People's Democratic Republic of Algeria
Ministry of Higher Education and Scientific Research
University Larbi Ben M'hidi Oum El Bouaghi
Institute of Sciences and Techniques of Physical and Sports Activities

Course of

Applications and Software used in sports

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Courses for students: **2nd year Bachelor's degree**
Semester **4**
Specialization: **Sports Training**

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Content:

Applications and software

I. Introduction :

Software and applications are computer programs created to perform specific functions on a computer, smartphone, tablet, or other electronic device.

Below is a short definition of each term:

II. Logiciel (Software)

Software, or a computer program, is a set of code, information, and instructions that enable a computer or similar device to function and perform specific tasks. Programs can be divided into several types:

1. **System software:**

These are programs that manage hardware resources and provide services to other software. Examples: operating systems (Windows, macOS, Linux), device drivers.

2. **Application software:**

These are programs designed to help users perform specific tasks. Examples: word processors (Microsoft Word), spreadsheets (Excel), web browsers (Chrome, Firefox).

3. **Development software:**

These are tools used by developers to create, debug, and maintain other software. Examples: compilers, code editors (Visual Studio Code), integrated development environments (IDEs).

III. Applications (Apps)

Programs called applications are a type of software and are generally designed to run on mobile devices such as smartphones and tablets. They are often found in app stores like Apple's App Store or Google Play. Applications can be divided into different categories:

1. **Native applications:**

Developed specifically for a particular platform (iOS, Android) using specific programming languages (Swift for iOS, Kotlin for Android).

2. **Web applications:**

Accessible via a web browser and requiring no installation on the device. Examples: Gmail, Google Docs.

3. **Hybrid applications:**

A combination of native and web applications, they can run on multiple platforms and are often developed with frameworks like React Native or Flutter.

IV. Common examples of applications and software:

- Office suites: Microsoft Office, LibreOffice
- Communication applications: WhatsApp, Zoom, Slack
- Graphic design software: Adobe Photoshop, CorelDRAW
- Social media applications: Facebook, Instagram, Twitter
- Project management software: Trello, Asana, Jira

V. Key Differences Between Software and Applications :

1. Scope :

Software has a broader scope and can include operating systems, utilities, etc., while applications are generally more specific and user-oriented.

2. Platform:

Software can run on a variety of platforms, including desktop computers, servers, etc., while applications are often designed for mobile devices.

3. Distribution:

Software is often distributed via CDs, internet downloads, etc., while applications are typically distributed through app stores.

VI. Conclusion :

Pour résumer, les programmes et les applications jouent un rôle crucial dans le fonctionnement et l'utilisation des appareils électroniques d'aujourd'hui, chacun ayant des attributs et des usages uniques.

Flexibility measurement via a goniometer - CJOrtho application

I. Introduction :

CJOrtho is a mobile application created by the French College of Young Orthopedists (CJO) for healthcare professionals working in orthopedics and rehabilitation. Available on Android and iOS platforms, it contains numerous useful tools for daily clinical practice: orthopedic classifications, validated clinical scores, a patient database, and, most importantly, a digital goniometer. This feature allows users to measure joint ranges of motion directly with a smartphone or tablet, eliminating the need for a standard mechanical goniometer. Using the device's integrated sensors (accelerometer and gyroscope), the application measures the angle of movement of a joint during an examination, thus offering a fast, portable, and integrated method for orthopedic consultations.

CJOrtho is an application designed for orthopedic surgeons and healthcare professionals treating musculoskeletal disorders. Developed by the College of Young Orthopedic Surgeons, it provides decision support and aids in the management of patients consulting for musculoskeletal disorders. It also facilitates clinical assessment and pre- and postoperative monitoring..

II. Function

The goniometer offered by CJOrtho is highly effective for monitoring joint mobility after surgery, a period of immobilization, or during rehabilitation. Users can enter measurements into a database, allowing for comparisons over time and tracking of patient progress. However, the reliability of the measurements depends on the correct positioning of the phone and adherence to anatomical points, which requires basic training and careful use. Nevertheless, this digital tool proves to be an invaluable asset for orthopedists, physiotherapists, and rehabilitation specialists, as it combines ease of use, accessibility, and time savings. CJOrtho thus demonstrates how mobile technologies can improve medical practice by offering reliable and user-friendly instruments for daily clinical assessments.

III. Applications in sports:

In the sports and sports medicine sector, the CJOrtho app with its goniometer plays a crucial role in measuring and monitoring joint mobility in athletes. This allows for the rapid and accurate assessment of the range of motion of major joints used during sports, such as the shoulder, knee, ankle, and hip. These assessments are essential for analyzing flexibility, symmetry, and functional recovery after an injury. For example, after an ankle sprain or knee surgery, professionals can measure the progression of flexion and extension to adjust the rehabilitation program and gradual return to training.

The CJOrtho app, used in sports, allows for the objective recording and analysis of athletes' improvements during their training, thanks to an integrated database that facilitates the storage and comparison of measurements over time. Coaches, specialized physiotherapists, and doctors can therefore work more efficiently by exchanging precise information on joint flexibility and the recovery process. Furthermore, the app's portability makes it an easy-to-use tool in the field, whether in a gym, training center, or even during competition, without the need for bulky equipment. Finally, CJOrtho's digital goniometer functionality enables a more scientific and individualized approach to analyzing athletic performance, identifying early joint limitations that could increase the risk of injury or hinder an athlete's progress.

IV. The application's tools include four:

The application includes four tools:

- The most frequently used classifications in Orthopedics and Traumatology
- The main clinical scores per joint for monitoring your patients
- A goniometer
- A database for storing patient information and linking it to the other tools in the application

V. New features in version 4.0

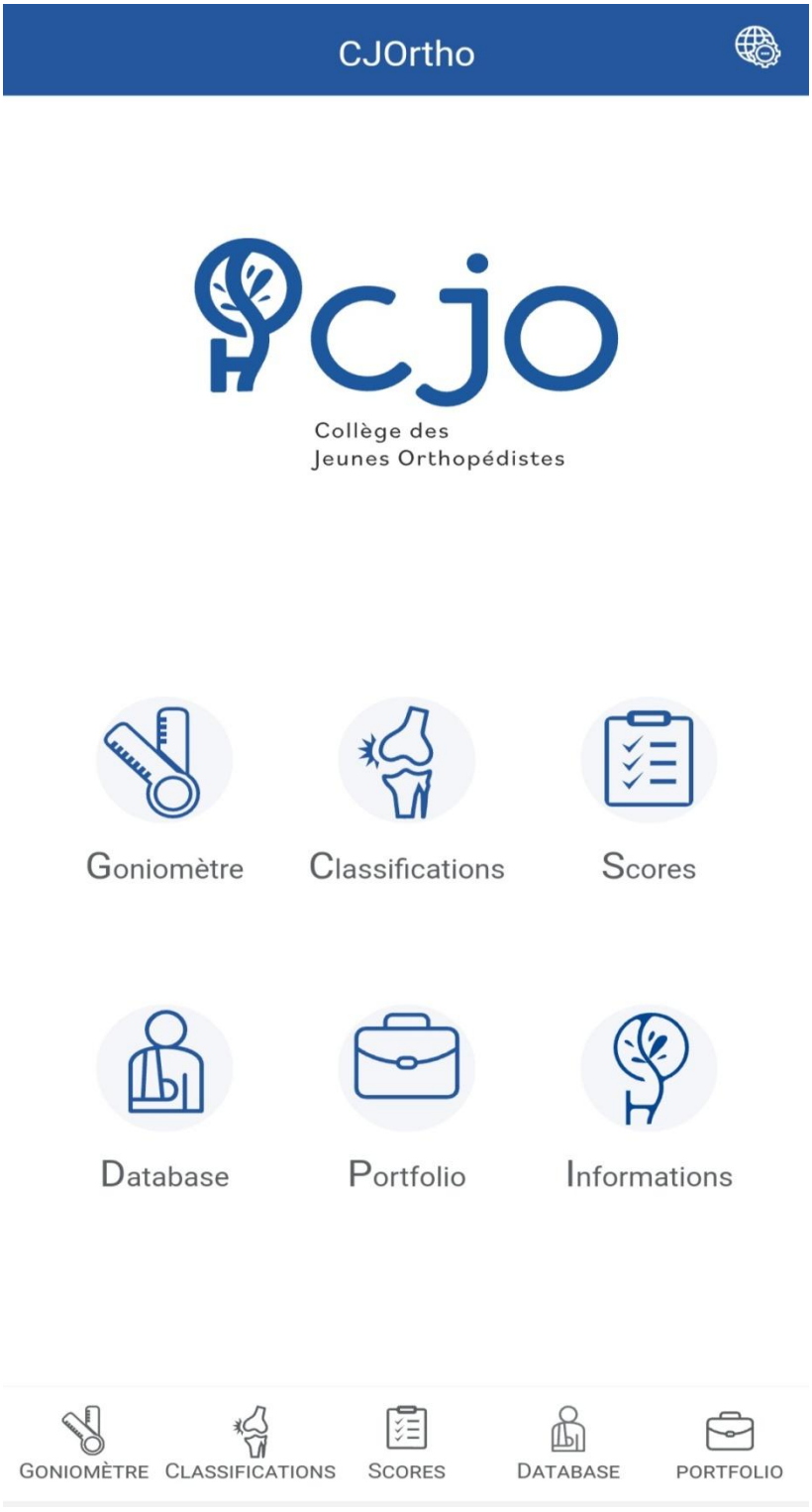
For version 4.0, the CJO has embraced artificial intelligence and now offers:

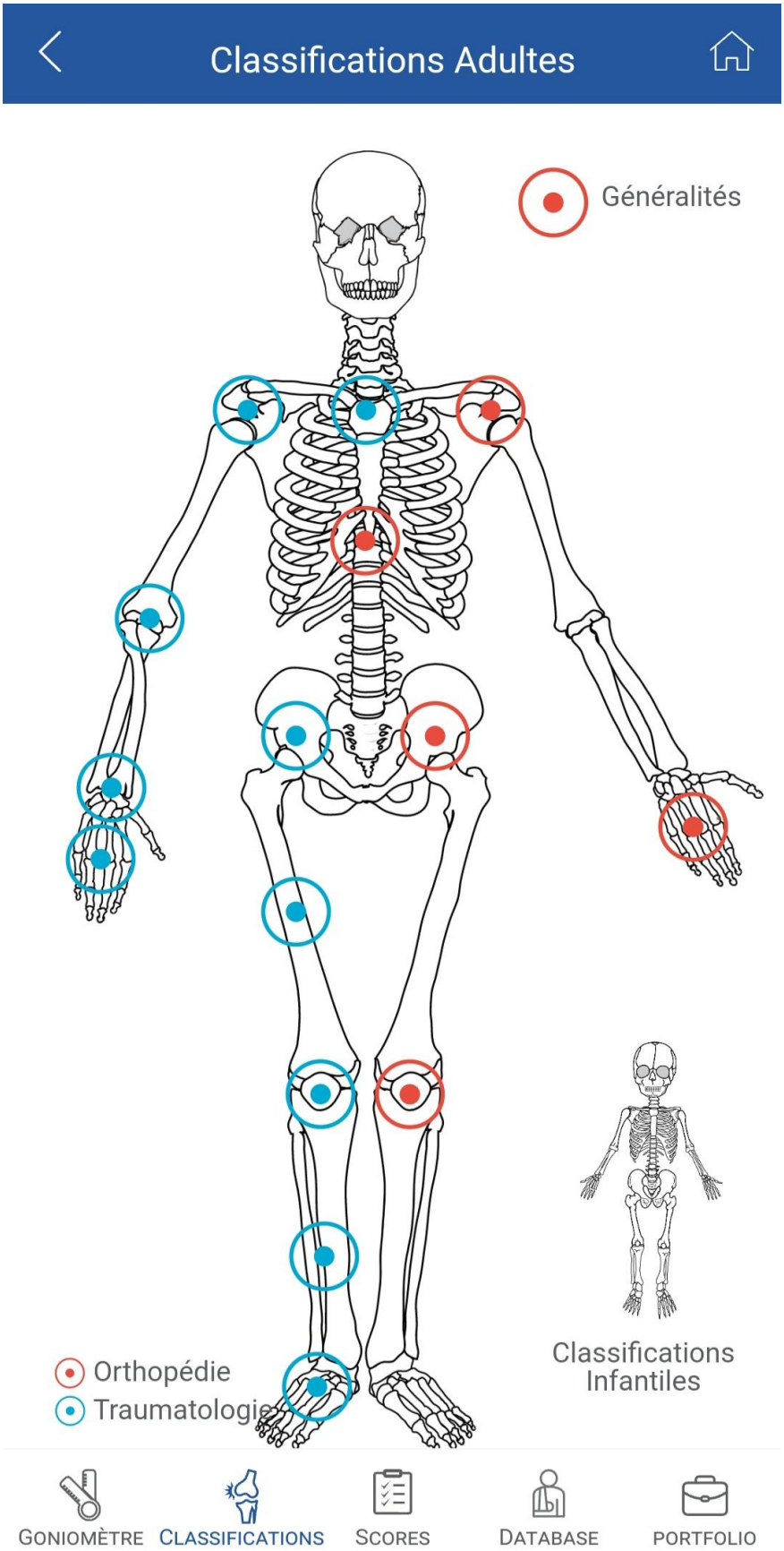
- An innovative optical character recognition system for calculating scores
- Character recognition for patient records
- Fast and practical, it will be an essential tool for your patient follow-ups:
- Print the patient information sheet and the score of your choice
- Have your patient complete the questionnaire
- Scan the pages to obtain the result and save the entered information in your database

VI. Applications:

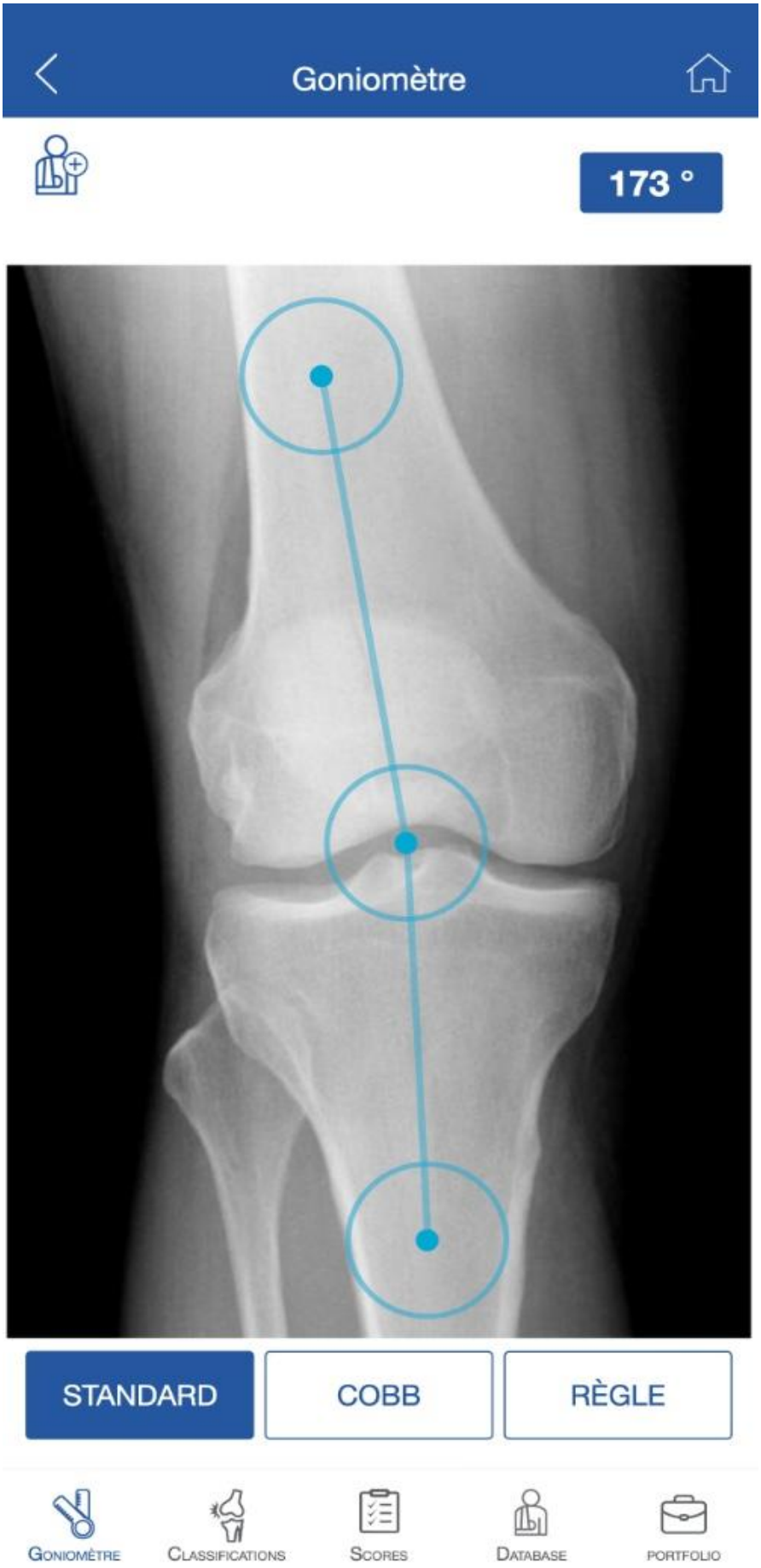
To measure a Flexibility, follow these steps:

1. Download the application from the Play Store
2. Open the application
3. Tap the goniometer icon.
4. Take a photo or choose one from the gallery on your phone.

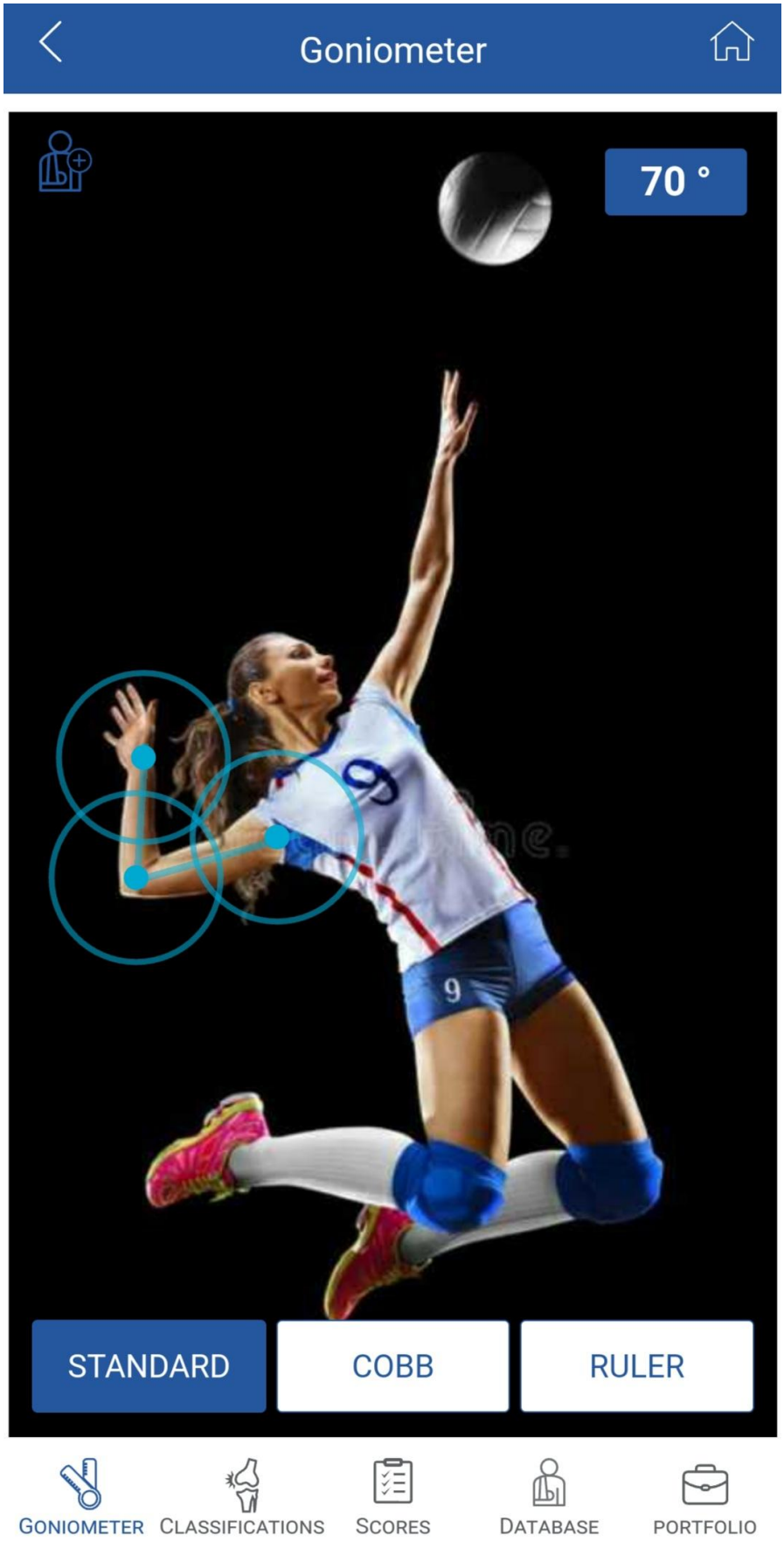

CJOrtho
CJO
Collège des
Jeunes Orthopédistes
Goniomètre
Classifications
Scores
Database
Portfolio
Informations
GONIOMÈTRE
CLASSIFICATIONS
SCORES
DATABASE
PORTFOLIO

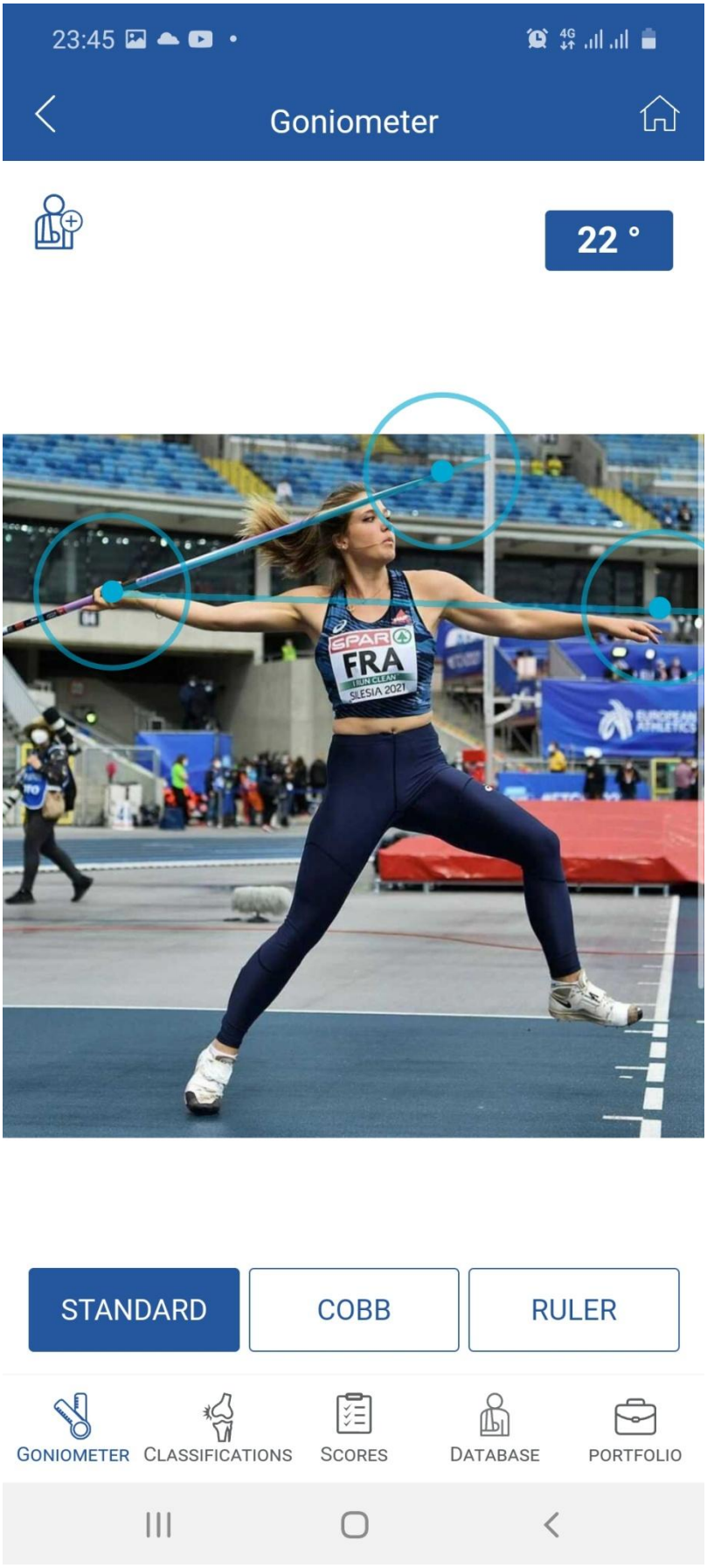

Classifications Adultes
Généralités
Orthopédie
Traumatologie
Classifications Infantiles
GONIOMÈTRE
CLASSIFICATIONS
SCORES
DATABASE
PORTFOLIO

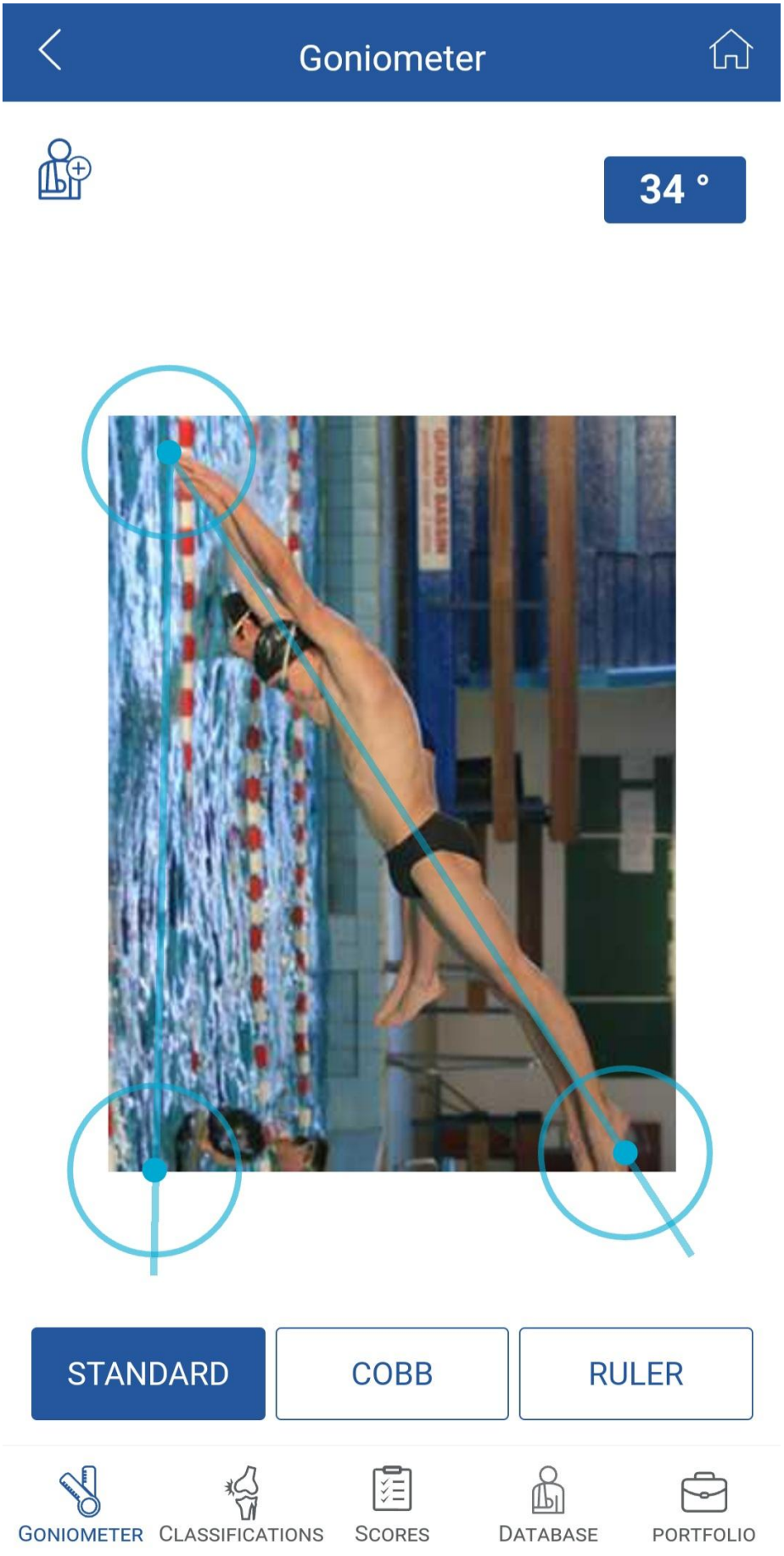

Goniomètre
Dernière valeur :
0 °
Goniomètre
Pour inclure une photo :
Prendre une photo
Choisir une photo
GONIOMÈTRE
CLASSIFICATIONS
SCORES
DATABASE
PORTFOLIO

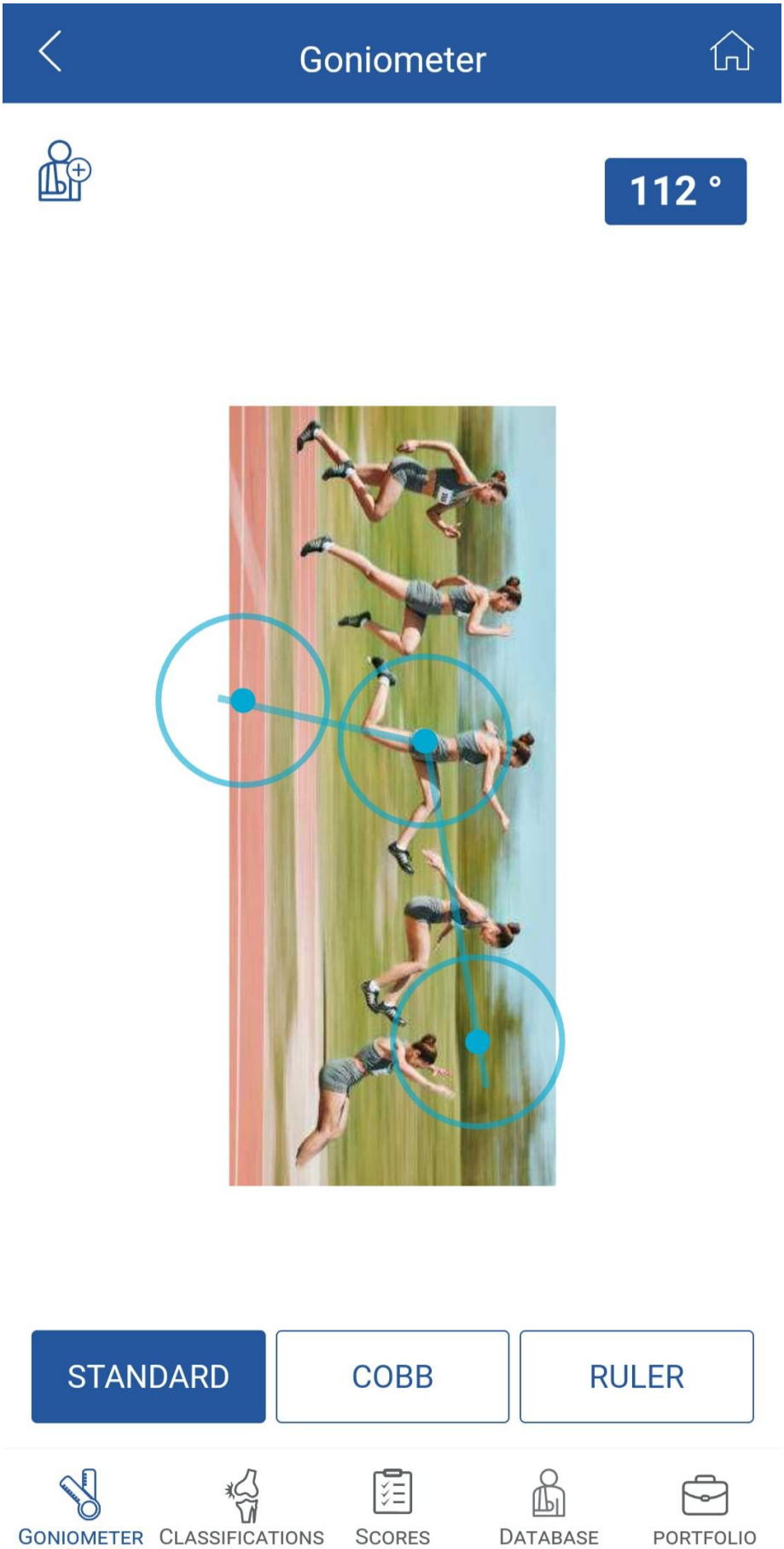

Goniomètre
173 °
STANDARD
COBB
RÈGLE
GONIOMÈTRE
CLASSIFICATIONS
SCORES
DATABASE
PORTFOLIO


Goniometer
115 °
STANDARD
COBB
RULER
GONIOMETER
CLASSIFICATIONS
SCORES
DATABASE
PORTFOLIO


Goniometer
70 °
STANDARD
COBB
RULER
GONIOMETER
CLASSIFICATIONS
SCORES
DATABASE
PORTFOLIO


23:45
Goniometer
22 °
SPAR
FRA
SILESIA 2021
STANDARD
COBB
RULER
GONIOMETER
CLASSIFICATIONS
SCORES
DATABASE
PORTFOLIO


Goniometer
34 °
STANDARD
COBB
RULER
GONIOMETER
CLASSIFICATIONS
SCORES
DATABASE
PORTFOLIO


Goniometer
112 °
STANDARD
COBB
RULER
GONIOMETER
CLASSIFICATIONS
SCORES
DATABASE
PORTFOLIO

VII. Conclusion :

In conclusion, the CJOrtho app with its digital goniometer represents a major advancement in the field of functional assessment, both for orthopedics and sports medicine. Its precision, lightweight design, and ease of use allow for quick and objective measurement of joint ranges of motion, which helps ensure accurate and personalized monitoring of athletes. This digital tool is ideally suited to a contemporary approach to prevention, rehabilitation, and improvement of physical performance.

However, as with all measurement tools, its effectiveness depends on proper and consistent use, as well as knowledge of anatomical points. When used correctly, CJOrtho can be a valuable asset for sports professionals, such as physicians, physiotherapists, strength and conditioning coaches, and trainers. It offers a practical, safe, and scientifically based method for joint monitoring. By combining mobile technology and clinical expertise, it perfectly demonstrates how digital tools can contribute to improving treatment and athletic performance.

Kinetic quantification of the entrainment load using GPS

I. Introduction:

The purpose of the training is to allow the sportsman in general and the footballer in particular to demonstrate his technical and tactical abilities as best and as long as possible during the match but also throughout the sports season. These abilities ensure the durability of brief, intense and repeated efforts throughout the match, and thus allow the expression of the footballer in all situations of the match. Sports performance during a match is, in fact, conditioned by several qualities (Paillard, 2010). Today we cannot separate the body from the mind or even physical training from mental training. (Reiss, 2017, 615). Therefore, it is necessary to work in synchronization the physical and the mental so that they are at the service of the technical-tactical capacities.

Sports training is a complex action exerting a systematic and specific effect on the level of optimal performance in a situation of trial and competition (Carl, 1989, 218). Sports training exerts an external and an internal load that modifies homeostasis and forces the body to mobilize adaptation mechanisms that improve more and more at the end of each training session.

There is no valid quantitative measure of the constituents of training load for all forms of motor effort or their subcategory, since training load categories differ completely in method, content and training means. However, it would be necessary to succeed in reducing this diversity to one and the same form of motor effort. (Weineck, 1999, 19).

At each training session or sports discipline a dominant in terms of physical quality, this is why the measurement differs: for the force we use the kilogram, the Newton, %1RM, for the impulse: the Nuwton/second, for the speed of movement: the distance in meters, the meter/second, for the acceleration the meter/S², the heart rate, the time…

Several methods have emerged to control training and prevent overtraining: Some of them are objective such as: the heart rate method using the formula of Banister 1975, Calvert & al 1976, from Banister and Hamilton 1985, Morton & al 1990, Busso & al 1991, Candau & al 1992, from Edward 1993, Mujika & al 1996, Busso & al 1997, Banister & al 1999, Millet & al 2002, Busso & al 2002, Busso 2003, of Lucia 2003, Avalos & al 2003, Wood & al 2005, Hellard & al 2006, Desgorces 2007.

Target heart rate methods through the Karvonen formula and from maximum heart rate formulas (Astrand & Ryming 1954, Haskell and Fox, 1970, Inbaret 1994, Tanaka & al 2001, Robergs and Lanwher 2002 , Gellish & al 2007…), the methods of lactatemia, of the percentage of the VMA, of the maximum repetitions (Brzycki, Epley, Lander, O'Conner et al, Lombardi, Mayhew et al, Wathen). (Jimenez Alfonso & De Paz, 2008, 12), VO2max, methods of distances travelled, speeds and accelerations using a stopwatch, accelerometer, radar, photoelectric cells… GPS using the method of Casamichana 2013. (Hourcade, 2019, 43). Other methods are, however, subjective, such as Foster's 1998 effort difficulty perception method, Robinson's 2004

perceptual mood index (Coquart 2016, 79 and 191). The condition index (Hooper & al, 2005, 109).

II. Concepts:

- Artificial intelligence:

Artificial intelligence (AI) consists of implementing a number of techniques

- The GPS :

The Global Positioning System (GPS) is a utility that belongs to the United States, it provides positioning, navigation and time reference services, called "PNT services" (positioning, navigation, and timing). (gps.gov, 2022).

It is a satellite geolocation system used to determine the geographical coordinates of any point on the surface of the globe. Its accuracy can reach 1 meter. (futura-sciences, 2022)

- **Principle of operation:**

The operating principle of GPS is based on measuring the distance of a receiver from several satellites (the satellites are distributed in such a way that 4 to 8 of them are always visible).

Each satellite transmits a signal, picked up on Earth by the receiver, to very precisely measure the distance separating the transmitter from the receiver thanks to the travel time. With the reception of signals from four satellites (three to obtain the point of intersection of the three spheres, a fourth for time synchronization). (futura-sciences, 2022)

The signals picked up by the receiver are processed by a mobile terminal which also stores the cartography, in order to make it easier for the user to know his position and the direction in which he is heading. Maps could not be viewed without navigation software. This software contains one or more maps of a specific geographical area, most often a country or a continent. Navigation assistants are stand-alone GPS devices, as they embed the navigation software, the receiver and the terminal in the same box. The receiver is able to calculate the speed of propagation of the waves emitted to deduce the distance which separates them. The combination of mapping software makes it possible to obtain an efficient route guidance system (display of a map with directions and audio guidance). It is developed in different forms: in-car system, autonomous box with integrated receiver, personal assistant or smartphone associated with a GPS receiver.

Références	Année de publication	Saison sportive concernée	Matériel de recueil de données	Pays de l'équipe observée	Niveau de compétition	Système de jeu	Domicile Extérieur	Météos, Surface de jeu	Période d'observation	Présentation des données
Tierney.P.J et al.	2016	2014-2015	GPS Stat sports®	U21 U18 Angleterre	Championnats « Elite Jeune»	4-4-2/4-3-3 3-5-2/3-4-3 4-2-3-1	Non précisé	Herbe	Août à Mai	Zones de vitesse ($km.h^{-1}$) Accélérations+Décé
Suarez-Arroges.L et al.	2015	2013-2014 ?	GPS GPSports®SPI Pro X	Espagne	Division 1+ Coupes N et Euro	4-4-1-1	Non précisé	Non précisées	1 mi-temps seulement	Zones de vitesse ($km.h^{-1}$) Distance ($m.min^{-1}$)
Bradley.P et al.	2013	2010-2012 ?	Prozone Sports Ltd® v.3.0 (multi-caméras)	Angleterre	Division 1+2+3	Standardisé	Non précisé	Non précisées	Standardisée	Zones de vitesse ($km.h^{-1}$) Distance (m)
Bradley.P et al.	2011	2006-2007	Prozone Sports Ltd® v.3.0 (multi-caméras)	Angleterre	Division 1	4-4-2 4-5-1 4-3-3	Non précisé	Non précisées	1 saison	Zones de vitesse ($km.h^{-1}$) Distance (m)
Dellal.A et al.	2010	2005-2006	Amisco Pro®	France	Division 1	Non précisé	Non précisé	Non précisées	1 saison	Zones de vitesse ($km.h^{-1}$) Distance (m)
Di Salvo.V et al.	2007	2002-2004	Amisco Pro® v.1.0.2	Espagne	Division 1+ Champ. Ligue	Non précisé	Non différencié	Non précisées	2 saisons	Zones de vitesse ($km.h^{-1}$) Distance (m)
Barros.M.R.L et al.	2007	2001-2004	DVideo®	Brésil	Division 1	Non précisé	Domicile + Extérieur	20-30°C	3 saisons	Zones de vitesse ($km.h^{-1}$) Distance (m)
Burgess et al.	2006	2002-2003	Track Performance®	Australie	Division 1	Non précisé	Non précisé	Non précisées	1 saison	Zones de vitesse ($km.h^{-1}$) Distance ($m.min^{-1}$)
Mohr.M et al.	2003	2001-2002 ?	Caméras VHS (Panasonic NV-M50)	Italie Danemark	Division 1+ Champions Ligue	Non précisé	Non précisé	Non précisées	3 périodes (début, milieu, fin)	Zones de vitesse ($km.h^{-1}$) Distance (m)
Rienzi.E et al.	2000	1998-1999 ?	Caméra (Sony TR 75E)	Angleterre Amérique du Sud	Division 1 Internationaux	Non précisé	Non précisé	Non précisées	Non précisée	Zones de vitesse décrites Distance (m)
Bangsbo.J et al.	1991	1988-1990 ?	Multi-Caméras (pas de référénce)	Danemark	Division 1+2	5-3-2	Domicile	Non précisées	milieu de 2 ème partie de saison	Zones de vitesse ($km.h^{-1}$) Distance (m)
Ekblom.B	1986	1982-1983	Traçage à la main sur plan (Echelle 1:400)+ TV	Suède Allemagne Angleterre	Division 1+2+3+4	Non précisé	Non précisé	20-30°C	Printemps/ Eté Automne	Quelques données de distance (revue)
Withers.R.T et al.	1982	1978-1979	Caméra + magnétophone	Australie	Division 1	Non précisé	Domicile + Extérieur	Non précisées	Non précisée	Zones de vitesse décrites Seuils en foulées
Reilly.T & Thomas.V	1976	1974-1975 ?	Traçage à la main sur plan	Angleterre	Division 1	4-3-3	Domicile + Extérieur	Non précisées	Non précisée	Zones de vitesse décrites Distance (m)

Characteristics of the main studies relating to the analysis of the movements of the footballer, from 1976 to 2016

Centre-backs seem to be the ones who travel the least distance. Full-backs have, on average, greater distances covered than central defenders and forwards, without reaching those of midfielders. Centre-backs cover less distance than full-

backs (9333-10980m vs. 10152-11474m). Midfielders have greater distances than defenders (backs) and forwards (11,300 vs. 10,095 and 10,374 m). The forxards display distances covered of very unequal values according to the studies. They cover an average of 10374m during a football match, the distances evolve according to the system of play and the offensive animation of the team. (Hourcade, 2019, 18-19).

III. Composition:

The GPS is composed of 3 distinct parts, also called segments: (techno-science, 2022)

1. The space segment:

It currently consists of a constellation of 30 satellites (NAVSTAR for Navigation Satellite Timing And Ranging), with 6 different trajectories. They follow an almost circular orbit at an altitude of 20,000 to 20,500 km, which they cover in 11 hours 58 minutes at a speed of 13,000 km/h.

2. The control segment:

This is the part that controls and monitors the system. It is composed of 5 American ground stations of the 50th Space Wing of the Air Force Space Command, based at Schriever Air Force Base in Colorado (the master station is based in Colorado Springs) in the base of Cheyenne Mountain. Their role consists in recording all the information emitted by the satellites, to calculate the positionings.

3. The user segment:

It brings together all civil and military users who only receive information from satellites. The receivers are passive, and the system cannot therefore be saturated: the maximum number of GPS users is unlimited.

Previous and similar studies:

The use of GPS has shown that defenders and centre-forwards are those who run the shortest distance during the match, unlike midfielders. On the other hand, for the distance covered in sprints, the midfielders are outstripped by the attackers. Their physical profile and their training must therefore be different. (Ignasse, 2012).

The following table shows the different studies using sophisticated equipment to measure match load.

Table N°2: Characteristics relating to the analysis of the movements of the footballer between 2000-2010

Player / Setting	Football team
HID: High Intensity Distance	14-19km/h (3.9-5.3m/s) (from 10% in 2000 to 15% in 2010)
VHID : Very High Intensity Distance	>19km/h (5.3m/s) (from 4% in 2000 to 8% in 2010)
Speed	18, 21, 23, 25 km/h (5, 5,83, 6,4 et 6,94m/s)
Acceleration/deceleration	2, 3, 4, 5 et 5.5m/s² -2, -3, -4, -5 et -5.5m/s²

IV. The GPS used in football:

The footballer moves on the field in all directions, the 3D positioning thus gives his coordinates via his receiver which is in space, in a 3-axis reference (X, Y, Z). Advanced Sport Instruments (ASI) is a Swiss company based in the Olympic capital Lausanne, created in 2011, its expertise was forged from the passions of the two founders: sport and electronics in order to develop the equipment to be used in sport such as: FieldWiz, AdMos, AdMosLive, Custom.. (ASI, 2022)

Among the different brands of GPS, we will present the Feilwiz not for commercial purposes, but rather because we had the opportunity to experience it within the training center of the Algerian football federation: Sidi Moussa.

V. The FieldWiz GPS Tracker:

The FieldWiz is an electronic system for monitoring and measuring strategic and physical performance. It measures team performance and retrieves important match and training data and helps staff make informed decisions and improve strategies.

It also allows you to perform periodization, view entire matches, analyze trends, training loads but also the positions and movements of players... FieldWiz follows FIFA International Match Standard recommendations in electronic performance and tracking systems. (fieldwiz-benelux, 2022)

VI. The components :

They are: a connected shirt, a sensor and a docking station.

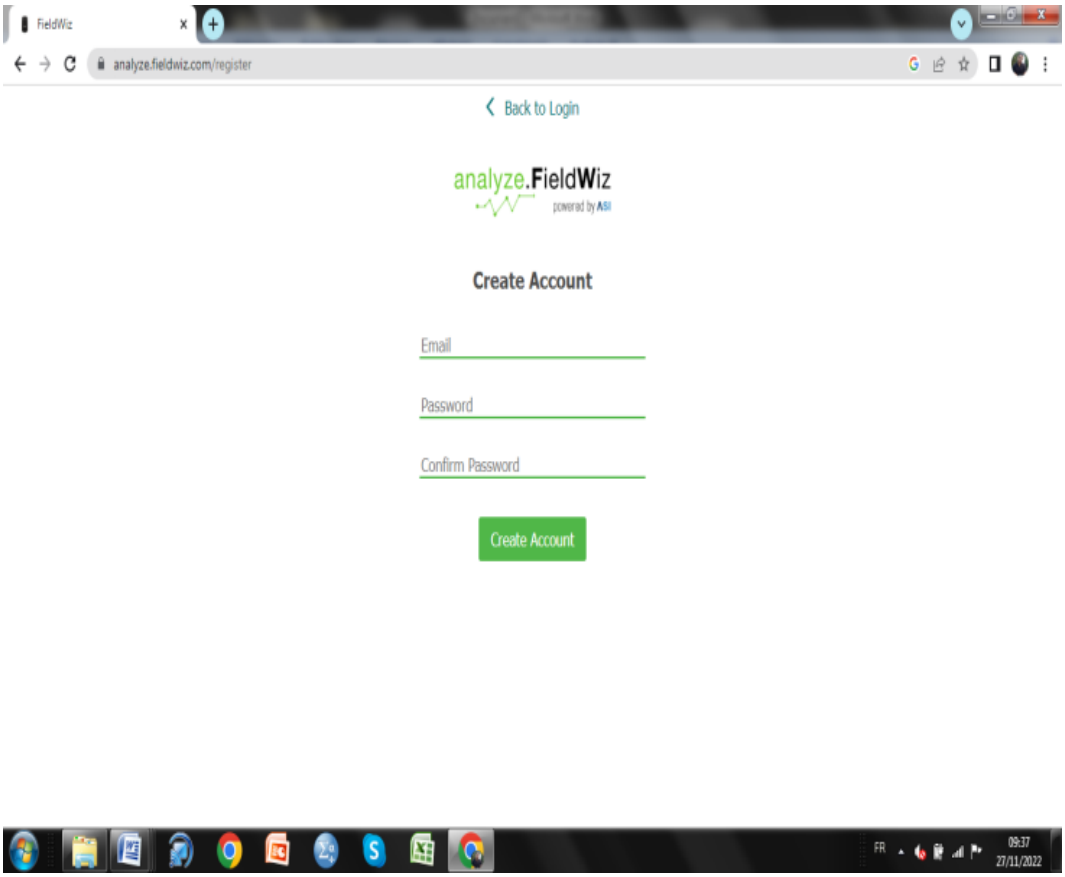
Components of the Fieldwiz GPS sensor

Source : https://fieldwiz-benelux.com/

VII. The analyze.fieldwiz platform:

It is a software for processing data collected by the FieldWiz GPS tracker.

Interface of the analyze.fieldwiz platform



VIII. Data collected:

1. Positioning and mouvment data:

- ✓ Total Distance
- ✓ Distance per speed zone
- ✓ Maximum speed
- ✓ Average speed
- ✓ High Intensity Distances
- ✓ Sprint statistics
- ✓ Heat map, field positioning
- ✓ % Distance in Field Areas
- ✓ Accelerations in m/s^2
- ✓ Decelerations in m/s^2

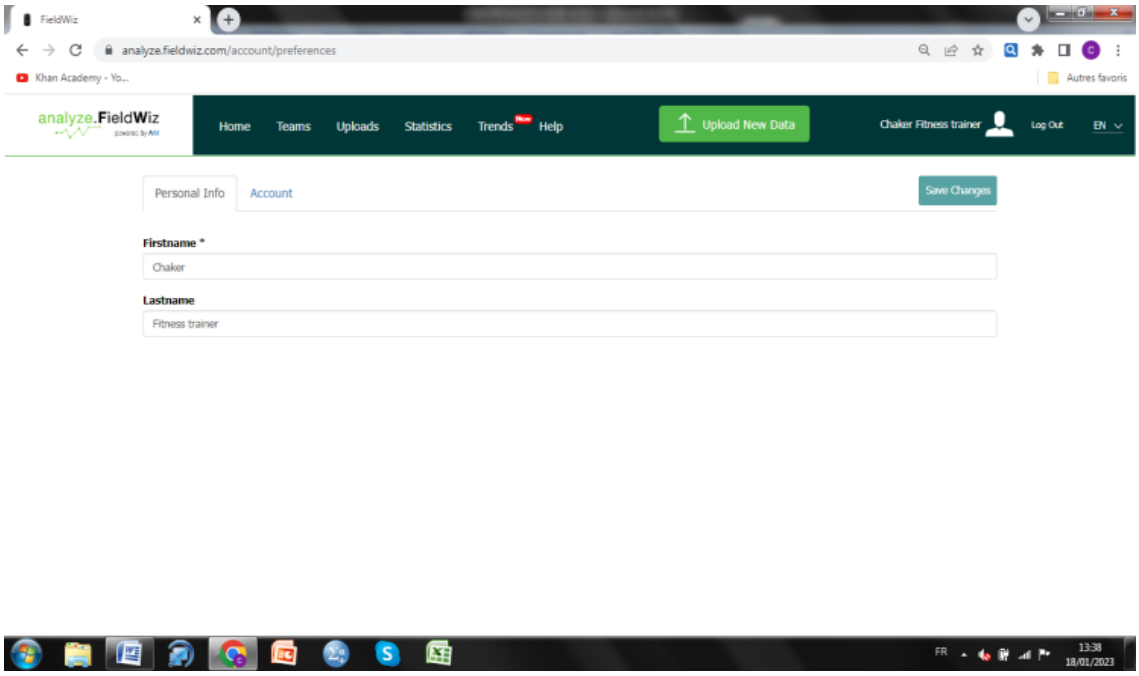
2. Heart rate data:

- ✓ Heart rate in beats per minute.
- ✓ Maximum heart rate
- ✓ Average heart rate
- ✓ HR zones based on individual max HR
- ✓ HR individual work target

IX. Applcation and Analysis:

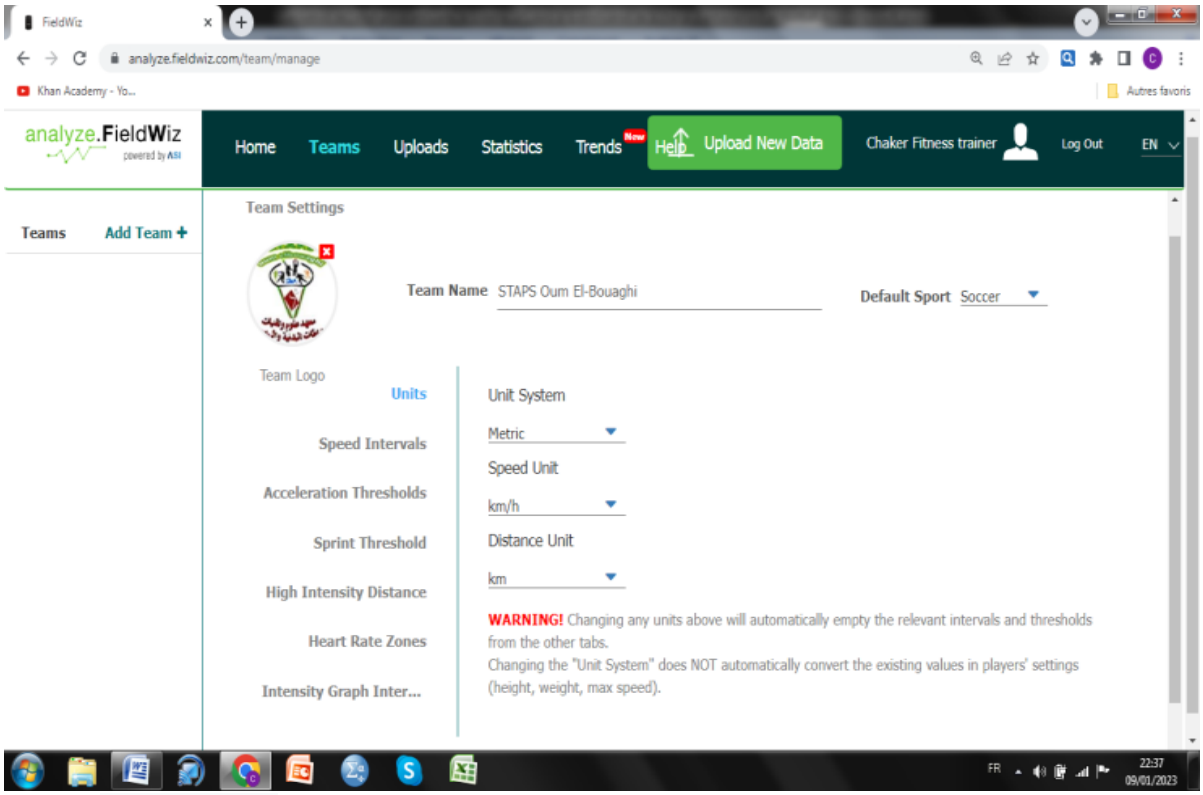
The processing of the GPS recording goes through the following steps:

1. Create an analyze.fieldwiz account:



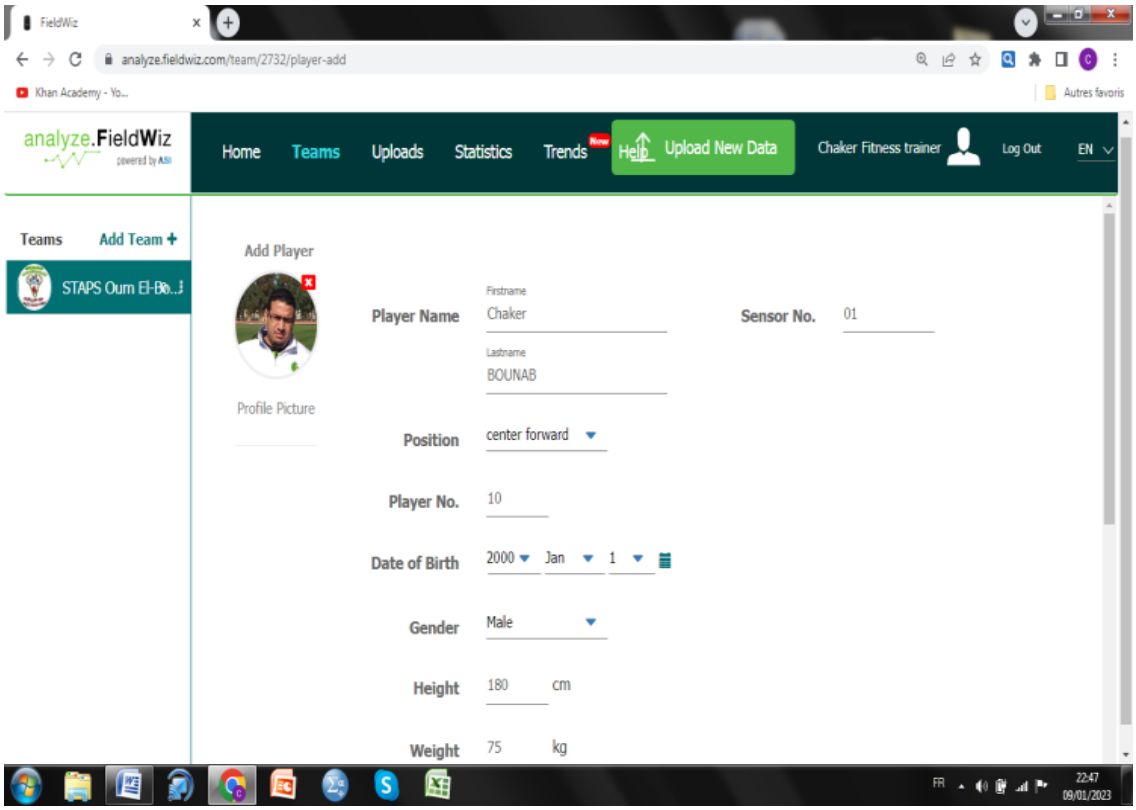
2. Create a team:

We named it: STAPS Oum El-Bouaghi, adding the logo and the type of discipline practiced while choosing the units we want to follow and then we register.



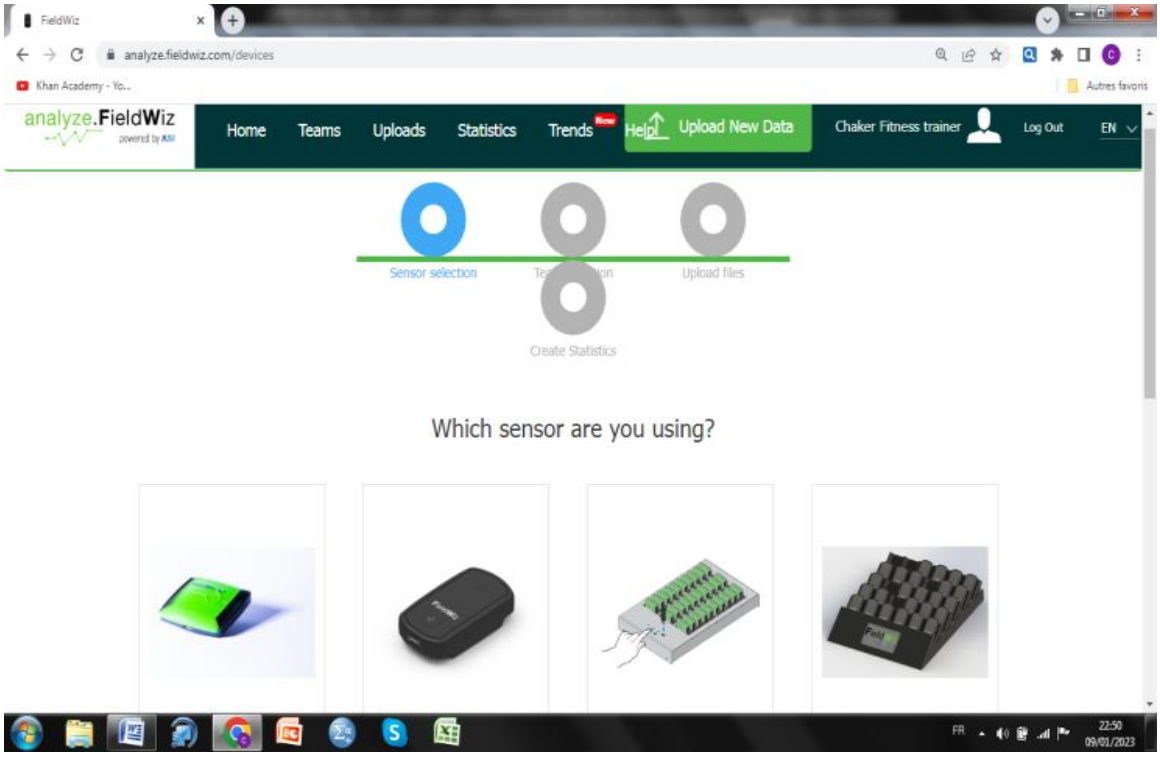
3. Add players:

Mention the name, first name, date of birth, weight, height, game position, shirt number, GPS sensor number, then register each player.



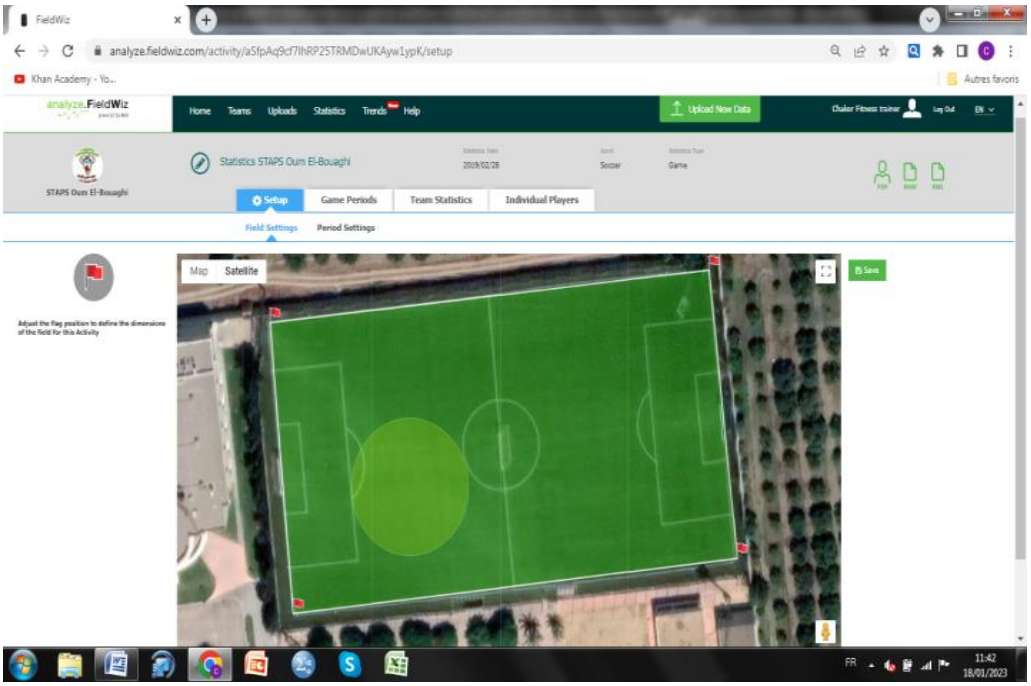
4. Import GPS recording:

Upload new data and select the type of GPS used



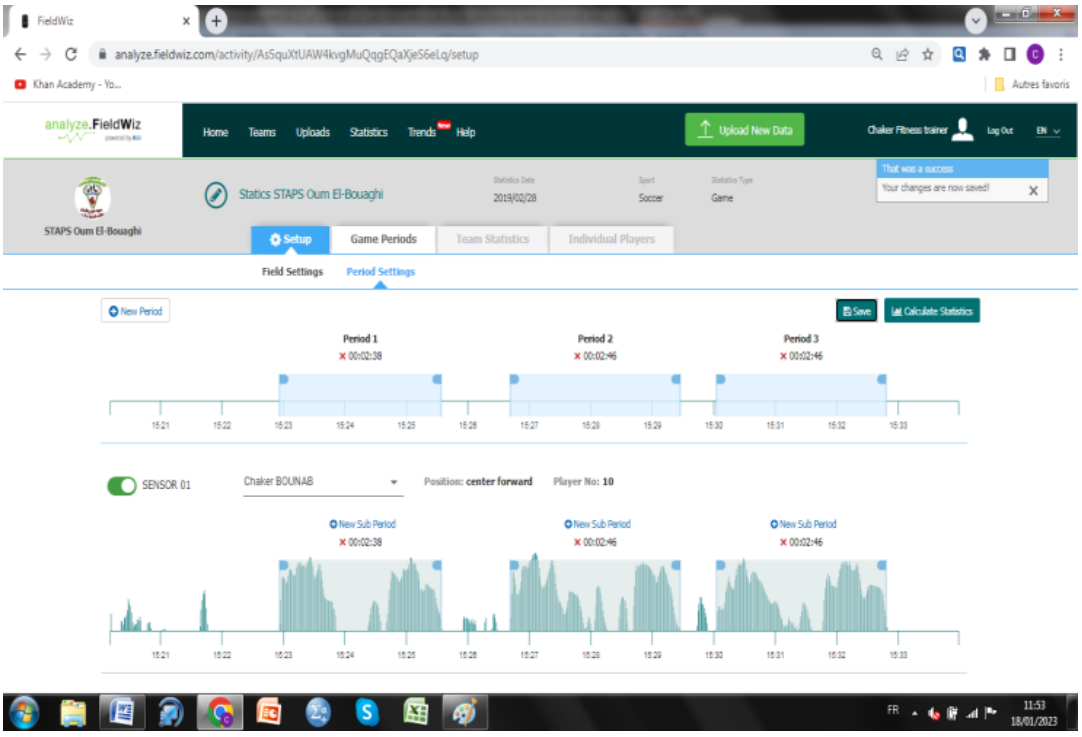
5. Naming and defining statistics:

Position the four corners of the field on the map.



6. Divide the sequence into periods:

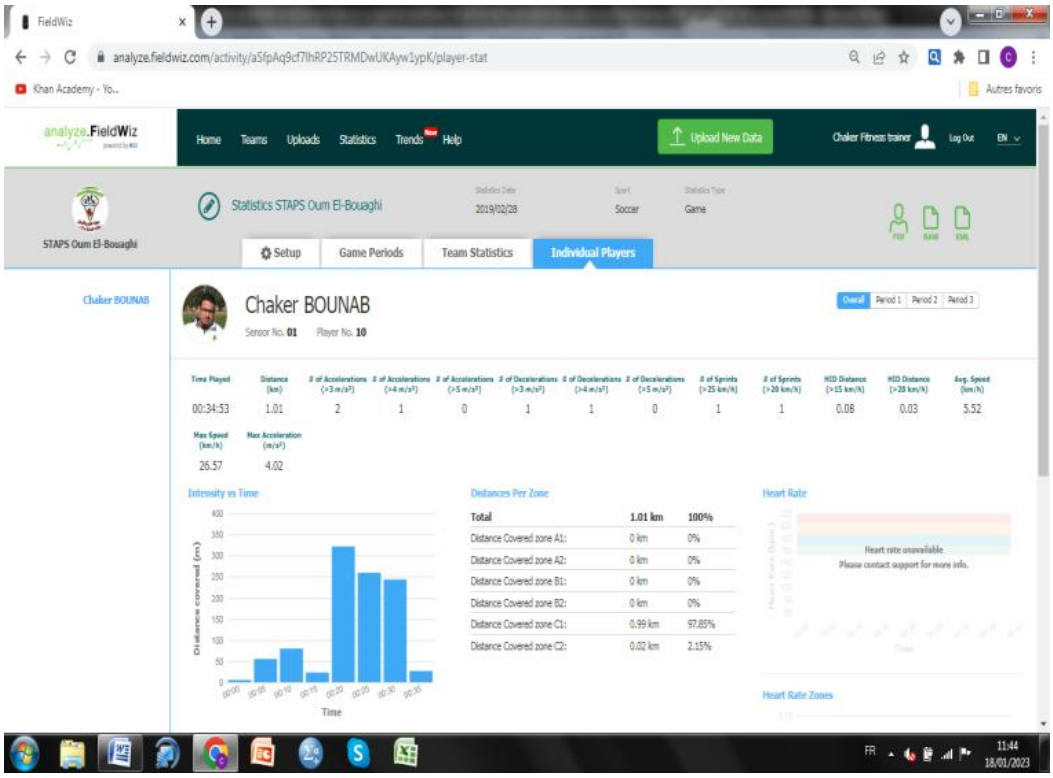
To facilitate the study, the GPS sequence is divided and then recorded over periods according to the player's activity. This phase ends with registration.



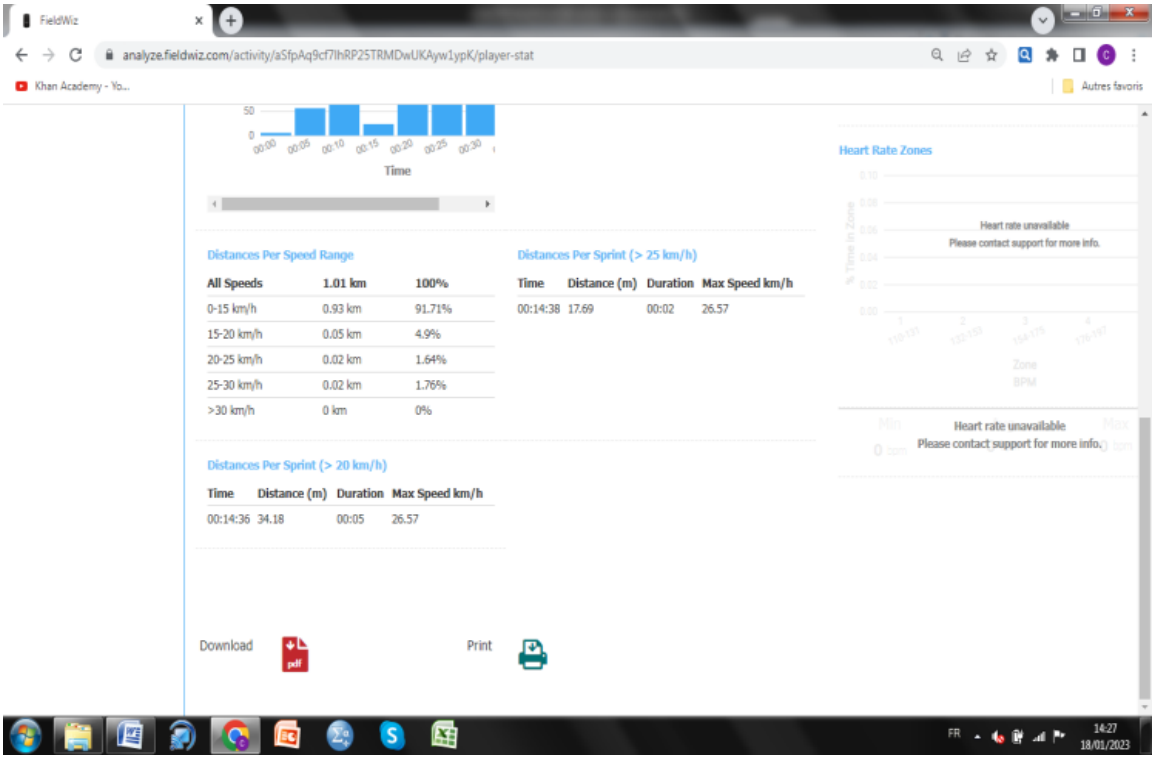
7. Statistics:

- **Individual statistics:**

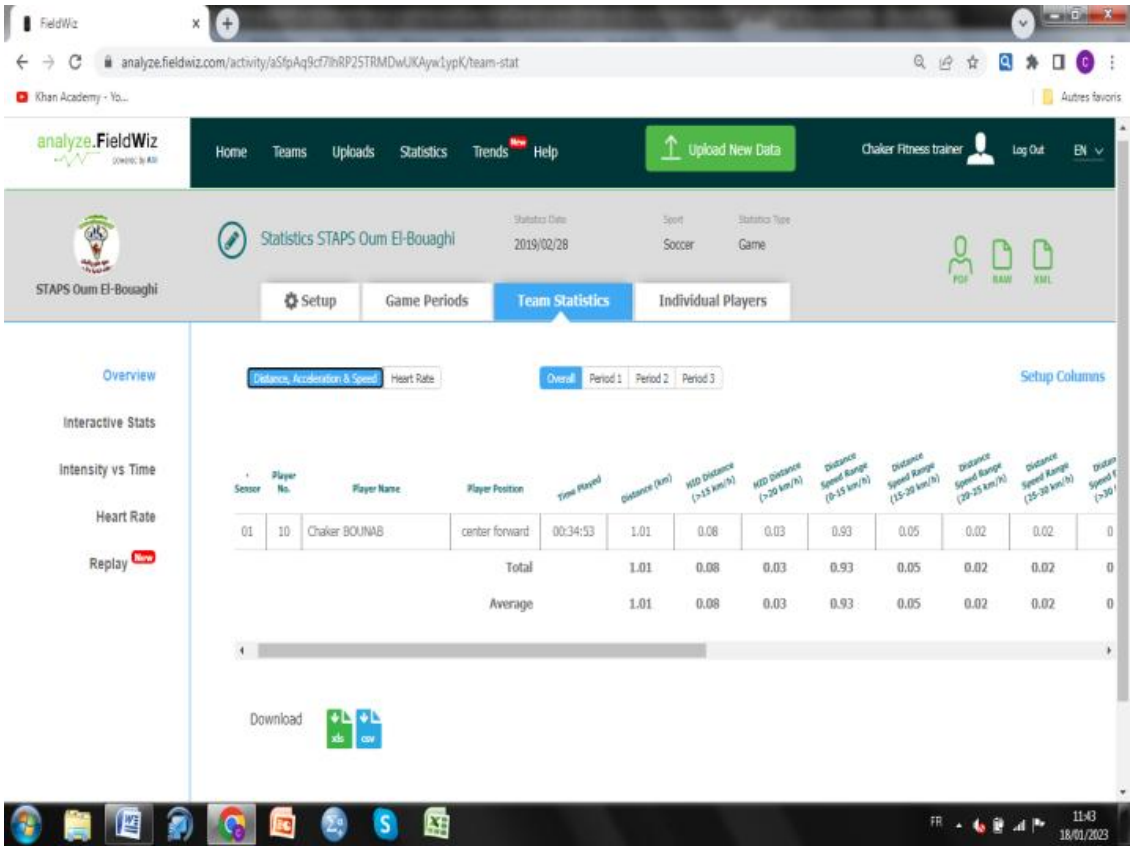
Creation of individual statistics 1st part



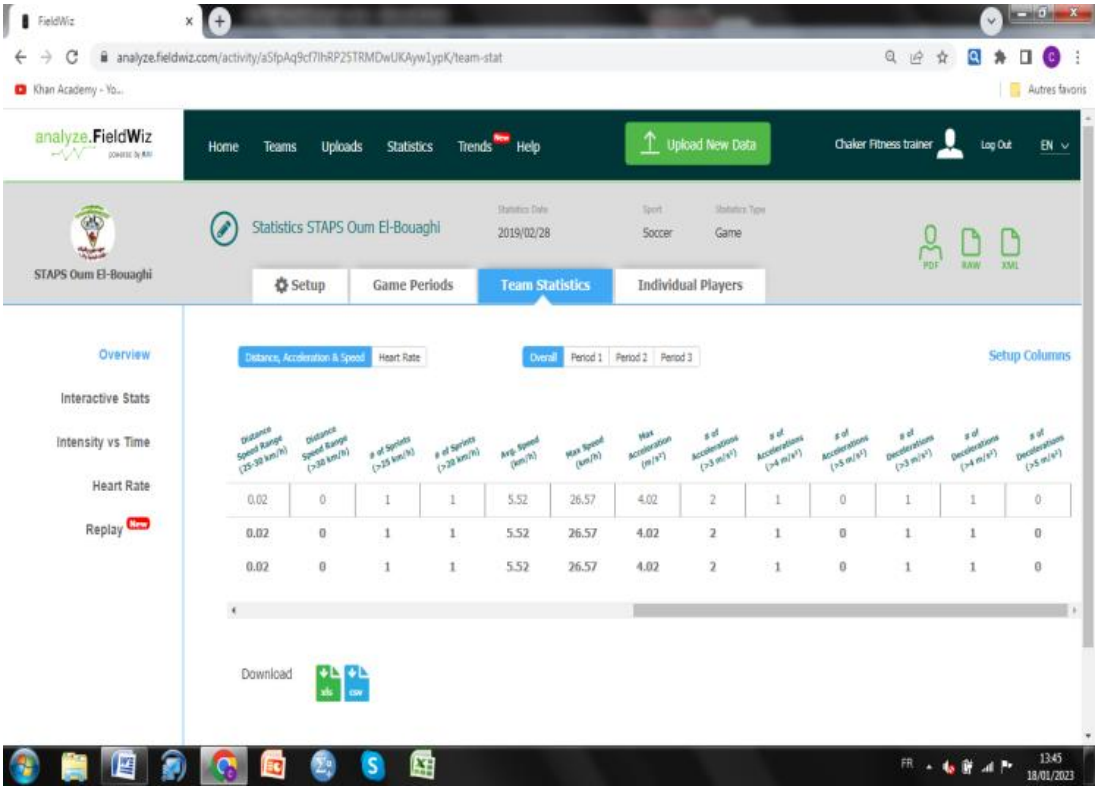
Creation of individual statistics 2nd part



- **Team statistics:**



Creation of team statistics 2nd part



8. **Presentation of the results in PDF form:**

We can present the results as a PDF document by clicking on the upper right icon.

GPS report cover page in PDF form

FieldWiz
an ASI brand

STAPS Oum El-Bouaghi

Statics STAPS Oum El-Bouaghi

Game Report

28.02.2019

Chaker BOUNAB

www.asi.swiss

1st player 1st period GPS report, 1st part

STAPS Oum El-Bouaghi

Player Statistics Report

Statics STAPS Oum El-Bouaghi

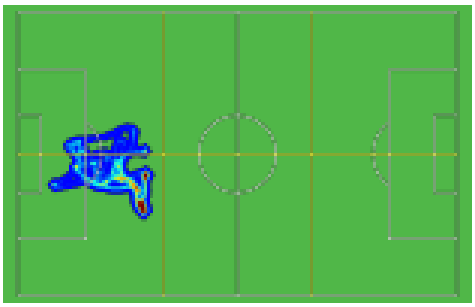
2019 / 02 / 26

FieldWiz
an ASI brand
www.asi.swiss

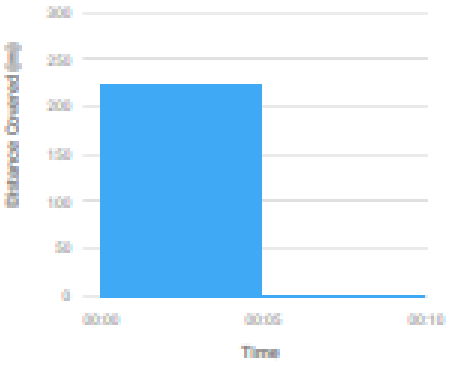
Chaker BOUNAB
PLAYER NO. 10
SENSOR NO. 01
(Period 1)

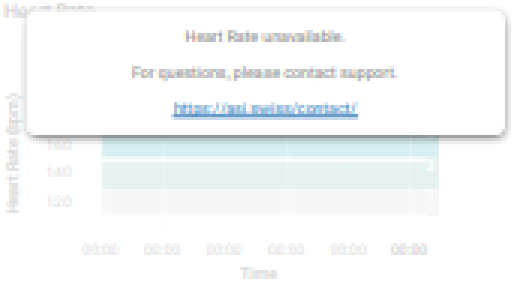
Time Played (minutes)	00:02:38	# Decelerations >4 m/s²	0	HID Distance (15km/h)	0.01
Distance (km)	0.22	# Decelerations >5 m/s²	0	HID Distance (20km/h)	0
# Accelerations >3 m/s²	3	# Sprints >25 km/h	0	Max Acceleration (m/s²)	3.22
# Accelerations >4 m/s²	0	# Sprints >30 km/h	0		
# Accelerations >5 m/s²	0	Max Speed (km/h)	17.46		
# Decelerations >3 m/s²	1	Avg. Speed (km/h)	4.97		

Field Position Heat Map



Intensity vs. Time





Statistics Per Speed Range

All Speeds	0.22 km	100%
0-15 km/h	0.21 km	95.08%
15-20 km/h	0.01 km	4.92%
20-25 km/h	0.00 km	0.00%
25-30 km/h	0.00 km	0.00%
>30 km/h	0.00 km	0.00%

FieldWiz
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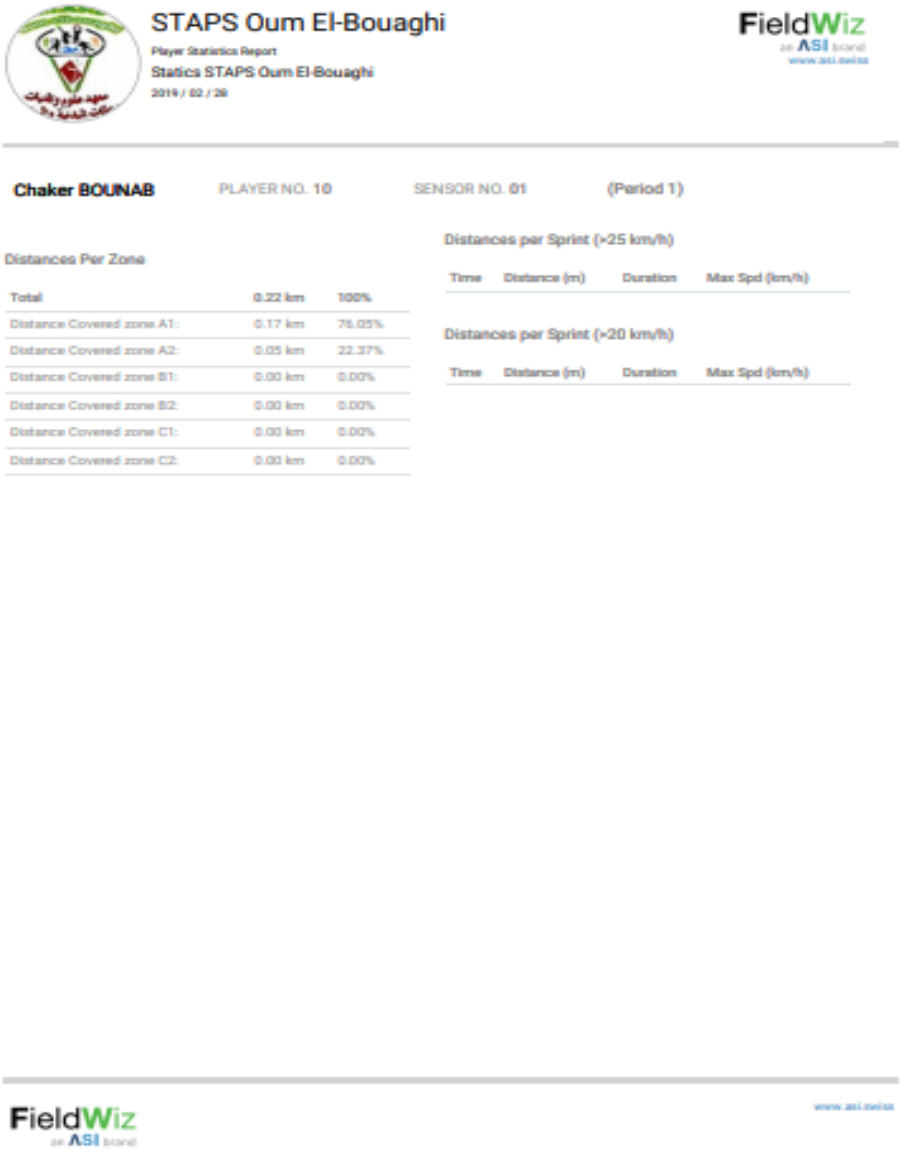
1st player 1st period GPS report, 2nd part



STAPS Oum El-Bouaghi

Player Statistics Report

Statics STAPS Oum El-Bouaghi

2019 / 02 / 28

FieldWiz

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Chaker BOUNAB PLAYER NO. 10 SENSOR NO. 01 (Period 1)

Distances Per Zone

Total	0.22 km	100%
Distance Covered zone A1:	0.17 km	76.05%
Distance Covered zone A2:	0.05 km	22.37%
Distance Covered zone B1:	0.00 km	0.00%
Distance Covered zone B2:	0.00 km	0.00%
Distance Covered zone C1:	0.00 km	0.00%
Distance Covered zone C2:	0.00 km	0.00%

Distances per Sprint (>25 km/h)

Time	Distance (m)	Duration	Max Spd (km/h)

Distances per Sprint (>20 km/h)

Time	Distance (m)	Duration	Max Spd (km/h)

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The results obtained by using GPS will be presented in the form of distance, speed and acceleration varied according to time, which will be compared with the results of the same team, the opposing team, the previous match or with reference results, as we can compare the results of a player with his same team.

X. Conclusion:

The evolution of the presentation material of the situations makes it possible to get closer and closer to the real situations in football. By dint of this illustration, we confirm the effectiveness of the GPS device insofar as it makes it possible to give indicators of the training load through the evaluation of the distances covered, the average and maximum speed of the race and the acceleration/deceleration of players in a match, It is also possible to draw up the physical profile of footballers according to their playing position.

Strength measurement via the My Jump 2 app

I. Introduction

My Jump 2 is the first scientifically designed app to measure jump height.

The app, called "My Jump Created" specifically for this study, evaluated the flight time of a high jump (identifying takeoff and landing times using the app's video) and converted these measurements into jump height using the equation mentioned in the research: $h = t^2 \times 1{:}22625$.

II. Application features:

- My Jump 2 can measure several metrics, including vertical jump height, airtime, force, power, contact time, vertical stiffness, and the Reactivity System Index (RSI) for jumps such as the countermovement jump (CMJ), static jump (SJ), and drop jump (DJ), among others.
- The app can also assess the Force-Velocity profile using the Pierre Samozino method, which is helpful in determining whether an athlete should focus primarily on strength or speed.
- Multi-user support: Multiple profiles can be created, which is convenient for teams.
- Data can be exported to Excel or Google Drive to track progress.
- It is available on iOS (App Store) and Android.

III. The app's reliability:

- Numerous scientific studies show that My Jump 2 is extremely accurate and reliable for assessing jump height and airtime when used correctly. For example, one study revealed a very high intraclass correlation coefficient between My Jump 2 and a force plate for measuring jump height.
- It's an excellent portable option that is significantly less expensive than a specialized force plate.
- This is especially useful for coaches, individual athletes, and even small teams, as it allows them to track jumping performance without the need for costly equipment.

IV. Application limitations:

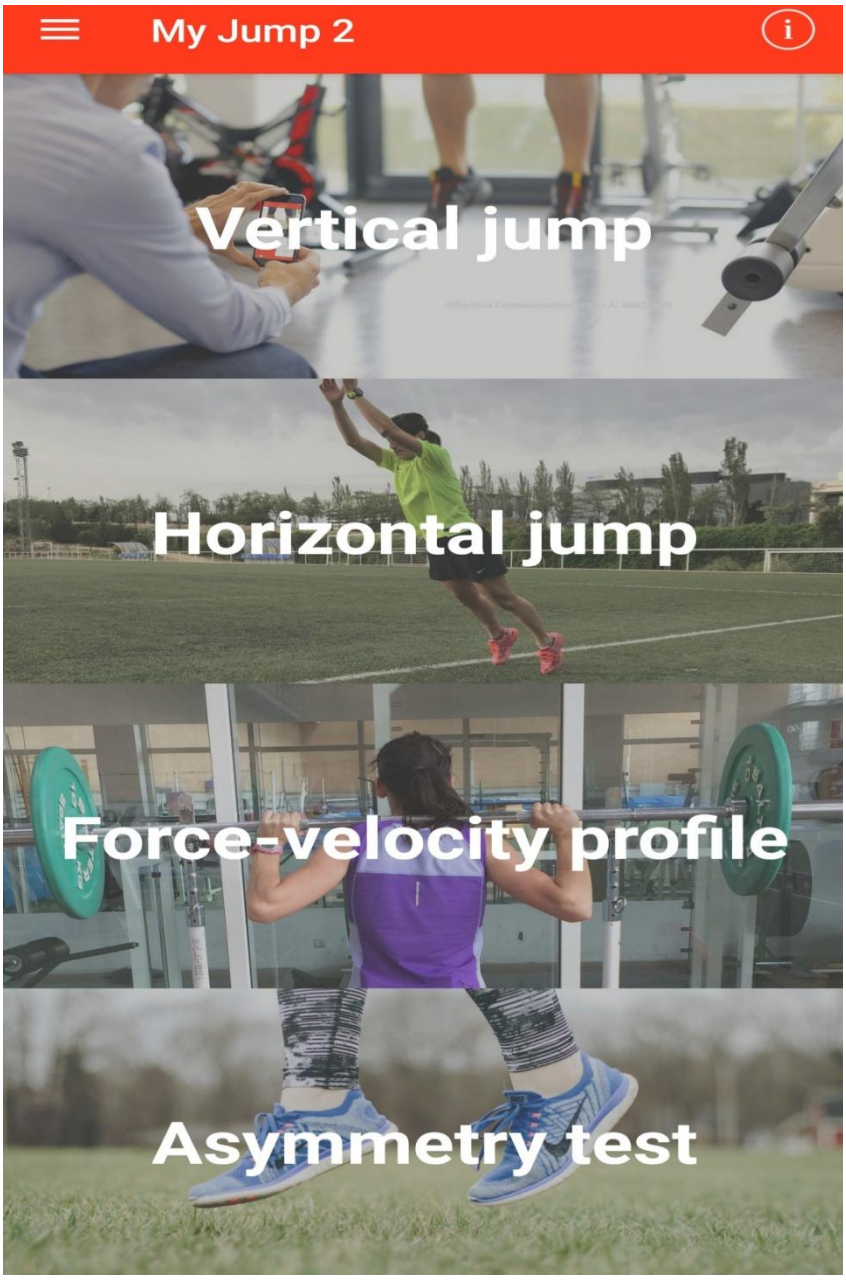
- While altitude and flight time measurements are accurate, estimates of maximum power and other parameters may be less reliable. One study, for example, reports “moderate agreement” regarding maximum power.
- To use the application effectively, good video quality is essential: a camera with a high frame rate is preferable for greater accuracy.Concernant Android,
- It appears the app is no longer being regularly updated: on Google Play, it states: “My Jump 2 is no longer maintained. My Jump 2 is now part of My Jump Lab…”

- The app's interface has received criticism regarding certain practical uses: “The app may work very well in an academic or laboratory setting, but… for putting a group of 30 athletes through a series of tests, it's not suitable.” As with any tool, knowledge of training or biomechanics is necessary to interpret the data (force versus velocity, asymmetries, etc.).

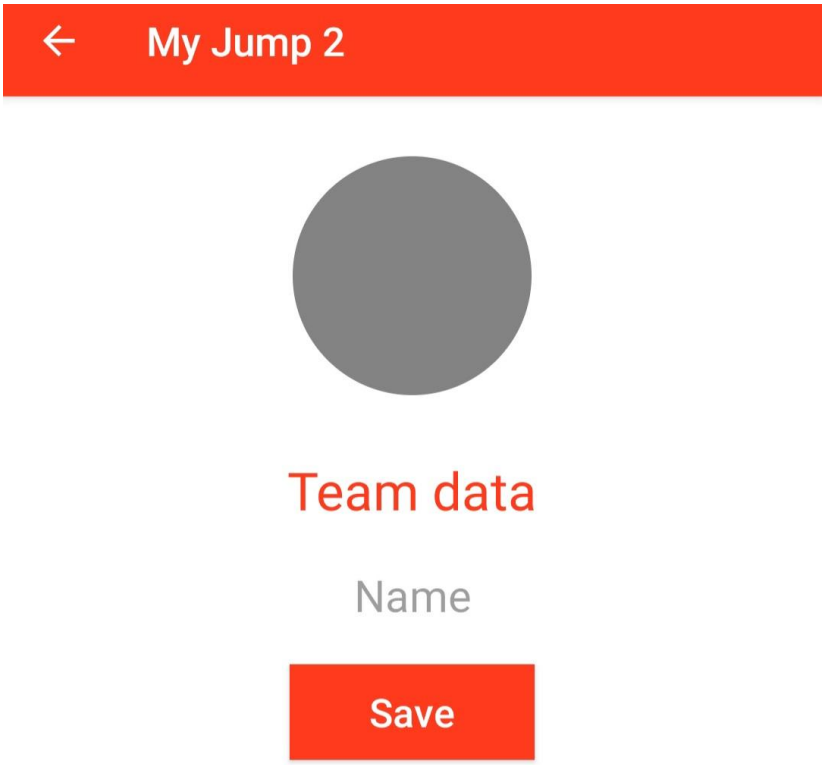
V. Application:

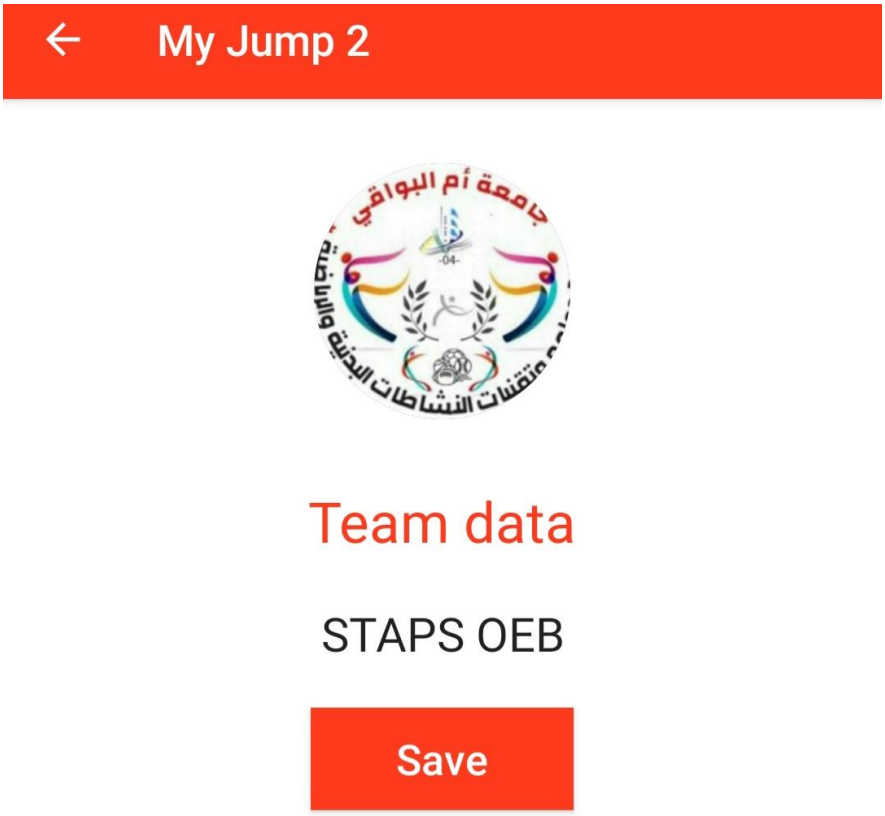
To measure a type of strength, follow these steps:

1. Download the application from the Play Store
2. Open the application

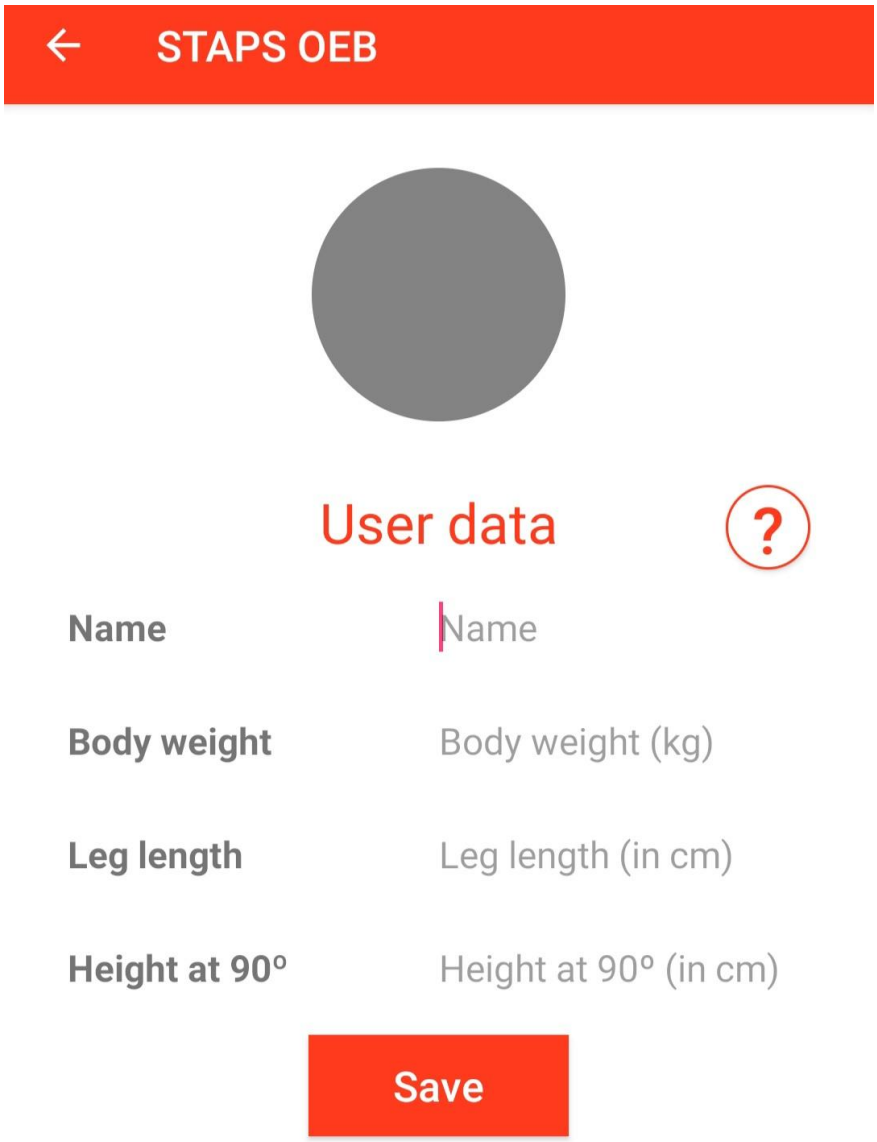


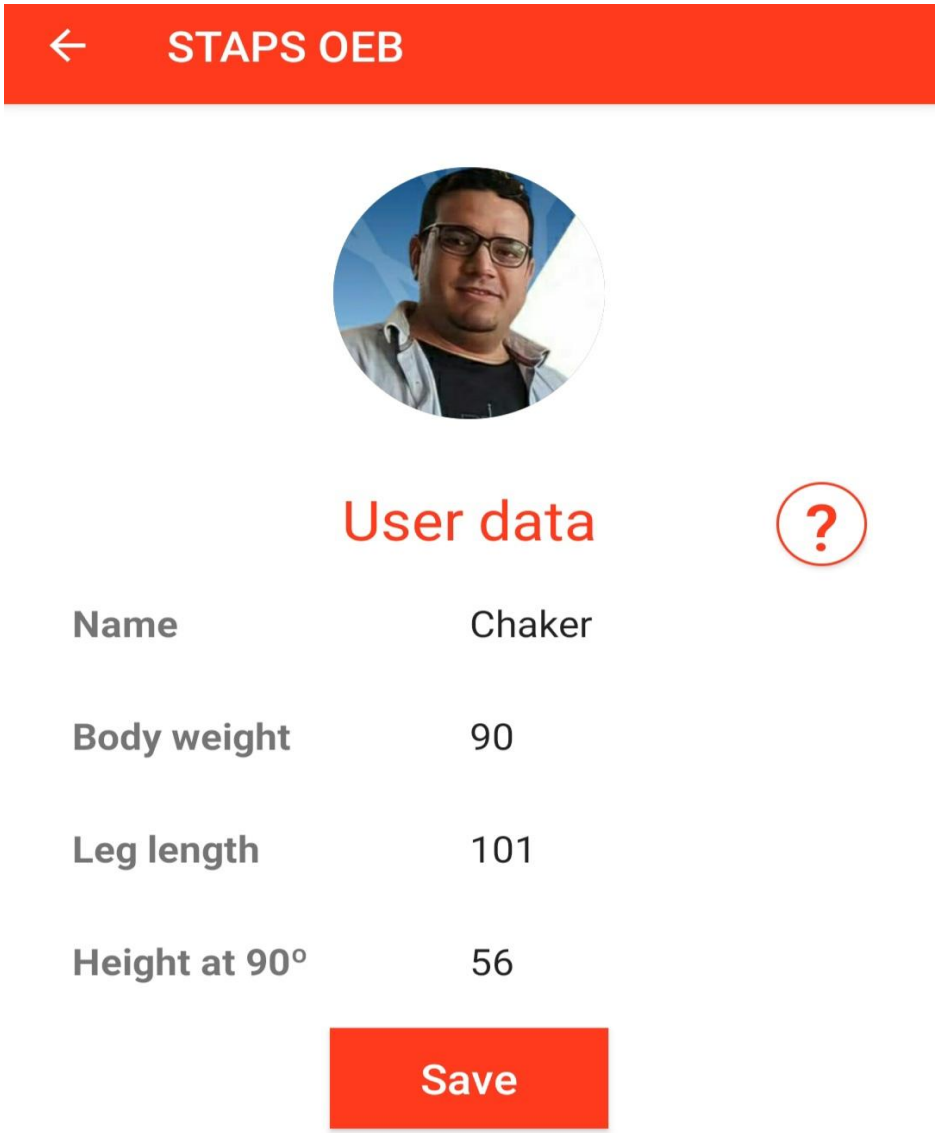
3. Create a team by entering its name

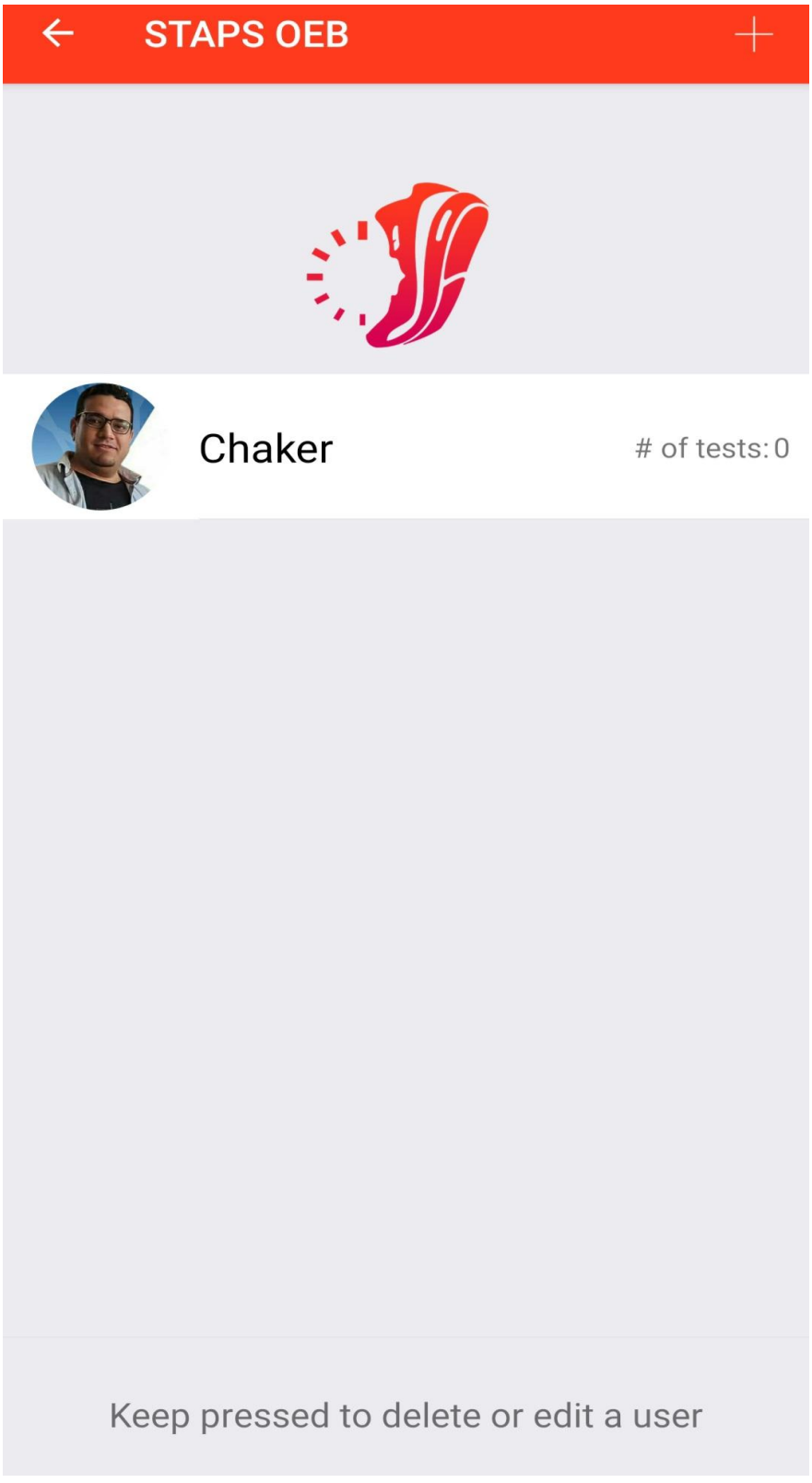



My Jump 2
Team data
STAPS OEB
Save

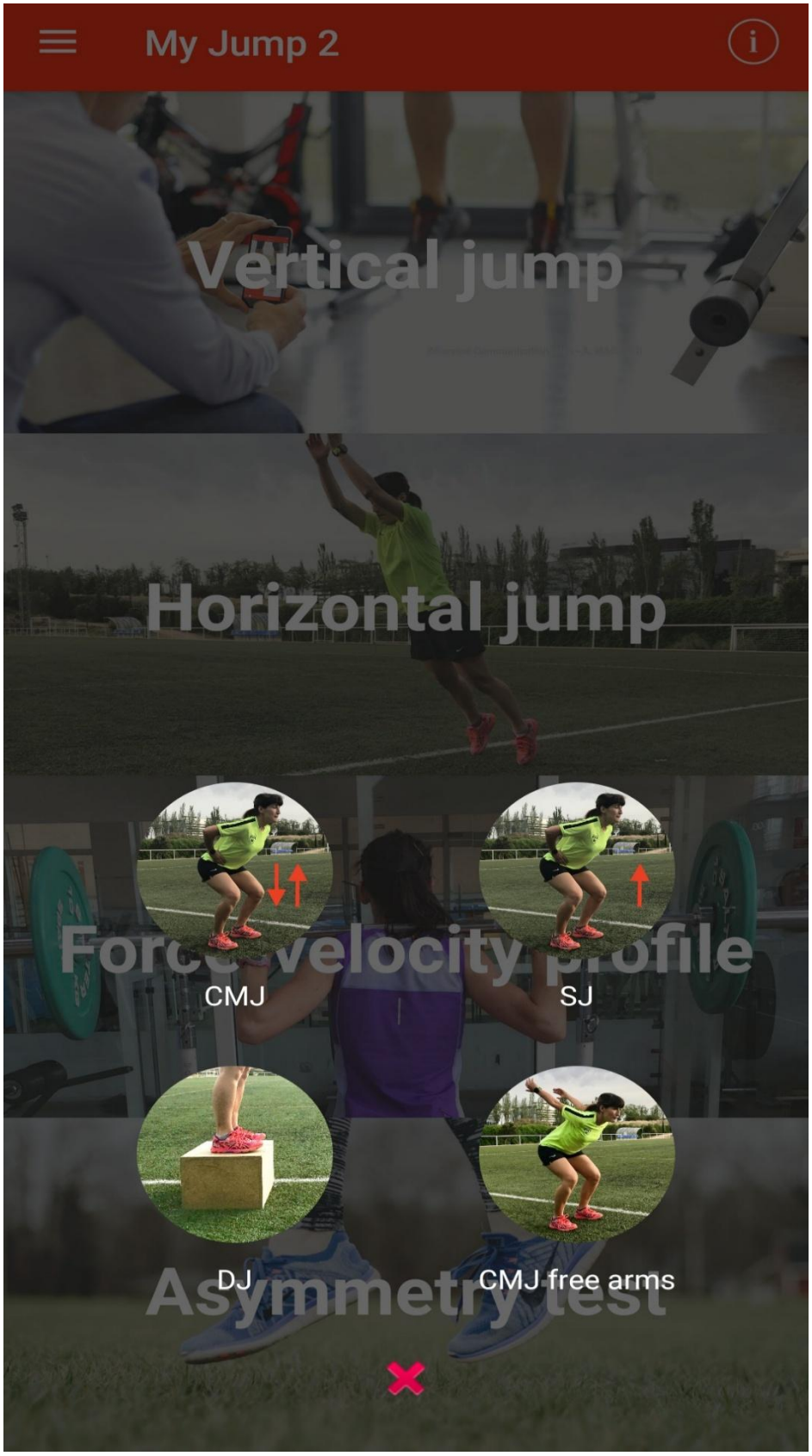
4. Add players by entering their names, lower limb lengths, weights, and heights from a seated position



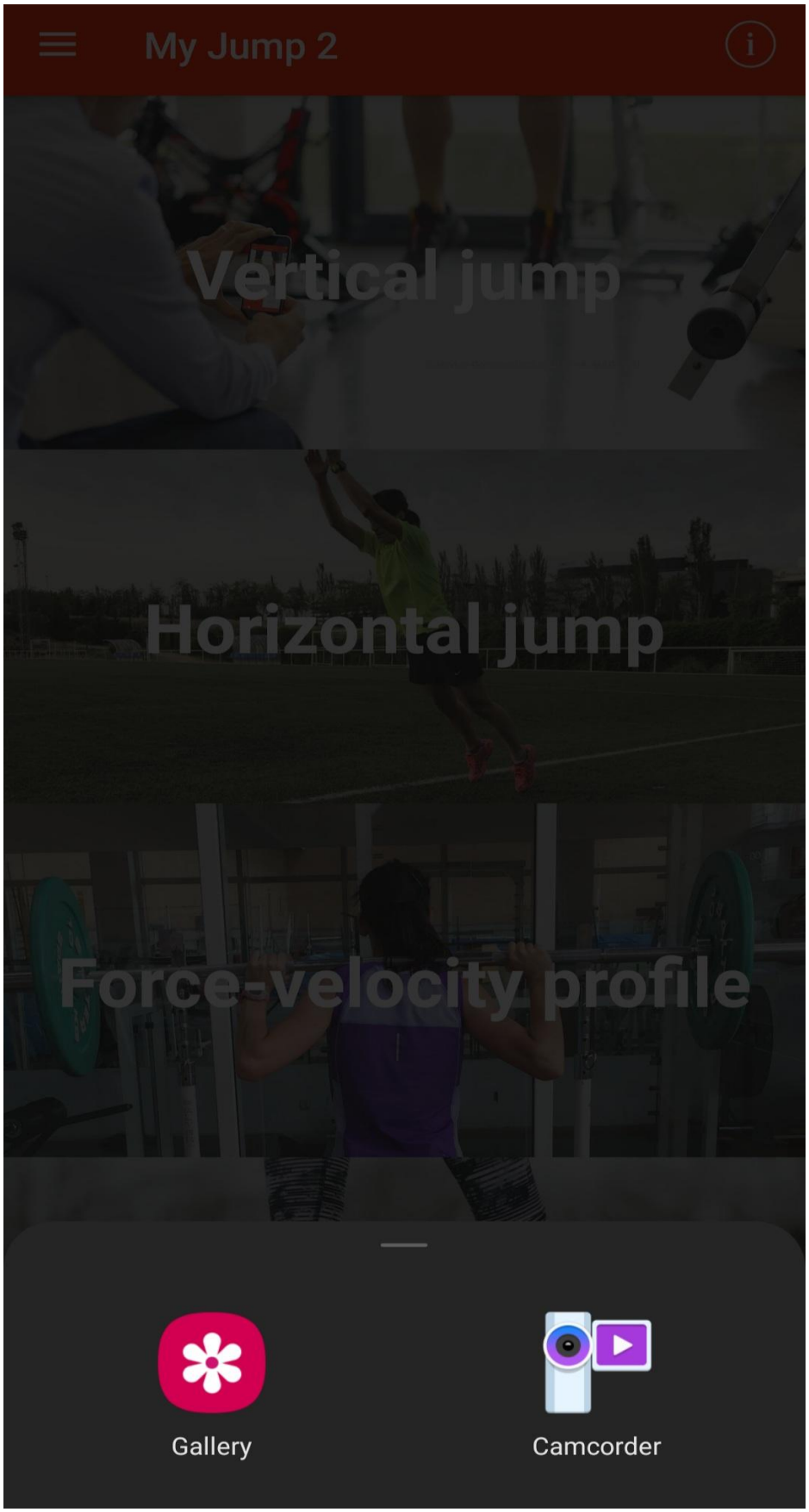

STAPS OEB
User data
?
Name
Chaker
Body weight
90
Leg length
101
Height at 90°
56
Save


STAPS OEB
Chaker
# of tests: 0
Keep pressed to delete or edit a user

5. Choose a jump

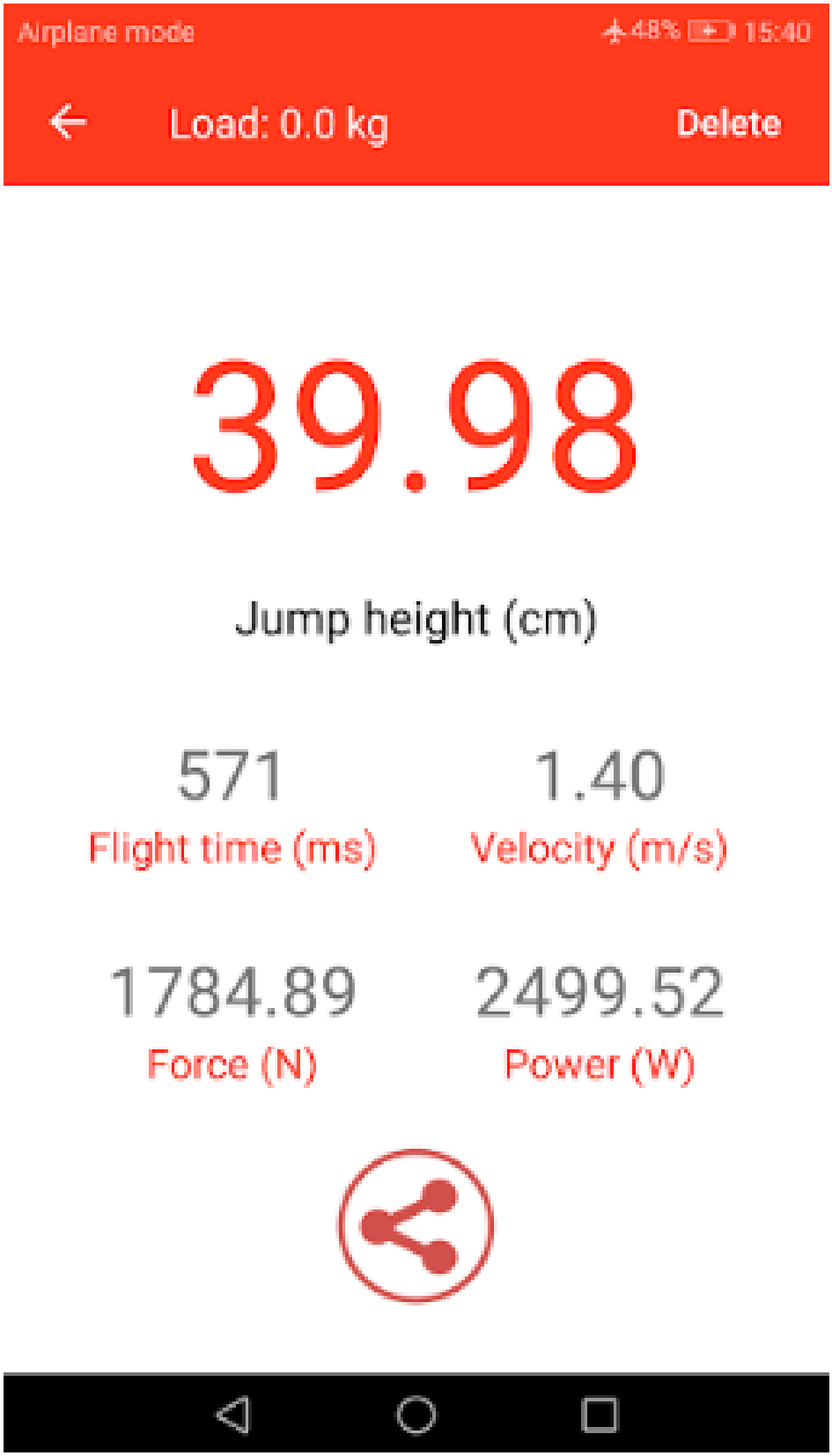


6. Then select the camera to record a video sequence



7. Divide the session by clicking on takeoff and landing

8. Then the results will appear



VI. Conlusion

In summary:

- If you're a personal trainer or lead a small group and want to assess jump performance, My Jump 2 is a good option.
-
- Make sure you film properly: use a stable camera, film from the side if possible, and choose an appropriate frame rate (if feasible).
- For detailed analyses (such as maximum power or a complete profile for a large team), this app can be a useful supplement, but it doesn't compete with top-tier strength platforms.
- If you're using an Android device and are still looking for the app, carefully check compatibility or consider trying the newer version, My Jump Lab (which includes My Jump 2 and additional tests).

Maximum strength measurement – the 1RM app

I. Introduction :

The 1RM, or one-repetition maximum, refers to the maximum weight an athlete can lift once for a given exercise, using proper technique and without assistance. It's a fundamental element for assessing a person's maximum strength.

Every bodybuilder, fitness enthusiast, or gym-goer should know their 1RM. Using established formulas, you can accurately calculate the 1 Rep Max for various exercises such as the bench press, squats, deadlifts, or other activities in your training program.

For example, if someone can perform one repetition of the bench press with 80 kg but cannot complete a second, then their 1RM for the bench press is 80 kg.

II. Intérêt de la répétition maximale dans le sport

One-repetition maximum (1RM) is frequently used in sports, particularly in activities like bodybuilding, weightlifting, athletic training, and rehabilitation, as it helps determine the appropriate weights to use during training sessions.

- Working at 60–70% of 1RM primarily develops muscular endurance.
- At 75–85%, the focus is on strength development.
- At 90–100%, the focus is on developing maximum strength or explosive power, depending on the speed of execution.

III. Méthodes d'évaluation

Direct measurement:

The load is increased slowly until the athlete is only able to perform one correct repetition. This method is the most reliable, but it requires good technique and an experienced observer.

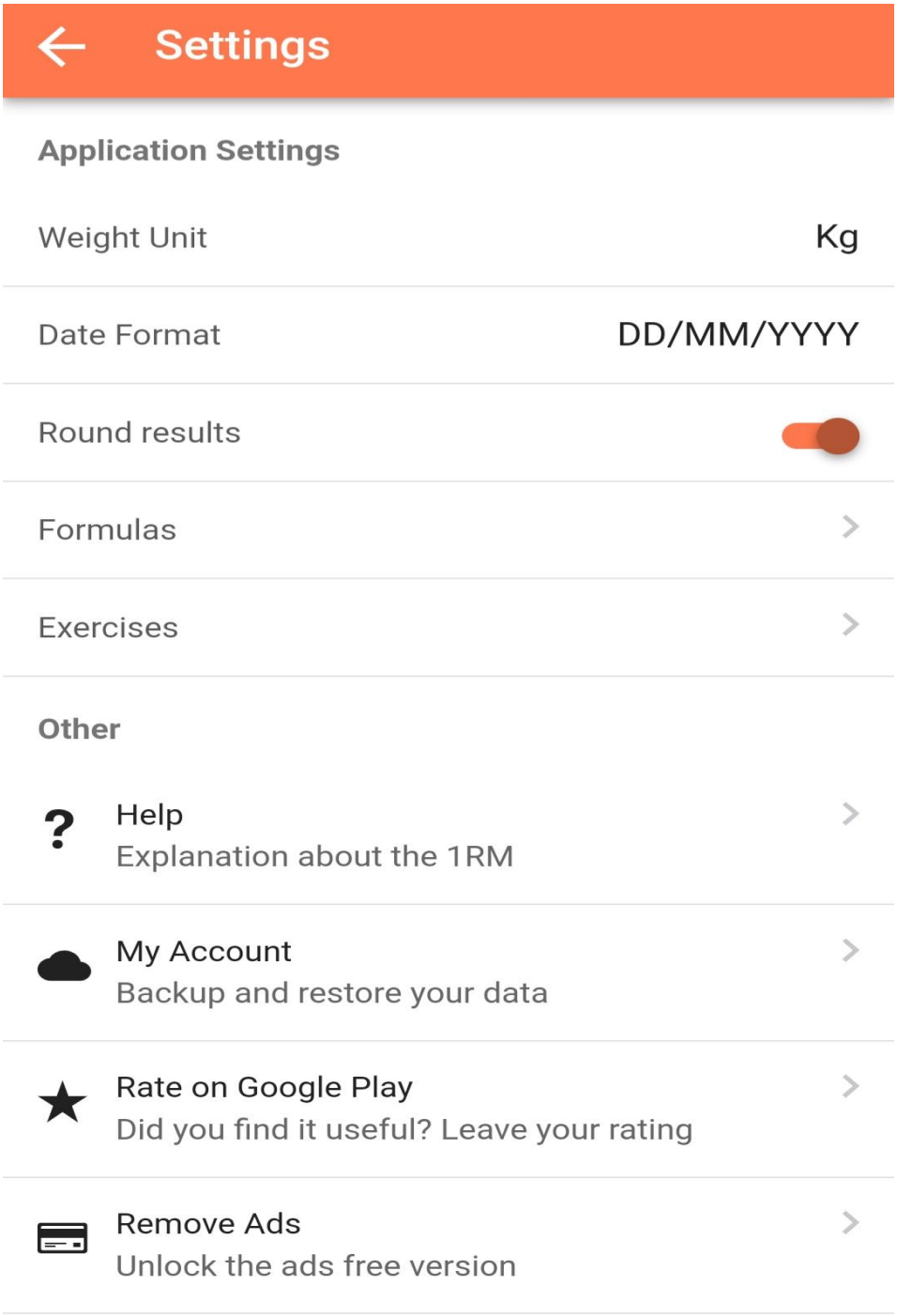
Indirect estimation:

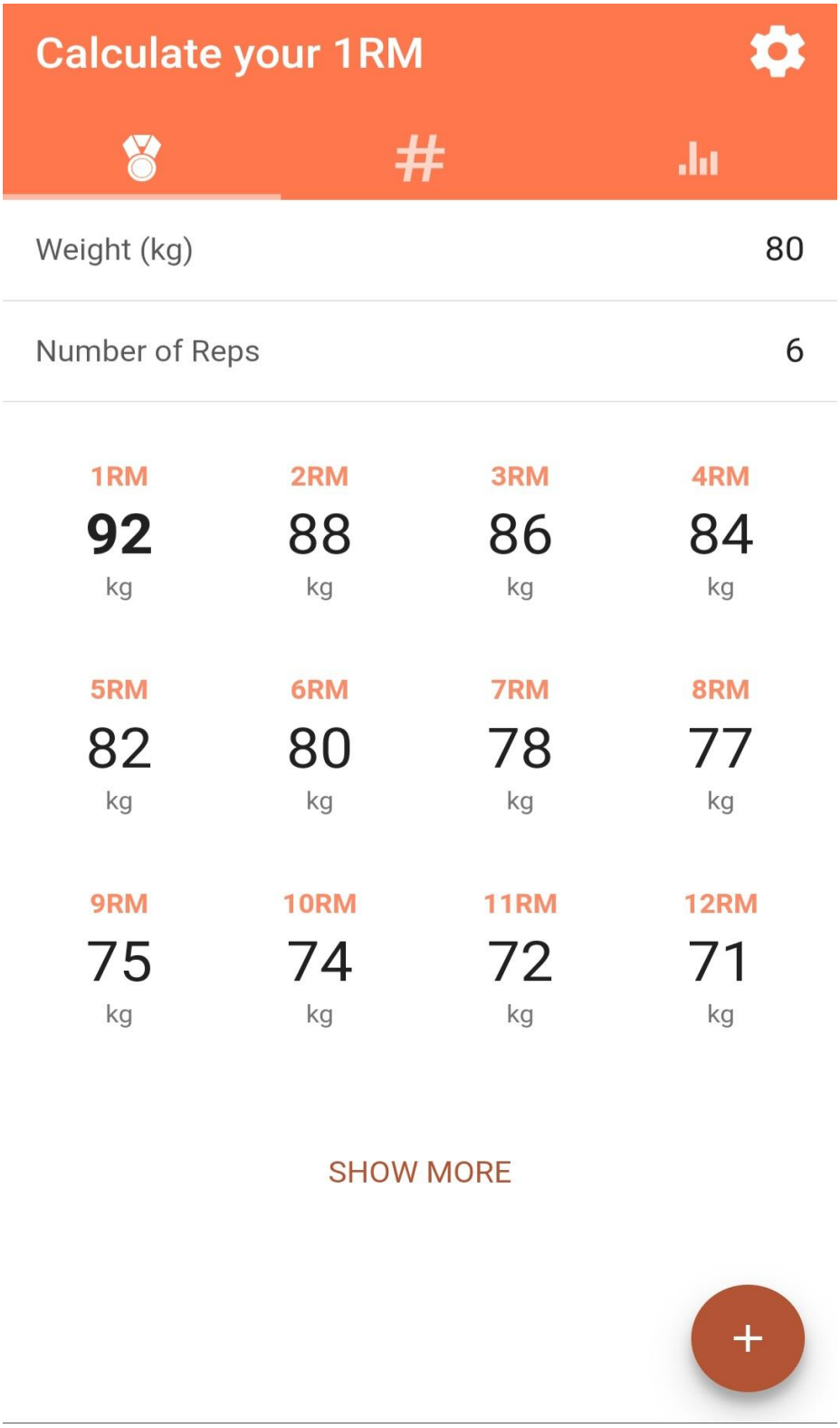
The 1RM is calculated from a submaximal test (such as the maximum weight lifted for 5 or 10 repetitions). Formulas, such as Epley's, help estimate the 1RM.

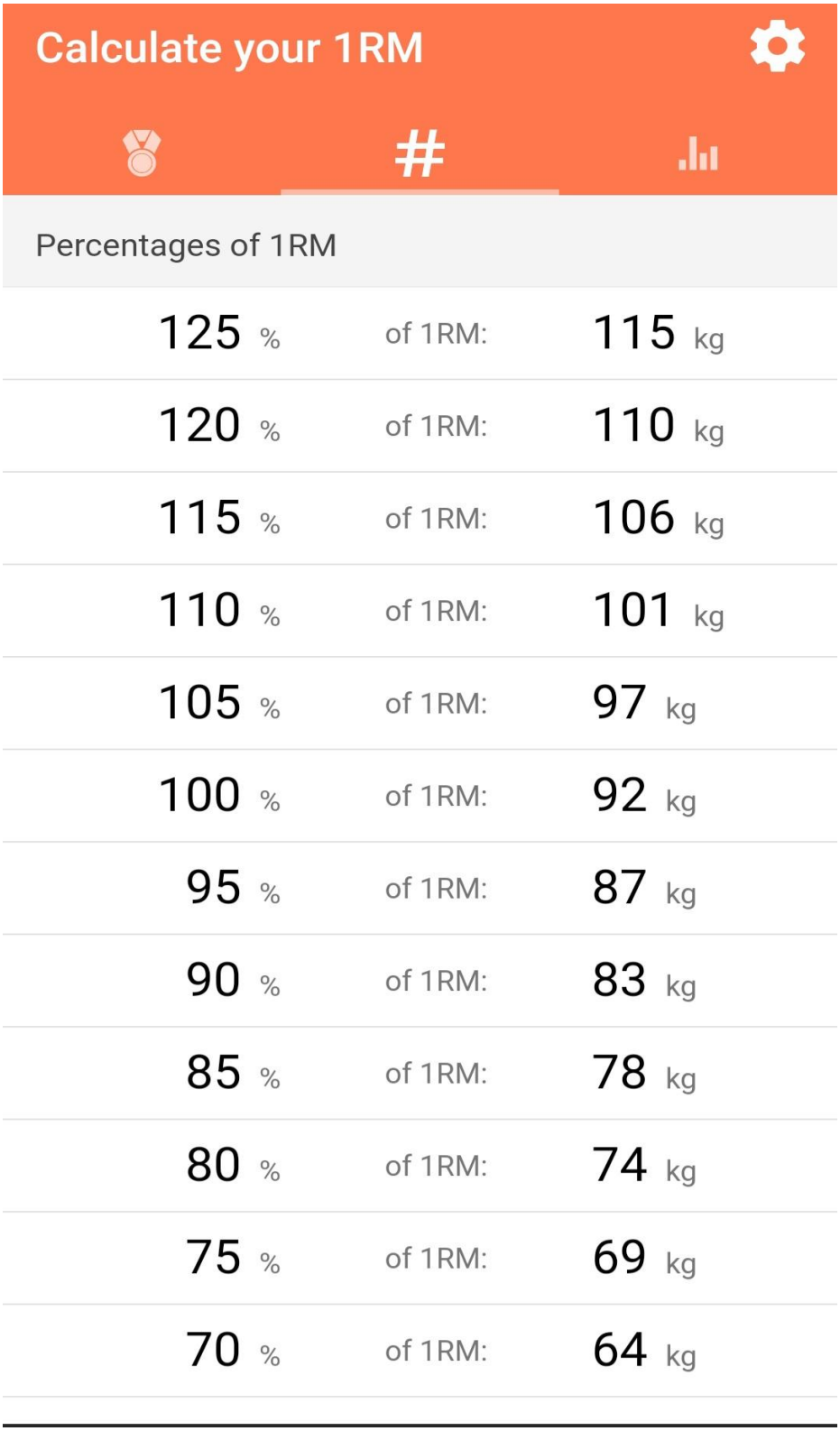
IV. Applications:

To measure a Maximum strength, follow these steps:

5. Download the application from the Play Store
6. Open the application
7. Enter the weight and number of repetitions

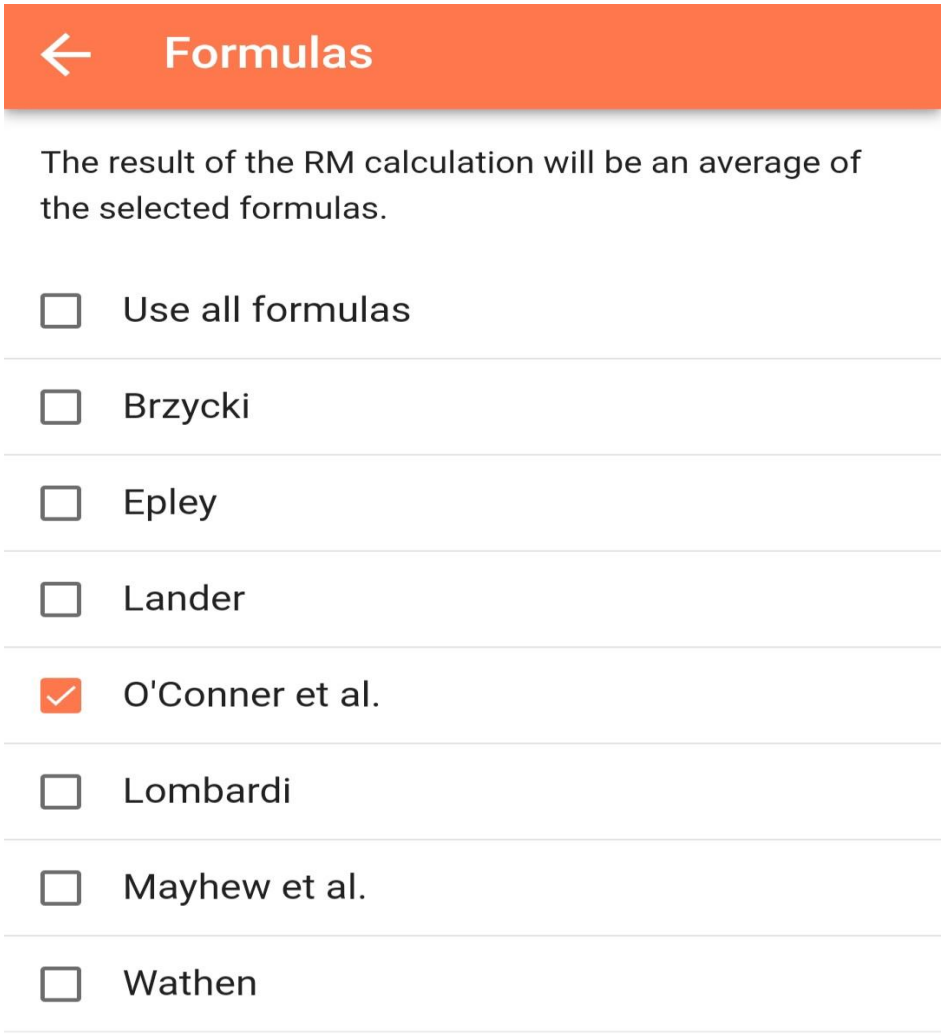

Settings
Application Settings
Weight Unit
Kg
Date Format
DD/MM/YYYY
Round results
Formulas
Exercises
Other
Help
Explanation about the 1RM
My Account
Backup and restore your data
Rate on Google Play
Did you find it useful? Leave your rating
Remove Ads
Unlock the ads free version


Calculate your 1RM
Weight (kg) 80
Number of Reps 6
1RM 92 kg
2RM 88 kg
3RM 86 kg
4RM 84 kg
5RM 82 kg
6RM 80 kg
7RM 78 kg
8RM 77 kg
9RM 75 kg
10RM 74 kg
11RM 72 kg
12RM 71 kg
SHOW MORE


Calculate your 1RM
#
Percentages of 1RM
125 % of 1RM: 115 kg
120 % of 1RM: 110 kg
115 % of 1RM: 106 kg
110 % of 1RM: 101 kg
105 % of 1RM: 97 kg
100 % of 1RM: 92 kg
95 % of 1RM: 87 kg
90 % of 1RM: 83 kg
85 % of 1RM: 78 kg
80 % of 1RM: 74 kg
75 % of 1RM: 69 kg
70 % of 1RM: 64 kg

V. The different formulas

Formula Name	Equation	Variables	Example (60 kg × 5 reps)	Estimated 1RM (kg)	Notes / Use
Epley (1985)	1RM = W × (1 + 0.0333 × R)	W = weight liftedR = reps	60 × (1 + 0.0333×5)	**70.0**	Simple and widely used; reliable up to ~10 reps
Brzycki (1993)	1RM = W / (1.0278 – 0.0278 × R)	W = weight liftedR = reps	60 / (1.0278 – 0.0278×5)	**68.3**	Accurate for ≤10 reps; popular in research
Lombardi (1989)	1RM = W × R^0.10	W = weight liftedR = reps	60 × 5^0.10	**77.1**	Exponential model; good for experienced athletes
O'Conner (1989)	1RM = W × (1 + 0.025 × R)	W = weight liftedR = reps	60 × (1 + 0.025×5)	**67.5**	Common in strength & conditioning contexts
Mayhew (1992)	1RM = (100 × W) / (52.2 + 41.9 × e^(–0.055×R))	W = weight liftedR = reps	(100×60)/(52.2 + 41.9 × e^(–0.275))	**71.4**	Developed from bench press data; high precision
Wathan (1994)	1RM = (100 × W) / (48.8 + 53.8 × e^(–0.075×R))	W = weight liftedR = reps	(100×60)/(48.8 + 53.8 × e^(–0.375))	**72.2**	Precise; suited for trained populations



VI. Conclusion :

In summary, one-repetition maximum (1RM) is a fundamental indicator of maximum muscular strength and a key tool for planning, adapting, and evaluating training programs in sports. It allows for the scientific personalization of workload, optimizing performance while minimizing the risk of injury..

Analysis of human movement using Kinovea software

I. Introduction :

Kinovea is a free, open-source video annotation and motion analysis tool that is mostly used in biomechanics, sports science, rehabilitation, and coaching. You may use it to import video of movement (athlete, patient, etc.), annotate it, take measurements (angles, distances, timing), compare videos side-by-side, track motion, and export data for additional study.

- It is extremely beneficial in the realm of sports and rehabilitation because:
- Instead of just qualitative evaluation, it enables objective measurement of movement (e. g. , joint angles, velocities).
- By comparing an athlete's or patient's technique to a reference, it visually shows their technique, allowing for feedback.
- With consistent measurements, it helps track changes throughout time (pre- and post-injury, training interventions).
- Because it is available for free, it is a viable option for therapists, coaches, clinics, and colleges.

II. Key Features & Capabilities

Kinovea performs a few of its most important tasks, such as:

- Frame-by-frame navigation, slow-motion playback, and video import.
- Tools for sketching: lines, circles, grids, markers for noting stance and technique.
- Measurement tools: measure distances, angles, track motion across frames, and calibrate space/time.
- Comparison: comparing two films (such as athlete vs ideal), layering them, and doing a side-by-side comparison.
- Export data: video export with annotations, measurement data export (to CSV/Excel).
- capture live camera, recording, and delay functions (useful in the lab or field).

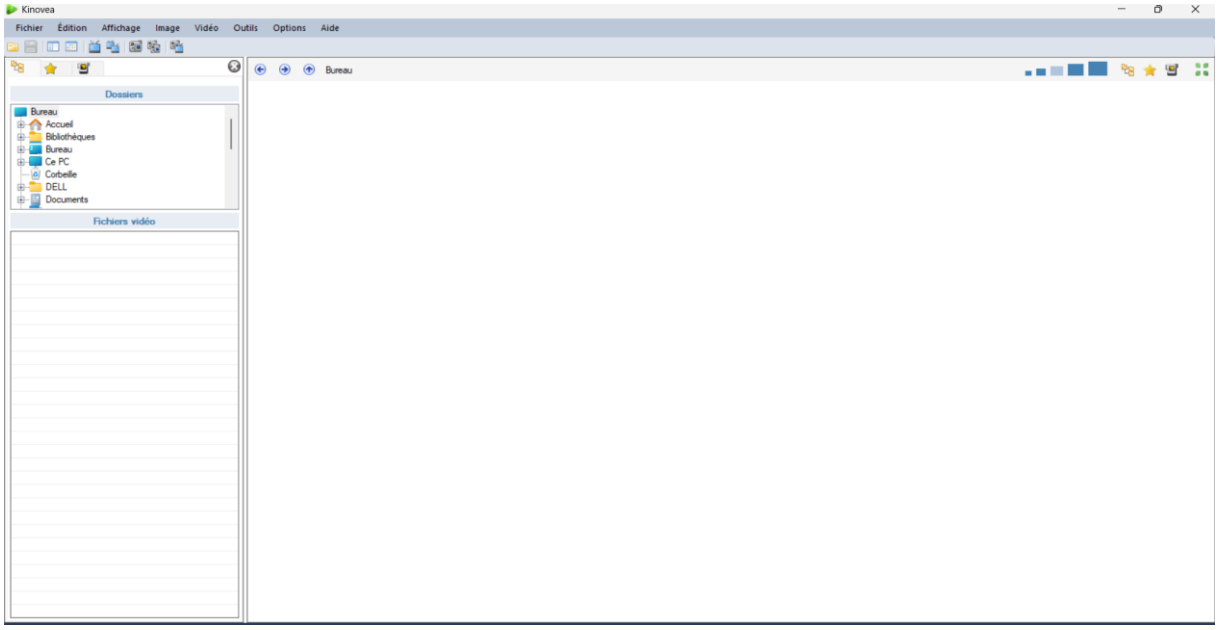
III. Step-by-step tutorial

Here's how to use Kinovea in a typical process:

1. Setup and Installation

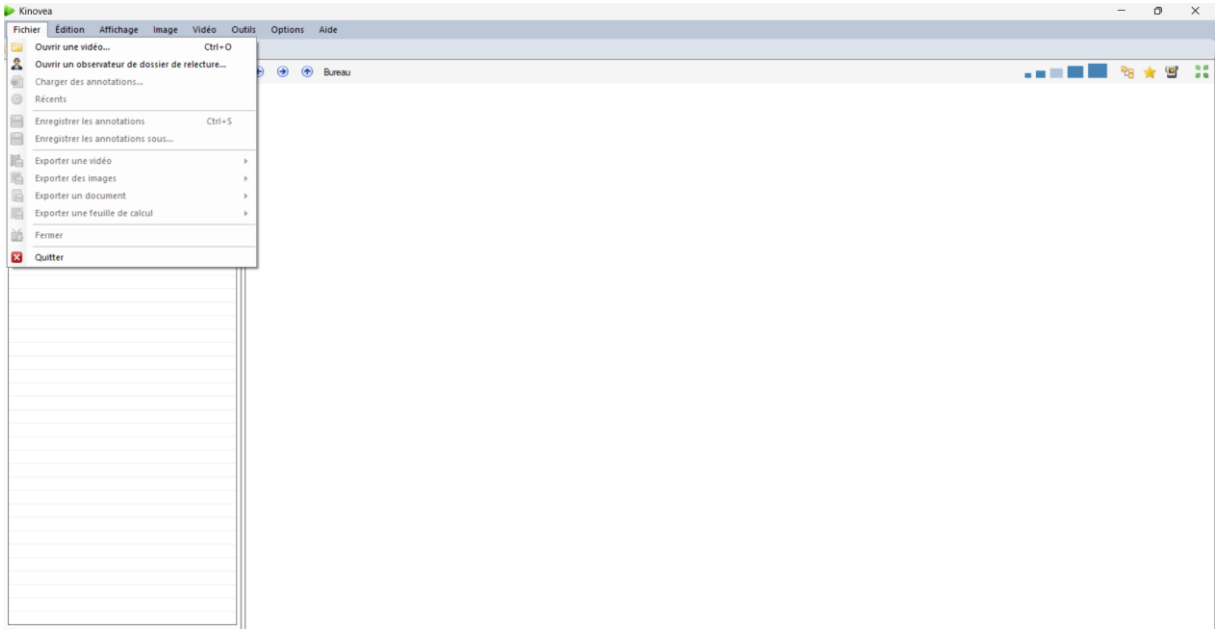
- Download the latest version of Kinovea from the official website.
- Install it on your computer (usually Windows; pay attention to compatibility).
- Familiarize yourself with the interface: main window, timeline, controls, annotation panel.

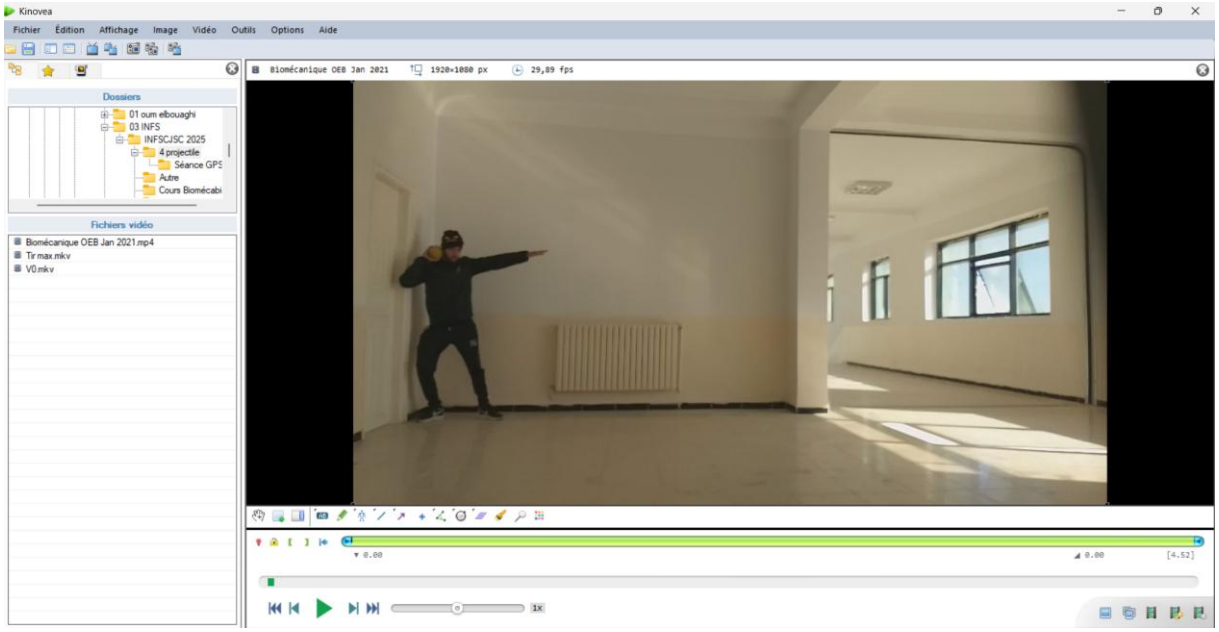
• Set your preferences (units, video playback speed, default marker styles).



2. Importing and Navigating Video

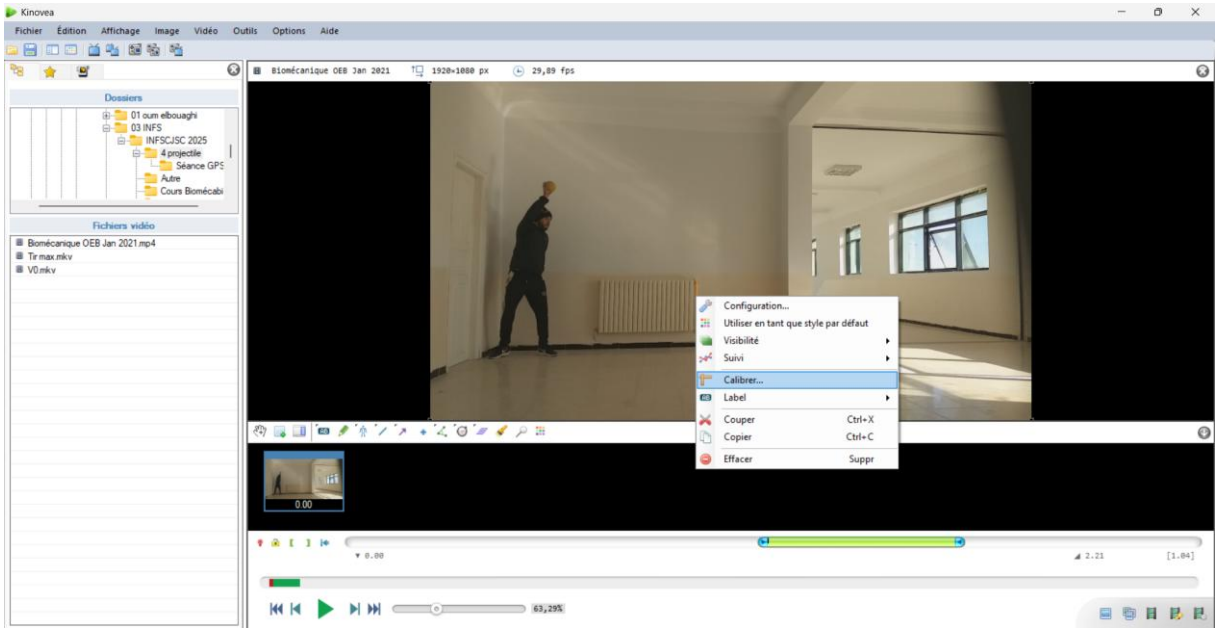
- Open a video file (e.g., athlete performing movement).
- Navigate using play, pause, slow motion, frame- advance/back.
- Use key-frame markers (set start and end of movement sequence).
- If needed, synchronise two videos (for comparison).

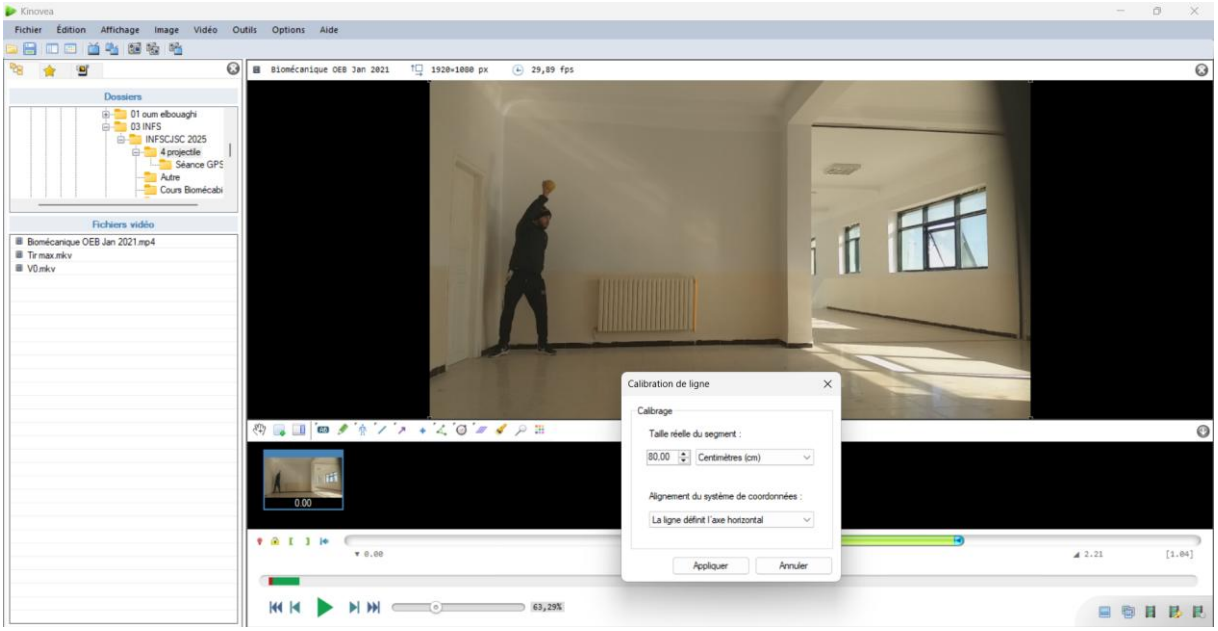




3. Calibration (Important)

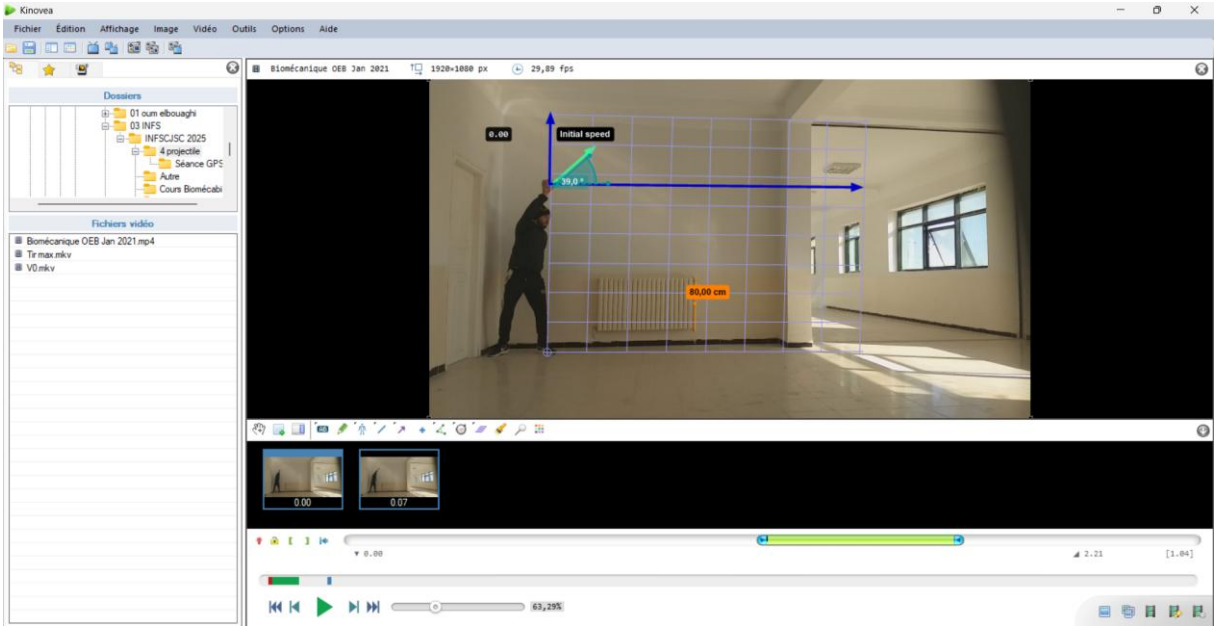
- To make accurate measurements you must calibrate: set a known distance or time scale in the video (e.g., a metre marker in frame).
- For angle/time measurements, ensure the scale is correct (units m, s, degrees).





4. Annotating & Drawing

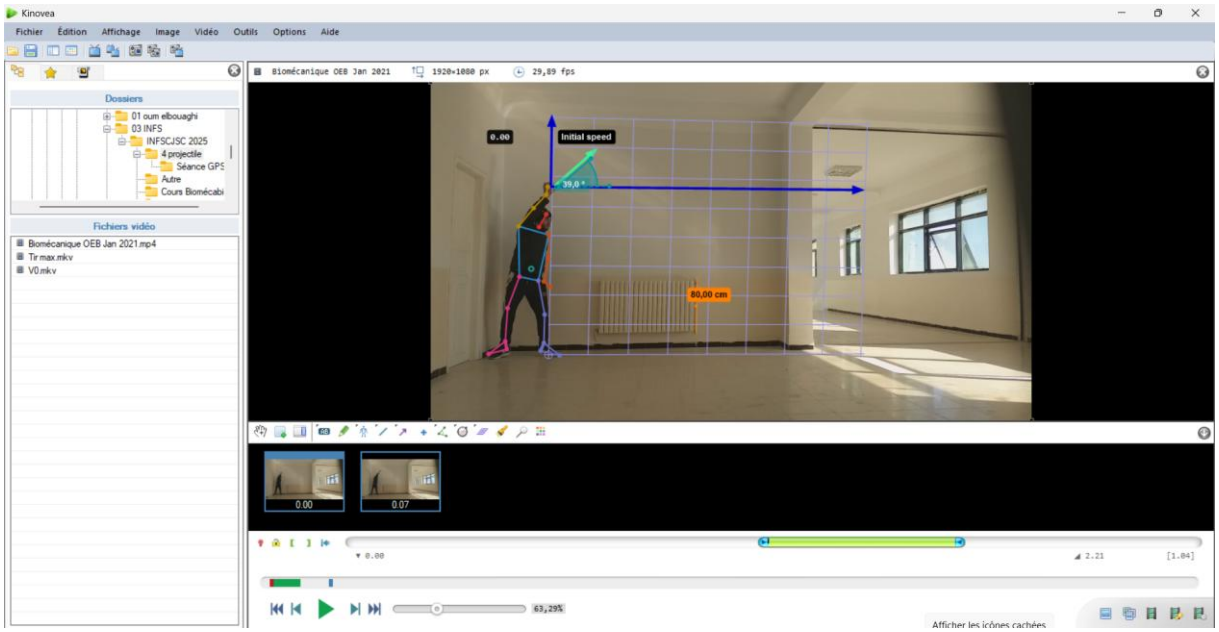
- Use draw tools to add lines (e.g., limb segments), circles (joint centres), text labels.
- Use a grid or background image if you want to compare posture.
- Annotate key moments in the movement (markers).



5. Measurement

- Select measurement tool: distance (between two points), angle (between segments), time interval.
- Place your points/lines on the video frame.
- For movement tracking: you can track a marker frame-by-frame across video, generating data for trajectory, velocity, angle changes.

- Use the “track” function if available: it captures the motion of a point over time.

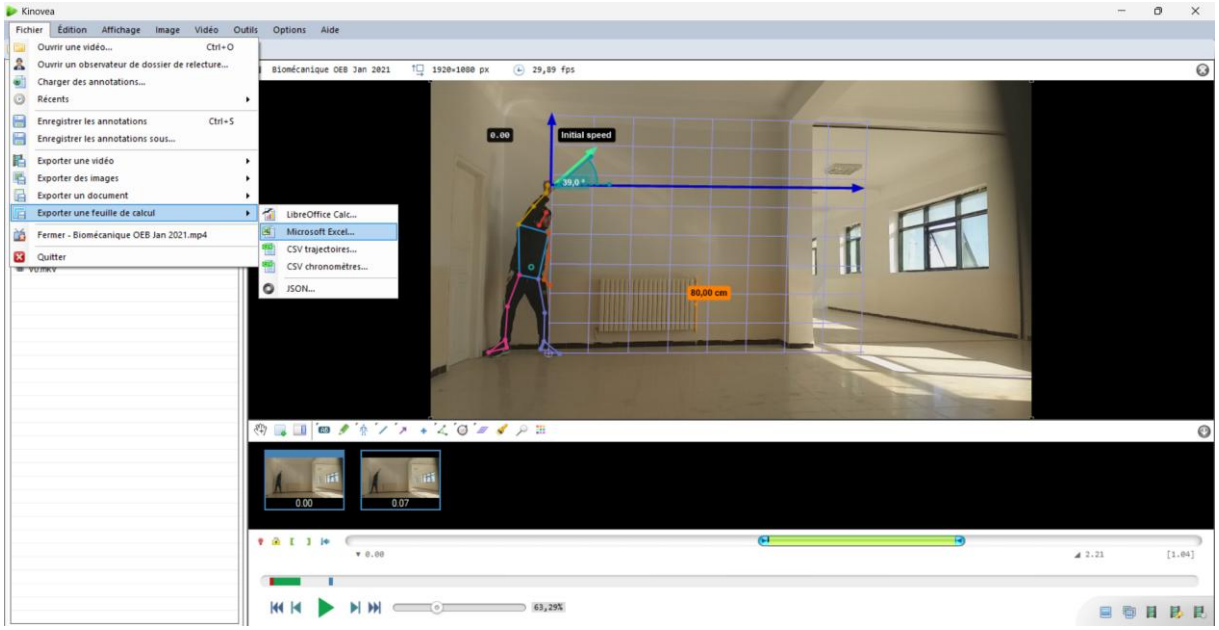


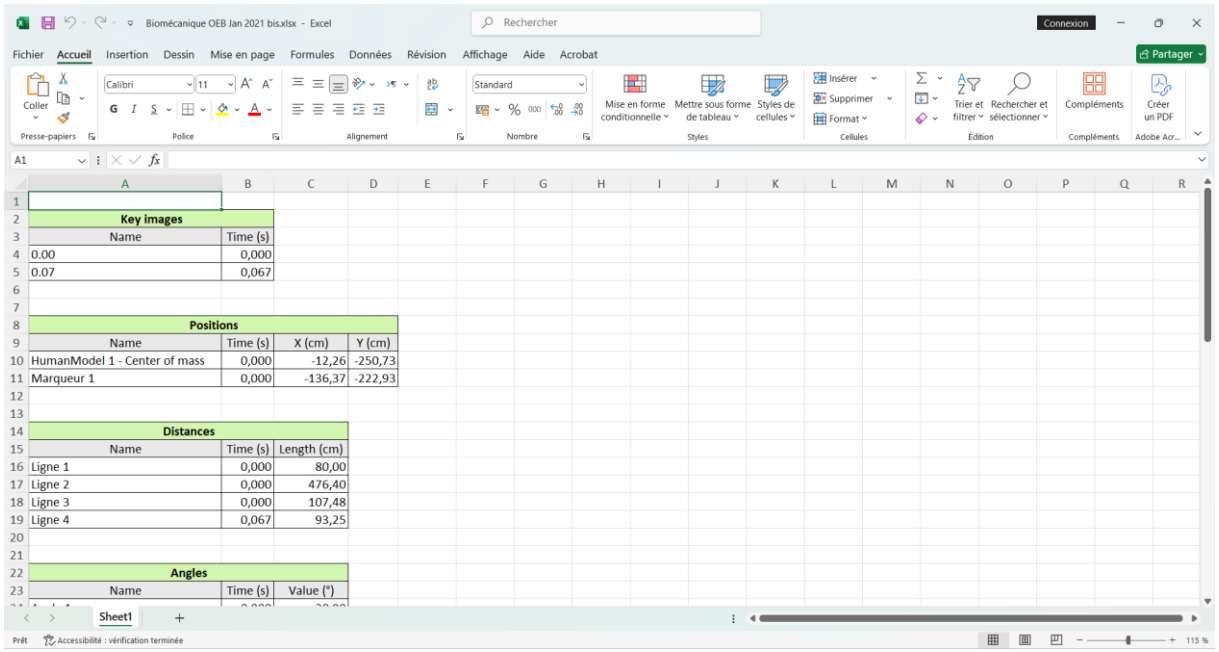
6. Comparison & Overlay

- Load a reference or ideal movement video.
- Synchronise start time.
- Use overlay or side-by-side view to compare the athlete’s movement versus the reference.

7. Exporting Results

- After capturing measurements, export the measurement table to CSV or Excel for further analysis.
- Save the video with annotations (if you want to share with athlete or client).
- Save a “project” file so you can revisit later.





IV. Applications in Sports and Rehabilitation

1. **In sports, Kinovea can be used for:**

- Technique analysis (e.g., sprint start, take-off from a jump, throwing mechanics).
- Injury rehabilitation monitoring: quantifying joint angles, movement asymmetries, and functional recovery.
- Performance tracking: comparing an athlete's movement over time, before and after a training intervention.
- Feedback to the coach: visual feedback for athlete corrections.

2. **In rehabilitation:**

- Joint mobility assessment (range of motion), gait analysis, and functional movement patterns.
- Documenting recovery by measuring changes in movement quality or amplitude.
- Providing visual feedback to patients to improve motor control.

Tips, Best Practices & Pitfalls

Tips:

- Use a clear camera setup: good lighting, stationary camera, minimal distortion.
- Include a known scale (e.g., a ruler) in the video for calibration.
- Keep the camera perpendicular to the plane of motion when measuring angles/distances to avoid parallax error.
- Use consistent settings (camera angle, framing) every time to ensure accurate longitudinal measurements.
- Label and save measurement files clearly (date, object, motion).
- Check the exported data for outliers or incorrect frames (manual correction may be necessary).

Pitfalls:

Calibration error: if the scale is wrong, all measurements will be off.

Camera angle/plane. If the movement is 3-D but you record in 2-D without consideration, you may miss depth or get inaccurate angles.

Motion blur / low frame rate: fast movements may blur, making tracking inaccurate.

Over-reliance on the software: remember that good video capture and proper setup are critical before measurement.

Ignoring repeatability: when comparing over time, ensure consistent conditions (camera, lighting, athlete setup).

V. Sample Workflow Scenario

Scenario: A coach wants to analyze an athlete's knee flexion angle during the take-off phase of a high jump.

3. Position the camera perpendicular to the athlete's frontal plane and use a vertical reference point (e.g., a tape measure on a wall).
4. Record several jumps.
5. Upload the video to Kinovea.
6. Calibrate the scale (e.g., a visible distance of 1 m).
7. Identify the frame where the take-off begins and where peak knee flexion occurs.
8. Draw two limb lines (thigh and lower leg) at peak flexion and measure the angle between them.
9. Save the measurement and export to a CSV file.

10. Repeat after a training intervention (e.g., 6 weeks later) and compare the angles.
11. Provide the athlete with visual feedback, highlighting any deviations from the ideal movement.

VI. Conclusion

Kinovea is a powerful and accessible tool for movement analysis in the context of sports performance and rehabilitation. Combining video recording, annotation, measurement, and export capabilities, it enables therapists to quantify movement, provide visual feedback, and track progress over time. However, the quality of the analysis depends largely on proper video recording setup, calibration, and a consistent methodology. Careful use of Kinovea contributes to more informed training and treatment decisions, improved communication with athletes/patients, and more objective monitoring of results.

Video analysis of the football match - Metrica software

I. Introduction

Metrica Sports is software designed specifically for video and data analysis in the sports field. It targets amateur clubs, independent coaches, and elite teams alike.

Its aim is to facilitate the analysis of matches and training sessions, the coding of events, data visualization, and the extraction of tactical and technical insights.

II. Versions and Key Features

1. Metrica PlayBase

This version is designed for amateurs and semi-professionals. It offers the ability to import videos, replay them, tag events, create playlists, and integrate visual annotations for presentation.

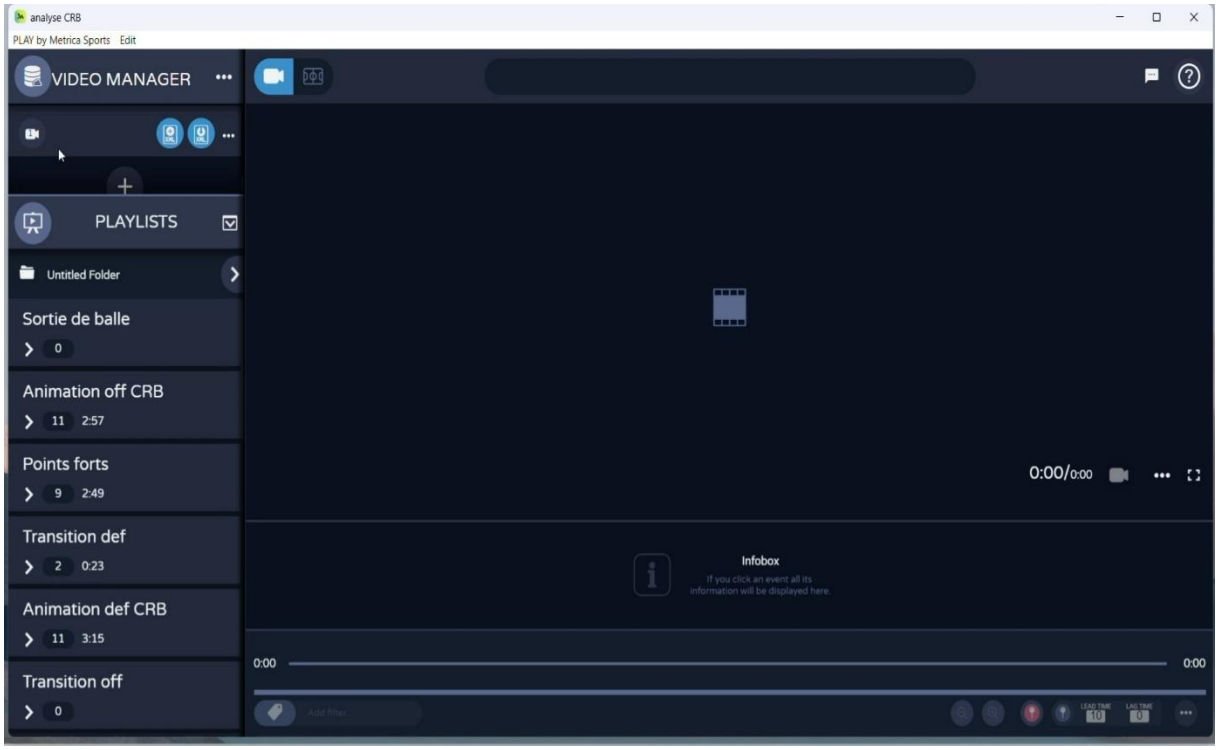
2. Metrica Nexus

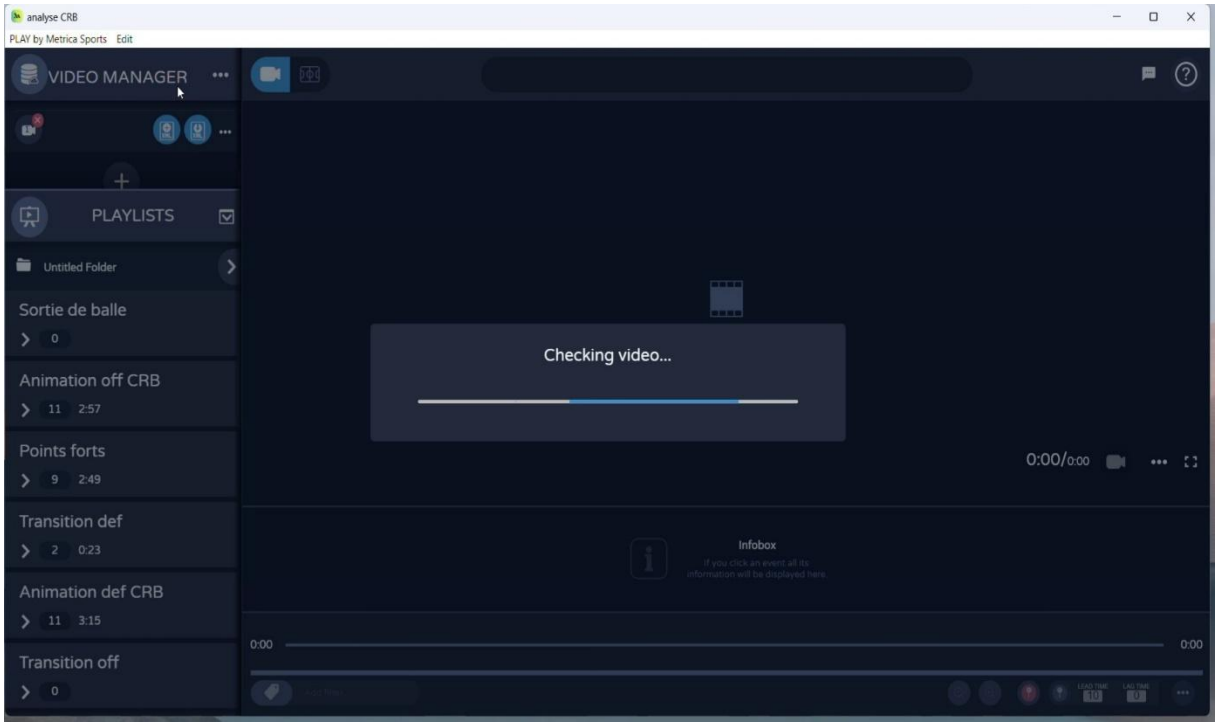
This version is designed for analysts and elite teams. It offers sophisticated tools: automatic player tracking, sequence coding, high-level exports, and real-time workflows.

Features include: automatic player and ball tracking; event coding; tag creation; and tag group management.

Television: illustration, underlining, and highlighting of players.

III. Applicaion

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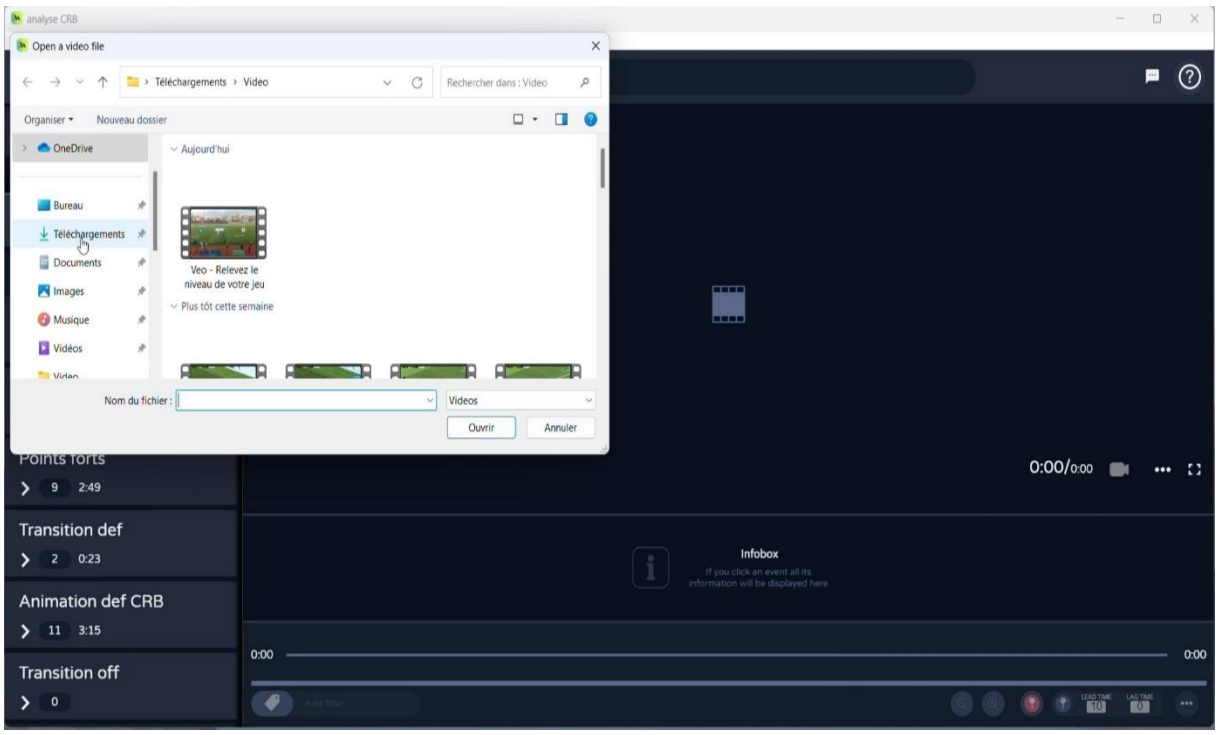
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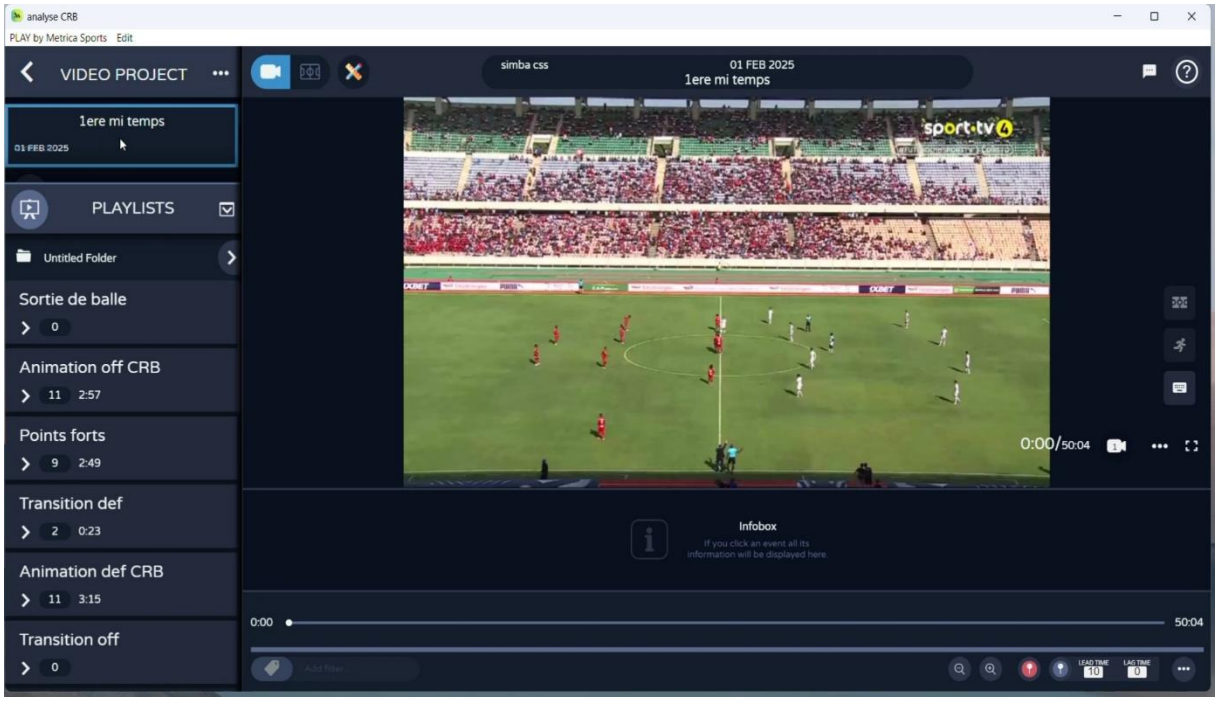
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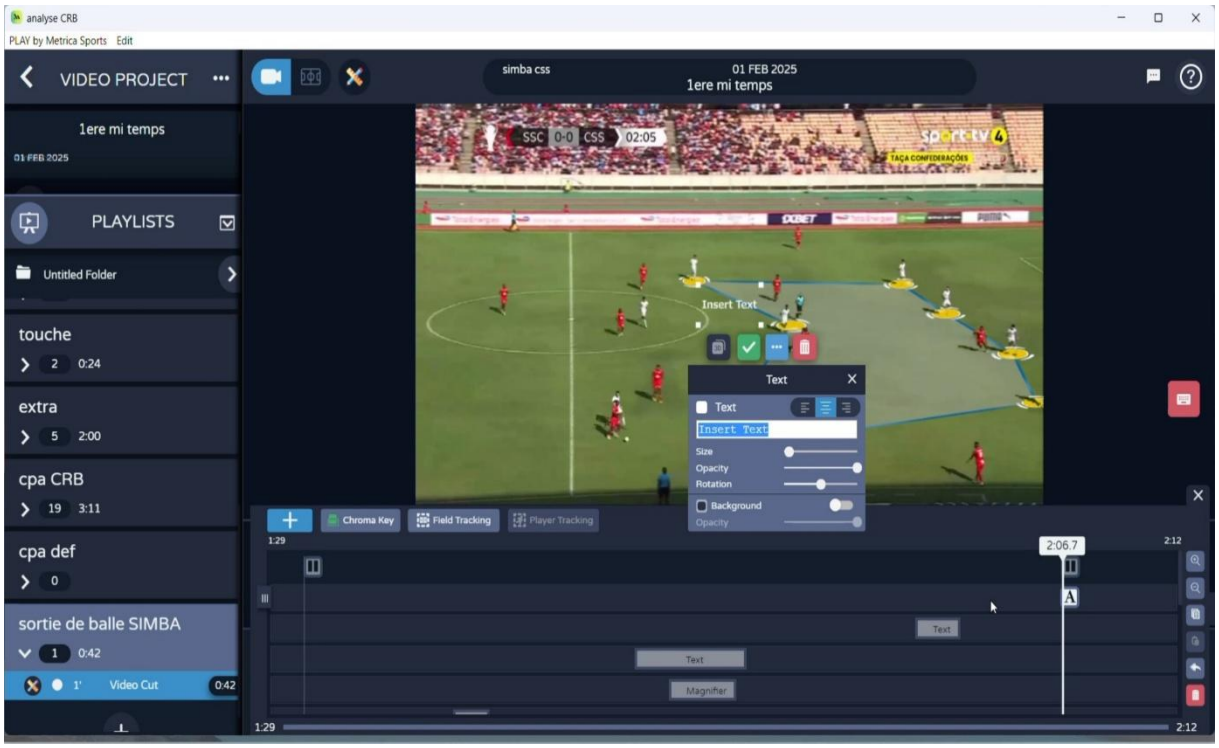
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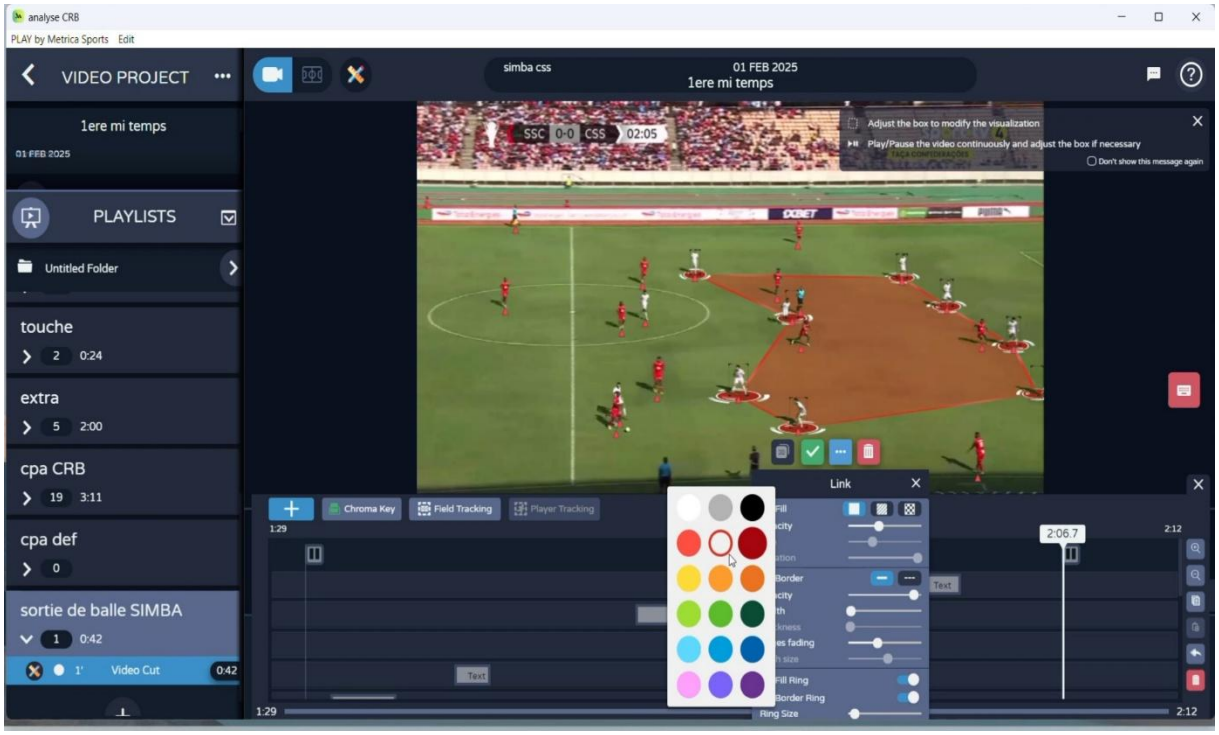
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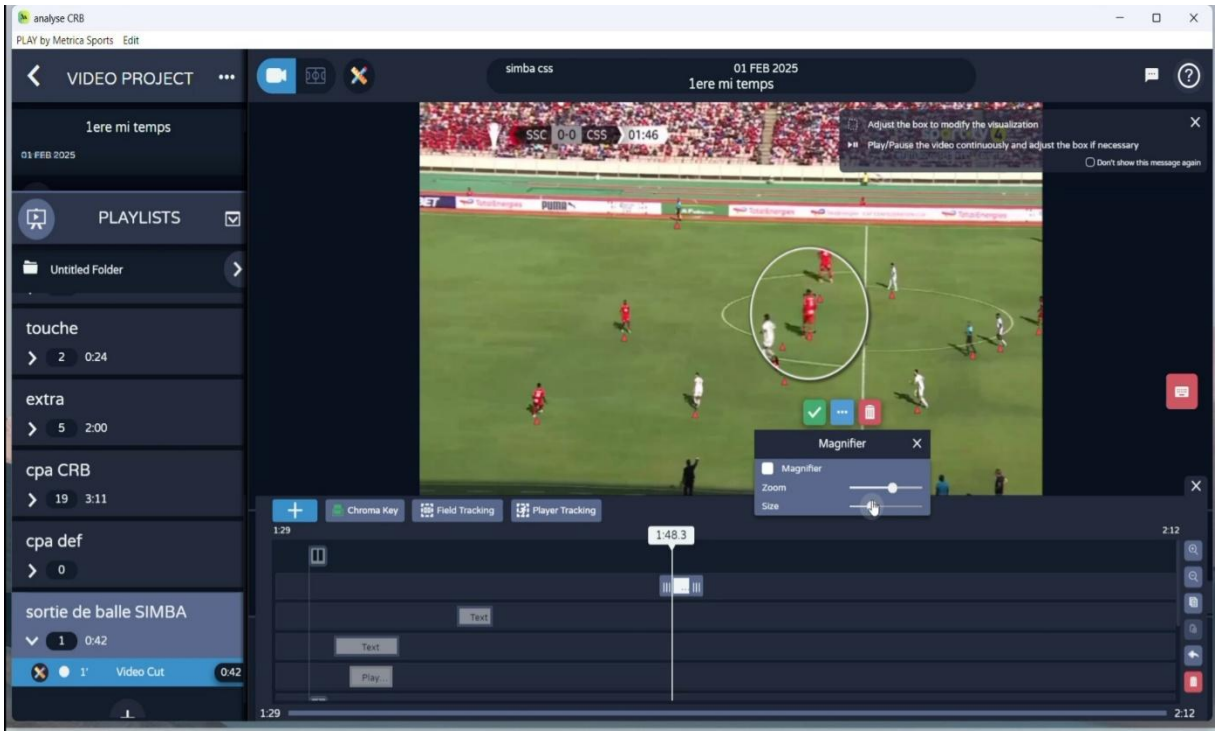
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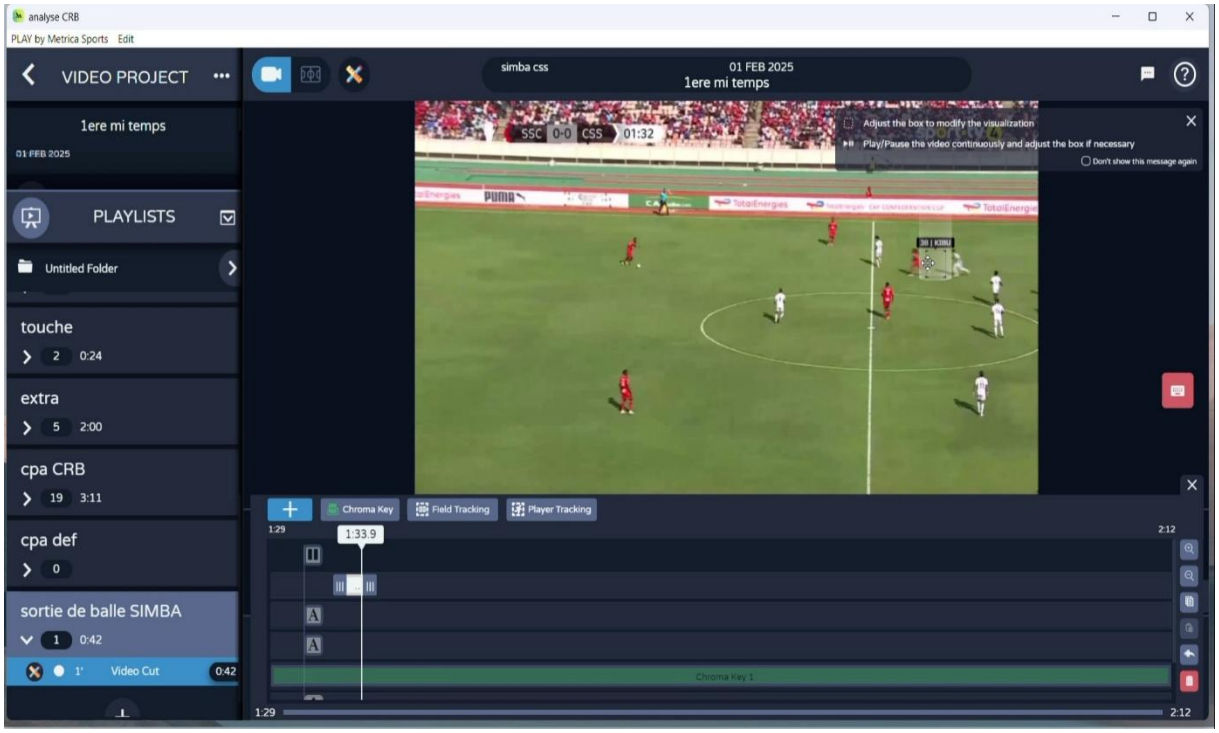


Conclusion :

Metrica Sports is a robust, all-in-one video and tactical analysis tool dedicated to optimizing game understanding and athlete performance. With its two main versions, PlayBase and Nexus, it meets the needs of both amateur clubs and professional teams. This

tool facilitates the coding of actions, the analysis of individual and group behaviors, and the creation of clear and educational visual presentations.

Integrating Metrica into the training process allows coaches and analysts to identify their team's strengths and weaknesses, improve tactics, and support player development through tangible and visual feedback. However, to get the most out of it, a thorough understanding of the software and meticulous organization of video work are essential.

In short, Metrica has established itself as a key benchmark in contemporary sports analysis, combining technology, accuracy, and efficiency to enhance performance.

Video analysis of human movement - Dartfish software

I. Introduction

Dartfish is a video analysis program used in sports, education, and motor performance research. It allows users to capture, analyze, compare, and comment on video sequences to improve technique, tactics, and movement intelligence. Highly regarded in the sports world, it is used by coaches, physical trainers, and performance evaluators.

II. Software objectives

Dartfish's primary mission is to assist coaches and athletes in observing, understanding, and correcting technical movements.

- It allows for the frame-by-frame analysis of a movement.
- It enables the comparison of two actions side-by-side (joint comparison).
- It allows for the incorporation of annotations (lines, angles, regions, remarks).
- It enables the creation of custom video sequences for learning or feedback.
- It allows for the evaluation of performance in real time or later.

III. Main features

1. Video capture and import

Users can capture video directly from an online camera or import existing videos. Dartfish supports various formats and offers the ability to view, fast-forward, or rewind frame by frame..

2. Technical analysis

With the integrated graphic tools, we can:

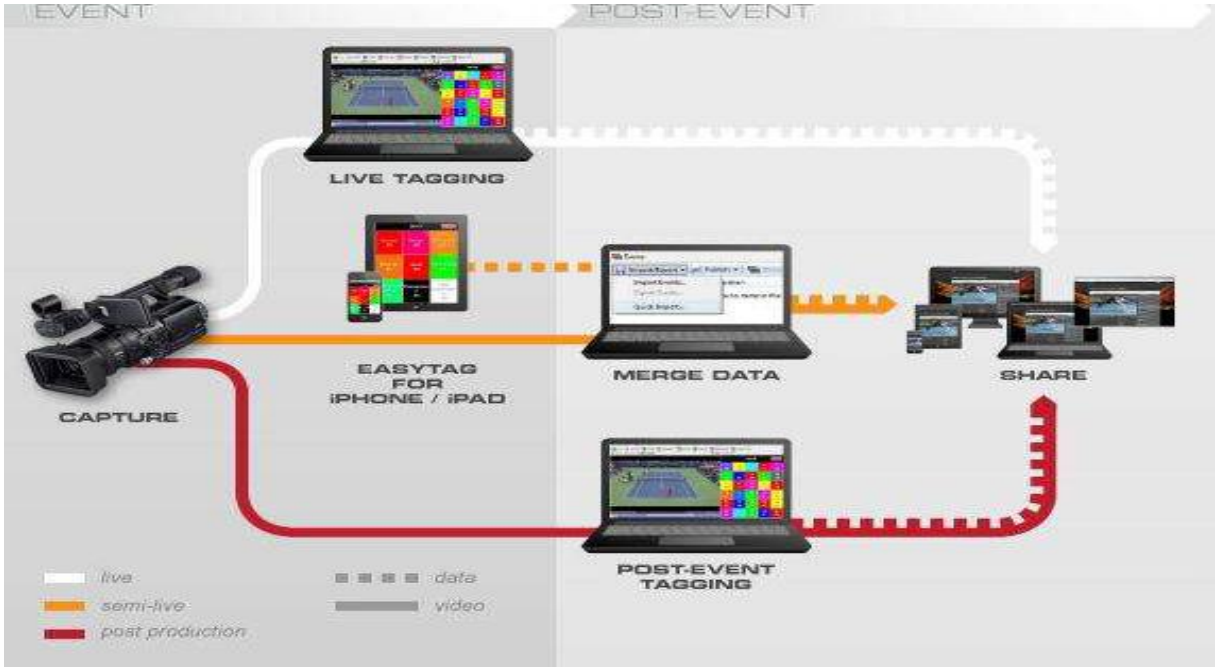
- Draw lines, circles, and angles to analyze posture or movement.
- Evaluate distances and speeds.
- Compare two sequences to assess two athletes or two attempts by the same athlete.

3. Coding and tagging

The program allows you to identify important actions (passes, shots, jumps, fouls, etc.) to simplify searches and statistical analysis. These tags can then be exported as a table or graph.

4. Creating and sharing presentations

Dartfish offers the ability to generate recap sequences, integrate audio commentary, and broadcast videos on the virtual platform Dartfish.tv, where athletes have the opportunity to review their performances.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EASYTAG FOR iPHONE / iPAD
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Page de démarrage - Dartfish
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Entrez dans la nouvelle dimension du vidéo casting
S'enregistrer maintenant
Continuer la dernière session
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Commencer une nouvelle tâche
Capturer une vidéo
Lire une vidéo
Analyser une performance
Gérer et partager des vidéos
Démonstrations vidéo du logiciel
Capture d'une vidéo
Découper une vidéo
Lecture d'une vidéo
Gestion des vidéos
Partager une vidéo
Didacticiels en ligne...
Ressources
Afficher l'aide
Support en ligne
Mise à jour
Visionner des vidéos
www.dartfish.tv
Share what moves you
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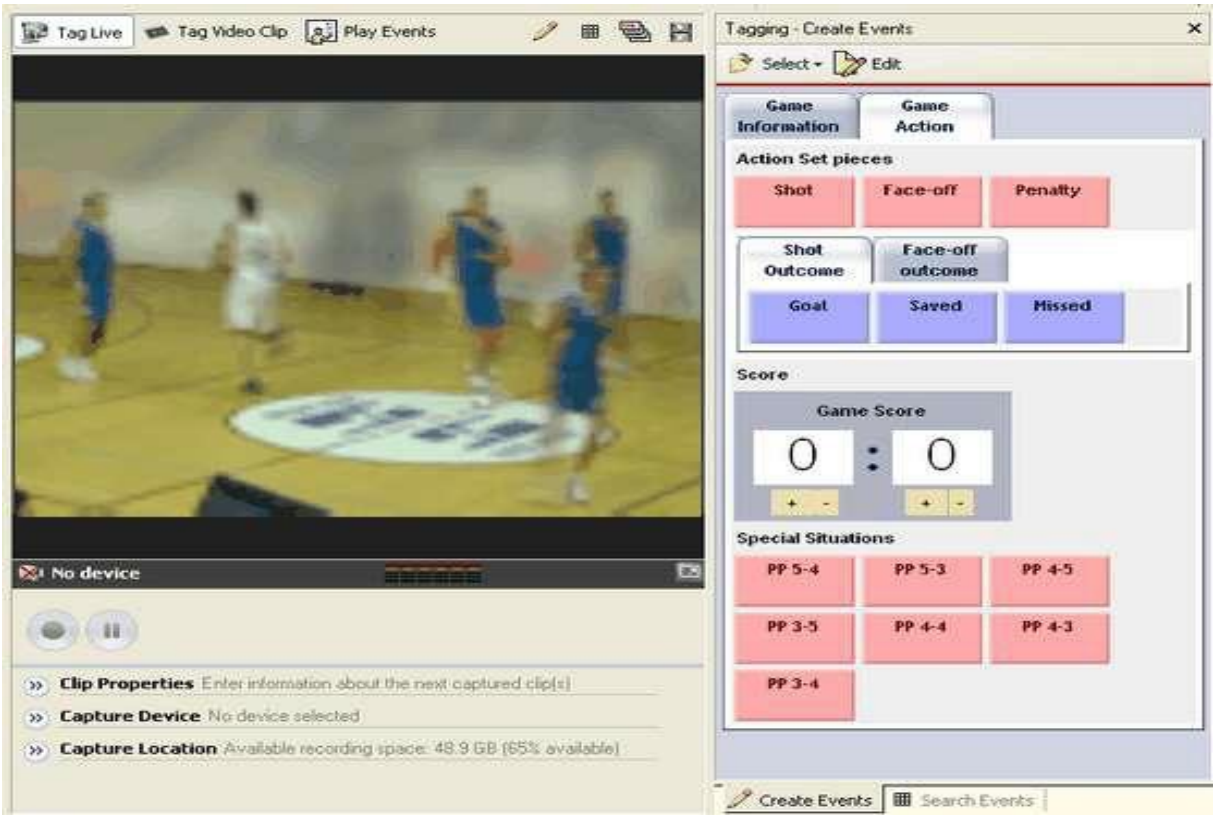
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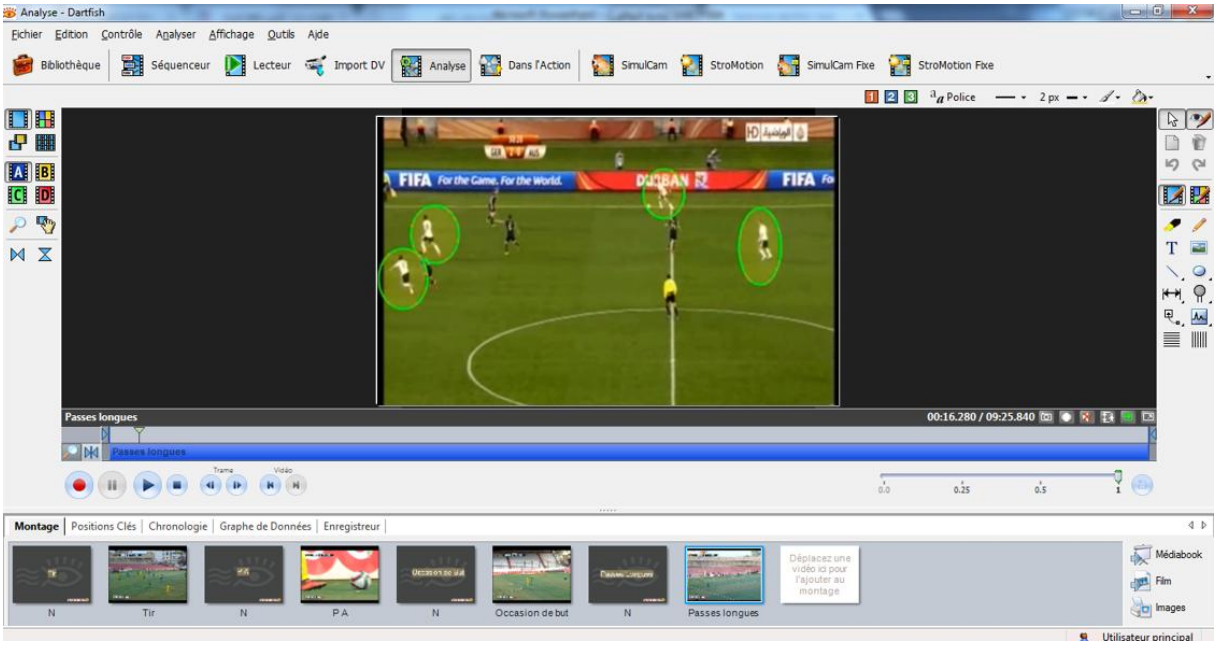
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IV. Use in sports

- In athletics: study of technical movement (throwing, jumping, running).
- In team sports: tactical analysis, observation of movements, interaction between players.
- In individual sports: correction of posture, improvement of precision and timing.
- In coach training: teaching materials to illustrate biomechanical and strategic principles.

V. Benefits of the software

- Highly accurate frame-by-frame analysis.
- Diverse tools and a user-friendly interface.
- Coaches save time thanks to automated coding.
- Improved visual communication between coach and athlete.
- Suitable for a variety of sports and skill levels.

VI. Limits

- The full version is paid, which can be expensive for personal use.
- It requires some initial technical training.
- Video files can be large depending on the recording quality.

VII. Example of a practical application

During a football training session, a coach films a player taking a shot. With Dartfish, it's possible to:

1. Slow down the video to analyze the movement.
2. Draw an angle between the foot and the ground.
3. Compare it to a professional player's shot.
4. Annotate the video and show it to the player to correct their posture and document and share the analysis to track progress.

VIII. Conclusion

For movement analysis and technical development in sports, Dartfish software has become an indispensable tool. It offers a visual and scientific method for analyzing performance, thus facilitating a better understanding of movement and improved training. Dartfish combines video, measurement, and data transmission to leverage technology for the benefit of athletic performance and training.

Bodybuilding and workout – the MuscleWiki app

I. Introduction

Body building or weight training is a sport that involves stimulating muscles using added weights or resistance exercises to tone, increase, and strengthen muscle mass. Many weightlifters lift weights to develop muscle mass or burn fat. However, it's important to note that this discipline is also commonly practiced to improve physical abilities such as strength, stamina, and endurance. Indeed, many athletes from martial arts, functional sports, team sports, and even track and field incorporate weight training into their workouts to increase striking power, improve speed and endurance, and prevent injuries..

II. App Overview

The MuscleWiki app is a mobile tool (iOS/Android) designed to support users during their weight training, strength training, or fitness workouts, whether at home or at the gym. It offers exercise programs, movement demonstrations, and tools to track progress. The goal is to provide accessible, organized, and engaging training, regardless of the user's initial fitness level.

III. Application Objectives

The primary objectives of the application are:

1. To offer personalized programs based on the user's level (beginner, intermediate, advanced), their goals (muscle gain, toning, fat loss), and the equipment available (with or without equipment).
2. To provide a diverse collection of exercises with visual demonstrations and detailed explanations to ensure correct form.
3. To facilitate progress tracking: number of workouts, weights lifted, repetitions, sets, and physical or performance improvements.
4. To offer flexibility: training sessions at home or at the gym, adaptable to free time, available equipment, or fatigue levels..

IV. App Features

Typical features found in this type of app include:

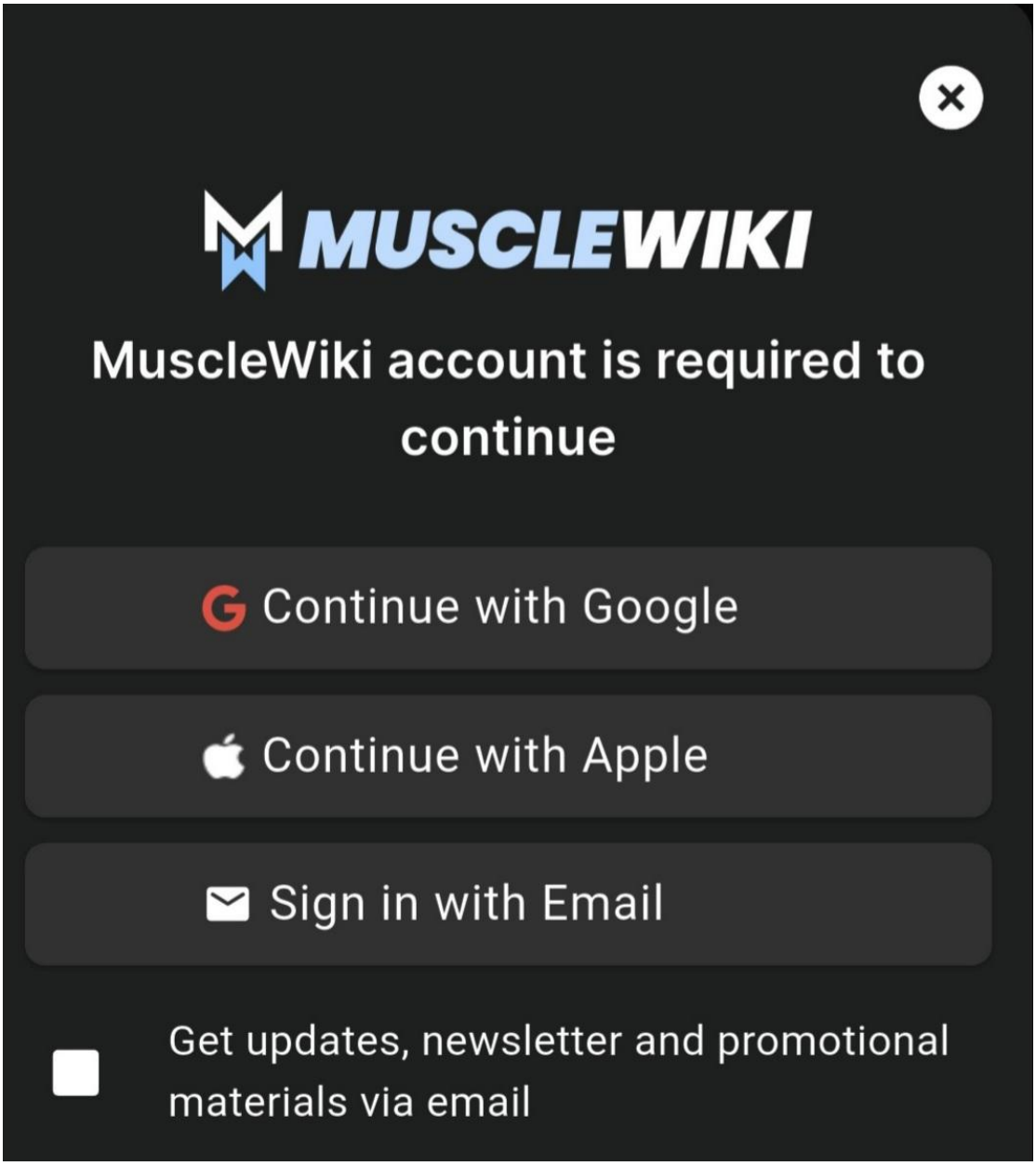
- Exercise Library: access to a wide variety of exercises targeting various muscle groups (chest, back, legs, arms, shoulders, etc.).
- Standard or Custom Training Programs: users can select a program based on their goals or create their own.
- Training Session Tracking: recording of exercises performed, sets, repetitions, weights lifted, and progress tracking over time.
- Demonstrations and Visual Tutorials: videos or animations illustrating proper form to minimize the risk of injury.
- Customization: options to modify the duration, intensity, and frequency of sessions, or to substitute exercises based on available equipment.

- Alerts/Reminders: to prevent missing a session and maintain consistency.
- Statistics / Graphs: to monitor progress, exercise volume, increases in strength or mass, etc.

V. Practical Application Instructions

Here's the best way to get started with the app:

1. On your first use, please complete your profile: age, gender, weight, height, fitness level, and goals (e.g., "muscle gain," "toning," "fat loss").
2. Choose a suggested workout program or create one that fits your limitations (time, equipment).
3. Before each session, watch the exercise demonstrations and organize your equipment.
4. During the session, record each exercise, set, repetition, and weight used. Maintain proper form to prevent injuries.
5. After the session, check your statistics: progress compared to the last session, total volume, etc.
6. Adjust your next session based on your fatigue level, performance, or availability.
7. To achieve results, ensure you maintain a consistent training schedule.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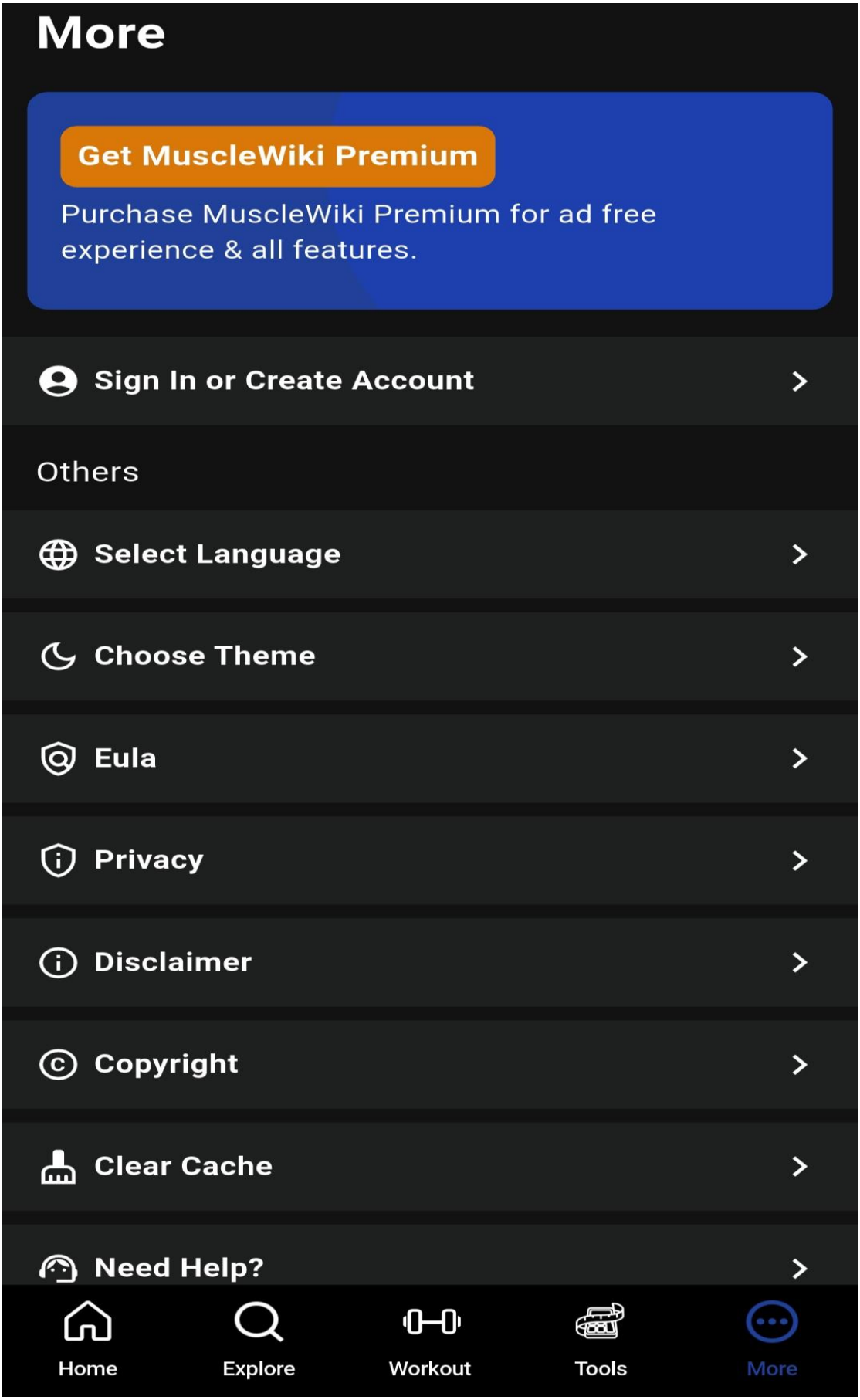
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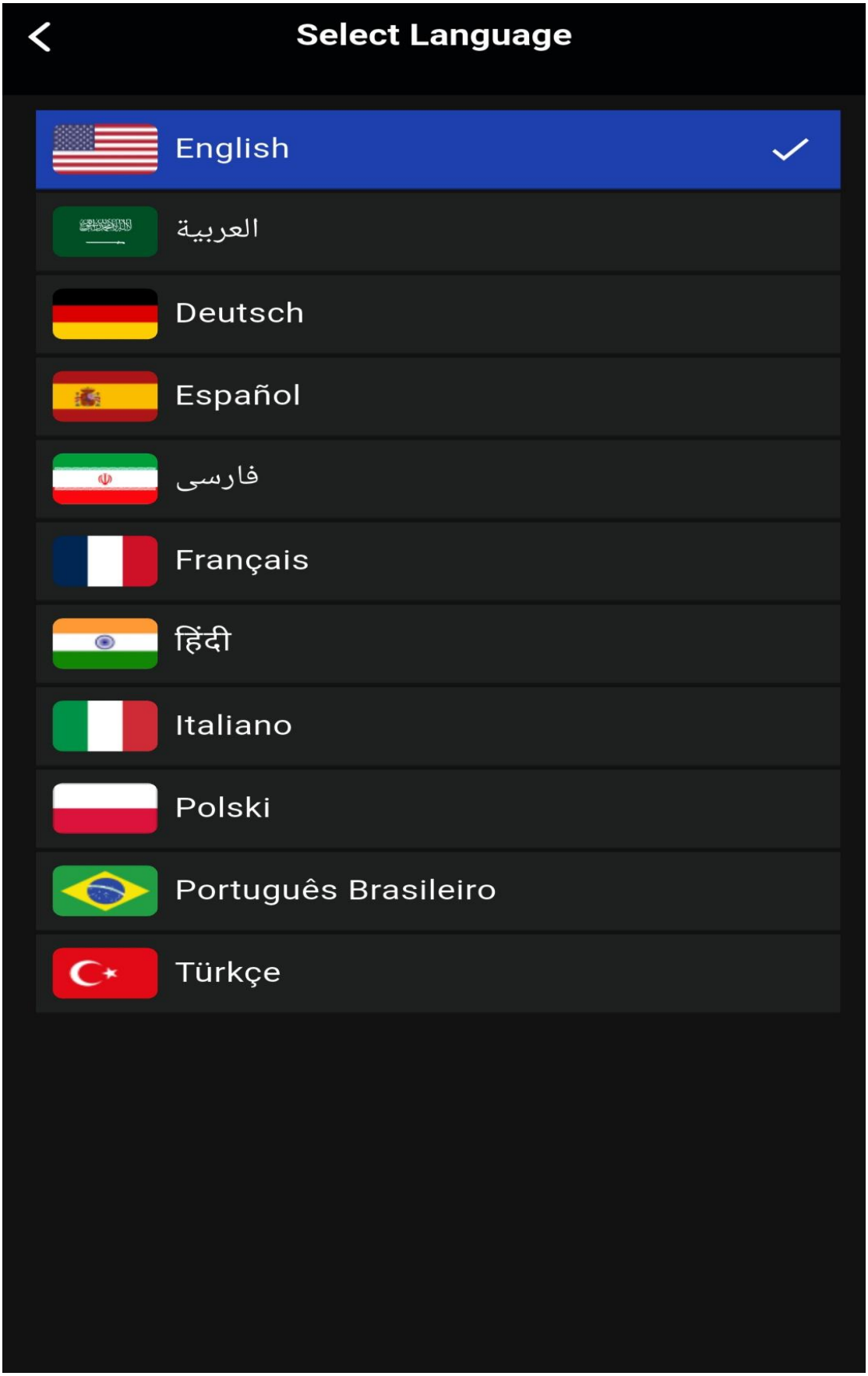
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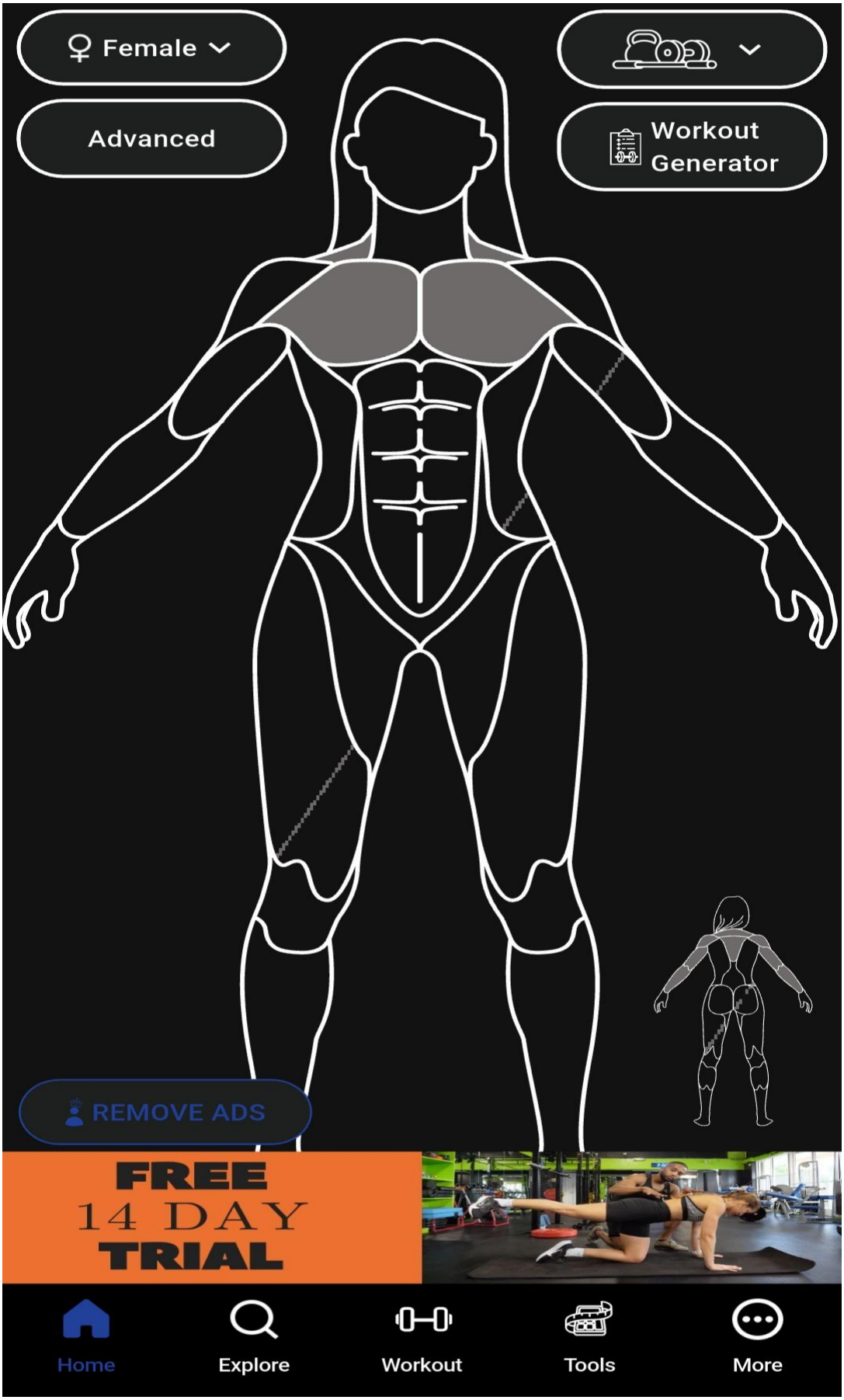
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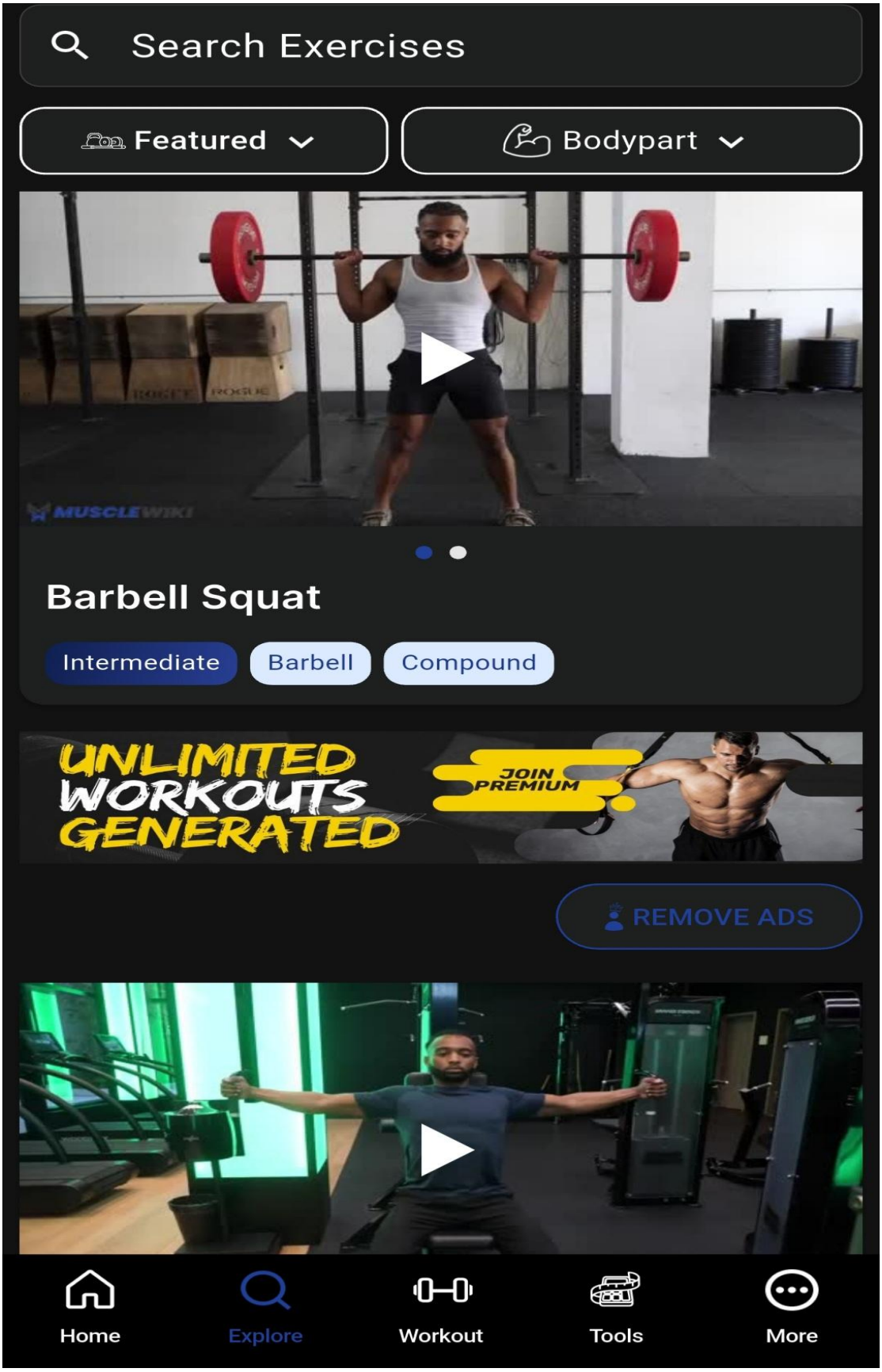
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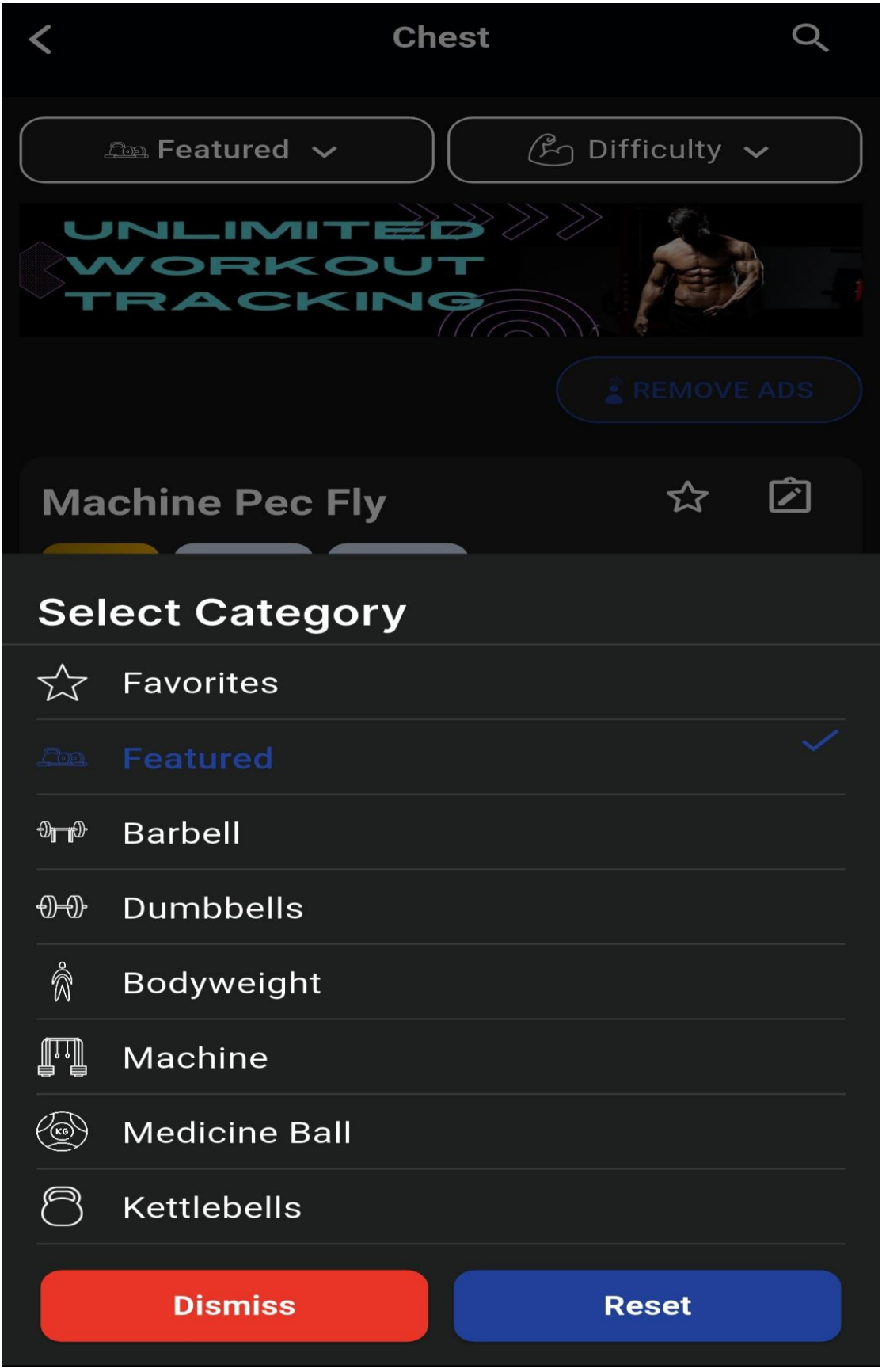
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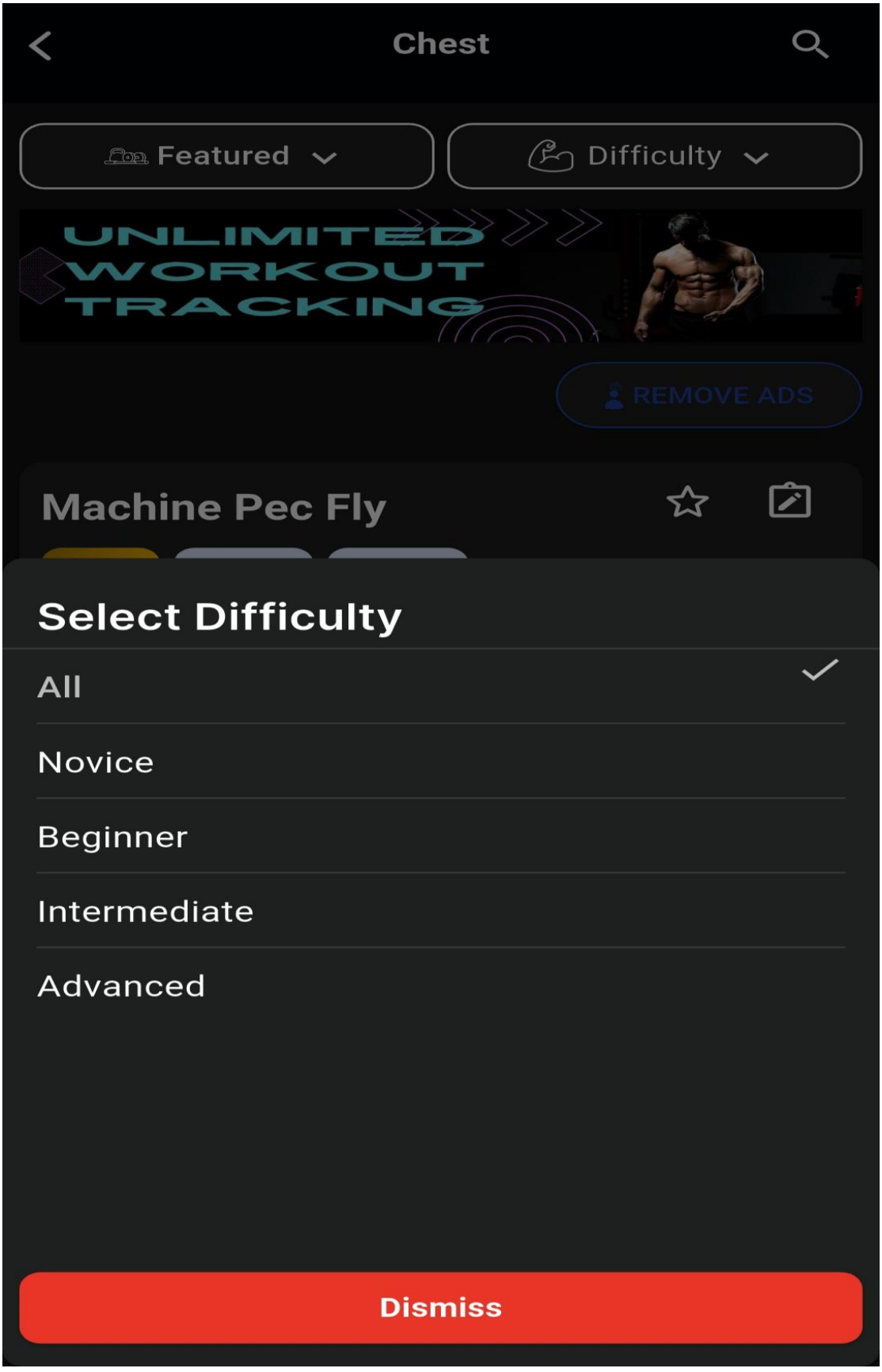
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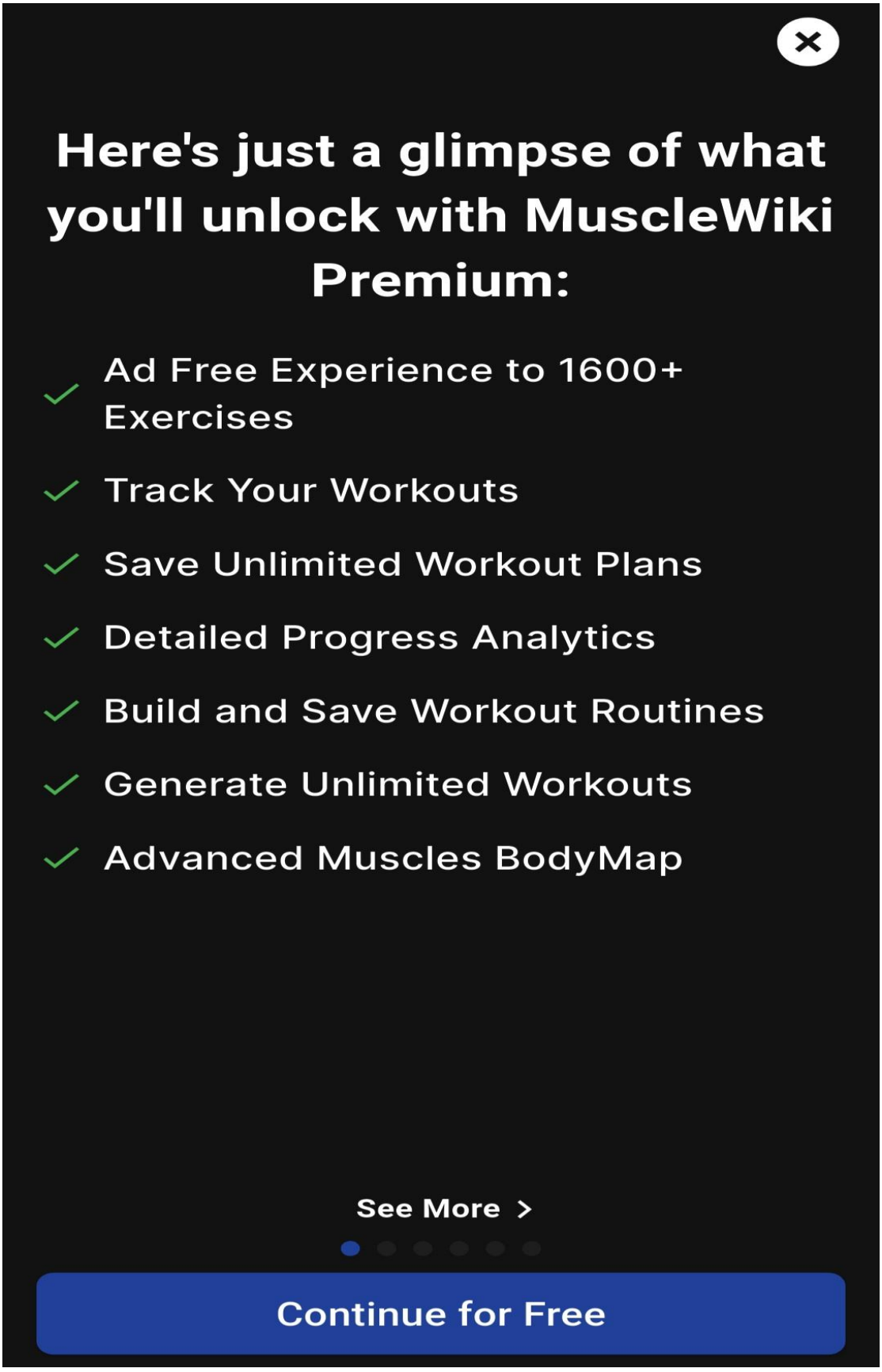
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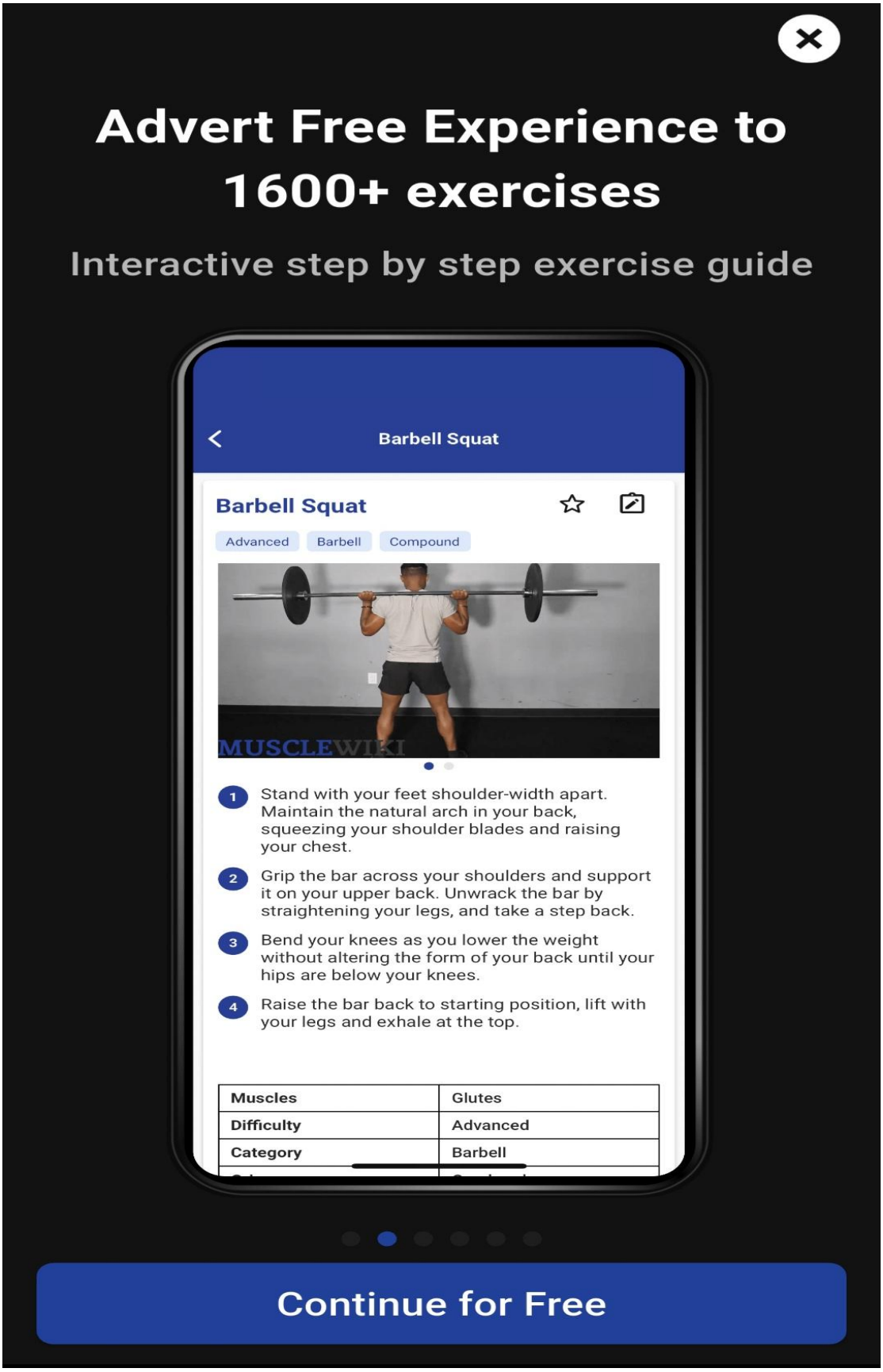
Track Your Workouts
Save Unlimited Workout Plans
Detailed Progress Analytics
Build and Save Workout Routines
Generate Unlimited Workouts
Advanced Muscles BodyMap
See More >
Continue for Free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Interactive step by step exercise guide
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Advanced
Barbell
Compound
MUSCLEWIKI
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2 Grip the bar across your shoulders and support it on your upper back. Unwrack the bar by straightening your legs, and take a step back.
3 Bend your knees as you lower the weight without altering the form of your back until your hips are below your knees.
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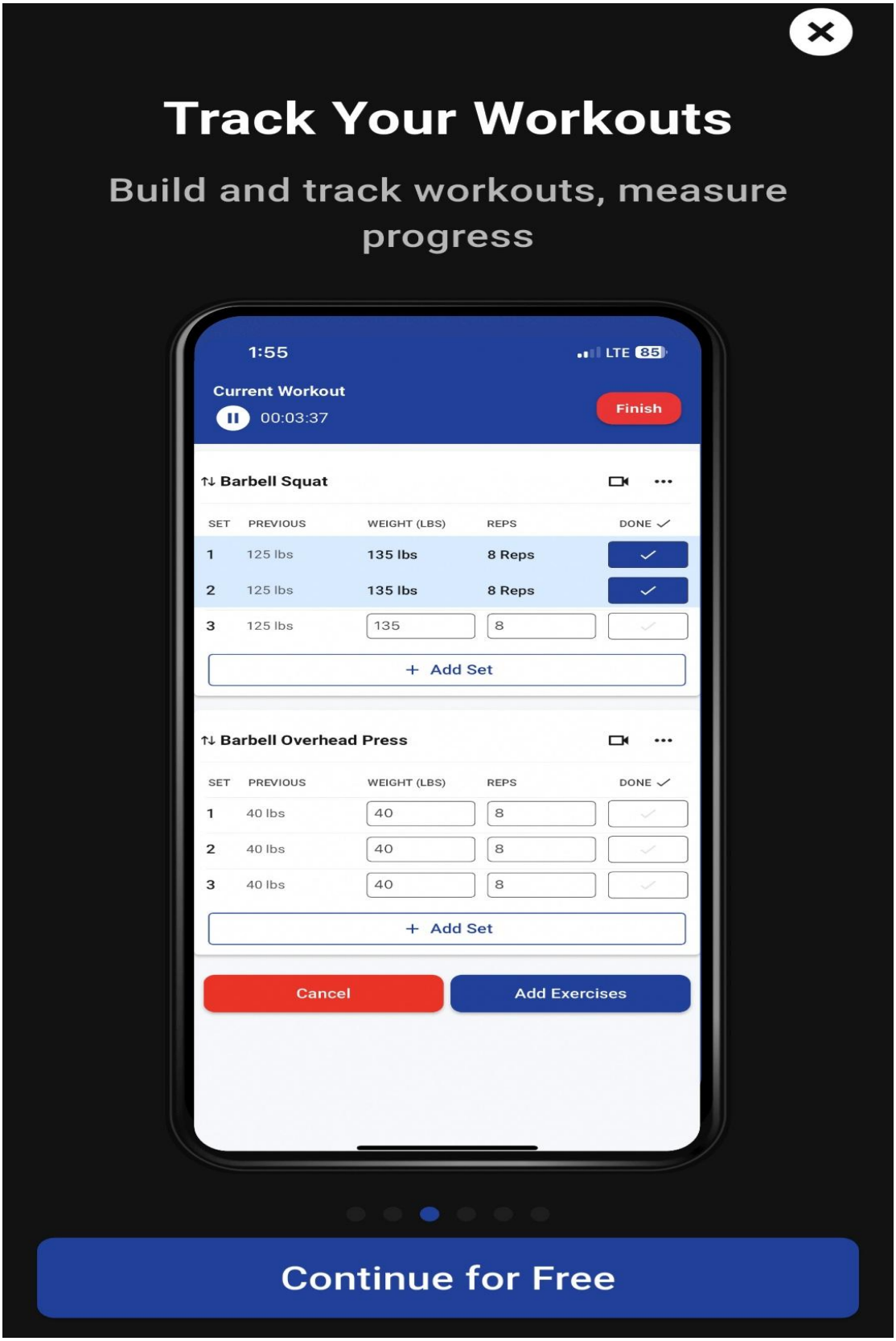
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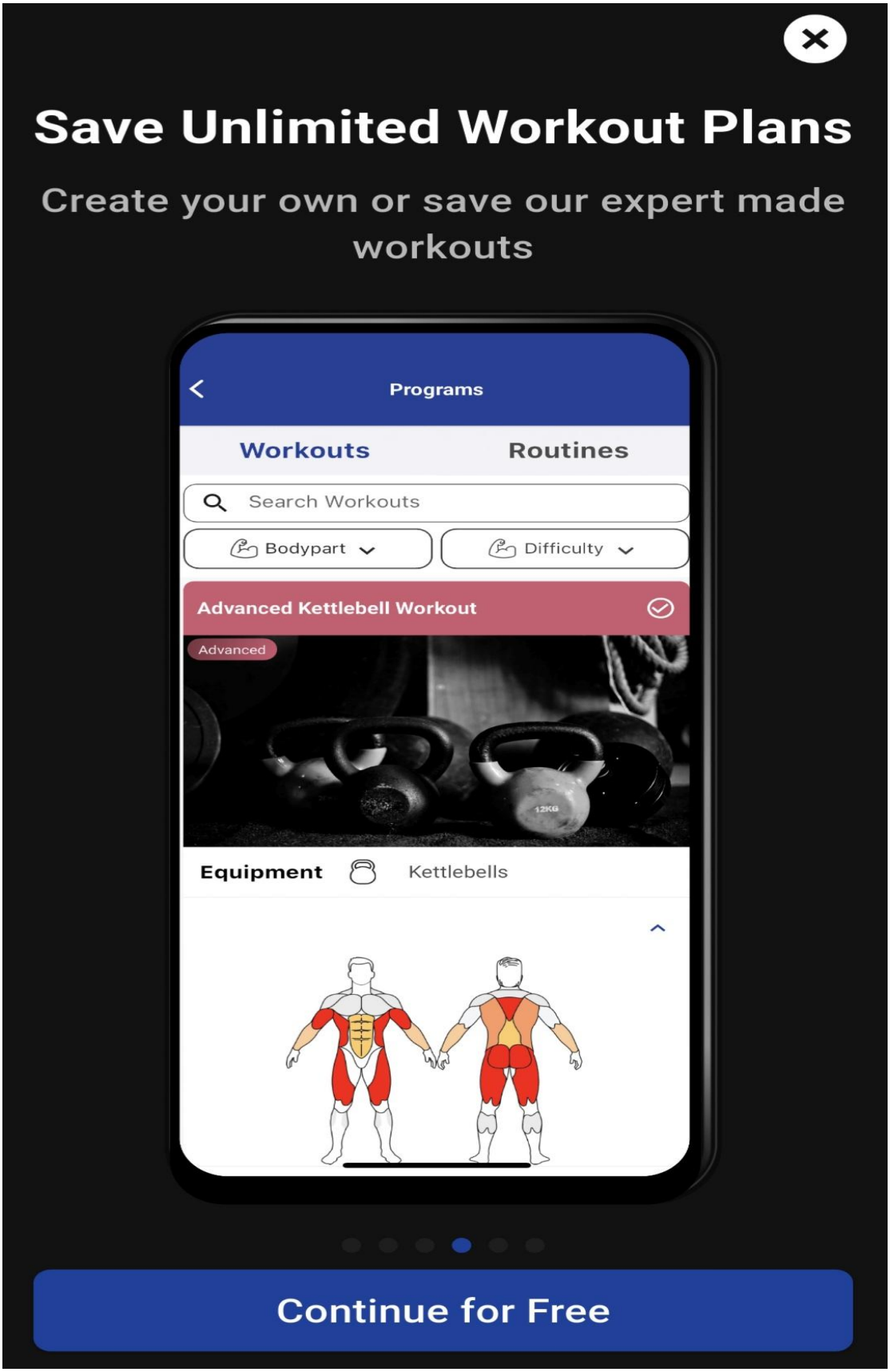
Save Unlimited Workout Plans
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Bodypart
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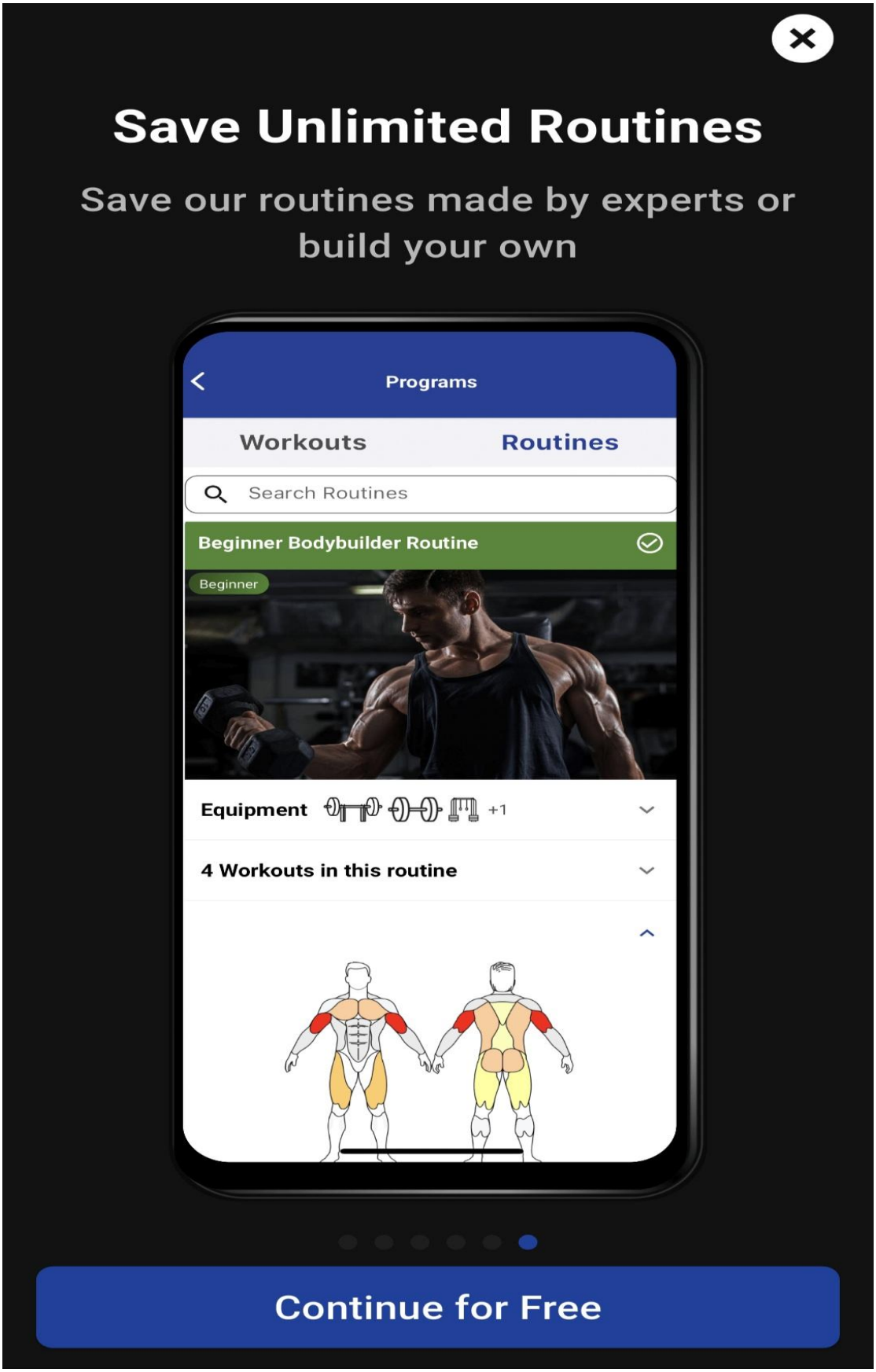
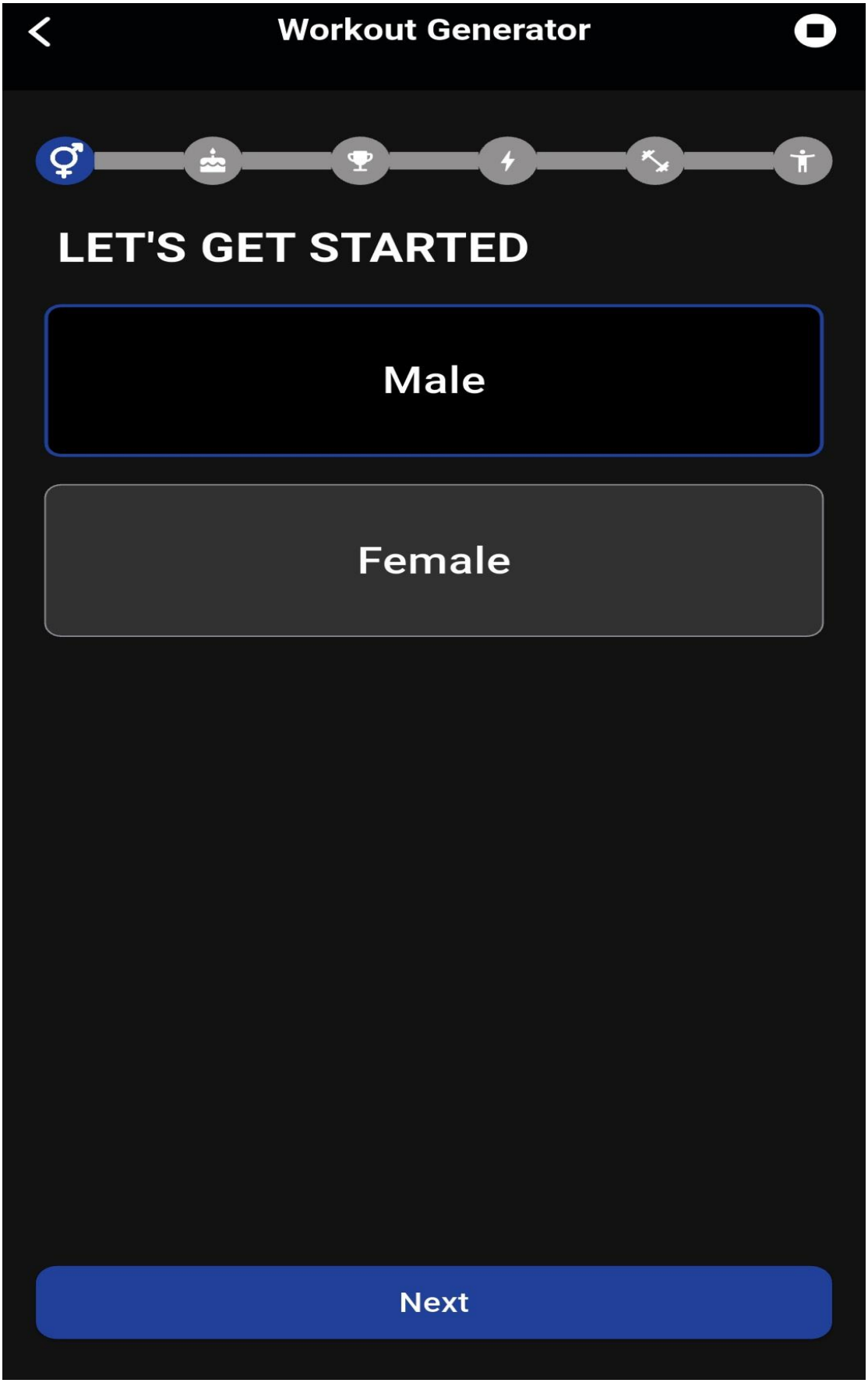
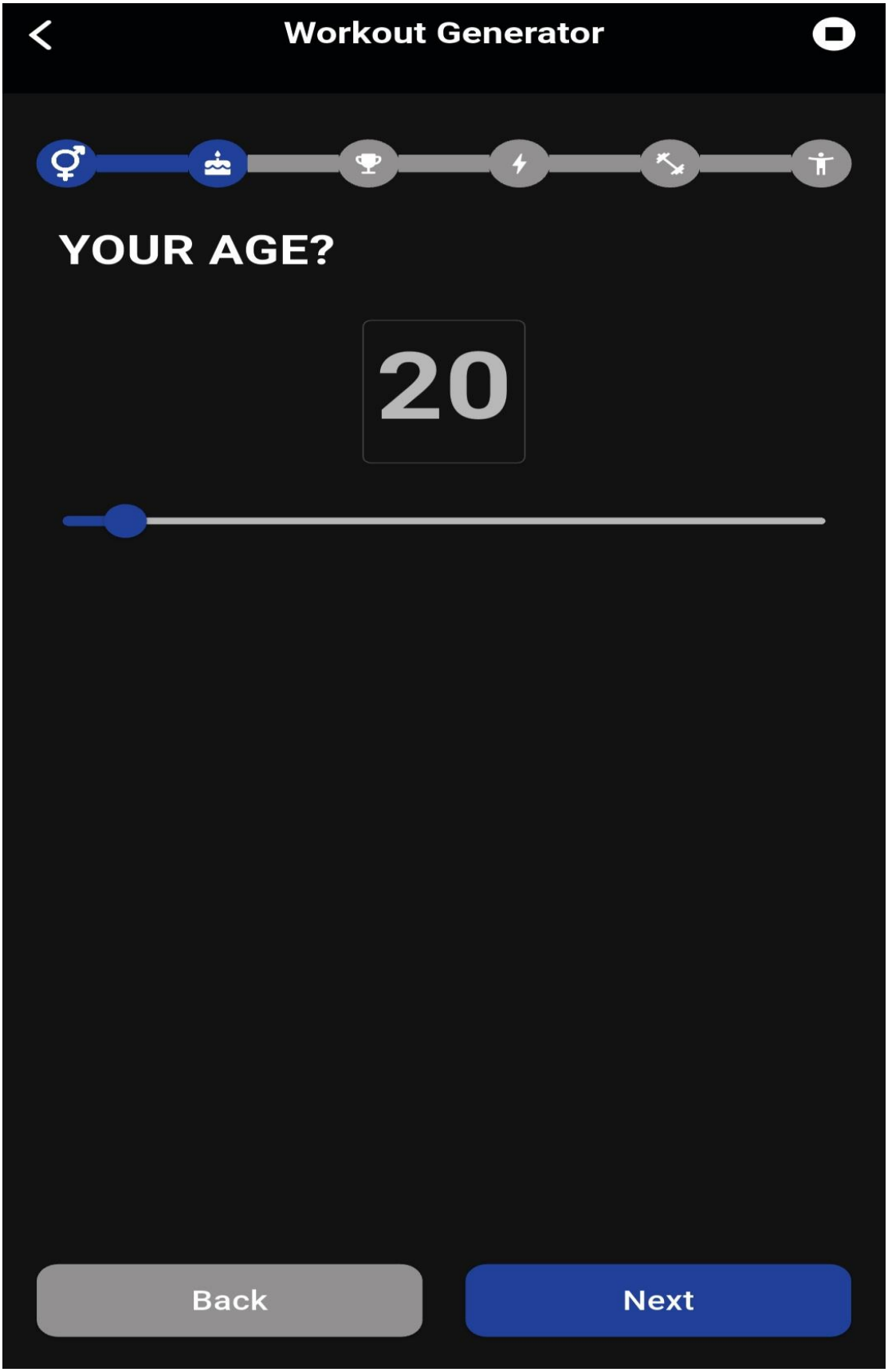
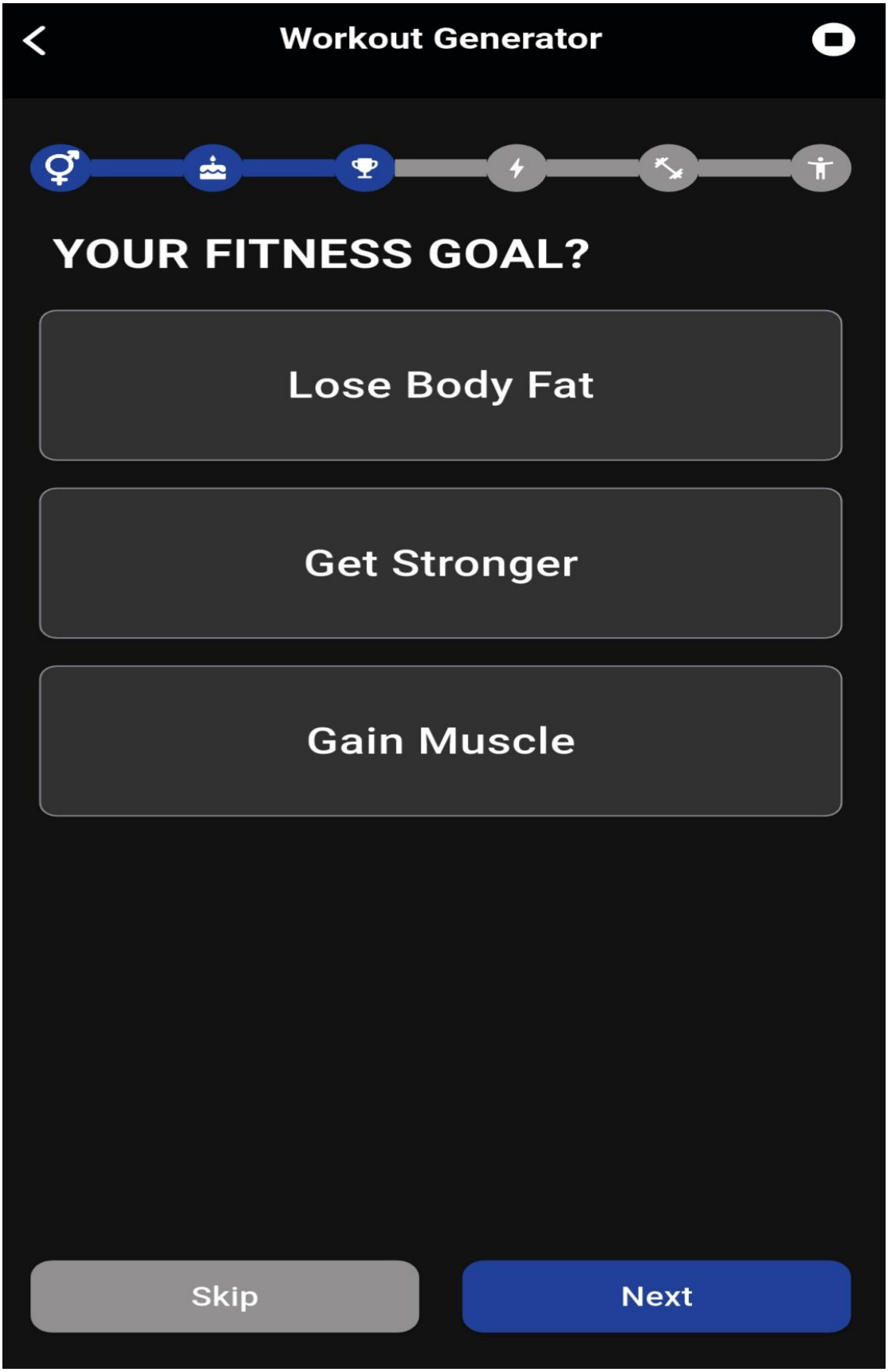
Advanced Kettlebell Workout
Advanced
Equipment
Kettlebells
Continue for Free

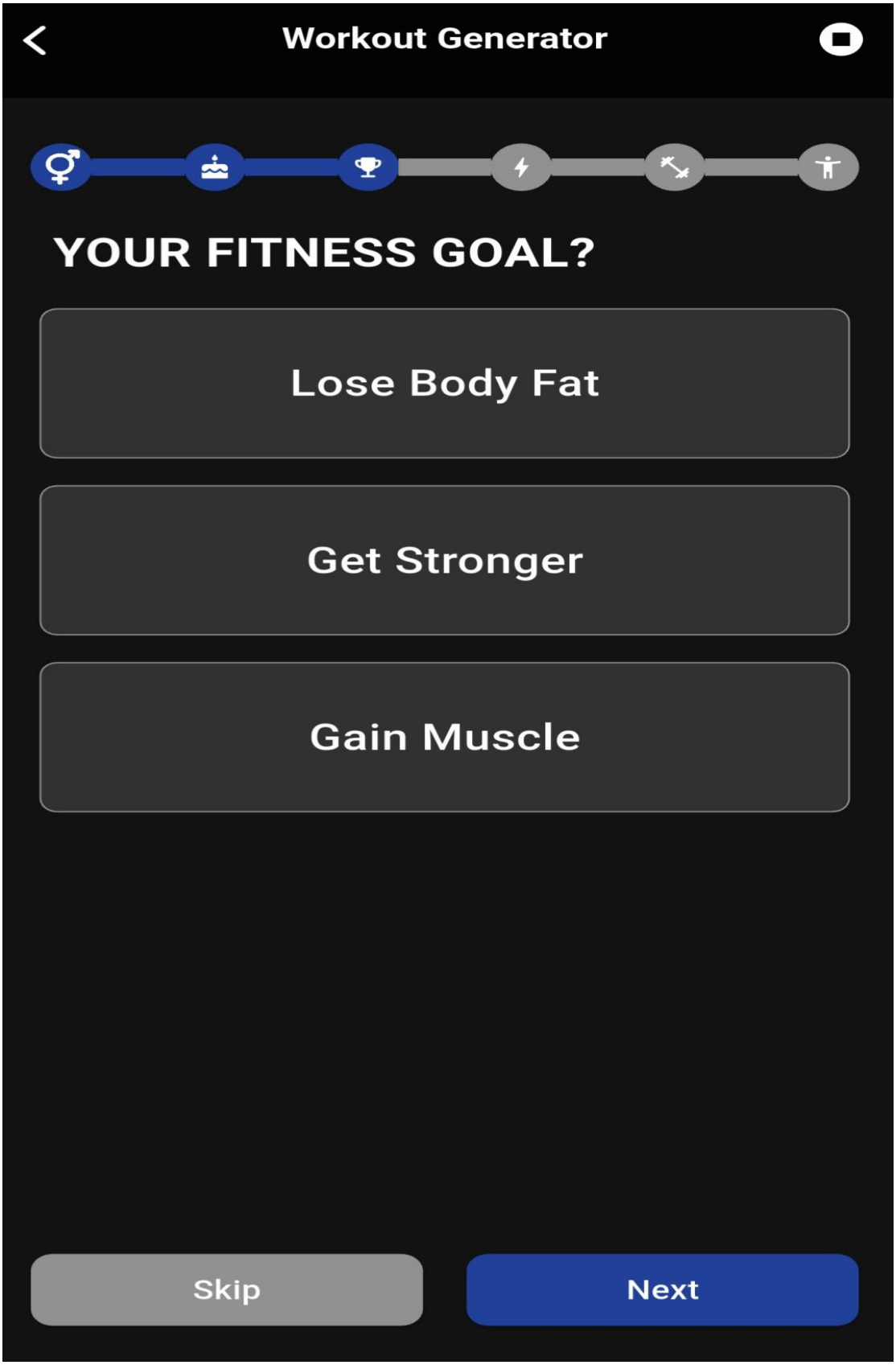

Detailed Progress Analytics
View detailed analytics of your workout progress
Analytics
Lifting Volume
Week
Month
Total Weight (kg)
355 kg
Jan 1 - Dec 31, 2024
Total Sets
21
Kg
Sets
250
200
150
100
50
25
20
15
10
5
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Activity
Week
Month
Total Duration
1h : 23m : 38s
Oct 14 - Oct 20, 2024
Workouts
5
Minutes
Workouts
80
8
Continue for Free

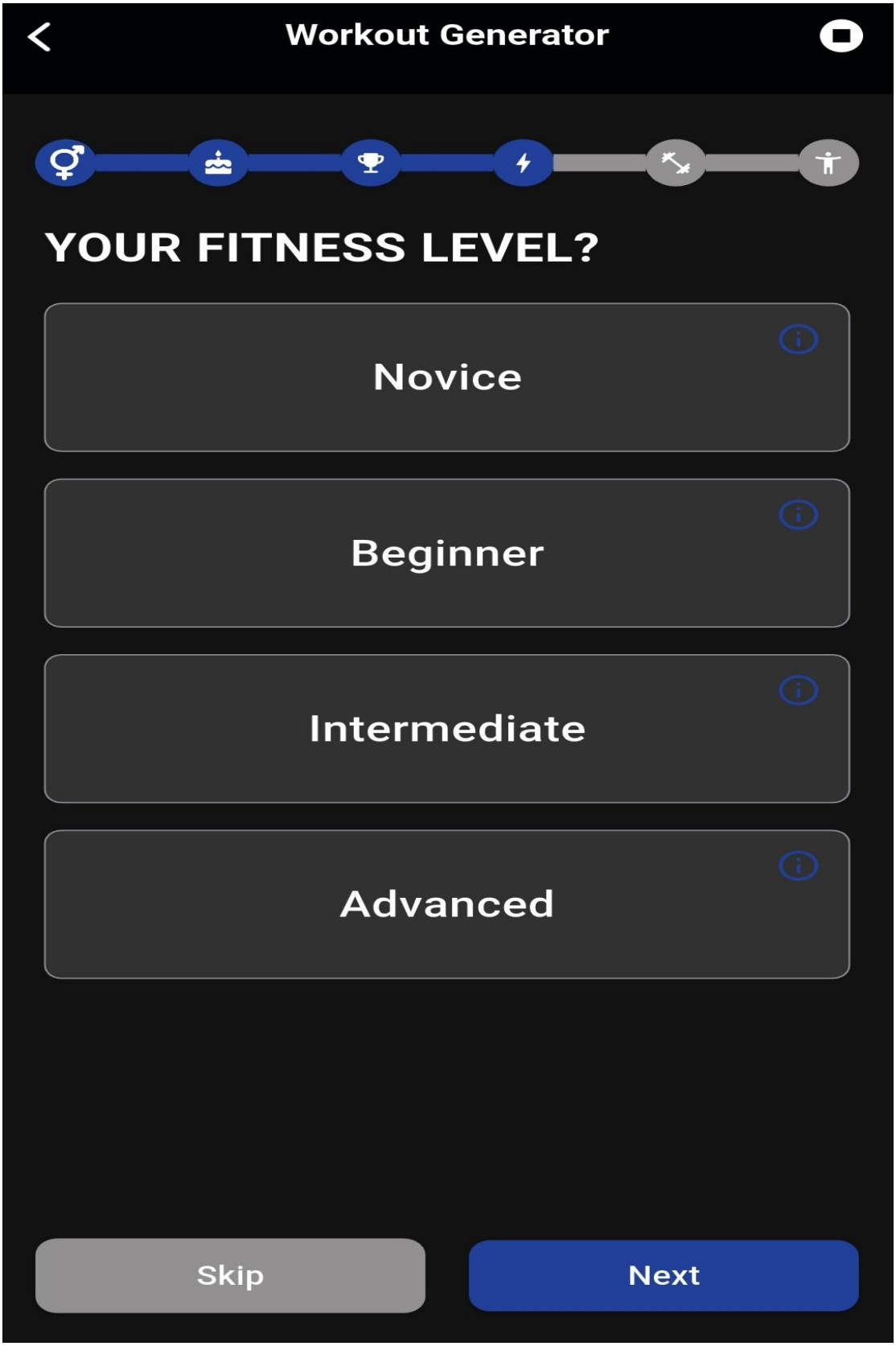

Save Unlimited Routines
Save our routines made by experts or build your own
Programs
Workouts
Routines
Search Routines
Beginner Bodybuilder Routine
Beginner
Equipment
+1
4 Workouts in this routine
Continue for Free


Workout Generator
LET'S GET STARTED
Male
Female
Next


Workout Generator
YOUR AGE?
20
Back
Next


Workout Generator
YOUR FITNESS GOAL?
Lose Body Fat
Get Stronger
Gain Muscle
Skip
Next


Workout Generator
YOUR FITNESS GOAL?
Lose Body Fat
Get Stronger
Gain Muscle
Skip
Next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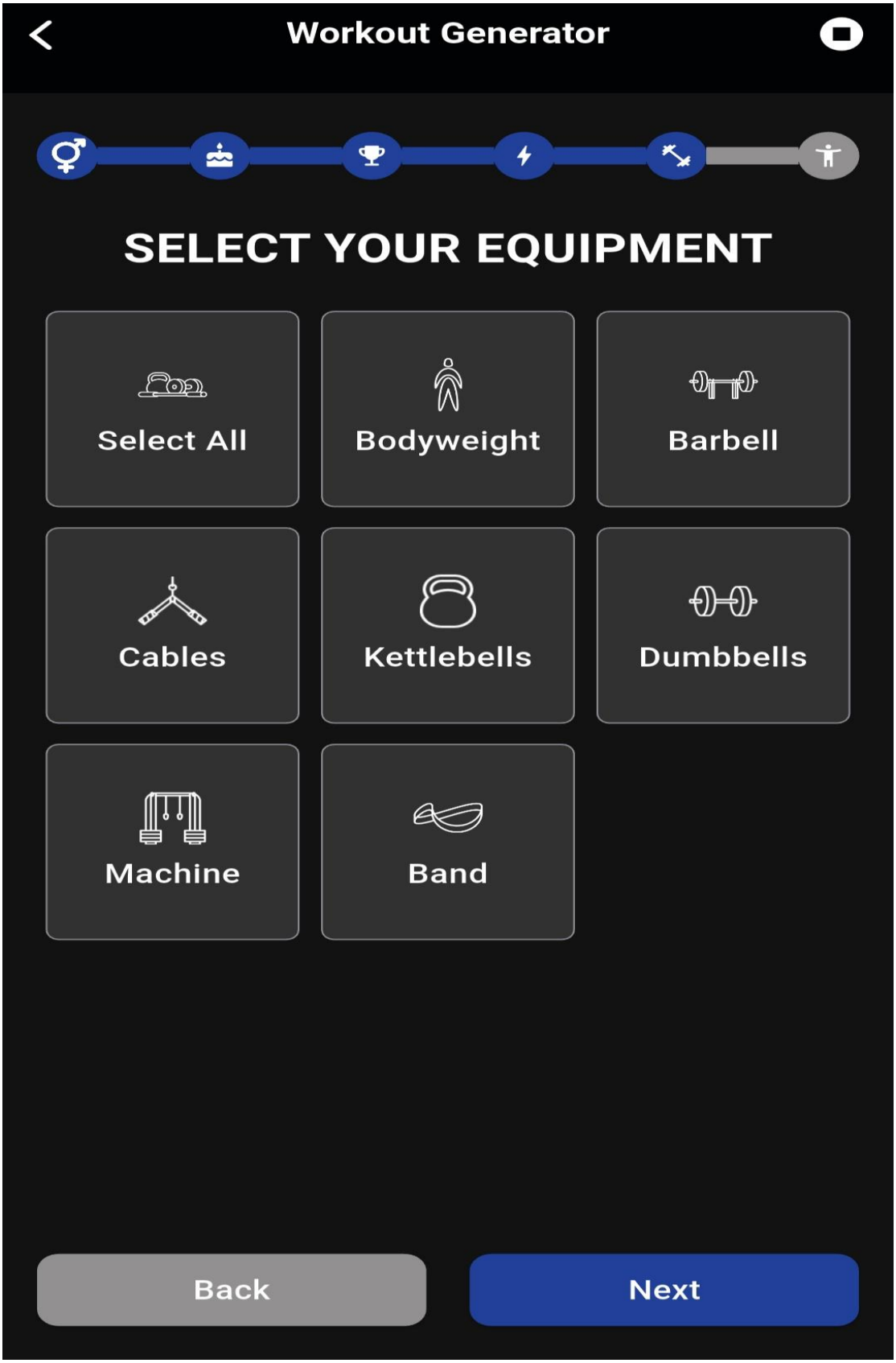
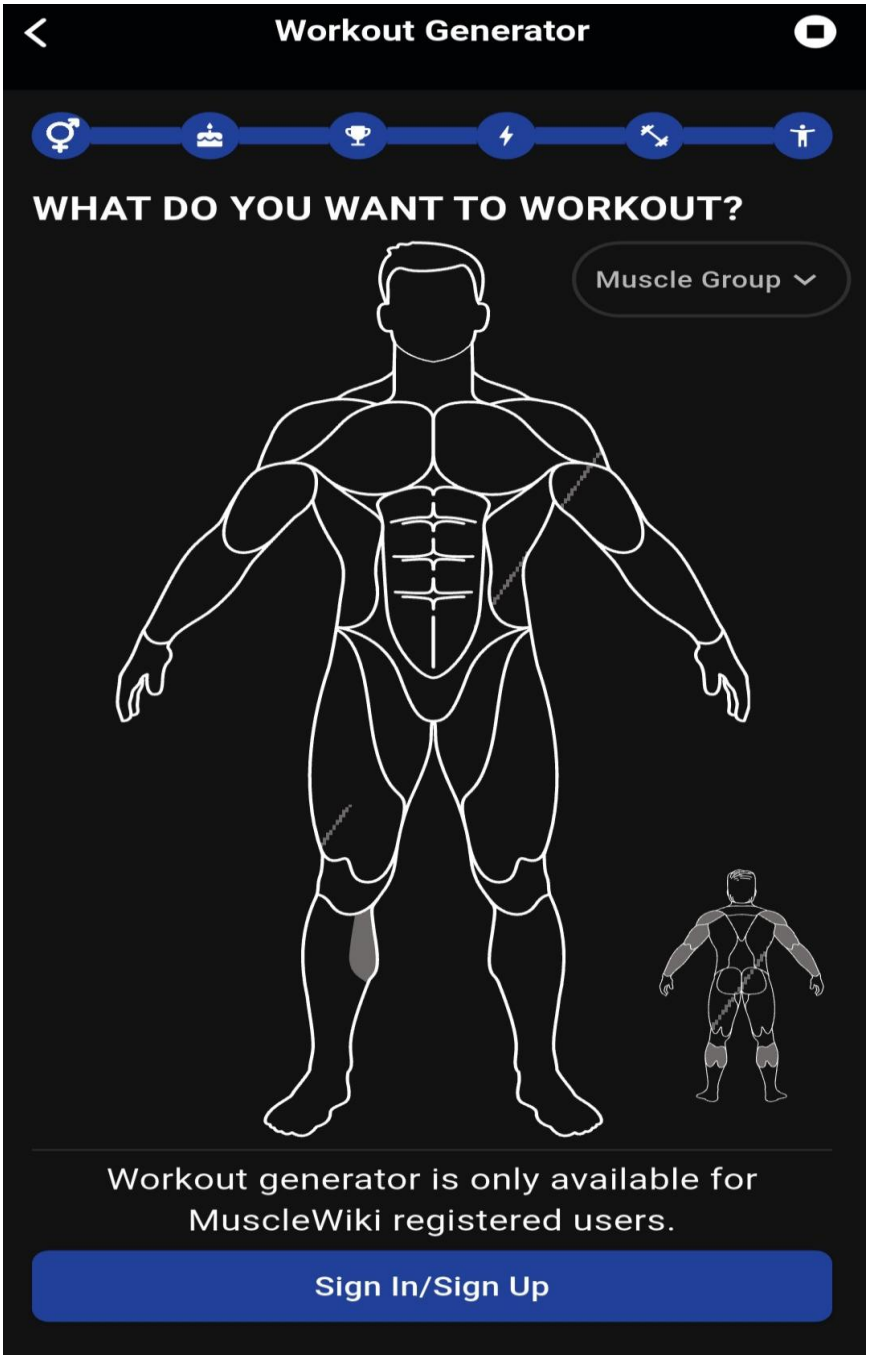
YOUR FITNESS LEVEL?
Novice
Beginner
Intermediate
Advanced
Skip
Next


Workout Generator
SELECT YOUR EQUIPMENT
Select All
Bodyweight
Barbell
Cables
Kettlebells
Dumbbells
Machine
Band
Back
Next



I. Conclusion

The MuscleWiki app is a modern, adaptable, and motivating tool for starting or improving your performance in bodybuilding and strength training. It allows users to organize their workouts, monitor their progress, and maintain their motivation. However, to get the most out of it, it's essential to observe the fundamentals of good training (technique, frequency, recovery) and apply them thoughtfully. When used correctly, the app can be a valuable tool for achieving your fitness, strength, or body composition goals.

The use of the Neuro-Tracker to improve decision-making in football

I. Introduction:

The purpose of the training is to allow the sportsman in general and the footballer in particular to demonstrate his technical and tactical abilities as best and as long as possible during the match but also throughout the sports season. These abilities ensure the sustainability of brief, intense and repeated efforts throughout the match, and allow the expression of the footballer in all situations of the match. Sports performance during a match is, in fact, conditioned by several qualities (Paillard, 2010). Today we cannot separate the body from the mind, physical training from mental training. (Reiss, 2017, 615). So you have to work in synchronization between the physical and the mental so that they are at the service of the technical-tactical capacities.

The movements seem infinite, it must be said that there are 125,000 billion synapses in the cerebral cortex, the equivalent of the number of stars in 1,500 galaxies. (Reiss, 2017, 613). For the footballer to make a good decision during the match, he will need good visual or verbal information regarding the ball, his teammates and his opponents. We can also talk about the acquisition of tactile information. So elements of brain science such as cognition and intuition are paramount and can be improved. In this regard, neuroscience research shows the interest that cognitive training can have on sports performance, which is why we find, nowadays, that sports coaches are beginning to take a close interest in it.

Indeed, the richer and more diversified the technical-tactical repertoire of the footballer, the higher his information intake, the faster and more effective his decision will be. To get started, several means are used to develop this acquisition of information, whether classic or modern, such as the neurotraicker.

II. Physical and motor qualities:

There are many classifications of physical qualities (the components of physical condition) but that of Weineck is the most recent and seems more global and more relevant. This classification is structured around conditional and coordinative qualities. It is more or less arbitrary, but useful for didactic (Weineck, 1997) and scientific reasons.

1. Conditional capacities:

They are based on the efficiency of energy systems and include: endurance, speed and strength.

1.1. Endurance:

Sports endurance is the ability to maintain the intensity of optimal muscular actions for a defined time or a fixed objective. Exceptionally, the time is indefinite. It

is multifactorial and correlated with the body's ability to renew the energy it consumes as quickly as possible (Reiss, 2017, 110) this is why we speak of the notion of $\tilde{V}o2max$ which is the maximum rate of production of energy by oxidative pathway. Overall, endurance has two forms: general (demands less than 1/3 of muscle mass) and local (demands more than 2/3 of muscle mass) (Weineck, 1999, 107)

1.2. Strength :

According to Bradet (1996), strength is the ability to overcome external resistance or to oppose it, thanks to muscular contraction. It has three forms: maximal, force-speed (explosiveness and power) and force-endurance (Weineck, 1999, 178).

Explosive force is the ability to produce the greatest acceleration on oneself or on a machine (Reiss, 2017, 327). It solicits the anaerobic alactic energy system.

1.3. Speed :

Speed is the ability to perform motor actions in minimal time. It depends on the processes of the neuro-muscular system (Weineck, 1999, 293). It has several types: reaction speed, acceleration, action or movement speed (frequency and gestural speed), maximum speed (force-speed) and force endurance (speed maintenance) (Reiss, 2017, 373). In general, the authors distinguish between cyclic speed (Succession of identical motor actions such as running) and acyclic (Isolated motor action such as a football technique) (Paillard, 2010)

Maximum speed is obtained on a straight line from 20-30m for adult beginners and from 50-70m for adult sprinters (Reiss, 2017, 376).

2. Coordination skills and flexibility:

They organize motor skills, shape coordination and lead to the construction of motor and technical skills. These capacities are related to the bio-informational potentialities of the subject.

2.1. Coordination skills:

Coordination capacities, also called: agility, dress or psychomotor qualities, determined above all by the process of control and regulation of movement (Hirtz, 1979, 348). They allow the athlete to master actions in predictable (automatism) or unpredictable (adaptation) situations, to perform them economically and to learn the movements fairly quickly (Frey, 1977).

The factors of the coordination capacities are divided by two: the capacities of control and those of adaptation.

2.1.1. The control capacities:

They are five, represented by the acronym ORDER. O for Orientation, R for Reaction, D for Differentiation, R for Rhythmicity and E for Balance. (Meinel & Schnabel, 1987, 250)

- **The capacity of orientation:** it is the capacity to determine the position and the movements of the body in space and in time.
- **The ability to react:** it is the ability to react quickly to signals, to combat situations.
- **The capacity of differentiation:** it is the capacity which makes it possible to treat in a different way the information perceived by the organs of the senses.
- **Rhythmicity:** it is the ability to grasp a given rhythm that we have designed.
- **The ability to balance:** it is the ability to maintain balance during an action, or during a gesture. It is an unconscious act which brings into play the automatisms of equilibration and which makes it possible to adjust the movements and our position in order to remain in a stable position, static or moving. It is a permanent activity induced by sensory information from vision, the inner ear (the vestibular organ) and proprioceptive receptors (Gaubert et al, 2014, 267).

2.1.2. Adaptive capacities:

They are four, represented by the acronym ORCA. O for Orientation, R for Rhythmicity, C for Combination and A for Analysis. (Weineck, 1999, 399)

Combination capacity: refers to the ability to control the movements of different parts of the body and to integrate them in a coordinated way into a movement of the whole body, which is the objective of motor exercise.

The ability to analyze: refers to the ability to achieve a high degree of harmonization of detail between the different parts of the body. It results in great precision and great economy in the execution of the movement.

2.2. Flexibility:

Suppleness, also known as flexibility or mobility, is the ability or even the property possessed by the sportsman to execute, by himself or with the help of external forces, large-amplitude movements which involve several joints (Weineck, 1999, 363). It has two components: joint mobility and the stretching capacity of muscles, tendons and ligaments (Frey, 1977, 351). It can be: general or specific, active or passive.

III. The engine and technical-tactical repertoire:

The motor repertoire, i.e. the motor experience of the athlete, also plays an important role in the development and quality of coordination ability. Indeed, any movement, however new, is executed on the basis of old coordinations (Zaciorski, 1972, 106; Harre, 1976, 120).

Consequently, the richer the motor repertoire and the more automated coordination it includes, the more the load on the central nervous system is lightened and the more the movement takes place according to the automated pattern. The mechanism is in a way comparable to a construction game whose constituent elements represent automated coordinations. a determined motor action (Weineck, 1999, 407).

The study of decision-making or information in football is still difficult to define because the situations which the players face are both complex and brief (McMorris & Graydon, 1997, 462). Without neglecting the influence of teammates and adversaries (McMorris & MacGillivary, 1988, 555).

The analysis of information and decision-making shows two distinct and complementary epistemological aspects; The first, described as “cognitive”, considers the decision as an information processing process, based on the mobilization of knowledge bases to better identify and interpret relevant cues in the environment (Cyril & Kermarrec, 2011, 4) . The second qualified as “naturalist” considers the decision as a process of adaptation to the current situation (Ross et al, 2006, 408).

IV. Content of the perceptual-cognitive training:

Mental training methods, in the form of training by observation or verbal training, aim to improve the technical-tactical repertoire of the footballer. This training consists of learning or improving a sequence of movements or a tactic by a mental representation without actually carrying out this exercise.

The motor experience makes it possible to know, for this purpose, the sizes of the movements determining for the execution of a gesture. There is a kind of pre-information in the performer, a brief stimulus is enough for the extrapyramidal system to transmit the appropriate command from the neurophysiological point of view, on both sides, stimulates selective vigilance from the cognitive point of view.

The knowledge of the movement serves as pre-information and is reflected in its primoris anticipation characteristics. (Weineck, 1992, 301)

The motor experience allows the footballer to choose more quickly and more efficiently the motor elements he needs during the execution of his motor action.

(Weineck, 1992, 291)

The quality of the reception and processing of information through the sensory receptor organs has a decisive influence on the development and degree of expression of decision-making qualities. The more the sportsman is able to analyze the progress of his own movements and at the same time the environment, the more he is able to add himself to new situations and to provide motor solutions according to his own possibilities (Zarciorsky, 1972, 106)

1. **Knowledge bases and their organization in long-term memory:**

Our long-term memory (MTL) is considered to be the basis of our knowledge which is stored for a long time, which is called a multiple motor and technical-tactical repertoire. For this reason experts have better access to the latter than novices to de, they develop knowledge bases that cover declarative knowledge (knowing what to do) and procedural knowledge (knowing how to do), specific to their field (Ericsson , 1996,). Athletes' knowledge bases increase and organize effectively through practice (McPherson, 1993, 173). In this context, the link between knowledge bases and expert decision-making can be demonstrated by studying, on the one hand, the content and type of knowledge required to make decisions in football, and on the other hand, the mode of organization of knowledge. which promote their use in specific situations. The technical-tactical repertoire of experts is more extensive, more refined and specific to football. Compared to novices, expert footballers have more sophisticated knowledge structures, i.e. a more extensive network of concepts and a greater number of links between procedural and declarative knowledge. (Cyril & Kermarrec, 2011, 4)

3. **Mechanism of the mnemonic system:**

Studies on mnemonic processes are mainly organized around two hypotheses:

The performance of experts is explained by an increased mnemonic capacity: they can identify, integrate and retrieve a greater quantity of information than novices (Simon & Chase, 1973, 398),

This difference is explained by a double process: the experts would be able to activate their knowledge, either implicitly and directly in MLT, or explicitly and indirectly through working memory (MT) (Craik, 2002, 313).

It is generally accepted that the engram (physical substrate of memory in neural circuits) depends on long-term changes in the efficiency of existing synapses or even on the actual formation and rearrangement of synaptic connections. (Porves et al, 2011, 794.

The future adaptation of the mnemonic mechanism to complexity can be explained by "context structuring": experts adapt faster than novices to situations provided they are "structured". (Cyril & Kermarrec, 2011, 5)

4. Strategies for taking visual information:

The degree of finesse, to a large extent, is directly related to the quality of the various analyzers involved in receiving the information. We are talking here about different receptors of the five senses, almost all of which in football are provided by the receptors of the optical apparatus. So the perceptual activity in football constitutes the model of visual attention which is considered as the main theoretical model.

The peculiarity of experts would consist in directing their visual activity on the important information that precedes and determines decision-making (Williams & Ward, 2003).

In this perspective, visual information acquisition strategies are jointly determined by the characteristics of the context and by individual experience (or the familiarity of the subject with the situations encountered). (Cyril & Kermarrec, 2011, 5)

V. Methods used for perceptual-cognitive training:

The objective of this type of training is to increase the mobilization of footballers' knowledge to establish a clear judgment to be internalized on the context. The methods of perceptual-cognitive training call upon these effects of modification in the processes of enrichment and technical-tactical stabilization by accelerating the establishment of model diagrams, the methods are diversified:

1. **Verbal information method.**
2. **Variation of opponent positions.**
3. **Variation of the dynamics of its own group in attack, defense and counter-attack.**
4. **Stadium crowd noise can be used to increase NeuroTracker learning rates**
5. **Visual information method.**

In football, visual perception uses two main methodological orientations: occlusion techniques and eye movement recording techniques.

5.1. Temporal occlusion techniques

They are also called Spatial occlusion techniques, they made it possible to access the types of information used by the expert to facilitate decision-making (Williams & Ericsson, 2005, 297).

5.2. Techniques for recording eye movements

They are also called visual prospecting techniques, they have made it possible to determine how expert players seek and select information in the situation presented, and to deduce the operating rules of decision-making (Henderson, 2003, 501).

Studies on the taking of visual information in football suggest that experts have developed effective prospecting strategies specific to their activity, because experts perceive relevant information earlier, faster and with more precision than novices (Savelsbergh et al., 2002, 283; Williams & Ward, 2003, 245).

This can be explained by the negligence of expert footballers who exercise it on useless areas and focus their attention on the relevant areas of the game (Nougier & Rossi, 1999, 251).

VI. Percepcio-cognitive training on neurotraicker:

1. The Neuro-Tricker:

The NeuroTracker is a tool for training and developing attention and alertness, mental skills essential for making decisions on the playground. The NeuroTracker is used by elite sports teams. It is based on proven scientific data. In soccer, players must spot and track their teammates, opponents, and the ball all at the same time. The NeuroTracker allows you to target and train these skills in short sessions of about 5 minutes each. (Neurotracker, 2016)

2. Principle of operation of the NeuroTracker:

The NeuroTracker improves attention and alertness using a method called three-dimensional tracking of multiple moving targets. There are eight yellow balls inside a virtual cube. Four of them flash orange.

You must identify and follow the last four balls, while ignoring the others. After identifying them, the balls all start moving simultaneously. The exercise lasts 8 seconds, at the end of which the balls stop and you must identify the 4 initial targets. If your answer is correct, the NeuroTracker increases the speed of the balls to increase the level of difficulty. If your answer is incorrect, the speed is reduced. A session repeats the 8-second exercise 20 times.

During training, the brain learns to make very complex predictions. Indeed, it must analyze and predict the movement of the objects presented in just a few fractions of a second. As they pass each other, the objects further add to the complexity of the task demanded by the brain. Indeed, at this time, the brain must use its working memory to predict the movements of objects when they are actually out of sight. (Neurotracker, 2016)

Principle of operation of the NeuroTracker

Significant results are observed after about fifteen training sessions, generally carried out over 3 to 5 weeks at a rate of 2_3 sessions/week. However, you should know that there is no danger that this training is done daily. (Neurotracker, 2016)

The use of virtual reality in professional football neuroscience improves the ability to take in information quickly from the environment and regulate it. The objective is therefore to further develop the cognitive dimension of training to help players progress beyond the physical aspect: to optimize their perceptual processes and therefore improve their actions in situation. Virtual reality therefore allows a better understanding of decision-making thanks to more precise movement data. "We use it, with the neuroscientific approach, to transform field information", it allows the footballer to react in the right way at the right time. (West-France, 2021). The neurotraicker:

Shortens the technical-tactical learning time in the assimilation of possible situations.

Increases the stability of a motor action and/or a tactical scheme.

Increases the precision, speed of execution of a technique and a tactic.

Allows a fairly high frequency of repetition per unit of time thus saving energy

Is very effective when training has to be interrupted as a result of injury because it allows the preservation of motor representation and slows down the process of muscle atrophy.

Variation of the exercise

VII. CONCLUSION

Information and decision-making considered in modern football the strong point in the technical-tactical palette of the footballer, and of course of a team.

Because footballers who see and process information quickly can position themselves on the pitch, avoid confrontations and return the ball correctly.

With the arrival of physical preparation, footballers became faster, stronger, more enduring, more efficient... thus forcing receivers to let go of the ball faster and above all better to prevent teammates from getting into a duel too much. . Gathering information will be one of the most defining tricks in football.

The purpose of information acquisition training is to force the player to predict the trajectory of the ball by reading the movements of the opponent and his teammates. Components that can be integrated into many types of technical-tactical

exercises.

The evolution of the material for presenting situations makes it possible to get closer and closer to real situations in football, to enrich and structure knowledge in long-term memory, improve the mnemonic system, the relevance and the speed of visual information acquisition.

Anatomy app

I. Introduction :

This is a 3D application for human anatomy. It allows users to explore the human body interactively and realistically. It serves as a precise and contemporary educational tool for students of medicine, physiotherapy, and nursing, as well as for healthcare professionals. Thanks to its meticulously designed 3D models, it offers a comprehensive representation of the structure and function of the human body.

II. Features and Content.

The application offers a complete 3D representation of the human body, including the muscular, skeletal, nervous, circulatory, digestive, respiratory, and urinary systems. Users can virtually rotate, zoom, and segment the various structures to inspect each element from all angles.

In addition, Complete Anatomy provides over 700 anatomical illustrations and animations that explain the function of muscles and joints. This visual and scientific approach is complemented by interactive lessons, videos, assessments, and radiological material (MRI, CT scans, X-rays).

III. Interface and Customization

The interface, available in French and several other languages, is easy to use and intuitive. Users can change the language in the settings, add notes, integrate images, and design their own models. These options make the learning process more customizable and memorable.

Complete Anatomy also offers the ability to synchronize data across various devices (computer, tablet, smartphone), making learning more flexible and convenient.

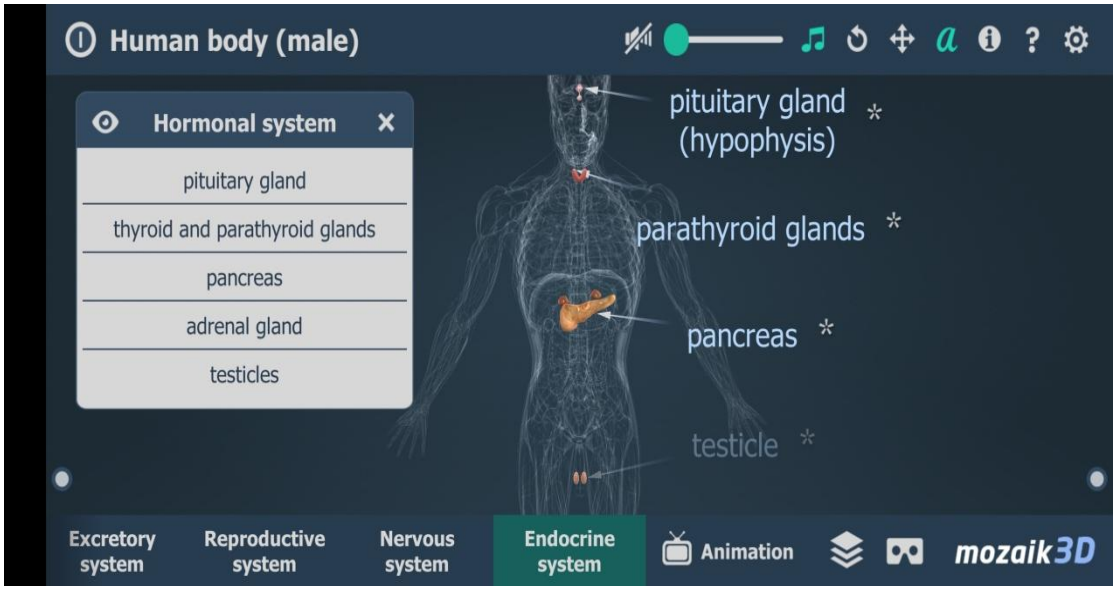
IV. Educational Use

This application is widely used in medical and health faculties. It assists students in understanding the spatial relationships between various bodily structures and in preparing for their practical and theoretical assessments. Professors also have the ability to design customized lessons and share three-dimensional models with their students, making courses more engaging and immersive.

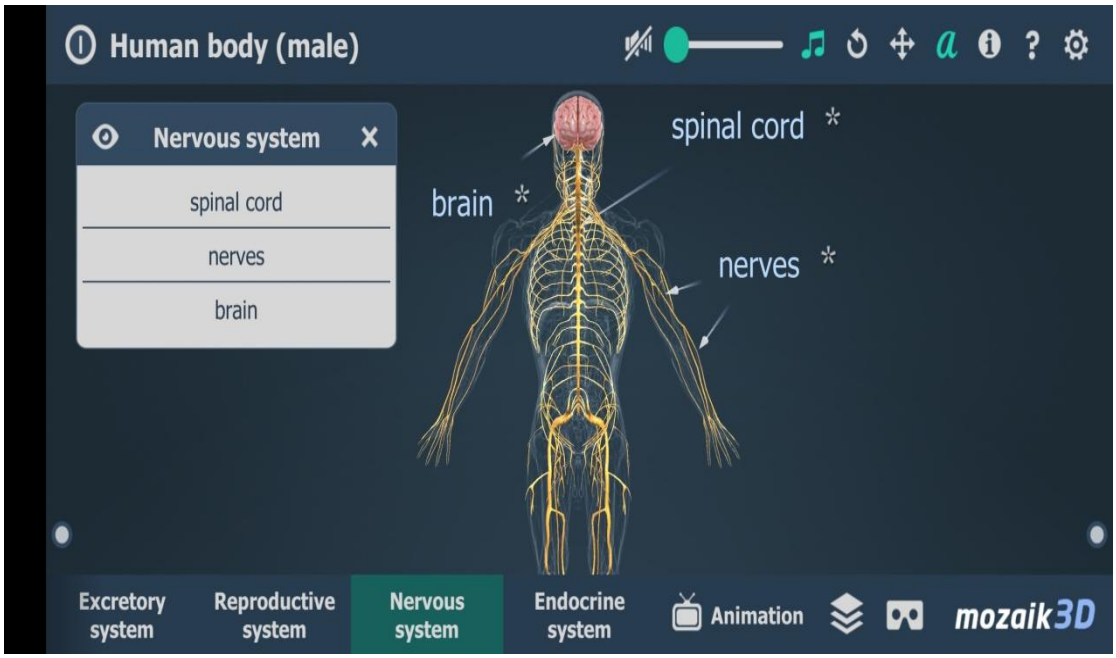
V. Access and Usage Conditions

The Complete Anatomy app is available for free download on iOS, Android, Windows, and Mac platforms. However, some advanced features require a premium subscription. A free trial period is typically offered to evaluate the tools before subscribing. To ensure a smooth experience, it is recommended to use a recent device due to the high-quality graphics.

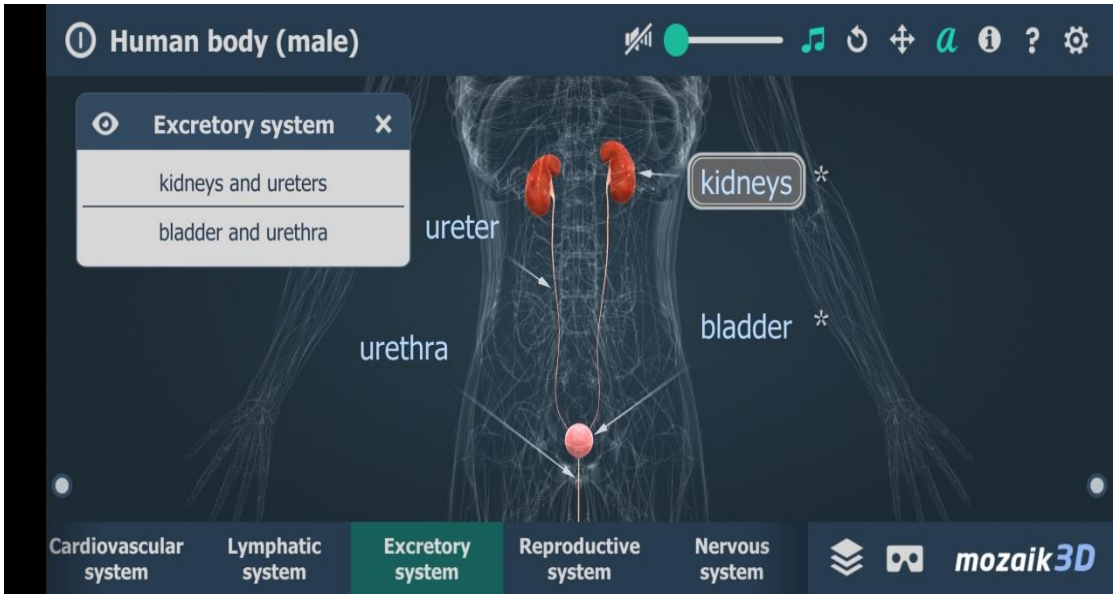
The glandular system



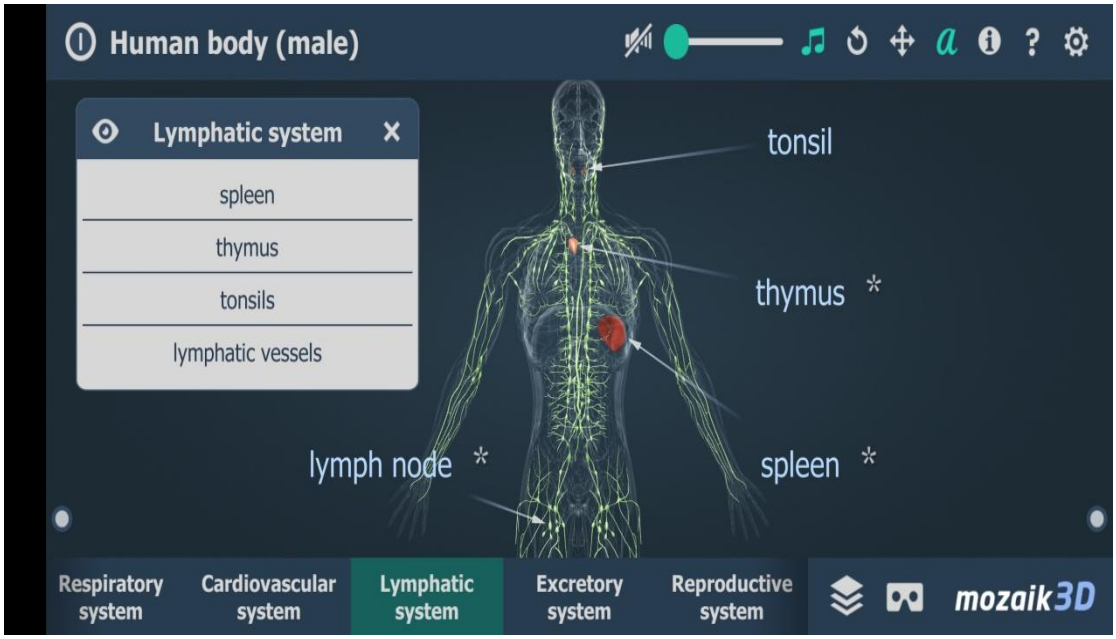
The nervous system



The urinary system



The immune system



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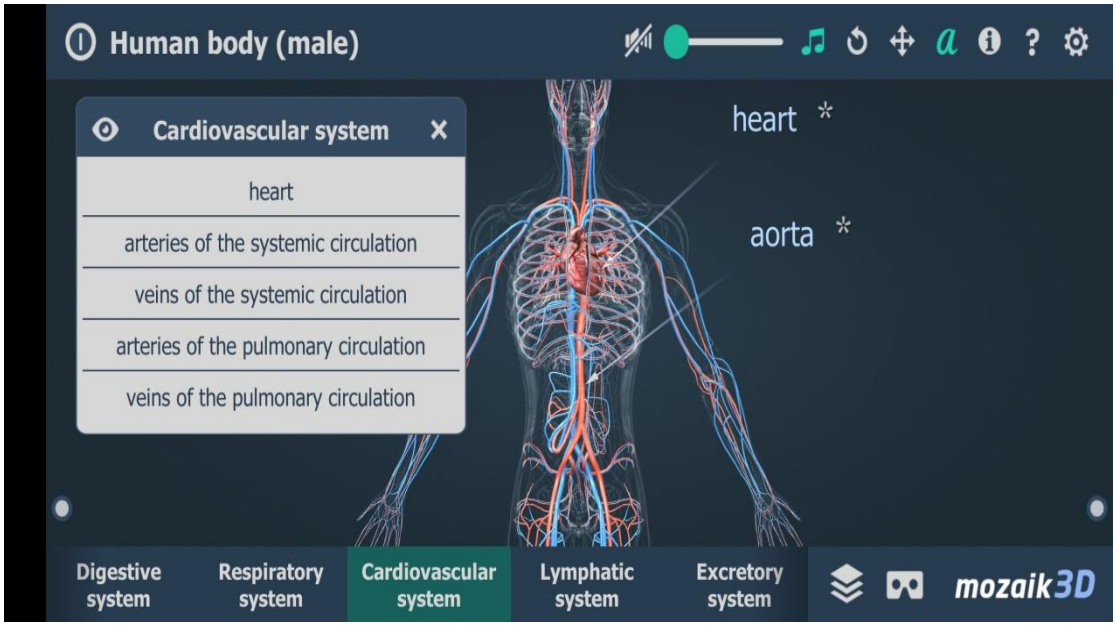
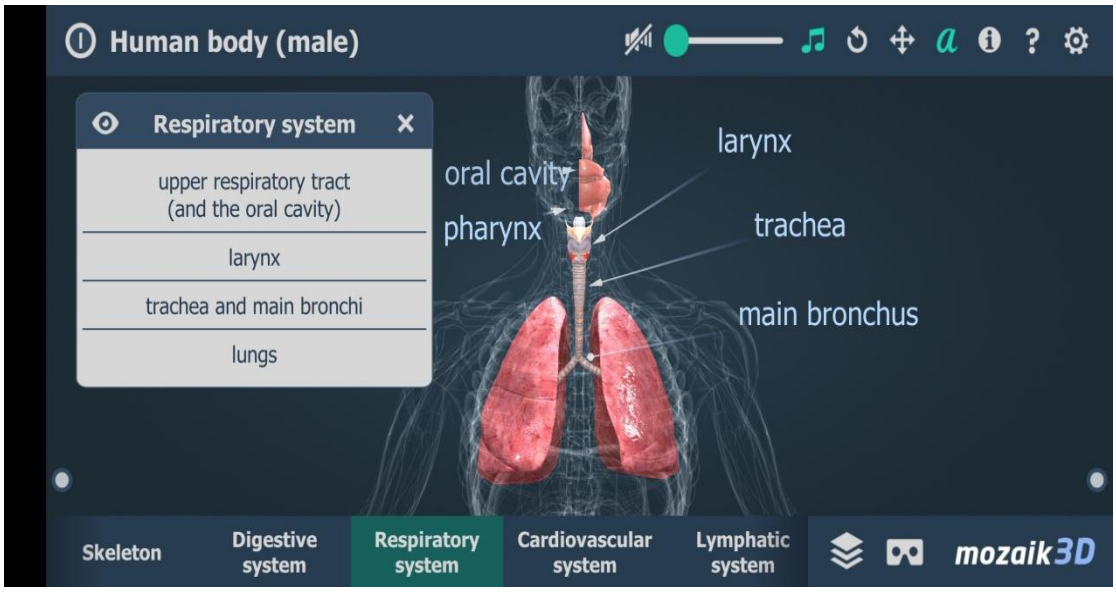
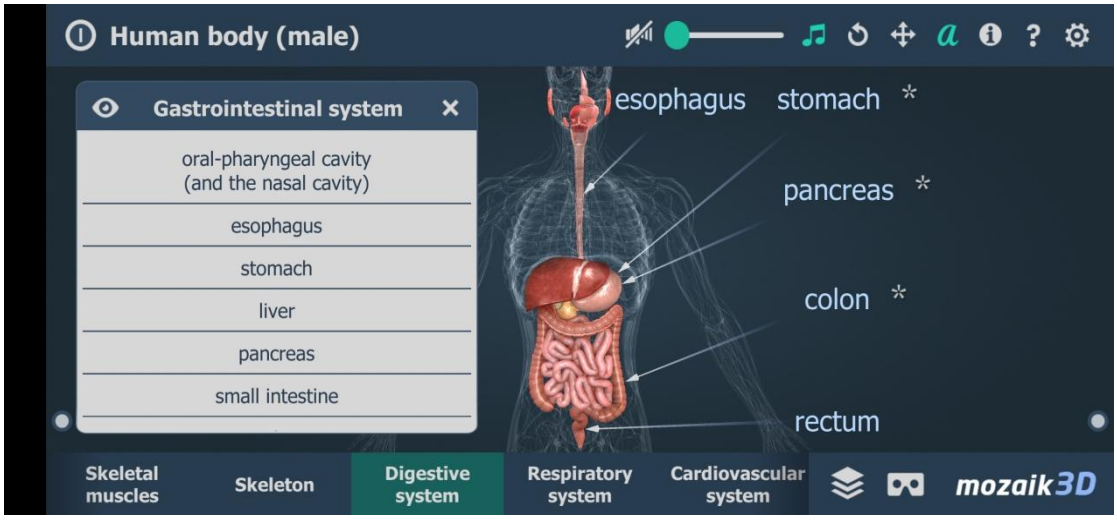


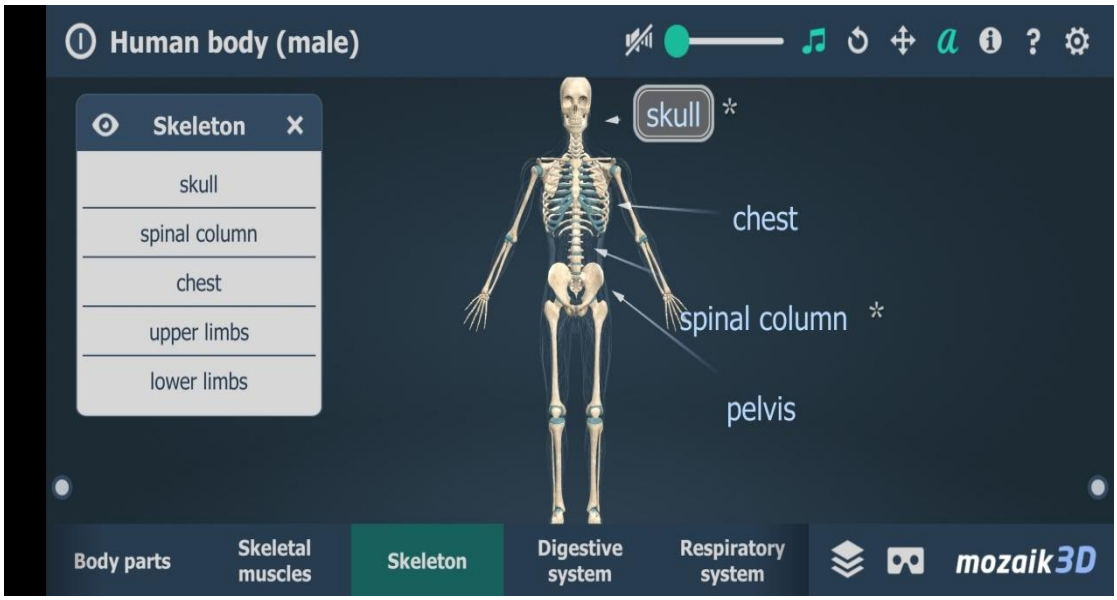
The respiratory system

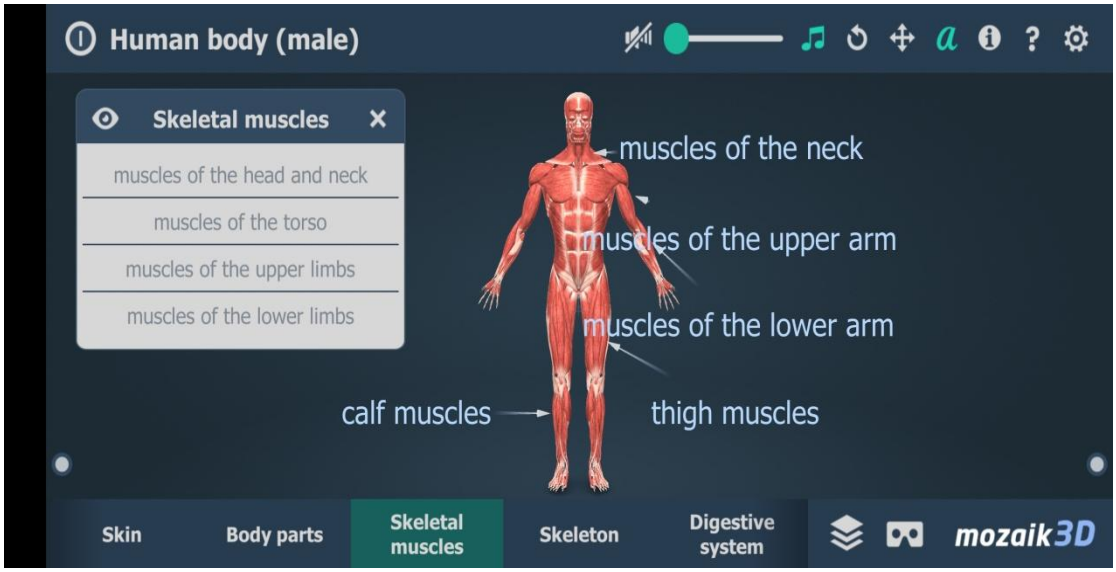


The digestive system

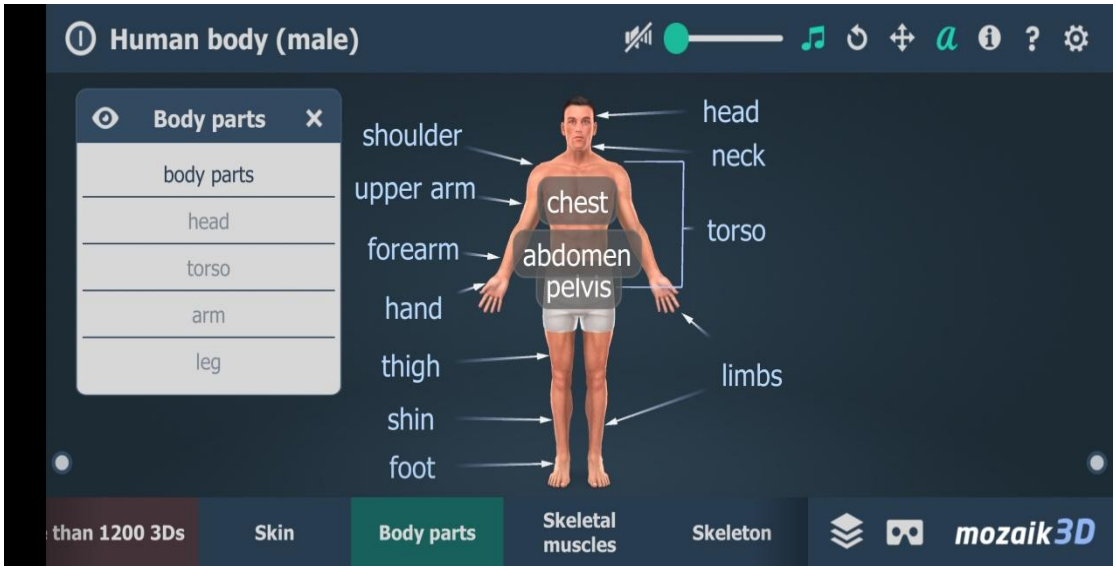


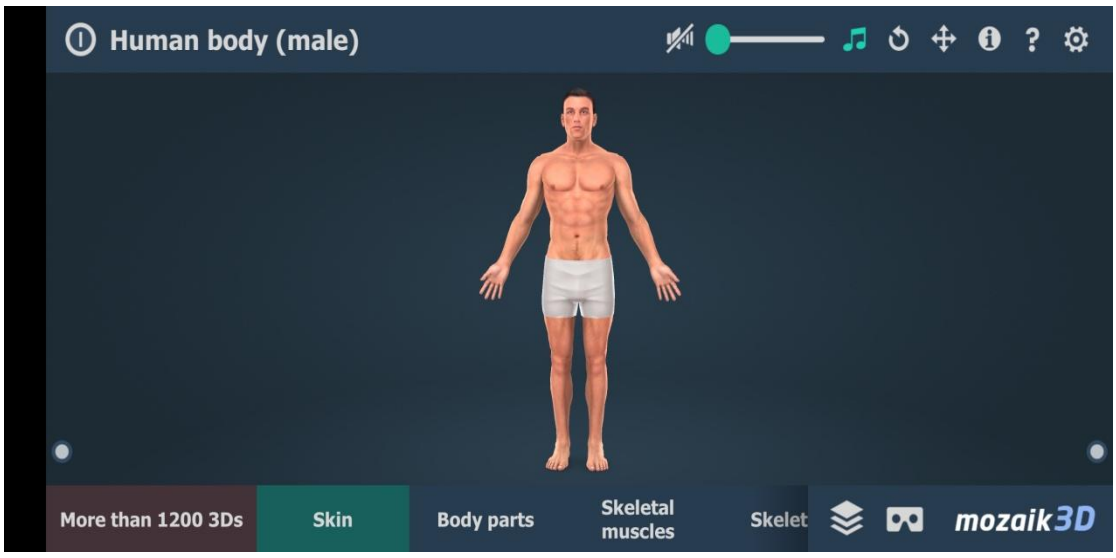
The musculoskeletal system





The integumentary system





VI. Conclusion

In summary, Complete Anatomy is a comprehensive, innovative, and immersive tool for examining the human body. With its interactive 3D models, explanatory videos, quizzes, and customization options, it has become an essential resource for learning, teaching, or reviewing anatomy. This application combines scientific rigor, cutting-edge technology, and an accessible pedagogical approach, making the study of anatomy clearer, more visual, and more engaging.

Creating a training session plan – the Tactical Board application in football

I. Introduction :

A lesson plan typically includes the following elements:

- The specific objectives of the lesson.
- The approximate duration of each step.
- A detailed description of the planned activities.
- The necessary teaching materials, such as slides, videos, or documents.

II. Présentation de l'application

The Tactical Board: Football app, designed by BLUELINDEN, is aimed at coaches, trainers, coaches, or even players who want to develop, observe, and share football tactics, game plans, and drills. It can be used on Android and iOS platforms. Key features include:

- Development of tactics/drills with a predefined number of scenarios (e.g., 47 tactics).
- Drawing tools (solid lines, dotted lines, arrows) to illustrate movements, passes, and strategies.
- Ability to save an unlimited number of tactics/drills, manage teams, and customize players (name, number, position, photo). Export of tactics/drills as PDFs or images for sharing or presentation.

III. Application Objective:

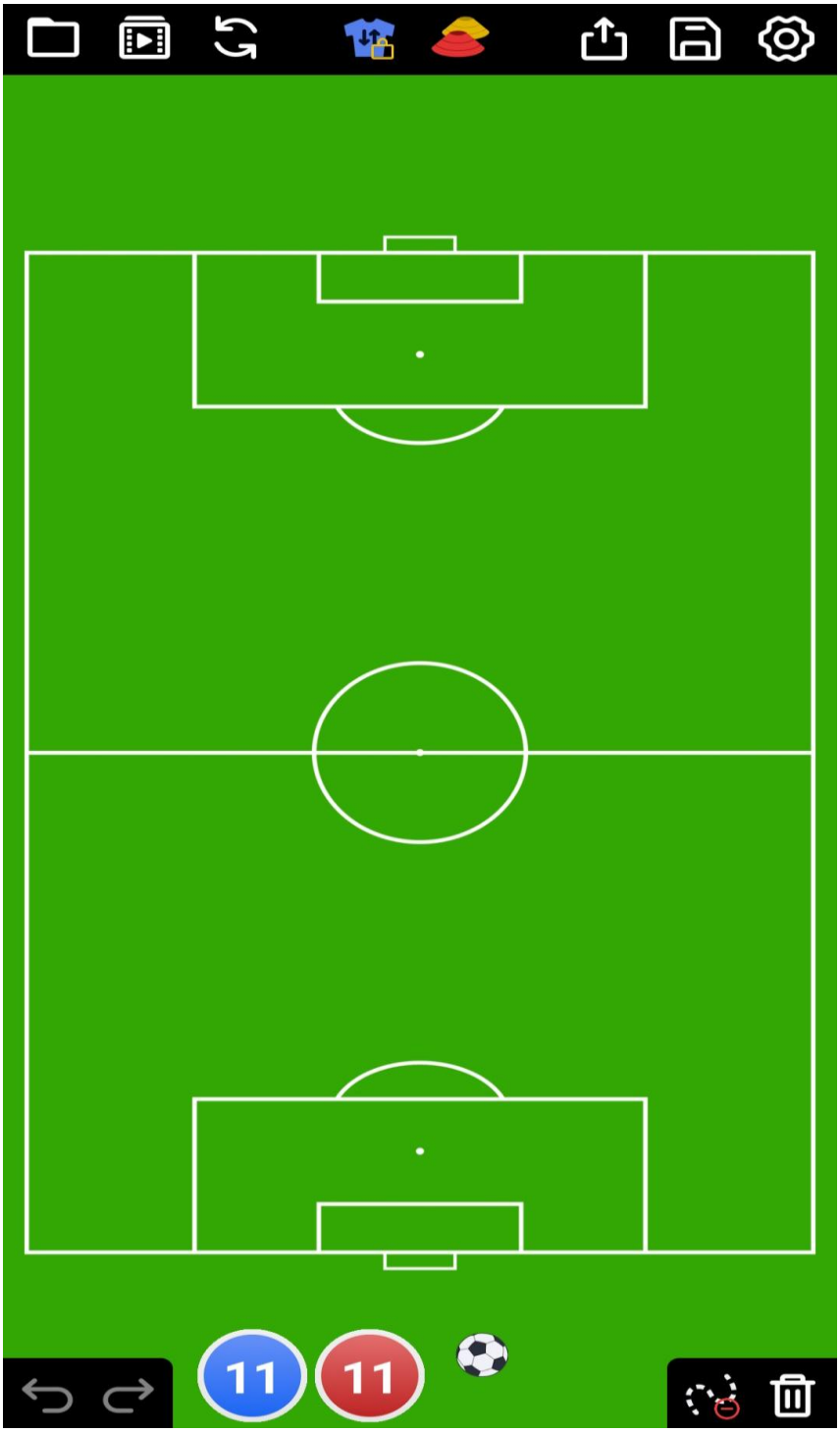
This application offers several advantages in a football training context:

- Clear communication: You can visualize your tactical ideas, making them easier for players to understand.
- Time saving and organization: Your diagrams and exercises are saved, organized into folders, and ready to use during training sessions.
- Flexibility and mobility: The application works on tablets/smartphones, so it can be used on the field, in the meeting room, or on the go.
- Sharing and teaching: Exporting your diagrams allows you to send them to players before or after training, or during tactical meetings.
- Customization: Adapt it to your group, club, or level—personalize the players, colors, and field.

IV. Using the application:

1. Installation and initial setup

- Get the application from your device's app store (Android or iOS).
- Launch it and configure: field size (full or half), units, drawing preferences.
- Familiarize yourself with the interface: workspace, toolbar, "new strategy" and "export" menus, etc.



2. Creating a new tactic/exercise

- Choose "New activity/tactic."
- Select the full or partial field mode depending on the objective.
- Position the participants (icons) on the field: name, number, position, photo if desired.
- Use the drawing tools: solid lines, dashed lines, arrows, to illustrate passes, movements, runs, and returns.
- You can organize your tactics into folders (for example: "defense," "fast attack," "set play").

3. Editing and Refining

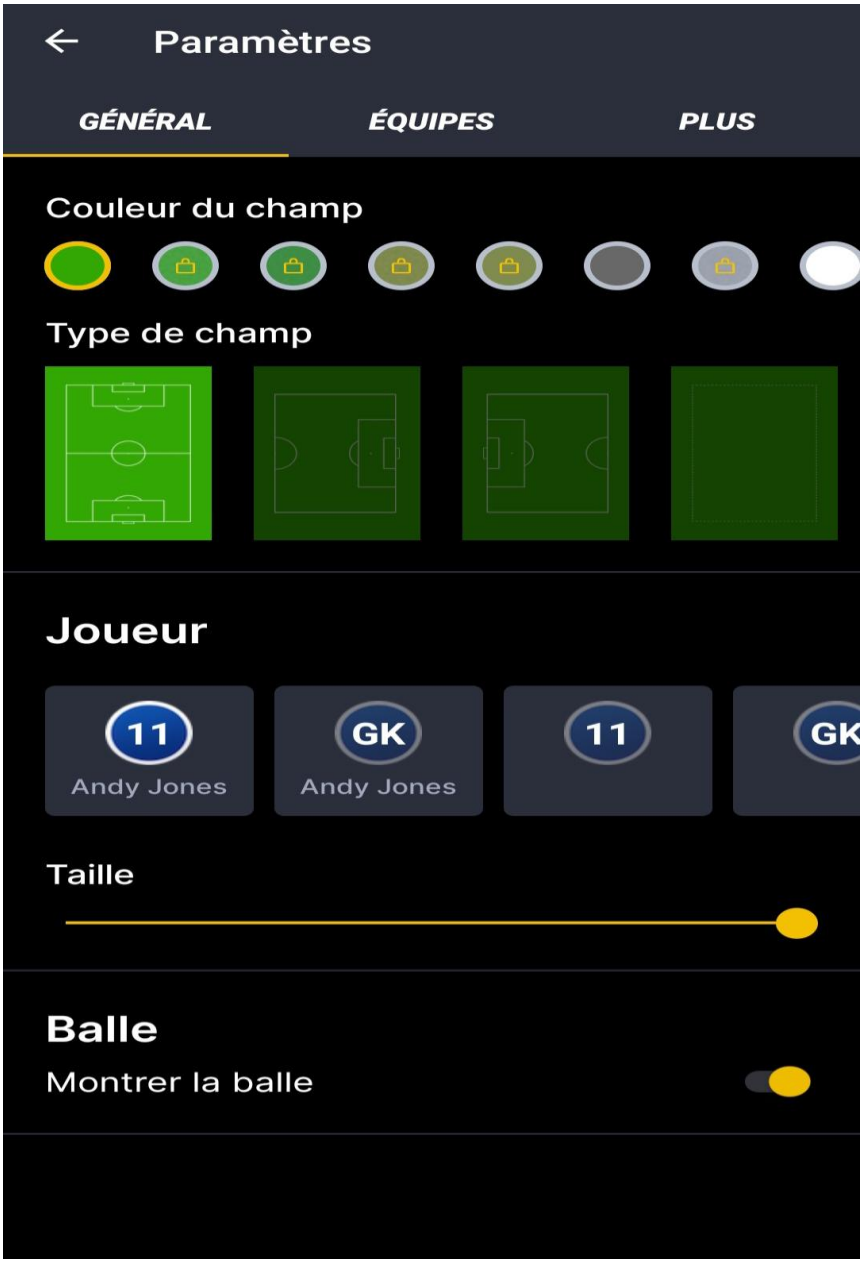
- Position players by dragging and dropping them.
- Adjust visually using color settings, ball size, and the number of players.
- Activate an alignment grid for precise positioning of elements (update announced).

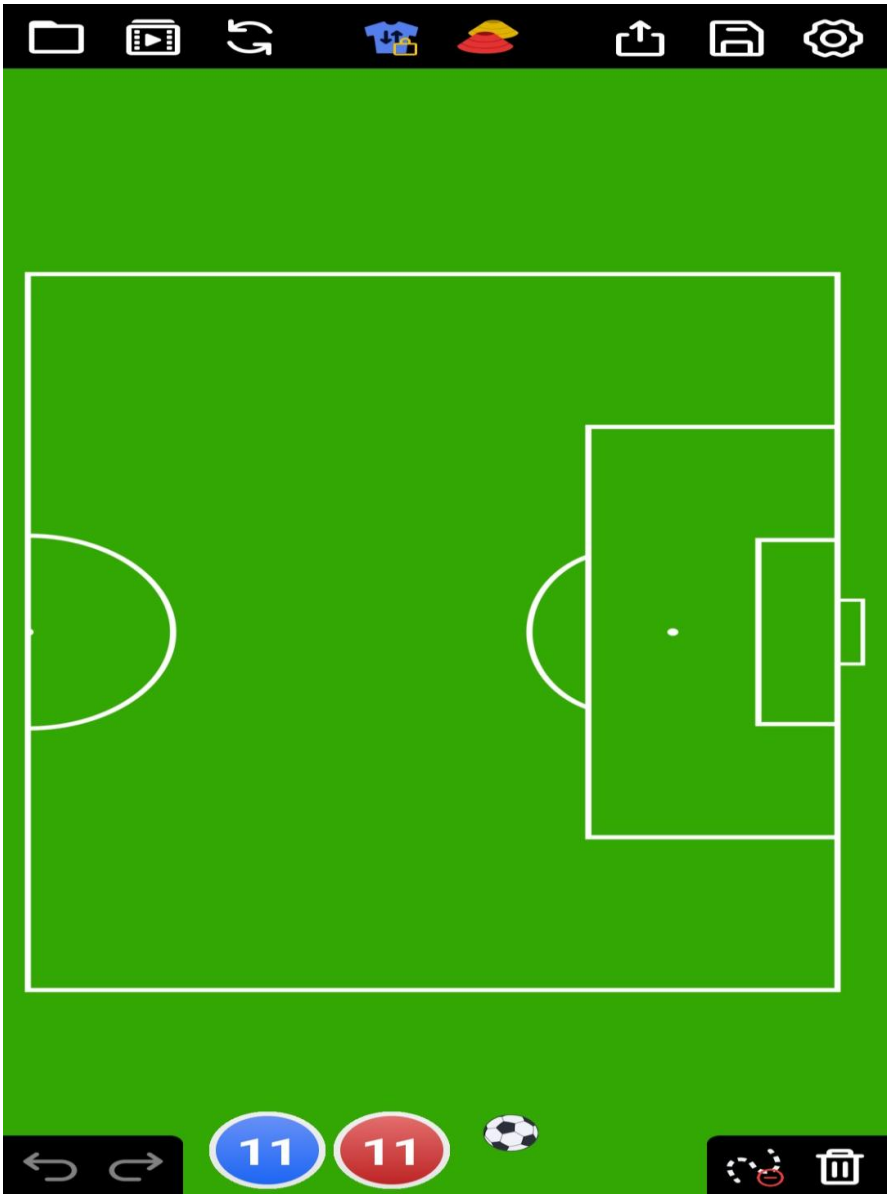
4. Animation & Exporting

- Once your diagram is ready, you can export it: image format (PNG/JPG) or PDF. Convenient for printing or sharing.
- Depending on the application version, it may be possible to easily animate the movements (check the paid options).
- Share it with your players and team, or keep it for your strategy sessions.

5. On-Field/Meeting Use

- During the pre- or post-match session, display your formation on a tablet or projector.
- Explicitly indicate to the players their positions, passing paths, and movements.
- After a game or session, use this tool to conduct a debriefing: highlight what was done correctly or incorrectly.4. Astuces & Erreurs fréquentes





V. Helpful tips:

- Plan your tactical formations in advance (e.g., "high press," "counter-attack") to be ready on match day.
- For better readability, use distinct colors for each movement category (e.g., red for defense, green for attack).
- Include a legend or explanatory comment in your exports so that everything is perfectly understandable, even without your input.
- Involve the players in the visualization process: show them the plan, then ask them to put it into practice on the field.

VI. Common mistakes/mistakes to avoid:

- Incorrectly calibrating your field or the number of players will lead to an unrealistic formation.
- Excessive use of detail or vague instructions: an overload of elements on the board can complicate understanding.

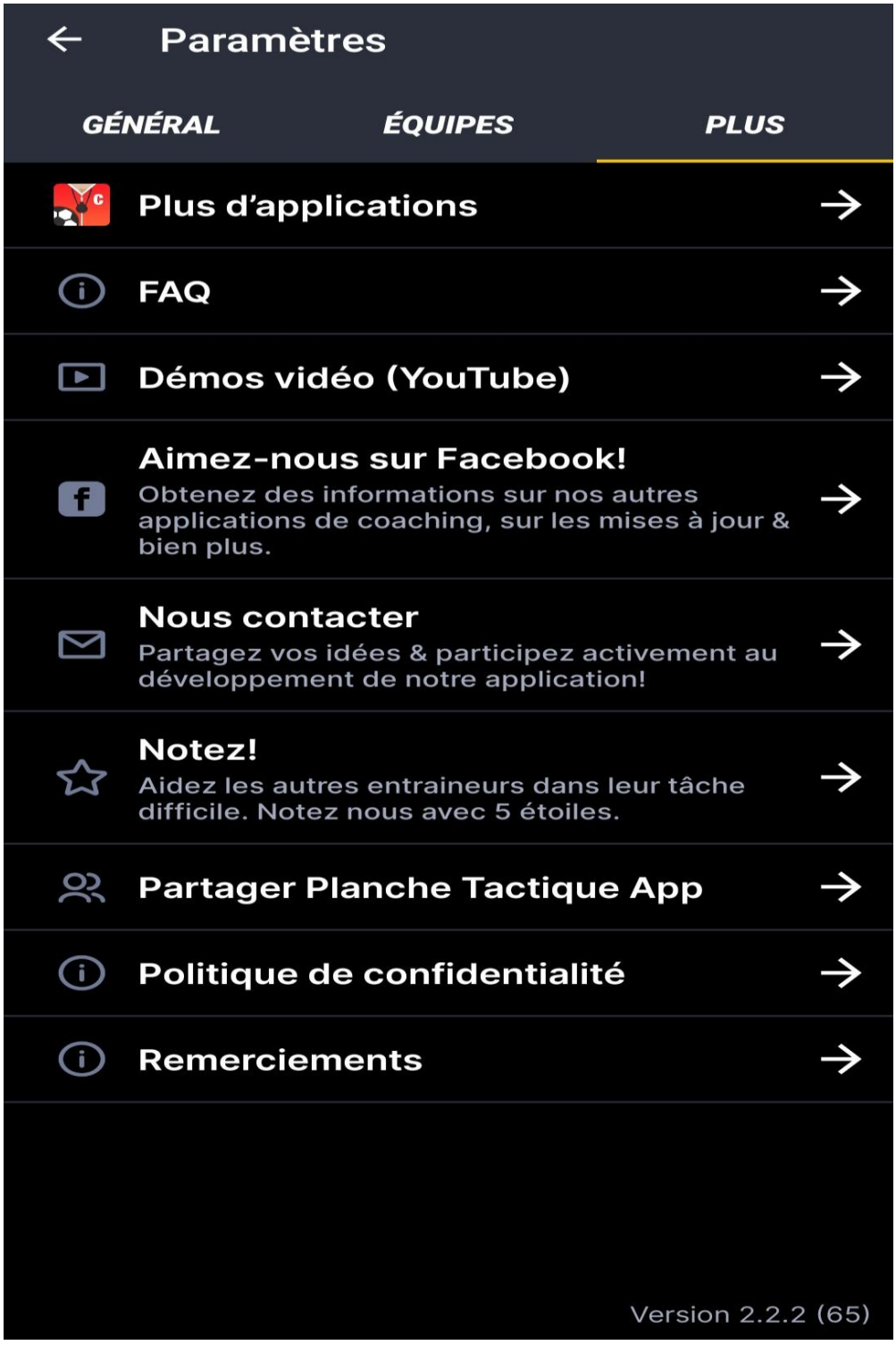
- Avoid modifying the system for the players: a "professional" strategy that is too complicated for young players can confuse them. Not to review the plans after each match or session to check their actual implementation on the field.

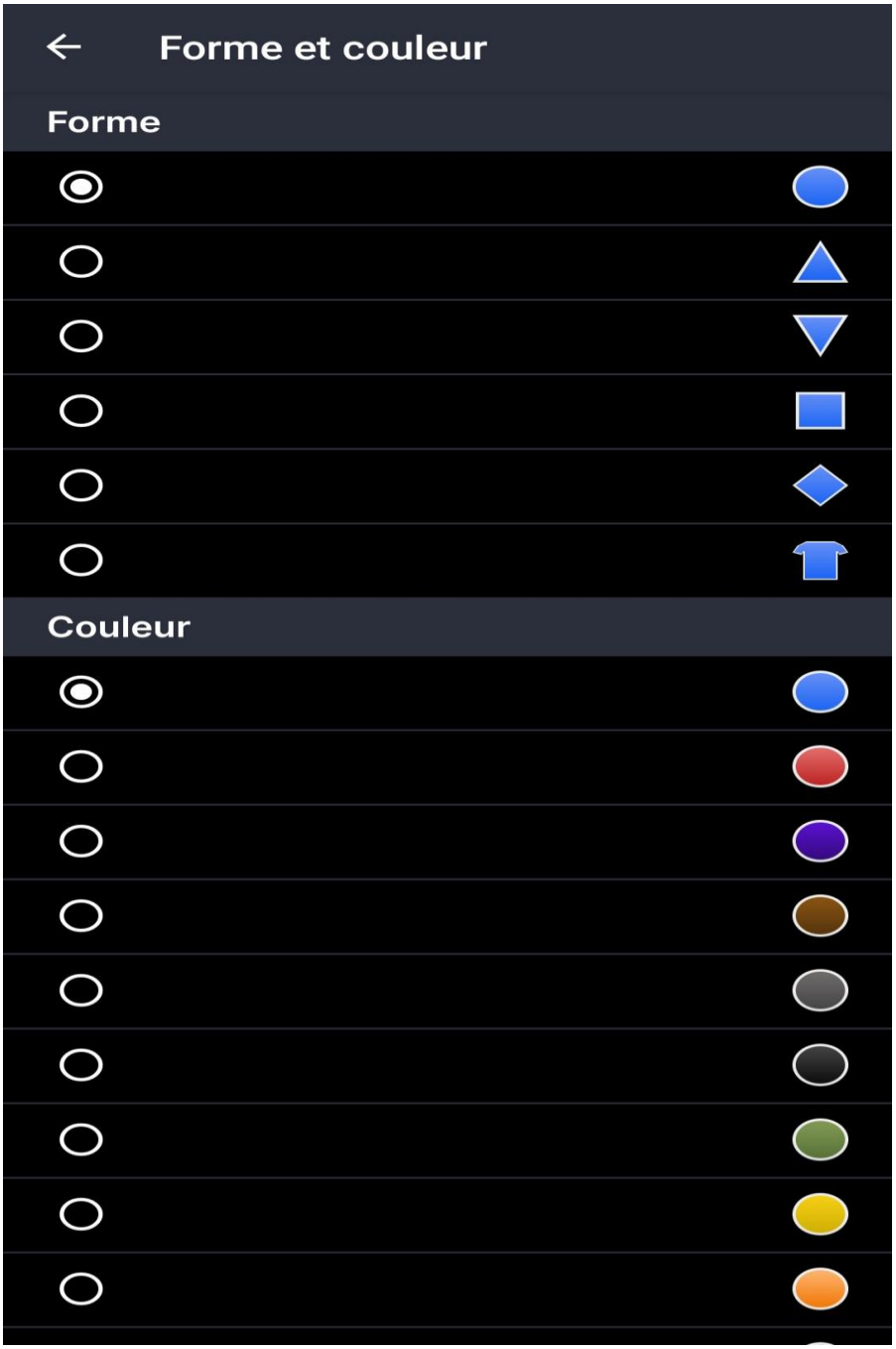
VII. Application in the context of football training

Here's how to integrate the application into a comprehensive training approach:

- Before the session: prepare the tactic/exercise in the application and send it to the players so they can review it in advance.
- During the session: use the board on the tablet to remind the players of the instructions and show them the movements.
- After the session/match: debrief using the application: open the diagram, compare it with the video/feedback, and adjust for the next session.
- For competition: before the match, show the opponent's tactics or your tactical plan, and the attack/defense formation.
- For club development: create a library of tactics, with historical data, to standardize the methodology across all teams, from youth to senior

We can use half a field



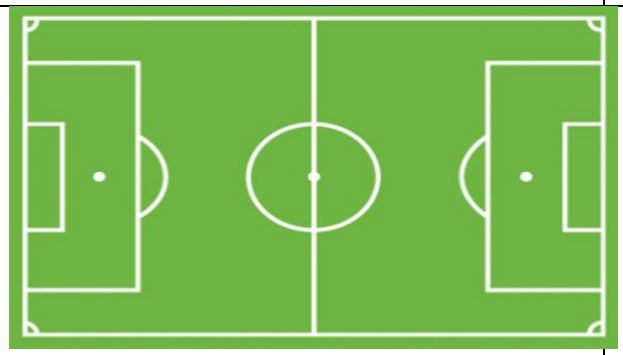
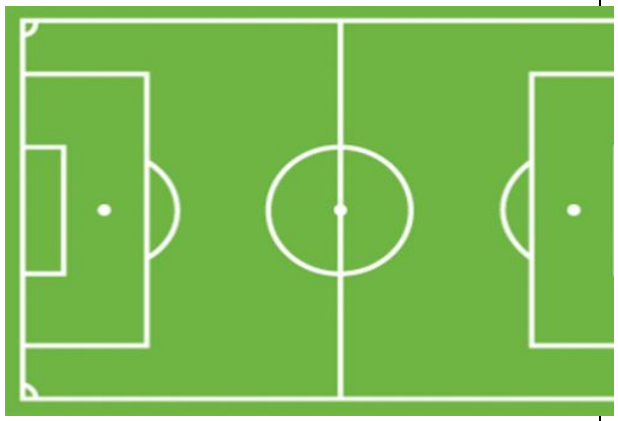


VIII. Conclusion

The "Tactical Board: Football" app offers a digital tactical board that serves as an effective and accessible tool for any trainer or coach wishing to organize, visualize, and share their tactical concepts. It facilitates teaching, improves preparation, and strengthens cohesion between the coaching staff and the players.

However, technology is only a tool: excellence always stems from precise instruction, on-site support, and adaptation to your audience. When used correctly, this app can be a real asset for improving efficiency, team cohesion, and progress.

Coach :	Bounab Chaker	**Objective:**		Session No	
Place :	University stadium			Date :	
Duration		Material :	Cones, balls, goals, bibs…	Category:	
Season :	2025-2026			Effective	

PARTS		OBJECTIVE	CONTENT	DOSAGE	SCHEMES	OBS
PREPARATORY	**handling**	Organization Explanation of the session's objective	- Jogging. - Athletic range	5’ 5’ 5’	O……O	
	Getting started	Preparing the body for exercise	- Active-dynamic stretching		O……O	
PRINCIPAL			**Exe 01:** …… …… …… …… …… …… …… …… …… …… **Exe 02:** …… …… …… …… …… …… …… …… …… ……		 	
FINAL		Return to calm	Stretching/jogging.	10’		

Energy expenditure during sports – the calorie chart app

I. Introduction

In the world of sports, energy expenditure is paramount for performance, recovery, and the athlete's well-being. Energy is the "fuel" that gives the body the ability to exert effort. It comes from energy-providing nutrients: carbohydrates, lipids, and, to a lesser extent, proteins. Understanding how the body uses this energy helps to adjust training and diet to optimize athletic performance.

II. Energy Expenditure During Exercise

Energy expenditure increases significantly during exercise, depending on:

- the intensity of the effort (the more intense the exercise, the greater the expenditure)
- the duration (a prolonged effort expends a lot of energy)
- body weight (a heavier body expends more energy to move)
- the type of activity (cycling, swimming, and running do not have the same energy cost)

Example:

- Brisk walking: approximately 5 kcal/min
- Running: approximately 10 to 12 kcal/min
- Swimming: approximately 8 to 10 kcal/min

III. The Importance of Nutrition

To ensure optimal performance, it is essential to balance energy expenditure with proper nutrition.

- Before physical activity: opt for complex carbohydrates (pasta, rice, whole-wheat bread) to replenish your energy stores.
- During exercise: consume fast-acting sugars (such as energy drinks or dried fruit) during prolonged activities.
- After exercise: consume protein for muscle repair and carbohydrates to restore glycogen stores.

A balanced diet helps prevent fatigue and injuries and promotes better recovery.

IV. Energy Sources Used During Exercise:

During physical exercise, the body primarily uses two main energy reserves:

1. Sugars (carbohydrates):

These are stored as glycogen in the muscles and liver.

Carbohydrates are the preferred energy source during intense, short-duration activities (e.g., sprinting, weightlifting).

They provide a rapid energy release, however, their stores are depleted quickly.

Each gram of carbohydrate provides 4 kcal.

2. **Lipils (or fats):**

Adipose tissue stores fats, which are used during long-duration, moderate-intensity activities (e.g., jogging, marathons).

They provide a large amount of energy, however, their use requires more oxygen and is therefore slower.

Each gram of fat provides 9 kilocalories.

3. **Proteins**

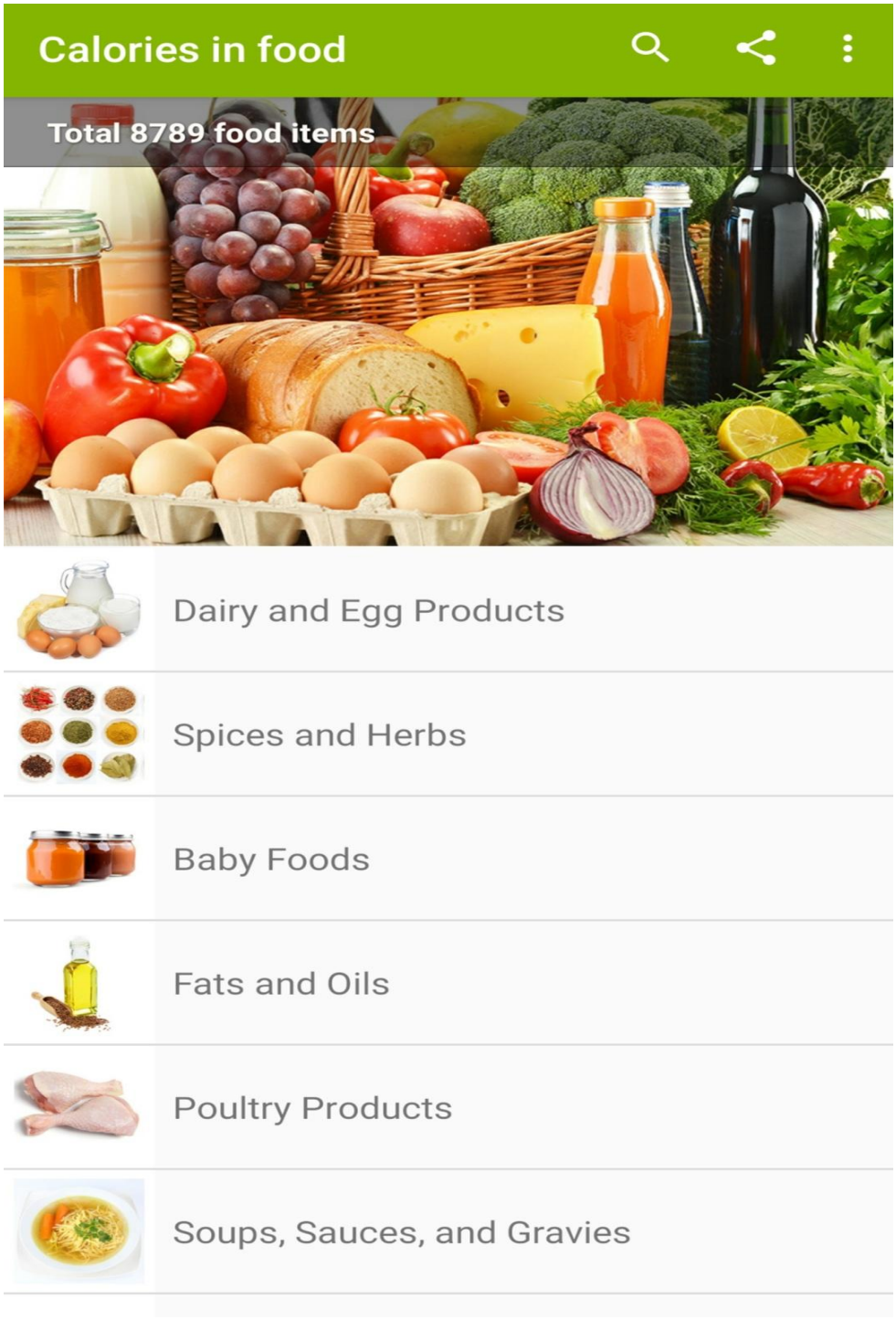
Proteins can also make a marginal contribution to energy production, particularly during prolonged activity or in cases of carbohydrate deficiency, but this is not their primary function.

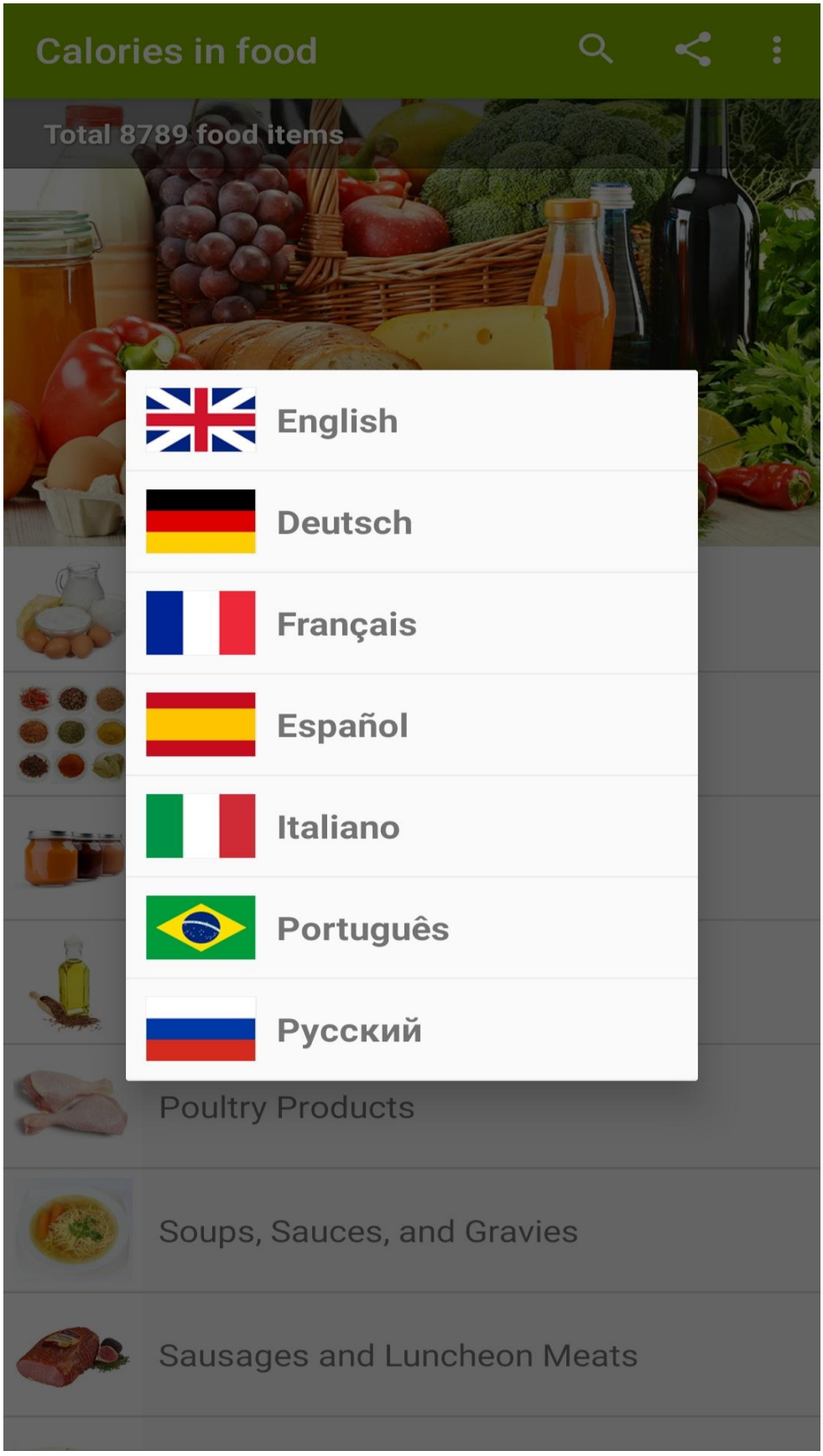
Each gram of protein provides 4 kcal.

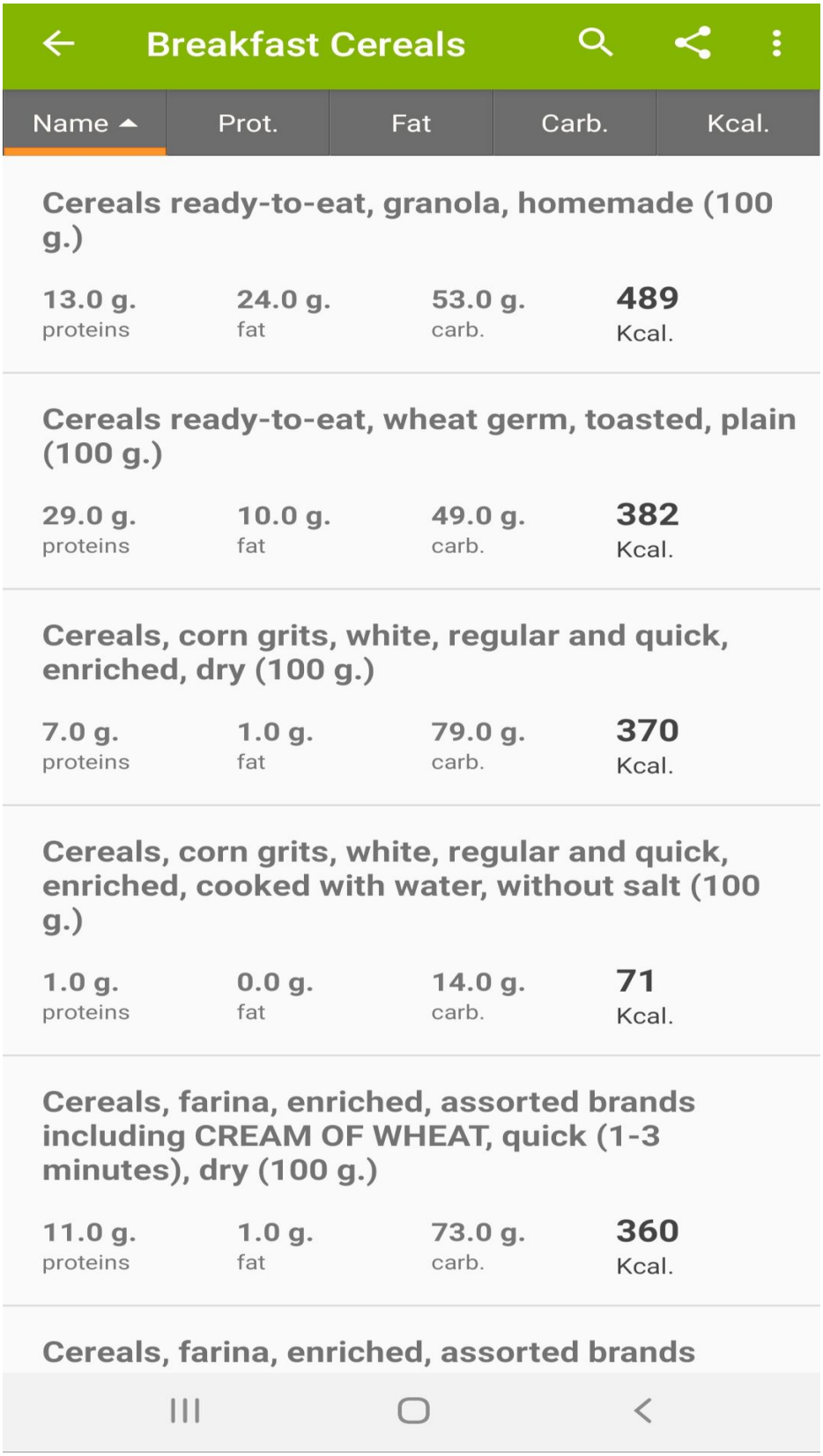
V. Application :

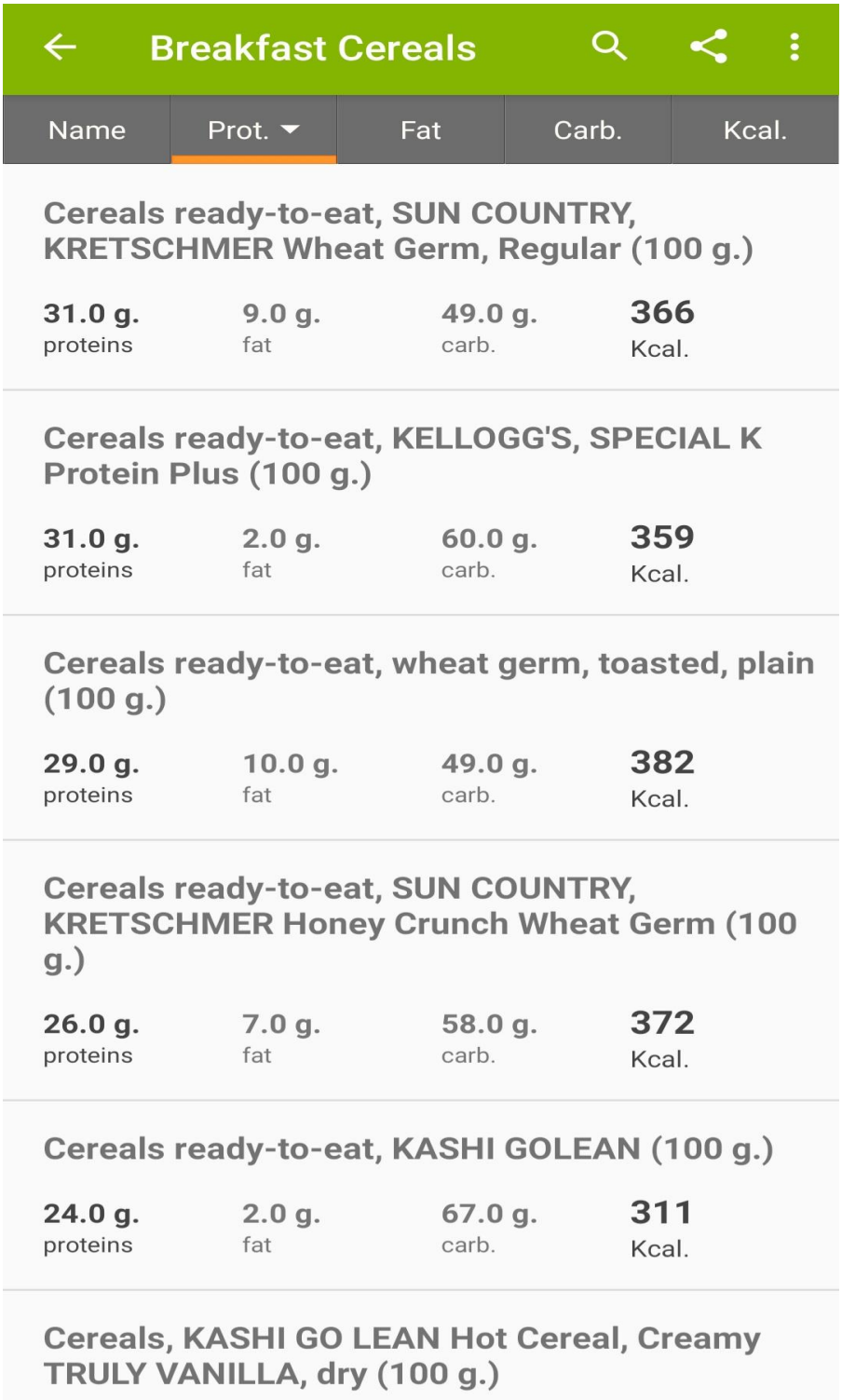
To measure an energy expenditure, follow these steps:

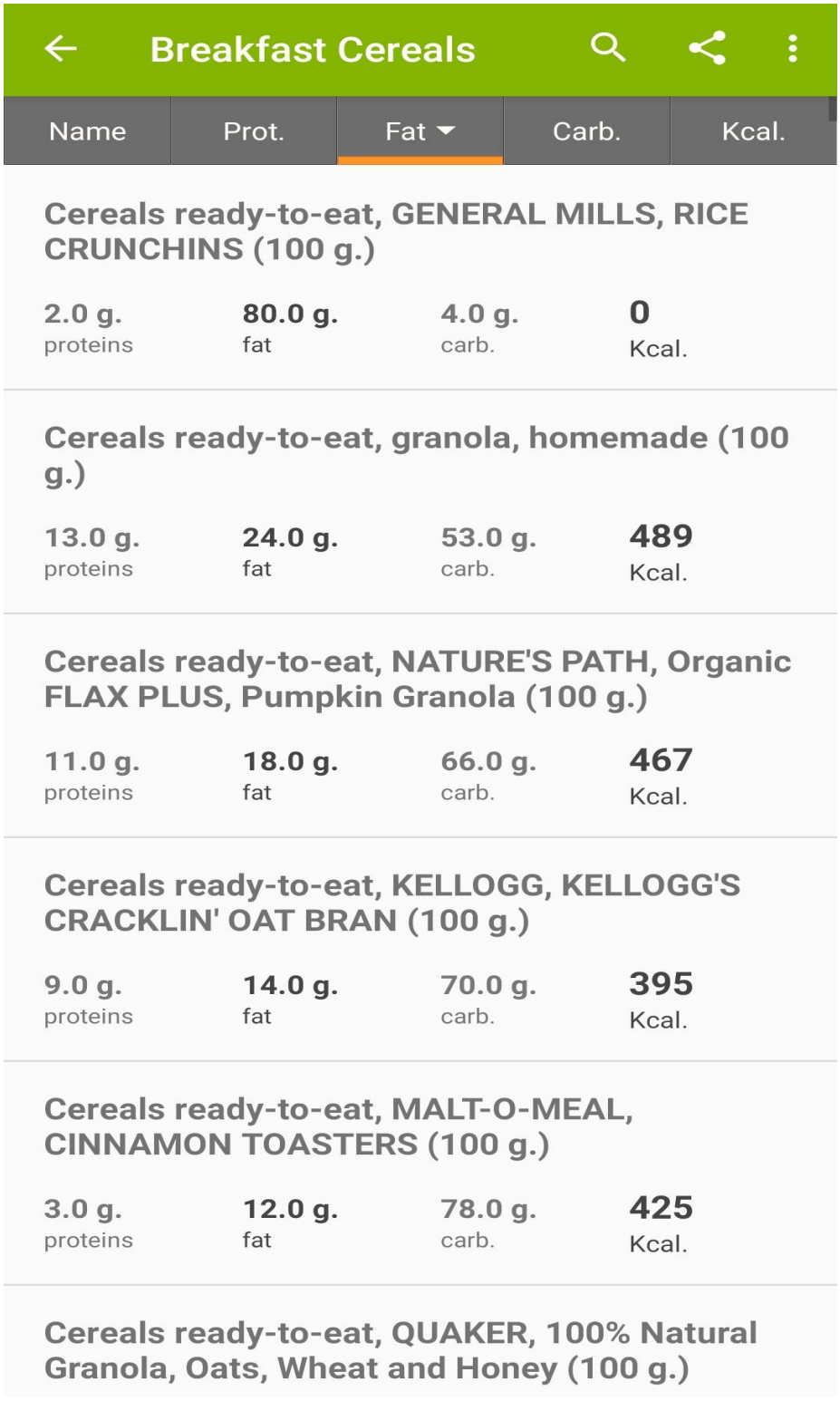
8. Download the application from the Play Store
9. Open the application
10. Choose the food

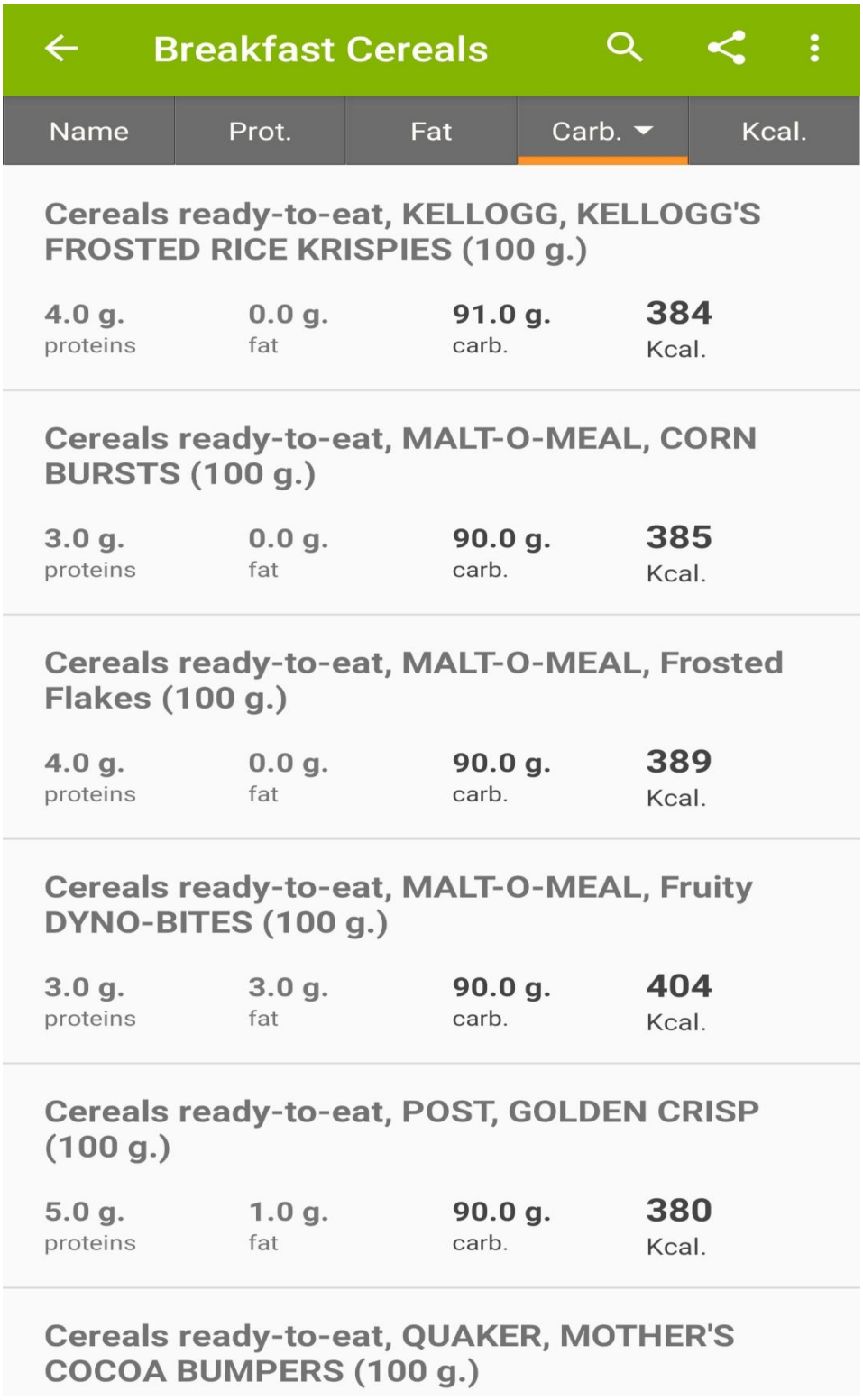

Calories in food
Total 8789 food items
Dairy and Egg Products
Spices and Herbs
Baby Foods
Fats and Oils
Poultry Products
Soups, Sauces, and Gravies

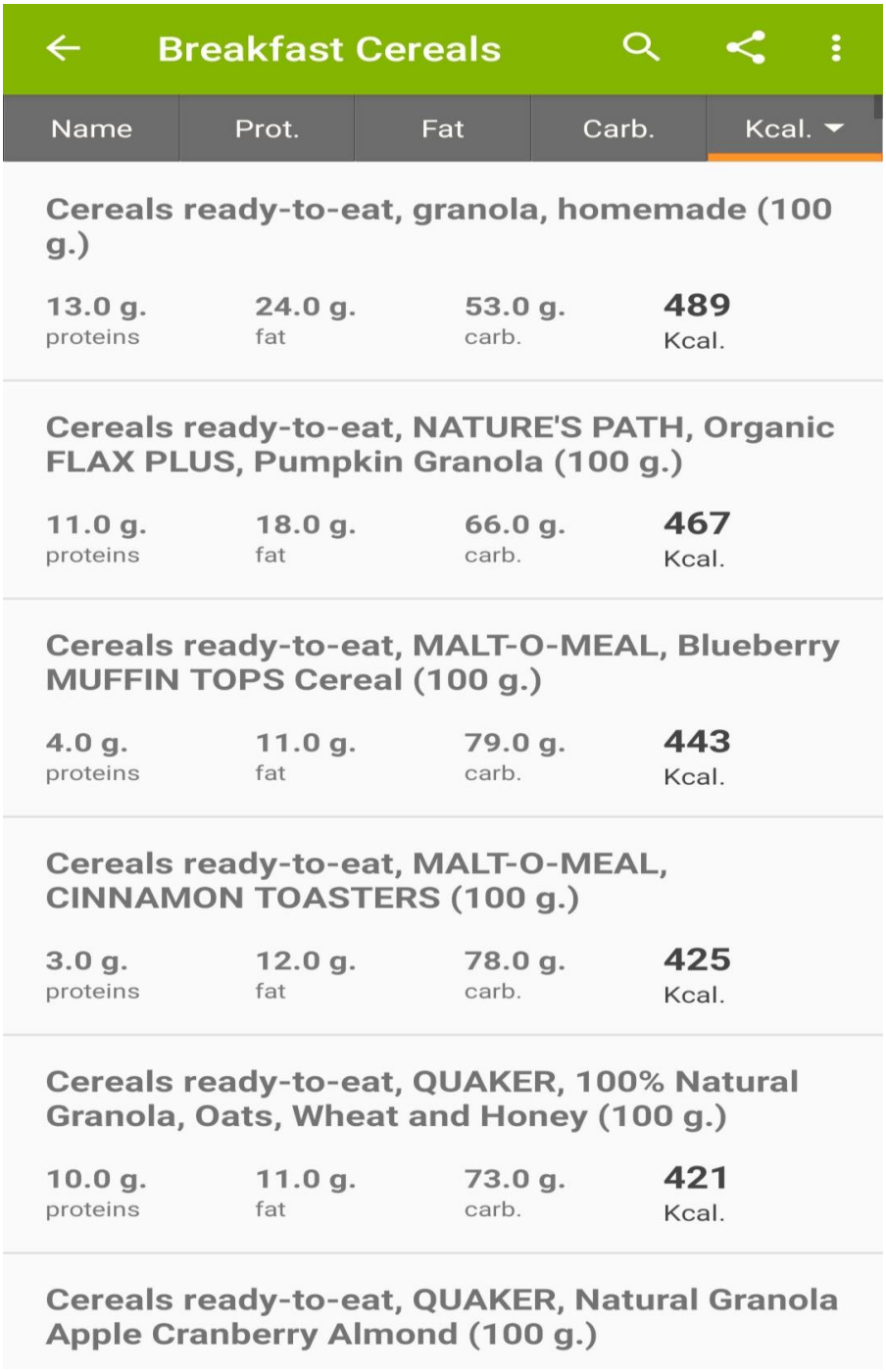

Calories in food
Total 8789 food items
English
Deutsch
Français
Español
Italiano
Português
Русский
Poultry Products
Soups, Sauces, and Gravies
Sausages and Luncheon Meats


Breakfast Cereals
Name
Prot.
Fat
Carb.
Kcal.
Cereals ready-to-eat, granola, homemade (100 g.)
13.0 g. proteins
24.0 g. fat
53.0 g. carb.
489 Kcal.
Cereals ready-to-eat, wheat germ, toasted, plain (100 g.)
29.0 g. proteins
10.0 g. fat
49.0 g. carb.
382 Kcal.
Cereals, corn grits, white, regular and quick, enriched, dry (100 g.)
7.0 g. proteins
1.0 g. fat
79.0 g. carb.
370 Kcal.
Cereals, corn grits, white, regular and quick, enriched, cooked with water, without salt (100 g.)
1.0 g. proteins
0.0 g. fat
14.0 g. carb.
71 Kcal.
Cereals, farina, enriched, assorted brands including CREAM OF WHEAT, quick (1-3 minutes), dry (100 g.)
11.0 g. proteins
1.0 g. fat
73.0 g. carb.
360 Kcal.
Cereals, farina, enriched, assorted brands


Breakfast Cereals
Name
Prot.
Fat
Carb.
Kcal.
Cereals ready-to-eat, SUN COUNTRY, KRETSCHMER Wheat Germ, Regular (100 g.)
31.0 g. proteins
9.0 g. fat
49.0 g. carb.
366 Kcal.
Cereals ready-to-eat, KELLOGG'S, SPECIAL K Protein Plus (100 g.)
31.0 g. proteins
2.0 g. fat
60.0 g. carb.
359 Kcal.
Cereals ready-to-eat, wheat germ, toasted, plain (100 g.)
29.0 g. proteins
10.0 g. fat
49.0 g. carb.
382 Kcal.
Cereals ready-to-eat, SUN COUNTRY, KRETSCHMER Honey Crunch Wheat Germ (100 g.)
26.0 g. proteins
7.0 g. fat
58.0 g. carb.
372 Kcal.
Cereals ready-to-eat, KASHI GOLEAN (100 g.)
24.0 g. proteins
2.0 g. fat
67.0 g. carb.
311 Kcal.
Cereals, KASHI GO LEAN Hot Cereal, Creamy TRULY VANILLA, dry (100 g.)


Breakfast Cereals
Name
Prot.
Fat
Carb.
Kcal.
Cereals ready-to-eat, GENERAL MILLS, RICE CRUNCHINS (100 g.)
2.0 g. proteins
80.0 g. fat
4.0 g. carb.
0 Kcal.
Cereals ready-to-eat, granola, homemade (100 g.)
13.0 g. proteins
24.0 g. fat
53.0 g. carb.
489 Kcal.
Cereals ready-to-eat, NATURE'S PATH, Organic FLAX PLUS, Pumpkin Granola (100 g.)
11.0 g. proteins
18.0 g. fat
66.0 g. carb.
467 Kcal.
Cereals ready-to-eat, KELLOGG, KELLOGG'S CRACKLIN' OAT BRAN (100 g.)
9.0 g. proteins
14.0 g. fat
70.0 g. carb.
395 Kcal.
Cereals ready-to-eat, MALT-O-MEAL, CINNAMON TOASTERS (100 g.)
3.0 g. proteins
12.0 g. fat
78.0 g. carb.
425 Kcal.
Cereals ready-to-eat, QUAKER, 100% Natural Granola, Oats, Wheat and Honey (100 g.)


Breakfast Cereals
Name
Prot.
Fat
Carb.
Kcal.
Cereals ready-to-eat, KELLOGG, KELLOGG'S FROSTED RICE KRISPIES (100 g.)
4.0 g. proteins
0.0 g. fat
91.0 g. carb.
384 Kcal.
Cereals ready-to-eat, MALT-O-MEAL, CORN BURSTS (100 g.)
3.0 g. proteins
0.0 g. fat
90.0 g. carb.
385 Kcal.
Cereals ready-to-eat, MALT-O-MEAL, Frosted Flakes (100 g.)
4.0 g. proteins
0.0 g. fat
90.0 g. carb.
389 Kcal.
Cereals ready-to-eat, MALT-O-MEAL, Fruity DYNO-BITES (100 g.)
3.0 g. proteins
3.0 g. fat
90.0 g. carb.
404 Kcal.
Cereals ready-to-eat, POST, GOLDEN CRISP (100 g.)
5.0 g. proteins
1.0 g. fat
90.0 g. carb.
380 Kcal.
Cereals ready-to-eat, QUAKER, MOTHER'S COCOA BUMPERS (100 g.)



VI. Conclusion

The energy expended in sports fluctuates depending on the intensity, duration, and type of activity. According to the demands, the body adjusts its carbohydrate and fat consumption. To progress, athletes must know how to manage their energy resources through balanced nutrition and adequate recovery time. In short, understanding the importance of energy consumption allows athletes to improve their performance while preserving their health..

Algerian National Institute of Industrial Property (ANIIP or INAPI)

I. Introduction :

Under the direction of the Ministry of Industry and Mines, the Algerian National Institute of Industrial Property (INAPI) was established as a public establishment of an industrial and commercial nature (EPIC) by Executive Decree No. 98-69 of February 21, 1998, within the framework of the reorganization of the parent institute (Algerian Institute of Standardization and Industrial Property).

I. INAPI location:

Algeria is a member of the World Intellectual Property Organization, which gives the activities of INAPI an international scope. These activities are carried out within a strict legal framework, defined by national legislation and international obligations. Professional prospects include modernizing the Institute, notably through the use of modern information and communication technologies, as well as improving information access for stakeholders. Indeed, issues related to industrial property remain largely unknown in the national economic context. It is equally important that the national scientific and technical research system be more closely linked to the information contained in the patent library managed by INAPI. This library represents a key avenue for obtaining information on the state of the art..

By intensifying its commitment to these six strategic areas, INAPI will continue to act as a development agent for the Algerian economy and businesses, making industrial property, a key pillar of an innovation-driven economic growth strategy, more accessible:

- Area 1: Improve service to users by reducing request processing times.
- Area 2: Make information more accessible through the inapi.org website.
- Area 3: Promote the use of industrial property to stimulate growth through innovation.
- Area 4: Contribute to improving the legal and institutional framework.
- Area 5: Become a key player in the fight against counterfeiting.
- Area 6: Continue to evolve from a procedure-based culture to a service-oriented culture.

II. History of INAPI

The Algerian National Institute of Industrial Property (INAPI) is a public industrial and commercial establishment (EPIC) with legal personality and financial independence, operating under the supervision of the Minister of Industry and Mines. The institute is responsible for protecting industrial property rights by providing public services that include registering applications for the protection of patents, trademarks, designs, geographical indications, and integrated circuits. INAPI was established by Executive Decree 98-68 of February 21, 1998, which defined its

creation and status following the restructuring of the parent INAPI, which encompassed both industrial property and standardization.

Since independence, responsibility for industrial property has been transferred successively to:

- The National Industrial Property Office (ONPI) in 1963, then to the Algerian Institute for Standardization and Industrial Property (INAPI) in 1973 (as part of a joint operation with standardization activities).
- A descriptive summary of the invention, not exceeding 15 lines in length.
- In 1986, a partial transfer of industrial property activities to the National Trade Register Center took place.
- In 1998, all industrial property operations were centralized within the newly formed INAPI, facilitating a reorganization of its activities, and placed under the supervision of the Ministry of Industry..

III. Missions de l'INAPI

According to Article 7 of Decree 98-68, which establishes the institute's statutes, INAPI is obligated to perform two major tasks.

Tasks in service to the State (public service): Implementing national policy on industrial property. Missions intended for operational staff and researchers, such as:

The examination, registration, and protection of moral rights (trademarks, designs, models, appellations of origin, and patents).

Making technical information more accessible and providing the public with all documentation and information related to its field of expertise.

Promoting, developing, and strengthening inventive and innovative capacity through material and moral incentives.

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