



REF Whac-a-mush

CE Class I Medical Device

User manual

Distribution mode

Available for direct download at
<http://virtualisvr.com/espace-client/>
Use under license

 **VIRTUALIS**

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DESCRIPTION

Whac-a-mush software is an immersive 3D simulation based on virtual reality technology which allows a person to be immersed in an artificial digitally created world. The software simulates a typical "whack-a-mush" game.

INDICATIONS

Rehabilitation of the upper and lower limbs and trunk, attention and inhibition functions. Hemispatial neglect.

CONTRAINDICATIONS

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

FOR USE BY

Healthcare professionals: Physiotherapists; Ergotherapists; Neuropsychologists; ENT doctors; Neurologists; PMR doctors (physical medicine and rehabilitation), etc.

Research Centers: CNRS, CHU, INSERM, etc.

WARNINGS AND CAUTIONS

During sessions, stay close to the patient in order to anticipate any loss of balance or discomfort caused by the use of virtual reality.

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.

Potential adverse effects are those due to the use of Virtual Reality, namely vomiting, malaise, dizziness, syncope.

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



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1. GENERAL

1.1. Advice for use

This type of re-education must be undertaken progressively, especially in Virtual Reality where the stimulation is much more "powerful" than the traditional optokinetic stimulators.

These stimulations have the potential to cause certain disorders: Vasovagal syncope, epileptic seizures, migraines, etc. (Despite a test phase on more than 2000 patients. Similarly to previous generation optokinetics, caution is required)

The contraindications are identical: Mainly epilepsy and migraines.

As postural reactions can be spectacular, it is VERY STRONGLY advised to place patients in a safe environment and to stay close to them throughout the session.

It is also recommended to increase the duration and intensity of the stimulation very gradually, after an initial short session to make sure of patients' tolerance to this type of stimulation.

Virtualis declines any liability for any disorders suffered by patients during or after use of its software.

1.2. 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)
- XBOX 360 Controllers
- HTC VIVE Controllers
- HTC VIVE Trackers
- USB HUB

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

NVIDIA: Gen9 GTX 970 / Gen10 GTX 1060
AMD Radeon: R9 290 / RW 480 / Vega 56

CPU

Intel: i5 4590
AMD: FX 8350 / Ryzen 1400

Operating System

Windows 7 SP1

RAM

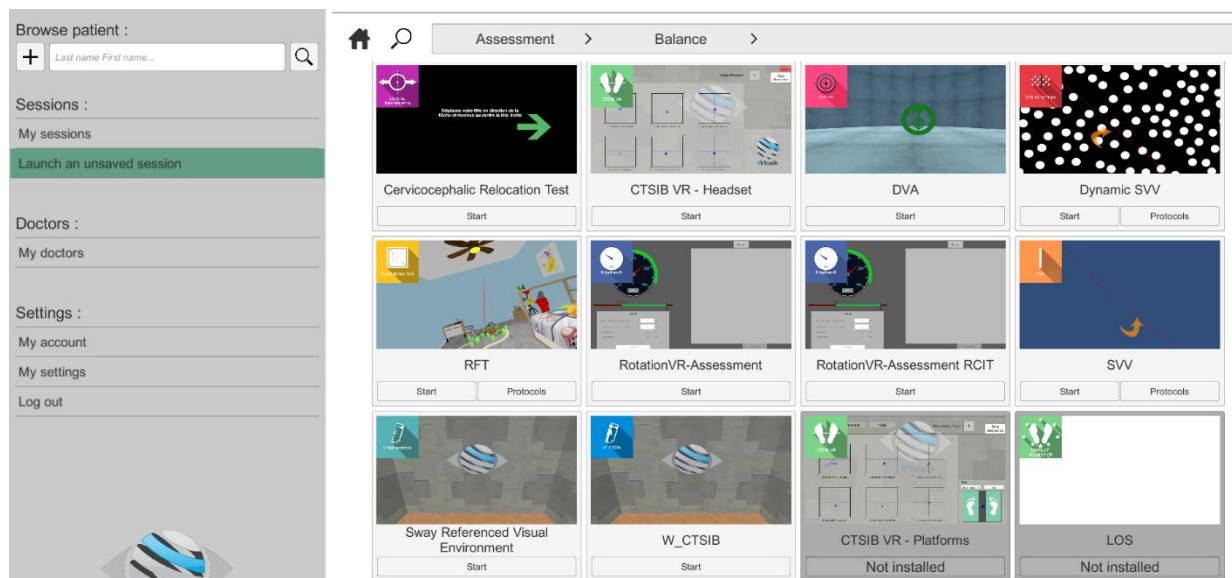
8 Go

2. USE OF PATIENT MANAGEMENT

Once connected to the Patient Management software, you arrive on the home page. It is from this home page that you will be able to start your VR software as well as the other Patient Management functions.

The software can be grouped according to criteria such as "Assessment" or "Re-education" and then by pathology type: Neurology, Balance, Functional, Motion Sickness or Fears - Phobias.

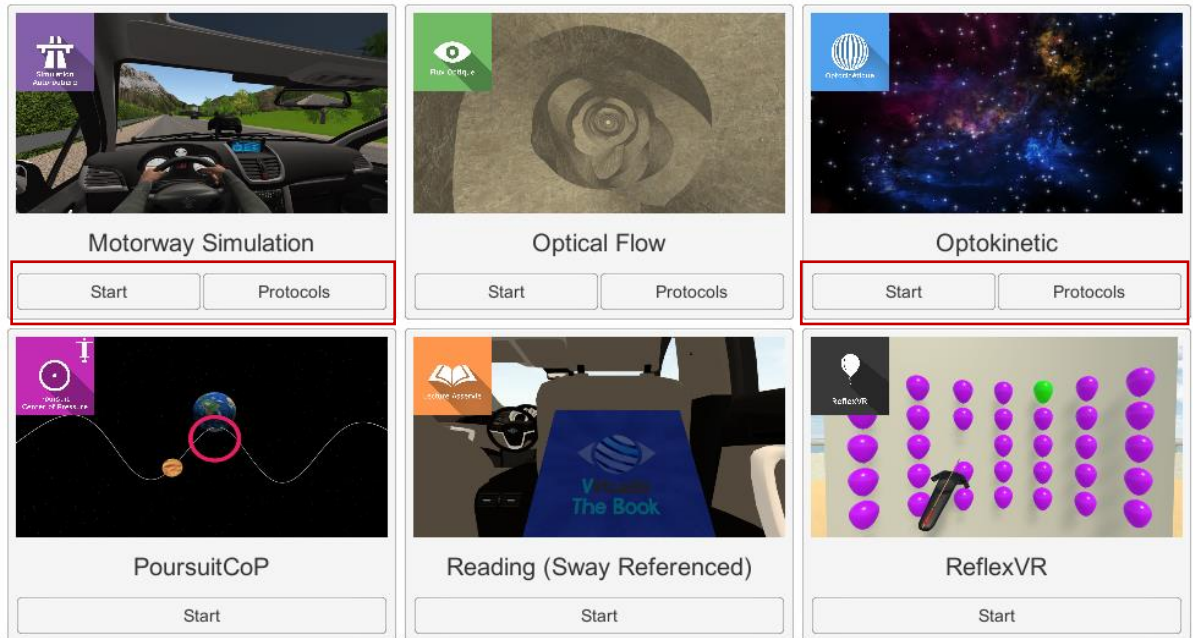
You can start or switch from one software to another from the home page by clicking the corresponding "Start" or "Protocols" button.



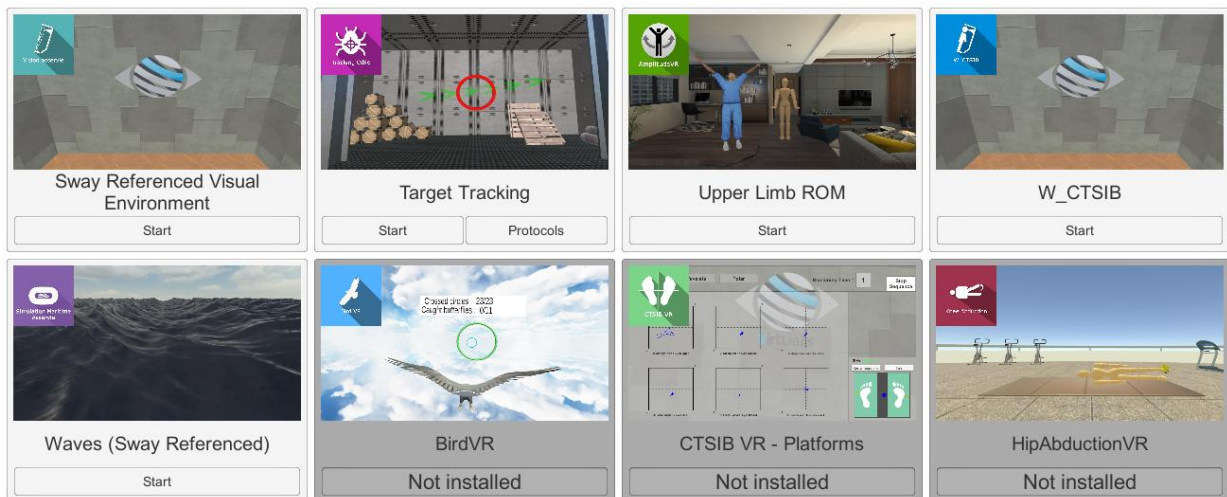
Some software can be started either in **manual mode**, by directly clicking the "Start" button, or in **protocol mode** by clicking the "Protocols" button.



Manual mode allows users to choose the settings for each environment. **Protocol mode** offers several sessions with different difficulty levels to test and gradually accustom patients to the VR environment.



Software that is not part of your subscription package is grayed out. If you want to use it, please contact our sales department.





3. Whac-a-mush

3.1. Start interface



When the software is started in **manual mode** ("Start" button), the opening is performed in a launch interface, consisting of a module selection menu on the left, a set up area on the right, and an action area at the bottom right.

Depending on the module selected in the left menu, the set up area shows the various possible settings/information.

It is possible to access the general Patient Management menu from the start interface by simply clicking the "Quit" button located in the action area, or by pressing the "escape" key on the keyboard.

The software is launched by simply clicking the "start" button in the action area.



Once this button is pressed, the software starts by taking into account the specified settings. You also have the possibility to modify some settings when the software has been launched, using the mouse.

The Start/Quit buttons allow the environment to be played back or stopped entirely to adapt the experience to the patient's sensations.

Once an environment has been selected, it launches in the headset, and you can see and track what is happening in your patients' headset from the software window.



3.2. Software field of application

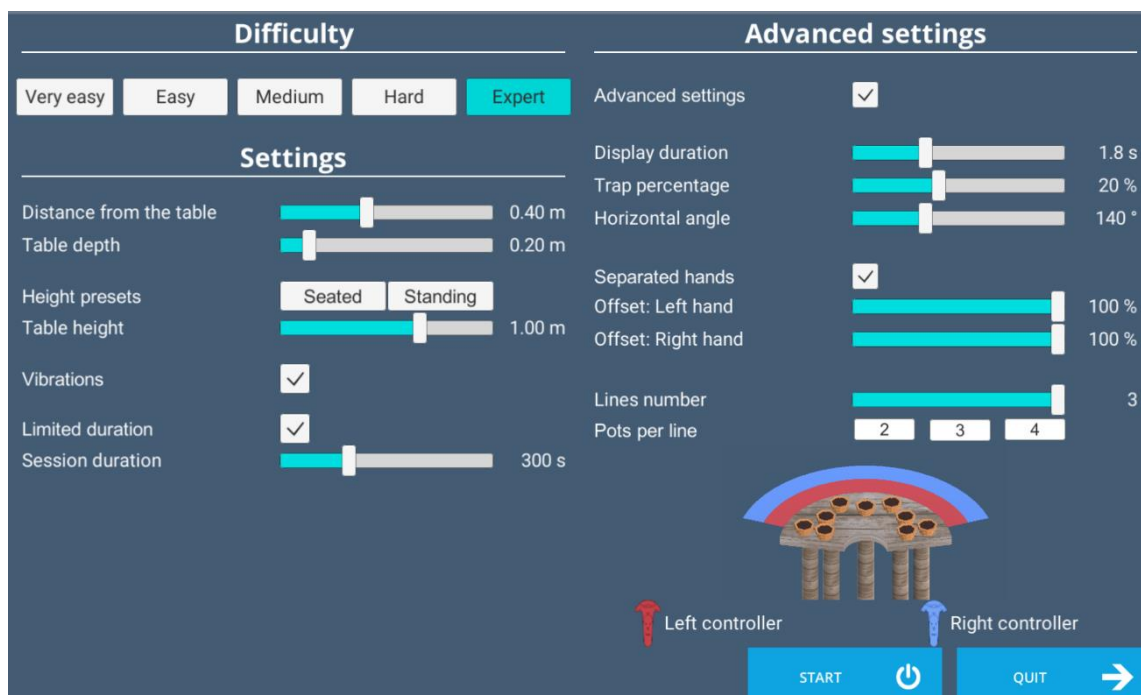
The software is used to work the upper and lower limbs as well as the trunk, in a fun environment. The patient has to whack a mushroom growing in a pot located in a horizontal plane using a virtual mallet. Possibility to dissociate the work of the upper limbs, stimulate the inhibition functions. Possibility to modulate the amplitudes and movement speed.

Indicated for pathologies of the upper limbs, trunk or lower limbs of neurological or orthopedic origin.

3.3. Installing the patient

Sitting or standing position; Feet can be positioned at will: together, pointing out, etc.

3.4. Session settings



Depending on the difficulty of the selected exercise, the variable parameters for this software are as follows:



Difficulty setting

Note: presets are provided for each difficulty level; these presets can be changed if the advanced settings are enabled

Very easy: 3 targets on a single line

Easy: 3 targets on the 1st line and 2 targets on the 2nd line

Medium: 2 targets on the 1st line and 4 targets on the 2nd line

Hard: 3 targets on the 1st line and 5 targets on the 2nd line

Expert: 2 targets on the 1st line, 3 targets on the 2nd line and 4 targets on the 3rd line

Settings

Distance from the table and Table Depth

Both parameters can be set using the cursor. The distance adjustment is used to move the table away or closer. The depth adjustment increases or decreases the table surface area.

Table height presets:

The table height preset depends on the selected working position: Sitting or standing.

Vibrations

Possibility to activate a vibration in the controller on impacts by checking the corresponding box.

Note: When there are gripping difficulties, the controller can be replaced by the tracker attached to a limb segment using the strap provided.

Limited duration

Used to define the session duration

Advanced settings

Possibility of activating the advanced settings by checking the corresponding box

Display duration

Corresponds to the defined target display time: time defined to whack the targets before they disappear.

Trap percentage

The number of traps can be set using the cursor.

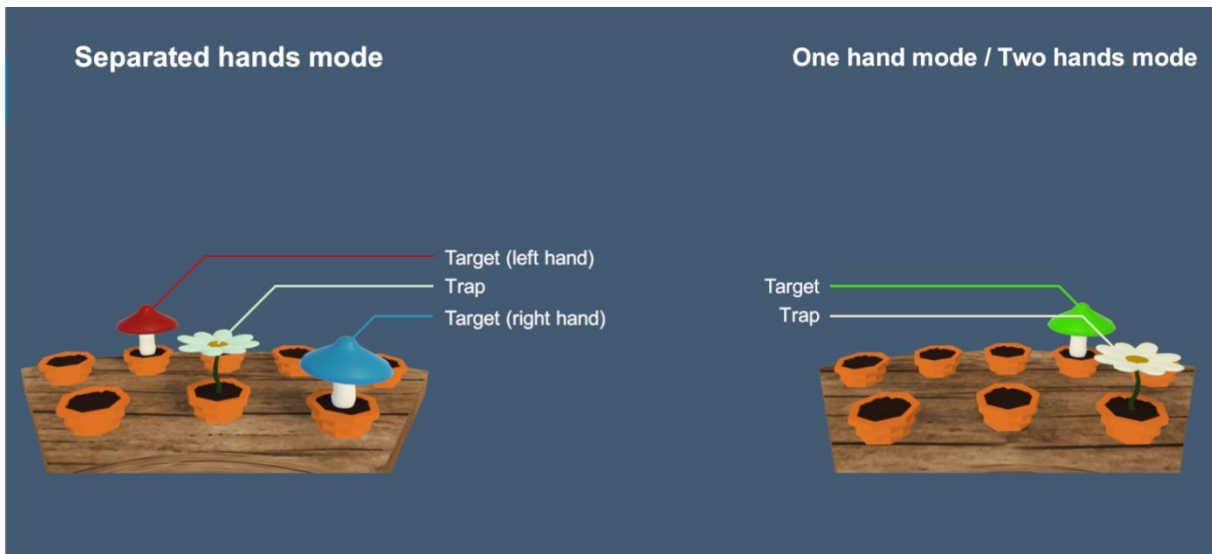
Horizontal Angle:

Adjusts the horizontal amplitude of the table. At the maximum setting the table will surround the patient.



Separated hands

- In **separated hands mode** there will be a different color for mushrooms to be whacked by the right and left hand. The targets are of different colors: the red targets must be whacked by the left hand and the blue targets with the right hand while avoiding the traps.
- If this option is not activated, the default mode is the **one or two hands mode**: this mode allows the use of both hands to whack the targets while avoiding the traps. The targets to be whacked will all be green.



Hand offset

The mushroom appearance zones can be defined specifically for each hand using the cursor. They may or may not overlap. There will be a change in the preview screen showing the user the table and the overlapping areas.

Lines number

Used to choose the number of lines: 1, 2 or 3

Pots per line

Used to choose the number of pots on each line by entering the required number

Note: the "lines number" and "pots per line" settings can be customized if the advanced settings are enabled

Tracker settings

Tracker parameters such as handle length, tilt and rotation of the mallet can be customized using the slider.

Color inversion of trackers or controllers

Activation of this option is possible for the separated hands mode: with the left hand you will have to crush the blue targets and with the right hand the red targets while avoiding the traps.

Score

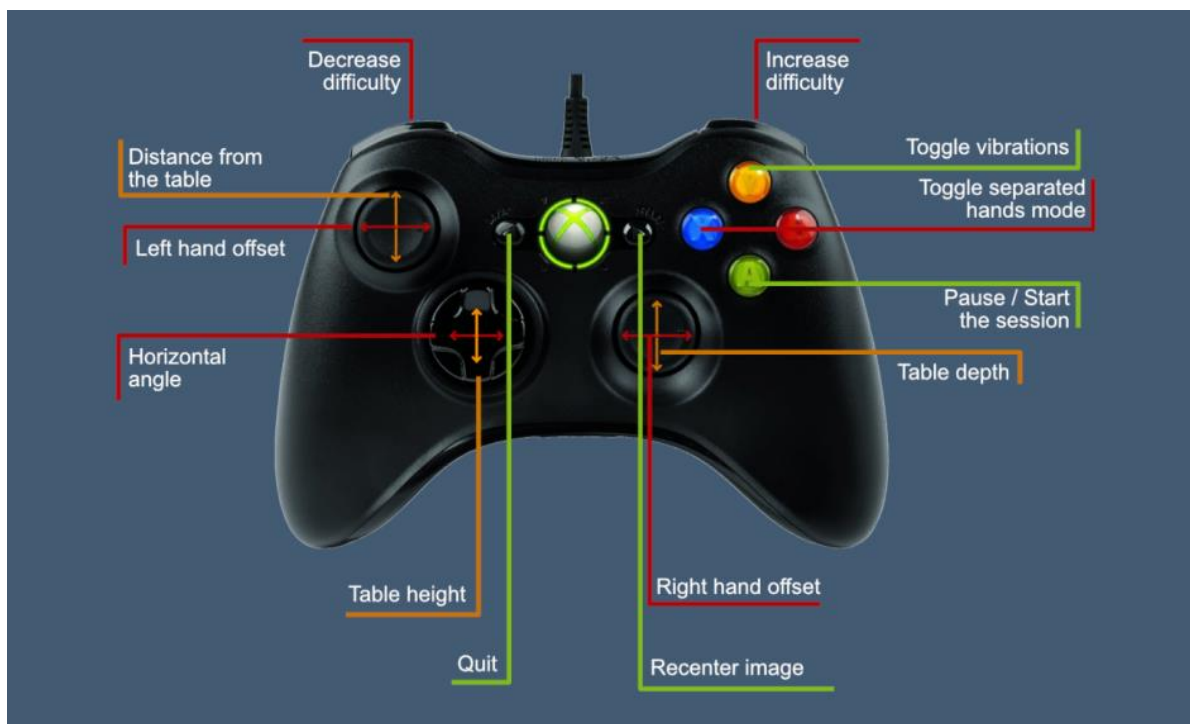
At the end of the exercise, users will get a score representing their success: the number of whacked mushrooms, the number of missed mushrooms and the errors.

The exercise duration and reaction times are also displayed.

3.5. Shortcuts

Keyboard or joystick shortcuts are accessible:

- on the "Shortcuts" tab available at the start interface level
- From the software, by clicking on the joystick icon in the upper right corner of the screen





3.6. Data processing

Data retrieval and analysis uses the Patient Management software.