REAL™ IMMERSIVE SYSTEM

USER MANUAL

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WARNING! CAREFULLY READ ALL INSTRUCTIONS PRIOR TO USE. OBSERVE ALL WARNINGS AND PRECAUTIONS NOTED THROUGHOUT THESE INSTRUCTIONS. FAILURE TO DO SO MAY RESULT IN COMPLICATIONS.

DEVICE DESCRIPTON

The REAL® Immersive System is a digital hardware and software medical device platform utilizing virtual reality technology designed for use in a clinical environment, or any other facility that may facilitate rehabilitation, setting that focuses on physical, neurorehabilitation and/or wellness needs.

REAL Immersive System consists of following components:

- All-In-One Headset with Software Application
- Headset Controller
- Large Sensor
- Small Sensors
- Tablet
- Sensor Charger (charging station)
- REAL Sensor Bands

Tablet is fitted with a touch screen, a power/lock key that turns the component on or off, and a charger/accessory port.

The headset contains a power button that turns the component on or off and a charger/accessory port. The headset also provides visual feedback of virtual reality applications in concert with the REAL Immersive System tablet and small and large sensors.

Large and small sensors (WTM and WSMs) are equipped with mechanical and electrical components that measure motion and direction in physical space and then translate that information into a virtual environment.

The sensor charger powers the sensors.

Headset controller (Only to be used in certain troubleshooting and administrative tasks. Not used during patient therapy.)

At full charge, the entire system can last at a minimum of 60 minutes and it is recommended that a therapy session does not exceed 60 minutes. Please sufficiently charge all components between use for a minimum of 60 minutes.

In the event of electromagnetic disturbances, the performance of the REAL Immersive System may be affected.

The REAL Immersive System is a Type BF Applied Part.

Frequently used features and functions:

Headset

- Plug headset power cord into wall outlet and headset to charge device. • Press power button to power on headset or restart headset. The power button is on top of the headset.

Headset Controller

- Buttons on the controller are used to control power, connect to headset, access settings, or control volume.

Large Sensor and Small Sensors

- Components are removed or placed back into the sensor charger (charging station) to activate or charge device.
- Components are placed into the sensor bands.

Tablet

- Plug tablet power cord into wall outlet and tablet to charge device.
- Press power button to power on tablet or restart tablet. The power button is on the edge of the device.
- User Interface:
    - Selecting the application
    - Logging in
    - Adding or selecting patient
    - Initializing and syncing to sensors
    - Selecting, starting, modifying, or ending therapy session
    - Viewing data
    - Logging out

Sensor Charger

- Plug sensor charger power cord into wall outlet and sensor charger to power on device to charge sensors.

Sensor Bands

- Place or remove sensor bands on or from patient.

There is no preventive inspection, calibration, and maintenance necessary for the REAL Immersive System besides the initial set up procedure. During the three-year product lifespan of the REAL Immersive System, the device will continue to perform safely without any routine maintenance. No parts within the REAL Immersive System will require inspection nor maintenance by a service personnel to ensure basic safety during the three-year product lifespan. Circuit diagrams and calibration instructions are not provided because service or parts repair is not necessary.

At the end of the three-year product lifespan, the user should dispose of the device through an environmentally safe electronic waste recycle system. Contact the local REAL representative if the following event occurs:

- The system no longer stays powered on and connected through the entire recommended duration of a therapy session.

Supply mains are electrically isolated in medical equipment to maintain basic safety.

The full expected latency of the device, including movement detection, processing, and visual representation is 35 milliseconds or less. This value is considered minimal and sufficiently low enough so that movement can be quickly detected.

INDICATION FOR USE
The REAL™ Immersive System is an immersive virtual reality and display system that interactively displays and tracks upper-extremity rehabilitation exercises for adult patients using a combination of virtual environments and full presence tracked avatars for visual feedback. These rehabilitation exercises are intended to be conducted in a seated position in a clinical environment or any other facility that may facilitate rehabilitation and prescribed and supervised by a medical professional trained in rehabilitation therapy.

CONTRAINDICATIONS
There are no known contraindications.

WARNINGS
If a patient complains of motion sickness, dizziness, headache, eye strain, or fatigue when using the device, stop use of device immediately.

Use caution when using this device if a patient has a history of vestibular issues or motion sickness.

PRECAUTIONS
Ensure a safe environment for the patient while performing activities with the device (e.g. remove any surrounding obstacles and ensure that the patient is unlikely to trip or fall). As this device is to be used for upper body rehabilitation, we recommend that the patient remain seated to avoid a fall.

Be aware of the patient's limitations in range of motion and avoid device or program use that could lead to excessive gestures that could injure a patient.

Extended use of the headset can cause discomfort or eye strain.

Incorrect placement of the sensors on the patient may result in the avatar appearing incorrectly or distorted on the headset and tablet.

Damage (mechanical and electrical) may result if the tablet, headset, sensors, and/or sensor charger are dropped or struck against another object. Device is not intended for continued use if dropped from higher than 1 meter.

Surface temperature around the headset exhaust may reach 46°C if operating above nominal room temperature.

3rd conductor of the AC cord is only a functional earth. To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

Sensors will transmit inaccurate position data if used near metal including, but not limited to, wheelchairs, walkers, and utility carts.

Headset tracking can be lost or compromised if large objects obscure the headset.

At no time should liquid products be allowed near any device component.

No modification of this equipment is allowed.

Use of accessories, transducers, and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the REAL Immersive System, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.

Accessories such as power adapters and cords should not be replaced by the end user and should only be replaced by Penumbra. Any changes or replacements of accessories will likely impact compliance of REAL Immersive System.

Use of this device should be in a secure information technology environment. Outbound https communication channels must be open.

AC power cord must not exceed 6 feet in length.

POTENTIAL ADVERSE EFFECTS/EVENTS
Visual stimulation through head-mounted displays have a small possibility of provoking an epileptic seizure. Should this occur, stop using the device immediately. Other possible complications include, but are not limited to, the following:

- claustrophobia
- discomfort or pain in the head or eyes
- disorientation/vertigo/dizziness
- drowsiness
- eye strain
- falls or fractures
- headache/migraine
- insomnia
- light-headedness
- motion sickness
- nausea• pain
- seizure
- repetitive strain injury
- vision problems
- skin irritation

Should any of the above occur, stop using the device immediately.

OPERATOR PROFILE

Operators of the REAL™ Immersive System should be trained in rehabilitation therapy. Follow hospital guidelines for use and access to account login credentials. The same account login credentials shall not be used by more than one REAL System at any given time.

Note: These rehabilitation exercises are intended to be conducted in a clinical environment and prescribed and supervised by a medical professional trained in rehabilitation therapy. Rehabilitation therapy treatment and technique decisions will vary based on the clinical judgement of the treating medical professional. A medical professional must be present at all times to provide direct supervision throughout course of therapy.

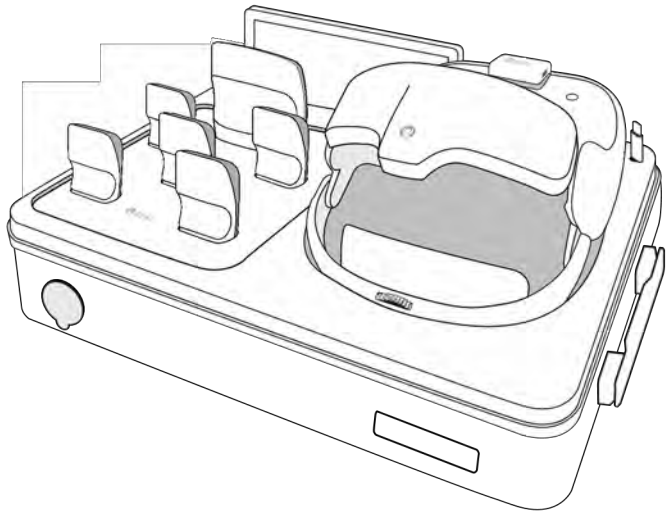
OPERATING PROCEDURE

Note: Prior to first time use, HMD and Tablet must be configured and connected to the local internet. Note: Over-the-air software updates may occur throughout the lifespan of the REAL System. User may be prompted/required to complete software updates to continue using the product.

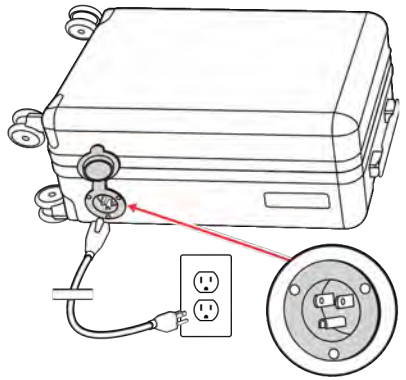
Note: These rehabilitation exercises are intended to be conducted in a seated position. The patient must be seated at all times when the system is in use.

SECTION 1: GETTING STARTED AND CHARGING COMPONENTS

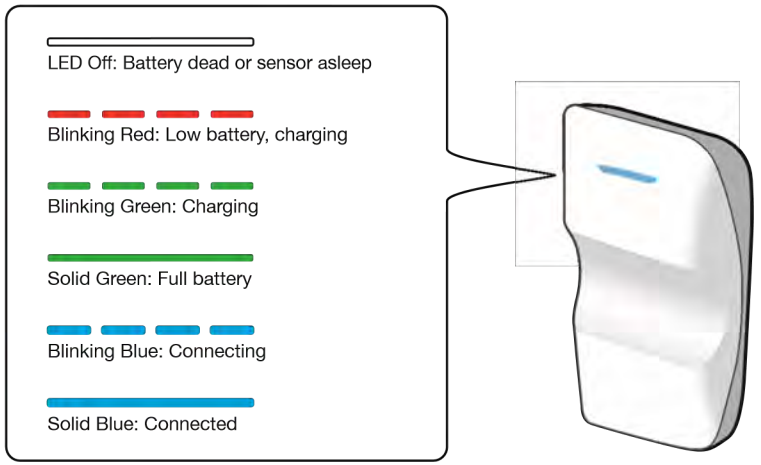
1. Remove REAL Immersive System case from the shipping container.



2. Connect the REAL Immersive System case to its power cord (AC adapter power cord). Plug the power cord into a grounded electrical outlet, making sure that it is the same voltage as indicated on the unit nameplate. Ensure the power receptacle is connected to a supply mains with protective earth.

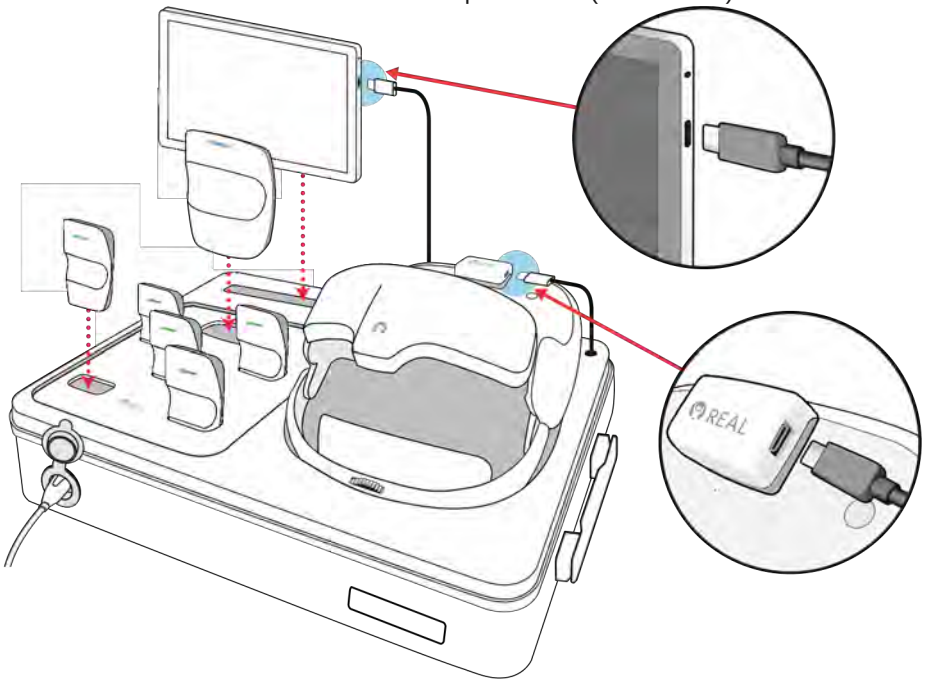


3. Ensure sensors with white sides facing forward are in their corresponding size slots on the sensor charger. LED lights on sensors will show the following:



4. Ensure the headset is connected to its power cord (USB-C cord). LED lightson top of headset will only show blinking green or solid green to indicate charging status.

5. Ensure the tablet is connected to its power cord (USB-C cord).



SECTION 2: INTERNET CONNECTIVITY

Connecting via WiFi

1. Turn on tablet by pressing power button for approximately 5 seconds (May take up to 30 seconds if tablet was fully drained of battery).

2. Open the TherapyView™ app if it is not already open.

3. On the log in page, click on the “Network Setup” button.

4. Connect using the desired wireless network name and password.
5.
6. Click the button at the top left of the screen to return to the TherapyView home screen.

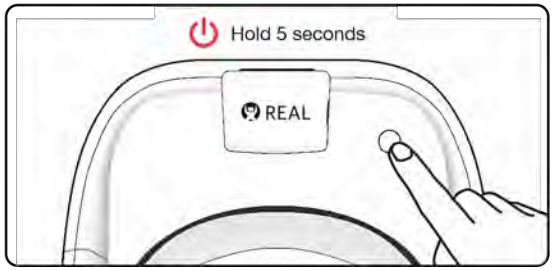
Continue to Section 3 when the components are sufficiently charged, and the system has secure internet connectivity.

SECTION 3: START-UP SYSTEM FOR PATIENT USE

1. Unplug power cords from tablet and headset when ready to use.

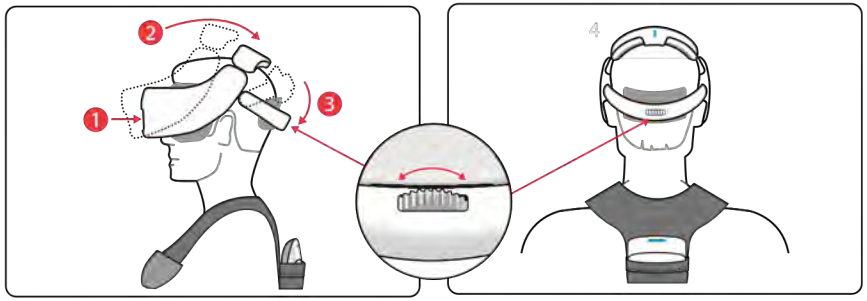
2. If tablet is not turned on, turn on.

3. Turn on headset by pressing and holding power button for approximately 5 seconds.

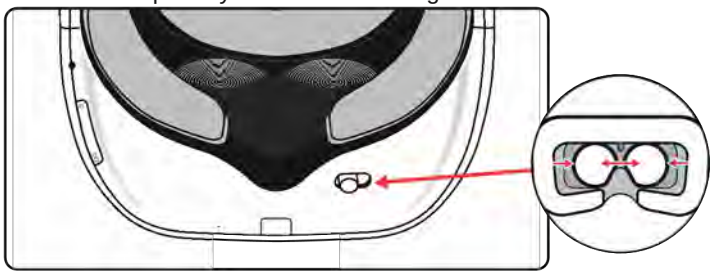


4. Ensure the patient is in a seated position away from metal components and remains seated at all times for the duration of the therapy session.

5. Place headset on patient’s head in the sequence numbered below. Patient can immediately begin visually interacting with the environment.



Note: Size of headset strap and interpupillary distance can be adjusted for fit. Top of head pad may be removed temporarily for better fit on larger heads.

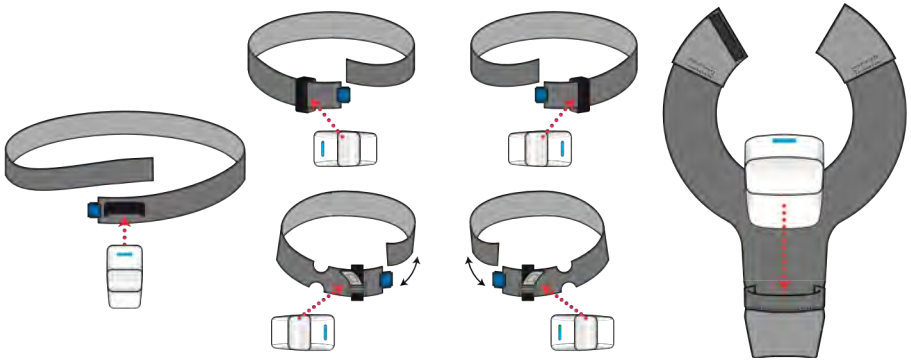


Note: Patient can keep eyeglasses on.

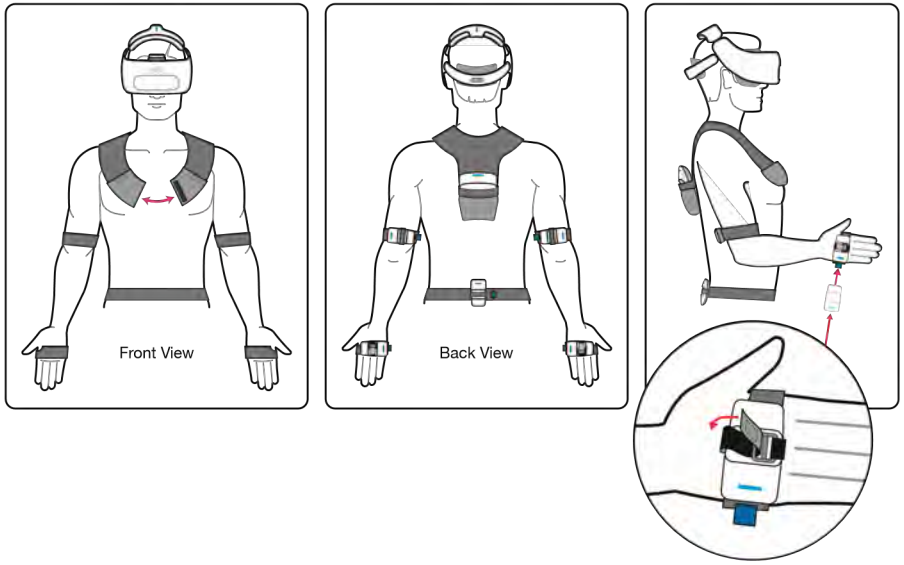
6. Remove sensor bands from reusable packaging (sold separately). Each patient should have their own sensor bands and bands should not be shared between patients.

7. Remove all sensors from sensor charger.

8. Place small sensors onto bands by sliding them into elasticized loops. For the hand sensor bands, tighten elasticized loop using the buckle. Place large sensor into pocket of shoulder band.

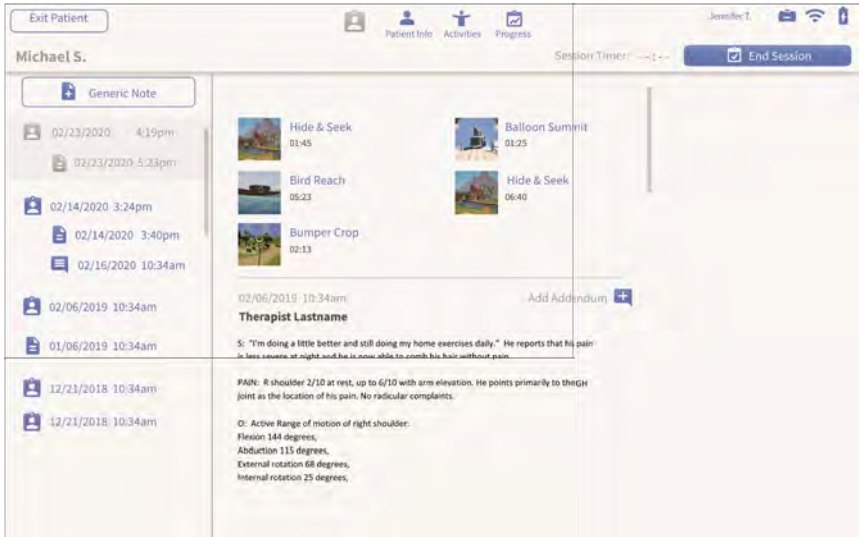


9. Once sensors are placed in the bands, put each band onto its corresponding body part (see image below). Connect hook and loop fasteners of shoulder band if desired. Make sure the elbow sensor is sitting behind the patient's elbow. Adjust bands for comfortable fi t, if necessary.

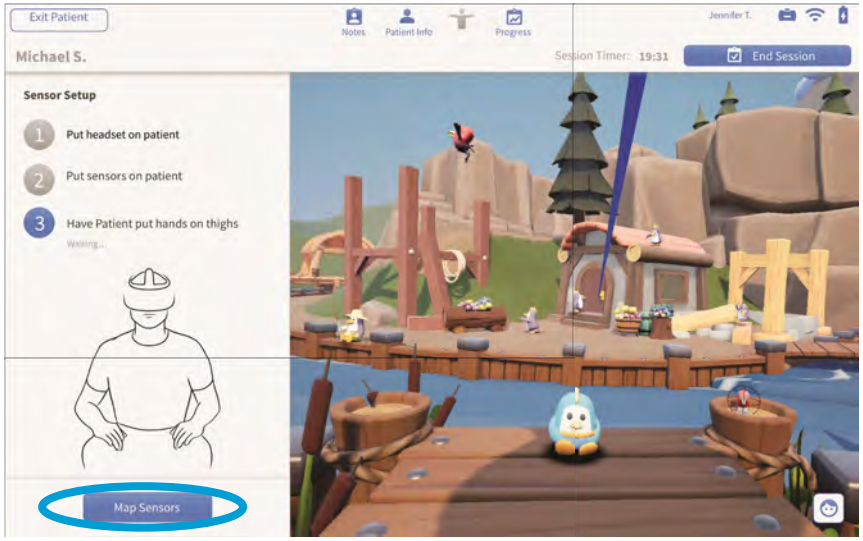


10. Log in on the tablet. Add new patient or select patient from directory; edit patient information as needed.

11. Once a patient is selected or created, the healthcare provider (HCP) may initiate the session by pressing "Start Session."



12. Have the patient sit in a neutral position, facing forward with hands on knees or thighs. Press the button on the tablet screen to calibrate the sensors.

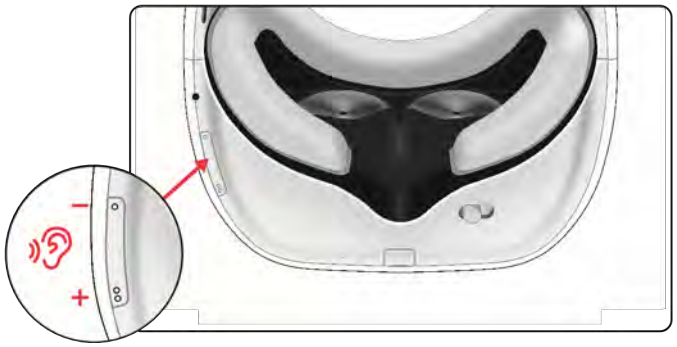


13. Confirm patient's avatar in VR space corresponds to actual patient's physical movement. Edit the default avatar settings to match your patient. If the avatar looks correct, press "Continue". If not, HCP can recalibrate the sensors by selecting the "Remap Sensors" button.
14. The HCP may navigate to additional therapy activities by selecting the corresponding icon from the display. Once the activity has loaded, the HCP can press the "Start Activity Session" button to begin the activity. See Section 6 for more information.

Section 4: THERAPY ACTIVITIES

1. Confirm patient's avatar in VR space corresponds to actual patient's physical movement.

2. Confirm application audio can be heard but doesn't block out HCP's communication; adjust volume on headset as needed.



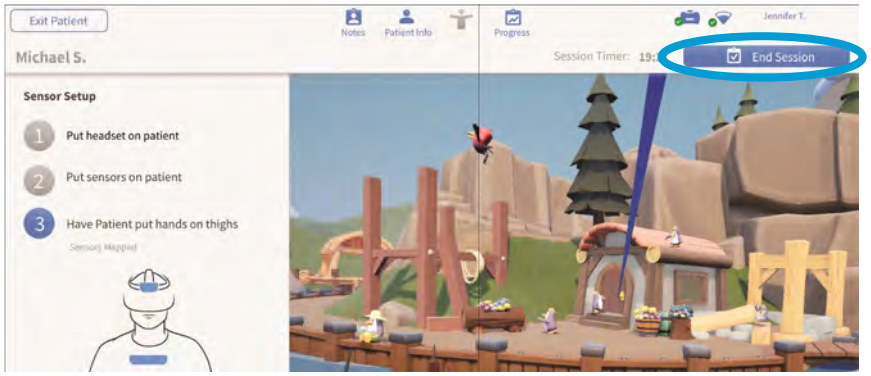
3. Conduct rehabilitation session as planned. (See Section 6 which includes a software description for details of therapeutic activities).

4. Always remain with the patient throughout therapy session to provide direct supervision.

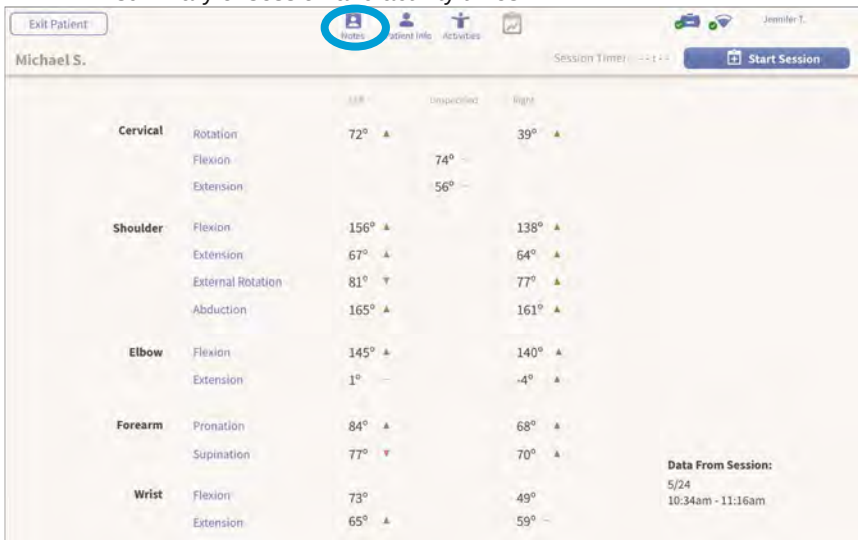
5. Monitor patient view on tablet; select and begin new activities as desired.

Note: If sensors lose synchronization or headset loses tracking, turn off entire system then back on to reset. Headset is turned off and on using the power button. App should be relaunched on the tablet. Sensors are turned off and on by placing them in the powered charging station (while the REAL™ Immersive System is plugged in) and removing them again.

6. When planned therapy activities are complete, press "End Session" on tablet. Patient will be returned to the Hide and Seek activity.



7. View patient results on tablet. You may also switch to the Notes tab for a summary of session and activity times.



Section 5: SYSTEM REMOVAL

1. Remove sensors and bands.

2. Remove headset from patient's head.

3. Power off headset by pressing and holding onto the power button for approximately 5 seconds.

4. Log out of tablet.

5. Clean headset and sensors with institutional approved sanitizing wipes*.

6. Ensure REAL Immersive System Case is plugged in.

7. Connect tablet and headset to their respective power cords.

8. Return all sensors to sensor charger. Red or green LEDs should be noted on sensors when placed correctly in the charging station.

9. Store and label bands for future individual patient use.

10. Sufficiently charge all components after each use and prior to next use for 60 minutes.

Note: Standard operation is to power cycle and relaunch application between therapy sessions to reestablish system connections.

*Handle the lenses on the headset carefully to avoid smears or scratches. Wipe lenses with a soft cloth for cleaning as needed. Clean outer and inner plastic components of headset with institutional approved sanitizing wipe. Do not use petroleum-based compounds, acids, caustics, or chlorinated solvents to clean or lubricate any parts. Use only water-based solvents for cleaning.

REAL™ Immersive System Case Instructions:
The REAL Immersive System is housed in a travel case that may be locked with the attached combination lock that secures the zipper. The combination lock should be turned to the red dot position at all times. If the combination lock is turned away from the red dot, turn it to the red dot position.

How to reset the combination lock:
1. Set all combination dials to the following: (0-0-0 default)

2. Find the hole located to the right of the dials. Use a paper clip or similar tool to press down on the reset button until an audible “click” is heard.

3. Set personal combination by turning the dials to display the desired set of numbers, e.g. 2-8-7.

4. Push the slide button located on the left of the dials towards the direction of the arrow and the reset button will push back up. An audible “click” will be heard.

5. Remember the personal combination and repeat the steps above to reset the personal combination, if necessary.

How to use the combination lock:
1. To unlock: Turn the dials to the correct combination. Push the slide button on the left of the dial towards the direction of the arrow to unlock.

2. To lock: Put the loop portion of the zipper into the slots of the lock, then turn the dials randomly to conceal the personal combination to lock.

Section 6: SOFTWARE DESCRIPTION

REAL y-Series contains a variety of experiences with a multitude of activities that incorporate clinically recognized, existing therapeutic, functional, and wellness exercises to facilitate motor learning, cognitive function, memory, and relaxation. Settings for each experience and their activities will involve parameters such as turning on and off avatar features and environmental factors. While using the REAL y-Series, the HCP remains responsible for the patient’s safety and the appropriateness of individual exercises including range of motion (ROM) attempted and any other limb or joint limitations unique to that patient.

REAL Home

REAL Home is a peaceful, serene lakeside experience to acclimate patients to VR. The REAL Home experience moves at its own pace and provides a secure space for patients to spend as much or as little time as they wish here before, in-between, and after activities. Patients can listen to music, birds chirping, lapping water, and wind chimes as they enjoy the tranquil lakeside and grow comfortable in this virtual space.

Happy Valley™

Happy Valley is designed to support physical rehabilitation, cognitive function, and wellness immersing the patient in a delightful world of penguins. Happy Valley includes a total of 18 therapeutic and wellness activities.

Hide and Seek™ Activity

Hide and Seek can be used with or without a displayed avatar tracking the patient's body as it primarily relies on cervical proprioception and range of motion (ROM). Hide and Seek puts the patient in a pastoral setting with a number of animated animals that react to the patient's acknowledgement of them.

Visually scanning the environment, patients are tasked with finding a small penguin by hovering a blue gaze pointer on the penguin by turning and rotating their head to exercise their cervical range of motion. The penguin will then disappear and reappear in a different location. The pointer is positioned to represent the patient's vertical midline and is itself a useful tool as some patients in neurorehabilitation have lost their sense of body position resulting in "midline shift." The blue pointer provides a visual, external cue to their true body midline helping them relearn centering themselves. Hide and Seek encourages visual scanning of the patient's environment, an important functional ability, and cognitive recognition of nameable animals, objects, and environmental locations in their immediate surroundings. At the end of the patient's session, the patient can visualize overall progress they made during the session in the form of virtual "rewards."

HCPs may adjust various activity parameters using the TherapyView application.

Catch & Glow™ Activity

Catch & Glow is designed to help the patient exercise cervical proprioception and ROM. This activity takes place in a low-stimulation, nighttime environment, where the patient is tasked to focus on and control a small penguin with their head movement to catch fireflies that appear in a specific pattern. This activity provides a range of challenges to help focus on the patient's gaze stability, oculomotor and visual control, and postural and cervical control. The HCP can control the complexity of the activity by adjusting various activity parameters.

Hot Air Balloon Activities

Hot Air Balloon is a family of activities designed to help the patient work on trunk and core control, Base of Support, strength, centering, and postural proprioception. By leaning their torso in a certain direction, and holding it there against gravity, they fly a hot air balloon in that same direction. To fly the balloon away and towards them, the patient uses thoracolumbar flexion and extension, and to fly from left to right involves thoracolumbar flexion to the left or right. This set of activities provides a range of challenges focusing on enhancement of trunk control, postural stability, and dynamic balance, all of which are foundational to body function. HCPs may adjust various activity parameters.

Balloon Pilot™ Activity

Balloon Pilot takes place near the ground. The patient-controlled balloon is tethered to the ground to limit balloon travel and encourage simple torso centering, trunk mobility, and dynamic weight shifting. The patient can pilot the balloon on-tether to nearby interactive objects, such as the trees and the bell.

Bumper Band™ Activity

Bumper Band takes place halfway up the mountainside. The patient uses trunk extension, flexion, as well as lateral flexion to steer an untethered balloon to bump other balloons with band members in them, back to the performance stage.

Summit Rescue™ Activity

Summit Rescue takes place at the peak of the mountain where the patient steers the balloon to rescue hikers and bring them back to the safety of the chalet. The patient is asked to counteract different obstacles using cognitive planning, problem solving, and trunk control movements.

Sunrise™ Activities

The Sunrise family of activities focuses on simple shoulder flexion. The patient holds their arms out straight in front of them and raises their arms up and over their head in a motion that ideally, is pure shoulder flexion with a maximum, healthy ROM of 180 degrees. This exercise may be done passively with HCP assistance or actively by the patient themselves. This exercise encourages postural alignment and symmetrical shoulder flexion.

When this motion is initiated, a Sun rises up from beyond the horizon in proportion to the patient's shoulder flexion ROM. The Sun also rotates in the sky and translates side to side, depending on the patient's postural symmetry. When the patient's arms are horizontally and vertically symmetric, and their torso is in vertical alignment with their pelvis and head, the Sun will be smiling broadly and high in the sky straight ahead of the patient.

If the patient's posture exhibits asymmetry or other compensating characteristics, the Sun's position and the expression on its face will alter from the "ideal" state, thereby providing the patient an external visual cue as to their posture, and allowing them to learn via alternative references, what is proper, non-compensating posture. Maximum shoulder flexion ROM achieved during this activity will be stored as a session output for the HCP's record. HCPs may adjust various activity parameters through the tablet.

Sunrise Activity

As the patient fully lowers and fully raises their arms to the best of their ability, the lighting in the virtual world will exhibit night-time or daytime according to the sun's position, thus greatly accentuating the activity and feedback of a simple coordinated arm raise. There is a rep counter on the tree to count the number of reps the patient completes. Optional mirror therapy setting available.

Harvest™ Activity

Harvest involves growing a variety of vegetables by raising and lowering one's arms a number of times in order to trigger the appearance of day- night cycles. This activity creates an incentive for the patient to do multiple repetitions of this exercise if called for by the patient's rehabilitation or wellness plan. Optional mirror therapy setting available.

Ice Cave™ Activity

Ice Cave involves freeing a variety of Cave Penguins from ice blocks by raising and lowering one's arms a number of times in order to trigger the appearance of day-night cycles. This activity creates an incentive for the patient to do multiple repetitions of this exercise if called for by the patient's rehabilitation or wellness plan. Optional mirror therapy setting available.

Bird Forest Activities

The Bird Forest family of activities incorporates standard functional exercises including dynamic reaching and pronation/supination requiring the patient to reach out with one or both hands to pick up birds and place them into nests. Patients have opportunities to reach from low to high, high to low, from left to right and vice versa to practice functional reach. These exercises mimic standard functional exercises that would be practiced during rehabilitation to help the patient regain skills necessary to live at home with a degree of functional independence, and perform activities of daily living (ADL) such as unpacking groceries, cooking, unloading a dishwasher, self-care, etc. HCPs may adjust various activity parameters

Free Birds™ Activity

In Free Birds, the patient uses functional movements to pick up and place birds into nests. Optional setting to include pronation and supination therapy by instructing patients to pick up and place birds into their nests.

Nest Hop™ Activity

In Nest Hop, the patient uses functional movements to pick up a single bird and place it into a series of nests, under an optional time limit. When a target nest has been filled, a new target nest will appear, and the patient will have to move the bird from the previous nest to the new target nest. Optional setting to include pronation and supination therapy by instructing patients to pick up and place the bird into nests.

Bird Match™ Activity

In Bird Match, the patient uses functional movement to pick up a bird and place it into a nest with its matching-colored ribbon. Optional setting to include pronation and supination therapy by instructing patients to pick up and place the birds into their nests.

Sports Park Activities

In the Sports Park family of activities, the patient must move their upper extremities to intercept a Chuckleball™ coming at them, in a time dependent manner. These activities require quick cognitive processing and visual-motor integration to succeed, and thus are more advanced activities for a neurorehabilitation patient. Other primary skills being challenged are reflective movements, dynamic postural control, visual recognition, and motor control. HCPs may adjust various activity parameters.

Chuckleball Activity

The patient fends off approaching Chuckleballs by deflecting them with their hands or head. This activity is designed to challenge reflexive movements, dynamic control, visual recognition, and motor control.

Chuckleball Arena™ Activity

Designed to exercise trunk control and functional reach, the patient must defend their goal using their hands or head as a penguin tries to score with a Chuckleball. Using cognitive skills, the patient must predict the trajectory and reach for a certain location to block and hit the Chuckleball into the opposing goal or into other characters within the environment to collect points. The HCP can control how fast the ball travels towards the patient, the direction and distance the patient must reach to block the ball, and the number of balls to be kicked at the patients.

Flying Fish™ Activity

Designed to facilitate trunk stability and functional reach, patients will test their reactive movement by blocking blue fish with their hands or head or dodging red spiky fish. Fish may turn from blue fish, which should be deflected, to red spiky fish, which need to be avoided. This requires extra cognitive processing to decide, under time pressure, which fish should be contacted, and which should be avoided, in addition to predicting where the fish are coming and integrating proper movement to accomplish the task.

Creative Canvas Activities

The Creative Canvas family of activities is table-top based, designed to support functional reach, fine motor control, and cognitive abilities. These activities incorporate simple cognitive and creative elements through selecting colors, painting pictures, and stamping images, while providing a therapeutic experience. For patients who cannot benefit from more advanced functional reach activities, the activities in Creative Canvas allow patients to focus on rehabilitation of their cervical range of motion. The activities also include a canvas angle setting that allows the HCP to adjust for more able patients to experience more advanced arm reach and fine motor control. HCPs may adjust therapy settings and difficulty through various activity parameters.

Paint by Numbers™ Activity

In Paint By Numbers, the patient will fill in empty cells of an image with the required matching color and number by selecting the color and filling in the image with

various brush strokes. Besides using the left or right hand to select colors and paint on the canvas, the patient can utilize Gaze Painting Mode. This mode allows the patient to select paint colors from a palette and paint on the canvas using only the gaze pointer, providing a cervical motion exercise variation. The patient also has the ability to access a hand palette in the non-painting hand, to help promote two handed interaction within the activity. The HCP can control the level of complexity by choosing the number of color selections available.

Free Paint™ Activity

Free Paint allows the patient to express their own artistic creativity, without restrictions. This activity has two modes: Blank Canvas and Coloring Book. There are no rules, goals or tasks that need to be completed; the patient can paint whatever they would like on a canvas. Using the paintbrush, the patient chooses a color from the color palette or paint swatches to paint the canvas. The patient also has the ability to access a hand palette in the non-painting hand, to help promote two handed interaction within the activity.

Free Stamp™ Activity

Free Stamp allows the patient to express their creativity by selecting and stamping down images onto a provided canvas background to create their own artistic compositions. There are no rules, goals or tasks that need to be completed. This activity helps provide a free form cognitive exercise encouraging the patient to combine stamps together creatively to construct their own scene and story. Three sets of stamp collections are available to the patient: Happy Farm, Happy Trails, and Happy Geometry. The patient also has the ability to access a hand palette in the non-stamping hand, to help promote bimanual coordination within the activity.

Mad Tavern™ Activity

Mad Tavern is a pain distraction activity using distraction techniques where the patient is surrounded by animated characters in a cozy tavern setting. Visually scanning the environment, the patient interacts with each character by using the blue gaze pointer by turning and rotating their head to exercise their cervical range of motion. The patient's pointer is positioned to represent the patient's upper body vertical midline and triggers a series of short stories within the tavern. This activity is designed for practicing visual processing skills and cognitive aspects for focus and attention.

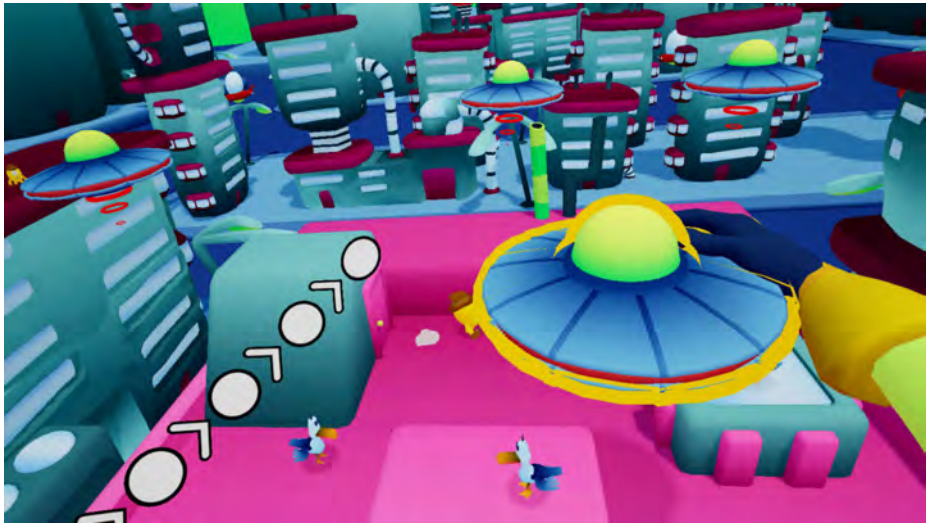
Island Antics™

Island Antics experience is designed for patients who need to work on upper body reconditioning and motor functions. It transports patients to a city of antics where they get to be a celebrated hero tasked to help island citizens using multi-directional movements to complete tasks. Island Antics includes 4 activities that support therapeutic motions to exercise trunk control, functional reach, reaction time, fluid movements, postural control, coordination, and cross-body movements.

Island Antics promotes big and dynamic movements to improve postural stability, coordination, encourage full upper-body movement, to help address impairments like resting tremor, postural instability, bradykinesia, hypokinesia, depressed moods, and loss of cognitive function (sustained attention, difficulty changing strategies quickly). Functional deficits that can result from such symptoms can include a sense of weakness during functional activities, and impaired balance and posture. High intensity exercises require high effort, increased amplitude, increased repetitions, and accuracy.

Make island improvements with big movements!

Save the Seagulls™ Activity

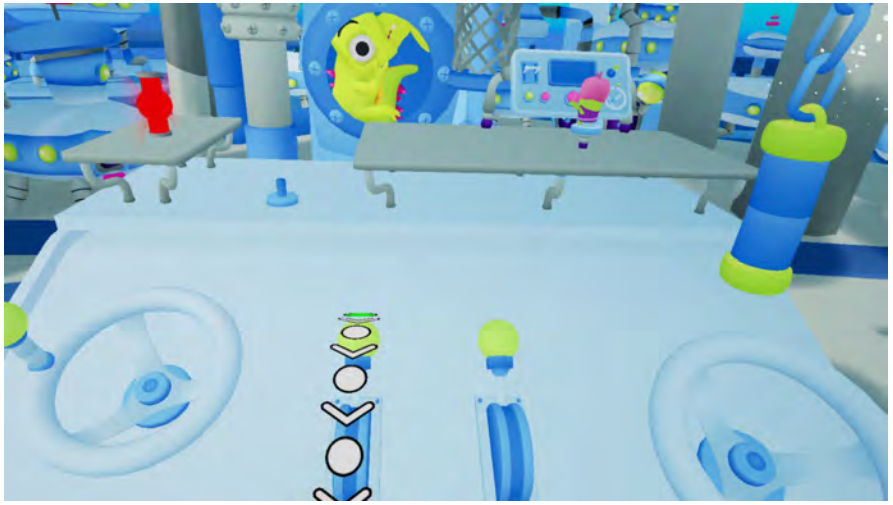


Using trunk control, functional reach, and cross body motions, patients are tasked with fending off UFO drones poaching seagulls by tossing them back like frisbees. A UFO Mothership has descended upon Island Antics and is planning to abduct the island seagulls. A swarm of mini-UFOs will approach the seagulls on top of the building in front of the patient. When a UFO reaches their selected seagull, the UFO tractor beam will turn on and begin to abduct the seagull. The patient will need to reach out utilizing trunk control, functional reach, and cross body motions to fend off UFOs by touching and tossing them back like frisbees. Each successful UFO toss will knock a piece of equipment off the UFO Mothership causing damage. Once all the pieces of equipment on the UFO Mothership are destroyed, all UFOs in the scene will return to the UFO Mothership and all together they will blast off back into Space.

Citizen Crossing™ Activity

Using trunk control, functional reach, and dynamic balance, patients are asked to help citizens cross a street being blocked by a giant beached whale. A giant whale is beached in the middle of Island Avenue after crashing through civilian pathway bridges and preventing the citizens from crossing safely. The citizens need the patient's help to cross the road and continue their way to work. Using trunk control, functional reach, and dynamic balance, the patient must reach out to pick up the citizen and follow the path visualization to place the citizen on the other side of the street. Once the patient has successfully helped the island citizens cross the road, the patient is asked to free the whale by launching her back to the ocean in one swift upwards movement.

Leaks and Levers™ Activity



Leaks and Levers concentrates on shoulder flexion and extension to turn various valves and pull different levers. Patients use these therapeutic motions to fix the city's plumbing system by turning valves to unblock pipes. Too many sea creatures are getting flushed and blocking the island's pipes. Seated in front of a control panel of pipes and valves, the patient is tasked with fixing the city's plumbing system by turning valves to unblock pipes. Using shoulder active range of motion (ROM), strength, and multi-directional arm movement patterns, the patient turns the valves and pulls the levers. Upon successfully turning the valves and pulling the levers, the sea creatures will be sent back to the sea.

Coconut Chuck™ Activity

Using a giant slingshot, patients send coconuts over the ocean and onto floating cargo ships by exercising functional reach and trunk movement. A coconut will be knocked off the palm tree and slide down the path to a giant slingshot. Using functional reach and trunk movement, the patient must reach out to pull the slingshot and send the coconuts through the air onto the floating cargo ships. Once the coconut is resting in the giant slingshot, the patient should reach forward and lean back while pulling arms back as far as possible. Upon completing that movement, the coconut will launch out in the sky, over the ocean, and onto the cargo ship. After all coconuts have been launched to the cargo ship, the patient must pull down on a chain to activate the work whistle, which causes the cargo ship to depart towards the main island. Utilize one or two hands to activate the slingshot. Slingshot paths can be created to be longer or shorter based on patient needs.

Mindful Market™

Welcome to Mindful Market, where patients can emphasize high-level cognitive skills, performing instrumental ADLs (Activities of Daily Living), and stimuli tolerance, in an engaging, lively marketplace. Recover executive functions, working memory, sequencing and sorting abilities, and resilience to stimulation by volunteering at multiple small businesses in the charming market square. Make savory sandwiches, feed the market's animals, and flex your monetary skills as you volunteer your uniqueskills for the benefit of the townspeople's enthusiastic entrepreneurs.

Designed to rebuild confidence in cognitive skills, this virtual space offers differing stimulation levels and challenge settings that can help support community re-entry.These therapeutic and wellness activities can be utilized to help patients ease backinto the workplace. All activities take place in environments with adjustable settingstailored to patient needs. Mindful Market contains three visual stimulation levels, sotherapists can determine what level of visual detail is most suitable for the patient.

Sandwich Shop™ Activity

Take on the role of a chef in Sandwich Shop, fulfilling sandwich orders for customers tohelp build sequencing and working memory skills. The patient is in front of a sandwichmaking station, like a real kitchen environment, where they can utilize different countertops to the left, right, and in front of them to access sandwich ingredients.
Customers arrive one at a time to request their orders, which are listed in steps on large tickets for the patient to see. Sandwich sequences are communicated to the patient through images of ingredients listed from bottom to top. Once the order is complete, lift the order and present it to the customer at the window. Customers will respond withfacial expressions and actions to convey their sandwich satisfaction. If an incorrect order is made, a customer may show confusion or mild disappointment.

Harvest Helper™ Activity

Help a local farmer sort her delivery of animal feed while the animals clamor for their food. Catch items as they're thrown to improve ability to concentrate in a distracting environment. The farmer unloads her delivery of animal feed by tossing each item to the patient. The farmer picks up an item from the tractor trailer and tosses the item when the patient indicates they are ready to catch by placing their hands up to match the outline shown in the activity. As the patient catches each item the farmer throws, they can increase resilience and ability to concentrate around audio stimulation as they sort each item in its place. Sort each item using object recognition and place each item on the correct pallet in front of the patient. The farmer will provide reactions when the patient places the animal feed on the correct pallet. There are three pallets to choose from and each pallet will have an example of the item that the farmer throws.

Stamp Stand™ Activity

Designed to improve memory and money management skills, patients will sell postage stamps and help customers stay within their designated budget. Use mental math and working memory to get as close to the customer's budget as the patient can. The customer will have a certain amount of money shown to the left of the patient. Patients will use the stamp sheets on the right side to provide the customer with the correct number of stamps equal or close to the value. Each small stamp square equals the price at the top of the stamp sheet. Add up the small squares to determine the entire cost of the sheet. Use the calculator for additional assistance.

Music in Motion™

Engage in musically driven exercises by using therapeutic motions like visual scanning, core control, and shoulder flexion in reactive environments in a fantastical

virtual world. Music in Motion is an entertaining music-themed VR rehabilitation experience designed for upper extremity and cognitive rehabilitation. Clinicians can utilize this experience to deliver engaging and effective rehabilitation exercises to support patients who suffer from neurological disorders. Encouraging movement early during the rehabilitation process is key to regaining function in affected extremities.

Rhythm relies on varying parts of the brain (frontal and parietal cortices, as well as the cerebellum) to stimulate motor pathways and encourage neural reorganization. Patients may utilize rhythm combined with music therapy to promote recovery of lost function.

Music in Motion has four activities in two environments that can be customized by the clinician to fit each patient's rehabilitation needs by modifying range of motion and speed of each activity. Combining rehab with rhythm, patients are asked to move their body to the music and hit notes while gathering prizes as a reward for their hard work. This allows them to keep track and visualize their progress session by session.

Song Safari™ Activity

Utilize cervical ROM and visual scanning to spot various candy critters hiding within the sweet or beach environment. To spot each candy critter, hold the gaze-pointer on the critter hiding in the environment. Each critter will peek out from behind or above various objects and then hide again. After successfully spotting each critter, they will jump out and perform a celebratory animation before hiding again.

Lean into the Music™ Activity

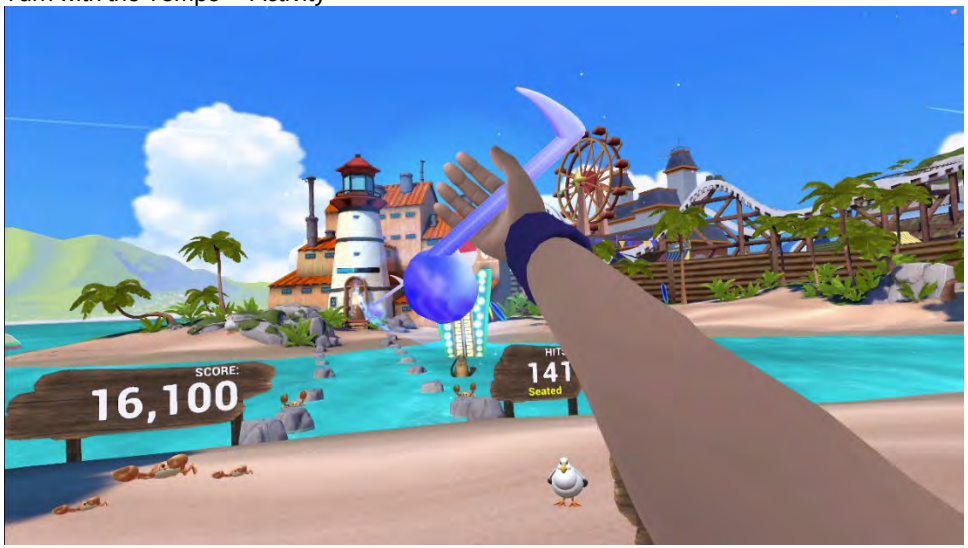
Use cervical range of motion, trunk control, and core stabilization to steer and elevate the flying bird toward various targets. Steer and control the bird by leaning the body – lean back to raise the bird, lean forward to lower the bird, or lean left and right to guide the bird in those directions. The bird will spin if it is lined up with the targets.

Reach for the Rhythm™ Activity

Utilize trunk control, dynamic balance, and functional reach to touch colored targets with the appropriate hand (right or left) as they fly by. Red targets are hit with the

left hand while blue targets are hit with the right hand. The virtual avatar will have colored wrist bands to help the patient with color coordination.

Turn with the Tempo™ Activity



Reach out and utilize wrist/forearm pronation and supination to match the flying music notes' color and rotation. Reach out to hold the music note and turn the right or left wrist to match the note's rotation. The virtual avatar will be holding red and blue music notes to help support the patient's proper alignment to the incoming music notes.

Pleasant Cove™

Pleasant Cove focuses on the mental wellness component of therapy for patients recovering cognitive skills while providing options for the therapist to address rehabilitation goals through more directed, stress-relieving experiences. Pleasant Cove includes a relaxing mix of activities set in a low-intensity, tranquil vacation destination to help improve quality of life, confidence, and engagement though relaxation and procedural memory-inspired tasks. Pleasant Cove is an intuitive and flexible experience with multiple activities that can incorporate structure or be used for relaxation.

Bountiful Birdseed™ Activity

Working on sustained attention, patients use wrist ROM to interact with birds by picking up and shaking seeds out of the can. The patient can experience a friendly interaction with birds happy to eat seeds off the ground or even from their right or left hand. If the patient is up for a challenge, they can try to coax the shy blue bird into their hand. If the patient is gentle, they'll be rewarded with a dance.

Playful Percussion™ Activity

Focusing on sequencing, psychomotor skills, and working memory, patients participate in a playful percussion interaction with a xylophone and mallets. Patients can create their own melodies or for more of a challenge, follow the arrows to play the correct notes of a song from the jukebox-style songbook. The songbook will both play and be used to guide the patient through eight simple songs of varying difficulty levels including “Ode to Joy,” “Pop Goes the Weasel,” “Mary Had a Little Lamb,” “Jingle Bells,” and “Twinkle, Twinkle Little Star.”

Green Thumb Gardening™ Activity

Grow flowers in mere moments! The patient can personalize their garden by decorating and arranging by size, color, or shape for added difficulty. Following visual cues, use the shovel to place dirt, pour a packet of one of three seed types, water the newly planted seeds, and pick the flowers for final placement once the flowers have finished blossoming. Practice sequencing skills by matching the instruction card placed in front of the floral foam.

ADL Cards™ Activity

ADL (Activities of Daily Living) Cards includes three mini activities – Sequencing, Sorting, and Item Find! Cards will feature ADLs; specifically, bathing, dressing, grooming, and eating. Interact with the cards by picking them up and placing them in the correct order based on the specific exercise. Upon placing the cards in the correct order, the green bird will celebrate.

- Sequencing: The patient will have either 3 or 5 cards where they will put the process of the specific ADL in order from start to finish.
- Sorting: The patient will pick out the appropriate ADL and place those cards in order from start to finish.
- Item Find: Using the cards in front of the patient, verbally cue the patient to pick up a card using their object identification skills.

REAL® Pinball

Aim for your highest scores in this fast-paced, vintage pinball experience that supports range of motion, processing speeds, muscle tone & endurance, control of voluntary movementfunctions, neuromusculoskeletal skills, and psychomotor skills. Patients can engage in three themed pinball tables where the primary objective is to score as many points as possible before losing a total of three pinballs. Various control methods can be used to launch and hit the ball including a kayak paddle, pong, and rackets. Customize settings to promote bimanual coordination or utilize gaze-only control designed for patients who have upper body impairments.

Carnival Blast™ Activity

Step right up and join the circus, testing the patient's ROM and endurance as they try to score as many points as possible before losing all their pinballs.

- Hit all 6-star targets to win additional points and see the elephant ride across the stage. Note: Once a star target has been hit, it will turn blue.
- Hit the pinball into each of the clown bumpers to win additional points and see the clowns pop up from behind the bumpers.
- Hit the pinball along the roller coaster track to win additional points and see the giraffe pop up.

Alien Arrival™ Activity

Using ROM, the patient can engage in a friendly battle against an alien boss acrossthree pinball challenges.

- First Challenge: Hit all 12-star targets
- Second Challenge: Defeat Robots*
- Third Challenge: Defeat UFO and Robots*

The patient will use their gaze to aim each ball launch. After a short countdown, the pinball will launch out and put the activity in play. As the patient successfully hits targets in the activity, the alien boss will express anger and frustration. Likewise, the alien boss will laugh at the patient when it initiates a new challenge from the robots and UFO.

*For the second challenge, the patient will defeat 25 waves of robots in a variety of patterns. Some robots might be carrying an extra pinball above their head, when these robots are struck the patient will have a multi-ball experience. For the third challenge, upon defeating the UFO and robots successfully, the patient will receive an extra ball reward and extra bonus points.

Magical Garden™ Activity

Using ROM, the patient can discover their magical abilities and complete various pinball challenges and missions in an enchanted miniature garden. The patient will have a mission objective map in front of them on the table. There will be 3 missions that need to be achieved at each time. Once all 3 missions are lit and completed, the mission map is reshuffled with new missions and the patient is rewarded bonus points.

Missions include:

- Mushroom House: Multi-ball mode, unlocked once three balls are locked.
- Branch Path with Acorns: Collect the golden acorns by hitting the pinball up the branch path and into the mushroom house.
- Gnomes: Hit the gnomes to wake them up and they will start to run a lap on the track.
- Mole's Mound: Hit the front door of the mole mound three times to initiate whack-a-mole.
- Whack-a-Mole: Once the mole has awakened from its mound, play whack-a-mole. Once the mole has been hit 5 times, the patient is rewarded with extra points.
- Flowerpots: Hit the pinball into each of the 4 flowerpots until the flowers are completely grown to win additional points.
- Turtle: Hit the pinball into the turtle to watch the turtle spin.
- Lanterns: Hit the ball past the spinners on the right and left side of the table to see each lantern light fill up. Once the two lanterns are fully lit, the patient will receive bonus points.

TECHNICAL SPECIFICATIONS

Sensor Accuracy*	± 2 cm at a max distance of 75 cm
Sensor Precision*	2 cm or less
Latency	≤35 milliseconds
Operating Temperature	15°C to 30°C
Operating Pressure	102 kPa or less
Operating Relative Humidity	30% to 90%
Operating Elevation	2,500 meters or less
Radio Module	Output power (EIRP*): 6.31 mW (8 dBm) max Frequency Band: ISM (Industrial, Scientific, and Medical) Typical Center frequency: 2.44 GHz Channel: 77 channels Bandwidth: 2 MHz per channel Modulation: GFSK (Gaussian frequency-shift keying) Data flow: Bi-directional *EIRP = Equivalent Isotropic Radiated Power

TECHNICAL INFORMATION

REAL™ Immersive System is intended for use in the electromagnetic environment specified below. The customer or the user of REAL Immersive System should assure that it is used in such an environment.

Emissions Test	Compliance	
RF emissions CISPR 11	Group 1	REAL Immersive System uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	REAL Immersive System is suitable for use in all establishments other than domestic and those directly connected to the public mains.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage Fluctuations/ Flicker emissions	Complies	

REAL Immersive System is intended for use in the electromagnetic environment specified below. The customer or the user of REAL Immersive System should assure that it is used in such an environment.

Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±15 kV air	±8 kV contact ±15 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	Voltage Dips 30% reduction, 25/30 periods At 0°	Voltage Dips 30% reduction, 25/30 periods At 0°	Mains power quality should be that of a typical commercial or hospital environment. If the user of the EQUIPMENT requires continued operation during power mains interruptions, it is recommended that REAL Immersive System be powered from an uninterruptible power supply or a battery.
	Voltage Dips > 95% reduction, 0.5 period At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°	Voltage Dips > 95% reduction, 0.5 period At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°	
	Voltage Dips > 95% reduction, 1 period At 0°	Voltage Dips > 95% reduction, 1 period At 0°	
	Voltage Interruptions > 95% reduction, 250/300 periods	Voltage Interruptions > 95% reduction, 250/300 periods	

*REAL Immersive System is calibrated appropriately to detect movement in virtual reality space in relation to real space accurately and precisely. Sensors will compute and display position at an accuracy of a 2 cm radius with respect to real space at a max distance of 75 cm relative to the headset. Sensors will also reproducibly compute position at a maximum deviation of a 2 cm radius for repeated movements at a max distance of 75 cm relative to the headset. Please note that accuracy and precision specifications contain limitations and are dependent on certain factors such as the amount of metal near the system. For example, if the patient is in a metal wheelchair and cannot move to a non-metal chair, reduction in accuracy and precision may occur.

(50/60 Hz) magnetic fi eld IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fi elds should be at levels characteristic of a typical location in a typical commercial or hospital environment.

SYMBOL GLOSSARY

	Refer to User Guide (Instruction Manual)
	Prescription only – US Federal Law restricts this device to use by or on the order of a physician
	Type BF Applied Part
	WEEE
	Manufacturer
	Catalog Number
	Lot Number
	Date of Manufacture
	Both Direct and Alternating Current
	Class II Equipment
	Serial Number
	US and Canada Certification
	Medical Device

REAL™ Immersive System is intended for use in the electromagnetic environment specified below. The customer or the user of REAL Immersive System should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz (6 Vrms in ISM radio Bands within 150kHz – 80MHz)	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of REAL Immersive System, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2.7 GHz where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey [a], should be less than the compliance level in each frequency range [b].
Radiated RF IEC 61000-4-3	10 V/m 80 MHz to 2.7 GHz	10 V/m	

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which REAL Immersive System is used exceeds the applicable RF compliance level above, REAL Immersive System should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating REAL Immersive System. [b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances between portable and mobile RF communications equipment and REAL Immersive System

REAL Immersive System is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of REAL Immersive System can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and REAL Immersive System as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.7 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance *d* in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.
NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Immunity to RF Wireless Communications Equipment

Test Frequency (MHz)	Band a) (MHz)	Service a)	Modulation b)	Maximum Power (W)	Distance (m)	IMMUNITY TEST LEVEL (V/m)
385	380-390	TETRA 400	Pulse modulation b) 18 Hz	1.8	0.3	27
450	430-470	GMRS 460, FRS 460	FM c) ±5 kHz deviation 1 kHz sine	2	0.3	28
710	704 – 787	LTE Band 13, 17	Pulse modulation b) 217 Hz	0.2	0.3	9
745						
780						
810	800-960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation b) 18 Hz	2	0.3	28
870						
930						
1720	1700-1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation b) 217 Hz	2	0.3	28
1845						
1970						
2450	2400-2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation b) 217 Hz	2	0.3	28
5240	5100-5800	WLAN 802.11 a/n	Pulse modulation b) 217 Hz	0.2	0.3	9
5500						
5785						

a) For some services, only the uplink frequencies are included.
b) The carrier shall be modulated using a 50 % duty cycle square wave signal.
c) As an alternative to FM modulation, 50 % pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:
1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Les changements ou les modifications qui n'ont pas été expressément approuvés par la partie responsable de la conformité peuvent faire perdre à l'utilisateur son droit d'utiliser l'appareil.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential setting. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

Mode of Operation:

Charging mode and battery mode

Highest Clock Frequency:
HMD: 32 MHz
WSM: 32 MHz
WTM: 24.576 MHz

Frequency Range:
GFSK: 2402 MHz – 2479 MHz

Transmitting Frequency and Modulation:
Gaussian Frequency-shift Keying (GFSK) modulation. 2 Mbps modulation for all transmitter frequencies. BLE

Antenna Make, Model, and Gain:

Device	Antenna Make	Antenna Model	Antenna Gain
WSM	Johanson	P/N 2450AT43B100E	Peak Gain 1.3 dBi Average Gain -0.5 dBi
WTM			
HMD	Penumbra, Inc.	P/N 17107	Peak Gain 0.7 dBi Average Gain -2.6 dBi

Power Output and Data Rate:

Device	Power Output	Data Rate
WSM	Programmed by the firmware to +8dBm.	GFSK modulation, 2 Mbps data rate.
WTM	Programmed by the firmware to +4dBm.	
HMD	Programmed by the firmware to +8dBm.	

Manufacturer:
Penumbra Inc.
One Penumbra Place
Alameda, CA 94502 USA

Tel: 1.855.REAL-SYS
1.855.732.5759

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