 2–3 workouts a week!
- Rest – 1–3 minutes
- Include core/postural training



Australian Strength Conditioning Association (ASCA) guidelines

First level (age 6-9)

Base resistance training on body weight, work with light resistance with rubber bands and a broom stick. Perform 15+ repetitions.

Second level (age 9–12)

Simple exercises with dumbells and machines (adjusted to the size of the trainee). Perform 10–15 repetitions (about 60% of 1RM).

Third level (age 12–15)

increase loading weight. It is very important to master the technique, until that, avoid powerlifting. Perform 8–15 repetitions (about 70% of 1RM).

Fourth level (age 15–18)

Split training (divided program).
6–15 repetitions (about 80% of 1RM).

Effectiveness of strength training vs power in youth

(Effects on muscle force, power and speed)

(David G. Behm et al, 2017)

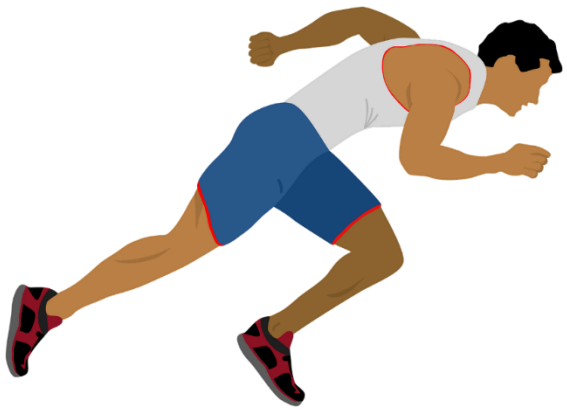
	General	Trained vs.	Untrained	Children vs.	Adolescents
Power training effects on jump measures	0.69 Moderate	0.67 Moderate	**0.80 Large**	***0.74 Moderate***	*0.57 Moderate*
Strength training effects on jump measures	0.53 Moderate	0.48 Small	**0.61 Moderate**	***0.68 Moderate***	*0.42 Small*
Power training effects on sprint measures	0.38 Small	0.32 Small	**1.19* Large**	***0.47 Small***	*0.13 Trivial*
Strength training effects on sprint measures	0.48 Small	0.45 Small	**0.57* Moderate**	***0.73 Moderate***	*0.36 Small*
Power training effects on lower body strength measures	0.16** Trivial	Not reported	Not reported	Not reported	*0.16** Trivial*
Strength training effects on lower body strength measures	1.14 Large	1.23 Large	**1.08 Large**	***1.39 Large***	*0.88 Large*

Conclusion: Strength training is more effective than power training for development of strength and power in youth!

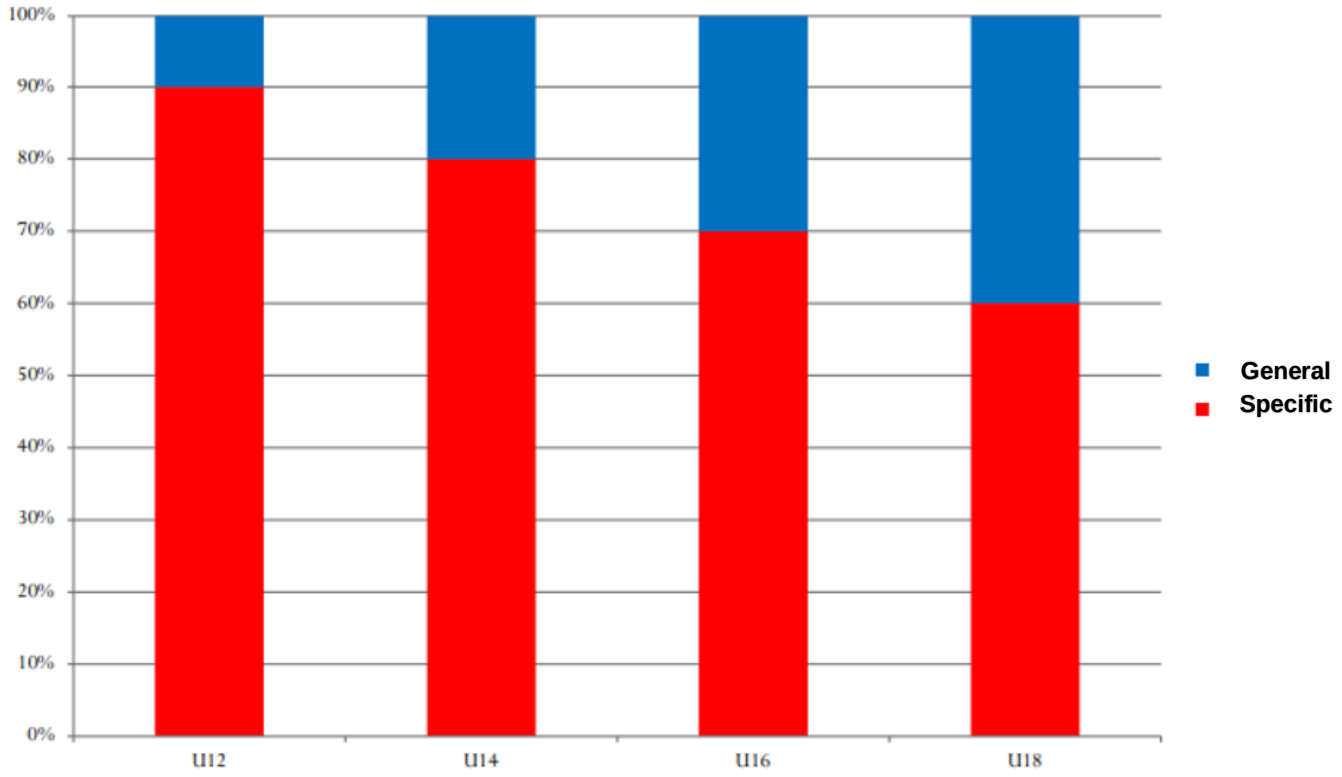
1RM tests are considered safe and not dangerous as long as they are supervised and performed properly (training technique and supervision).

Recommendations for training physical components (for children and teenagers)

Physical component	Effort %	Total training distance	Method	Examples	Training part	Weekly units	Duration (minutes)	Physiological aspects
Reaction speed, Running speed, agility (short)	100	100-200	Short sessions, long recovery	10-15 sessions 10-15 meters	Right after warm-up	1-2	10-15	A-lactic neuro-muscular
Endurance, Speed, Agility (Prolonged)	80-95	300-800	Medium sessions, medium recovery	3-12 reps, 50-200 meters	Towards the end/the end of training	1-2	15	High lactic acid concentration
Intense specific endurance	65-75	900-1500	Medium sessions, medium recovery	3-25 70-500 meters	Ending phase of training	League: 1-2 Prep period: 3-4	0-3	Medium lactic acid concentration, aerobic, anaerobic
Medium specific endurance	50-60	1200-2000	Medium sessions, medium recovery	12-20 70-150 meters	Ending phase of training	Once a week, 3-4 in prep period	20-30	Medium lactic acid concentration (Aerobic)
General endurance	35-45	2000-4000	Continuous or long sessions	1-6 800-4000m	Ending phase of training or as a whole session	Once in two weeks	30-35	Low lactic acid concentration (Aerobic)
Jumping endurance	50	60-150 Jumps	10-20 5-12 jumps	Low hurdles, stairs or marking	During training	2-3	10-12	



Distribution of general and specific training



The best way to cheer yourself up is to try to cheer somebody else up (Mark Twain)

Summary of build-up training

Talent scouting

Scount for talents in competitions and other sports events.

Technical development

Initially, specialize in several sports and professions, afterwards proceed to single sport.

Develop the correct form of the important techniques.

Training

Perform many general training in teams.

Work on specific training to 30%, gradually increase to 40%.

Competitions

Concentrate more and more on your specific event.

The "German" philosophy of youth training

- Broad multi-sport education = diverse education.
- Orientation towards combined sports.
- The competition program offers blocks of competitions, in addition to regular combined events.
- Gradual specialization in construction/build-up training
    - Initially, participate in team sports
    - Afterwards, a single sport profession
- Always maintain a high level of general training/training.
- Every year, start with general training/training content.

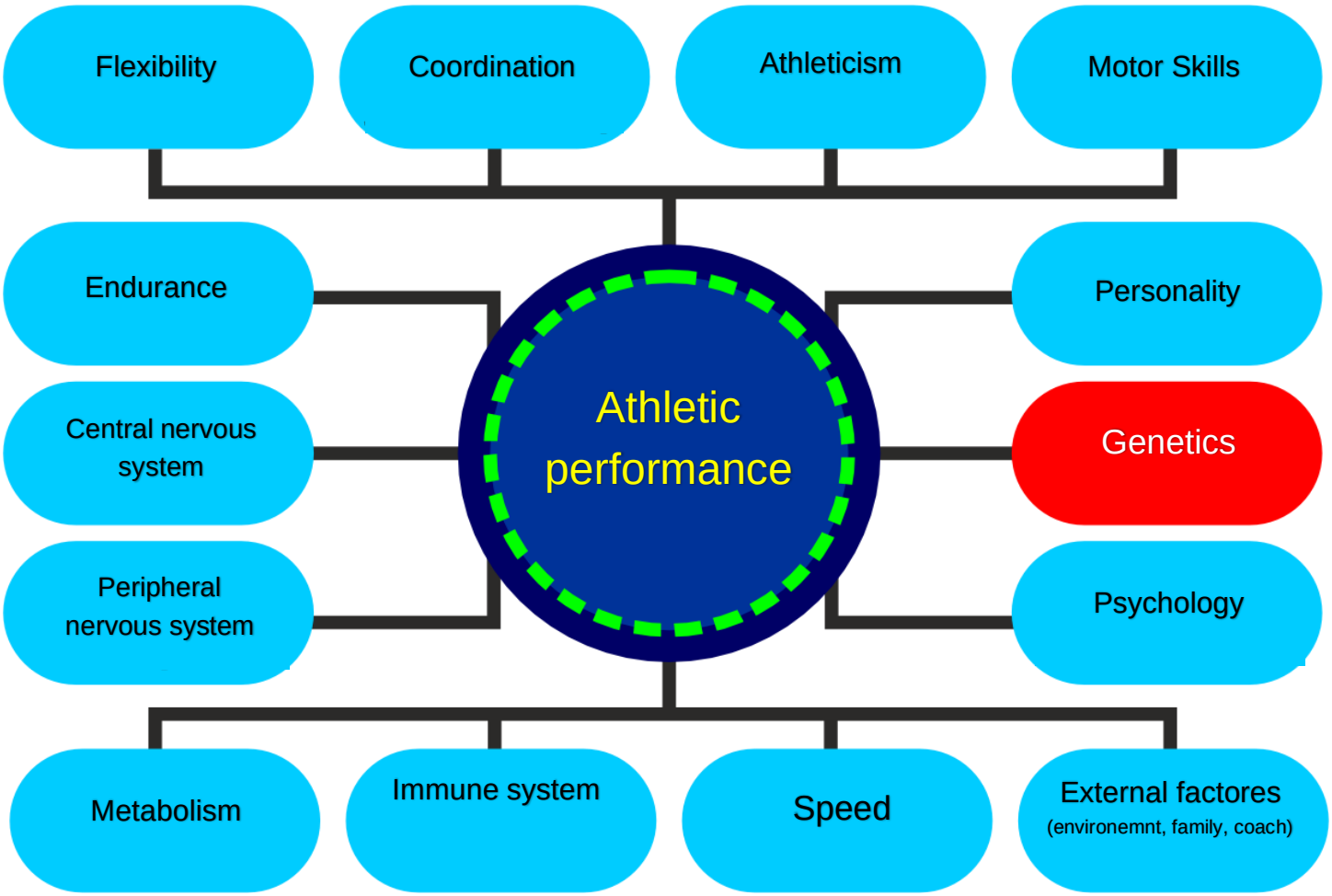
Coaches work towards skill-oriented training

- Coaches change relevant parts of training:
    - To define fresh stimuli in training
    - To prevent the athletes from getting bored

  As we get old, we lose the ability to perform different exercises as the body becomes weaker, therefore any storage we gain prior to that phase, the better.

Motor skills

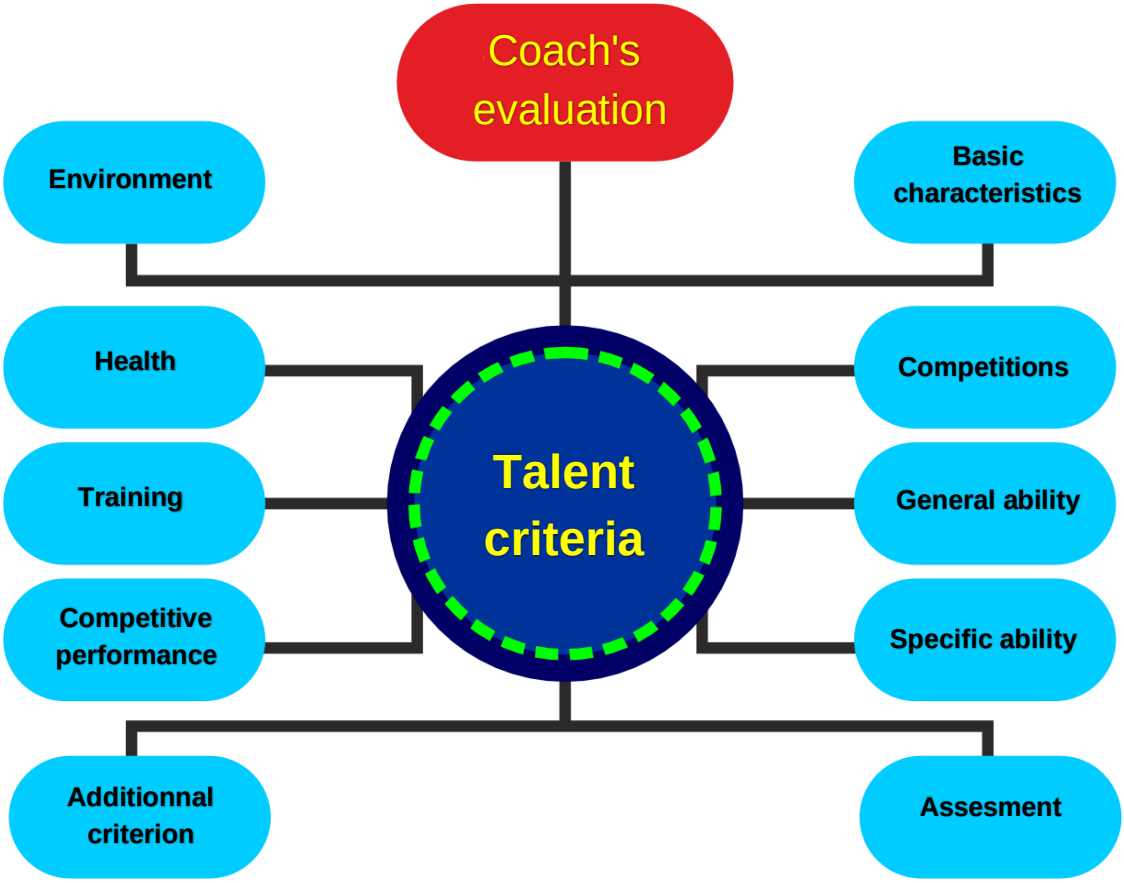
- Relate to the necessary motor skills for the specific competition
- Motor skills determine the performance, work on relevant skills for the specific event



Talent:

“A special/higher-than-average ability to perform an action or a series of actions. Physical talent may be functional, expressive or athletic”

Talent criteria in the process of improving elite athletes



Speed training in children and youth

(J, Obradovic)

Improvements in speed during childhood follow a non-linear process.
The central nervous system undergoes rapid growth in first seven years.
While coordination patterns and locomotor skills reach adult levels by that time, they are not complete until sexual maturation or adulthood.

First accelerated adaptation occurs between the age of 5-9 in both boys and girls.

Second period of accelerated adaption occurs between ages of 11-14 in girls and 12-16 in boys.

Usually, Boys are able to perform better than girls.

During these periods of natural accelerated adaptaions, the system will have higher ability to respond additional stimuli.

Speed training content for young ages

	Early childhood	Pre-pubertal	Pubertal	Adolescent
Age	0-7	8-11 ♀ 8-12 ♂	11-15 ♀ 12-16 ♂	15+ ♀ 16+ ♂
Sprint training focus	Locomotor movement skills	Technical development	Technical development Maximal sprints	Maximal sprints
Complementary training	Physical literacy development	Polymeric coordination/movement skills	Polymeric Strength Hypertrophy Coordination	Strength Hypertrophy Complex training
Primary training adaptation	neutral	neutral	Neutral and morphological	Morphological and neutral

Suggested guidelines for sprint-specific training prescription throughout childhood

Age	8-12 ♂ 8-11 ♀	12-16 ♂ 11-15 ♀	16+ ♂ 15+ ♀
Volume (m)	100-250	250-450	Up to 600
Distance (m)	0-30	0-50	0-60+
Exercises per session	3-4	2-3	1-2
Intensity (speed)	Submax-max	Submax-max	Maximal
Training focus	Technique, movement patterns	Technique, sport-specific sprints	Sport-specific sprints
Between-sprints recovery	Full/Almost full (10-20s per 10m)	Full (20-30s per 10m)	Full (30s per 10m)
Sessions per week	1-2	2-3	3-4
Recovery between session	72	72-48	48-24

Strength training for youth

(J, Obradovic)

In the past, there were controversies regarding resistance training in children. Nowadays it is known that with proper work, resistance training and weight lifting can produce a significant increase in strength at a young age.

Before puberty, anabolic hormone concentrations are low, limiting the potential for significant changes in muscle structure (hypertrophy).
Additionally, strength gains that occur naturally in preadolescent children are modulated by neural factors.

Effectively designed resistance training programs can improve strength and muscle characteristics at a young age, in addition to those generated by normal growth and development. Effective strength improvement can be achieved through a variety of resistance training approaches: machines, free weights, power balls, bands, and body weight.

At a young age, it is important to start with a basic training program that involves all the main muscle groups, for both genders.
First, work on large muscle groups and then small muscle groups. In addition, it is important to focus first on the weak muscles, and always start with a low weight to train a correct technique.

The following table describes recommendation for strength training weekly schedule at a young age, which details training's frequency, intensity, volume and rest:

Strength training	Children (7-12 year)	Adolescents (13-18year)
Frequency	2 per week (uneven days)	3 per week (uneven days)
Intensity	Light load – correct technique	50-80% of 1RM
Volume	1-2 sets x 5-12 repetitions	2-3 sets x 5-20 repetitions
Rest periods	60-120 sec	30-120 sec

Examples for training exercises in weekly plan

Session #1			Session #2			Session #3		
Exercise	**Sets**	**Reps**	**Exercise**	**Sets**	**Reps**	**Exercise**	**Sets**	**Reps**
Parallel box squat	3	12-15	Push-ups	3	8-15	Jump squats	3	5-8
Inverted row	3	5-8	Walking lunges	3	8-12	Hand walk crawl	3	10-20m
Hip bridge – feet on box	2	8-10	Chin-ups feet on ground	3	6-10	High knee step up	3	6-10 per leg
Plank elbow to hand walks	2	8-10	Swiss ball wall squat	2	8-12	Tricep bench dips feet raised	2	8-12
Resisted lateral arm raise	2	6-10	Cat likes	2	5-8	Alternate lateral lunge	2	8-12
Front plank	3	'ש 30	Lying back extensions	2	8-12	Decline push ups	2	6-10
Back foot elevated single leg squats	3	5-6 per leg	Split squat jump cycle	3	8-16	Slow sit ups 10s	3	3-5
Bent knee windscreen wipers	3	8-10	Side plank hip lifts	3	8-12	Kneeling alternate arm leg raise	3	8-12

5. Performance model of elite football players

This chapter summarizes data of elite level soccer players: attributes of abilities and performance by positions and levels of competition in the modern world football. (The full chapter is accessible at the end of the booklet).

Players characteristics by positions

PERFORMANCE INDICATORS	GK	Full Backs	Centre Backs	HM	AM	WM	Strikers
Physiological	Height Strength Power Agility Coordination Reaction Time	Speed Power Stamina	Height Strength Speed Power Stamina	Stamina Speed Power Strength	Stamina Speed Power Strength	Speed Stamina Power Strength	Speed Agility Power Strength Stamina
Tactical	Vision Organisation Communication Distribution	Support play When to cross Passing Running off the ball Forcing offside	Vision Organisation Communication Passing	Vision Organisation Communication	Vision Organisation Communication	Vision Organisation Communication	Vision – awareness of space Anticipation Organisation Communication
Technical – Def	Shot stopping Coordination Recovery speed Save Punch	Tackle Pressing opposition Interception – anticipation Clearance Defensive header	Tackle Defensive header Pressing opposition Interception – anticipation Clearance	Tackle Pressing opposition Interception – anticipation Heading	Tackle Pressing opposition Interception – anticipation Heading	Tackle Pressing opposition Cover full-back Interception – anticipation Heading	Tackle Pressing opposition Interception – anticipation Heading
Technical – Att	Passing Throw Ball control with feet Kick Tackle	Tackle Interception – anticipation Dribbling Running with the ball Clearance Defensive header	Passing Heading Running with the ball Support play Dribbling Crossing Shooting	Passing Running with the ball Dribbling Support play Crossing Shooting Heading	Passing Running with the ball Dribbling Support play Crossing Shooting Heading	Passing Running with the ball Dribbling Support play Crossing Shooting Heading	Shooting Heading Reception Dribbling Passing Running with the ball Support play Crossing
Psychological	Concentration Motivation Attitude Body language	Concentration Motivation Attitude Body language	Concentration Motivation Attitude Body language	Concentration Motivation Attitude Body language	Concentration Motivation Attitude Body language	Concentration Motivation Attitude Body language	Concentration Motivation Attitude Body language

GK – Goal Keepers; HM – Holding Midfield; AM – Attacking Midfield; WM – Wide Midfield.

In football, success demand from each player to effectively perform a specific role and a set of functions based on the position he plays in on the field.

Individual performances of players in a team sport such as football must always be analysed in a relevant context they have been initially created. Disregarding team conditions while analysing individual performance may induce numerous failures.

Then and now

Numbers vary between competitions, but recently we see a clear change that illustrates how football has progressed.

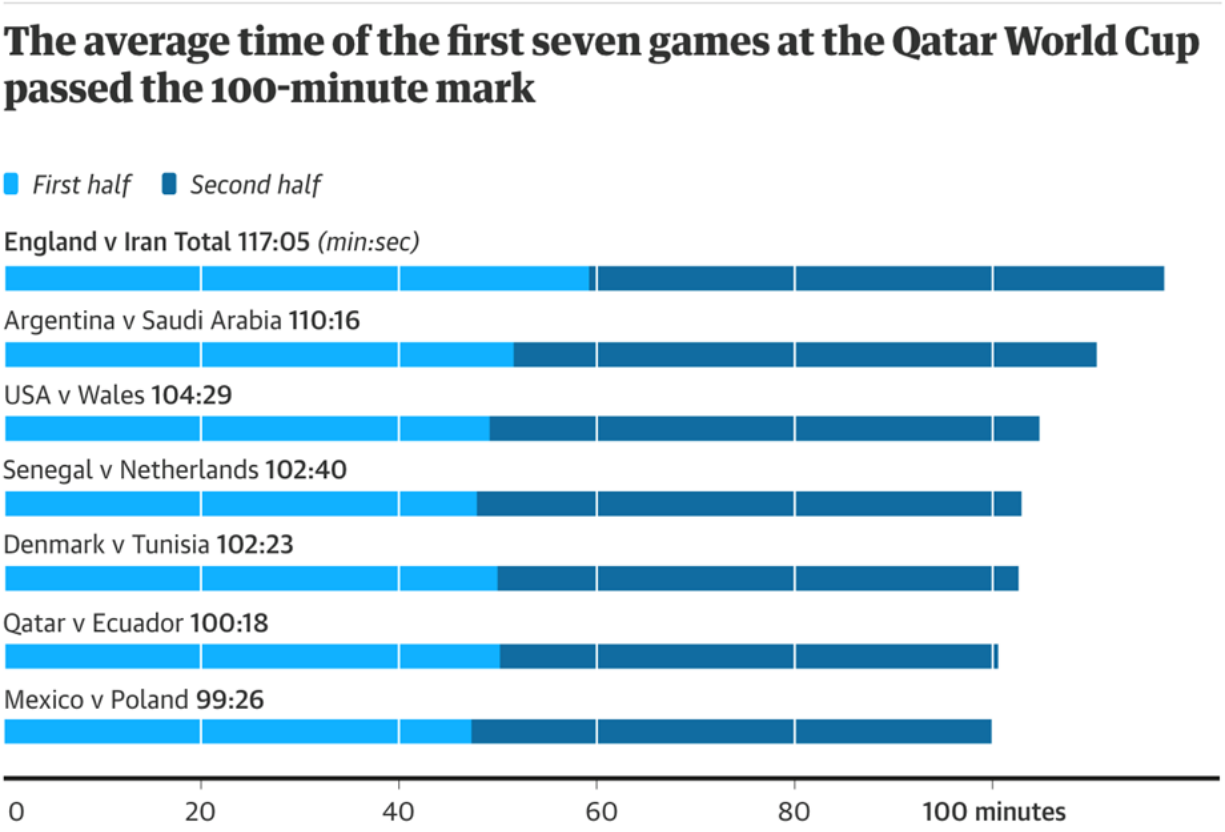
A new trend of game duration

(World cup 2022, Qatar)

In the group stage, 563 min were added.
1 of 8 opening games under 100 min

Pierluigi Collina: “The ball is now actively in play for 55 to 67 minutes”

According to Opta, the average playing time in the first six matches of this World Cup was 106 minutes and 12 seconds, compared to 97 minutes and 12 seconds in 2018.



Performance of youth elite players

Table 2. Differences in physical/motor activities of youth Greek football players in the season 2017/18 which playing in European and National leagues' matches.

	Players participation in				
	UEFA Youth League,n=6	National Youth League, n=16			
measurements	72	199			
	marginal means (stand. errors)		***Difference***	***p*-value**	**η^2**
Total Distance, TD, *meters*	9,391 (366)	8,806 (206)	-585	0.187	0.007
Very high-intensity speed running distance, VHS, *meters (sprinting or speed 19.8-25.2 km/h)*	408.1 (22.1)	379.0 (12.9)	-29.1	0.282	0.005
Maximal sprinting speed running distance, MS, *meters (sprinting or speed >25.2 km/h)*	95.2 (8.5)	82.7 (4.9)	-12.4	0.230	0.006
High Speed Running, HSR, *meters (running speed >19.8 km/h)*	505.0 (28.6)	464.3 (16.1)	-40.7	0.239	0.005
Distance/Time, D/T, *meters/minutes*	99.5 (1.4)	97.9 (0.8)	-1.7	0.315	0.004
Sprints, *number*	35.3 (1.8)	32.5 (1.0)	-2.8	0.193	0.006
Accelerations *>2m/s2,n*	54.1 (2.5)	52.4 (1.4)	-1.7	0.577	0.001
Decelerations *>2m/s2,n*	71.4 (3.1)	61.7 (1.7)	-9.7	0.010	0.025
Maximum velocity (Vmax),*m/s*	8.33 (0.08)	8.24 (0.04)	-0.09	0.346	0.004

Obvious differences in variables are shown between national and international level.

Performance of Scottish Premier League players

Factors/ Position group	Strikers (n = 12) M ± SD	CV%	Wingers (n = 23) M ±SD	CV%	Midfielders (n = 44) M ± SD	CV%	Forwards (n = 9) M ± SD	CV%	Defenders (n = 30) M ± SD	CV%
Total Distance (m)	7359.0 ± 1391.1$^{*\#\beta}$	18.9	9199.8 ± 662.1	7.2	10354.1 ± 757.3	7.3	8155.6 ± 1058.6$^{*\beta}$	13	7830.6 ± 1227.5$^{*\beta}$	15.7
Distance (m)/min	94.3 ± 1.2$^{*\psi}$	1.3	99.6 ± 5.8$^{*\psi}$	5.8	108.7 ± 6.1	5.6	103.4 ± 7.4	8	90.4 ± 7.8$^{*\psi}$	8.6
Total Load (index)	654.7 ± 118.7$^{\$}$	18	871.7 ± 49.0$^{\psi}$	5.6	1047.1 ± 119.0	11.3	1005.0 ± 48.1	4.8	752.0 ± 106.8$^{\$}$	14.1
Load/ min (index/min)	8.3 ± 0.58$^{\$}$	6.9	9.3 ± 0.52	5.7	11.1 ± 1.3	12	10.5 ± 0.71	6.7	8.8 ± 0.8$^{\$}$	9
Speed max (km/h)	29.3 ± 1.8	6.2	31.2 ± 1.8	5.8	29.5 ± 2.0	6.7	29.2 ± 2.1$^{\$}$	7.2	28.2 ± 2.4	8.6
Acceleration (frequency)	34.2 ± 7.3$^{\#}$	21	37.1 ± 8.6$^{\#\psi}$	23	31.3 ± 7.5$^{\#}$	24	38.6 ± 7.9	20.4	25 ± 6.6	26
Deceleration (frequency)	33.6 ± 9.4	28	41.7 ± 9.0	22	37.1 ± 9.6	25.9	40.4 ± 6.4	23	23.5 ± 5.7$^{\$}$	24
Jumps (frequency)	8.8 ± 3.4$^{\#\psi}$	39	12.5 ± 4.0	32	10.9 ± 5.8$^{\#\psi}$	53	11 ± 3.5	32	15 ± 4.7	31
Explosive efforts (frequency)	97 ± 13.8	14	96.4 ± 1.5	1.5	93.2 ± 8.0	8.6	79 ± 14.1$^{\$}$	17.7	96.6 ± 1.4$^{\$}$	1.4

*$Significant differences from all other groups; *significant differences from Midfielders; #significant differences from Defenders; @significant differences from Strikers; ψ significant differences from Forwards; β significant differences from Wingers. $p < 0.05$ for all comparisons.*

Performance of players in UEFA CL

WIDE BOYS

In his first season of Champions League football, Porto left-back Zaidu made a noteworthy impression with his pace, the Nigerian international recording the fastest sprint of 34.49 as he surged up the wing to make himself available for an overlap in the home group stage fixture against Marseille. Overall, Zaidu was one of seven wide players among the top ten, with five full-backs or wing-backs among that number in Hans Hateboer, Kyle Walker, Achraf Hakimi and Alphonso Davies as well as Zaidu.

Second on the list was Chelsea's Mason Mount, an attacking midfield player recognised by UEFA's observers for his work rate in transition from attack to defence. The only player in the top ten who consistently operated from a central position was the Dortmund centre-back Manuel Akanji.

FASTEST SPRINTS (km/h)

Zaidu	Porto	34.49	v Marseille
Mason Mount	Chelsea	34.38	v Real Madrid
Manuel Akanji	Dortmund	34.2	v Man City
Hans Hateboer	Atalanta	34.06	v Liverpool
Kyle Walker	Man City	33.98	v Dortmund
Ousmane Dembélé	Barcelona	33.98	v Paris
Achraf Hakimi	Inter	33.98	v Shakhtar
Leroy Sané	Bayern	33.91	v Paris
Ivan Perišić	Inter	33.77	v Real Madrid
Alphonso Davies	Bayern	33.77	v Paris
Emre Can	Dortmund	33.3	v Man City
Raphaël Varane	Real Madrid	33.3	v Inter
Antonio Rüdiger	Chelsea	33.3	v Porto
Mohamed Salah	Liverpool	33.3	v Atalanta
Duván Zapata	Atalanta	33.3	v Real Madrid

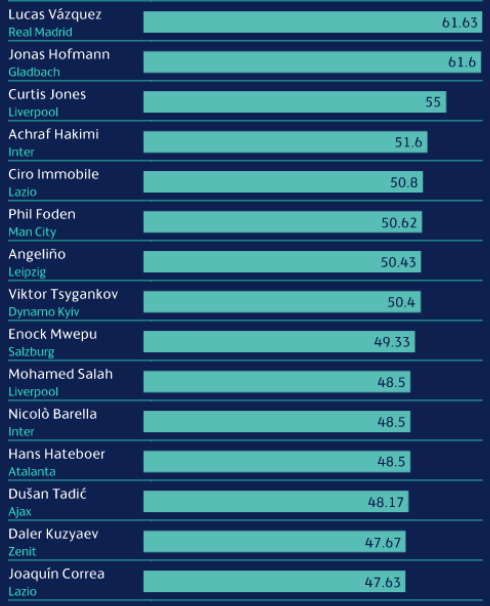
Kai Havertz (Chelsea), Marcus Rashford (Man Utd), Phil Foden (Man City) and Dominik Szoboloszlai (Salzburg) also recorded sprints of 33.3 km/h

Sprints higher than 25km/h

KEEPING PACE

Across the eight appearances he made in the 2020/21 Champions League, Real Madrid right-back Lucas Vázquez averaged more sprints per match than any other player. This allowed him to make an impact at both ends of the field, such as at Borussia Mönchengladbach in the group stage when he delivered 11 crosses from open play, or in the 3-1 quarter-final victory over Liverpool when – as highlighted by UEFA observer Ginés Meléndez – he worked hard to restrict the threat of Liverpool's Sadio Mané while joining the attack at every possible opportunity, and providing the throw-in for his side's third goal.

MOST SPRINTS (average per match)



Minimum of five matches played

20 players to have covered the most distance. This was a reflection of his role as the most forward-looking of his side's three centre-backs; indeed his license to attack meant that of the Lazio squad, he ranked joint fifth for most passes in the final third (51), supplying 21 open-play crosses and ten chances in his eight appearances.

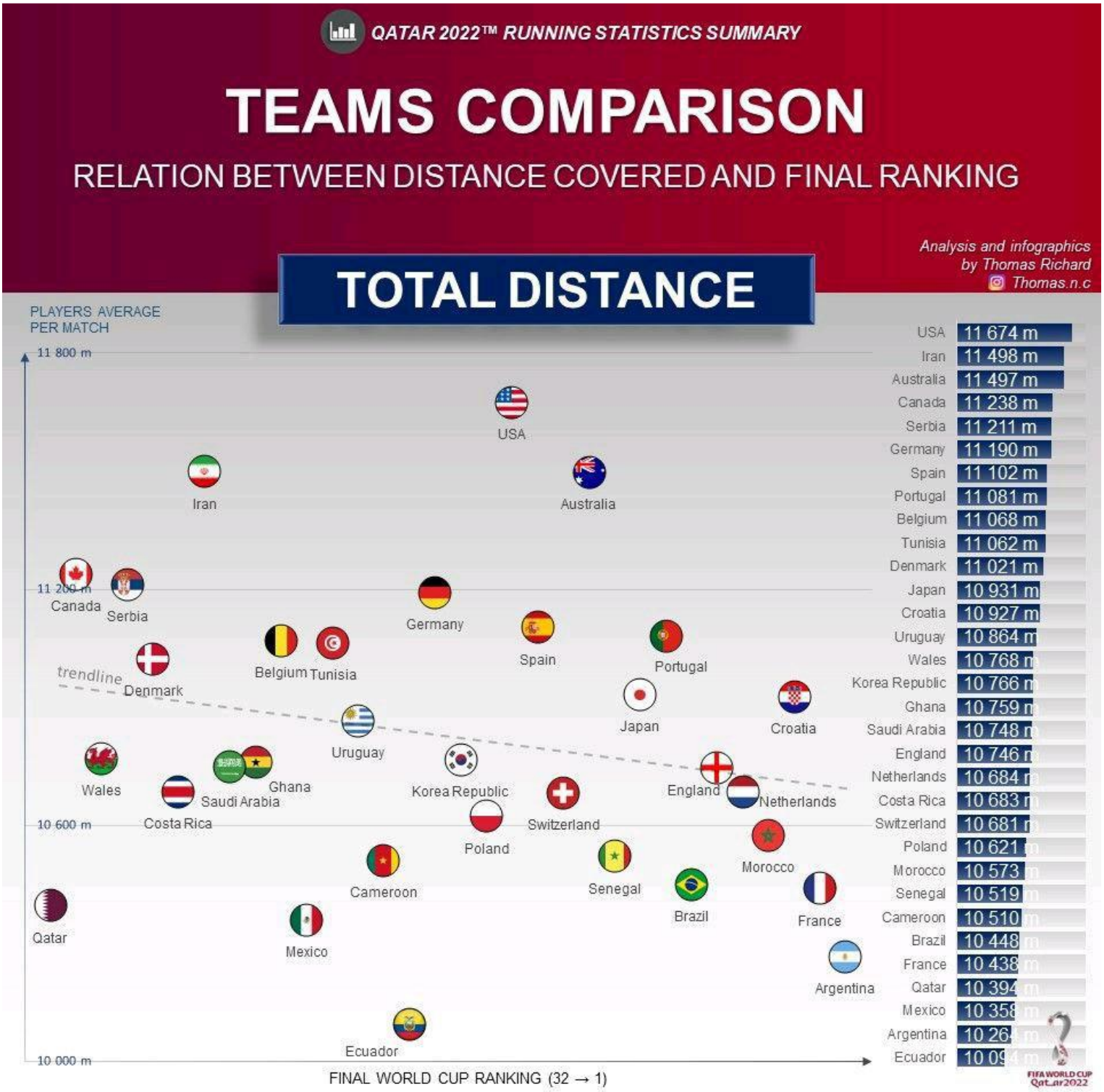
AVERAGE DISTANCE COVERED PER PLAYER (km per match)

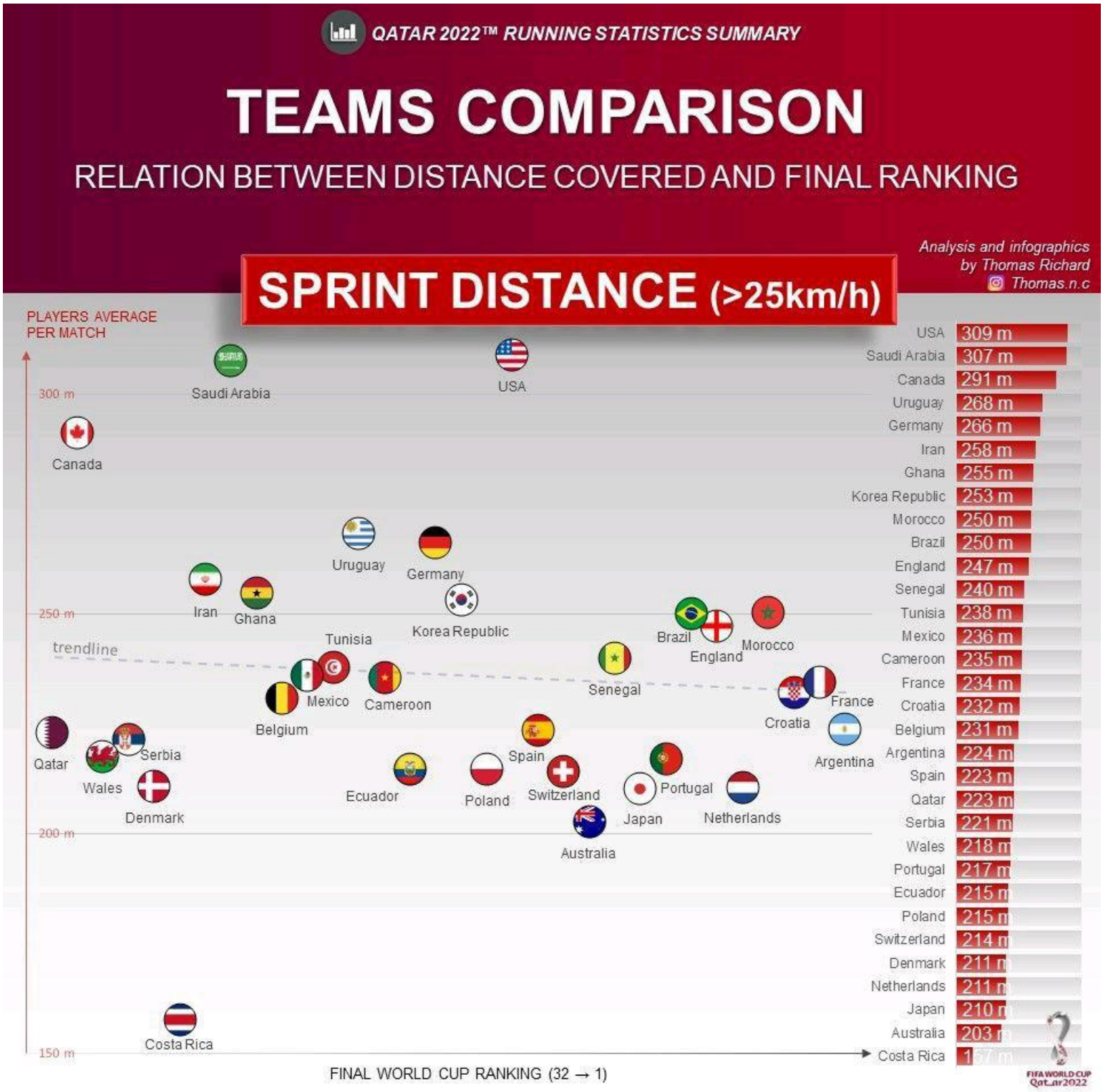
Christoph Kramer	Gladbach	12.2
Alex Sandro	Juventus	12.03
Joshua Kimmich	Bayern	11.71
Nicolò Barella	Inter	11.7
Jonas Hofmann	Gladbach	11.67
Hans Vanaken	Brugge	11.53
Dušan Tadić	Ajax	11.48
Lucas Vázquez	Real Madrid	11.48
Florian Neuhaus	Gladbach	11.32
Koke	Atlético	11.09
Mykola Shaparenko	Dynamo Kyiv	11.07
Sergej Milinković-Savić	Lazio	11.06
Francesco Acerbi	Lazio	11
Ruud Vormer	Brugge	10.96
Yann M'Vila	Olympiacos	10.92
Curtis Jones	Liverpool	10.89
Sérgio Oliveira	Porto	10.87
Mahmoud Dahoud	Dortmund	10.86
Viktor Tsygankov	Dynamo Kyiv	10.83
Enock Mwepu	Salzburg	10.78

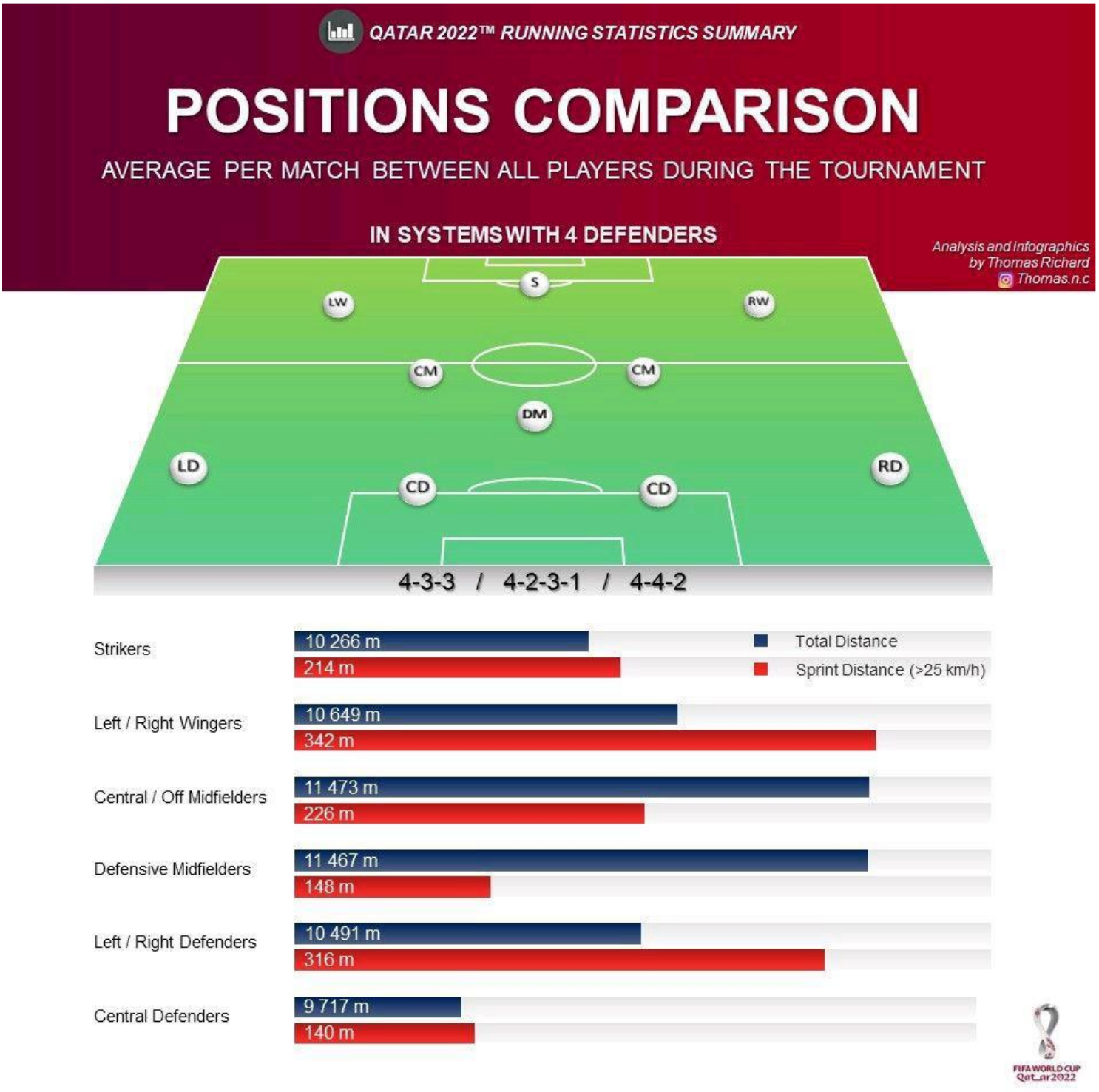
Performance of players at the WC 2022

We can see from the research that total run volume does not play the most important role in which team is more successful. The quality of running is before the quantity, and it is not measured only by intensity, but also by the tactical decisions of the players. It is also clearly noticeable that certain positions have different volumes and intensity of running.

We can also conclude that the parameters cannot be interpreted without connection with technical and tactical indicators, but that there is a trend in terms of team and especially individual running quality.


QATAR 2022™ RUNNING STATISTICS SUMMARY
TEAMS COMPARISON
RELATION BETWEEN DISTANCE COVERED AND FINAL RANKING
Analysis and infographics
by Thomas Richard
Thomas.n.c
TOTAL DISTANCE
PLAYERS AVERAGE
PER MATCH
11 800 m
11 200 m
10 600 m
10 000 m
trendline
USA
Iran
Australia
Canada
Serbia
Germany
Spain
Portugal
Belgium
Tunisia
Denmark
Japan
Croatia
Uruguay
Wales
Ghana
Saudi Arabia
Korea Republic
England
Netherlands
Costa Rica
Switzerland
Poland
Morocco
Cameroon
Senegal
Brazil
France
Qatar
Mexico
Argentina
Ecuador
FINAL WORLD CUP RANKING (32 → 1)
USA 11 674 m
Iran 11 498 m
Australia 11 497 m
Canada 11 238 m
Serbia 11 211 m
Germany 11 190 m
Spain 11 102 m
Portugal 11 081 m
Belgium 11 068 m
Tunisia 11 062 m
Denmark 11 021 m
Japan 10 931 m
Croatia 10 927 m
Uruguay 10 864 m
Wales 10 768 m
Korea Republic 10 766 m
Ghana 10 759 m
Saudi Arabia 10 748 m
England 10 746 m
Netherlands 10 684 m
Costa Rica 10 683 m
Switzerland 10 681 m
Poland 10 621 m
Morocco 10 573 m
Senegal 10 519 m
Cameroon 10 510 m
Brazil 10 448 m
France 10 438 m
Qatar 10 394 m
Mexico 10 358 m
Argentina 10 26
Ecuador 10 09
FIFA WORLD CUP
Qatar2022


QATAR 2022™ RUNNING STATISTICS SUMMARY
TEAMS COMPARISON
RELATION BETWEEN DISTANCE COVERED AND FINAL RANKING
Analysis and infographics by Thomas Richard
Thomas.n.c
SPRINT DISTANCE (>25km/h)
PLAYERS AVERAGE PER MATCH
300 m
250 m
200 m
150 m
trendline
Saudi Arabia
USA
Canada
Uruguay
Germany
Iran
Ghana
Korea Republic
Tunisia
Brazil
England
Morocco
Senegal
Mexico
Cameroon
France
Croatia
Belgium
Argentina
Qatar
Serbia
Wales
Denmark
Ecuador
Spain
Poland
Switzerland
Portugal
Japan
Netherlands
Australia
Costa Rica
FINAL WORLD CUP RANKING (32 → 1)
USA 309 m
Saudi Arabia 307 m
Canada 291 m
Uruguay 268 m
Germany 266 m
Iran 258 m
Ghana 255 m
Korea Republic 253 m
Morocco 250 m
Brazil 250 m
England 247 m
Senegal 240 m
Tunisia 238 m
Mexico 236 m
Cameroon 235 m
France 234 m
Croatia 232 m
Belgium 231 m
Argentina 224 m
Spain 223 m
Qatar 223 m
Serbia 221 m
Wales 218 m
Portugal 217 m
Ecuador 215 m
Poland 215 m
Switzerland 214 m
Denmark 211 m
Netherlands 211 m
Japan 210 m
Australia 203 m
Costa Rica 1
FIFA WORLD CUP Qatar2022


QATAR 2022™ RUNNING STATISTICS SUMMARY
POSITIONS COMPARISON
AVERAGE PER MATCH BETWEEN ALL PLAYERS DURING THE TOURNAMENT
IN SYSTEMS WITH 4 DEFENDERS
Analysis and infographics
by Thomas Richard
Thomas.n.c
S
LW
RW
CM
CM
DM
LD
RD
CD
CD
4-3-3 / 4-2-3-1 / 4-4-2
Strikers
10 266 m
214 m
Left / Right Wingers
10 649 m
342 m
Central / Off Midfielders
11 473 m
226 m
Defensive Midfielders
11 467 m
148 m
Left / Right Defenders
10 491 m
316 m
Central Defenders
9 717 m
140 m
Total Distance
Sprint Distance (>25 km/h)
FIFA WORLD CUP
Qatar2022


QATAR 2022™ RUNNING STATISTICS SUMMARY
POSITIONS COMPARISON
AVERAGE PER MATCH BETWEEN ALL PLAYERS DURING THE TOURNAMENT
IN SYSTEMS WITH 3 DEFENDERS
Analysis and infographics
by Thomas Richard
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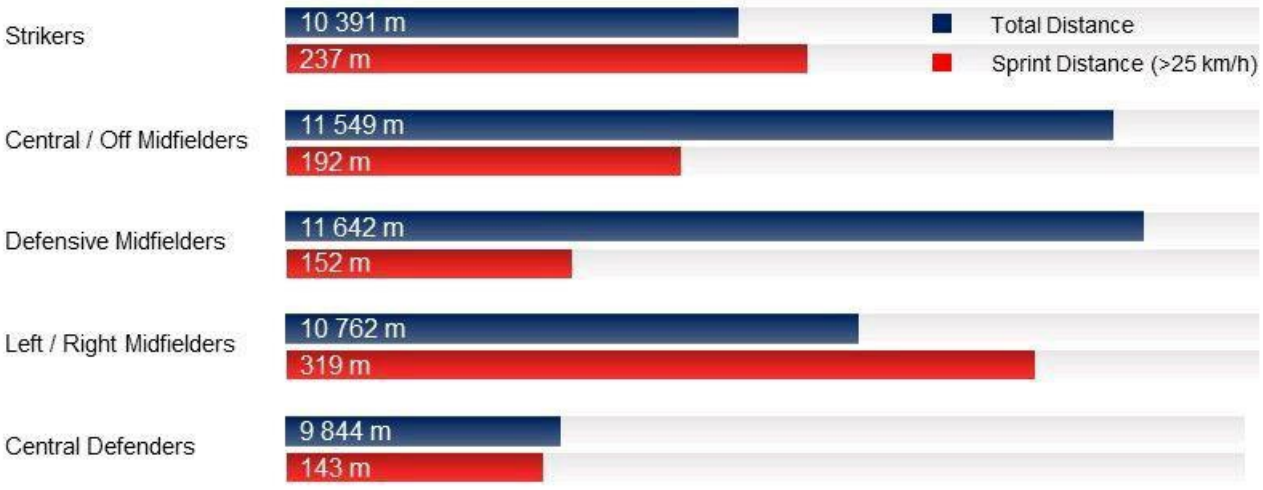
S
S
CM
LM
DM
DM
RM
CD
CD
CD
3-5-2 / 3-4-3


Strikers
10 391 m
237 m
Total Distance
Sprint Distance (>25 km/h)
Central / Off Midfielders
11 549 m
192 m
Defensive Midfielders
11 642 m
152 m
Left / Right Midfielders
10 762 m
319 m
Central Defenders
9 844 m
143 m

AVERAGE PER POSITION

4 DEF SYSTEM

	Total Distance (m)	Dist 15-20 km/h (m)	Dist 20-25 km/h (m)	Dist > 25 km/h (m)	n° High Speed Runs	n° Sprints	Max Speed (km/h)	N (n° values)
Strikers	**10 266**	**1 236**	**605**	**214**	**112**	**48**	**31,3**	42
Wingers	**10 649**	**1 428**	**754**	**342**	**130**	**61**	**32,6**	85
Left Wingers	10 499	1 410	715	340	129	59	32,8	44
Right Wingers	10 810	1 447	797	344	131	63	32,4	41
Central/Off Mid	**11 473**	**1 754**	**747**	**226**	**148**	**56**	**31,0**	55
Def Midfielders	**11 467**	**1 776**	**642**	**148**	**150**	**47**	**30,2**	92
L/R Defenders	**10 491**	**1 288**	**693**	**316**	**119**	**55**	**32,5**	127
Left Defenders	10 489	1 287	699	332	119	56	32,6	61
Right Defenders	10 492	1 290	687	302	119	55	32,4	66
Central Def	**9 717**	**1 088**	**440**	**140**	**99**	**35**	**30,8**	167

5 DEF SYSTEM

	Total Distance (m)	Dist 15-20 km/h (m)	Dist 20-25 km/h (m)	Dist > 25 km/h (m)	n° High Speed Runs	n° Sprints	Max Speed (km/h)	N (n° values)
Strikers	**10 391**	**588**	**1 339**	**237**	**122**	**48**	**31,7**	18
Central/Off Mid	**11 549**	**764**	**1 772**	**192**	**150**	**54**	**30,9**	24
Def Midfielders	**11 642**	**605**	**1 789**	**152**	**148**	**46**	**30,2**	35
R/L Midfielders	**10 762**	**781**	**1 533**	**319**	**136**	**59**	**31,9**	46
Left Midfielders	10 787	777	1 566	282	137	58	31,7	23
Right Midfielders	10 737	784	1 500	357	135	60	32,0	23
Central Def	**9 844**	**439**	**1 089**	**143**	**101**	**35**	**30,8**	79

QATAR 2022™ RUNNING STATISTICS SUMMARY

TEAMS COMPARISON

DETAILED TABLES

Analysis and infographics by Thomas Richard
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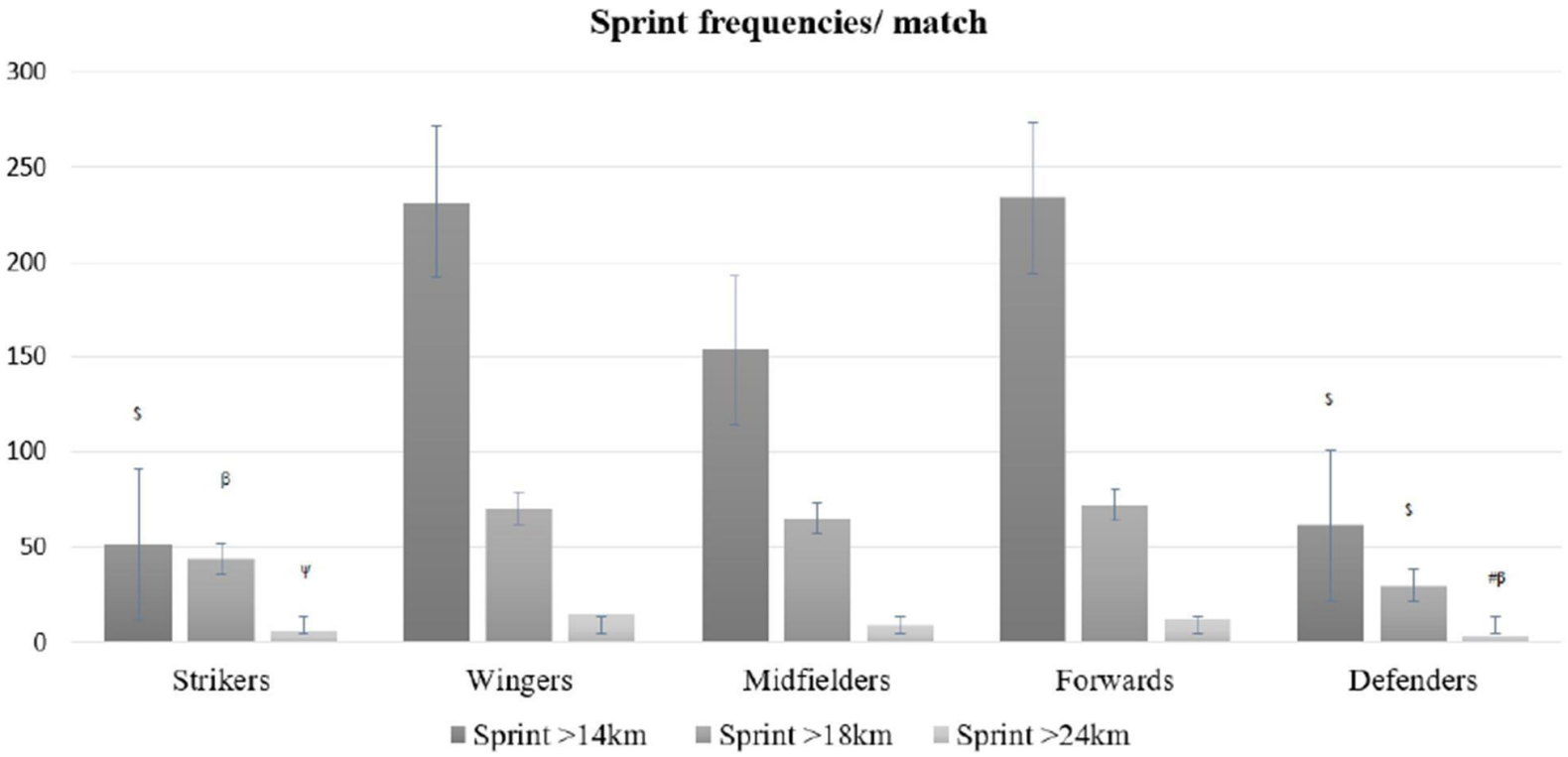
TOP 5

Team and Match	Total Distance	Dist 15-20 km/h (m)	Dist 20-25 km/h (m)	Dist >25 km/h	N° High Speed Runs	N° Sprints
USA Avg	**11 674**	**1 831**	**804**	**309**	**157**	**63**
England-USA	11 176	1 751	702	235	152	55
Iran-USA	12 030	1 936	845	335	162	66
Netherlands-USA	11 367	1 746	804	365	152	62
USA-Wales	12 121	1 891	864	301	163	68
Iran Avg	**11 498**	**1 548**	**761**	**258**	**136**	**57**
England-Iran	11 684	1 607	785	194	143	58
Iran-USA	11 614	1 571	748	255	137	56
Wales-Iran	11 195	1 467	750	325	129	57
Australia Avg	**11 497**	**1 594**	**697**	**203**	**142**	**54**
Argentina-Australia	11 506	1 617	691	195	145	55
Australia-Denmark	11 421	1 602	675	214	143	52
France-Australia	11 591	1 546	635	181	138	50
Tunisia-Australia	11 470	1 610	787	220	143	60
Canada Avg	**11 238**	**1 765**	**793**	**291**	**151**	**58**
Belgium-Canada	11 620	1 920	869	334	163	63
Canada-Morocco	10 572	1 580	703	262	136	52
Croatia-Canada	11 521	1 796	806	277	154	60
Serbia Avg	**11 211**	**1 652**	**682**	**221**	**137**	**50**
Brazil-Serbia	11 029	1 604	649	207	135	49
Cameroon-Serbia	11 249	1 656	751	248	140	52
Serbia-Switzerland	11 354	1 696	647	209	137	49

FIFA WORLD CUP Qatar2022

Sprint frequencies by player position



Factors/ Position group	Strikers (n=12)		Wingers (n=23)		Midfielders (n=44)		Forwards (n=9)		Defenders (n=30)	
	M±SD	CV%	M±SD	CV%	M±SD	CV%	M±SD	CV%	M±SD	CV%
Sprint >14km (frequency)	51.3±51.5$	47%	231.8±36.4	16%	153.6±31.5	20%	234.5±63.0	19%	61.2±39.9$	65%
Sprint >18km (frequency)	43.8±20.7β	47%	70.3±13.2	19%	65.2±12.9	20%	72±7.6	25%	30±9.6$	32%
Sprint >24km (frequency)	6.5±4.3ψ	66%	15.1±5.6	37%	9.0±4.6	53%	12.2±4.7	30%	3.8±2.8#β	73%

Different profiles in the same positions

Position	Profile	Characteristics	Abilities
Goalkeepers	Defensive	Reliability	Explosivity
	Offensive		
Defenders	Rock	Security	Strength
	Ball Playing		
	Libero		
Wide	Wing back	Dynamic	Speed
	Full back		
Midfielders	Playmaker	Accuracy	Endurance
	Box to box		
Wide midfielders	Wings	Creativity	Agility
	Wide strikers		Speeed
Forwards	9	Directnes	Speed
	9½		Strength
			Agility

Conclusion: Significant effects were observed in positions of the player when comparing performance indicators, as offensive midfielders had a higher total and relative distance and load during the high-level soccer games. Strikers had a lower percentage of submaximum, maximum, and up to maximum limit efforts during the game than other groups, while defenders demonstrated a higher frequency of sprints above 24 km/h. The forwards showed a higher number of jumps (<30 cm) and a total frequency of explosive efforts. Muscle damage did not differ in terms of playing position, suggesting a relevant muscle involvement for every player regardless of his position, up to 24 h after the match. More specifically, according to these findings, no training game format alone is able to develop overall soccer fitness, with each format eliciting a unique physical load. These results make it possible to create a specific training game according to playing positions, associated with the predominant activities performed during competition. Consequently, players would adopt a position-specific recovery program after the match, particularly for midfielders who are exposed to higher muscle damage after the match.

6. Long term athlete development (L.T.A.D)

LTAD principles

Vision and goals

"Building a professional guiding program for all participants of sports industry, a program that directs Israel to achievements at national and international level"

Professional background

Introduction

High-quality professional planning and its implementation is an important key in promoting a young athlete towards professional achievements while fulfilling maximum personal potential.

Planning is a consistent and graded basis for the coach to work with the athlete in order to improve, this program was developed with attention to professional and scientific aspects with a long-term vision that places the athlete at the center of the system.

The program is for all who is involved in training and accompanying the young athlete: coaches, parents, teachers, and other individuals, at local, regional and national levels of activity.

The program will asist the coaches and instructors to comprehend the importance and understanding of learning the profession’s components at the ages of 6 to 15/16.

The hope is that with the approach of training technical and tactical skills, physical and mental abilities, that at the end of the process, the youth in age 15/16 will turn the training process to competitions and victories, with an optimal basis that fulfills the maximum personal potential.

The professional planning will not come at the expense of the coach's ability to educate and respecting the needs of the athletes and their personal development.

Key factors in building the program

The professional program below is a professional need that often created from an existing problematic situation as detailed:

In most cases, nowadays activities include the following elements (or some of them):

- Large quantity of games/competitions in relation to number of training sessions
- Lack of knowledge, that causes coaches and instructors to train children in the ways and methods of training adults
- Training and competition methods for males are applied to females
- Short-term preparation aims for winning and not pleasure and long-term processes
- Chronological age is a major factor in training planning, instead of biological age
- Preference of early developed athletes over athletes who develop late
- Lack of awareness for 'critical' and 'sensitive' stages for learning and absorbing physical skills and skills
- Early specialization in specific sports, aims children towards one sport over another
- Focusing on what is good for the association and not what is good for the child
- Parents' lack of awareness
- Lack of a single method in various frameworks, which aims for interests of the child.

As a result of these and other factors, the young athlete has many disadvantages, which affect several short and long term areas:

- Lack of ability fulfillment in adulthood
- Decrease in movement abilities
- Poor development of skills
- Implementation of technical errors
- Less enjoyment of sports in older age
- High risk of injuries
- Reaching the peak of ability at a young and unoptimal age
- Shorter sports career and more.

The data bellow and the points above are the scientific professional basis on which the program was created.

Nurturing years

Herbert Simon, a Nobel Prize winner in behavioral economics and decision-making process of business organizations: "Planned training lasts 10 years to excel in any field". In addition, researchers Bloom (1985) and Erickson (1993) also claimed that it takes between 8 and 12 years of training for the young athlete to become an elite athlete. There is a common definition, the "law of the 10 years" or the "law of the 10,000 hours" (it doesn't matter if the training takes less or more time, around 8000 hours, the principle remains the same). This means that the child's development and becoming an elite athlete is a long process, which requires patience, caution, deep and correct planning of the training, competition and recovery process. There are no shortcuts to success. Rushing these processes with multiple competitions will prevent physical, technical and mental abilities to fulfill.

Planning

Multi-year planning (periodization) is a framework for organizing the athlete's development process relating to training, competitions and recovery. The process is created logically and based on scientific aspects, aiming towards reaching the maximum fulfillment of the potential at the appropriate time. Long-term planning takes into account elements such as growth, maturation, training ability, mental development and more. Planning must be adapted to the athlete's biological age.

Multi-year periodization is divided into 6–7 periods (according to the proposed model - see table 2 below).

Biological age - chronological age

Chronological age reflects the real age, the number of years, months and days that passed from birth to presnt. On the other hand, biological age reflects the degree of development in physical, movement, cognitive, mental and other aspects (chronological development does not necessarily correspond to biological age).

The stages of training in sports should be based on biological development (biological age) and not on chronological age. Everyone grows eventually, but timing and rate of growth are different between individuals, even up to a gap of years between children that were born at the same time. In training planning, this fact must be taken into account and the training process must be adapted to the biological age.

It is very important not to excessively prefer children who developed relatively early over those who are late to develop. This phenomenon is also reflected in the preference (naturally) of those born in the first months of the year that usually developed first, over those born later. There is also a preference for those who appear stronger and taller due to early growth (which is usually a temporary advantage).

Basics

All athletes must acquire basic athletic ability at the appropriate age (usually at a young age), since the children's nervous system develops rapidly (before the period of accelerated growth), activities related to this system should work a lot. These activities include the following components: agility, balance, coordination and speed. It is likely that those who do not follow this principle will not reach their maximal potential abilities in the future.

The **FUN**damentals stage contains the word FUN, which is the key to the learning and training methods of fundamentals.

Simultaneously to physical basics, during the pre-accelerated development period, the body is in an excellent condition for learning basic technical skills in wide variety of sports. At a young age, wide variety of sports makes it easier in the future to add specific abilities at a high level in the chosen sport.

Specialization

Specialization is a process in which the hours dedicated to the specific profession are increasing in relation to the other training components. It is possible to assume that in sports with late development (ball sports, combat sports and more), the specialization process should be started gradually - from the age of 10 onwards. In addition, at this stage one should concentrate on the basics of the sports.

It is important to emphasize: early specialization leads to one-dimensionality, lack of basic movement ability, high tendency of injuries, 'burnout' and early retirement from competitive sports.

Considering the previous sections regarding that the required time to build a gradual training process in the sports industry takes over than 10 years – the specific age of specialization differs from one industry to another and is derived from the age that the young athletes begin to reach achievements.
Examples can be seen in table 3 on page 103.

Key principles for a long-term plan for youth

The **main** goal in choosing/building the training is to achieve the best personal performance as an adult.

Athletics for children aged 6–11

Rapid development general, physical and mental attributes

Development of the nervous system

Speed, agility, coordination

Enjoying the sport

Sports games and team events

Basic movements

Basic training during the age of 11–15, what to do until the age of 16?

Enjoyment and motivation from training and competitions

Introduce a wide range of coordinative skills

Learn main techniques and coordination in athletic activities

Exercise agility and speed in sprints, jumps and throws

Learn techniques in other basic sports (gymnastics, weightlifting, basketball, etc.)

Practice nitial athletic conditioninng (muscles strength)

Improve typical weak areas and weaknesses

Characteristics and required emphases of different age groups

Age	Goal	Psychological	Physical	Tactical	Technical
boys and girls: 0-5	Enjoy acquiring plenty of physical activities that develop athleticism	Early activity improves self-confidence and self-image, encourages brain functions, motor and social skills, emotions, creativity, imagination and fun	Unstructured activity combining various movements helps building strong bones and muscles, develops posture, coordination, balance and efficient movement	Learning game rules and spatial orientation	Running, pausing and changing direction (catch-ups, relay races). Working on the shoulder girdle is critical at these ages - crawling, dragging, pulling, etc. Ball (soft) games in a wide variety of shapes/sizes. Ball throwing games with both hands. Creating fun games that combine: jumping with two legs, with one leg, side jumbing, horizontal jumping etc.
boys and girls: 5-6	Practice basic movements and applying them in different games. Focus on enjoyment and fun during the activity	The coach needs to lead the young kids. Learn about conduct and values of an athlete. Learn how to concentrate on the task and how to control emotions. During training, children cannot sit and listen extensively	Practice different skills while moving: General movement exercises (knee lifts, swings, agility, rolling) Hand and eye coordination, spatial orientation Balance (body control, body awareness)	Learn game rules, running directions and opposition actions	Technical abilities in this category must effectively support the tactical recommendations. Imitation (the trainer demonstrates) of basic elements related to the specific activity/sport.

Age	Goal	Psychological	Physical	Tactical	Technical
Boys: 6-9 Girls: 6-8	Learnn all the basic movement skills and building athletic ability. Window of opportunity for physical abilities: flexibility, coordination, agility and speed.	The kid tends to be introvert, encourage him to gradually find a place in the team. The coach will encourage, affirm and create fun games. The coach will focus on effort rather than result. Children must be active because their attention is usually short. Children have limited thinking ability, they have to repeat an action many times. Children should be able to experiment and create on their own.	Spatial orientation, balance, speed, agility, strength, pulling, tracking and landing. unstructured physical activity. Mobile games that include passing, catching, running, changing direction. Exercises with resistance (running, throwing, kicking)	Learn to look up during action, control body movements, understand when to attack and defend, how to mark, and improve reading game-play situations (e.g creating space)	First, learn correct technique of movements. Afterwards, learn correct running technique (with and without ball), jumping and landing technique, running and stopping, and also specific skills (holding, shooting, kicking, passing, etc.).
Boys: 9-12 Girls: 8-11	Learn and practice specific sports skills	At these age the athletes use knowledge, interpret and draw conclusions.	Develop relevant basic coordination, speed and agility.	Learn to play a smart and efficient game. Play games with scores.	Emphasis on gradual development of game abilities. Learn basic coaching skills.

Age	Goal	Psychological	Physical	Tactical	Technical
		Also, they have the ability to recall specific information (movement, cognitive) and use it. The coach must demand a higher degree of concentration and involvement in training. Learn to understand and develop the competitiveness, how to deal with mistakes effectively, create a systematic plan towards improvement, develop ability for self-management and responsibility, respect the coach, players and referees. Players can't be afraid to make mistakes and all players must learn to be team players.	Development of decision making. Work on strength endurance exercises without additional weight, and on core muscles. Learn different sports games that will develop and improve speed, agility, coordination and balance.	Practice basic (attack/defense) movements. Read simple situations (defense/attack). Observe at opponent's weaknesses and use it. Learn to play consistently, using given aims.	

Age	Goal	Psychological	Physical	Tactical	Technical
Boys: 12-15/16 Girls 11-14/15	Practive how to train. Training is at the center.	Learn to face the mental challenges of competitions. athletes should be trained in competitive situations through training or competitive matches and exercises. Maintain enthusiasm and enjoyment despite potential moodiness. Develop the player's identity (work ethic, competitivness). Learn how to manage pressure. Situation awareness and potential actions.	Period of peak rapid growth. Focus on aerobic training while developing skills, speed, strength and flexibility. Rapid growth of the bones, tendons, ligaments and muscles emphasises the need for flexibility and coordination training.	Read more complex match situations, quality decision making under pressure, cooperation by detecting opposition's disadvantages and advantages.	Focus on improving training skills. Learning and practicing complex skills.

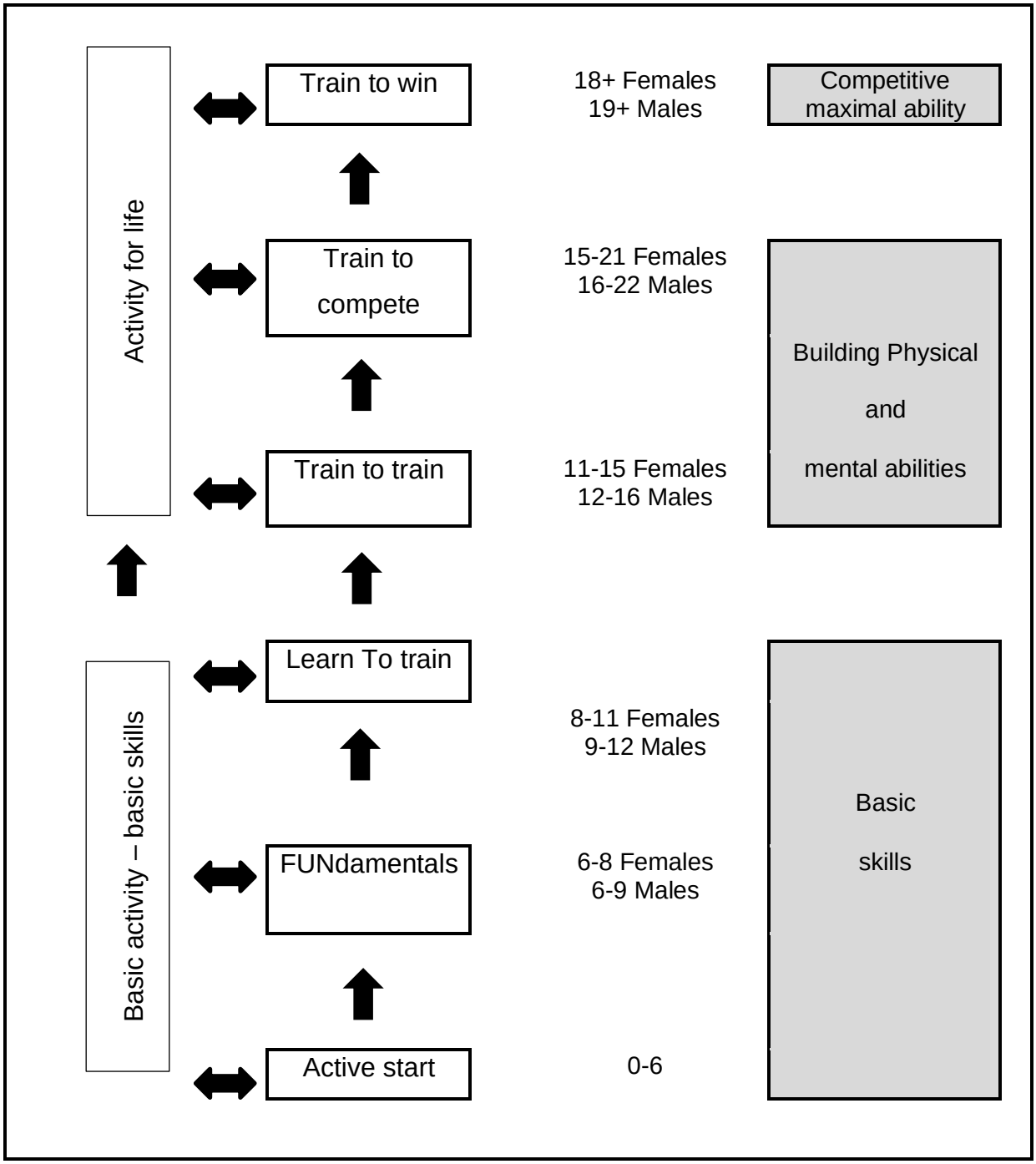
Impossible is a word to be found only in the dictionary of fools (Napoleon Bonaparte)

Table 2: L.T.A.D model

Phase	Age	Activities
1. Active start	0-6	Basic movements and applying them during games
2. FUNdamentals	Males: 6-9 Females: 6-8	Basic movement, skills and physical abilties
3. Learn To train	Males: 9-12 Females: 8-11	Skills from several sports
4. Train to train	Males: 12-16 Females: 11-15	Build physical ability: aerobic basis, speed, strength. Develop skills in the chosen sport (or two sports)
5. Train to compete	Males: 16-23 Females: 15-21	Ideally prepare the body physically and professionally
6. Train to win	Males: 19+ Females: 18+	Competitive abilities
7. Active for life	Any age	Transition from competitive framework to physical activity for life

During each of the stage, there may be a transition between amateur and competitive activity. This transition happens for many reasons: late maturity, desire or unwillingness to compete or invest in the sport, etc.

Table 3: Development model and the two-way transition to life activity



Age Characteristics

Phase	Defenition of phase	Optimal biological age
0	Initial movement	0-5/7
1	Kids athletics	5/7-11/12
2	Multiple competitions	11/12-13/14
3	Developing competitive team	14/15-16/17
4	Specialization	16/17-18/19
5	Performance	Maxmial perfornce - 26
6	Activity for life	

LTAD framework program

Recommendations

	Kids	Young teens	Elite teens
Age	**6-11**	**12-15**	**16-19**
Focus	**Playing**	Learning	**Improving**
General/Specific	**More general**	**Balanced**	**More Specific**
Planning	**Season dependent**	**Developmend dependent**	**Competitions dependent**
Weekly training sessions	**3-4**	**5**	**5-6**
Loading duration	**30-60 minutes**	**60-75 minutes**	**75-105 minutes**
Game formation	**3V3,5V5,7V7**	**9V9,11V11**	**11V11**
Effects	**Loving football & improving coordination**	**Achieving basic physical basis and technical elements**	**Preparation for the game**

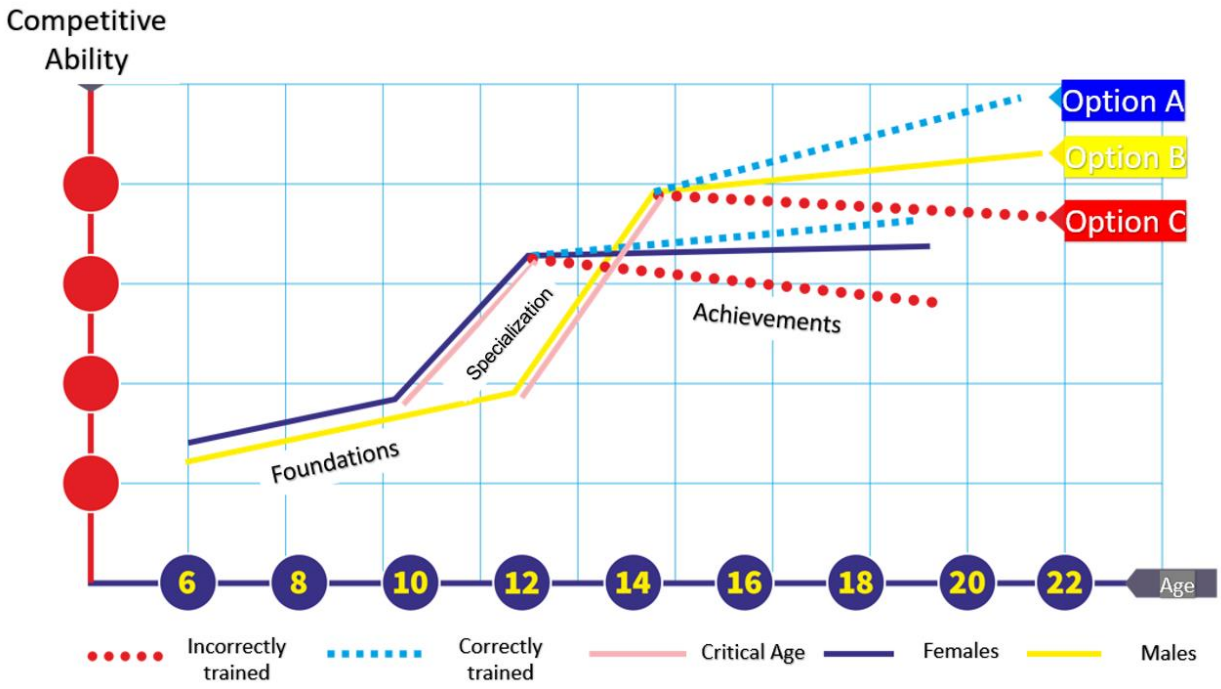
7. The biological development of the young player

(and its affects on competitive sports)

The biological development of the young player continues until the age of 18. At the age of 13–15 (boys) and 10–13 (girls) there is an accelerated development of the physical, mental and anthropometric (such as height, weight and muscle mass) values.This period is significant in regards to different loads of training, competitions, matches and for the improving coordination and learning technique.

At the age of 6–13 (boys) and 6–10 (girls) there is a moderate increase in all values with a slow and gradual development. During this period, a diverse physical, mental and coordinative activity is required.

Enters the framework at age 6 ⟹ moderate development up to age 12
at age 12/13 up to 16 ⟹ accelerated development
after age 18 a transition to high competitive level with ability's exhaustion or stagnation to withdrawal.



- **Option A**: Continued development and maximized competitive ability in adulthood.
- **Option B**: "Glass ceiling" stagnation and inability to fulfill competitive ability in adulthood.
- **Option C**: Deterioration or retirement at adulthood.

First, we will examine how boys or girls develop towards the age of youth

Girls

Starts at the age of 9-10
Finishes at the age of 12-13

Boys

Starts at the age of 12-13
Finishes at the age of 15-16

Due to increased activity of the pituitary gland

Increased hormone production

Burst of body growth and non-simultaneous sexual development in all body organs

Changes over 2-3 years:
up to 25% of height,
up to 40% of weight

Anthropometric and physiological differences between genders

	Boys	Girls
Age of highest growth rate	13.4 (13-16)	11.4 (10-13)
Age of final height	18	16
Age of peak weight gain	14.5	12.5
Muscle % during birth	25%	20%
Muscle % of an adult	50% (Male sex hormone)	40%
Age of peak muscle % growth	18-25	16-20
Fat % during birth	10-12%	Slightly higher
Fat % of an adolescence	15%	25% Estrogen (female hormone)
Fat % of an adult athlete	8-12%	15-22%
VO2Max during adolescence (ml/kg/minute)	44	40
	In adults: decreases by 1% every year	
In adolescence: rises from 1.2L to 2.7 between age of 6 to 12	Doubles from age of 6 to 12 from 1.2L to 2.7L	15-20% less than boys

Initial muscle mass 0.8 kg (25% of bodyweight)	
Age 13-14	40% of bodyweight
Age 17-19	40-50% of bodyweight

Initial fat mass: 12-15%	
Age 13-14	15%
Age 17-19	8-20%

Biological and cognitive development consequences on young athlethe's physical activity

It is important to remember that a child is not a small adult.
During training of competitive athletes we must focus on:

- Level of talent
- The training process and adaptation of loads, content of training, volume and intensity for the athletes
- Finding professional, educational and interesting training methods that allow the young athlete to remain competitively active in the future.

Sports training among children

(Prof. Jelle Jolles, Netherlands, 2021)

- Every child is **curious, initiative and likes challenges**.
- A young brain is **hungry for stimulation, and needs sensory, social, emotional, cognitive and physical stimulation**.
- Child's self-regulation continues to develop throughout childhood and into adulthood, at a **different individual pace** from child to child.
- The young athlete must be given **time to discover his talents** (even a tree that grows slowly can grow to be the tallest of trees).
- The child's **inner motivation** must be strengthened.
- **At a young age the emphases should be on enjoying the sport and love for the sport**, not on achievements. **Until the age of 12, it is recommended not to choose a main sport**.
- **Children will always choose short-term goals**. They have no long-term vision
- At a young age it is important to offer the child a **wide variety of sports activities.**
- The duration of each developmental phase varies from child to child
- Even a child whose development is slow and whose achievements are mediocre, **can become a super athlete**! And the opposite is also true - a child who reaches impressive achievements at a young age will not necessarily become an elite athlete.
- It is better to **divide into groups according to ability and not age.**
- **It is not possible to determine the child's developmental phase through tests.**
- **There is no need to accurately analyze every movement and motor skill in the child**. This may create a negative effect because it is perceived by the child as non-constructive criticism
- While training children, **the child is the one in the center**, not the coach. The coach should see himself as a tool, designed to support the optimal development of the child
- The coach should see the **child/adolescent as a whole**, and consider all aspects of his personality and not just his athletic aspects.
- **Self-assessment and self-feedback** are keys to personal development.
- **Sports and competitions are good for the adolescent's social mind**, they prepare him in a healthy way for an adult social life. By participating in competitions, the teenager learns to appreciate his value.

Recommendations for optimal development of the young footballer:

1. To look at young children differently - childhood is a period of chances and opportunities.
2. During childhood, 4 developmental dimensions must be taken care of properly: physical, cognitive, social and emotional.
3. The young child should be encouraged to build his performance ability.
4. Work with the child on self-regulation and self-knowledge.
5. Work with him on expression, thinking and drawing conclusions.
6. Three phases of puberty must be acknowledged: early, middle and late phase. Each phase requires a different approach.
7. Take care of wide development of skills and abilities.
8. The coach should take on diverse roles in the child's life: coach, supporter, manager, inspirer, mentor and advisor.
9. Schools must create conditions for the development of curiosity in cooperation with parents.
10. The role of the government is to enable the transfer of knowledge, a change of attitude and the creation of suitable conditions.

Developmental differences between genders

During the first three years of their lives, girls develop faster than boys in all areas: motor, language, cognitive and social. They stand, walk and talk faster, and their maturation processes develop earlier. Later on, the rate of development is similar, and from the age of 6, both men and women develop at a different rate. In some areas boys will develop more and in other areas the girls will be more developed.

Around the age of 3, the child learns to distinguish between genders, and for the most part, he wants to join children of his own sex. He learns what interaction is expected of him and imitates his environment.

As far as physical ability, the increase in physical ability is linear only up to the age of 10–11 for girls, and 12–13 for boys. From these ages onwards, the clear differences begin.

Usually, the boys tend to be more active with physical activity that involves contact between the players. The girls do tend to use contact but less than the boys. Girls prefer coordinated movement activities.

Other “free” behaviors such as running in the garden, lying on the floor, etc. is more accepted for boys, while from girls, it is expected to behave in a more refined and appropriate manner that conforms to the rules (of an educational institution).

For example: sitting upright on a chair and raising a finger for permission to speak.

Boys are requested to behave in certain manner regarding physical behavior more than the girls, but obey less.

Physiological and structural differences between genders

The different chromosomal structure of men and women influence greatly on physiological and structural differences between genders since puberty.
While female sex hormones are estrogen and progesterone, the male hormone – testosterone, is low amongst women. This fact is related to the most of the physical abilities components, especially strength.

The height and weight of women are lower compared to men. Heart and lungs dimensions of men are larger, and their pulmonary ventilation is higher than womens, so as the blood volume and hemoglobin concentration (13.7 g/100ml in men vs 8.15 g/100ml in women).

Maximal oxygen consumption:
Difference between women and men is around 50%–60% in liters of oxygen/minute (absolute oxygen), 20%–25% in ml oxygen/kg body weight/minute (relative oxygen to body weight), yet only 10%–15% in ml oxygen/LBM kg per minute (relative oxygen to body weight without fat)

Women's upper body and lower are approximately 50% and 35% weaker than men's (respectively). In women, muscle endurance is 30%–40% lower than men. Muscle strength compared to cross-section size is similar in both genders. Muscle fibres division to red (slow – ST) and white fibers (fast – FT) is similar between genders, but cross-sectional area of the fibers is larger in men, causing an advantage in muscle strength. Men's brain is 9% larger than womens (after calculating body size), but the number of brain cells is equal between genders (in women, cells are more compact).

The female hormone estrogen, is related to females having a wider pelvis, shorter limbs and narrower shoulder structure than. Also, females have a greater carrying angle of the elbows, which is a biomechanical disadvantage in running and throwing.
Adipose tissue in women is double than men. Estrogen is responsible for the excess storage of fat in girls during puberty, while testosterone causes muscular development in boys.

A relatively small muscle mass and a relatively high percentage of fat in the women affect the metabolism at rest and during exercise. In addition, men use energy than women over the same training unit.

At rest, CP-ATP storage is similar between genders. On the other hand, during a short and intense effort, glycolytic process is higher amongs men, contributing to higher levels of lactic acid after performing anaerobic efforts.

Muscle glycogen utilization rate is around 25% higher in men.

Men use 30% more proteins during intensive effort than women.

Women are more flexible than men in most organs of the body, due to a higher level of the relaxin hormone.

Females tend to engage less physical activity males. Also, they choose activities that are traditionally seen as suitable for girls: gymnastics, dance, ballet, aerobic gymnastics with less activities that are currently seen as suitable for both genders such as swimming, tennis and cycling.

Women have a lower pain threshold and they tend to be more emotional about the pain, which is manifested in a higher incidence of chronic pain.

Factors that influence differences between genders

Hereditary factor: affects the differences in weight, pelvic structure, percentage of hemoglobin in the blood and many other factors.

Hormonal factor: Male and females hormones are found in both genders. The difference is in the concentration of these hormones.

Social factor: social pressures have a direct and indirect effect on the avoidance of females from engaging in sports: the fear of appearing "masculine" , and also, there is reluctance towards women with high physical abilities.

Differences between genders during physical performance

Development phases of competitive athlete at a young age:

- Up to age 6–8 in both genders - rate of development is the same
- Up to age 12–13 boys and 10–11 girls - slow and steady development
- Up to age 15–16 boys and 13–14 girls - moderate development
- At the age of 16–17 girls - gradual development and stabilization
- Up to age 17–19 boys - accelerated development

Physical fitness components

In general, in competitive sports, men's performances are 10%–20% higher than women's (except for maximum strength - see below). However, it should be emphasized that the differences between genders are not relevant in competitive sports, since women and men each compete against the same gender.

Ability tests of main fitness components indicate these differences:

Speed (running):

Women are slower than men by 10%. For example: the world record for men's 100 m is 9.58 seconds, while for women is 10.49 seconds - a difference of 9.49%. A similar difference in the world championships over the last decade. Male winner in the last championship was 9.77 seconds and the female's was 10.71 seconds - a difference of 9.62%.

Cardio:

Also in running of endurance sports, the difference is around 10%. Last marathon record for men is 2:03.23 hours and for women 2:15.25, a difference of 9.75%. In the last world championship, the male finisehd in 2:09.51 hours and the female in 2:25.44 hours (12.3%). The differences are also similar in the shorter distances: in the 1,500m run, the world record for men is 3:26.0m and for women 3:50.46m, a difference of 11.18%.

Explosive Force:

The difference between men and women reaches around 20%.
For example, the world record in long jump is 8.95m for men and 7.52m for women (19%). In World Championship of 2013, male winner achieved 8.56m and the female winner 7.01m, a difference of 22%.

Maximum force:

The difference between genders reaches 40%–50%. The world record in weightlifting (in heavy weight) is 263kg for men compared to 190kg for women (38.4%).

Muscle endurance: In women, muscle endurance is lower in 40%–50%.

Flexibility, coordination and movement: women have an advantage over men.

The largest difference between genders is in maximum strength

The difference in speed and explosive power may derive from the strength of the maximum force.
On the other hand, the difference in endurance is related to the fact that women's internal body organs (heart and lungs) are smaller. Other reasons are hereditary, hormonal and traditional-cultural-social factors. However, in recent years, the gaps that existed in the past relating to social and cultural factors are getting smaller.

Differences in brain function between genders

Brain research reveals substantial biochemical differences between men and women in brain function, differences that are inherent from birth, and do not result from environmental influences. On average, the weight of a man's brain is around 1,400 grams and a woman's is 1,200 grams, this does not indicate higher abilities of males but a heavier mass.

Differences in brain function affect the function of genders

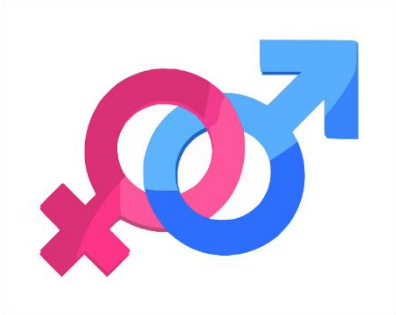
The right part of the women's brain is dominant, in men, the left part is dominant.

The difference in creativity (right lobe) is evident – it is stronger in women, compared to the logical ability (left lobe) – which is higher in men. For example: when both sexes think about the same question, a different area of the cerebral lobes is activated in each of them.

Due to women's greater ability to focus attention, they are able to perform several actions at the same time, while men are better at performing one task at a time.

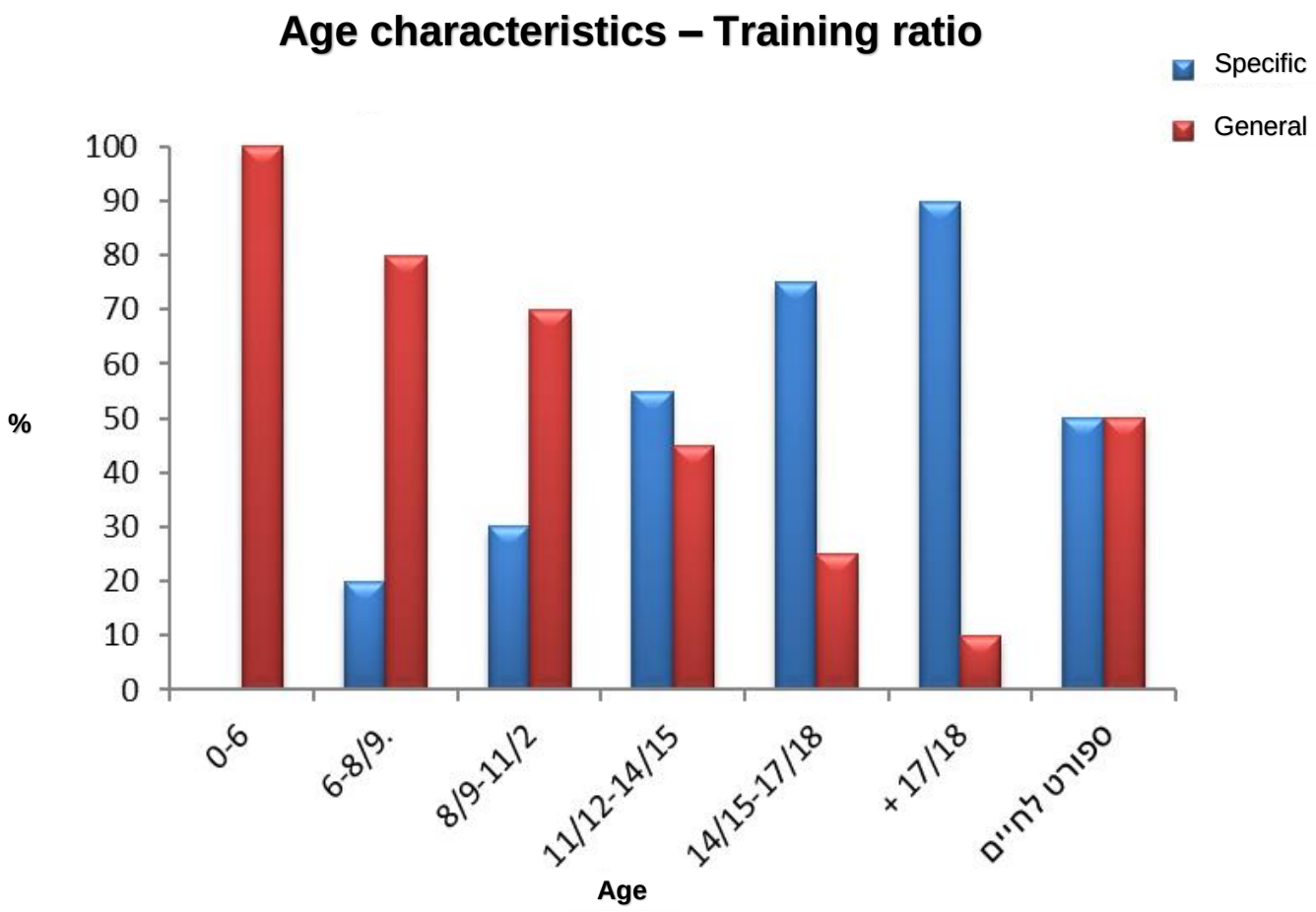
Women, compared to men, react emotionally to every stimulus they encounter: they hate, love and develop affection (or aversion) even for details that are not related to emotion.

The verbal part is wider and more developed in the woman's mind, so she is more inclined to conversation and more easily creates a quick and direct connection with her environment.



Men are faster than women in 10%. Explosive force difference is 20% and maximal force is 35-45%

The following graph summarizes the ratio of training throughout life, specific (sport) versus general training.



Adversity causes some men to break; others to break records (William Arthur Ward)

8. Optimal lifestyle for young athletes

Recovery and regeneration:

Physical efforts cause physiological changes in the body. in fact, after an intense and prolonged exercise, several reactions occur that are similar to a disease state:

- During exercise, children and teenagers can reach an increased heart rate of 220-230 beats per minute.
- Body temperature increases (up to over 40c)
- Increased concentration of lactic acids
- Loss of fluids, risk of dehydration
- Depletion of glycogen stores

Post exercise, the young athlete must regain oxygen and water, since without them, there is no life. 72% of the human body consists of fluids. Loss of 2-3% fluids may cause dehydration.

Exercise may induce 3 types of fatigue

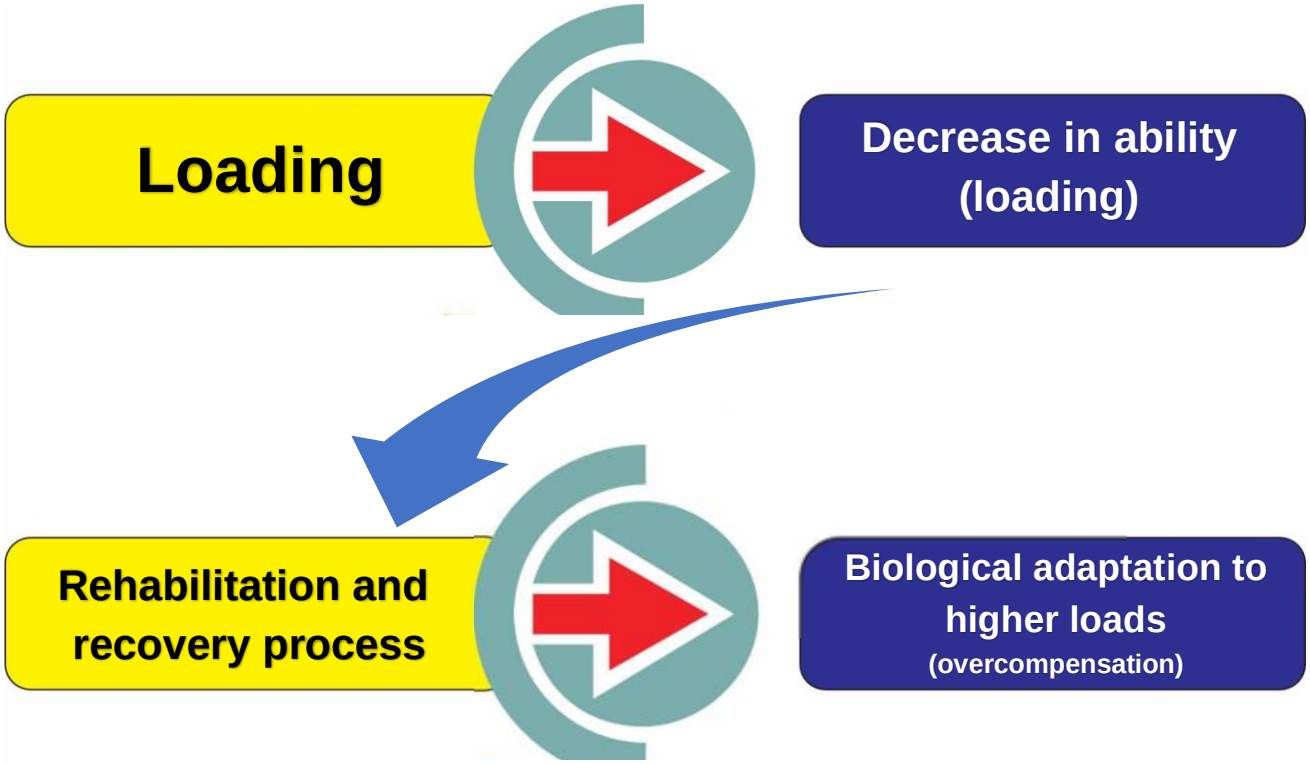
- Excessive muscle fatigue
- Excessive physiological fatigue
- Excessive mental fatigue

Additional injuries might occur, such as willows, ingrown toenails, etc.

The expression for fatigue can be in:

- Pain
- Excessive emotionality
- Lack of motivation
- Depression and agitation
- Restless sleep
- Lack of appetite

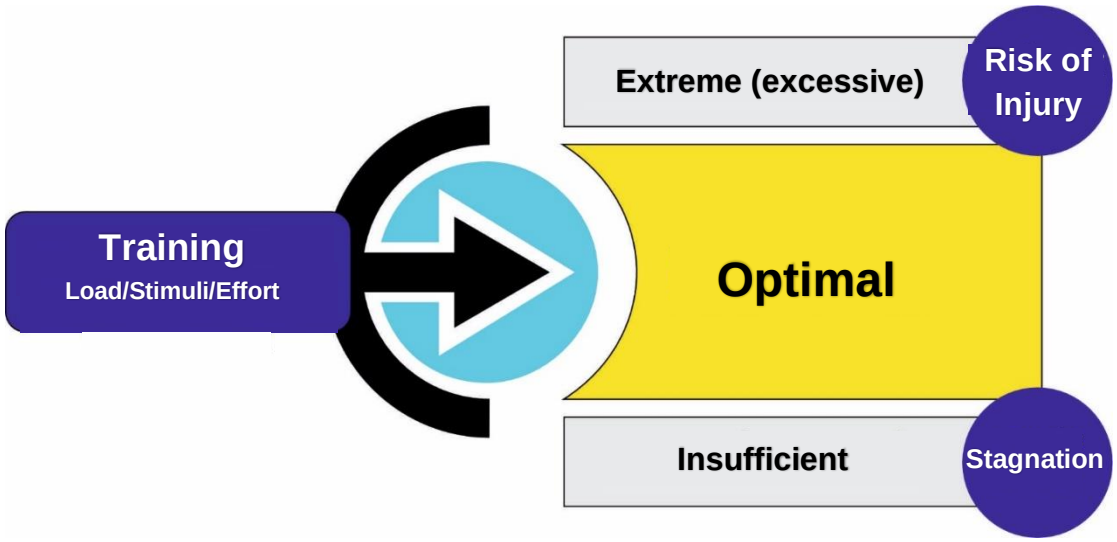
At any age and any situation we should have a positive lifestyle related to nutrition, rest, sleep, clothing, aesthetics and treatment of injuries and diseases. Fatigue after exercise, especially when participating in competitive sports, has physiological and sometimes mental effects that are very similar to diseases. Intense and extreme exercise contributes to an acceleration heart rate, body temperature, higher concentration of lactic acid in the muscles, pain, weakness and depletion of glycogen stores. In competitive sports, fatigue and often exhaustion are an integral part of the athlete's lifestyle, mainly because of the physical and mental effort invested during training, competitions or matches. Therefore, the athlete must adapt his lifestyle to the loads and its effects. Higher loads in training and competitions requires more recovery.



Training Process

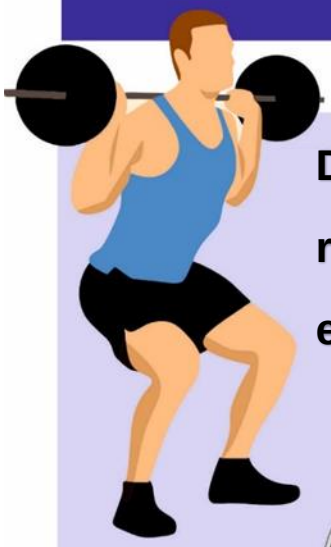
Training must be optimal and balanced

Intense and frequent training may cause injuries and stagnation, but a very low intensity training prevents improvement.



Recovery and regeneration are part of the training and matches program

To reach high level of competitivness and training, the athlete must recover, regenerate and rehabilitate properly. Imbalance between loads and required recovery, risks the athlete's health, but also the ability to increase loads and performance.



Duration, quality and timing of recovery directly determine the effectiveness of training

Conduct before, during and after training, competition or game

Guidelines for the athlete before the training, game or competition:

- Be prepared physically and mentally for training matches and competitions.
- Repeat the hours of training matches and competitions.
- Repeat the actions you perform before activities: arrival time at the shuttle statio, training facility or the matches.
- Prepare yourself physically: treat health problems, muscle cramps, etc.
- Prepare clothing and food:
  - Training or game outfit
  - Towel and toiletries
  - Extra shirt for replacement
  - Training suit before and after the activity
  - Warm clothing after the activity
  - Eating after the activity
  - Drinking (water or soft drink) before, during and after the activity.

During training, matches and competitions:

- Take advantage of the breaks to consume energy (glycogen) and especially fluids by drinking water (gradually).

- Time breaks, resting on the bench or periods between fights or quarters are an excellent opportunity to restore fluids and recover.

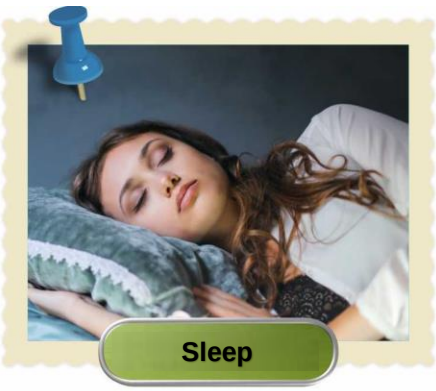
- Healthy and balanced nutrition during the day is just as important as the nutrition during training and competitions. Make sure to eat and drink every 2–3 hours.

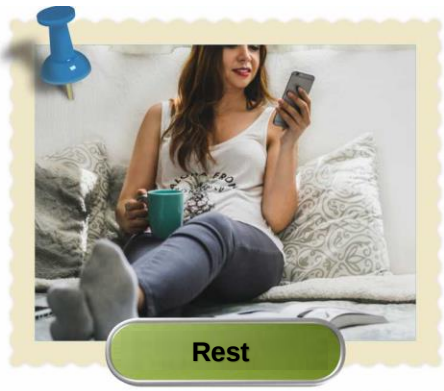
- Prepairing sandwiches and fruits in advance is the best way to provide energy and all the food components needed for training, games and competitions.
  Bring sufficient food according to the time spent away from home.
  Choose the type of food according to the training, match, competition or weather.
  In the summer, choose foods that are more resistant to heat and vice versa.

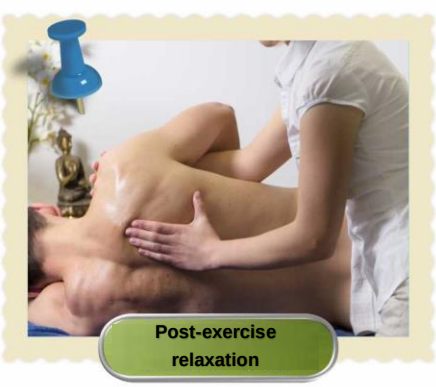
- During rest, wear warm clothing (sweatshirt) and keep your body warm before the next exercise. During longer breaks, change wet clothes with sweat and refresh yourself in a shaded place.

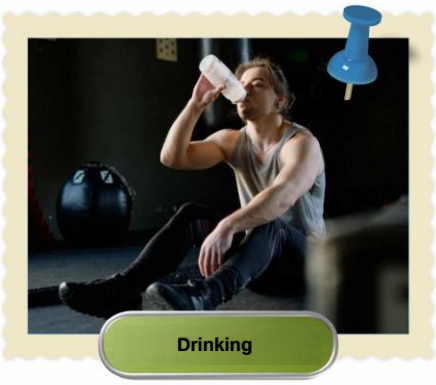
Remember - in order to achieve good results and performance, it is important to follow the rules of rest, nutrition, drinking and aesthetics.

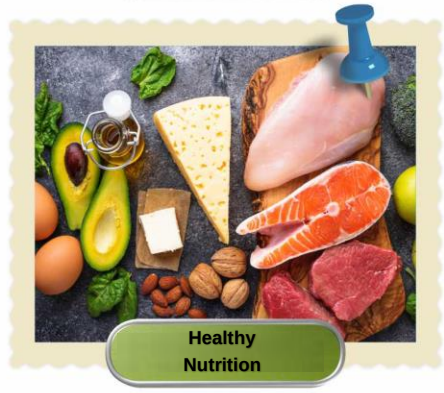
The components of recovery in a correct lifestyle of athletes











Healthy Nutrition

*** This section was written by nutritionist Tali Lok and taken from the booklet "Healthy Lifestyle of the Young Athlete", edited by Yitsik Ben Melech, 2008.**

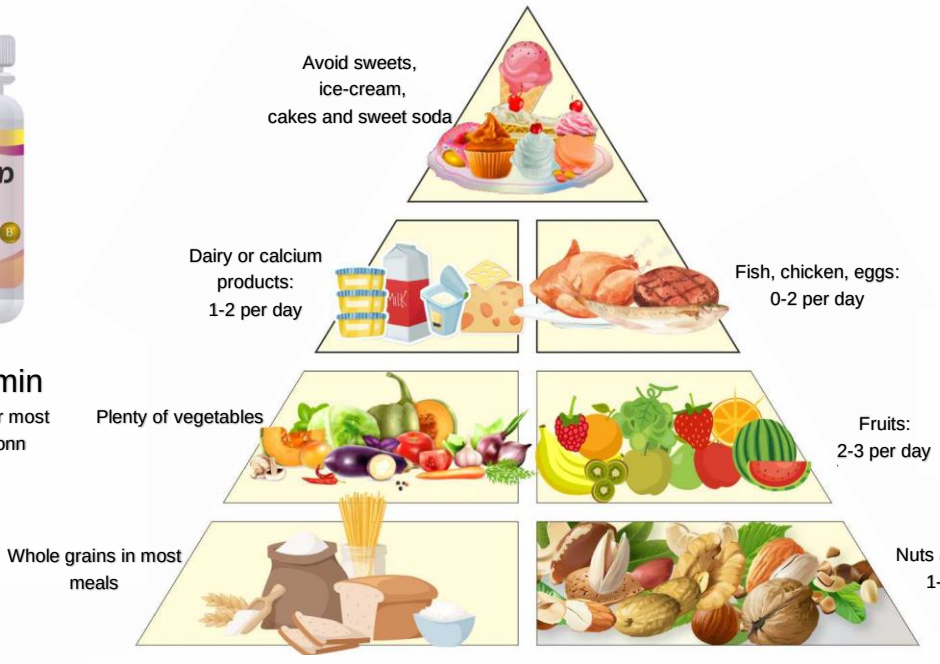
Nutrition is an integral part of an athlete's life. With proper nutrition, the athlete may control his health and daily functioning, with positive effects on sports performance. When it comes to young athletes, nutrition plan usually does not satisfy their nutritional needs. Most of the time, their nutrition is influenced by habits developed at home, advertisements, social norms, academic stress and various chores.

A nutrition plan that is mainly based on "junk food", irregular meals, skipping meals, insufficient fruits and vegetables, does not provide the young athlete with the appropriate nutritional needs and may cause deficiencies that will prevent reaching potential ability, cause disorders in the growth process and may induce fatigue in matches and training.

A healthy diet should include all types of nutrients: carbohydrates, proteins, fats, water, dietary fiber, vitamins and minerals:

Multi-Vitamin

Recommended for most of the populationn



Alcohol

"No-go"

Carbohydrates

Carbohydrates (sugars), are the most available source of energy for humans.
Also, they are considered a main component of the diet. In the human body there is a small storage of carbohydrates called glycogen. The glycogen is found in the liver, muscles and also in a small amount in the kidneys. Glycogen provides energy to the body during physical activity and more. There is a correlation between diet with increased carbohydrates and the ability to perform in sports: a lack of carbohydrates will decrease the athletic ability and the ability to maintain effort over time.

Carbohydrates are divided into:

Simple carbohydrates

- Break down faster, sharpley and quickly raise the blood sugar level.
- Found in white sugar, sweets, etc.
- Eating sweets before training or a match will lead to an increase in the blood sugar level, followed by a decrease that may cause a state of hunger, dizziness, weakness, an additional need for sweets and usually also a decrease in athletic ability.

Complex carbohydrates

- Break down slowler that simple carbs, maintain a balanced blood sugar level throughout the day and provide energy for about three hours after the meal.
- Found in rice, pasta, bread, whole wheat cornflakes, potato, sweet potato, legumes (which also contain a large amount of protein).

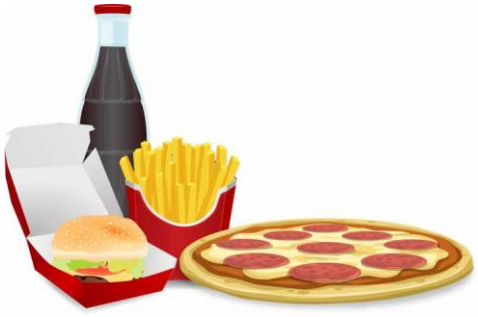
Proteins

Proteins are involved in all types of cells creation in the human body.
Athletes need proteins (in combination with carbohydrates) to rebuild the muscle after intense activity. Although athletes need a larger amount of protein than a sedentary, the amount in the daily menu should still be moderate.

Excess protein does not improve strength and may even harm the body.
In general, the healthy should provides the recommended required amount of protein for athletes, so there is no need for supplements. Proteins are digested slowly, that is why meal timing and composition must be planned according to training hours and competitions, so that high-protein food does not disturb the stomach during activity.
Protein sources are meat, chicken, fish, eggs, legumes and dairy products. Plant-based foods cannot be used as a substitute for protein unless a combination of grains and legumes is made. For example, rice and lentils or spaghetti and beans.

Fats

Fats are the largest energy storage of the human body.
Some types of vitamins are absorbed only in the presence of fat, such as beta-carotene that isfound in carrots. In order for the vitamin to be absorbed by the body, the carrot must be eaten with a oil. Healthy and recommended fats are mainly found in plant-based foods such as avocados, olives, nuts, almonds, canola oil, tahini and fish.
Foods such as butter, margarine, cakes, ice creams, dairy products over 5% fat, fatty meats and coconut are not recommended.
In athletes, excessive fat consumption leads to less carbohydrates consumption and weight gain. Eating high-fat foods close to exercise activity has a negative effect on performance, so the athlete should avoid high-fat foods such as fries or high-fat meat before activity.



Vitamins and minerals

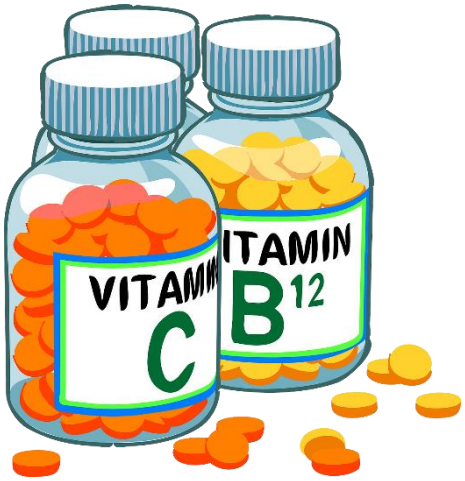
Vitamins and minerals in small amounts are important for the body.
They play different roles in the metabolic processes and in various biological processes.
Most vitamins are not made in the body, so they must be obtained from food.
Vitamins and minerals are found in fruits and vegetables, whole grains (bread, pasta, rice, etc.), meat products, cheese and eggs (vitamin B12).

Functions of several vitaminns:

- Vitamin C strengthens the bones
- Vitamin A is important for vision and skin
- Vitamin K causes the blood to clot

Functions of several Minerals:

- Zinc prevents hair loss
- Magnesium participates in muscle contraction processes
- Phosphorus participates with calcium in bone building.



Importance of drinking

The human body consists of 60%–70% liquids.
During exercise our body tends to lose fluids and salts (sodium and potassium) due to increased sweating.
Moreover, the enviornemnt also affect fluids loss: training or playing under hot weather, fluid loss will be greater. An athlete who does not restore the amount of fluids he lost during the activity, may become dehydrated. Dehydration can cause depletion of energy reserves and a decrease in sports performance.
It is important to drink also during the day, and not only during the activity.

Paying attention to the following principles will assist reaching proper saturation:

1. Take a personal drinking bottle with you to school.

2. Use drinking facilities in the sports club and the changing rooms.

3. Make sure to drink about 2 glasses of water every two to three hours, so you won't have to complete the daily amount of fluids at once.

4. Weighing before and after training/match will be the measure of fluid loss.
The weighing will be done without clothes (avoid weighing the sweat in the clothes).

<u>Drinking during training, matches or competitions</u>

- 2 hours before training/match - 500 ml (2-3 glasses of water)
- 20 minutes before training, match or competition - 250 ml (1 glass of water)
- During training, match or competition - 150-300 ml every 15-20 minutes (total 600-1200 ml).
- After training or a game - based on the weight changes before and after training/match, 150% of the weight lost must be regained.
  For example, if after the activity there is a loss of 1 kg, 1.5L of fluids must be restored.
  Restore fluids in duration of two hours after the activity (not at once).
  It is recommended that each athlete have a personal bottle to avoid "group flu".

Nutrition, development and growth

Adolescence occurs the age of 10–18, and is characterized by rapid growth, development and changes of body structure: boys and girls become men and women. That is why dietary habits, composition of food, timing of meals and the amounts of food the body receives to fulfill its needs are of the utmost importance.

Young athletes are under a relatively heavy physical load, which requires special nutritional planning. The training load during the growth period may create nutritional deficiencies that will lead to impaired maturation, height growth, abnormal bones development , weight loss, weakness, lack of concentration, fatigue during exercise, leading to decreased competitive abilities. Nutritional requirements during adolescence are dictated by three main processes that occur during this period:

- Accelerated growth rate. Occurs in a concentrated period of time frame (1-2 years) and initiates individually. In girls, usually occurs at the age of 10–12, in in boys at the age of 13–15. The rapid growth during adolescence is characterized by an increase in height, muscle and fat tissues and weight gain.

- Additional energy (calories). The accelerated addition of body tissues requires additional energy of food and a larger amount of proteins and minerals - calcium, iron and zinc.

- Healthy and balanced diet. Nutritional deficiency during this period may damage growth. Also, when it comes to young athletes who are under high physical loads, the result of this deficiency may be even more severe if combined with an unbalanced diet, strenuous physical activity and the increased nutritional requirements during adolescence. The nutritional deficiency may lead to irreversible physiological damage and slowing of growth in height.

  In conclusion, healthy and balanced nutrition during the period of accelerated growth is critical for reaching competitive potential and may contribute to the career in the future of the athlete.

Nutrition close to training/match

Healthy nutrition with ideal timing may be the difference between a successful training or match and an inability to perform or recover from them.

Nutrition also affects the progress of improvement. Process of training, even if done correctly and persistently, will not bring the desired results if there is no full synchronization between training and nutrition. It is important to note that the nutrition during the day is just as important as the one close to the training or the match: an athlete who eats properly and timed close to training, but during the day does not follow the rules of the balanced nutrition, will have difficulty reaching achievements and competitive potential.

Carbohydrates are the primary energy source for anaerobic activity (e.g. sprints) and intense aerobic activity. Also, carbohydrates provide energy to the active muscle at a faster rate than proteins or fats.

The carbohydrate reserves (glycogen) in the muscles and liver are affected by dietary habits and physical activity. When these reserves are depleted and there is no supply of carbohydrates from food, there is a drop in the blood sugar level and the athlete may feel weak and tired.

Depletion of glycogen storage occurs in the following situations:

- After an overnight fast of 8–12 hours: the fast empties the glycogen stores in the liver, therefore training or playing without a nutritious breakfast will cause fatigue and weakness at the beginning of the training/match.

- Intense aerobic activity for an hour: this will cause a depletion of 55% of the glycogen reserves.

- Intense aerobic activity for two hours: this will completely deplete the glycogen stores in the liver and muscles. For this reason, it is very important to consume carbohydrates during training or matches lasting more than 1 hour.

Nutritional recommendations for meal planning close to the training/match

Below are the recommendations for eating before, during and after exercise:

Eating before practice/game

Eating before a training/match has several purposes:

- Maintain balanced blood sugar levels and prevent sugar drop and cravings during activities.
- Store maximal amount of carbohydrates in the muscles and liver for energy.
- Provide fluids to prevent dehydration.

Evening training/match

2-3 hours before the exercise (planned at 19:00–21:00) dinner must be eaten, and only after lunch has almost completely digested.
Example for dinner: Sandwich with 5% cheese / cereals with yogurt / yogurt + fruit / bun and yogurt.

15 minutes before the exercise it is recommended to consume additional carbohydrate that digest easily: banana / 3 dates.
When a match is planned, it is recommended to prepare nutrition the night before.

During training/match

As mentioned, intense aerobic activity for two hours will lead to a glycogen depletion of 55%. When performing the same general activity for two hours, glycogen will completely deplete in the liver and in the muscles.

The purpose of this meal is to preserve the glycogen storage in the muscle and to maintain balanced blood sugar levels, since low sugar levels can cause headaches, dizziness and nausea.

Therefore, after an hour of activity, it is recommended to consume carbohydrate such as a banana or an energy bar. It is possible to use half-time break for this snack.

Eating after practice/game

Eating after the training/game is very important for sevral reasons: replenishing the glycogen in the muscles and liver, repairing muscle and tissue damage and for recovery processes of the muscles and tissues for the next activity.

The first meal will be an hour after the activitiy, and it will contain carbohydrates, protein and fluids. For example: sandwich (with 5% cheese / pastrami / egg / tuna) + fruit. Usually this meal will be on the way home, so early preparation is recommended.

The next meal will be up to 2 hours after the activity. This meal contributes to the important processes mentioned above. This meal contains more calories, and usually occurs at home. The meal contains carbohydrates like pasta, rice, cereals and a portion of chicken / turkey / fish meat. If the athlete did not arrive home for this meal, he can eat another sandwich and consume the large meal later.

During intense training, training camp or tournaments, it is important to provide the muscles with available carbohydrate (fruit or energy bar) immediately after the training/match and increase the total of daily carbohydrates.

**Ask not what your teammates can do for you,
Ask what you can do for your teammates.
(Magic Johnson)**

The following tables describe meals planning before, during and after the exercise at different times of the day

Pre-match nutrition - morning

Time of match	Awakening	Breakfast	Breakfast examples	Notes
08:30	06:00	6:30-7:00	Cereal with milk/ cup of yogurt+ fruit/ 5% cheese sandwich+fruit/ bun+yogurt	**Dinner the night before -** pasta/rice/cereals+ chicken/meatballs/fish. **15 minutes before match** - banana/3 dates.
10:00	7:00-7:30	8:00-8:30	Cereal with milk/ cup of yogurt+ fruit/ 5% cheese sandwich+fruit/ bun+yogurt	**Dinner the night before -** pasta/rice/cereals+ chicken/meatballs/fish. **15 minutes before match -** banana/3 dates.

Post-match nutrition - morning

Time of meal	Post-match meal examples	Notes
Up to 1 hour	Sandwich (with 5% cheese/pastrami/egg/tuna) +fruit	Usually this meal is eaten on the way home, prepare it ahead of time
Up to 2 hour	Pasta/rice+ chicken/meatballs/fish	When skipping large meal, eat a sandwich and consume the large meal later
'''	Fruit/energy bar	During intense training/training camp/ tournament

Pre-match nutrition - evening

Time of match	Awakening	Daily routine	Notes
21:00–19:00	**Until 10** **It is possible to take short nap/rest at noon**	**1. Entire breakfast** **2. Meal (e.g. sandwich) every 2-3 hours** **3. Entire lunch 3-4 hours before the match** **4. Additional meal 2-3 hours before the match (cheese sandwich/cereals/yogurt+fruit)**	**Night before match: pasta/rice/cereals+ chicken/meatballs/fish.** **15 minutes before match: banana/3 dates.**

Post-match nutrition - evening

Time of meal	Post-match meal examples	Notes
Up to 1 hour	Sandwich (with 5% cheese/pastrami/egg/tuna) +fruit	Usually this meal is eaten on the way home, prepare it ahead of time
Up to 2 hour	Pasta/rice+ chicken/meatballs/fish	When skipping large meal, eat a sandwich and consume the large meal later
Immediately after match	Fruit/energy bar	During intense training/training camp/ tournament

General recommendations

Use breaks during matchesto refill energy reserves (glycogen) and restore fluids.

Timeouts and sitting on the bench are excellent opportunities for hydration and recovery.

Healthy and balanced diet during the day is just as important as the diet next to training and matches - make sure to drink and eat every 2-3 hours.

Preparing sandwiches and fruits in advance is the best way to provide the energy and nutritional components needed for training and playing successfully.

Pack enough sandwiches and fruits according to the time sepnt away from home.

Choose foods according to the weather. When it's hot, choose heat-resistant food like pastrami or tuna.

Sleep and rest are inseparable from a quality progress in training and sports career.

Make sure to rest after training and matches to allow maximal muscle recovery.

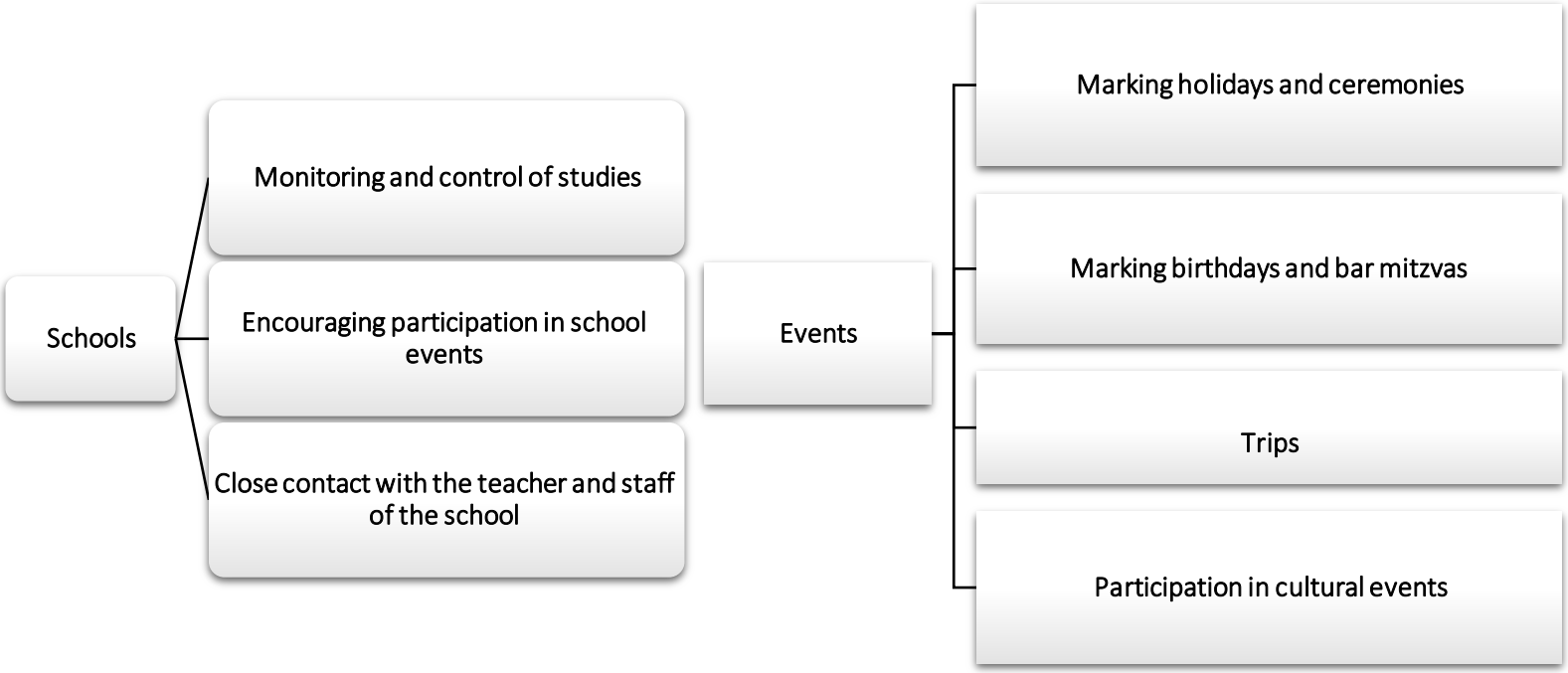
Remember:

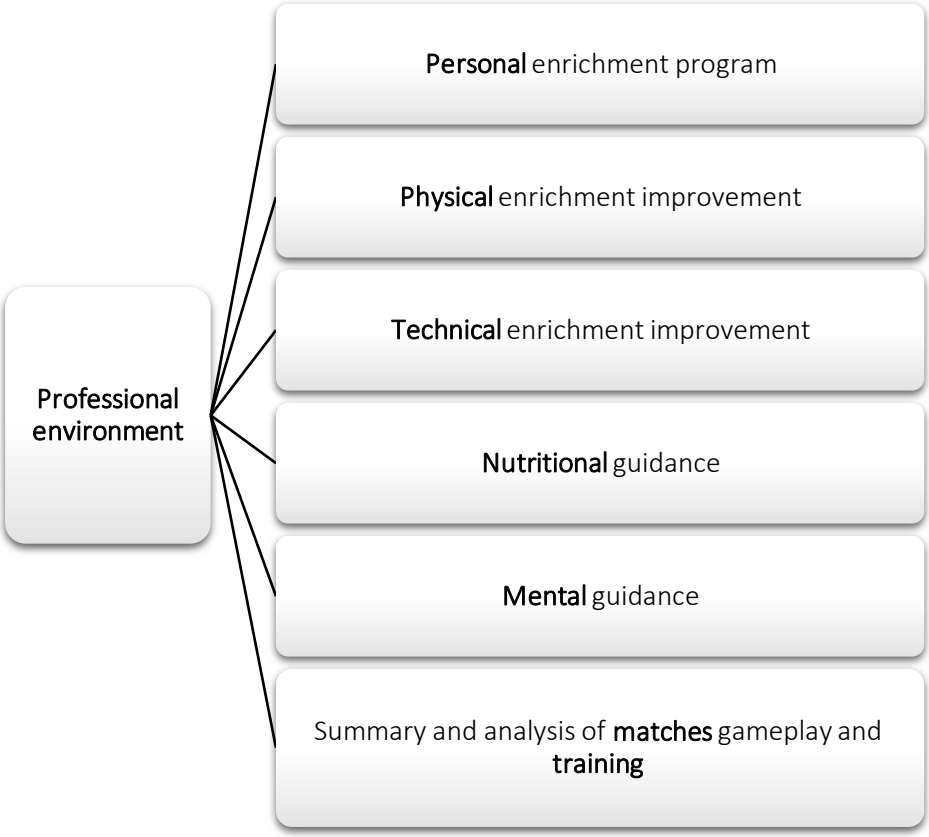
In order to gain high achievements, it is important to follow the guidlines of nutrition, hydartion and a healthy lifestyle!

To succeed - do your best anywhere you are with every means you possess

Educational-enrichment activities for children, parents and coaches

- Lectures and conversations with parents
  - Nutrition and lifestyle
  - sleep, rest
  - Aesthetics
  - Biological and professional development
  - Mental aspects
  - Using sport for education, social and cultural learning and against crime
- Lectures and conversations with players
  - Healthy lifestyle
  - Nutrition, sleep, aesthetics
  - Importance of training
  - Health
  - Rules
  - Physical fitness, technique, tactics
  - Studies, behaviour, values
  - Mental aspects


Schools
Monitoring and control of studies
Encouraging participation in school events
Close contact with the teacher and staff of the school
Events
Marking holidays and ceremonies
Marking birthdays and bar mitzvas
Trips
Participation in cultural events


Professional environment
Personal enrichment program
Physical enrichment improvement
Technical enrichment improvement
Nutritional guidance
Mental guidance
Summary and analysis of matches gameplay and training

Medical treatments

This chapter details some of the common injuries of players, their characteristics, signs and methods of treatment.

General guidelines

- Train in appropriate shoes according to training surface.
- Make sure the training/playing field is clear of obstacles.
- Make sure the equipment is safe and usable.
- Make sure clothing fits comfortably.
- Immediately after training/match,take a shower and change clothes.
- Try to avoid from infectious disease, especially during periods of training/matches.
- Maintain hygiene.
- Treat minor injuries so they don't turn into serious injuries.

Contusion

A Contusion is a bruise which is not accompanied with damage to the integrity of the skin or bleeding. Falls usually results in bruises and not injuries (because of the clothing that prevents external damage to the skin).

Symptoms:

- Pain at the bruise area.
- Local swelling
- Internal hemorrhage
- Possible limitation of movement ability.

Treatment:

- Cooling the bruised area using ice bag, wrapped in a cloth or towel (do not place the ice directly on the body). The area can be bandaged loosley.
- After the injury, elevate the injured part above the height of the heart to prevent swelling. Also at night, in order to prevent pain.
- Consult a doctor (or an emergency room) if you suspect internal bleeding, a bone fracture or a situation where the swelling or internal bleeding was not caused by the bruise.

Nose bleeding

Referring to a slight nose bleeding, without injuries/bruises.

Treatment:

- First and foremost, stop the bleeding.
- Sits with your head bent down and breathe through the mouth to prevent the blood from reaching the pharynx.
- Press the nose wings with two fingers for several minutes.
- Cool the nose externaly with an ice cube.
- Don't blow your nose after the bleeding has stopped.
- If bleeding continues for more than twenty minutes, consult a doctor.
- If nose bleeding occurs regularly, contact a doctor to find out the cause.

Toothache

Strong tooth ache is usually caused by inflammation of nerves (pulpitis).
A swelling or pus are formed in the area of pain, accompanied with complaint of hypersensitivity to hot or cold drinks with continuous pain.

Another type of pain derives from concentration of pus under the tooth or around the root, which originates from the nerve of the tooth or gum disease. Common complaint here is pulsating pain with or without swelling.

Emergency treatment in both cases is first of all discovering the source of the pain, draining the pus and providing immediate treatment to stop the pain.

Stomach ache

Usually caused by inflammation or bruise. In these cases, pain is constant or cyclical and may wake up from sleep.

Stomach ache may include:

- Urinary tract infection
- Inflammatory bowel diseases or gallstones
- Abdominal wall sensitivity due to bruise and/or bleeding
- Pain projecting from abdomen to another organ such as the spine.
- In situations of lactose intolerance or pain hypersensitivity, additional symptoms can occur, such as fever, nausea, vomiting, weakness, fatigue, weight loss, jaundice and abdominal bloating.

Digestive system disorder

Treatment:

Rest lying down or sitting.

In some cases, pain dervies from the need to pass stool.

To prevent dehydration in a condition of constipation, consume vegetables, dried fruits, fiber and other foods that facilitate bowel activity.

In the case of diarrhea, it is important to drink plenty of water and reduce fever.

If passing stool and taking pain relievers did not reduce pain, or in cases of injuries, bleeding or penetration of foreign object, consult a doctor.

Ingrown toenail

Growth of the nail (usually of the toe) into the flesh.
Sometimes the flesh grows above the nail.
In many cases, a blister forms in the area, and the lack of ventilation also causes infection and pus.
In any case, this is a very painful situation that interferes with walking.

Main causes:

- Improper cutting of the nail
- Narrow and tight shoes
- Fungus
- Nail contusion.

Line any medical problem, best treatment is prevention.
To prevent the formation of an ingrown toenail, nails should be cut straight, from end to end, not rounding the ends of the nail. Also, avoid cutting too deep which may create pressure of the nail on the skin during growth.
Useful tools for treating an ingrown toenail: specialised pliers, strong scissors and skin lifters (also used as nail sanders).
Remember: forming daily routine will prevent this situation.

Bee sting

Bee's venom is dangerous for individuals that are hypersensitive (allergic) to stings.

Prevalence of allergay is 10% of the population.

Symptoms

• Sharp pain for several minutes.

• Local redness and swelling. Usually, symptoms pass after several hours.

In cases of allergic reaction, a local response occurs, followed by nausea, stomach achen and diarrhea.
In complicated situations, it possible to develop an obstruction of the respiratory tract due to facial and throat swelling, cyanosis and even loss of consciousness.

Allergic indivuals should carry an Epipen.
It should be noted that there is a vaccination against the sensitivity.

Treatment:

Carefully remove the stinger with tweezers or by scraping the skin. Do not press externally on the stinger.

- Disinfect the sting area
- Cool the place with a paper towel dipped in cold water or an ice pack
- If necessary, take pain reliever
- In case of a rash, eye swelling or shortness of breath, go to the emergency room immediately

Plantar fasciitis

A condition in which there is pain in the heel during stepping.
Pain usually appears after physical activity or at the first step after resting.
The intensity of the pain ranges from moderate to severe and in some cases, may interfere with walking and cause limping.
Without appropriate treatment, this condition may become chronic and cause significant functional impairment.

Causes:

- Over-weight
- Prolonged standing
- Intense activity while standing
- Direct blow
- Defective structure of the foot (flat foot, high arch)
- Foot inversion
- Muscular imbalance and more

The treatment:

- Weight reduction
- Reducing activity during treatment
- Strengthening, flexing and stretching relevant muscles
- Cooling the effected area
- Special bandage to reduce loads
- Customized insoles
- In severe cases – pain reliver
- In extreme cases - surgical operation to remove the fascia from the bone (many avoid this procedure due to fear of nerve damage).

No gains without pains — Benjamin Franklin

9. The coach/trainer in competitive sports

The process of training, competitions and matches is based on practical experience, scientific knowledge, broad information and methodical solutions for training and sports achievements.

Necessary conditions for sports training:

Talents

Training/playing conditions

Sport success correlates with the level of training and coaching.
The coach guids the athletes in the process of training, competitions and matches.
The coach also affects on their way of life and their behavior.

Ideally, the coach/trainer should have the following abilities and skills:

- Knowledgeable in the sports profession
- Managing and navigating skills in training, competitions and games
- **Abilities to educate, advise and organize**
- Suitable personality
- Decision making
- Motivation
- leadership
- Dilligent
- The ability to constantly monitor athlete's condition
- Intuitive ability to diagnose advantages and disadvantages, weaknesses and varying situations of the athlete and the team

Coaches and sports professionals cannot stand still.
They must learn and improve all the time
and also demand improvement from their athletes

Training at different sports and levels

Introduction

Sports training includes a wide variety of fields, that is why several distinctions must be made:

- Intensity levels
- Professional vs non-professional sports
- Different ages (training children, youth and adults)
- Team vs individual sports
- Personal sports
- Professional commercial sports.

Detaild breakdown:

- **Sports levels:**
  - Coach/trainer/teacher in classes and leisure sports
  - Coach/trainer in competitive sports
  - Coach in comptetitive sports with totally different requirements.
- **Professional vs non-professional sports**: professional sports (e.g. adults soccer/tennis) and non-professional sports (such as athletics) must be separated.
- **Age**: training adults in competitive sports vs training and guiding children and youth.
- **Soccer coach and trainer**: Team sports use knowledge, information and experience from individual sports (mainly from athletics, weightlifting and gymnastics).

The importance of the coach in sports

The athlete is an episode, the coach is the basis of continuity

Academy of Coaches in Cologne, conducted a poll, asking 170 successful coaches about the possible reasons for their success:

Successful coaching in competitive sports depends on:

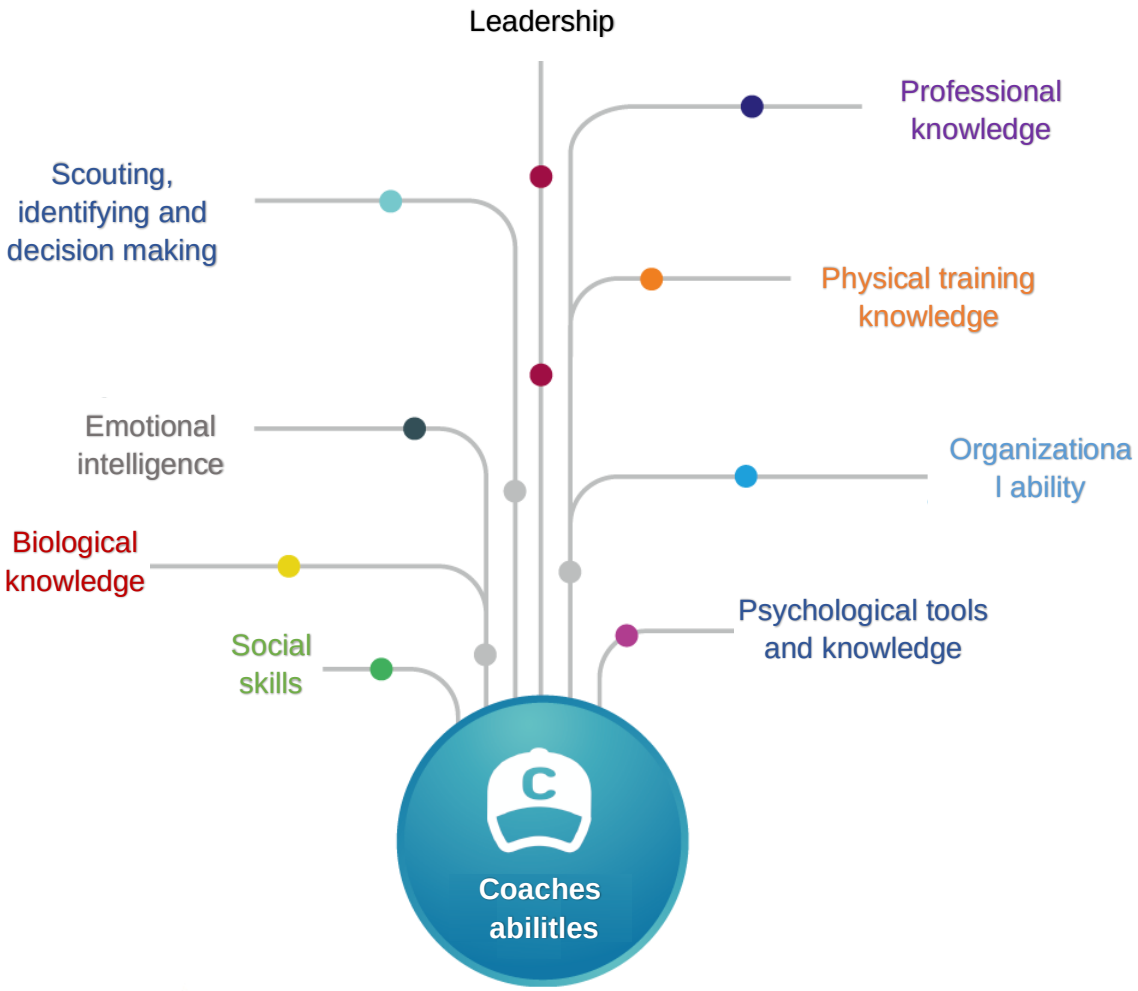
Skills | Diligence | Motivation

Additional factors contributing to coaches success:

1. Experience, Following an expirienced expert
2. Constant learning and courses
3. Expirience in competitive training and competitions
4. Competitive sports background
5. Formal education: Professional, education and scientific

Some coaches have a lot of knowledge and able to train well, but they fail in the final goal - maximizing the ability of the athlete. The only possible way to achieve this goal is having the skills as detailed above and shown in the drawing below, these attributes may help the athlete to reach the desired success.

Coaches necessary skills (besides personality traits)



**Science provides a lot of information, but may not work in the field.
Practice may bring results but the reasons may be unknown.
A combination of the two will bring success!**

Importance of the coach in football

Coaches (especially youth coaches) have a special status that affects personality and life skills development through sports, which contribute to shaping their future. The coach needs to identify, nurture, learn and understand players individually and serve as a role model.

Coach's success is not only related to his achievements, but rather from his ability to contribute to the player's personality, training, education and behavior.

Coaching is quite complex but nevertheless very satisfying and enjoyable.

The quality of relationship between the coach and the player is very important. A coach should have a **realistic** approach, he must understand that mistakes are legitimate, the coach also makes mistakes and that's acceptable.

The coach should create a positive interaction with the players and the team, and most importantly, make it clear that his goal is to help them personally, preferably before discussing rules and professional goals. This mutual commitment is crucial team's success. The coach must determine mutual communication plan with the team and the athletes prior to training and other chores. The plan will include relevant situations, such as absence from training, tardiness, etc. Criticism should be used in the "sandwich" method - always attach a positive comment next to a negative one.

In educational situations, it is better to encourage the players to find the answers themselves, as well as having a mutual discussion and let them express their opinion.

The coach must ask the players how they can contribute to their individual and team success, and accordingly, set expectations that match both the players and the coach.

The coach must plan everything periodically: **yearly, monthly, weekly and daily**.
All of the goals should be interpreted according to the current time period of the plan.
In planning, emphasis should be placed on external goals that focus on results, instead of performance goals that focus on steps that will lead to a better result.

Preparation is half of the victory

Development of the coach

- Seek feedback from different sources, stay open-minded and be ready to accept criticism and changes.
- Form a team of colleagues for regular brainstorming.
- Self-feedback after every training session, reflect on his decisions and actions.
- Always look for weaknesses that may affect training abilities and work on them to reach higher levels.

Measuring success

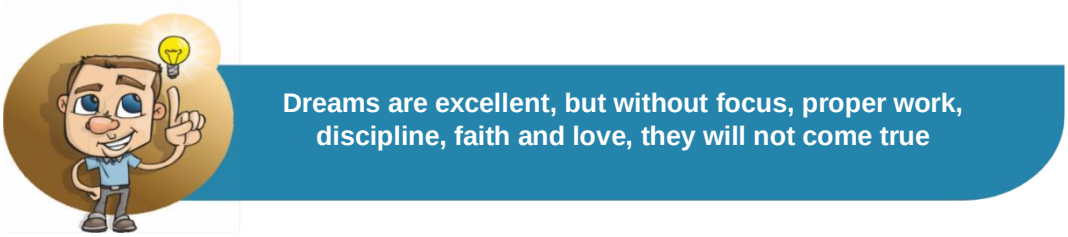
- During youth training, it is important to acppreciate athletes' effort, positive attitude and motivation.
- Success will be measured by the ability of the players to implement the methods and drills learned during the training, that is the main focus.
- In some cases effort will be enough to win and on others it wont. Young players have to understand that is part of the process, that is what they train for.
- The coach should ask the athlete about their possible contribution regarding individual and team's success, it allows him to determine realistic expectations. It is important to remember that not everyone will have the same expectations or responsibilities.

Setting goals

- Set individual and team goals for the present and the future according to their abilities.
- Limit 2–3 goals per training session, as too many goals may confuse the athlete.
- In youth training, it is better to focus on a simple, specific target. For example, work on changing direction of movement in one direction instead of teaching all the directions at the same time. This will create a sense of success before moving on to the next subject or complex skill.
- Training goals should be specific. To develop a certain ability, estimate the necessary duration of training period and make sure to work on it extensively during training.
- Goals must be challenging to create a sense of satisfaction and pride among the athletes.
- Goals must be realistic and compatible to players' abilities.
- Each specific goal must be timely evaluated during training.

Youth coaching roles in football

- Direct training of the team.
- Match preparation and management.
- Prepare training and match plans under the instructions of the manager, matches schedule and methodical principles.
- Analyze and summarize the process of training and matches, reach conclusions and form solutions at every period of the process.
- Report to the manager and the professional staff on planning, monitoring, summary and analysis.
- Participate in professional meetings, trainings, seminars and different tasks decided by the club.
- Initiate actions to improve and promote the players and the team.
- Constant scouting of talented players and bringing them to the team.
- Assist the players with education, social issues, behavior and personal improvemnt.
- Following a code of conduct.



Recommendations for competitive coaching

Recommendations for competitive coaching

- Constantly act and deal with weaknesses and failures
- Avoid and prevent euphoria in successes
- Always seek further improvement

Recommendations for competitive coaching

Investing in talented athletes under your guidance

Training a new athlete requires a lot of time and energy,
Do not give up on talented athletes who have not reached their full potential.

Therefore you must:

- Get to know the athletes personally (social and educational level)
- Create a sense of "unit pride" and status in the training team
- Supply benefits and compliments
- Plan and set realistic goals for long, medium and short term periods.

Recommendations for competitive coaching

Scouting new talented athletes

- Watching competitions of regional and local schools
- Watching competitions and training in other sports
- Observe and follow activities in physical education classes in schools
- Observe and follow activities in community centers
- Performing tests to identify talented athletes

Recommendations for competitive coaching

Provide additional values in training process

- Summarize and analyze training and competitions
- Learn the pros and cons of others and your own
- Look for ways to improve training and competition experiences
- Always deliver exercises and training content in a surprising and interesting manner
- Think "outside the box", be creative and original

Recommendations for competitive coaching

Focus on achievements and reaching goals

- Pay attention to results but study the process that led to them
- In both **failures and successes**, the reasons must be known
- **Adjust** the volume and level of **training to results and achievements**
- Plan long-term (4 years), medium-term (a year) and short-term (weeks) goals
- Set goals and objectives for each component in every phase of training, matches and competitions.

Stagnation in achievements, results and training equals to deterioration

Recommendations for competitive coaching

Improving coaching skills

- A good coach never stops learning
- Gaining knowledge enables you to teach your athletes
- The coach needs to set an example in all areas:
    - Right lifestyle
    - Aesthetics
    - Behavior
    - Ambitions and goals
- Always demonstrate the desire for achievements and competitiveness

Recommendations for competitive coaching

In competitive sports, prolonged satisfaction cannot occur

Strive for continuous improvement as an attitude and a way of life

Remember:

The good coach! – studies all the time

It is not enough to know - you also need to apply

It is not enough to want - you also have to perform

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