REF Dynamic Analysis

CE Class I Medical Device

User manual

Distribution mode

Available for direct download at

http://virtualisvr.com/espace-client/

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1. GENERAL

1.1. Description

Dynamic Analysis is a software program used to assess right and left upper and lower limb support during various actions: push-ups, squats, etc.

1.2. Indications

This module quantifies weight distribution between the right and left sides.

1.3. Contraindications

Epileptic patients, children under 15 years of age, pregnant women.

1.4. Software field of application

Upper and lower limb pathologies, balance, and posture disorders.

1.5. Intended user

Healthcare professionals: physiotherapists; occupational therapists; neuropsychologists; ENT doctors; neurologists; PMR doctors (physical medicine and rehabilitation), etc.

Research Centers: CNRS, CHU, INSERM, etc.

1.6. Warnings and caution

Immersion in Virtual Reality is a powerful tool, especially for stimuli that can induce sensory conflicts.

> **WARNING**
>
> These stimulations can potentially cause certain disorders: vagal discomfort, epileptic seizures, migraines, vomiting, malaise, dizziness, syncope etc.
>
> This type of re-education must be approached progressively, particularly in Virtual Reality where the stimulation is "powerful".

The contraindications are identical: Mainly epilepsy and migraines.

> **RECOMMENDATION**
>
> As postural reactions can be spectacular, we STRONGLY recommend that you place the patient in a secure environment and stay close to him/her throughout the session to anticipate any loss of balance or discomfort caused by the use of virtual reality.

> **RECOMMENDATION**
>
> It is also recommended to increase the duration and intensity of stimulation very gradually after an initial short session to ensure the patient's tolerance to this type of type of stimulation

Motion sickness is treated by "habituation", so you need to recreate the symptoms experienced during transport.

> **WARNING**
>
> It is essential to stop the session when the first symptoms appear, generally "sweating".

Define a working area of about 3m² to allow for risk-free movements.

Take a 10-to-15-minute break every 30 minutes of use.

It would be counterproductive to take into account the fact that some motivated patients may wish to go further. It's up to the professional to "dose" immersion so as not to provoke neurovegetative symptoms. This type of symptom can intensify in the hour following the session.

Nor can Virtualis be held responsible for any disturbances suffered by patients during or use of their software.

The accessories required to use the software may emit radio waves that can interfere with the operation of nearby electronic devices. If you have a pacemaker or other implanted medical device, do not use the product until you have taken advice from your doctor or the manufacturer of your medical device.
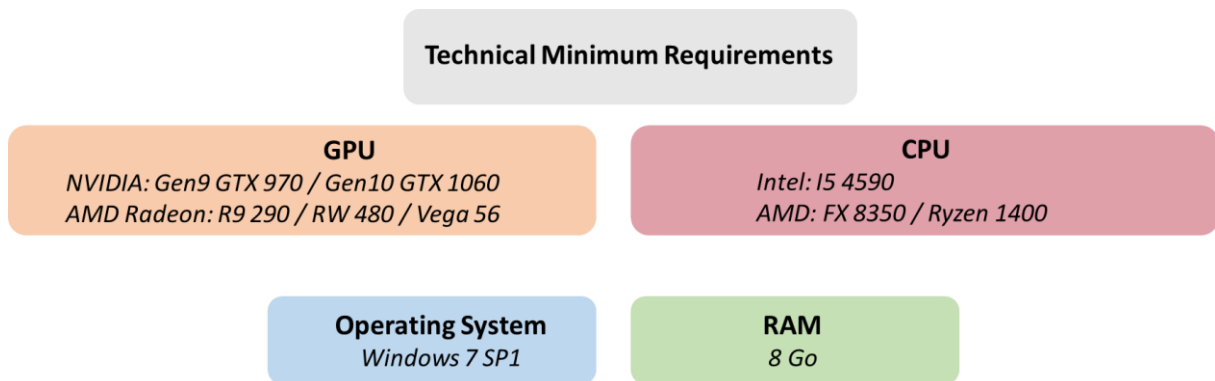
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⚠️ *Any serious incident should be notified in writing to* **qualite@virtualisvr.com**

1.7. Hardware and minimum configuration requirements

Hardware required to use the system:

- VR Ready PC
- VR System: HTC VIVE, HTC VIVE Pro or compatible system
- Lighthouse bases (HTC VIVE tracking)
- StaticVR or MotionVR platform

In order to install and use our virtual reality applications, we recommend a configuration equal to or higher than the system requirements:

Technical Minimum Requirements

GPU	CPU
NVIDIA: Gen9 GTX 970 / Gen10 GTX 1060 AMD Radeon: R9 290 / RW 480 / Vega 56	Intel: I5 4590 AMD: FX 8350 / Ryzen 1400

Operating System	RAM
Windows 7 SP1	8 Go

1.8. Required accessories

StaticVR or MotionVR force platforms.

2. SOFTWARE USE

2.1. Patient setup

On the StaticVR platforms:

- Patient standing on platforms: analysis of squat movements.

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- Patient in push-up or prone position, hands on StaticVR platforms: analysis of push-up movements.
- Patient seated in front of a table on which StaticVR platforms are placed, hands resting on the platforms: analysis of bimanual support movements.

On the MotionVR platform:

- Patient standing on the MotionVR platform: squat analysis.

2.2. Session settings
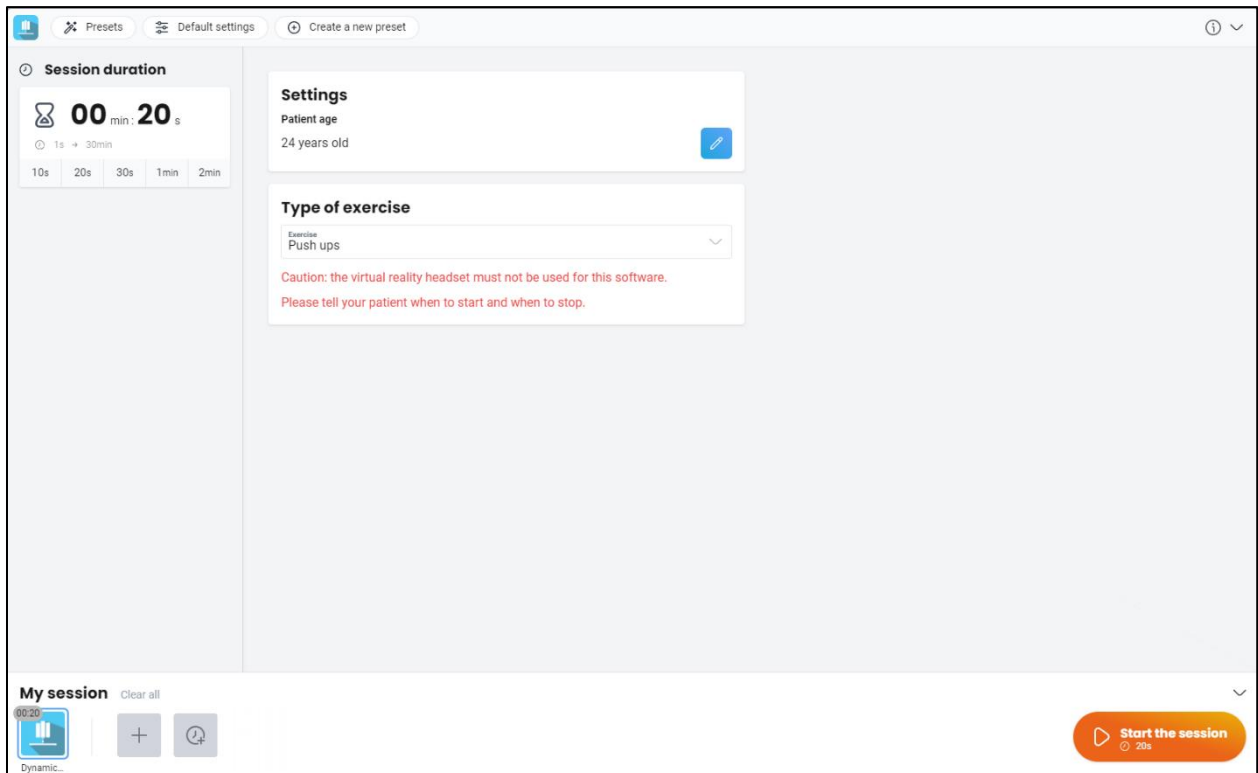
The default session duration is set à 20 seconds.

It can be modified to suit your specific needs.

For this assessment module, you can choose the type of exercise (push-ups, knee push-ups, wide push-ups or squats).
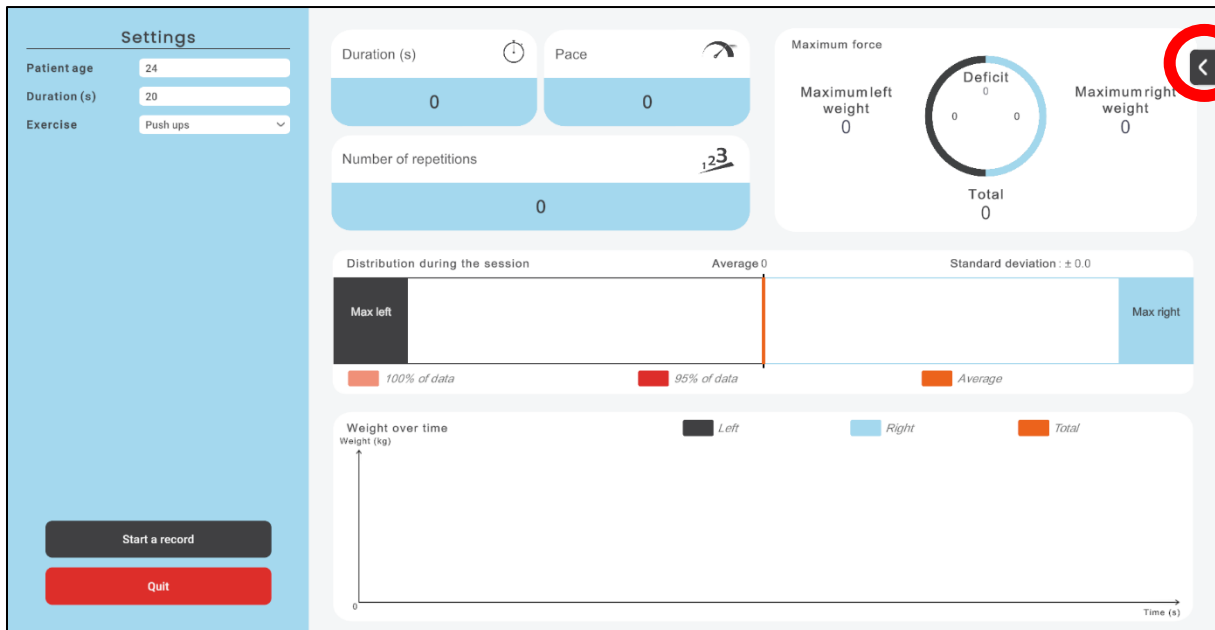
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2.3. Session
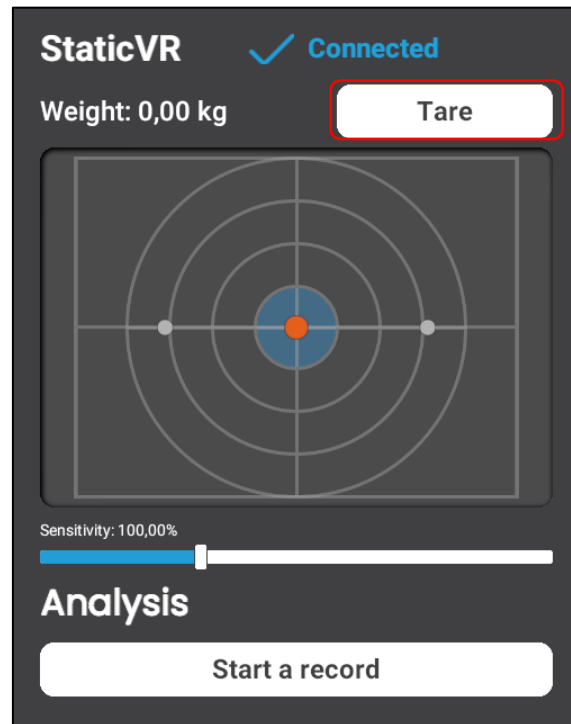
Once the presets have been selected, launch the virtual interface by clicking on "**Start the session**" in the bottom right corner of the screen.

2.3.1. Force platform tare

1. Click on the arrow at the top right of the screen to display the force platform settings (StaticVR or MotionVR).
2. Click on the "**Tare**" button on the force platform (StaticVR or MotionVR) **before letting the patient step up onto it**.

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3. Help the patient onto the force platform.

2.3.2. During the session

Once the patient has been correctly set up, click on "**Start a record**" in the bottom left corner of the screen.

You have 3 seconds to signal the start of the test to your patient.

You must give your patient the start and stop signals.

In the left of the screen, you can modify the session's duration, the exercise type and the patient's age.

In the middle of the screen, you can see the exercise's duration in seconds, the patient's weight distribution between their left and right sides, and its evolution across the whole session, as well as the weight deficit and its corresponding side.

2.4. Shortcuts

Press the "**F**" key on the keyboard to display the number of frames per second.

2.5. Results

Once the session is over, you can access the results.

2.5.1. Summarized results

- By default, the results are as follows:
- Average left weight (in %)
- Average right weight (in %)
- Average left weight (in kg)
- Average right weight (in kg)
- Maximum left weight (in %)
- Maximum right weight (in %)

- Maximum left weight (in kg)
- Maximum right weight (in kg)
- Maximum deficit (in %)
- Maximum deficit side
- Average deficit (in %)
- Average deficit side
- Pace
- Number of repetitions.

2.5.2. Report and charts

Click on the histogram icon to access detailed results and the session report.

Several display modes are available for viewing results:

By default, you are shown all the results (duration, pace, repetitions, average deficit, and maximum deficit).
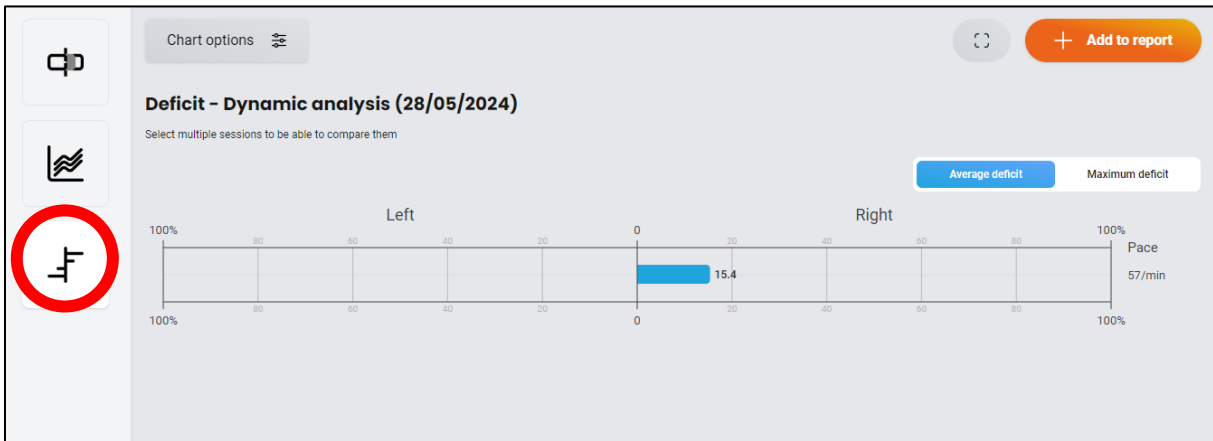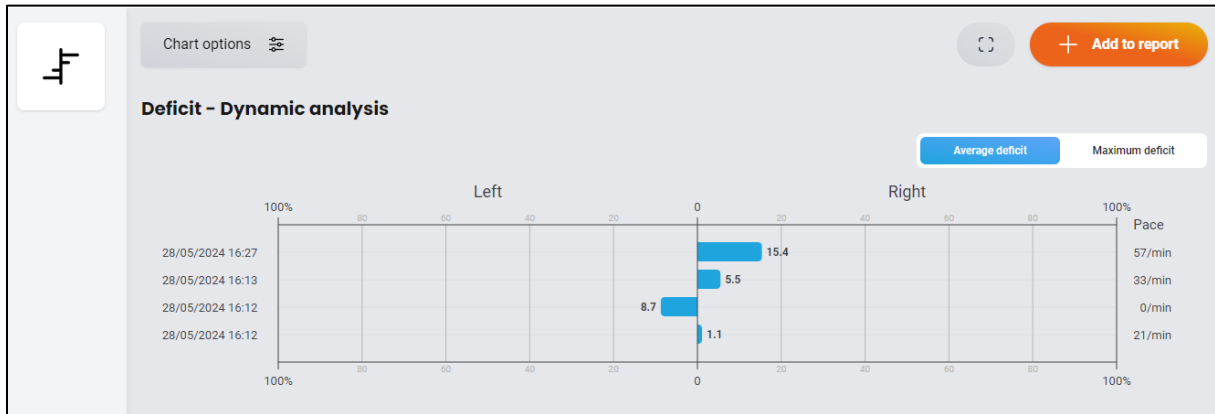
And:
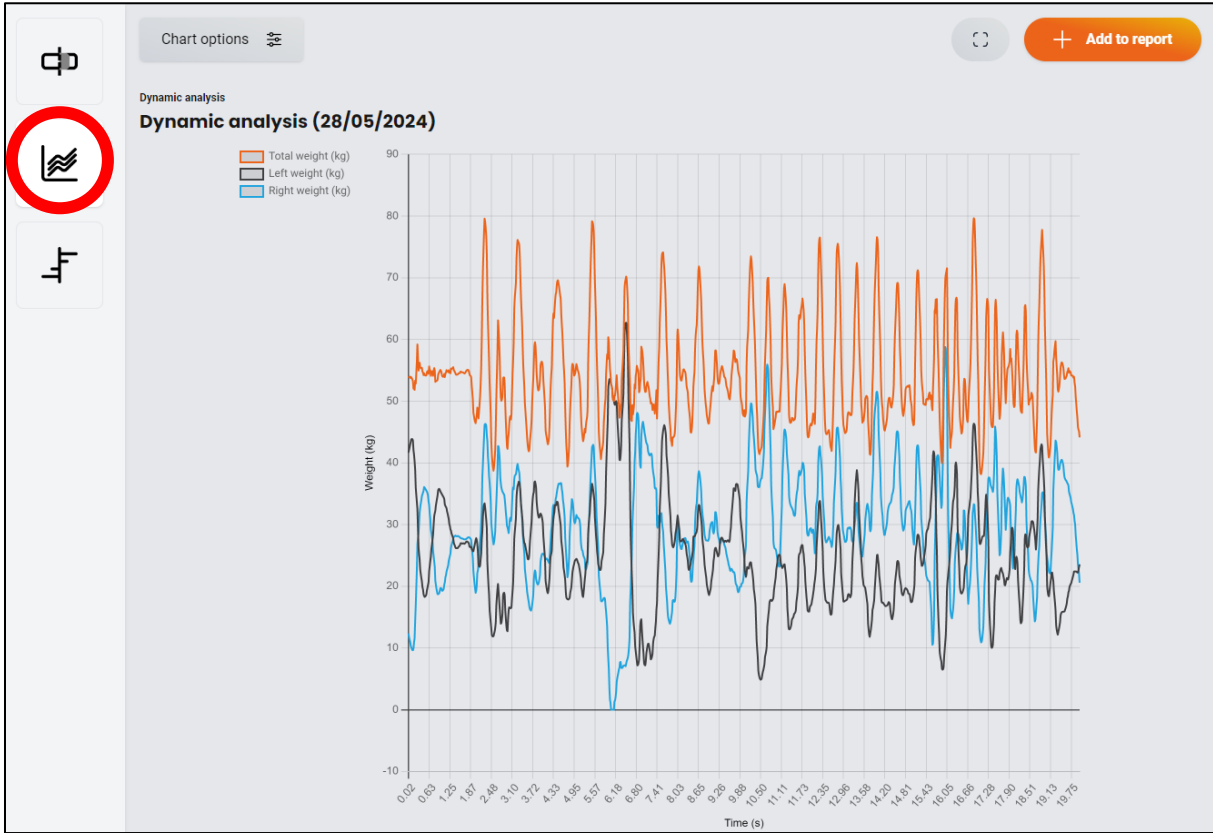
By clicking on the curves button, you can visualize the limbs' supports as curves with their total weight in red.

Or:

You can display the patient's progress across several sessions by selecting more than one session:

You can also access other results in the "**Chart options**".

2.6. Data processing

Data retrieval and analysis uses the Patient Management software (see dedicated user manual).

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