

User Manual

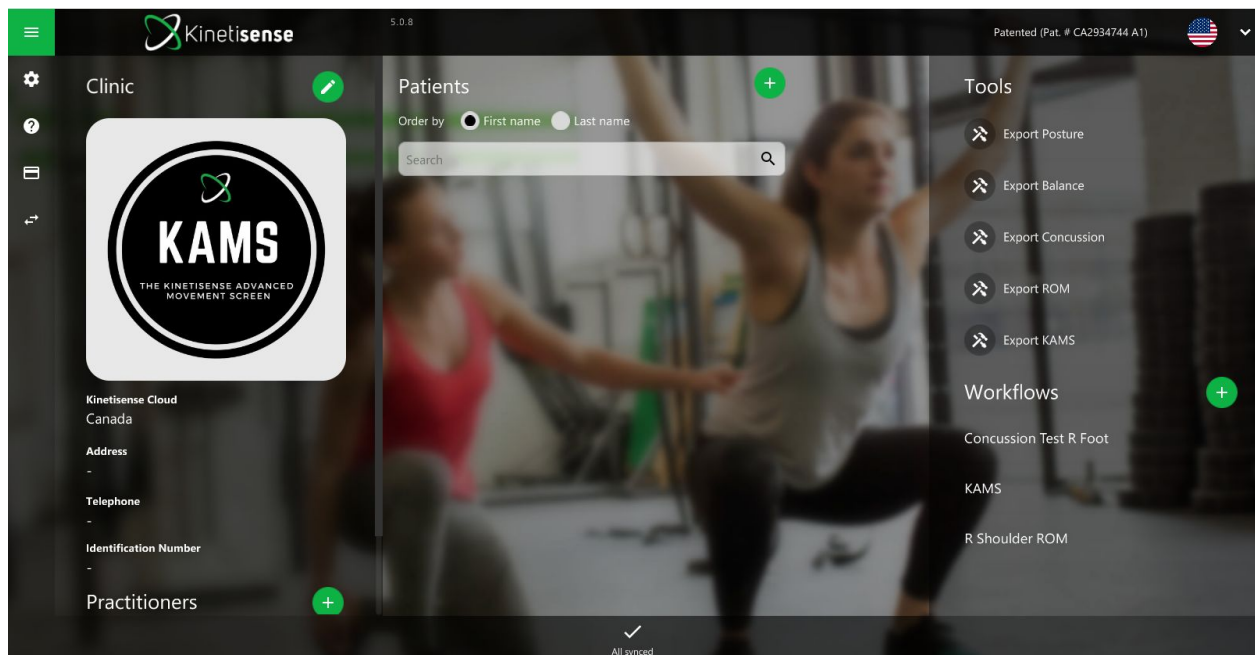
Customer Service Inquiries please dial (403) 458-4610, or email info@kinetisense.com.

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Setting Up Kinetisense for the First Time

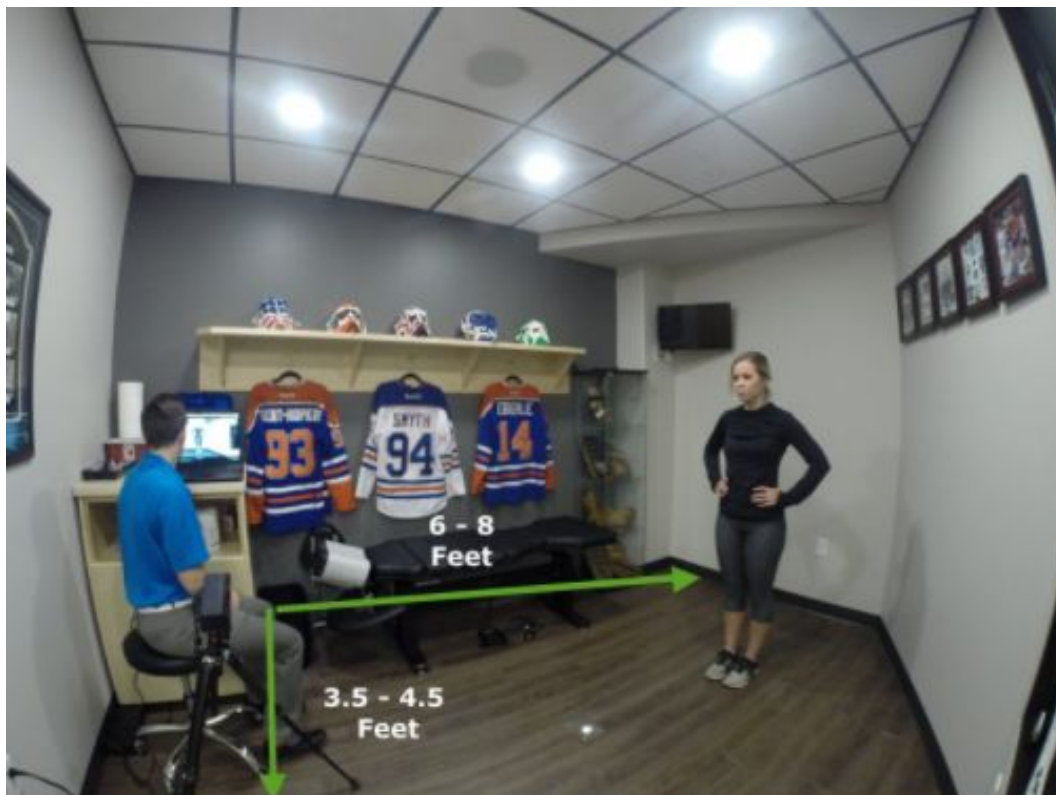


Things to Know Before an Assessment

You have purchased Kinetisense and you are ready to implement it into your practice, here are a few key tips that you need to know before you start using Kinetisense:

3D Sensor Placement

This is one of the most important, but often neglected aspects of using 3D Motion Capture technology. It is extremely important to have the 3D sensor in the proper position (3.5 - 4.5 feet off the ground). It is just as important to make sure that the room Kinetisense in has enough space that the patient can stand 6 - 8 feet away from the sensor without any objects obstructing the field of view between the patient and the sensor. The patient needs to be at least 1 - 2 feet away from the wall, especially if the wall and the patient's clothes are similar colors. Use the picture below as a reference for the space requirements needed:



Clothing Requirements

We recommend that the patient is wearing “**Tight and Bright**”. The Kinetisense software works best when the patient has tight fitted, light colored clothing on. Loose fitting, dark clothing is not ideal and can negatively affect the accuracy of the assessments. We recommend that patients are informed of this prior to their visit, or that clothes are readily available so the assessment can be performed. It is also recommended that patients **remove glasses, hats and put long hair in a ponytail**.

Lighting Requirements

Kinetisense functions in **almost** all settings. The system will not work if the 3D sensor is facing directly into natural light (sunlight), or bright LED lighting.

Traffic

Kinetisense’s patented technology has the ability to focus on one body, even in busy areas as long as the Patient is standing closest and in the field of view of the sensor. This allows the user to stand behind the Patient to administer passive ROM testing, set the Patient’s posture, as well as support during the balance test to decrease the risk of fall.

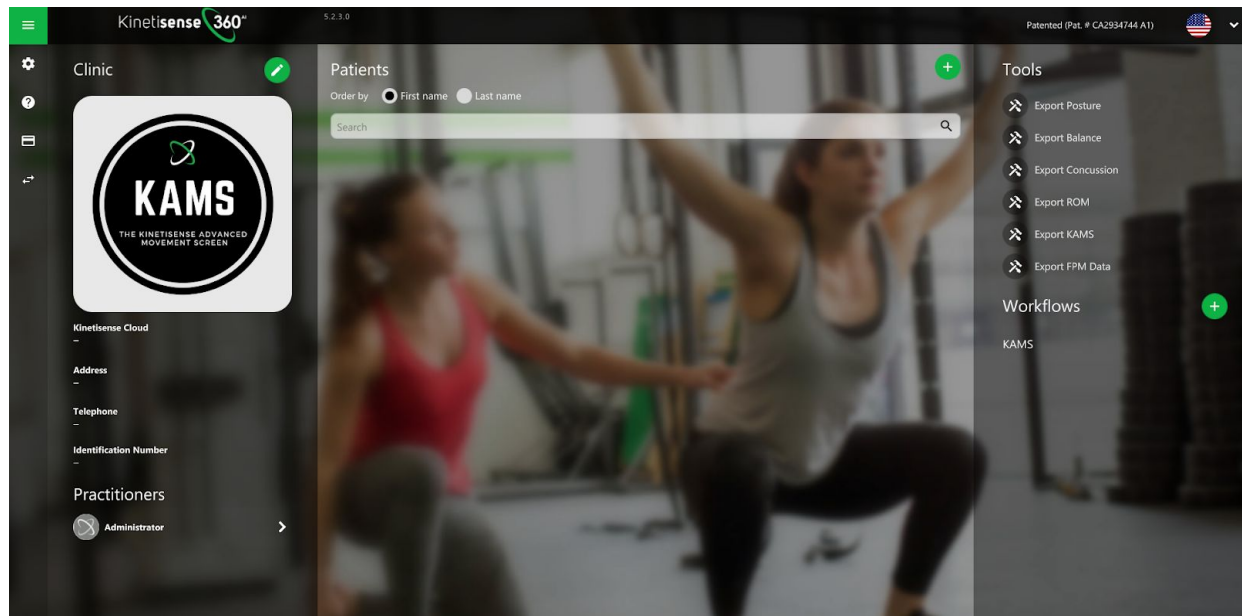
Other

Kinetisense assessments are most successful when the patient being tested is standing on a mat that is a different color from the floor.

Technical Support

If you need any help with technical support, please contact support@kinetisense.com, or have other questions relating to the system, please contact info@kinetisense.com for assistance.

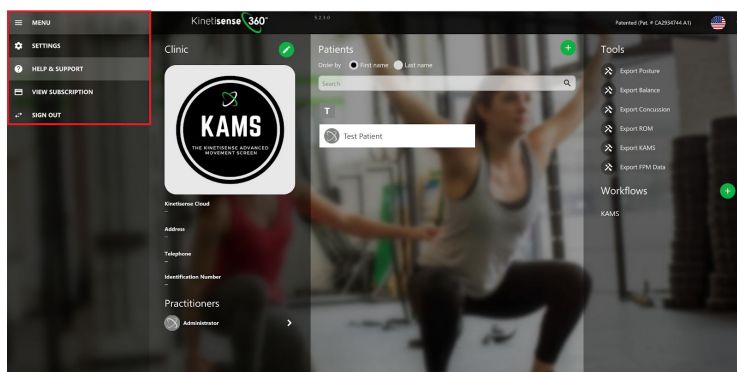
General Navigation



Main Menu

The Main Menu of the system can be accessed by clicking the green square with three lines in the top left hand corner of the screen. The Main Menu provides access to Settings, Help & Support, View Subscription and the Sign out feature.

Settings



In the Settings tab, the sensor Sensor needs to be set to either to the Kinect2 if the system is running off of a Kinect sensor or to LightBuzz if the system is running off of the Intel sensor.

Video recording can either be set to default or complete. If default is selected the system will save

each assessment at the frame rate that is selected, allowing for quick completion of saving assessment and moving onto the next. If complete is selected the system will record every frame, regardless of the frame rate selected. This option stores more data which will slow down the quickness of saving and moving onto the next assessment but is the most accurate option for playback. Neither of these options select the speed of the assessment itself, rather just the speed of saving an assessment.

The Frame Rates can be adjusted for each of the modules. There are four different options that can be selected: 15@1280x720, 30@1280x720, 60@640x480, 90@640x720. The lower frame rates (15,30) will have a better picture and resolution quality than the higher frame rates (60,90). If the user is looking to do faster movements in the Functional module, it is recommended that the frame rate be changed to 90@640x720.

Show list of patients provides the option to have the names all listed on the home screen if “Yes” is selected. If “No” is selected, patient names will need to be typed in the search bar to find their profile.

There is a checkbox to include generated notes in the SOAP notes section. If this is checked off, it will include this information when a report is generated.

There is a check box that allows videos to play immediately after an assessment when performing a workflow. This pertains to the KAMS assessment, once a movement is completed the video showing that movement will automatically play. By checking the box, the video will not play immediately after an assessment, the system will move onto the next assessment.

Ensure that the correct measurement system is selected. Below that there are various language settings to choose from.

Help & Support

Clicking on “User Manual” or “Video Tutorials” will navigate the user to a web page with the selected information.

Clicking “Contact Support” will navigate the user to the contact page on the Kinetisense website where a Demo can be booked, a Software Setup can be booked, or a Technical Support appointment can be booked. There is also an open text box below where questions can be submitted.

If there is an issue with the system that can not be duplicated by a Kinetisense employee, we will request a “Log file” to be sent that will allow a developer to get a better understanding of the issue that is occurring.

View Subscription

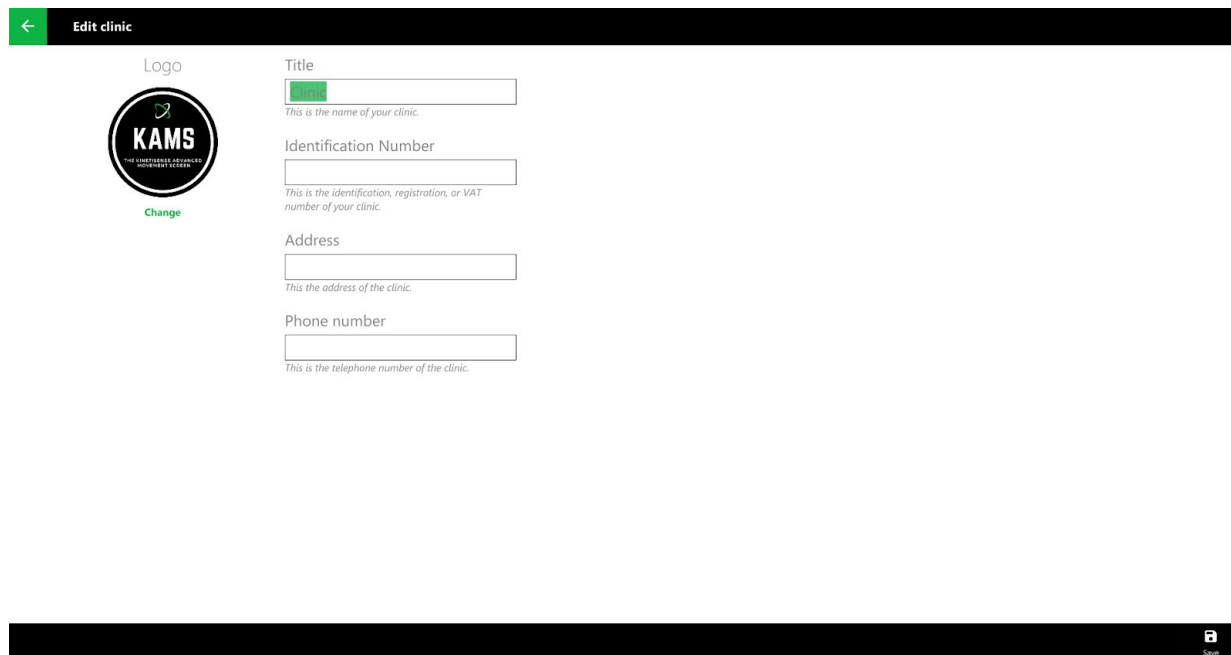
This allows the user to view the type and duration of their subscription and when it expires.

Sign Out

Clicking on this will allow the user to sign out of the system. Once signed out of the system, remember to enter the correct User Name and Password. Make sure to check off the “Remember me” and “Use Kinetisense Cloud” boxes. Before signing back into the system, make sure that the correct cloud is selected for the region that the user is in.

Customization

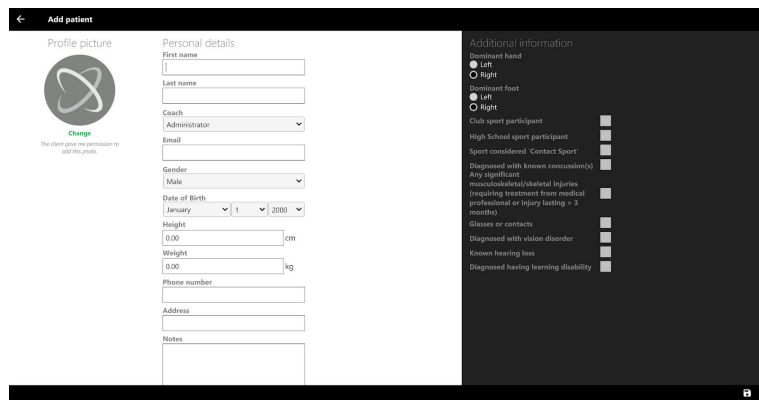
There are areas where the system can be Customized to fit a company/ business. This is located on the right hand side of the screen. Beside the word “Clinic” there is a green pencil, clicking this allows the clinic information to be changed.



As seen in the picture to the right, the logo as well as the name, identification number, address and phone number of the company/ business can be added here. Once the information is changed, click the save button in the bottom right hand corner of the screen.

Add New Patient

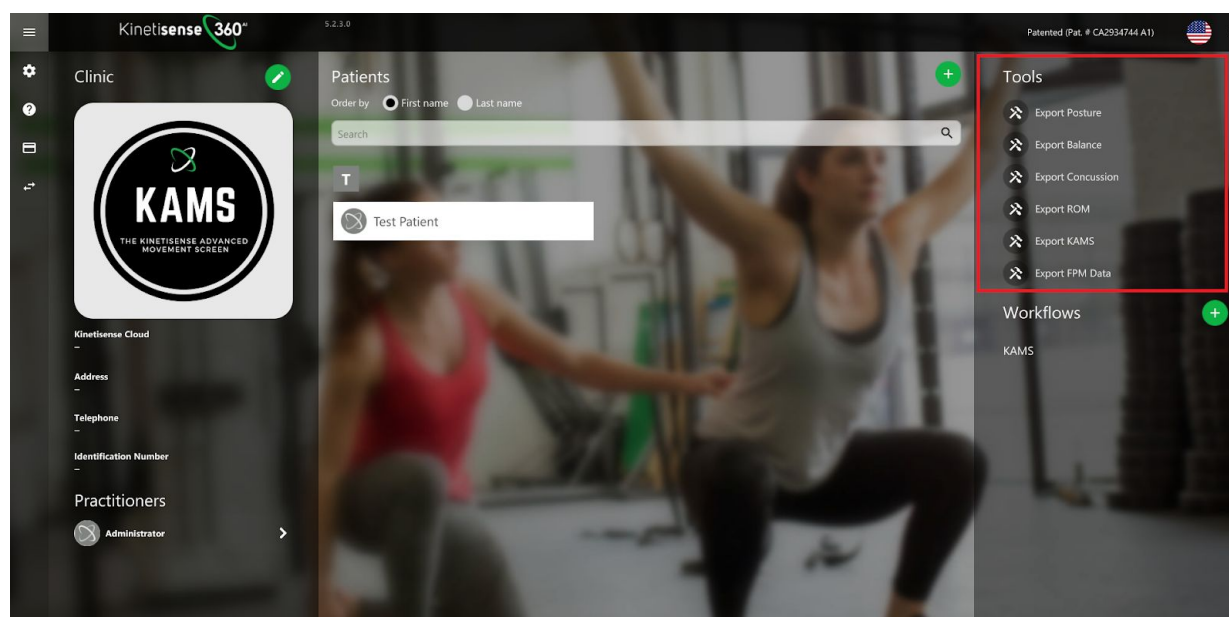
To add a new patient, click the green plus button along the top of the screen and the screen below will appear.



The information in the white half of the screen is required to be entered to create a new patient. The grey half of the screen is additional information that can be tracked if applicable. Once all of the necessary information is entered, click the save button at the bottom right hand corner of the screen.

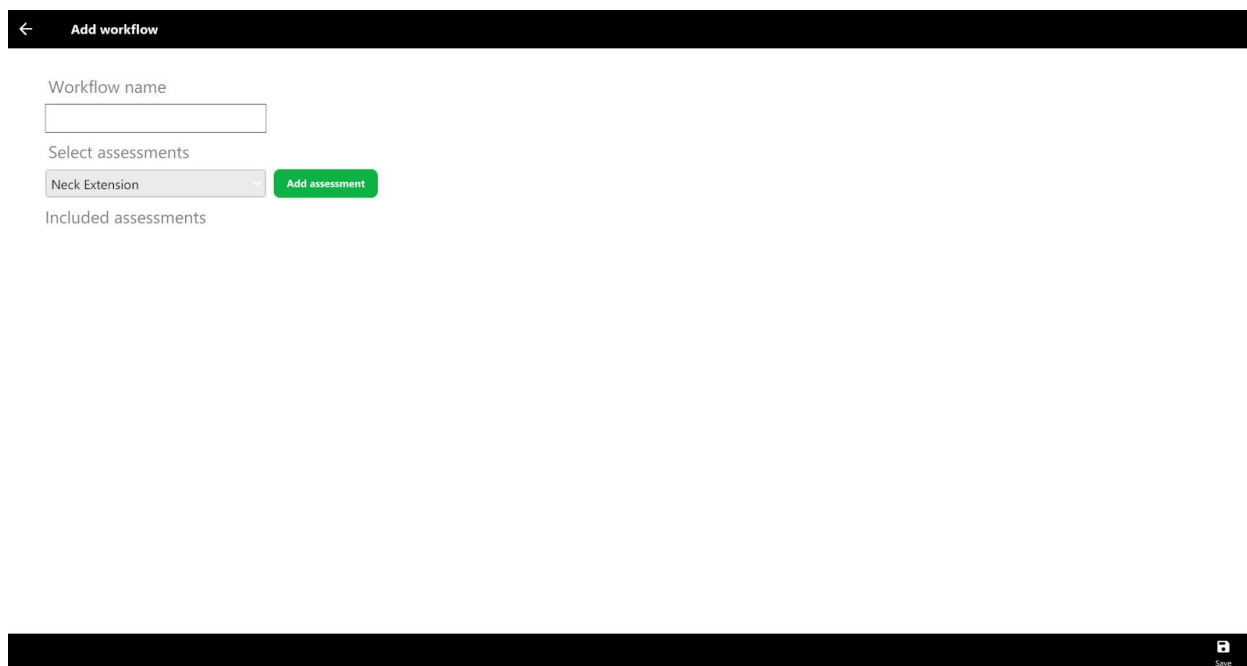
Tools

On the right hand side of the screen, there is a “Tools” function. There are six different export functions (Posture, Balance, Concussion, ROM, KAMS, FPM Data) that are available in Kinetisense. When an export tool is used, it will export all of the data pertaining to that module into CSV format onto a spreadsheet. Data can then be broken down for specific populations.



Build a Custom Workflow

There is a function in the Kinetisense system that allows the user to build their own custom workflow. This feature is located on the right hand side of the home screen about halfway down. To create a custom workflow, click the green plus button beside the “Workflows” title. After clicking the plus button, the screen below will appear:



The screenshot shows a mobile application interface for creating a custom workflow. At the top, there is a black header bar with a white back arrow and the text "Add workflow". Below the header, the form consists of the following elements: a text input field labeled "Workflow name"; a section labeled "Select assessments" containing a dropdown menu with "Neck Extension" selected and a green "Add assessment" button; and a section labeled "Included assessments" which is currently empty. At the bottom right of the screen, there is a black bar containing a white save icon and the word "Save".

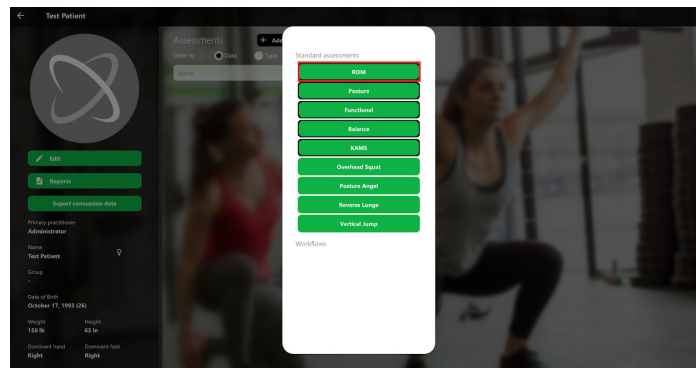
Each workflow that is created will require a Title. After naming the workflow, choose the desired assessments from the drop down menu. An assessment can only be completed once in a workflow, once the assessment is added to the custom workflow it is taken off of the assessment list. Please ensure that the assessments are added in the order that they are desired to be completed. The workflow can not be edited once it has been created, but a workflow can be deleted.

Range of Motion Tutorial

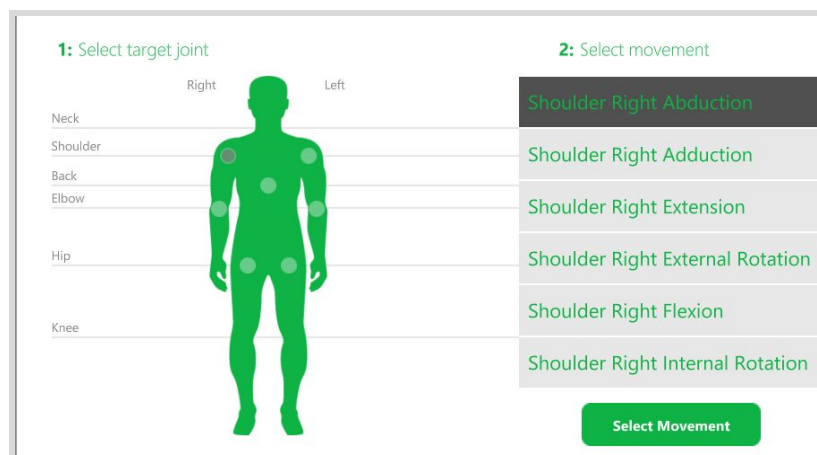


Getting Started

The first step in conducting a Kinetisense Range of Motion assessment is to load the Patient Profile. Once this is done, select “Add New” followed by “ROM” to begin.



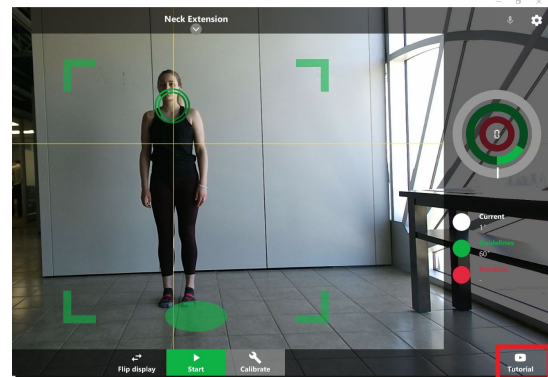
Once the ROM assessment screen has loaded, choose a joint to assess. Click the corresponding circle located on each joint to proceed. After selecting a joint to assess, select the movement to perform at that joint. The movement that is highlighted on the right side of the screen is the one that will be performed. Click “Select Movement” and the system will move to the assessment screen.



Calibrating Kinetisense Properly

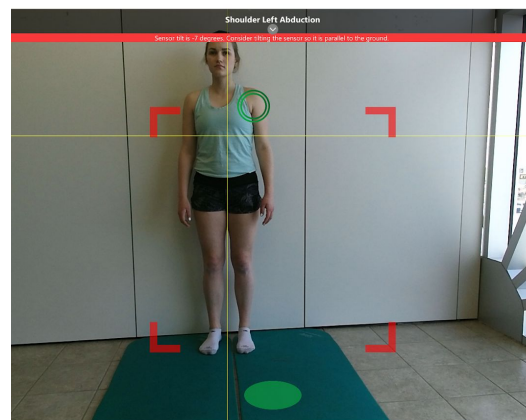
The Tutorial

Now that a joint and movement have been selected, ensure that the Patient is in the correct position. Locate the “Tutorial” button in the bottom right hand corner of the screen. This Tutorial button will show how the Patient needs to be positioned in relation to the sensor, as well as how to execute the movement.



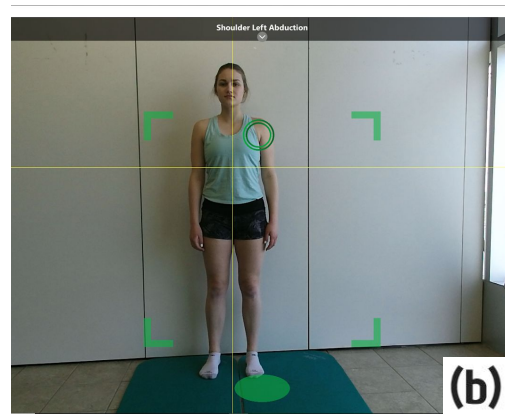
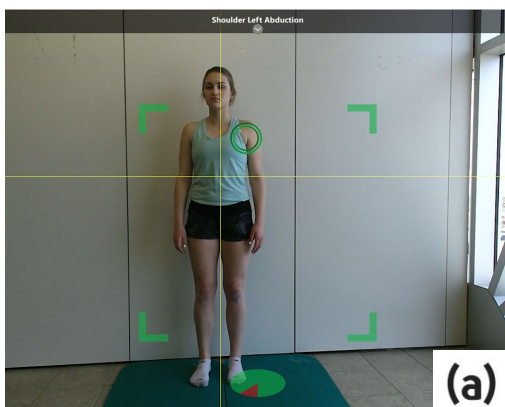
Distance Indicator Square

Now that the Patient is aware of how to stand, make sure they are aligned properly with the 3D Sensor. Around the Patient, there will be either a green or red square. The **red** color indicates that the Patient is not standing within the field of view of the sensor. The **green** color indicates that the Patient is within the field of view of the sensor to perform an accurate assessment.



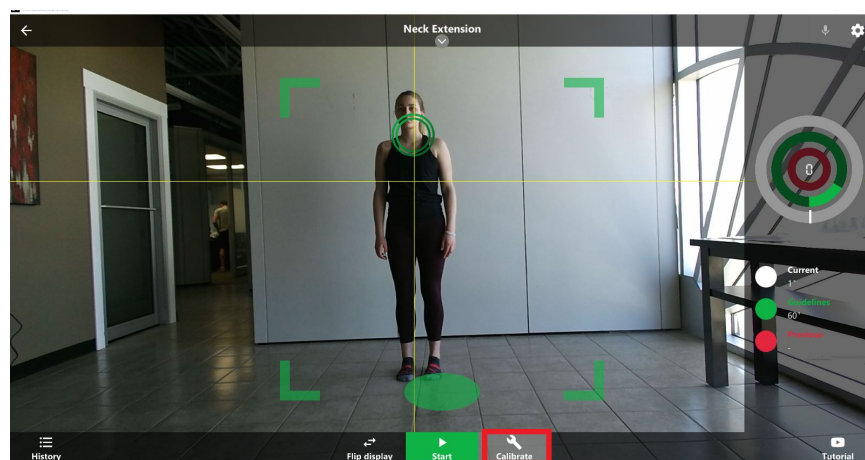
Alignment Circle

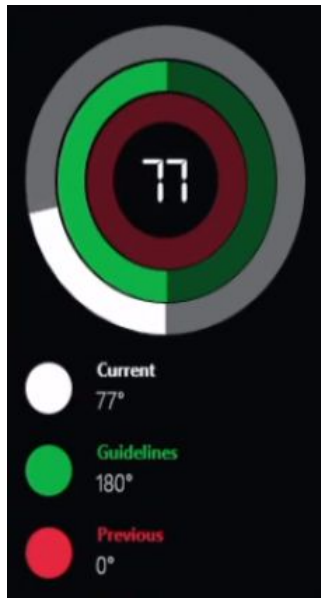
Once the Patient is the proper distance from the 3D Sensor, the next thing to note is the **green circle** located at the bottom of the screen. If the circle is showing a red section, this means that the Patient is not in the correct position or they are not square to the 3D sensor. In the graphics below in picture **(a)** the Patient's shoulders are not square with the 3D sensor and the circle is not completely green. In picture **(b)** the Patient has adjusted their shoulders to face the 3D Sensor and the circle is completely green. The user is now able to perform the assessment accurately.



Measuring Range of Motion

Now that the assessment is ready to be performed, calibrate the system (outlined in red in the image below) so the dial on the right side of the screen reads "0°". Press "Start" instructing the Patient to perform the movement selected. If the Patient experiences pain while performing their range of motion this can be tracked by selecting the "Pain" button that is located at the same place as the "Calibrate" button once the assessment is started.





The **Red Dial** is showing the Patient's previous assessment of that ROM. If no previous assessment has been completed, the red dial will not be active.

The **Green Dial** shows the AMA guideline for what a full range of motion for that movement is.

The **White Dial** shows what the Patient's current range of motion is while performing the movement. This is the number that is reflected in the center of the dial.

Once the assessment is completed, a pop up window will appear and with a SOAP notes charting option. Choice of “Pre-Treatment/ Post-Treatment”, “Passive”, or “Resistance” can be selected by the check boxes on the left hand side of the screen displayed below. If pain was captured during the assessment, the VAS and type of pain can be adjusted in this pop up window (displayed in the image on the next page). General energy level and general hydration level can also be tracked through repeated assessments on the sliding scales located in the top left hand corner of the pop up screen. These two measures are subjective reports by the patient and will not have an impact on the overall score. Once charting is completed either click “Save” or “Discard”.

Standard ROM Assessment

Save

General energy level

0

5

10

General hydration level

0

5

10

☒ Pre-Treatment
 ☐ Passive
 ☐ Resistance

100%

Subjective

Objective

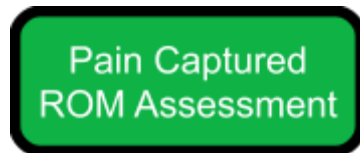
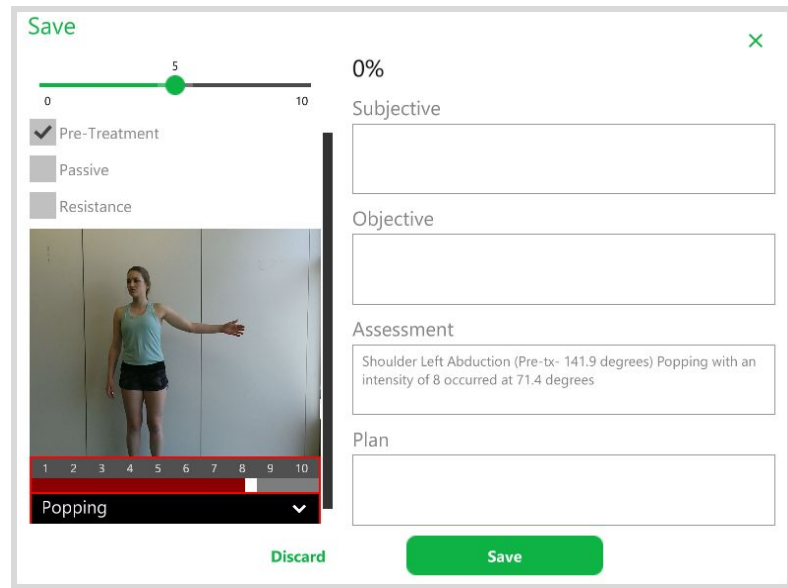
Assessment

Shoulder Left Abduction (Pre-tx- 166.8 degrees)

Plan

Discard

Save

Generating a ROM Report

Now that the ROM assessment has been completed there are three different ways to generate a report, each is outlined below:

1. ROM Assessment

- Upon completion of the ROM assessment, navigate back to the patient profile.
- Click into the assessment that was just completed.
- Locate the icons in the top right hand corner of the screen, click the page icon (fourth icon).
- The “Select Data Range” screen will appear with that assessment selected.
- In the bottom left hand corner choose to include/ exclude “Pictures”, “Charts”, and “SOAP notes”.
- Name the report.
- In the bottom right hand corner, click “Save as PDF” or “Save as DOCX”.

2. Reports Menu - ROM Summary

- Upon completion of the ROM assessment, navigate back to the patient profile.
- Click the “Reports” button on the left hand side of the screen.
- From the “Reports” menu, select “ROM Summary” under Legacy reports.
- At the bottom of this report there is a text box for “Prescribed Exercises and Stretches”.

- e. In the top right hand corner of the screen, click the “Print & PDF” button. This will open a flashing orange printer in the bottom toolbar of the computer screen.
- f. Click on this and a Print window will appear.
- g. To print the report, select a printer that is set up to the computer.
- h. To save the report select the “Microsoft Print to PDF” option, click “Apply”, “Print” and save the report to the desktop.

3. Reports Menu - Manual

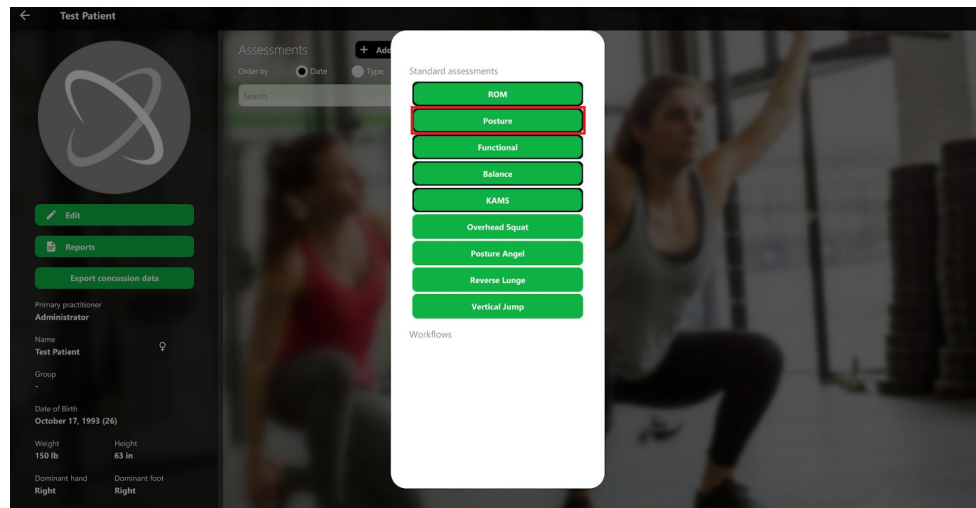
- a. Upon completion of the ROM assessment, navigate back to the patient profile.
- b. Click the “Reports” button on the left hand side of the screen.
- c. From the “Reports” menu, select “Manual”.
- d. Check off the ROM assessments desired to create a report.
- e. In the bottom left hand corner choose to include/ exclude “Pictures”, “Charts”, and “SOAP notes”.
- f. In the bottom right hand corner, click “Generate Report”.
- g. At the bottom of this report there is a text box for “Prescribed Exercises and Stretches”.
- h. In the top right hand corner of the screen, click the “Print & PDF” button. This will open a flashing orange printer in the bottom toolbar of the computer screen.
- i. Click on this and a Print window will appear.
- j. To print the report, select a printer that is set up to the computer.
- k. To save the report select the “Microsoft Print to PDF” option, click “Apply”, “Print” and save the report to the desktop.

Posture Tutorial



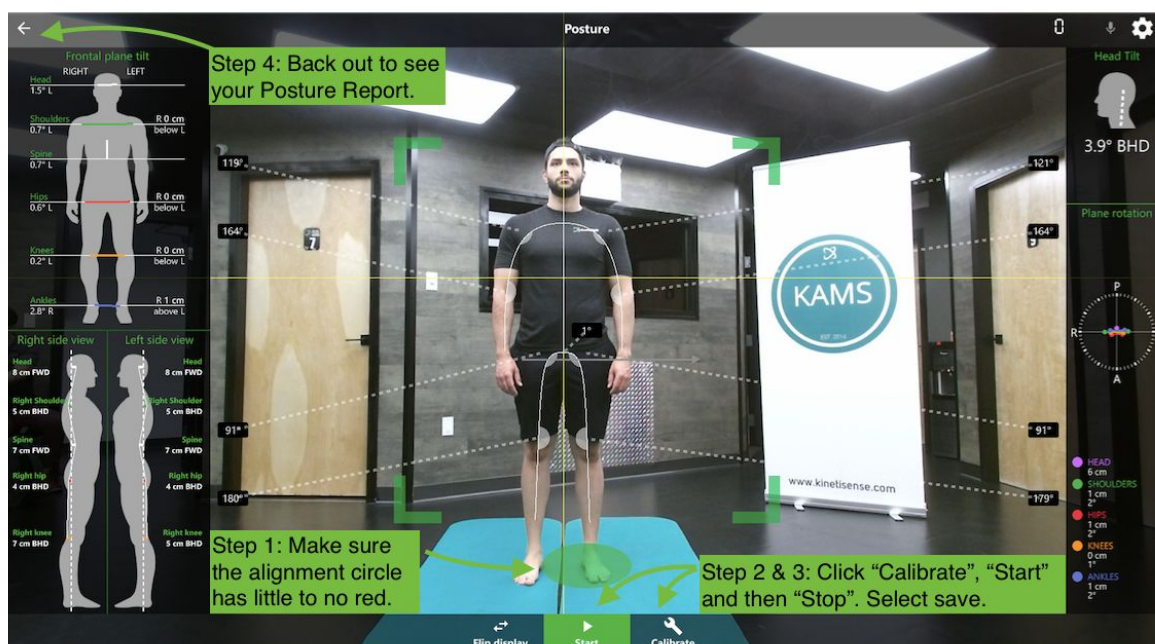
Getting Started

The first step in conducting a Kinetisense Posture assessment is to load the Patient Profile. Once in the Profile, click “Add New” and then select the “Posture” module to begin.



How to Perform a Posture Assessment

Once the Posture module has loaded, Kinetisense will automatically lock onto the Patient’s anatomical landmarks and display the information without user involvement. Once the screen loads, follow the steps outlined in the picture below:



How to Interpret the Posture Assessment Screen

Frontal Plane Tilt

This is shown on the left hand side of the posture screen in the top avatar. Kinetisense will generate Frontal Plane tilt of the Head, Shoulders Torso, Hips, Knees and Ankles. Looking at the screen, the measures on the left side of the avatar are in degrees and the right side are in centimeters/ inches.

Sagittal Plane

Kinetisense will automatically assess the Head, Shoulders, Torso, Spine, Hips and Knees. The numbers given depict how anterior and posterior that joint is from the plumb line, whether it be FWD (forward) or BHD (behind) in centimeters/ inches. The Plumb line is automatically generated and is located slightly anterior to the lateral malleolus.

Head Carriage

This is shown in the top right of the screen. Head carriage is depicted in degrees FWD (forward) or BHD (behind).

Plane Rotation

This is shown on the right side of the screen. The “compass” is showing an overhead view of how the patient’s joints are stacked. Be aware that all of the joint locations are anchored on the hips (the red line) which will always be centered on the compass. There are corresponding numbers below that indicate the degrees and centimeters/ inches of rotation, broken down by joint.

See the image below to locate these corresponding sections within the Kinetisense application.



How to Generate a Posture Report

In the information screen following a Posture Assessment, there are five report sections to each assessment completed. The Frontal Plane Avatar: depicting the frontal plane tilts. The Sagittal Plane Avatar: depicting the joint locations relative to the plumb line. The Transverse Plane view: showing a bird's eye view of the subject and the joints in relation to each other. The actual picture of the subject and the raw data listed in text format in the assessment portion of the SOAP notes.

There are three different ways to generate a Posture Report, each way is outlined below:

1. Trough an assessment
 - a. After completing a posture assessment, navigate back to the patient profile.
 - b. Once in the patient profile, click on the recently completed assessment, this will open the information screen.
 - c. In the information screen, locate and click on the page icon in the top right hand corner.

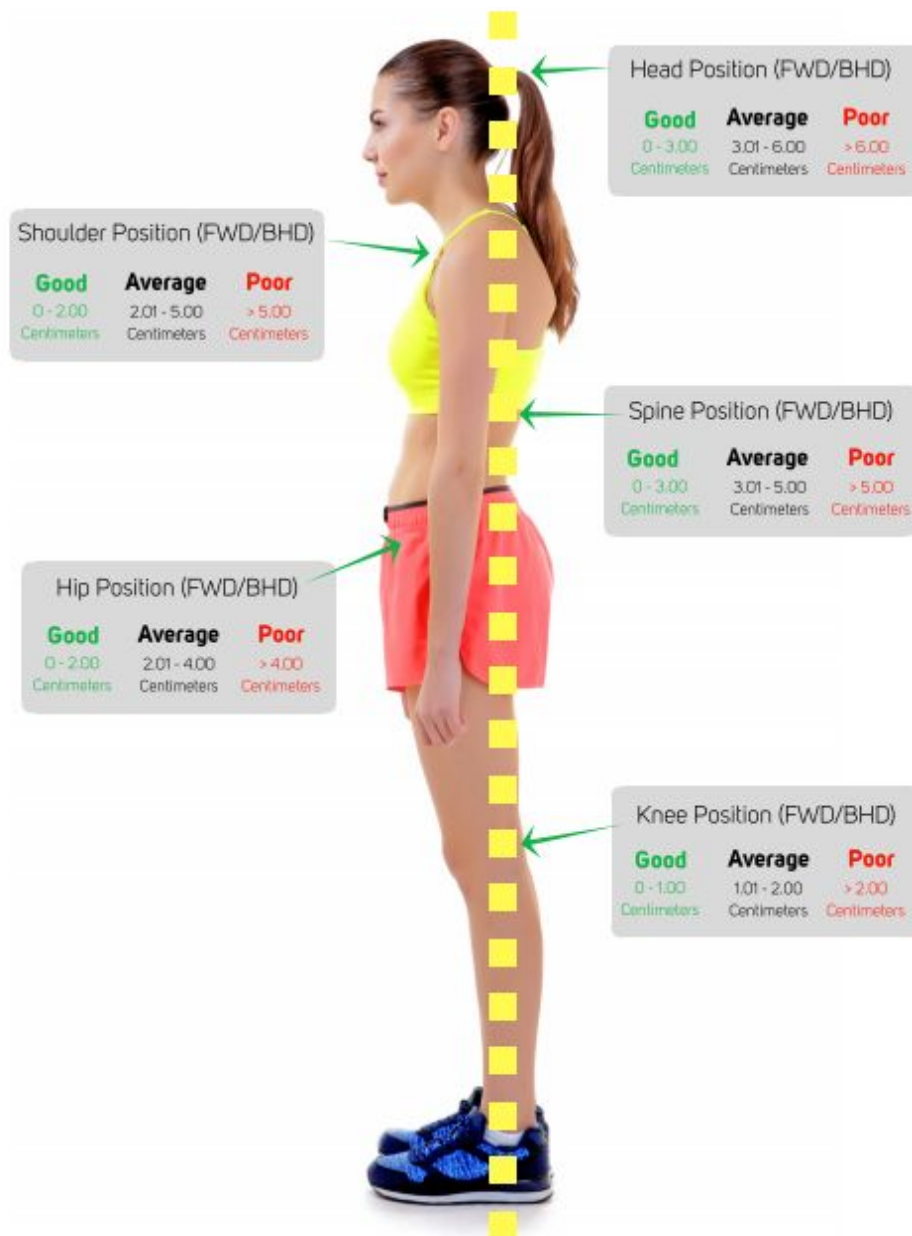
- d. This will open the “Select Data Range” page where that specific assessment will be selected.
 - e. Choose to either include/ exclude “Pictures”, “Charts” or “SOAP notes” in the bottom left hand corner by checking the boxes.
 - f. Name the Report.
 - g. Click either “Save as PDF” or “Save as DOCX” in the bottom right hand corner of the screen to generate the report.
2. Through the “Reports” menu (Manual)
 - a. After completing a Posture assessment navigate back to the patient profile.
 - b. Once in the patient profile, click the “Reports” button on the left hand side of the screen.
 - c. In the “Reports” menu select the “Manual” option.
 - d. Click the assessment(s) desires to generate a report from.
 - e. Choose to include/ exclude “Pictures”, “Charts”, and “SOAP notes” with the check boxes.
 - f. Name the report.
 - g. Click “Save as PDF” or “Save as DOCX” to generate a report.
3. Through the “Reports” menu (Posture Summary):
 - a. After completing a Posture assessment navigate back to the patient profile.
 - b. Once in the patient profile, click the “Reports” button on the left hand side of the screen.
 - c. In the “Reports” menu select the “Posture Summary” option.
 - d. In the top right hand corner of the screen click the “Print & PDF” button.
 - e. A flashing orange printer will appear in the bottom tool bar of the screen. Click on this and a Print window will appear.
 - f. To print the report, select a printer that is set up to the computer.
 - g. To save the report select the “Microsoft Print to PDF” option, click “Apply”, “Print” and save the report to the desktop.

How to Interpret a Posture Report

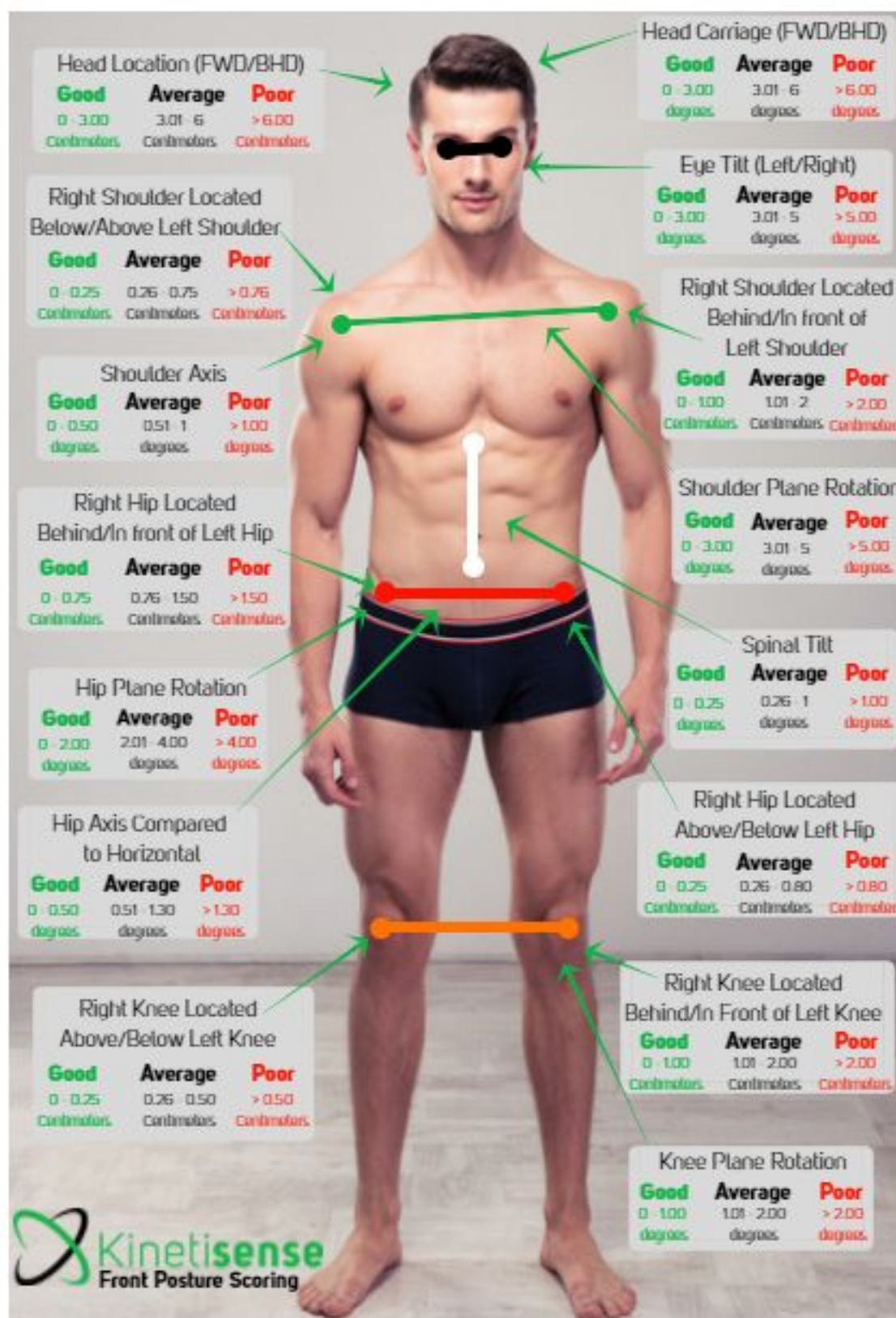
Posture has historically been a subjective assessment that users have eye-balled to identify dysfunctions. Kinetisense provides objective posture data that allows the user to give the patient something they have likely never seen before. This section instructs how to interpret the data collected from a posture report so that dysfunction can be identified quickly in order to provide corrective strategies or exercises.

When a Posture report is created for a single assessment the Frontal Plane, Sagittal Plane and Transverse Plane avatar images are included for each capture that is taken during the assessment. Below each avatar, the information is displayed in table format, providing all the measures in text format. Measures that are negative are to the **right** and measures that are positive are to the **left**.

There are two images displayed below that can assist in determining if the patient has good, average or poor posture based on the various areas of the body.



*All Values are Relative
to the Plumb Line*

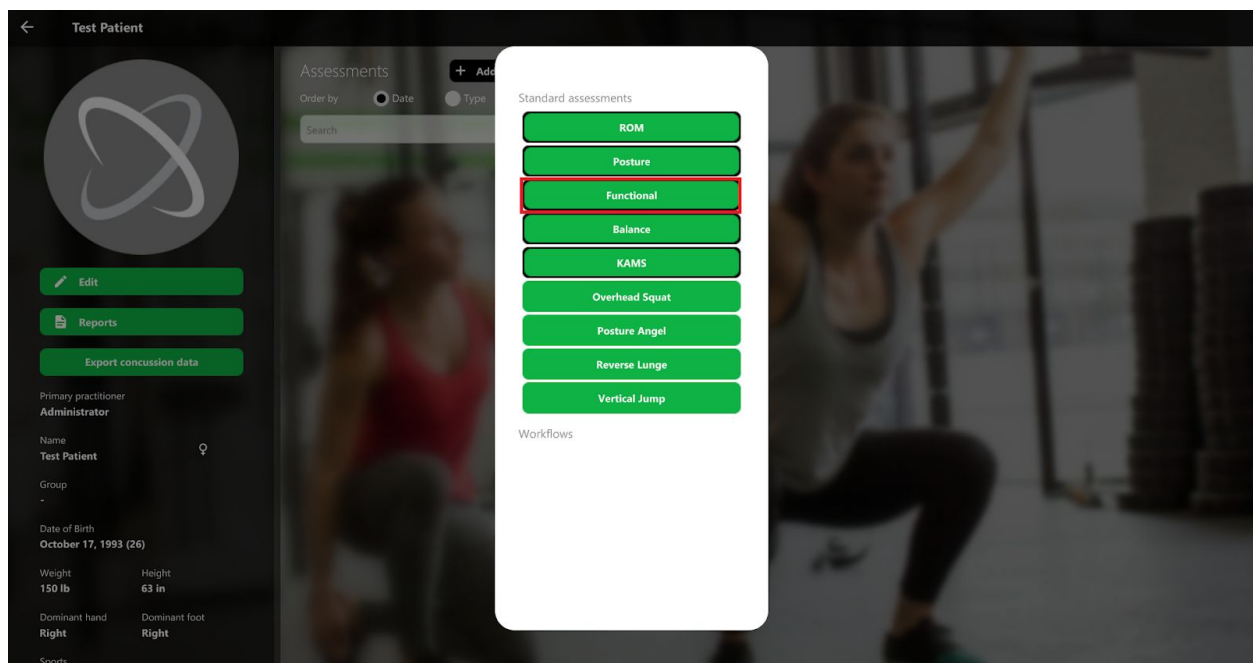


Functional Movement Tutorial



Getting Started

The first step in conducting a Kinetisense Functional Movement assessment is to load the Patient Profile. Once the Patient Profile is loaded, select “Add New” and then “Functional” to begin.

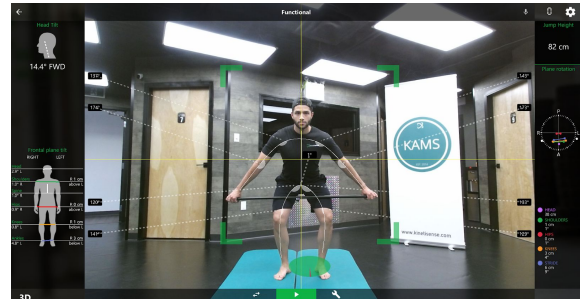


How to Perform a Functional Movement Assessment

The Functional Movement Assessment will automatically lock onto the patient’s anatomical landmarks as soon as the screen is opened, with no particular involvement. If the system does not automatically lock on, instruct the patient to take a step forward so the system recognizes them. The Functional Module allows for a large amount of freedom for the user to be creative and adapt the system to their personalized assessments. Simple or complex movements can be assessed in real time so patients can see an in depth breakdown of the movement. Movements can be recorded with the front or back of the body facing the sensor, along with side-lying (ex. side plank). Rotational movements are best recorded with the patient offset 45° from the face of the sensor. The video recording function also allows the user to save the video for comparison or expanded data collection purposes. When the Functional Movement screen first loads, there are 2 different views that the user is able to choose from. Those views are shown below:

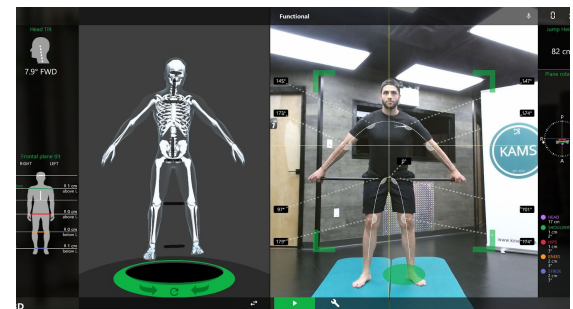
Color

This is the most commonly used view. The user can see the frontal plane tilt, head tilt, and transverse plane view. This is commonly used when the Patient has the ability to watch themselves on the screen and the user wants to use the real time assessment to train them on how to adjust or correct their movement.



Split View

This is the most commonly used view. The user can see the frontal plane tilt, head tilt, and transverse plane view. This is commonly used when the Patient has the ability to watch themselves on the screen and the user wants to use the real time assessment to train them on how to adjust or correct their movement.

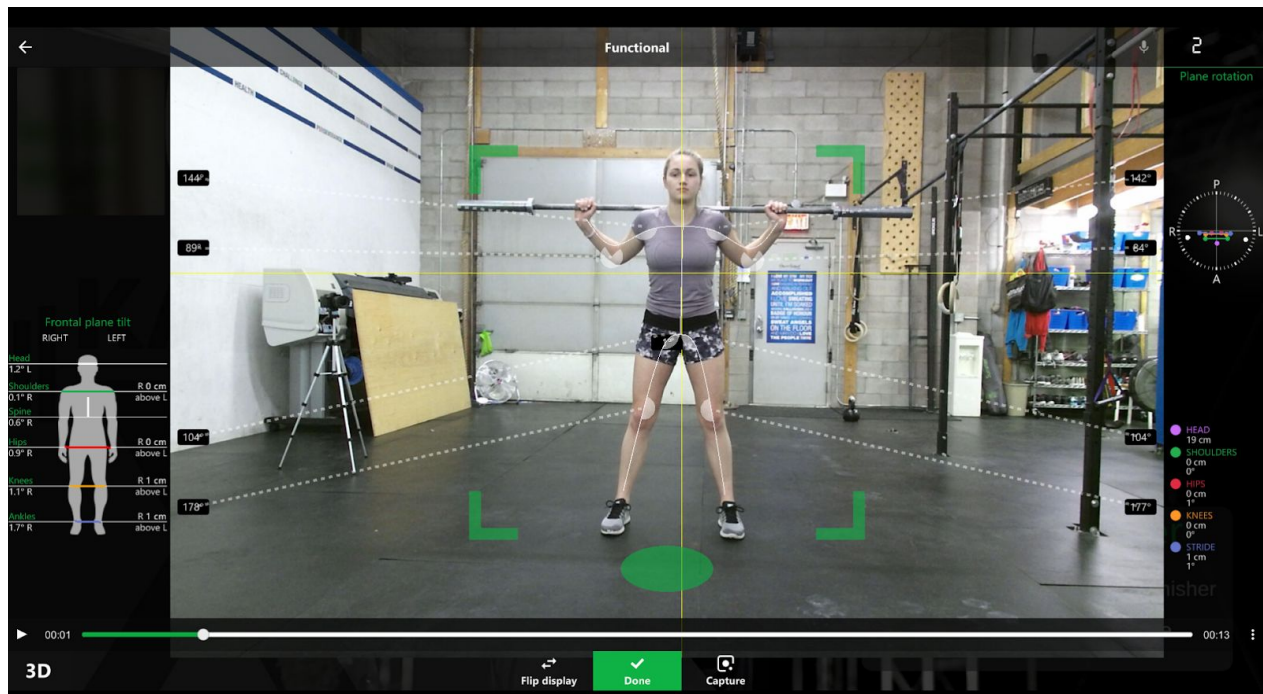


One of the great features of KAMSX is the user can replay the assessment in any view desired, so the benefits of each view can be utilized.

Now that the desired view has been selected, an assessment is ready to be completed. Some of the unique features of the Functional Movement Module are outlined below.

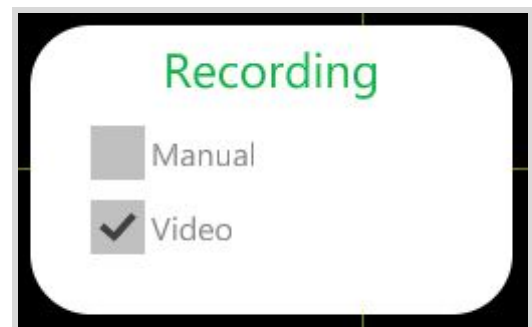
Jump Height

Jump height is located in the top right hand corner of the functional screen. To conduct a vertical leap test, the Kinetisense user will hit “Calibrate” when the Patient is standing upright and completely still, this will be followed promptly by clicking “Start”. After selecting start, the Patient will perform the jump and the user will click “Stop”. Once completing the assessment if it is satisfactory, select “Save”. Jump height is measured by calculating multiple joints’ displacement from their initial position.



Capture Features

There are two different capture features in the Functional Module. **Manual** is a standard photo and **video** allows the system to capture a video of the assessment. To access this feature, click the gear in the top right hand corner of the screen. It is recommended that the video option is selected for this module.



How to Pull Data from a Functional Movement Assessment

Once an assessment has been completed, there will be a video replay of the assessment, click the “Done” button in the center of the screen on the bottom. A white screen will come after with the option to “Discard” or “Save” the assessment. Click the “Save” button if the assessment was the movement that is desired. After saving the assessment, click the back button in the top left hand corner of the screen to navigate

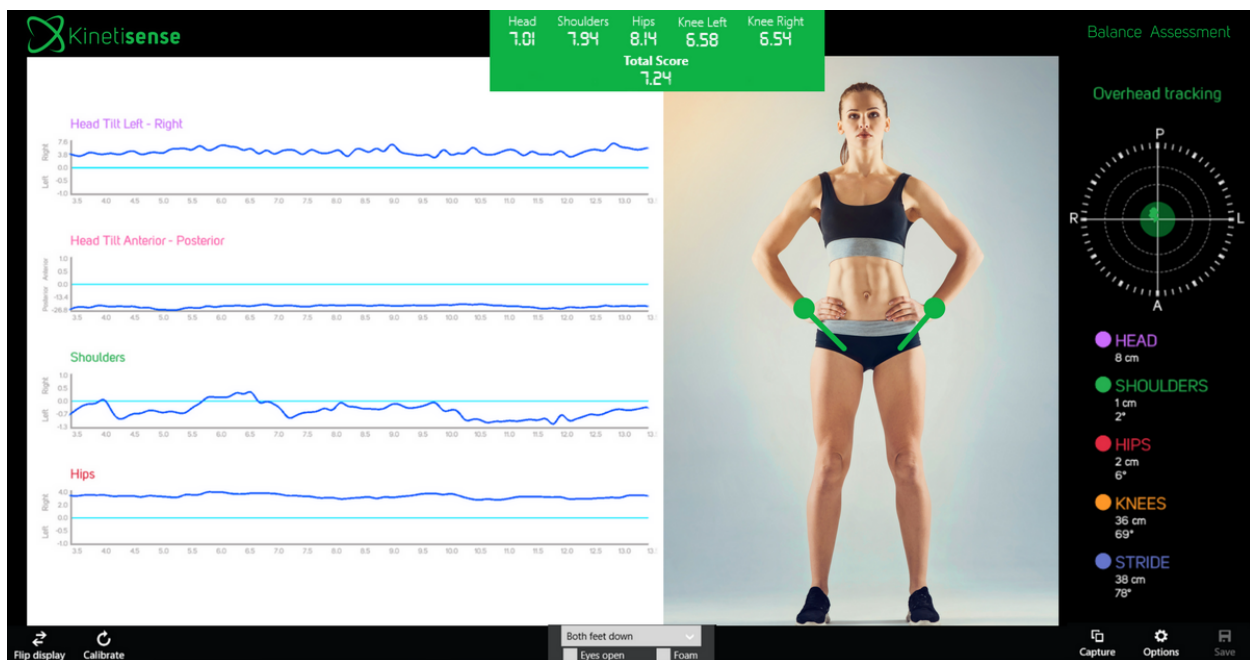
back to the patient profile. Once in the patient profile, select the Functional Assessment that was just completed. When the assessment opens, click the play button in the top right hand corner of the screen. The video of the assessment will play back, with the option to capture a point from the video and pull the data. The capture button is found along the bottom of the screen in the centre. Once all the desired data has been captured, click “Done”, “Save” and exit back into the patient Profile. Enter into the same assessment and all the captured data points will be displayed in the information screen and can be accessed by scrolling down.

How to Generate a Functional Movement Report

There are two different ways that a Functional report can be generated, they are explained below:

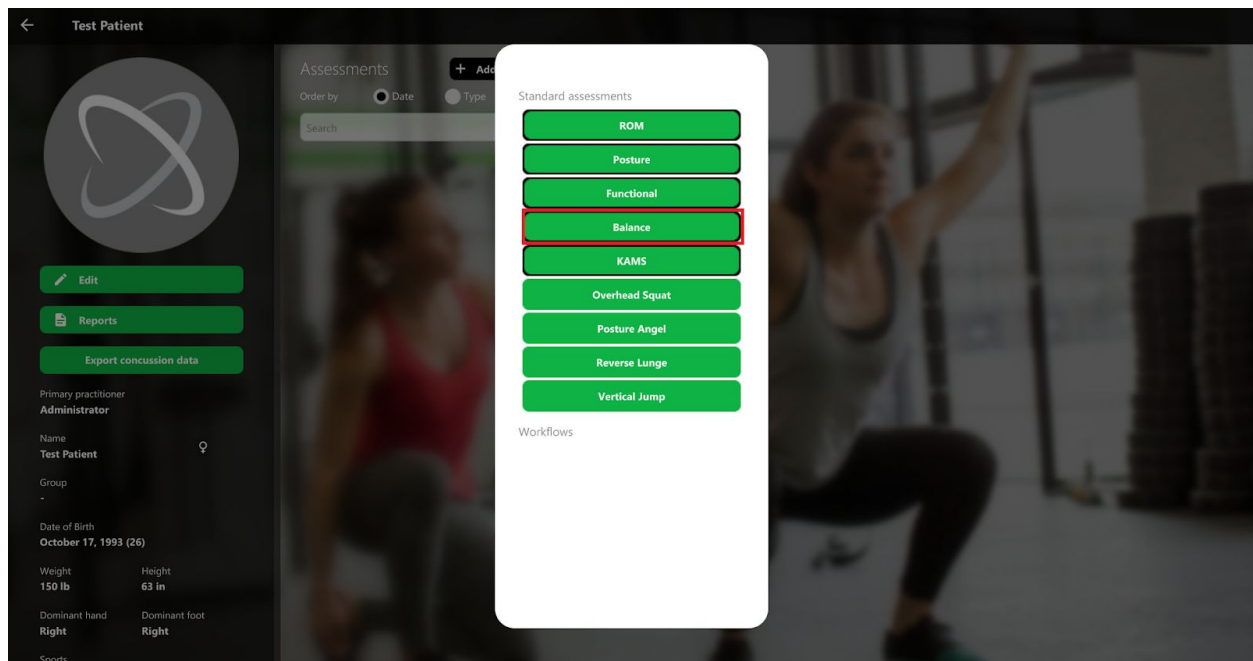
1. A Functional Assessment:
 - a. Click into an assessment that has been completed, all of the data taken from that assessment will be displayed in the white screen.
 - b. In the top right hand corner of this screen, click the page button.
 - c. This will open the “Select Data Range” page, where various assessments can be selected by checking the box.
 - d. In the bottom left hand corner of the screen, check to include/ exclude “Pictures”, “Charts”, or “SOAP Notes”.
 - e. Name the report.
 - f. In the bottom right hand corner of the screen select either “Save as PDF” or “Save as DOCX”.
2. The “Reports” button:
 - a. In the patient profile, click the “Reports” button on the left hand side of the screen.
 - b. When the “Reports” menu pops up, click “Manual”.
 - c. Check off the assessment(s) desired to create a report from.
 - d. In the bottom left hand corner of the screen, check to include/ exclude “Pictures”, “Charts”, or “SOAP Notes”.
 - e. Name the report.
 - f. In the bottom right hand corner of the screen select either “Save as PDF” or “Save as DOCX”.

Balance Module Tutorial



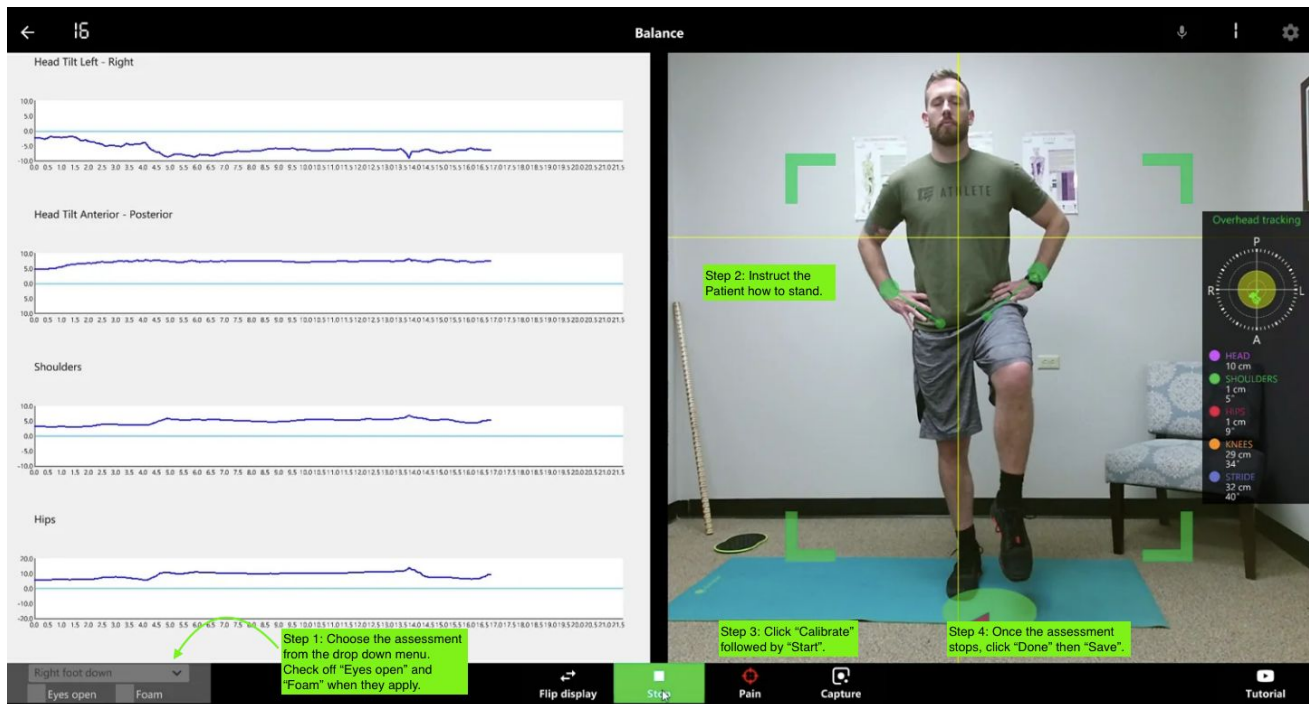
Getting Started

The first step in conducting a Kinetisense Balance assessment is to load the Patient Profile. Once the profile is loaded click “Add New” and select “Balance” to begin.



How to Perform a Balance Assessment

The Kinetisense balance test is very simple to conduct with very little user involvement. If performing a test on a geriatric patient or another patient that is at risk of fall, it is recommended to have someone stand **behind** the patient. This will not affect the results of the test, as the sensor will only pick up the person closest to the system. Regardless of the starting position, all assessments require the patient to place their hands on their hips. Everything the user needs to do is outlined in four simple steps in the pictures below:

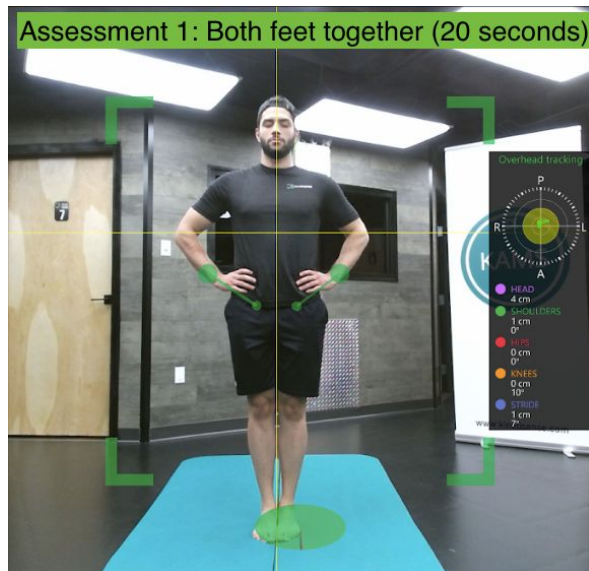


The balance module has many different practical applications that will determine how to prepare for the assessment(s). If the BESS Test Protocol is being completed, a two inch foam pad is required. If the SCAT5 Concussion baseline balance protocol is being completed, a foam pad is not necessary. For Geriatric Risk of Fall, all of the assessments are done on the floor. For specific athletic performance training, this can vary based on the practitioner preferences.

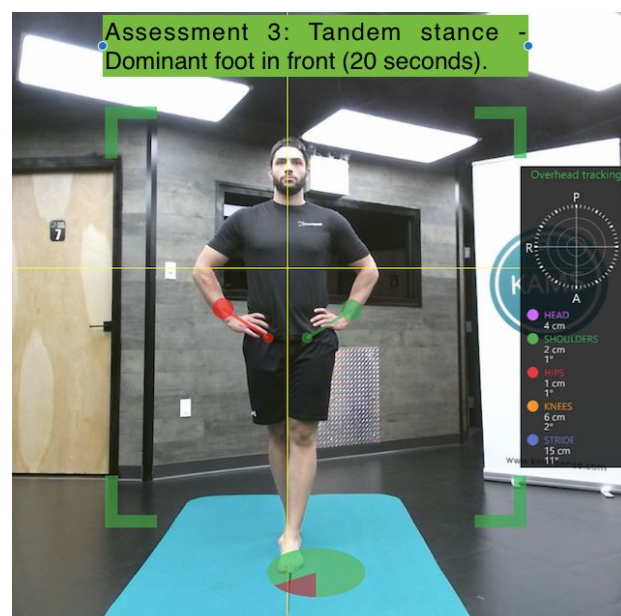
Before starting any balance test, ensure that the Patient is in the correct position, from there, click "Calibrate" and then "Start".

Geriatric Risk of Fall Protocol

All Geriatric Risk of Fall tests are conducted with eyes open and no foam. In the bottom left hand corner of the screen ensure that **Eyes Open** is checked and **Foam** is not checked. This protocol can be built as a custom workflow in the system.



Once all three assessments have been conducted, they will appear in the patient profile. Records will show how the patient scored on each assessment. There is also an option to combine the assessments to come up with an overall score by building it as a workflow. This is considered their **baseline score** and should be used as a measurement to determine negative or positive change.

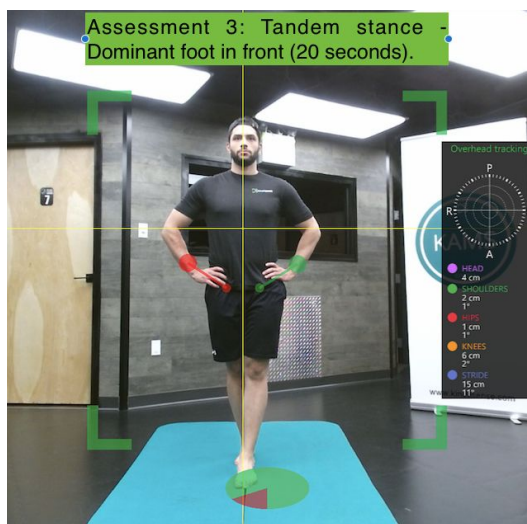
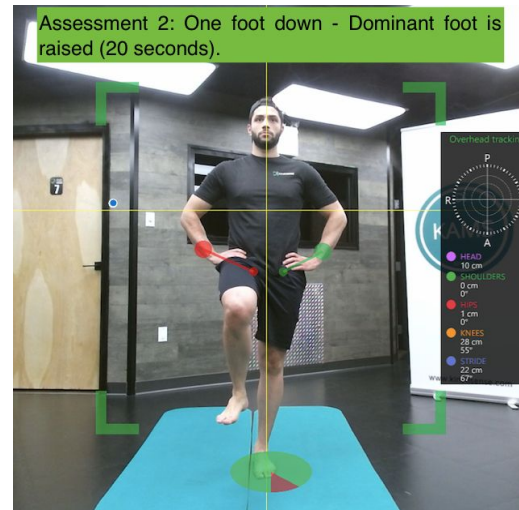
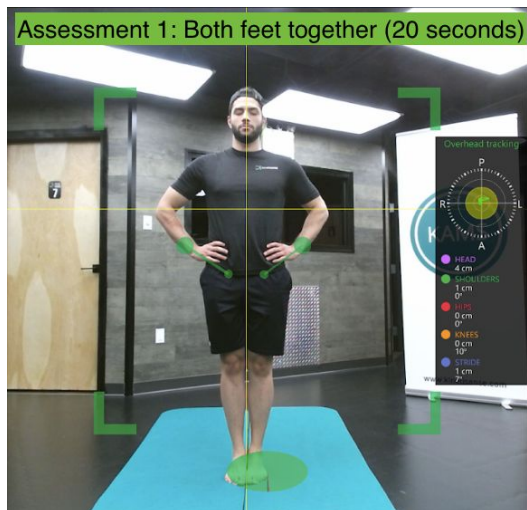


Concussion Balance Baseline Protocol

There are various different concussion protocols that can be built in the system as custom workflows, the SCAT5 and The BESS Test Protocol are outlined below.

The SCAT5 Concussion Baseline test assesses: both feet down, non-dominant single leg balance and tandem balance with the dominant foot as the front foot. All assessments are done with the eyes closed, barefoot on a hard surface.

The BESS Test Protocol assesses two feet down, non-dominant single leg balance, and tandem balance with the non-dominant foot in the back. This progression is done on a hard surface with the eyes closed and then on a 2 inch foam pad with the eyes closed.



Once all assessments have been conducted, they will appear in the patient profile. There will be records of how the patient scored on each assessment, but also the ability to combine the assessments to come up with an overall score if the test is built as a workflow. This is considered a **baseline score** and should be used as a measurement to determine negative or positive change.

How to Generate a Balance Report

The process of generating a Balance Report is similar to the previous modules. There are three different ways to generate a balance report, follow the steps below for each option:

1. Through the completed assessment:
 - a. Click into the balance assessment that was completed.
 - b. Once in the assessment, locate the report icon in the top right hand corner.
 - c. After clicking the report button, the “Select Data Range” screen will appear with that specific assessment selected.
 - d. In the bottom left hand corner of the screen choose to include/ exclude pictures, charts and SOAP notes with the corresponding check boxes.
 - e. Name the report.
 - f. Click the “Save as PDF” or “Save as DOCX” button in the bottom right hand corner and that will generate the balance report.
2. Through the reports menu (Balance Report):
 - a. Click to open the reports menu on the left hand side of the screen.
 - b. Click the Balance Report option under Standard Reports.
 - c. After clicking this, all of the balance assessments in the patient profile will be selected.
 - d. Click “Save as PDF” or “Save as DOCX” in the bottom right hand corner of the screen.
3. Through the reports menu (Manual Report):
 - a. Click to open the reports menu on the left hand side of the screen.
 - b. Click “Manual” which can be found either under “Standard Reports” or under “Legacy Reports”.
 - c. Once “Manual” is selected, choose the assessments to generate the report.
 - d. Once the assessment(s) are selected, choose to include/ exclude the pictures, charts and SOAP notes in the bottom left hand corner of the screen.
 - e. Name the report.
 - f. Once all of this is completed, choose either “Save as PDF” or “Save as DOCX”.

How to Interpret a Balance Assessment

Kinetisense provides users with a way to objectively measure a Patient's balance. Whether it is used for the Risk of Fall protocol, Concussion Baseline Testing, or simply to measure and track athletic performance, interpreting the results of the assessment is the most important step in properly using the module. Kinetisense will provide users with a score on a 100 point scale, broken down into 5 separate body parts. An example of a Kinetisense balance score is shown on the right.

Total Score	65%
Head	77%
Shoulders	83%
Hips	82%
Knee Left	76%
Knee Right	9%

The scoring for the balance module starts by scoring five body parts on a scale out of 100. The score is calculated by measuring tilt and sway at each segment over the time of the test. Once each score is generated, Kinetisense will then produce an overall score for the individual assessment. A score like this will be generated for each 20 second balance test that is conducted.

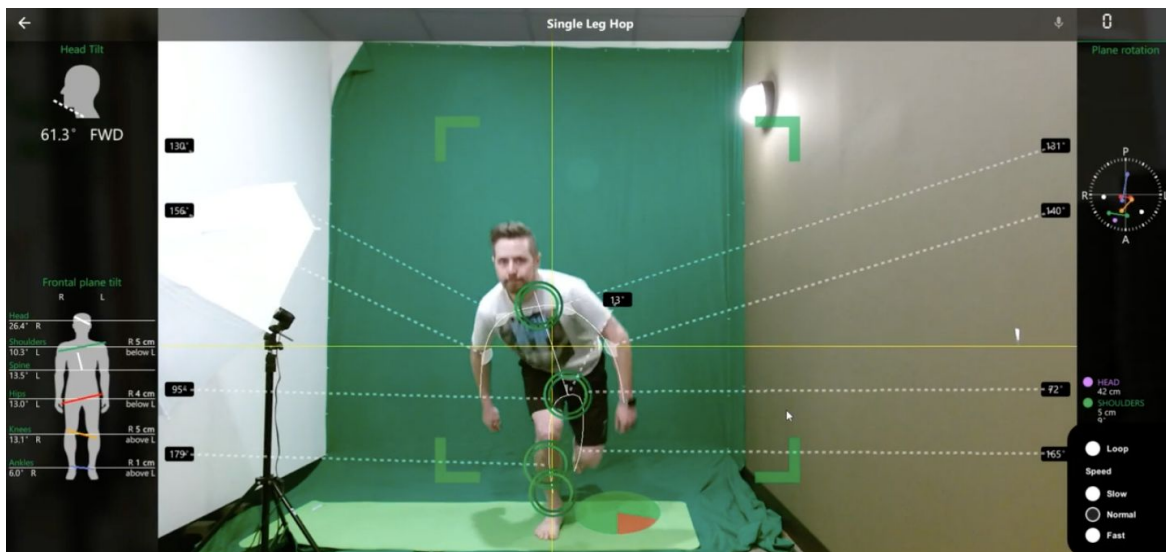
How do I use these scores to help my patients?

As mentioned previously, there are many uses for Kinetisense. If it is being used for **performance**, a baseline assessment would be performed as a starting point. The Patient can then be provided with guidelines to improve their balance and reassess to track progressions and regressions.

When using balance for **Geriatric Risk of Fall**, the score would still be considered a baseline, the score would then look to be improved or to track any changes in stability. Many medications have been proven to have an effect on balance, so baselining Patients before and after medication changes could be of importance.

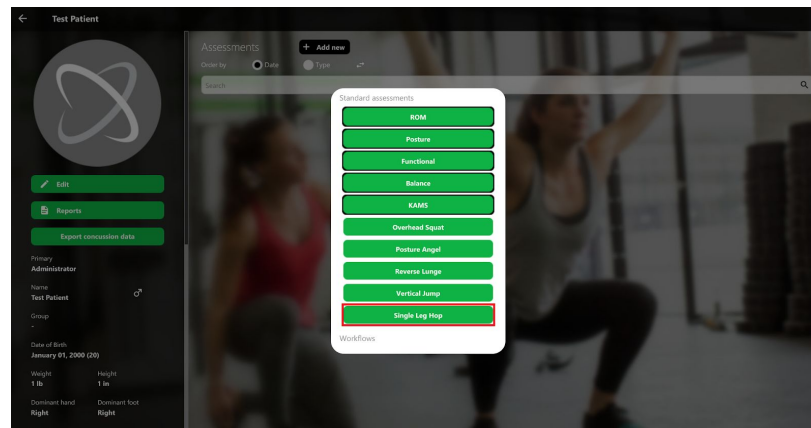
The most common use for the Balance module is to baseline balance in order to better assess and manage **concussion** symptoms. The score generated during the test would be used as the Patient's baseline balance score and will be used to assess whether or not a concussion has affected their balance and to what extent. For example, if an athlete scored 72% overall on their baseline and then received a hit to the head or body, their score might be 52% overall upon reassessment. The user would then recommend or implement a treatment plan and reassess until the individual was able to score reasonably close to their baseline score. The Return to Play decision is the caregivers but Kinetisense provides another layer of assessment in addition to cognitive tests, or standard concussion testing.

Single Leg Hop Tutorial



Getting Started

The first step in conducting a Kinetisense Single Leg Hop assessment is to load the Patient Profile. Once you have loaded the Patient Profile, click “Add New” and then “Single Leg Hop” to begin. Before conducting this assessment, ensure that the height and weight of the Patient are entered accurately.



How to Perform a Single Leg Hop Test

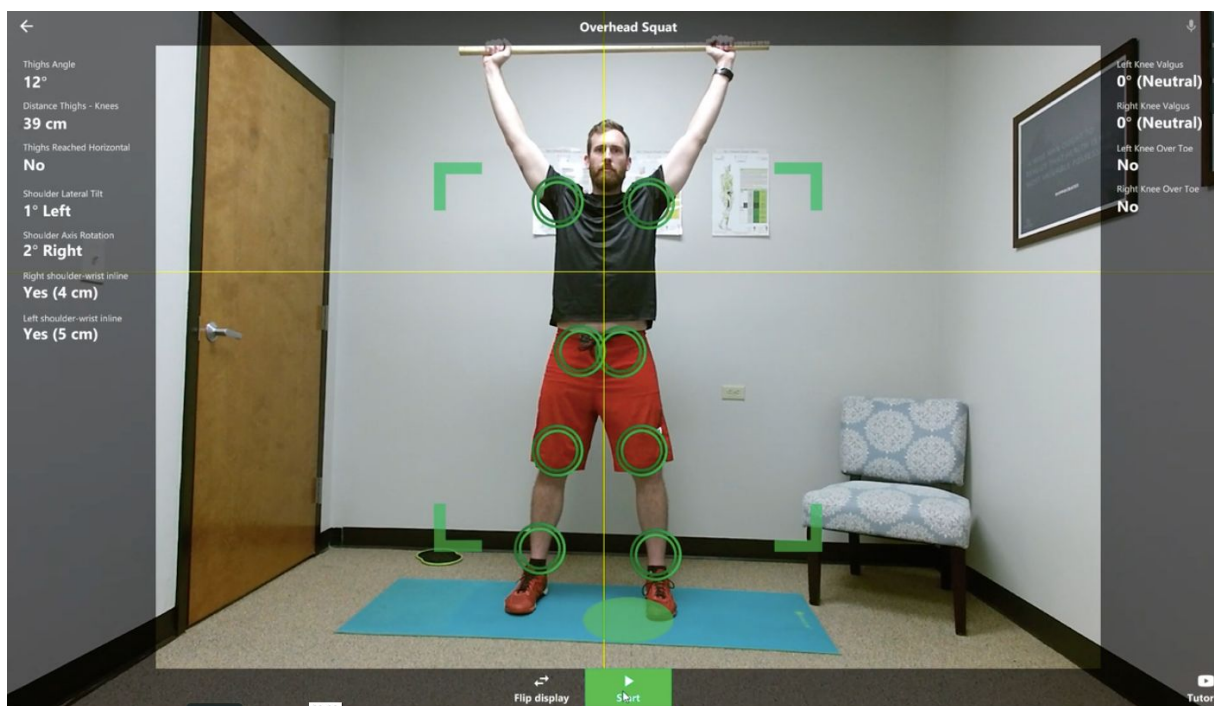
Have the Patient stand facing the sensor and within the correct field of view. Ensure that the Patient has their shoes and socks off to accurately perform this test. When the Patient is in the correct attire, have them stand tall. Before conducting the test, instruct the Patient that they will hop off of a single leg, and when landing, they will land only on that leg. Click “Calibrate”, promptly followed by “Start”. In the bottom left hand corner of the screen, the system will identify which leg to jump off of. Multiple jumps can be performed in one recording to assess fatigue. After completing the first leg, repeat these steps for the second leg. After completing the assessment, click “Stop” and “Save”. To look at the assessment, go back into the Patient Profile and enter into the Single Leg Hop assessment that was just completed. For a visual representation of this assessment, watch [this video](#).

How to Interpret Single Leg Hop Data

The Single Leg Hop test assesses the risk of ACL injury by looking at the rate and angle of Valgus collapse measured during the test. The system measures Valgus and Varus angle of the jumping leg upon take off and landing.

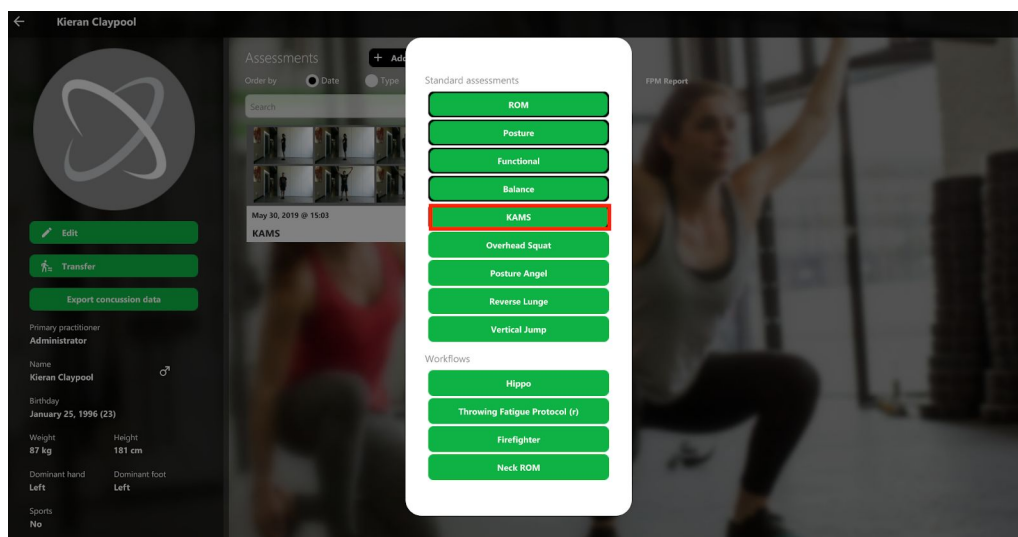
Data is collected from the jump along with the height and weight of the Patient from their profile, to determine the jump force output.

KAMS Tutorial



Getting Started

The first step in conducting a Kinetisense Advanced Movement Screen is to load the Patient Profile. Once this is loaded, click “Add New” and select “KAMS” to begin.



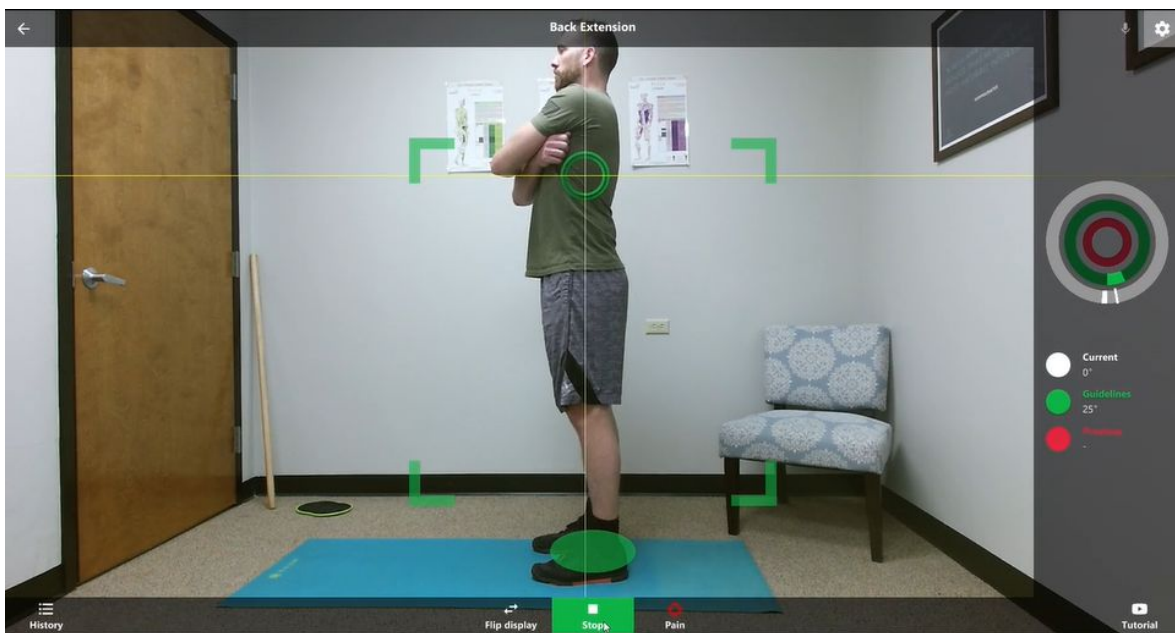
KAMS is a 12 Part Functional Movement Screen that scores each of the movements on a 12 point scale. If a Patient reaches the AMA guideline designated for the ROM being tested, they will score 100%. For each of the complex movements, they are scored on the amount and type of dysfunction present in the movement. The single leg vertical leap is based off of normative data from NCAA male and female athletes, it is important that the correct gender is selected when creating the Patient Profile to ensure an accurate score.

How to Perform a KAMS Assessment

A KAMS assessment is extremely easy to conduct. For descriptions of each movement, please reference the KAMS video linked below.

[Kinetisense KAMS Tutorial Video](#)

Once comfortable with instructing the Patients on the various movements, all that needs to be done as the Kinetisense Operator is to click “Start”, “Stop”, “Capture Pain” (if applicable), “Save” or “Discard”. Details on when to use each button is described below.



Once a KAMS assessment is started, the first four movements assess multisegmental trunk range of motion.

Once the Patient has been instructed on how to perform the movement, click “Calibrate”, then “Start”. Have the Patient move through the movement identified at the top of the screen in the centre then click “Stop” once they have completed the movement. From here a white screen will pop up where “General Energy Level” and “General Hydration Level” can be scored. These are subjective measures reported by the patient, they will not influence the score of the assessment. If pain was captured during the movement the VAS can be adjusted, as well as the “type” of pain, and SOAP notes can be charted. If pain is captured on any assessment, the Patient will be given a score of 0%, but the highest point in the range performed will still be charted in the “Assessment” portion of the SOAP notes. Once completing these tasks, either select

“Save” or “Discard” for the assessment and the system will automatically move onto the next assessment.

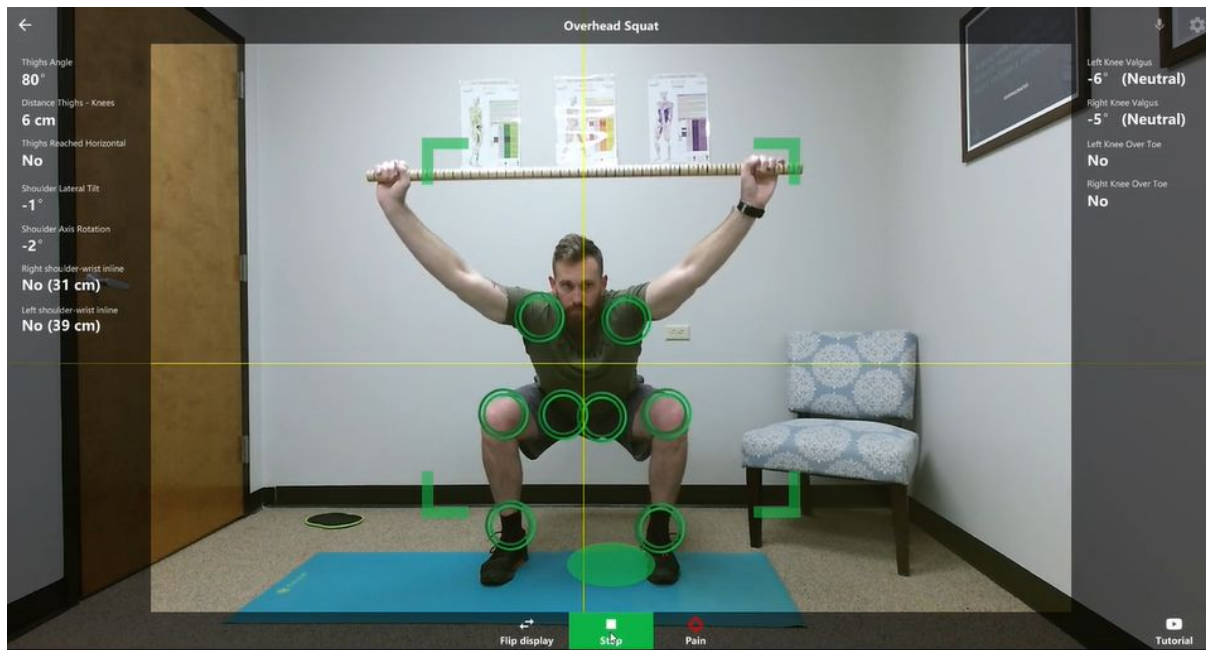
[Back Flexion](#): Once the system tags the patient, instruct them to stand with the left side of the body facing the sensor. From here instruct them to cross their arms over their chest, hands on shoulder style, they will bend forward as if to touch their toes keeping the arms crossed over their chest. The Patient is allowed to round their back, but it is recommended that they try and keep the knees as straight as possible.

Between performing these assessments, the patient will have to turn and face the sensor so the system can pick them up.

[Back Extension](#): Once the system tags the patient, instruct them to stand in the same orientation that they were for Back Flexion. From there the Patient will then extend back rather than flexing forward. It is recommended that the Patient try and keep the knees straight again while performing this movement.

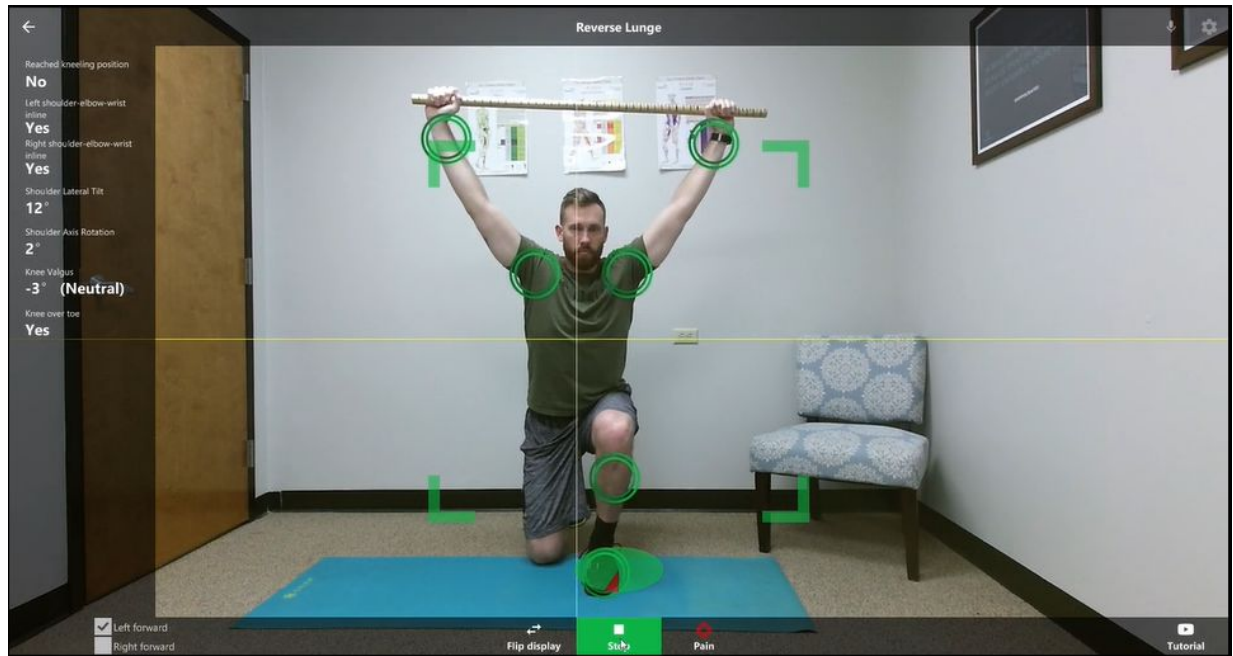
[Back Lateral Flexion Left/ Right](#): Instruct the Patient to stand facing the sensor with their feet together and their hands but their sides. From here instruct the Patient to laterally flex to the Left or Right sliding the hand down the IT Band on the represented side, keeping the shoulder in line with the body and not flexing forward.

Overhead Squat: To set up for this assessment, have the patient stand in a comfortable squat position. A dowel, PVC pipe or resistance band is required to perform this test. Have the patient rest the dowel on top of their head, with the arms in a field goal position, from here have the patient extend their arms up above their head and lock the elbows out. Instruct the patient to have the feet in a comfortable squat position, between shoulder and hip width apart.



For the user, ensure that the green alignment circle is all green at the bottom of the screen in the centre, and that the assessment circles are landmarked correctly on the patient - one on each shoulder, one on each hip, one on each knee and one on each ankle. Click “Start” and instruct the patient to perform a full depth squat slowly and controlled on the way down and back up, once this is completed click “Stop”. If the patient experiences, or verbalizes pain, click “Capture Pain” and they will receive an overall score of 0%. Select the check boxes once the assessment is completed if the patient had “Heels raised” or “Lumbopelvic Rounding” during the movement. The scores will be decreased based on the compensations present. After the check boxes on the left hand side of the screen have been addressed, either click “Save” or “Discard” the assessment.

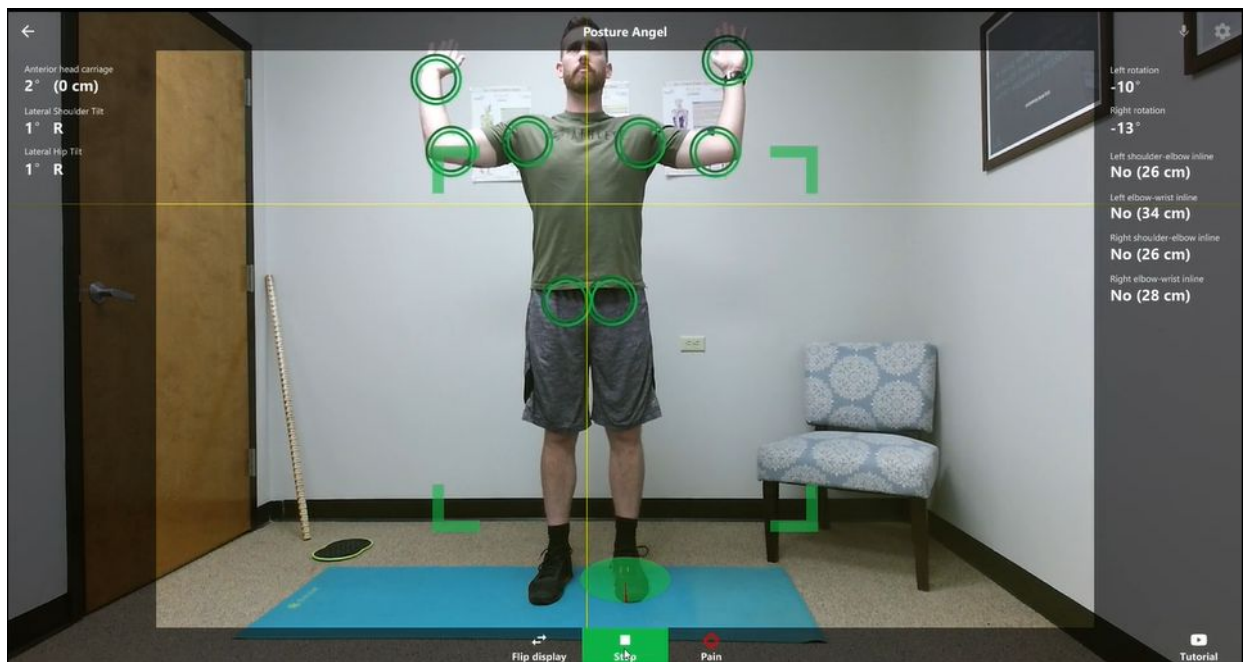
Reverse Lunge: Once the Overhead Squat is completed, the Reverse Lunge is performed next. The patient will need to keep the dowel in the same set up as it was for the Overhead Squat. The patient will start with the dowel overhead standing with the feet together.



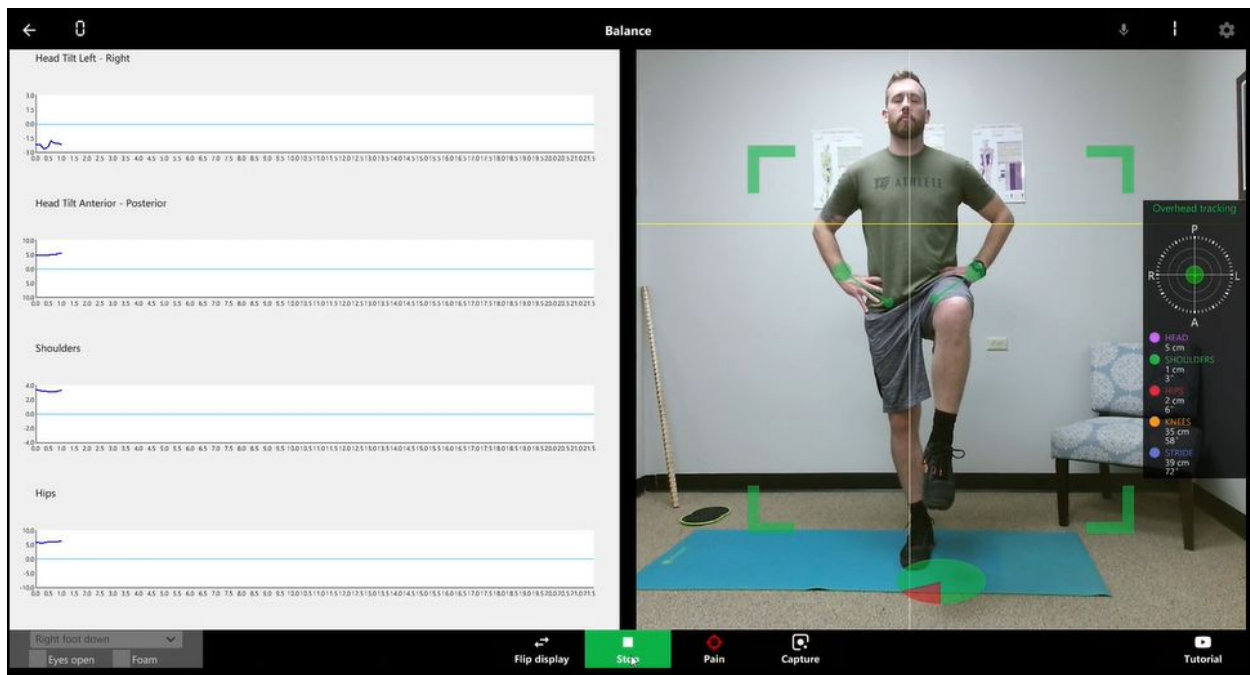
For the Kinetisense Operator, ensure that the green alignment circle is all green at the bottom of the screen and that the assessment circles are landmarked correctly on the patient - one on each wrist, one on each shoulder, one on the stationary knee and one on the stationary ankle. In the bottom left hand corner of the screen the system will identify which leg is forward. Click "Start" and instruct the patient to step or slide the foot back, touch the knee to the ground and return back to standing. If pain is present ensure that "Capture Pain" is clicked during the assessment. Upon completion of the lunge click "Stop". If the patient is unable to slide back and return to standing on either side when performing the movement, ensure that these boxes are checked off before moving onto the next assessment. If the patient experiences, or verbalizes pain, click "Capture Pain" and they will receive an overall score of 0%. Complete charting and either "Save" or "Discard" the assessment.

Posture Angel: Once completing the Reverse Lunge, the Posture Angel is the next movement.

For the user, ensure that the alignment circle is all green at the bottom of the screen and that the assessment circles are landmarked correctly on the patient - one on each wrist, one on each elbow, one on each shoulder and one on each hip. Click “Start” and instruct the patient to rotate the arms backwards. If pain is present ensure that “Capture Pain” is clicked during the assessment. Upon completion of the posture angel click “Stop”. Be sure to observe the patient for “Spinal Extension”, it is a subtle movement but is considered a major dysfunction within this movement. If this is present, select the check box upon completion of this assessment and the score will reflect accordingly. Complete charting and either click to “Save” or “Discard” the assessment.



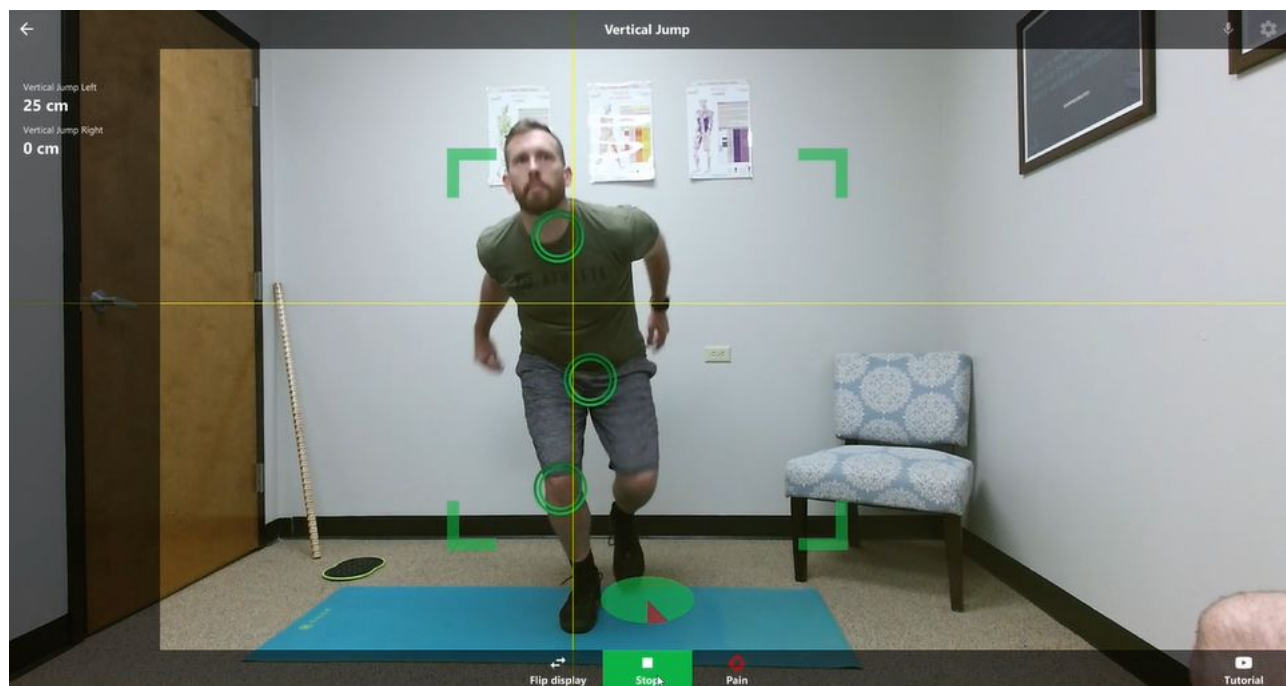
Single Leg Balance: Once completing the Posture Angel, the Single Leg Balance is performed. To perform this test, have the patient stand with their hands on their hips, as seen in the image below. From here, have the patient lift up the leg so that the hip is flexed to 90° and the knee is bent to 90° . Instruct the patient to try and have as little movement as possible while performing the test, and if needed they are able to touch the foot down and reset to reduce the amount of sway and movement.



Once the patient is in this position, click the “Calibrate” button followed by “Start”. There will be a countdown from three on the screen and then the system will begin to record the balance. The patient will start with the eyes open and as the system is counting down to start the test, instruct the patient to close their eyes. The default time for the test is set to run for 20 seconds, once that is complete the system will automatically stop the assessment and bring up the reported scores for the various areas of the body.

Single Leg Vertical Jump: Once completing the Single Leg Balance test, the Vertical Leap is performed. Instruct the patient to start standing tall, click “Calibrate” then “Start” instruct the patient to load the leg that is checked off in the bottom left hand corner of the screen and jump as high as they can, landing on one leg or both. Click “Stop” and then repeat the same steps on the other side. When both sides are complete, click save and the KAMS assessment is finished.

These tests are scored differently for males and females; ensure the correct gender is chosen when creating the patient Profile.



How to Interpret a KAMS Assessment

Trunk Range of Motion Assessments

Flexion - This assessment is looking for Patient's ability to reach a threshold of 90°. If 100% ROM is not reached, the value is taken and divided by 90 to determine the percent.

Extension - This assessment is looking for Patient's ability to reach a threshold of 25°. If 100% ROM is not reached, the value is taken and divided by 25 to determine the percent.

Lateral Flexion Left & Right - This assessment is looking for Patient's ability to reach a threshold of 25°. If 100% ROM is not reached, the value is taken and divided by 25 to determine the percent.



The screenshot shows a software interface for a KAMS assessment. It features two horizontal sliders for 'General energy level' and 'General hydration level', both set to 5 on a scale from 0 to 10. Below these are three checkboxes: 'Pre-Treatment' (checked), 'Passive', and 'Resistance'. On the right side, there are four text input fields labeled 'Subjective', 'Objective', 'Assessment', and 'Plan'. The 'Assessment' field contains the text 'Back Extension (Pre-to- 31.8 degrees)'. At the bottom, there are 'Discard' and 'Save' buttons. A '100%' label is visible at the top right of the form area.

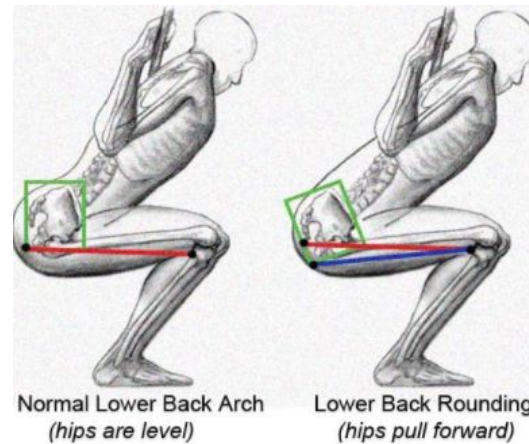
Overhead Squat

The scoring for the Overhead Squat is composed of nine different scoring mechanisms, with three components looking at both the left and right side of the body. The first aspect of the scoring is assessing if the patient performed a squat or not - were they able to squat down and stand back up, if they were able to perform this, the score will reflect "YES". The next aspect of scoring is to assess if the patient was able to reach a horizontal position in the squat (have the thighs parallel to the ground) - if this was successful, the score will reflect "YES", if the patient was unable to reach horizontal, the score will reflect "NO". Following this, Valgus collapse is assessed in both the Right and Left knees, if no Valgus is present, the patient will score 100%, if there is Valgus collapse present in the squat, there will be a value calculated in the system lower than 100%. Scoring for anterior/ patellar shearing, or knee over toe on both the left and right side of the body, this is a yes or no score. If the knee breaks the plane of the toe before the patient reaches horizontal in their squat, the system will score "NO", if the patient is able to perform the squat without having anterior shear, it will be reflected by "YES". This concludes the scoring for the lower body in the Overhead Squat.

The upper body is also an important contributing factor to the scoring breakdown for the Overhead Squat. The first upper body breakdown assesses both the right and left side of the body separately, looking if the wrist and shoulder are able to stay in line on each side as the patient goes through the movement and returns back to the start position. This is an all or nothing scoring, if the shoulder and wrist do not stay in line throughout the movement, the patient will score "NO", if the shoulder and wrist do stay in line throughout the movement, this is reflected by "YES". Shoulder lateral tilt is the next aspect that is measured, if there is no lateral tilt present, the patient will score 100%, any deviations from there will be calculated in the system and an output value will be reported less than 100%. Shoulder axis rotation is scored on the same breakdown as shoulder lateral tilt.

Upon completion of the assessment, there are three check boxes that appear on the scoring that the system is unable to identify: heels raised, lumbopelvic rounding, and pain. If the patient is unable to perform a squat with the heels remaining in contact with the floor for the whole duration of the squat, this box needs to be checked and it will drop the overall score. If the patient has lumbopelvic rounding (also referred to as a "butt wink" demonstrated below) present during the squat, this box needs to be selected and the score will be altered accordingly.

If the patient experienced pain at any point throughout the movement, check this box off and the score will reflect accordingly.



Reverse Lunge

The scoring for the Reverse Lunge is very similar to the scoring for the Overhead Squat however some of the values are represented differently. Valgus, shoulder lateral tilt and shoulder axis rotation are represented with the exact same scoring as the Overhead Squat. For the knee-over-toe measure a score of 0% indicates that the knee did pass over the toe during the move. Shoulder and wrist in line a score of 0% represents that the shoulders and wrists did not stay in line throughout the movement.

The Reverse Lunge also assesses if the patient was able to reach the kneeling position in the lunge with the leg that is going back. If the patient is unable to touch the knee of the moving leg to the ground it is considered a dysfunction. Being able to slide back and return to a standing position is also assessed in the system through the movement, this is a post test check box that needs to be clicked off by the user. If the patient is unable to complete the movement and return back to the starting position, this is considered dysfunctional and will be reflected in the score. There is also the option to monitor pain through the movement, if the person experiences pain throughout the movement this is something that the user can capture during the assessment.

Posture Angel

Posture Angel is measuring external rotation at the shoulder joint. The first score that is seen is head carriage - this is measuring the head movement anterior and posterior as the patient goes through shoulder external rotation. Shoulder rotation is the next portion

of the assessment that is measured, it is scored separately for the right and left shoulder. Through the movement of shoulder external rotation, if the AMA guideline is met, the system will reflect a score of 100% for this specific area. While performing this movement, lateral tilt is measured in the shoulders through the frontal plane. Hip lateral tilt is also measured in the frontal plane as a compensation. The final movement dysfunction that is assessed is spinal extension, this is a check box that needs to be selected once the assessment is completed if it is present in the patients movement. There is also an option to capture pain through the movement, if this is present then select the “Capture Pain” button and chart as needed.

Single Leg Balance Assessments

The balance assessment will provide users with a score on a 100 point scale, broken down into 5 separate body parts.

The scoring for the balance module starts by scoring five body parts on a scale out of 100. The score is calculated by measuring tilt and sway at each segment over the time of the test. Once each score is generated, Kinetisense will then produce an overall score for the individual assessment. A score like this will be generated for each 20 second balance test that is conducted.

A perfect score would be 100%, which would mean that the Patient was completely still and had no sway or tilt present for the 20 second duration of the test.

Single Leg Vertical Leap

The scoring for these tests are specific to men and women. Women are scored on their ability to get to 50cm and men are scored on their ability to get to 60cm. However, the focus should be on the asymmetry present from one side to the other.

How to Generate a KAMS Report

Upon completion of a KAMS assessment, there are two ways to generate a report, the steps are outlined below:

1. From the completed KAMS assessment:
 - a. Once the assessment is completed, the Functional Planar Mapping (FPM) will appear. Click the green “Continue” button at the bottom of the screen. This will navigate back into the assessment screen.

- b. The KAMS assessment that was just completed will appear, in the top right hand corner of the screen there are three buttons: an arrow with a line underneath, a page and a garbage can. Click on the second icon, the page.
 - c. From here the “Select Data Range” screen will open. In this screen select the KAMS assessment to generate a report from by clicking the check box.
 - d. In the bottom left hand corner of the screen, choose to include/ exclude pictures, charts and SOAP notes in the report.
 - e. At the bottom right hand corner of the screen there are two options to generate a report “Save as PDF” and “Save as DOCX”.
2. From the “Reports” Menu:
 - a. Once the assessment has been completed, navigate back to the patient profile.
 - b. Click the “Reports” button on the left hand side of the screen.
 - c. Select the “KAMS Report” from the list.
 - d. Check the KAMS assessment(s) desired to be included in the report.
 - e. In the bottom left hand corner of the screen choose to include/ exclude pictures, charts or SOAP notes.
 - f. In the bottom left hand corner of the screen, choose either “Save as PDF” or “Save as DOCX”.

How to Generate an FPM Report

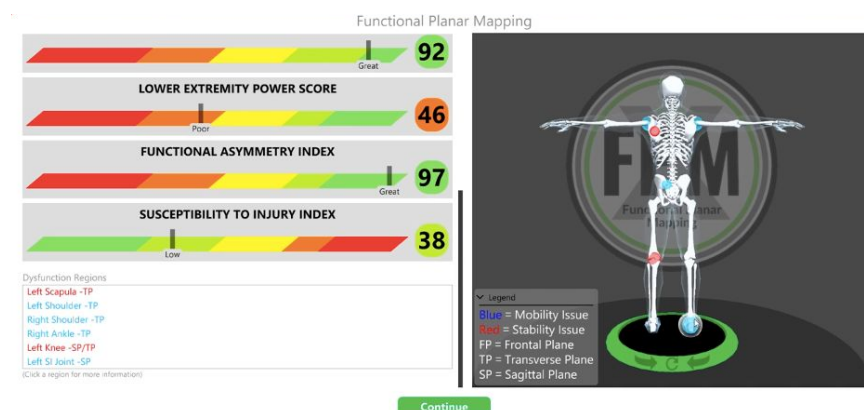
Upon completion of a KAMS assessment, a white screen with the Functional Planar Mapping (FPM) tool will pop up, from here there are two options with the steps outlined below:

1. Report button in assessment screen:
 - a. Click the page button in the top right hand corner of the screen.
 - b. The “Select Data Range” screen will appear, check off the KAMS assessments that are desired to be included in the FPM report.
 - c. In the bottom right hand corner of the screen choose “Save as PDF” or “Save as DOCX”.
2. Continue button in FPM Screen:
 - a. Click “Continue” in the bottom centre of the screen.
 - b. This will open a white screen, from there click the “X” in the top left hand corner, this will navigate back to the patient profile.

- c. When in the patient profile, click the “Reports” button on the left hand side of the screen.
- d. A list of various report options will appear, click “FPM Report”.
- e. The “Select Data Range” screen will appear, choose the desired assessment(s) to be included in the report.
- f. In the bottom right hand corner select either “Save as PDF” or “Save as DOCX”.

How to Interpret the Functional Planar Mapping (FPM) Tool

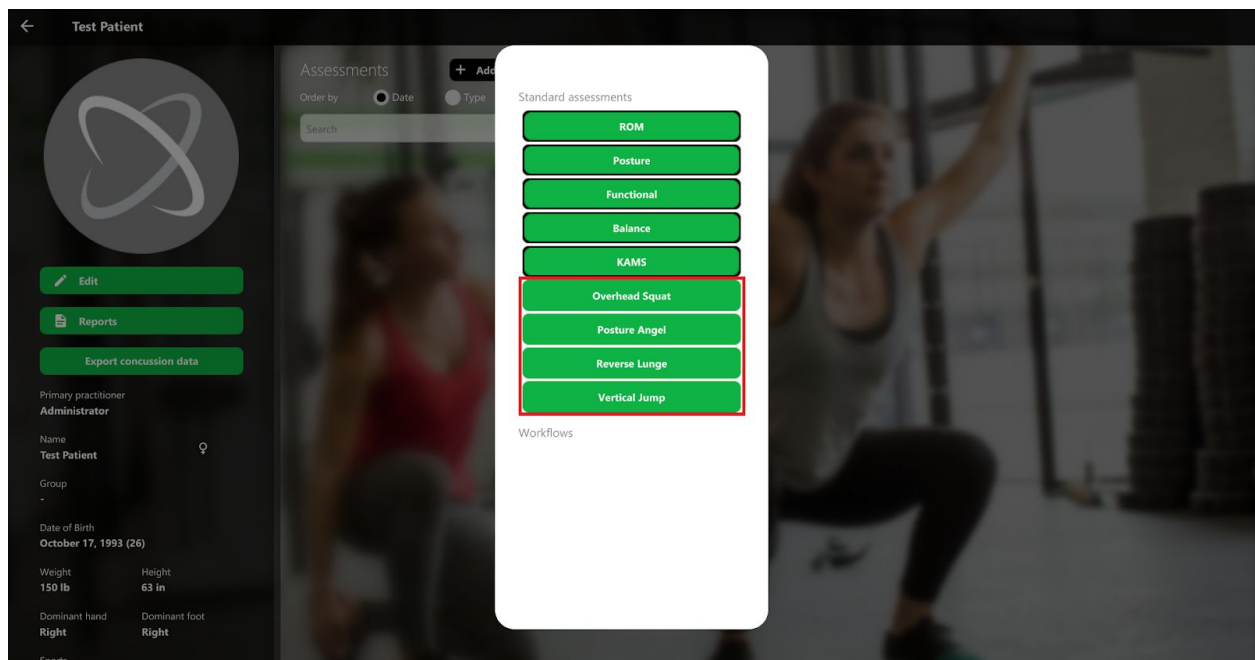
The FPM tool is an advanced output engine of KAMS that maps the joint regions that require either stability or mobility in the body that is specific to the individual's functional movement. The FPM tool creates a functional score card that outlines the individual's overall score, along with indexes for the following: balance, flexibility, core stability, dynamic posture, lower extremity power, functional asymmetry and susceptibility to injury.



The FPM tool identifies the top three dysfunctions in the upper body and the top three dysfunctions in the lower body that require either mobility or stability along with the plane of movement that the dysfunction is occurring in, as specified by the movement

compensations of the Kinetisense Advanced Movement Screen. For more information on the Functional Planar Mapping tool, please refer to the [Functional Planar Mapping and Movement Index](#).

Additional Modules



Additional Assessment Modules

There are four additional stand alone modules that are available for Kinetisense users, these include: Overhead Squat, Posture Angel, Reverse Lunge and Vertical jump. These four modules are carried out the exact same way that they are instructed in KAMS.

How Can I Implement These Modules?

There are various applications where these modules can be used. If KAMS is used as an initial assessment for new clients, the various modules can be used as a test/ retest. For example, if a patient's lowest scoring movement is the overhead squat, the user/ practitioner can work on that movement specifically. The overhead squat then becomes the test/ retest for that patient. Once their score for that movement stops seeing a consistent increase (reaches a plateau) retest KAMS and see how the overall score, indexes and areas of dysfunction change.

General Implementation

The steps above can be implemented to any of the modules that are used in KAMS such as the balance module. The Range of Motion module can be implemented in relation to the areas of dysfunction. If there is a specific area that a Patient is concerned about or wants to work on, address that area through visits while using the ROM module to assess that joint. After seeing a change in the joint, retest KAMS and see how the overall score, indexes and areas of dysfunction have been impacted.