Dear Customer,

Thank you for choosing a product from SenMetric, LLC. Please carefully read through these instructions in their entirety before use, and if you have any questions, please contact our customer support team at www.senmetric.com/support.

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Getting Started

Welcome to SenSen. To begin, please follow these instructions.

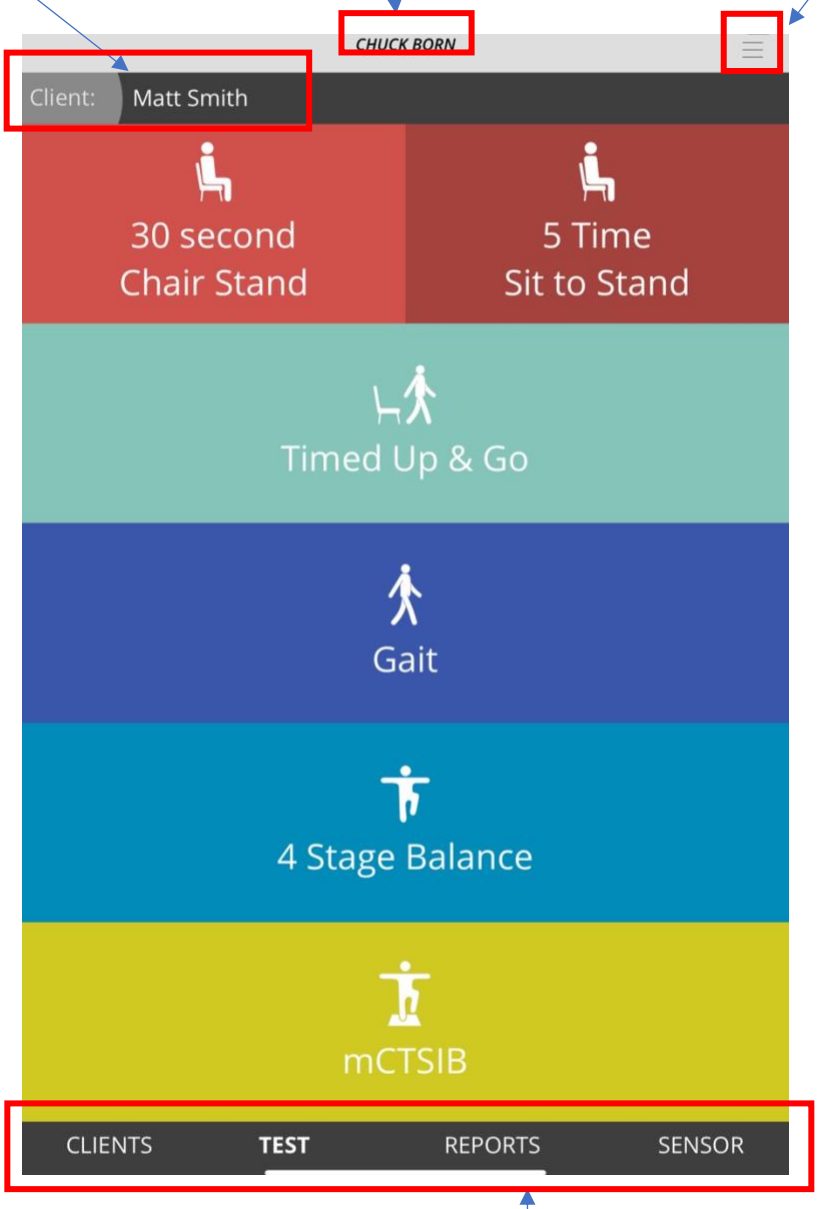
1. **Connect the Apple iPad to the internet.**
2. **Open SenSen and login using your provided username (email address) and password.**
3. **Select or create a client** by navigating to the CLIENTS tab on the bottom navigation bar.
4. **Connect a sensor** by navigating to the SENSOR tab. Follow the on-screen instructions. Your sensor will be named SENSEN. Give the sensor's button a 2-second press to turn on or charge the sensor if it does not show up.
5. **Administer a Test** by navigating to TEST on the bottom nav. From here you can select a test to administer. All test instructions are available by tapping the information button (i) on each test screen.
6. **View Reports** by navigating to REPORT, then tapping a blue dot next to the corresponding date and test.

Throughout the app, tap the information (i) icon for more information when visible, or open the menu and tap Help for more how-to information.

User Name. The current user's name will be displayed here.

Active Client. When a client is selected, their name will be displayed here.

Overflow Menu. Access Settings, About, Help, Feedback, User guide, and Logout pages here.



Main Nav. Visible on every screen. Sensor battery displayed on right-side when connected. The current screen will be displayed in **BOLD** type.

General Use, Safety, and Environmental Information

Environmental Restrictions

- SenSen must be used in a dry environment between +15 and +30 degrees Celsius, +59 and +86 degrees Fahrenheit.
- Using SenSen in strong sunlight can raise the temperature of the sensor or the iPad to temperatures above the working limits given above. (Storage limits are below.)
- Relative humidity must be between 10% and 85% and non-condensing.
- SenSen must not be exposed to water or splashing or spray (especially salt spray as occurs by the ocean) or harsh chemicals except for those used for cleaning as periodically required.
- The unit must be protected from temperature extremes during storage. Do not leave these in a parked car in the hot sun without taking reasonable measures to prevent the devices from becoming overheated. Likewise, do not store the devices where they may freeze. Storage outside the range of -20 to +45 degrees Celsius (or -4 to +113 degrees Fahrenheit) may damage the devices. The lithium-polymer batteries used in each device will suffer a permanent loss of capacity if overheated.
- Devices allowed to become cold should be warmed gently to avoid condensation forming on the electronics! Taking a sensor or an iPad from a cold car into a warm environment (such as an elder person's dwelling for an in-home evaluation) might result in irreparable damage to one or both devices! Keeping the devices in the supplied padded carrying case will help attenuate sudden changes in temperature and reduce the likelihood of condensation forming in the electronics of these devices.

Warnings

- The warnings, cautions, and instructions provided in this manual must be read, followed, and kept available for future reference by anybody using the device.
- CAUTION: Do not modify this equipment or use for anything other than purposes identified by SenMetric. Unauthorized modifications or changes in use are not permitted and will void any warranty. They may also result in hazard to the user or client.
- Some states do not allow LiPo batteries to be disposed of with regular garbage, and instead they must be taken to a hazardous materials waste collection facility. The sensor contains a LiPo battery.

Important Safety Information

- Read this User Guide prior to administering any tests.
- Reference the help pages throughout the app, or located in the Help section of the app for instructions on how to perform routine SenSen tasks, or use the (i) on most pages for screen-specific instructions.

- Never leave a client unattended while client is wearing the belt, or after a testing session has elapsed.
- Always “spot” the test subject during the administration of any balance test. The tablet may be placed on any convenient surface up to five meters or fifteen feet behind the client. The SenSen app has a brief countdown built in to each test before the tests begin. This is to get a steady reading prior to collecting data.
- Only use the sensor while securely enclosed in the belt, and do not let the sensor make direct contact with a client. This ensures that the sensor does not get contaminated with anything a client may be carrying and passed along to other clients.
- The user should keep the iPad behind the client with a direct line-of-sight between the sensor and the iPad because body-shadow interference with the radio signal could mean that some data is lost in transmission and the test will not be completed.
- If equipped, use the iPad hand strap to ensure that you have one hand free and available to support the client if needed.

Important Usage Information

- Only use supplied charging cables and plugs to charge both the tablet and sensor.
- Do not administer a test while the sensor or tablet are plugged in to the wall.
- Although our sensor is FCC-certified, in an environment with heavy WiFi or Bluetooth traffic, there may still be interference. In this situation, it may be helpful to move to a different location.
- Do not use SenSen in the vicinity of medical imaging equipment such as MRI machines, CT machines or PET scanners.
- Do not use the SenSen in an ICU or operating room or emergency room or any other place where distractions and tripping hazards may be present.
- SenSen has a built-in inactivity timer to protect the information within SenSen. After 10 minute, a warning will appear indicating that SenSen will automatically log out in 1 minute if no activity is present. Once logged out, you must have your username and email address in order to log back in.

Cleaning Instructions

- The belt can be easily disinfected. The Velcro can be sprayed with an aerosol disinfectant, and the interior of the belt should be wiped clean with a disinfectant wipe.
- The sensor can be wiped clean with a disinfectant wipe. Do not wet or submerge the sensor. Use only a damp cloth to clean it.
- Do not use ammonia, bleach or abrasives on any SENSEN components.
- Please be careful not to allow moisture into the charging port.
- The iPad may be cleaned according to Apple’s instructions using a soft, lint-free cloth. Keep liquids away from your iPad and don’t get moisture into any openings. Don’t use aerosol sprays, solvents or abrasives.

- See Apple's guidance here: https://support.apple.com/en-us/HT204172#ipads

Battery Charging and Disposal

Only charge the sensor when the battery icon on the tablet turns red, or if the device becomes unresponsive, which indicates that the sensor battery has died. After plugging the sensor in to a power source, charge for 30 minutes. SenMetric does not recommend leaving the sensor plugged in overnight, as this will shorten the life of the battery.

Only use the supplied charging cables and plugs to charge both the tablet and sensor.
Some states do not allow LiPo batteries to be disposed of with regular garbage, and instead they should be taken to a hazardous materials waste collection facility. The sensor contains a LiPo battery.

Warranty Information

SenSen Warranty:

The Manufacturer (SenMetric, LLC) makes no warranty or representation about the Products EITHER EXPRESSED OR IMPLIED, with the exception of the belt and wireless sensor. The belt carries a warranty for a period of 180 days from date of purchase. The sensor carries a warranty for a period of one year from the date of purchase. Both are warrantied against any defect that affects the functional performance of the unit. The warranty does not cover issues that arise from damage or abuse. Functional performance is defined as any change in behavior which prohibits it from functioning as intended by SenMetric at the time of purchase. The belt is defined as the belt, belt extender, and sensor pouch. Sensor is defined as the sensor that comes included with the product: powering on, charging, and sending data to the tablet. If a manufacturing issue results in the sensor or belt no longer working, SenMetric will work with distributor to restore the product to its original working state at the time of purchase. Any modification of the belt, pouch, or sensor will void the warranty. Remedies may include any combination of troubleshooting, repair, or replacement depending on the circumstances.

The customer is responsible for shipment of defective product(s) to the manufacturer and the manufacturer shall be responsible for return shipment to customer should the issue be determined to be a defect. Manufacturer guarantees to offer a resolution within five business days of receipt of returned product and to communicate the warranty status to the customer within this time window.

Party Responsibilities:

SenMetric may amend this warranty from time to time, and the distributor shall not in any manner make any representations or warranties regarding the products, including without limitation, any representations intended to alter or amend the warranty as set forth herein. The rights and obligations of each of the parties with respect to the warranty are as follows:

SenMetric will include a copy of the warranty set forth herein with each product sold. The distributor will serve as the initial point of contact for any customers filing a warranty claim. They will work with the customer to troubleshoot the issue using a troubleshooting form provided by SenMetric. If troubleshooting does not resolve the issue, the distributor will connect the customer with SenMetric, including sending the troubleshooting form to SenMetric Support via email that documents the attempts made to resolve the issue.

SenMetric will communicate with customers when troubleshooting fails to resolve the claim after the distributor refers the customer to SenMetric's Support Team. SenMetric will determine if the issue is a result of a defective product, and if so, restore the product condition to functional by either repair or replacement.

Tablet (Apple iPad) Coverage:

There is no warranty for the tablet, implied or otherwise, supplied from either the supplier (SenMetric, LLC) or the distributor. This product is covered through the manufacturer's

warranty and the customer is fully responsible for working directly with the manufacturer in the case of an issue. Neither the supplier nor the distributor will be held liable for any issues that arise with the tablet. Note that the warranty on the iPad is for one year from the date the supplier purchased the unit from the manufacturer, which may be different from the purchase date of the SenSen system by the customer from the distributor.

Warranty for the tablet may change without notice from the manufacturer, and neither the supplier nor the distributor shall be responsible for communicating this change to the customer.

Package Contents

- Tablet: Apple iPad Mini 6 and charger
- Wireless Sensor with charging cable (see picture below)
- SENSEN belt with elastic joiner and sensor pouch (see picture below)
- SENSEN belt extender with sensor pouch for thigh use
- Tablet hand strap
- SENSEN carrying case (see picture below)



SenSen Belt



SenSen Carrying Case



SenSen Sensor

Scoring

Scoring System

SenMetric's balance tests provide the traditional outputs that have been historically used with each of the tests: time-in-balance, total time, total count or meters per second. In all tests, data is collected from the "ding" that plays at the onset to either the time when the test completes, when the stop button is tapped, when the sensor detects free-fall (rare), or when the sensor is tapped twice in quick succession (ending the test).

NOTE: Please make sure the tablet's sound is turned on, otherwise the "ding" will not sound.

On some gait tests, data collection begins and ends with the user tapping the START and STOP button. On the Gait Test, the indicated distance does not include any distance used for acceleration or deceleration.

For balance tests, SenSen also includes an Instability Score, which represents the client's level of instability during the 4 Stage Balance Test and mCTSIB Test. Scoring starts at 1 (perfectly still) and runs up to 10. The higher the score, the more unstable the test subject is. This score is not capped, so a score higher than 10 may be present in the case of extreme instability. The Instability Score is calculated using Normalized Path Length, and is denoted in mG/s/s. More information on our calculations can be found on our website at www.senmetric.com/research.

Balance Tests: mCTSIB, 4 Stage Balance Test

The Instability Score starts at 1 as that represents the pull of gravity. It is possible to get an Instability Score that is higher than 10 in the case of extreme instability.

Timed Up and Go (TUG)

The TUG test automatically captures the total time that it takes a client to complete the Timed Up and Go Test. Each Total Time Score is broken down into segments:

- Reaction Time - the time that it takes a client to begin moving after the "ding"
- Walk Out - the time that it takes a client to walk out 10 feet
- Turn Time - the time that it takes a client to turn around the cone
- Walk Back - the time that it takes a client to walk back 10 feet
- Total Time - the total time that it takes to complete the TUG test

The TUG test also reports the gait speed during the walk out and walk back portions of the test. This gait speed calculation does not take into account the turning time.

30-second Chair Stand

The 30s Chair Stand Test reports the total number of stand/sit cycles that a client performs, STAND COUNT. If the client is descending into the chair from standing during the ending "ding" of the test, this is counted as a rep. If they are ascending from the chair during the ending "ding" of the test, this is not counted as a rep. Once the test ends, you are able to edit the stand count detected by SENSEN. Simply tap on the total count and edit the number directly using the tablet's keyboard. Once finished, tap FINISH TEST and then save the test result.

The Chair Stand Test also reports a response time, which is defined as the total time it takes for a client to begin the test after the “ding” sounds.

It is important to make sure that the sensor remains in position and does not move during the test, otherwise a faulty score can be reported. If you are not getting good results with the sensor at the sacrum, try switching to thigh placement by using the belt extender wrapped around the client’s thigh, and moving the switch on the test screen to thigh mode. The two placements use different counting algorithms, and thigh mode may be more accurate for slower, more unstable clients.

Gait Test

The Gait Test records the gait speed, as well as total time. Other indicators are total step count, and average stride length (calculated by averaging the total distance over each stride).

Response time is reported for a standing start, but not for walking-start tests. Response time is the time it takes for a client to begin the test after the “ding” sounds.

Adding & Managing Clients

Adding & Selecting Clients

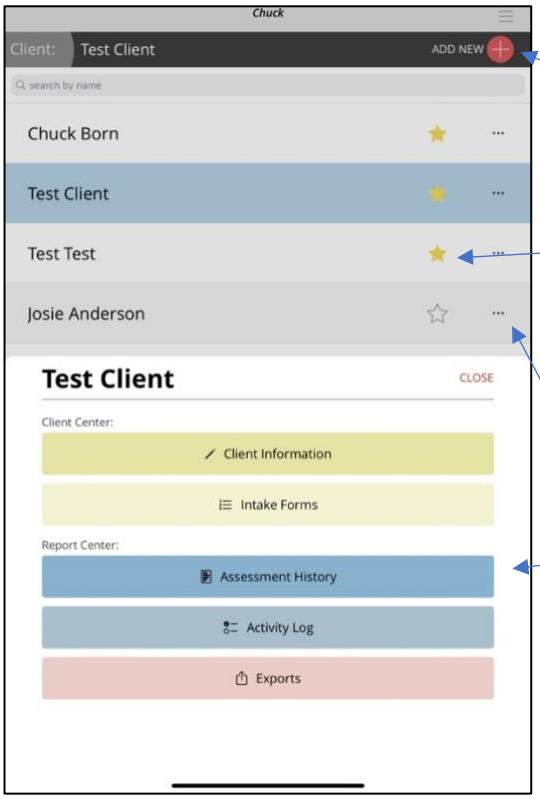
To select, add, or edit clients, tap the CLIENTS button in the bottom navigation bar. To select a client (necessary to administer a test or access reports and client history), tap the name of the client that you wish to access. To add a new client, tap the red + sign at the top of the page. You will be taken to the New Client screen. Here, fill out all of the required information and tap the save button. Tap discard to discard your new client information and return to the CLIENTS screen. *See below for an explanation of what the "Athlete" option means, and whether or not you should select it when adding a new client*.

To select a client, simply tap on the client's name. Their row will be highlighted and their name will appear in the header bar. From here you can either choose to administer a test or access historical testing data for this client.

To access a client's history and reports, tap the triple-dot menu to the right of the client's name and select either Assessment History, Activity Log, or Exportable Reports. *See an explanation of each of these options in the REPORTS menu section.*

To favorite a client, tap the star icon on the client's row and it will turn yellow. Any clients who have been favorited will appear at the top of the list, in alphabetical order. To remove a star, tap it again and it will turn white.

To access the Client Center, an overview of the client's personal information, and to administer a new intake form or review completed intake forms, tap the triple dot menu • • • and tap CLIENT INFORMATION. *Read more about the Client Center below.*



Add Client
Tapping ADD NEW will open up a new client information screen.

Favorites
Tap a star next to a client's name to favorite.

Client List
Tapping the triple dot menu will open up the Client Menu, where you can access the Client Center and Report Center screens.

Client Center Overview

The Client Center is a hub where all client-related information can be handled, including editing a client's information and administering an intake form. To access the Client Center, tap CLIENT from the bottom nav, tap the triple dot menu ••• to the right of any name. You'll see the two options for Client Center: Client Information and Intake Forms.

Client Information

In the Client Information screen, you can edit client information and add notes that will be stored in a client's file. Tap SAVE after making any edits that you wish to–otherwise they will not be saved. Measurement units can be changed in the settings menu, accessed via the app's Overflow menu, available on the top right-hand corner of the screen at all times.

Intake

On the Intake screen, you have the option of either administering an intake form, or viewing the history of intake forms administered for the client that you have selected. To administer a new intake form, select the desired intake form, then pass the tablet to the client—intake forms are designed to be completed by the client. As with the Assessment History tab, you can tap the blue dots to see their scores for each intake form administered. *See Intake Forms section for more information.*

What does the "Athlete" mean in a client profile?

- SenSen includes a "Athlete" option after the height and weight entry fields because BMI is calculated and used in the background. <u>This is a subjective measure that will not affect testing in any way.</u>
- In most cases, the calculated BMI is indicative of the person's body composition; a higher BMI generally corresponds to heavier and proportionally less muscular individuals. In some cases, particularly athletes and bodybuilders, a high BMI can be very misleading because these people carry extra muscle, not fat. A measured BMI for these muscular, unusually fit people is always accurate, but a calculated BMI uses a statistical model that is very inaccurate for these individuals.
- SenMetric provides a "Athlete" option so that these muscular, athletic people can be flagged in our data as not belonging to the statistically average group of people. These fit people will be excluded from cohort comparisons for average people. Any test subject such as a college athlete, marathon runner, tri-athlete, or competitive swimmer can be designated as exceptionally fit. Such people generally have a lower body fat ratio than the general population while still having a calculated BMI that falls inside the normal range.
- The Athlete option is especially helpful when the test subject is muscular with a low body fat ratio because this is where the Calculated BMI model fails. For example, anyone with broad shoulders, muscular arms, large fat-free thighs and no belly will be given a high calculated BMI based on their weight and height despite being

uncommonly fit and strong. Bodybuilders and “cross-fitters” often score as “overweight” despite having no excess body fat. This fit cohort should not be compared to the cohort of overweight sedentary people who share similar calculated BMI values for very different reasons.

- These fit people will generally score higher on balance tests than normal people and will skew cohort-related results if their data are combined. Further, while comparing fit people to other fit people can be useful, comparing them to unfit people of the same BMI is not useful and can be misleading.

Sensor & Belt

Overview

The sensor included with your SenSen is required to complete all tests. It uses an internal accelerometer and gyroscope to send movement data to SenSen. To be accurate, it is important to properly use the sensor. Follow these steps to ensure accuracy.

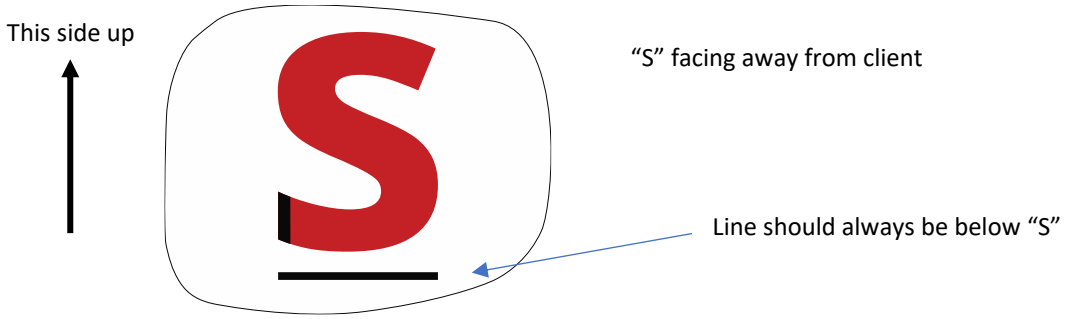


Figure 1 - Sensor with correct orientation

Sensor & Belt Placement

1. **Make sure the sensor is connected**

   Tap SENSOR from the main nav, which will automatically trigger SenSen to search for a nearby sensor. Once the sensor shows up, tap CONNECT. Once the sensor is connected, you will see the battery life and signal strength. You can also disconnect the sensor here. If you have more than one SenSen, you may wish to determine if the sensor you have in hand is the one SenSen is connected to, and the Blink button and Shake Test button can help with that.

   If the sensor does not show up in the list, give its button a 2-second press to turn it on, or use the provided charging cable to charge the battery.

   When a sensor is connected, you will see a battery indicator in the main navigation bar next to the SENSOR button.

2. **Place the sensor in the belt pouch**

   The sensor should be placed into the pouch on the back of the belt. Follow the instructions printed on the belt to ensure correct orientation:
   1. "S" should face away from the client

2. Black line should be underneath the “S”. See diagram below.

3. Put the belt and sensor onto the client

Put the belt on the client making sure that it’s snug enough that it won’t slide while walking. The top of the belt should sit just below the client’s umbilical (naval). The sensor should be centered horizontally on the back of the client.



Figure 2 - View of belt from rear

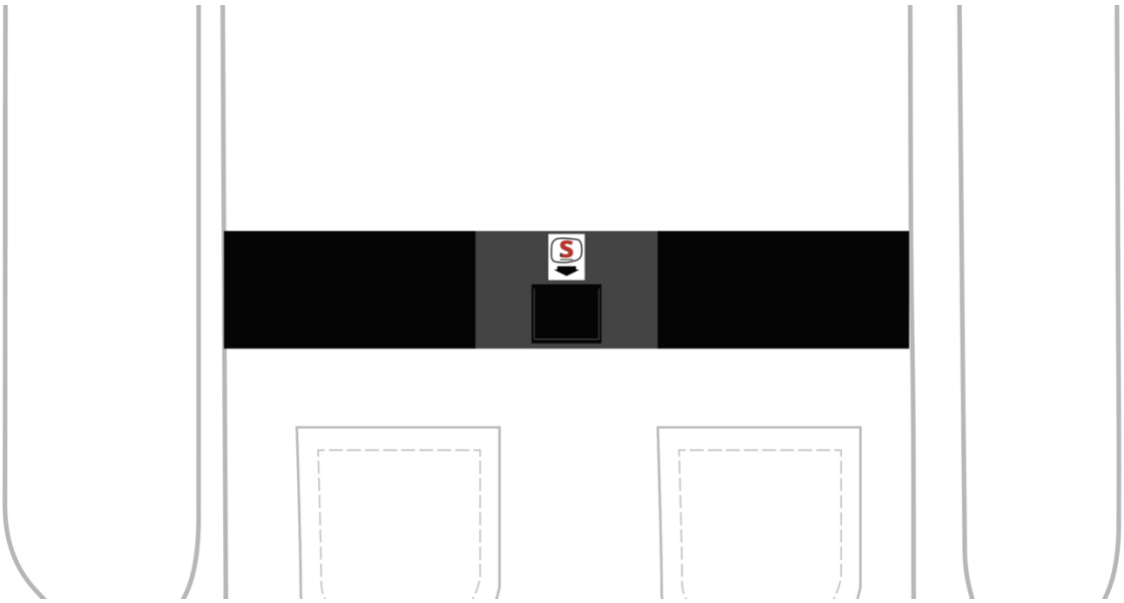


Figure 3 - View of belt and sensor orientation from behind client.

Thigh Belt

SenSen includes a thigh belt for use with the 30-second Chair Stand, which must be administered with the sensor on the anterior mid-thigh.

The Thigh Belt also doubles as a belt extender in case the belt isn’t long enough to fit all clients. To use the belt extender, simple use the Velcro ends to extend the length of the belt from 54” to 70”. Take care to ensure the sensor placement does not change, nor should the vertical location just under the umbilical.

The Thigh Belt has a sensor pouch, which is designed to be used for the 30-second Chair Stand test only.

Thigh Mode

Overview

For the 30-second Chair Stand, you must switch to a thigh placement to ensure consistent results. If you experience a 30-second Chair Stand count that is inaccurate, you can change the settings for this test and move the sensor to the mid-thigh.

Belt & Sensor Placement

For thigh placement, use the thigh belt. The sensor should go in with the same orientation as on the regular belt. The belt placement should be at the anterior mid-thigh. Please remember to move the sensor back to the regular location on the waist for all other tests.

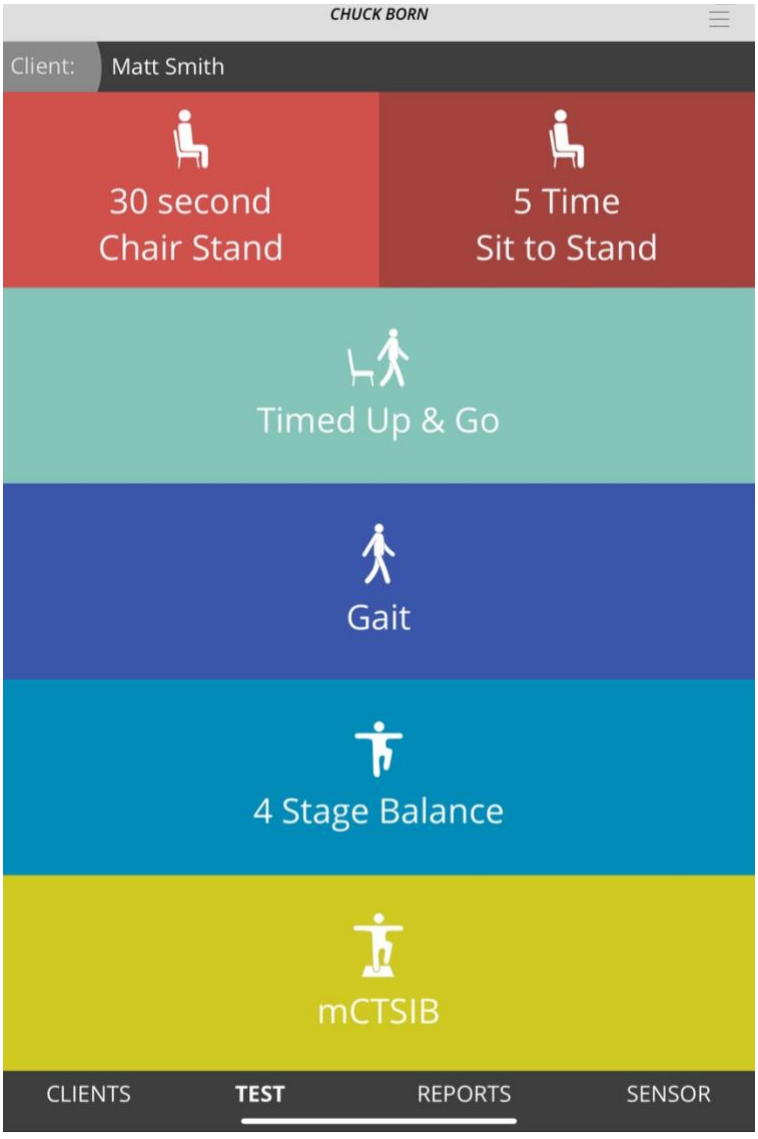
Testing

Overview

Accessing SenSen's assessments can be done by tapping TESTS on the main nav. In order to complete a test, you must have a client selected and sensor connected.

- A client's name will be visible in the gray header bar after the word "Client:" if a client is selected.
- A battery indicator will be present in the bottom nav, next to the SENSOR item, if a sensor is connected.

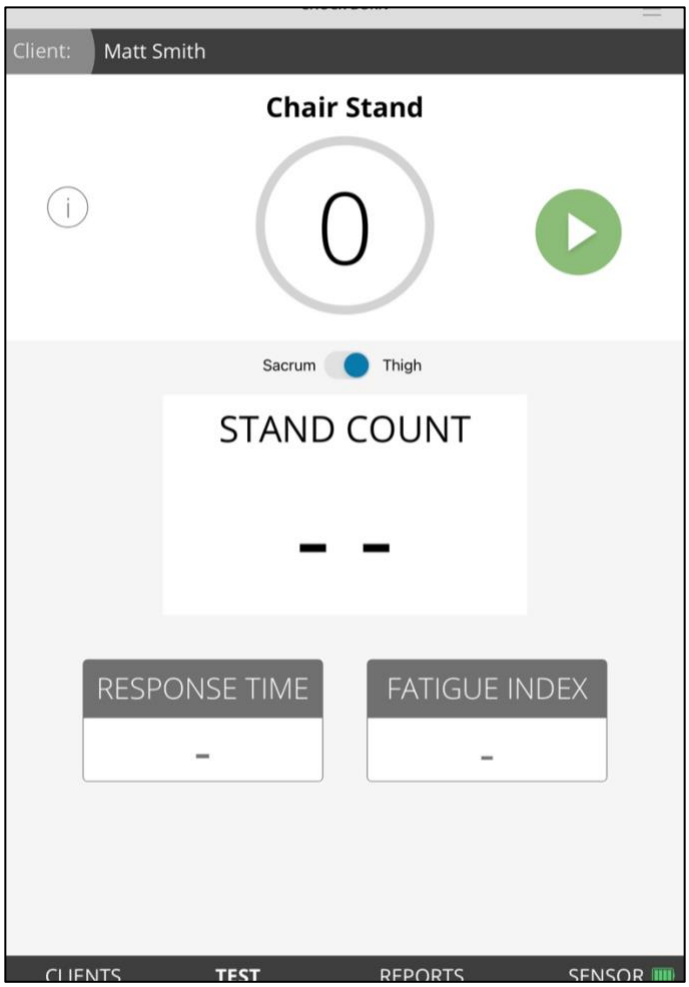
Tap the desired test to enter each screen. Instructions for each test are below:



30-Second Chair Stand. (30sCS)

Purpose

The 30 Second Chair Stand assesses functional lower body strength and endurance. The CDC recommends this test as part of their fall-prevention program, which is known as Stopping Elderly Accidents, Deaths and Injuries (STEADI).



General Information & Instructions

- **Make sure the sensor is placed on the client's thigh, using the Thigh Belt**. *See Sensor & Belt Placement*.
- Use a 17" high, straight-back, un-upholstered chair with no arms, positioned against a wall.
- Ensure that the following conditions are met before beginning test:
    - Client should sit in the middle of the chair, upright posture, feet flat on the floor.
    - Client should maintain a straight back with arms folded across the chest.

    - Client shall rise to an upright stance and sit up straight when seated.
    - The client's center of gravity must be behind their heels while seated. Watch that they are seated with the tibia vertical.
- Instruct the client:
    - Client should begin the test by sitting upright in a standard chair, with hands placed on opposite shoulders, arms crossed.
    - Feet should remain flat on the floor and remain steady for the test to begin.
    - When the client is ready, communicate that the test will begin shortly with a "ding". On the "ding", rise to full standing position, then sit back down again.
    - Repeat this for 30 seconds, or until the "ding" sounds again.
- Tap the green start button, wait for the 2 second countdown, and the "ding" will sound.
- Upon completion of 30 seconds, the "ding" will sound, and the test will be concluded.
- A test Summary will be presented, and you have the option to SAVE or DISCARD the test.
- In the unlikely event that SenSen's count and your observations differ:
    - You can override the stand count by tapping on the number once the timer has elapsed. Enter the desired number and tap FINISH TEST.

Test Countdown

- There is a 2 second countdown which happens between tapping START before each condition, and the audible "ding" from the tablet when this is complete and the test begins.
- The condition will end automatically when the "ding" sounds again. If the client fails a condition and you need to manually end the test by tapping the sensor or the STOP button, you will hear an audible "ding".

Outputs, Chair Stand

Stand Count. The stand count is the total number of times a client stands fully erect and sits back down in the chair. Partial reps are not counted by SenSen. *In the unlikely event that SenSen's count and your observations differ, you can override the Stand Count by tapping on the number once the timer has elapsed. Enter the desired number and tap FINISH TEST.*
Response Time. The response time is the length of time between the "ding" indicating the test started until the client began the test, measured in seconds.
Fatigue Index. The fatigue index is the difference in total time between the first complete stand-sit cycle, and the last complete stand-sit cycle. Expressed as a percentage. 0% indicates that there was no decrease in speed between the first and last stand-sit cycle OR there was an increase in speed (but no fatigue).

Chair Stand
Below Average Scores

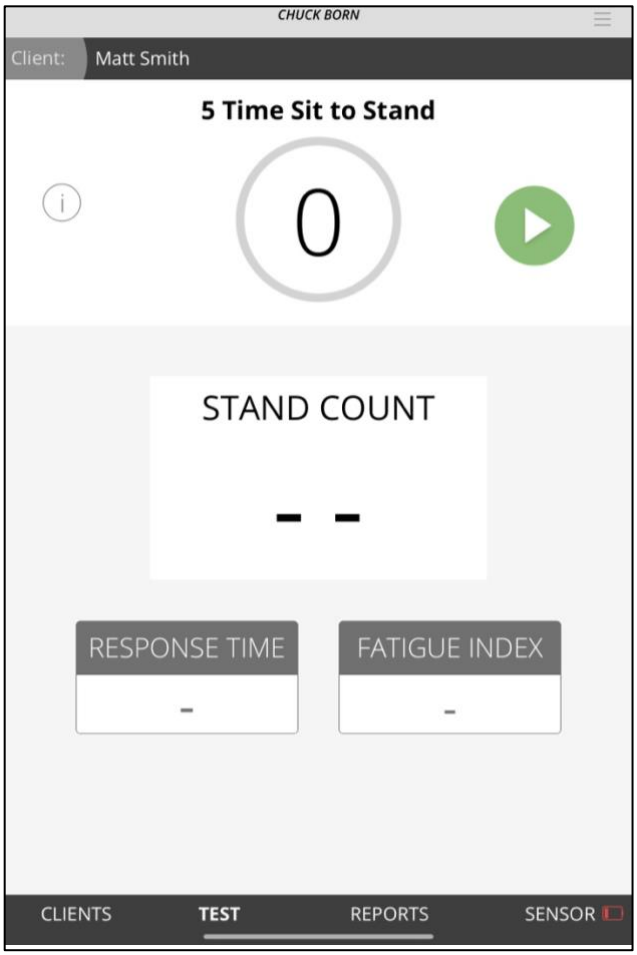
AGE	MEN	WOMEN
60-64	< 14	< 12
65-69	< 12	< 11
70-74	< 12	< 10
75-79	< 11	< 10
80-84	< 10	< 9
85-89	< 8	< 8
90-94	< 7	< 4

Average scores for 30-second Chair Stand, according to the CDC.

5 Time Sit to Stand (5xSTS)

Purpose

The 5 Time Sit to Stand assesses functional lower body strength and endurance, and is a variation on the 30-Second Chair Stand.



General Information & Instructions

- **Make sure the sensor is placed on the client's thigh, using the Thigh Belt**. *See Sensor & Belt Placement*.
- Use a 17" high, straight-back, un-upholstered chair with no arms, positioned against a wall.
- Ensure that the following conditions are met before beginning test:
    - Client should sit in the middle of the chair, upright posture, feet flat on the floor.
    - Client should maintain a straight back with arms folded across the chest.
    - Client shall rise to an upright stance and sit up straight when seated.

    - The client's center of gravity must be behind their heels while seated. Watch that they are seated with the tibia vertical.
- Instruct the client:
    - Client should begin the test by sitting upright in a standard chair, with hands placed on opposite shoulders, arms crossed.
    - Feet should remain flat on the floor and remain steady for the test to begin.
    - When the client is ready, communicate that the test will begin shortly with a "ding". On the "ding", rise to full standing position, then sit back down again.
    - Repeat this for 5 repetitions. When the 5th repetition is completed, SenSen will "ding" and the test is concluded.
- Tap the green start button, wait for the 2 second countdown, and the "ding" will sound.
- Upon completion of 5 repetitions, the "ding" will sound, and the test will be concluded.
- A test Summary will be presented, and you have the option to SAVE or DISCARD the test.
- **Sensor Placement.** For the 5 Time Sit to Stand, the sensor must be worn on the thigh, and not the sacrum. The count will not be accurate if it is worn at the sacrum.

Test Countdown

- There is a 2 second countdown which happens between tapping START before each condition, and the audible "ding" from the tablet when this is complete and the test begins.
- The condition will end automatically when the "ding" sounds again. If the client fails a condition and you need to manually end the test by tapping the sensor or the STOP button, you will hear an audible "ding".

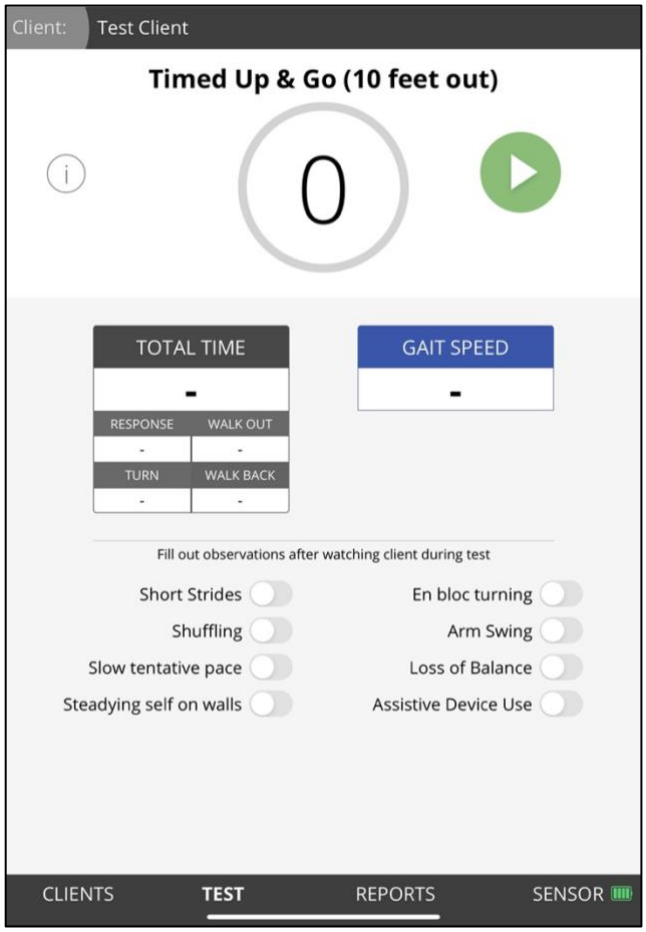
Outputs, Chair Stand

Total Time. The Total Time is the amount of time it takes for a client to stand up and sit down 5 times. Partial reps are not counted, the client must stand fully erect to achieve a repetition
Response Time. The response time is the length of time between the "ding" indicating the test started until the client began the test, measured in seconds.
Fatigue Index. The fatigue index is the difference in total time between the first complete stand-sit cycle, and the last complete stand-sit cycle. Expressed as a percentage. 0% indicates that there was no decrease in speed between the first and last stand-sit cycle OR there was an increase in speed (but no fatigue).

Timed Up and Go (TUG)

Purpose

The CDC recommends the Timed Up and Go test as a simple performance measure of lower extremity function, balance, mobility and fall risk in older adults. Per the CDC, an older adult who cannot complete the TUG in 12 seconds or less is at increased risk of falling. The CDC recommends this test as part of their fall-prevention program, which is known as Stopping Elderly Accidents, Deaths and Injuries (STEADI).



General Information & Instructions

- Make sure the sensor is correctly placed on the client. *See* *Sensor & Belt Placement*.
- Identify and mark a spot three meters, or ten feet, from the front of the chair.
- Client may wear regular footwear and use a walking aid, if needed.
- Instructions for client:

    - Begin the test by sitting upright in a standard armchair. The client can place their hands on the armrests of the chair, and use these armrests to push off when beginning the Timed Up and Go once the "ding" sounds.
    - After I tap start, there will be a 2 second countdown (See ***Sensor Calibration & Countdown*** below) ending in a "ding". When you hear this:
        - Stand up from the chair,
        - Walk to the indicator 10 feet from the chair at your normal pace,
        - Turn (in either direction) around the cone,
        - Walk back to the chair at your normal pace,
        - Sit back down and upright in the chair.
- SenSen will automatically stop the test when the client sits upright in the chair.
- Complete the observations, and then tap FINISH, advancing you to the Test Summary screen.
- On the Test Summary screen, you will be able to review the client's performance. Tap SAVE or DISCARD to continue.

Outputs, Timed Up and Go

Total Time. The total time it takes a client to complete the course

Walk Out. The time it takes the client to walk to the turnaround point.

Turn Time. The time it takes a client to turn around the point.

Walk Back. The time it takes the client to walk back to the chair.

Response Time. The response time is the length of time between the "ding" indicating the test started until the client began the test, measured in seconds.

Gait Speed. The average speed the client walks during the Walk Out and Walk Back portions of the test.

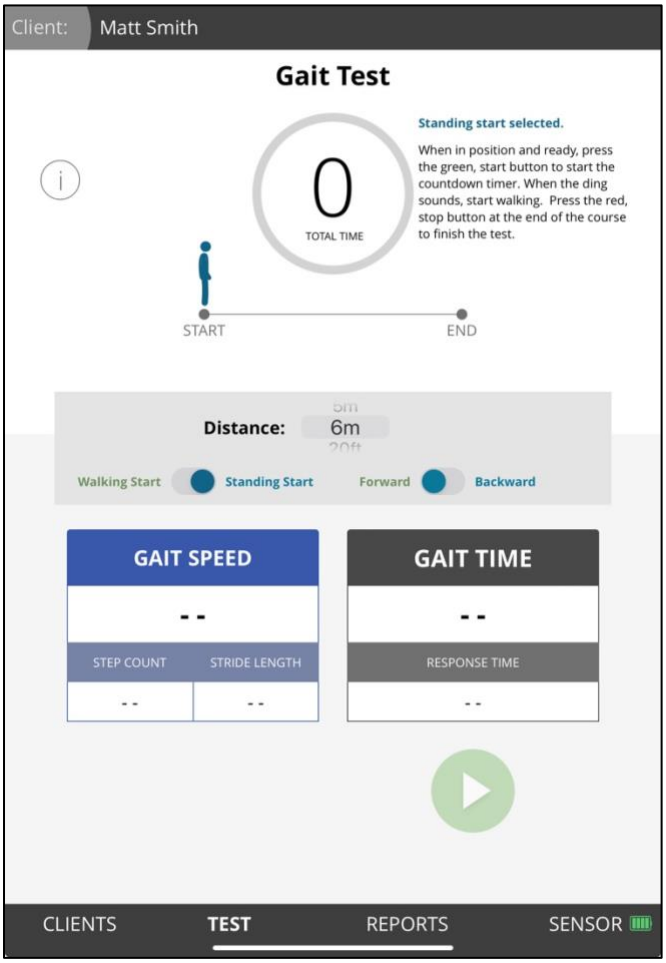
Sensor Calibration / Countdown

- There is a 2 second countdown which happens between tapping START before each condition, and the audible "ding" from the tablet when this is complete and the test begins.
- Advise the client to remain still from when you press START until the ding. During this time, the sensor is collecting data on the client's steady state, so it is important for the client to remain as still as possible. No data is collected until the "ding" sounds, and is only collected until the "ding" sounds at the end of the test.
- The condition will end automatically when the "ding" sounds again. If the client fails a condition and you need to manually end the test by tapping the sensor or the STOP button, you will hear an audible "ding".

Gait Test (GAIT)

Purpose

The Gait Test is used to assess functional mobility. Studies have shown it to be a valid, reliable, and sensitive measure not only of functional mobility but of general health. It is simple to perform in that you walk over a specific distance on a level surface.



General Information & Instructions

The Gait Test allows the user to select a Walking Start or Standing Start. For most cases, a Walking Start will be preferred.

- Make sure the sensor is correctly placed on the client. *See* *Sensor & Belt Placement*.
- Select the desired test distance and set a visual indicator for the client to walk to. SenSen defaults to a 3-meter distance. Set out a visual indicator where the course should end.

- Select the direction of travel for the patient, Forward or Backward. SenSen will separate these tests for reporting purposes, but all data points will be collected for both directions.
- Please note that the selected distance does not include any acceleration distance or deceleration distance, regardless of whether the Standing Start or Walking Start is selected. The selected distance is the distance that the client walks after the ding or the start button is tapped until the stop button is tapped, and this is the only distance that SenSen is collecting movement data from.
- Select whether to administer a standing start or walking start.
    - Standing Start: client starts walking from standing, and data is collected immediately when the test starts.
    - Walking Start: client starts walking, then user taps the START button when the client crosses the start line.
    - *Each test ends with the user tapping STOP when the client crosses the finish line.*
- Instruct the client:
    - [Standing Start]: Please start walking when the "ding" sounds. Walk to the finish line. There will be a brief (two second) countdown between pressing START and the "ding". Client should not start walking until the "ding" sounds.
    - [Walking Start]: Please start walking a few feet behind the start line. *Begin the test by tapping the green START button when the client crosses the start line.* Walk to the finish line.
- For each type of start, tap the red STOP button when the client crosses the finish line; a "ding" will sound.
- You will be presented with a Test Summary screen where you will be able to review the client's performance. Tap SAVE or DISCARD to continue.

Outputs, Gait Test

Total Time. The total time it takes a client to complete the course
Gait Speed. The average speed the client walks during the test (this does not include acceleration or deceleration periods, if applicable) in meters per second.
Step Count. The number of steps the client took during the test.
Stride Length (average). The average stride length during the test, calculated using step count and total distance traveled (in meters).
Response Time. The response time is the length of time between the "ding" indicating the test started until the client began the test, measured in seconds. (Standing start only)

Sensor Countdown

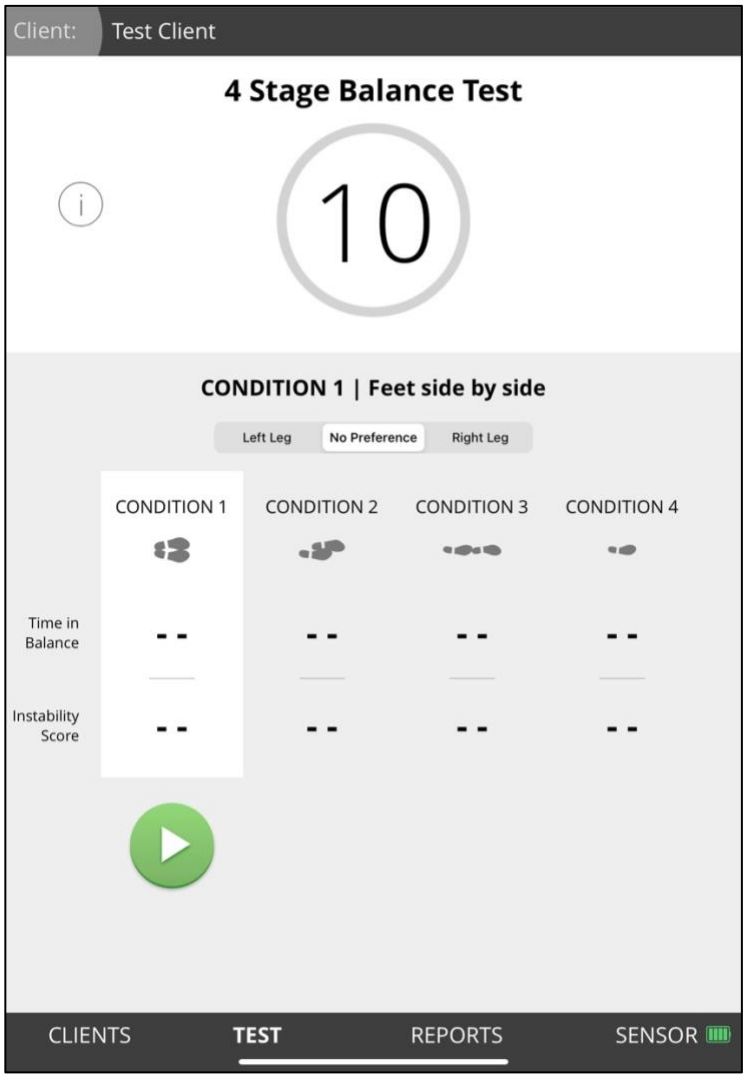
- There is a 2 second countdown which happens between tapping START before each condition, and the audible "ding" from the tablet when this is complete and the test begins.

- Advise the client to remain still from when you press START until the ding.
- The condition will end automatically when the “ding” sounds again. If the client fails a condition and you need to manually end the test by tapping the sensor or the STOP button, you will hear an audible “ding”.

4 Stage Balance Test (4SBT)

Purpose

The CDC recommends the 4-Stage Balance Test to assess static balance, which is an important part of postural stability. There are four standing positions that get progressively harder to maintain. Per the CDC, an older adult who cannot maintain the tandem stand (Condition 3) for at least 10 seconds is at increased risk of falling. The 4 Stage Balance Test is part of the CDC’s fall-prevention program, which is known as Stopping Elderly Accidents, Deaths and Injuries (STEADI).



General Information & Instructions

- Make sure the sensor is correctly placed on the client. *See Sensor & Belt Placement*.
- Client Instructions:
    - Footwear: Clients can remove shoes or wear shoes they would normally wear, and should stand erect for each condition.
    - Arm Placement: the client may hold her arms out and may move her body to keep her balance, but may not move her feet.
    - Start with feet together, ankle bones touching or as close as possible for the first condition.
    - Hold each condition for 10 seconds or until unable to maintain balance.
    - I will prompt you before each condition begins, please remain still until each condition starts with "ding"
- Clinician may assist the client to get into position and assist the client until the start of the test, but client must be independent while each condition is running.
- To start the test, tap the green start button, instructing the client the test is beginning, and that data will be collected as soon as the "ding" sounds, and will continue until the "ding" sounds again, indicating that the condition has finished. See ***Test Countdown*** below.
- The test ends automatically when the timer runs out. If the client moves a foot you must end the test yourself by tapping the STOP button on the tablet.
- The Leg Preference features allows a user to make a note of which leg the client used during the single-leg test. You can either ask your client to use a specific leg or make a note of which leg the client chose during the test. This label will appear on all reports, as well as in the test records in the Activity Log.
- Tap CONTINUE to advance to the next condition, or RETEST if the condition needs to be repeated.
- If a client fails a condition, you can choose to either end the test here, or continue to the remaining conditions by making the desired selection on the pop-up menu.
- Once the test is completed, a summary will be presented. Tap SAVE to record, or DISCARD to discard.

Test Countdown

- There is a 2 second countdown which happens between tapping START before each condition, and the audible "ding" from the tablet when the test begins.
- The condition will end automatically when the "ding" sounds again. If the client fails a condition and you need to manually end the test by tapping the sensor or the STOP button, you will hear an audible "ding".

Test Instructions

CONDITION 1 	Stand with feet side by side or their heels as close as possible.
CONDITION 2 	Place the instep of one foot such that it is touching the big toe.
CONDITION 3 	Tandem stance: place one foot in front of the other with the heel and toe touching.
CONDITION 4 	Stand on one foot, with the feet in a straight line.

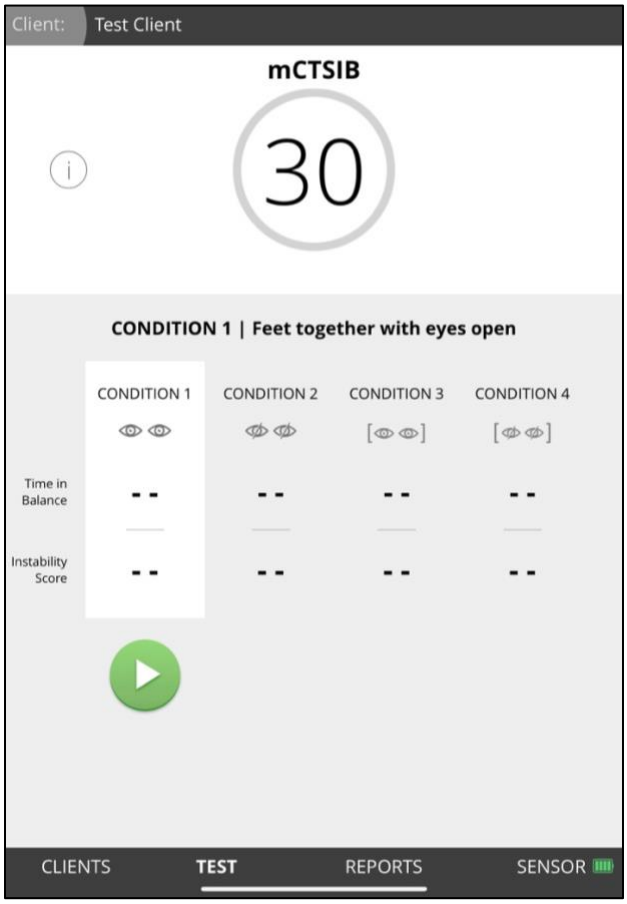
Outputs, 4 Stage Balance Test

Time in Balance. This is the time that the client remained in compliance with the condition. Total possible time is 10 seconds per condition, or 40 seconds total. Each condition's Time in Balance, as well as the Total Time in Balance are presented on the test summary.
Instability Score. The Instability Score is a measure of the client's sway during the test. The range is 1-10+.

mCTSIB (Modified Clinical Test of Sensory Interaction of Balance)

Purpose

The mCTSIB looks at how well a person uses sensory input while trying to maintain balance. The three balance systems under investigation are the somatosensory, the vestibular and the visual systems. In Condition 1, all balance systems are fully engaged. In Condition 2, the visual system is impaired. In Condition 3, the somatosensory system is impaired. Condition 4 tests only the vestibular system.



General Information & Instructions

- Make sure the sensor is correctly placed on the client. *See* *Sensor & Belt Placement*.
- Client Instructions:
  - Footwear: Clients can remove shoes or wear shoes they would normally wear, and should stand erect for each condition.
  - Arm Placement: Arms should be crossed, hands on opposite shoulders, or held steady at the sides.
  - Feet together, ankle bones touching or as close as possible.

    - Hold each condition for 30 seconds or until unable to maintain balance.
    - I will prompt you before each condition begins, please remain still until each condition starts with “ding”
- Clinician may assist the client to get into position and assist the client until the start of the test, but client must be independent while each condition is running.
- To start the test, tap the green start button, instructing the client the test is beginning, and that data will be collected as soon as the “ding” sounds, and will continue until the “ding” sounds again, indicating that the condition has finished. See ***Test Countdown*** below.
- The test ends automatically when the timer runs out. If the client moves a foot or opens their eyes (conditions 2 and 4) you must end the test yourself by tapping the STOP button on the tablet.
- Tap CONTINUE to advance to the next condition, or RETEST if the condition needs to be repeated.
- If a client fails a condition, you can choose to either end the test here, or continue to the remaining conditions by making the desired selection on the pop-up menu.
- Once the test is completed, a summary will be presented. Tap SAVE to record, or DISCARD to discard.

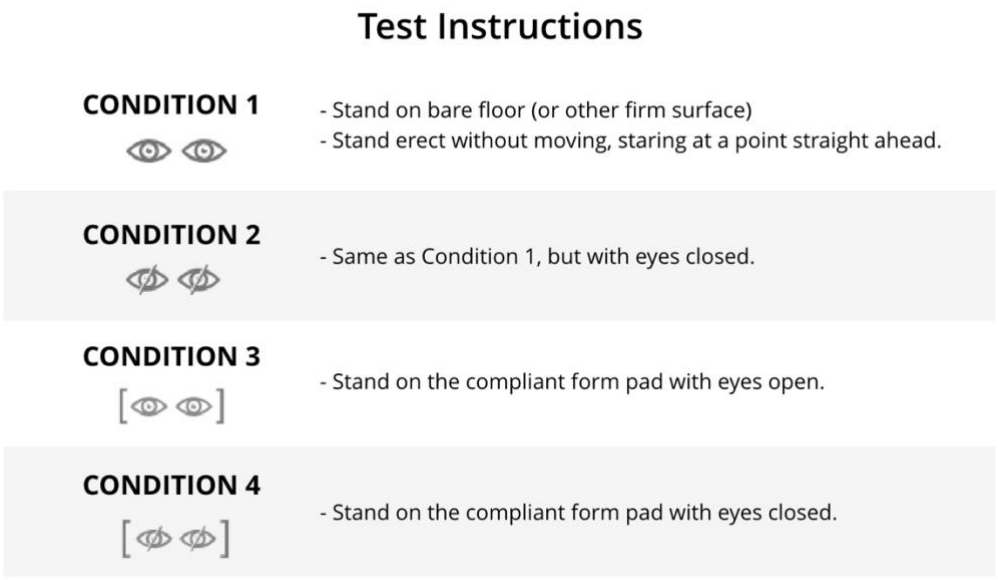
Voice Commands

- This test can be controlled by voice commands to make the testing process easier and safer. To enable voice commands, use the Settings menu. Once on the test screen, tap the orange microphone button until “ON” is displayed.
- You will see written assists showing you what voice prompts are available. These include the following.
    - Start Test – this will begin the countdown for each condition
    - Stop Test – this will end a condition early (no need to end a condition if the client makes it to the end without falling)
    - Next Condition – advance to the next condition.
    - Discard – Discard this condition.
    - Retest Condition – retest a recently failed completed condition.
    - Show Summary – when a condition is failed, you can say Show Summary to end the test and show the test summary
    - Continue – continue testing after a failed condition
    - Discard Test (Test Summary screen) – discard the entire test after completing.
    - Save Test (Test Summary screen) – save the entire test after completing.

Test Countdown

- There is a 2 second countdown which happens between tapping START before each condition, and the audible “ding” from the tablet when the test begins.

- Advise the client to remain still from when you press START until the ding. No data is collected until the “ding” sounds, and is only collected until the “ding” sounds at the end of the test.
- The condition will end automatically when the “ding” sounds again. If the client fails a condition and you need to manually end the test by tapping the sensor or the STOP button, you will hear an audible “ding”.



Outputs, mCTSIB

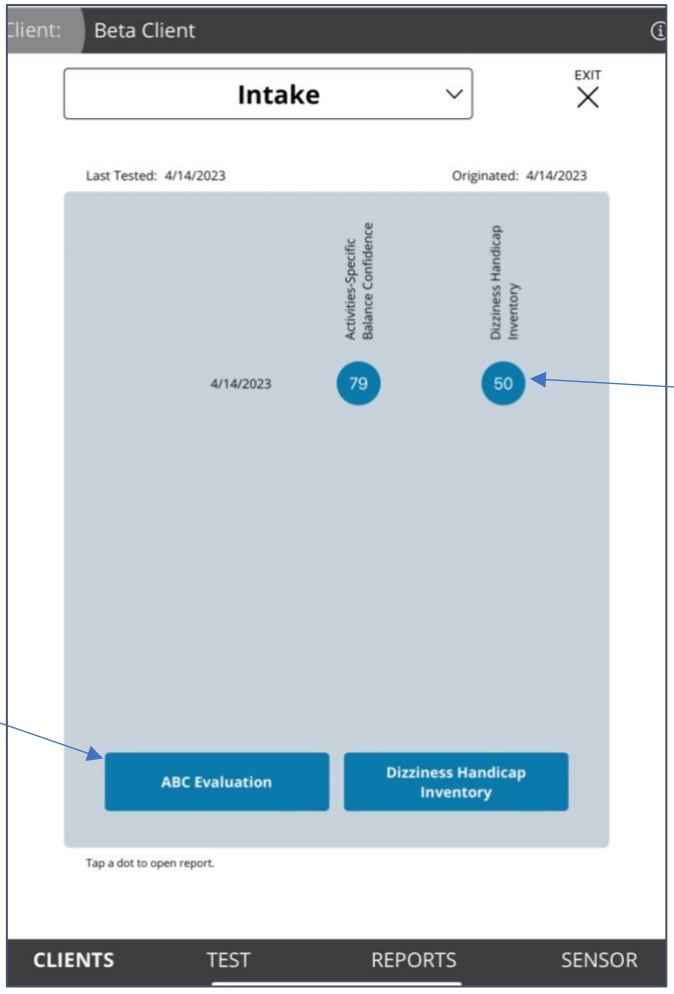
Time in Balance. This is the time that the client remained in compliance with the condition. Total possible time is 30 seconds per condition, or 120 seconds total. Each condition’s Time in Balance, as well as the Total Time in Balance are presented on the test summary.
Instability Score. The Instability Score is a measure of the client’s sway during the test. The range is 1-10+.

Intake Forms

Overview

SenSen includes 2 intake forms to be used when onboarding new clients. These are the Activities-Specific Confidence of Balance (ABC) Scale, and the Dizziness Handicap Inventory (DHI). Both forms, as well as their reports, can be accessed through the Client Center. CLIENT → (⋮) → Intake Forms. Here, you can see a list of which Intake Forms have been administered and when. Tapping on a blue dot will produce a PDF report of that particular test.

The buttons at the bottom of the screen will open a form to be completed. These are designed to be completed by the client, so you can hand the tablet to the client to complete.



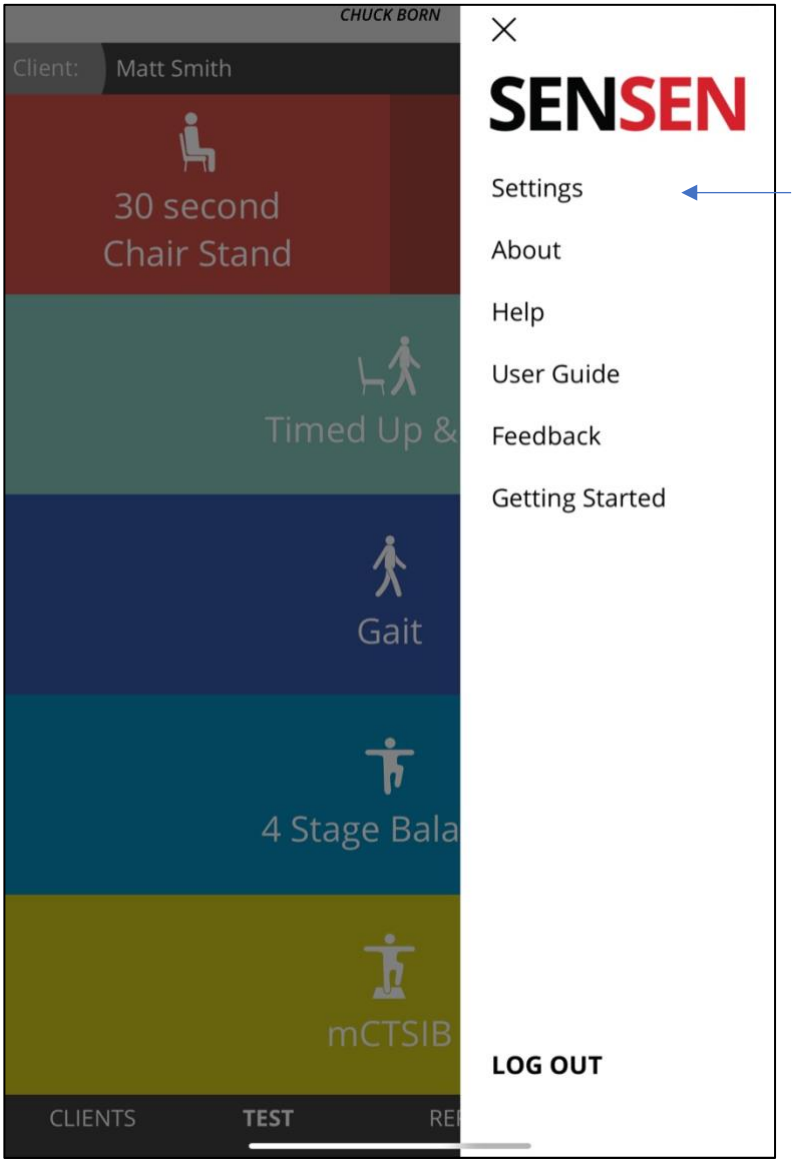
Intake History
All recent intake forms administered are displayed here. Tap on a blue score to open a report.

Intake Forms
Tap ABE Evaluation or Dizziness Handicap Inventory to administer a new intake form.

Overflow Menu

SenSen's Settings, About, Help, User Guide, Feedback, and Getting Started guide are in the overflow menu, which is accessed by tapping the triple line menu on the right side of the gray header.

The overflow menu is represented with the SenSen app with three stacked horizontal lines: ☰



Overflow Menu ☰

Links to Settings, About, Help, User Guide, Feedback, and Getting Started Guide. Tap Log Out to logout of your current session.

Settings

The Settings menu gives access to system-wide functions, including:

- Touch ID: turn on to enable this at login. Please note that you must have Touch ID enabled on the iPad to use.
- Units: decide between US and Metric.
- Language: currently SenSen is only available in English.
- Export File Delimiter: choose whether you want .csv files to be exported with a comma or pipe delimiter. Commas are selected by default.
- SYNC DATA. To perform a manual data sync, tap the SYNC DATA button. The most recent data sync date is always displayed directly below this button.

A note on syncing data. The syncing and backing up of data happens automatically when the user logs in, a user logs out, when WiFi is restored after having been off during a session, and when the user taps the sync button on the settings menu. Any client or test data will not be lost as long as the WiFi is turned on regularly to keep the tablet in sync with the server.

About

The About page displays general information about SenSen's development, the most current version, and provides links to the SenMetric Privacy Policy and Terms of Service.

Help

The Help page provides access to a list of frequently asked questions (FAQs) about using SenSen. Tap each question to reveal the answer and more information. The tablet must be connected to the internet to access this information.

User Guide

The User Guide provides access to the User Guide, a one-stop-shop for all information about how to use SenSen effectively. The tablet must be connected to the internet to access this information.

Feedback

The Feedback page provides access to a form where you can give feedback to the SenSen team. The tablet must be connected to the internet to access this functionality.

Getting Started

Getting Started opens up the 4-panel quick start guide that is presented when you login to SenSen for the first time.

Log Out

Logs you out of your session. You will need to log back in once you log out.

Reporting

Overview

SenSen provides built-in reporting features designed to highlight client performance ranging from a single test to a comprehensive client overview. All reports are accessible through the Report Center (REPORT).

Available Reports

TEST REPORTS

Single-Test Reports – reports in PDF format that break down a client's score in maximum detail, and can be used to support a billing claim. These reports are available from the Client Center. CLIENT -> (⋮) *next to the client* -> Assessment History; and they are available from the Activity Log by tapping "Full Report" under the date/time of the desired report.

Comparison Report – reports in PDF format that are customized based on specific dates within the same test. These reports are available in the Activity Log.

Client Summary Report – provides scores for the first and last instance of each test ever administered for a selected client on a one page report. Can be generated as a PDF or .csv file. These reports are available in Exportable Reports.

Client Detail Report – provides scores for every test ever administered for a selected client on one report. Can be generated as a PDF or.csv file. These reports are available in Exportable Reports.

4 Stage Balance Test Report – provides scores for every 4 Stage Balance Test ever administered for a selected client. Can be generated as a PDF or.csv file. These reports are available in Exportable Reports.

mCTSIB Report - provides scores for every mCTSIB ever administered for a selected client. Can be generated as a PDF of .csv file. These reports are available in Exportable Reports.

Timed Up and Go (TUG) Report - provides scores for every TUG ever administered for a selected client. Can be generated as a PDF or.csv file. These reports are available in Exportable Reports.

Gait Test Report - provides scores for every Gait Test ever administered for a selected client. Can be generated as a PDF of .csv file. These reports are available in Exportable Reports.

30 Second Chair Stand Report - provides scores for every 30-second Chair Stand ever administered for a selected client. Can be generated as a PDF of .csv file. These reports are available in Exportable Reports.

INTAKE FORMS REPORTS

Activity-specific Balance Confidence (ABC) Scale Report – provides the most recent scoring for the ABC form, with answers to each question, for a selected client.

These reports are available as PDFs. This report is available from the Intake Form screen, and the Exportable Report screen.

Dizziness Handicap Inventory (DHI) Report - provides the most recent scoring for the DHI form, with answers to each question, for a selected client. These reports are available as PDFs. This report is available from the Intake Form screen, and the Exportable Report screen.

Bulk Exports

SenSen allows for bulk exporting of Single Test Reports. The Bulk Exports feature allows you to download multiple reports at once, without having to select individual reports, saving you time and energy.

To access, navigate to the Report Center and select Bulk Exports from the dropdown menu. On this screen, you can select from the following sorting and filtering parameters for the export.

- Date Range
- Sorting Options: sort by Client, Test Type, and Date
- Filter Options: Client (can select multiple clients), Test Type (can select multiple tests)

Once you have set your preferred date range, sorting and filtering options, you can select one of two export options:

- Generate Report List: this will generate a list of all of the reports that qualify under the parameters that have been set in PDF format.
- Generate Reports: this will generate a report list followed by individual reports, each on a separate page in a multi-page PDF document.

Exporting Reports

All reports can be shared from the tablet as a PDF. With some of the reports, the data can be exported as a .csv file (see above for specific file-type availability). To share reports, look for the share icon  while viewing a report. From here, you can email, print, or AirDrop the report. To export the data, click on “Export to .csv” (when applicable) instead of on the share icon to generate a text file with either comma delimiters or pipe character delimiters depending on your choice in Settings. The file name will include the client name, test type (if applicable), and date.

Email Export

SenSen offers the option to immediately send your generated report to your email address with one button tap. The report will be sent as a PDF to the email address associated with your login

account (the same email address you use to login). Please look for an email from SenSen Reporting (reporting@sensen.io), and check your spam folder if you do not see.

The Email Export option is accessed by tapping the Email Report button at the top of any report screen where the full test report is visible.

Please note that you must be connected to WiFi in order to use this feature.

Printing Reports

To print a report, the tablet must be connected to the same Wifi network as an AirPrint enabled wireless printer. With this condition met, you will see the printer listed as an available printer from the Print menu.

For more instructions on AirPrint, see this Apple resource.

Emailing Reports using an Email Client

To use an email client to send a report, you must have an email client setup on the tablet. Once this is completed, you will be able to tap the share icon  and then tap the blue Mail icon, which will automatically populate an email with the selected report.

For more instructions on setting up an email client, see this Apple Resource.

AirDrop

To share, tap the  icon from the report, and select AirDrop from the list, and find the Apple device you'd like to share the report with. AirDrop provides a convenient, secure, and quick way to share reports from SenSen to another Apple device.

For more instructions on using AirDrop, see this Apple Resource.

Report Center

The Report Center provides access to all reporting that SenSen offers. This is separated into three tabs, accessed by the dropdown menu at the top of the page: Assessment History, Activity Log, and Exportable Reports.

Assessment History

Assessment History provides an overview of what tests were administered for a client on which date, indicated by blue dots that correspond to a test and date. Tapping the blue dot will

produce a Single Test report for the most recent test conducted on that date. Tapping the date will produce the Single Test reports for all the tests that were conducted on that date (multiple pages). Please note that if more than one of the same test was administered on a particular date, the Assessment History page will only reflect the most recent test from that date. To access every single test administered, navigate to the Activity Log.

Activity Log

The Activity Log provides comprehensive information on all test activity administered with SenSen for a selected client. Tests are separated by tabs, and within each tab you can see each test administered. Tap the blue "Full Report" icon to generate a Single Test Report for that test. Comparison Reports can also be generated here. Select which tests you would like to compare (up to 4), then tap COMPARE. A PDF report will be produced, and you can share this file by tapping the share icon on the top right-hand corner of the screen.

Exportable Reports

The Exportable Reports tab is where reports that can be generated as either a PDF or a .csv can be found. This includes the following:

- Client Summary Report
- Client Detail Report
- 4sStage Balance Test Report
- mCTSIB Report
- Timed Up and Go (TUG) Report
- Gait Test Report
- 30-Second Chair Stand Report
- Activity-specific Balance Confidence (ABC) Scale Report
- Dizziness Handicap Inventory (DHI) Report

To generate a report, tap the button to the right of the desired report.