REF **Target Tracking**

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

TARGET TRACKING software is an immersive 3D simulation based on virtual reality technology, which immerses a person in a digitally created artificial world.

Target Tracking is a software program for the rehabilitation of the cervical spine, balance, vestibular system and upper limb. It can be used in neurology (hemineglect, Parkinson's disease, etc.) or in orthopedics for the rehabilitation of various symptoms.

1.2. Indications

Rehabilitation of cervical spine amplitude, proprioception and reflexes. Ability to practice balance (notably vestibular disorders). Comprehensive or analytical rehabilitation of an upper limb (neurology, orthopedics, rheumatology).

1.3. Contraindications

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

1.4. Module field of application

Target Tracking is used to work the cervical spine or upper limb by tracking a target. The targets are insects. The patient must maintain the viewfinder on the target for a set time. The target can be controlled by head movements using the virtual reality headset, or by arm movements using a controller.

1.5. Intended user

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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.

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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.

⚠️ *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)

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
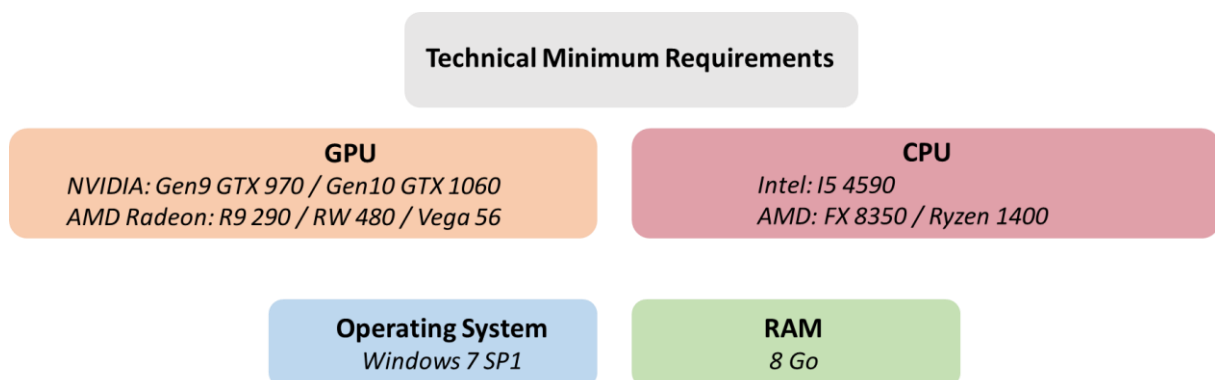
1.8. Required accessories

VR headset. HTC Vive controller optional.

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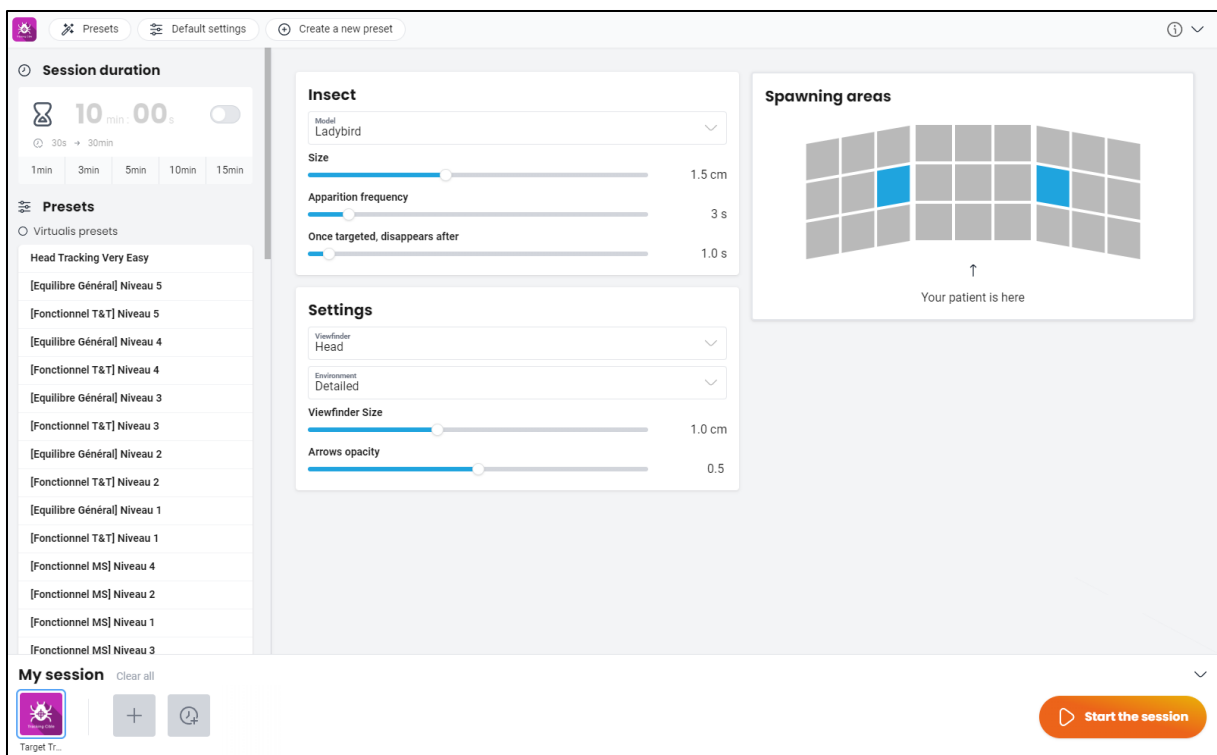
2. SOFTWARE USE

2.1. Patient setup

The patient can be seating or standing.

2.2. Session settings

2.2.1. Presets

Several different protocols are available. The presets show you exercises with different levels that may correspond to therapeutic objectives. They are given as examples and can be modified.
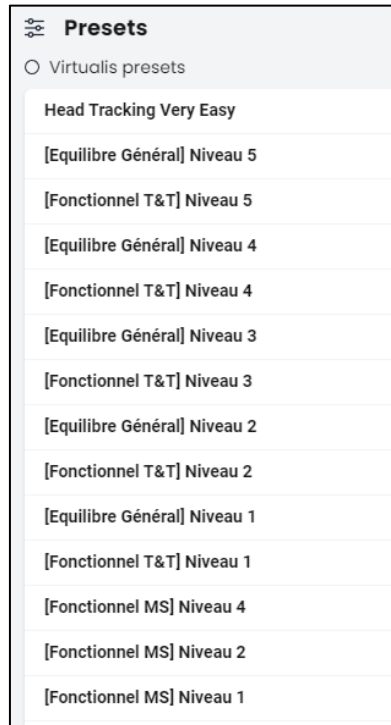
2.2.2. Insect
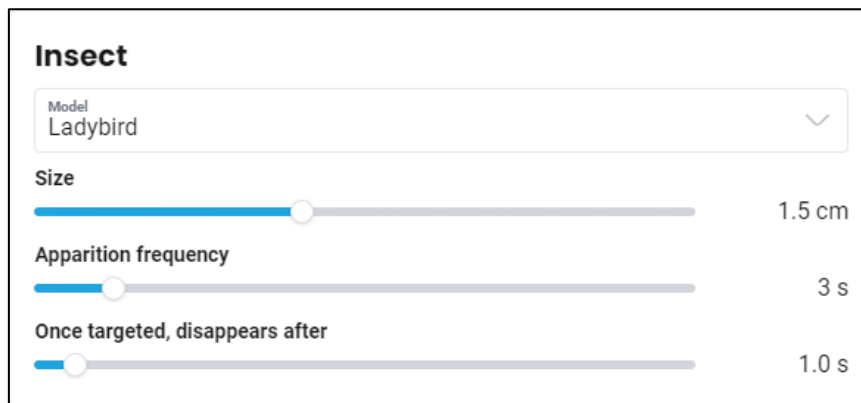
Model:

Several target tracking models are available: fly (3D); beetle; bumblebee; stipule; dragonfly; fly; cleg; glow-worm; ladybird; mosquito; moth; asilide; wasp.
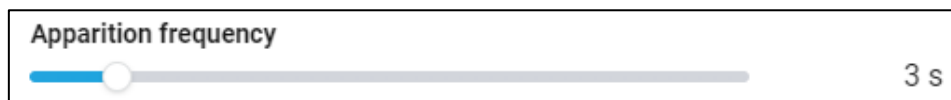
The selection is made from a drop-down menu.

Size:

Adjust the difficulty of the exercise by increasing or decreasing the target's size.

Value: 0.5 to 3.0 cm.

Apparition frequency:

Adjust the difficulty of the exercise by increasing or decreasing the target appearance's frequency.
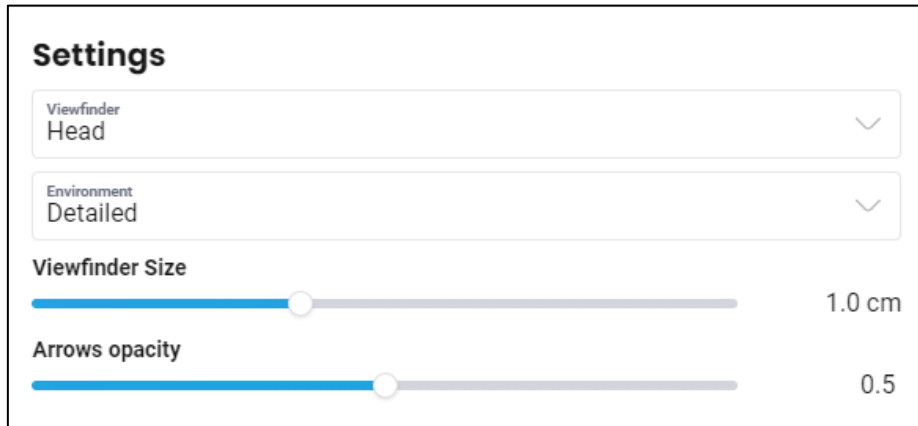
Value: 1 to 20 s.

Disappearance:

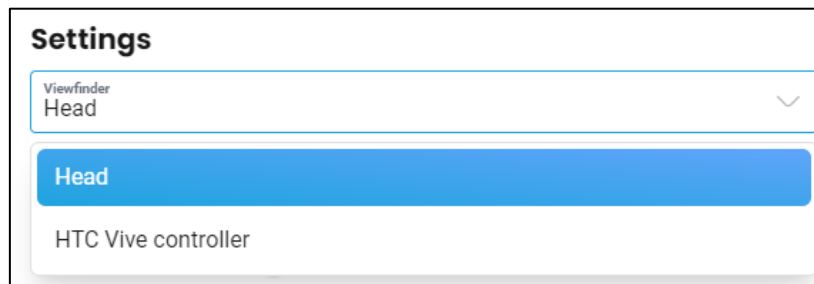Modifies the time it takes for insects to disappear after being targeted.

Value: 0,1 to 2,5 s.
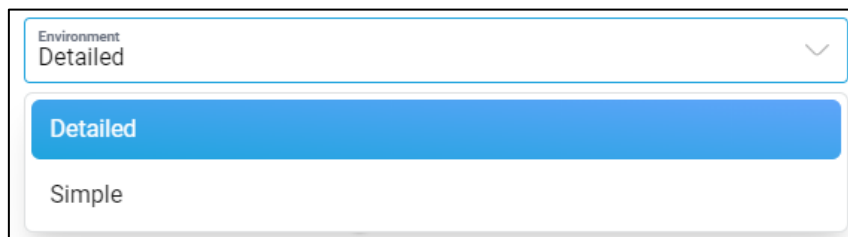
2.2.3. Settings

Viewfinder:

The target aiming mode can be executed in two ways: either using the patient's head movements (with the VR headset) or using upper limb movements (with a controller). The type of aiming device is selected from the drop-down menu.

Environment:

Sets the environment's level of detail.
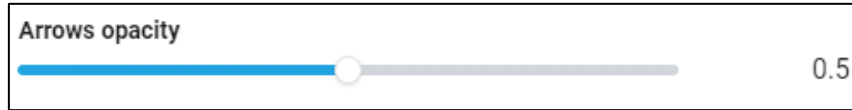

Viewfinder size:

Value: 0.1 to 2.5 cm.
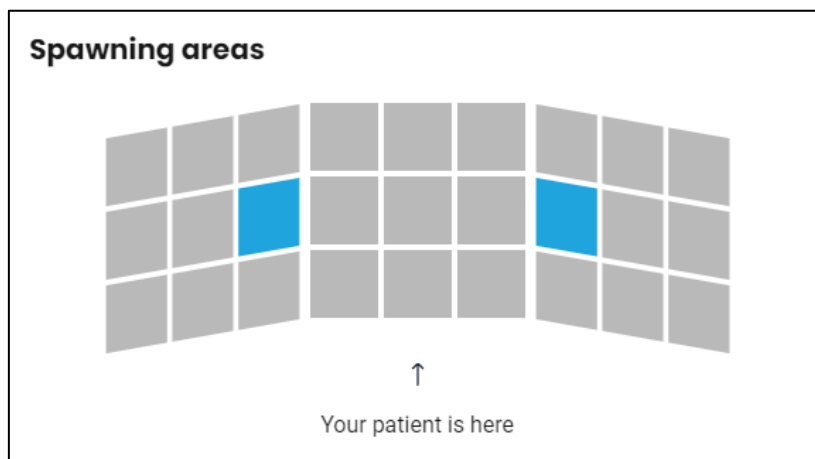
More accuracy is required if the viewfinder is small.

Arrow opacity:

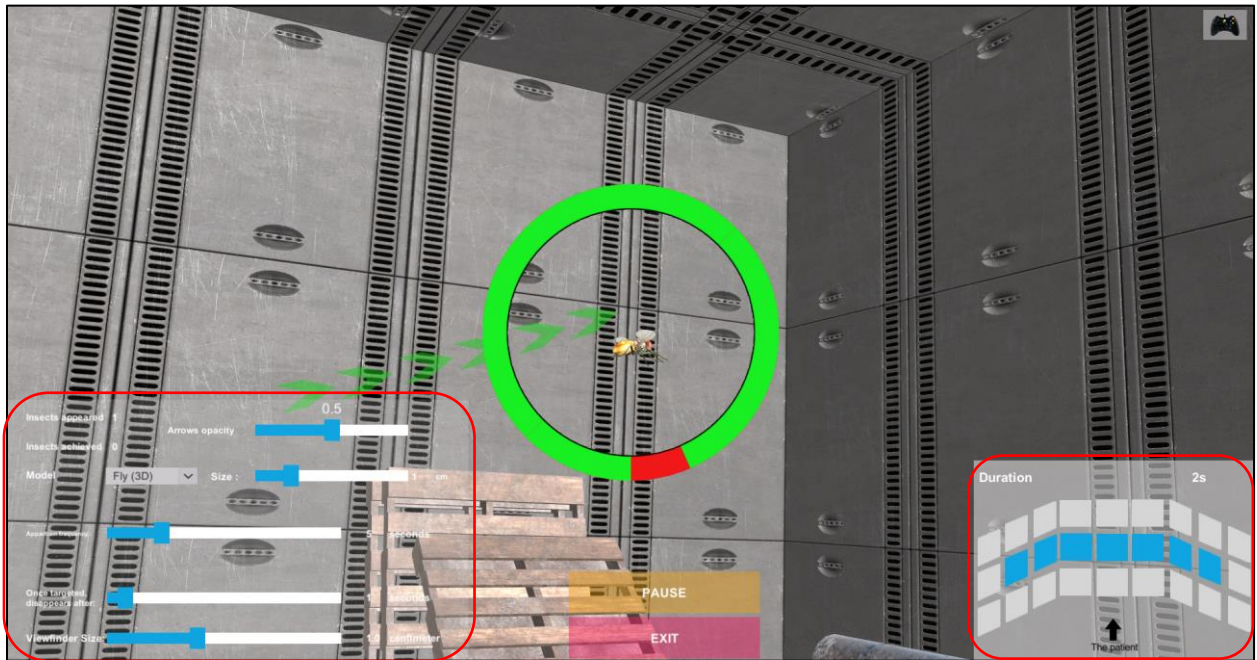Value: 0.0 to 1.0. From very see-through to very opaque.

2.2.4. Spawning areas

Insect spawning zones can be selected. The selection is made by simply clicking the required areas. At least two zones must be activated. When a zone is activated, it turns blue.

2.3. Session

Once the presets have been selected, click on "**Start the session**" in the bottom right corner of the screen.
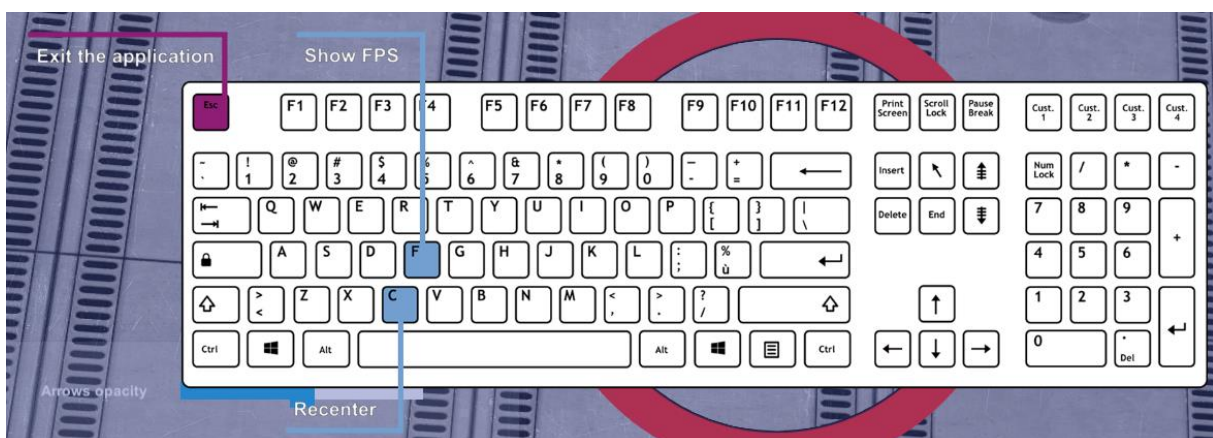
During the session, the user can modify the parameters from the **left-hand side of the screen**. They are not visible to the patient.

In the bottom right corner of the screen, the user can modify the spawning areas.

2.4. Shortcuts

During the session, the shortcut list is found by clicking on the Xbox controller icon at the upper right corner of the screen.

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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:

- Spawned bugs
- Touched bugs
- Score.

2.5.2. Report and charts

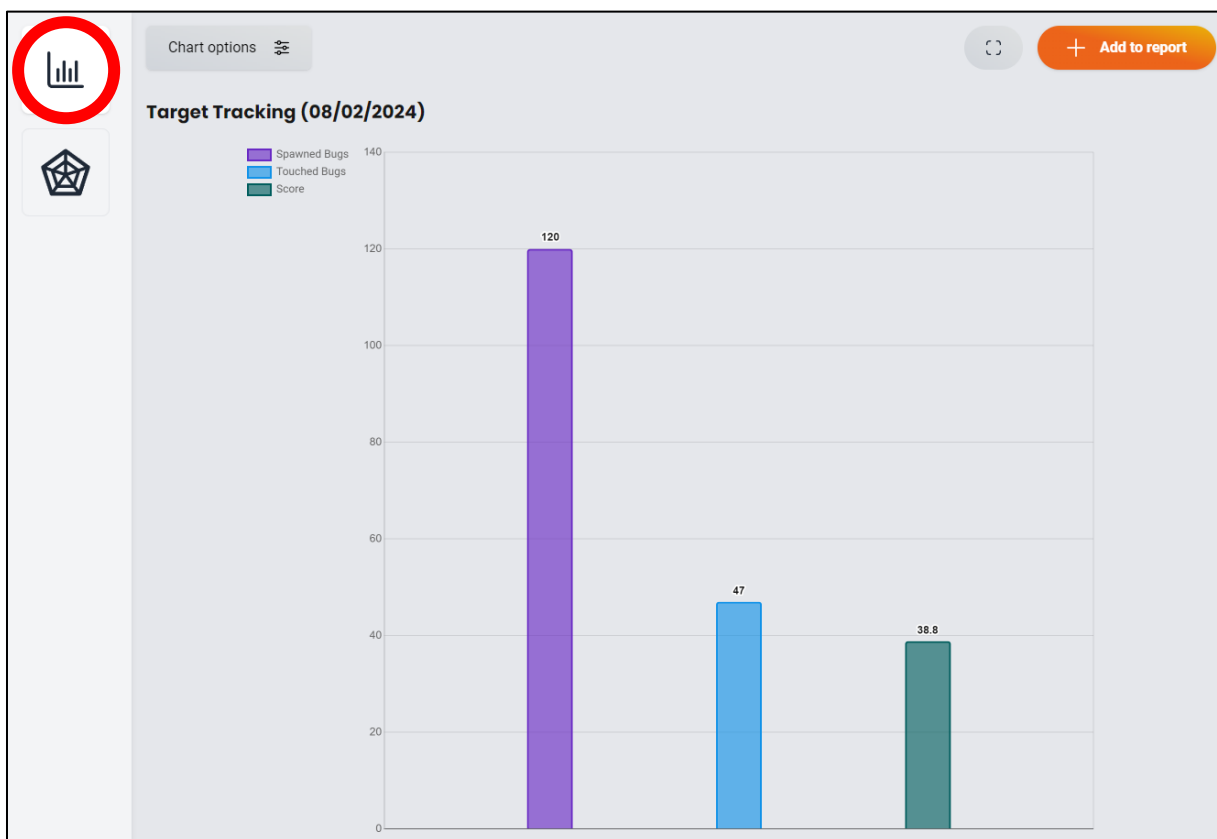Click on the histogram icon to access detailed results and the session report.

Several display modes are available to view the results:

And:

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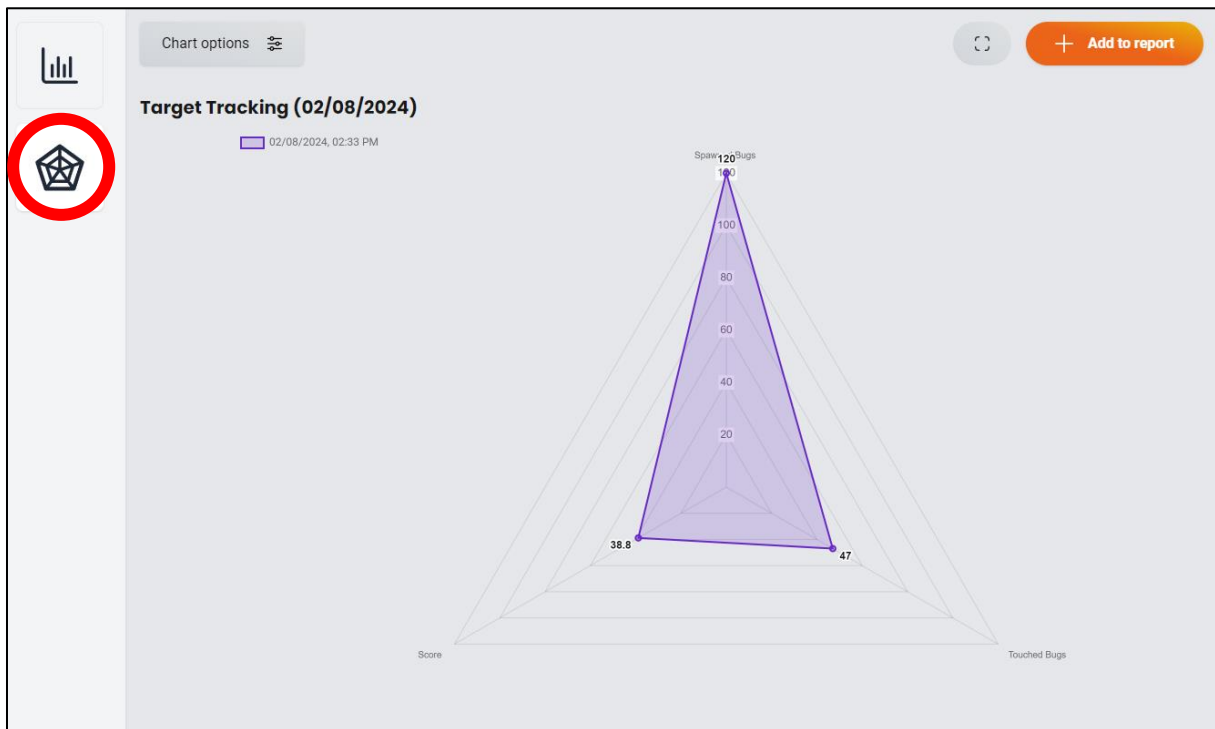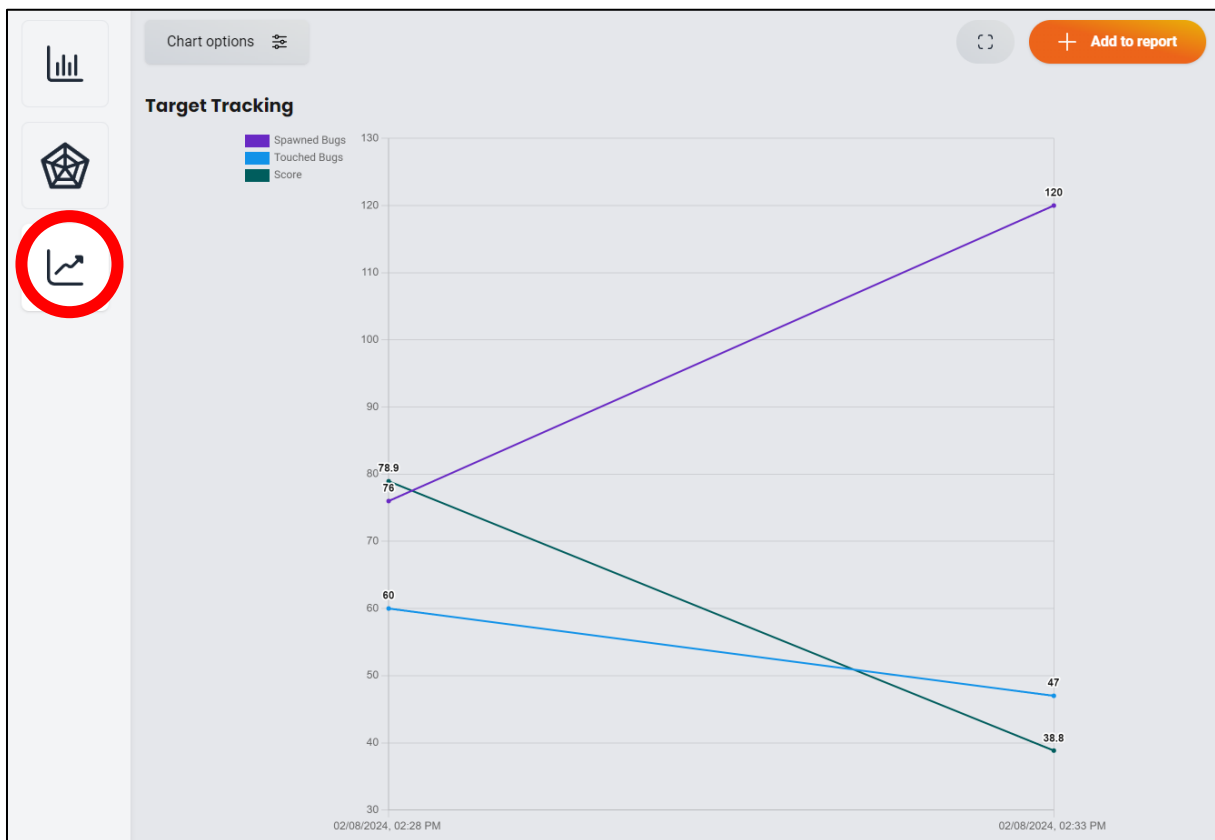
If more than one session is selected, the following graph is available:

You can access other results in "**Graph options**".

Include properties
Unselect all

Results

Spawned Bugs		+
Touched Bugs		+
Score		+

Parameters

Model		+
Size	cm	+
Viewfinder		+
Environment		+
Apparition frequency	s	+
Once targeted, disappears after	s	+
Viewfinder Size	cm	+
Arrows opacity		+

2.6. Data processing

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