



User manual

Gait analysis



KinTrack Version 3.1



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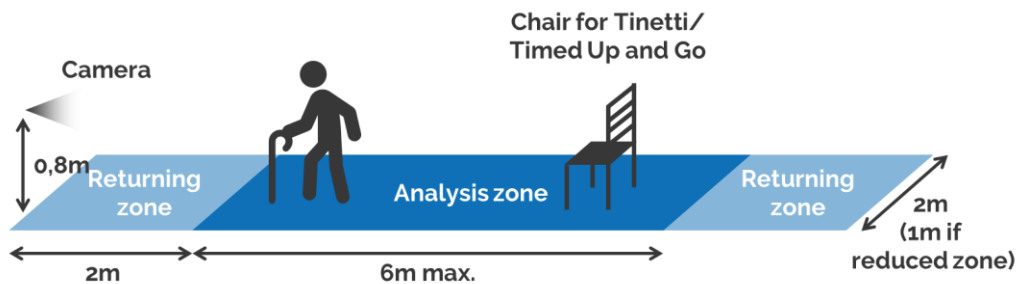



Symbols glossary

Symbol	ISO 15223-1:2021 Reference	Description
 Caution	5.4.4	Indicates that caution is necessary when operating the device or control close to where the symbol is placed, or that the current situation needs operator awareness or operator action to avoid undesirable consequences.
 Date of manufacture	5.1.3	Indicate the date when the medical device was manufactured
 Manufacturer	5.1.1	Indicate the medical device manufacturer
 Serial number	5.1.7	Indicate the manufacturer's serial number so that a specific medical device can be identified
 Medical device	5.7.7	Indicate the item as a medical device
 Unique device identifier	5.7.10	Indicates a carrier that contains unique device identifier information

1. Cautions and safety information

- ⚠ This software is a tool to assist in the evaluation of a patient. The provided results cannot, by themselves, motivate a treatment or provide a diagnosis.
- ⚠ Do not unplug the computer during use, you may lose data. It is recommended to choose a secure socket with an inverter.
- ⚠ Protect your patients' data:
 - Please log out after using the software. As a protective measure, the system will automatically log out after 20 to 60 minutes of inactivity (configurable time).
 - Please do not share your login information.
- ⚠ Take care of the equipment: please turn off the computer after use. As a protection measure, it will automatically shut down after 4 hours of inactivity.
- ⚠ Please do not modify the provided installation to ensure the proper operation of the software.
- Please install the equipment in a space that allows the patient to walk at least 5 m back and forth in front of the camera.



-  To export activity reports, use only the USB sticks provided by EKINNOX and do not connect other types of devices to the system's ports without EKINNOX's approval.
- ⚠ Use a secure internet connection and never leave the machine alone during data synchronization.
- ⚠ If you have remote access codes to KinTrack, please give them only to EKINNOX service agents.

2. General information

2.1. *Intended use*

KinTrack is a software that allows to analyze the patients' gait visually, qualitatively, and quantitatively. Its objective is to provide an aid to the evaluation of a patient for gait rehabilitation.

It is recommended for professionals in gait rehabilitation: physical and rehabilitation specialists, physiotherapists, and occupational therapists.

2.2. *Indications*

KinTrack is recommended for all types of patients requiring gait rehabilitation following traumatological or neurological injuries.

2.3. *Mode of operation*

KinTrack is based on software solutions that process the information provided by a camera that films the patient. This camera has a distance sensor based on the emission of low intensity infrared radiation.

2.4. *Conditions of use*

- The device is for indoor use. Avoid external light such as bay windows that may interfere with patient detection.
- Patients must wear clothes that allows the software to detect their silhouette from the video recording:
 - Do not wear dresses or blouses.
 - Pants, shorts, or Bermuda shorts must be close-fitting.
 - Avoid dark clothes that can absorb infrared radiation and compromise the camera's performance: prefer light-colored clothes.
- Keep the area where the patient is walking clear of objects and ensure that nothing enters the area during recording.
- Only health professionals (rehabilitation doctors, physiotherapists, occupational therapists) for whom an account has been created by the device administrator can log in to the device.



2.5. Performance

2.5.1. Visual analysis

KinTrack allows to film the patient while he is walking back and forth frontally or laterally compared with the camera axis.

These videos are recorded and allow a visual analysis a posteriori, in simple display or in comparison. KinTrack allows to visually compare the patient at 2 different moments of his rehabilitation, or to display simultaneously a frontal video and a sagittal video.

Several visual analysis tools are available as described in the chapter **Visualize a video** recording.

2.5.2. Qualitative analysis

KinTrack gives the possibility to qualitatively evaluate a patient according to 2 evaluation scales, TUG (Timed Up and Go) and Tinetti. To do so, KinTrack allows to film the patient while he/she performs the exercises requested by the evaluation test, and to fulfil the associated form (which constitutes his/her qualitative evaluation) by viewing the recorded video.

The procedures for performing these tests are described in the chapters **Timed Up-and-Go** and **Tinetti**.

2.5.3. Quantitative analysis

From the video obtained by recording the patient walking back and forth frontally compared with the camera axis, KinTrack provides gait parameters, either as values or as graphs. The procedure to obtain these parameters is described in the chapter **Frontal analysis**.

2.5.3.1. Numerical values

The following spatio-temporal parameters are calculated:

- Speed
- Cadence

For these two parameters, the values are calculated for a walking sequence, i.e., one way to or from the camera. For a whole activity, i.e., a set of walking sequences in front of the camera, the average value over the different sequences is calculated.

- Foot width
- Stride length
- Left and right step length
- Duration and proportion of the right and left support phase on a gait cycle
- Duration and proportion of right and left single support over a gait cycle
- Duration and proportion of double support over a gait cycle



The given values for each of these parameters are:

- For a sequence, i.e., one way to or from the camera, the median value of the parameter on this sequence.
- For a complete activity, i.e., a set of walking sequences in front of the camera, the average value of the values obtained for each sequence.

The details of the expected precision for these different parameters are given in **Appendix 1: quantitative performances**.

2.5.3.2. Graphs

In addition to the numerical data, KinTrack provides representative graphs of the patient's gait described in the chapter **Graphs**.

- Stride length: 2 curves that represent the distance of each foot from the camera over time, over a walking sequence.
- Foot width: 2 curves representing the distance of each foot from the camera axis and a graph representing the difference between these 2 curves and giving the foot width.

These graphs correspond to the data used to calculate the figures presented in the previous paragraph.

- Mean knee angle on a cycle: 2 curves that represent the average knee flexion/extension angles on a cycle, computed over the entire activity, for each leg.
- Mean hip angle on a cycle: 2 curves that represent the average hip flexion/extension angles on a cycle, computed over the entire activity, for each leg.

These graphs provide a characterization of the patient's gait at a given time. The details of the expected precision for the points of these curves are given in **Appendix 1: quantitative performances**.

3. Installation and start-up

3.1. Installation

The KinTrack software is installed by EKINNOX on a computer with a Kinect Azure camera plugged on the USB ports. If applicable, KinTrack can be installed on a compatible equipment of this type:

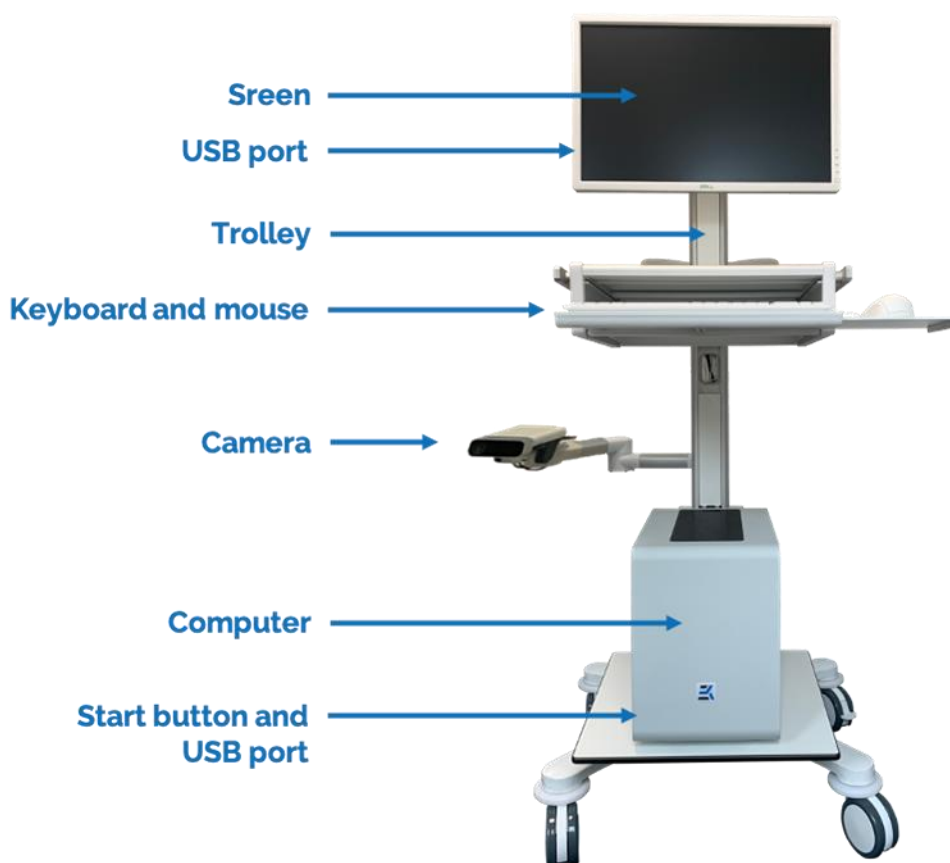


Figure 1: Complete equipment (non-contractual picture)

- Please install the equipment in a space that allows the patient to walk at least 5 m back and forth in front of the camera.
- Plug in the device and make sure that the power cable is not in a walking area.
- Turn on the computer and the screen. You will have access to the device login page.

3.2. Login page

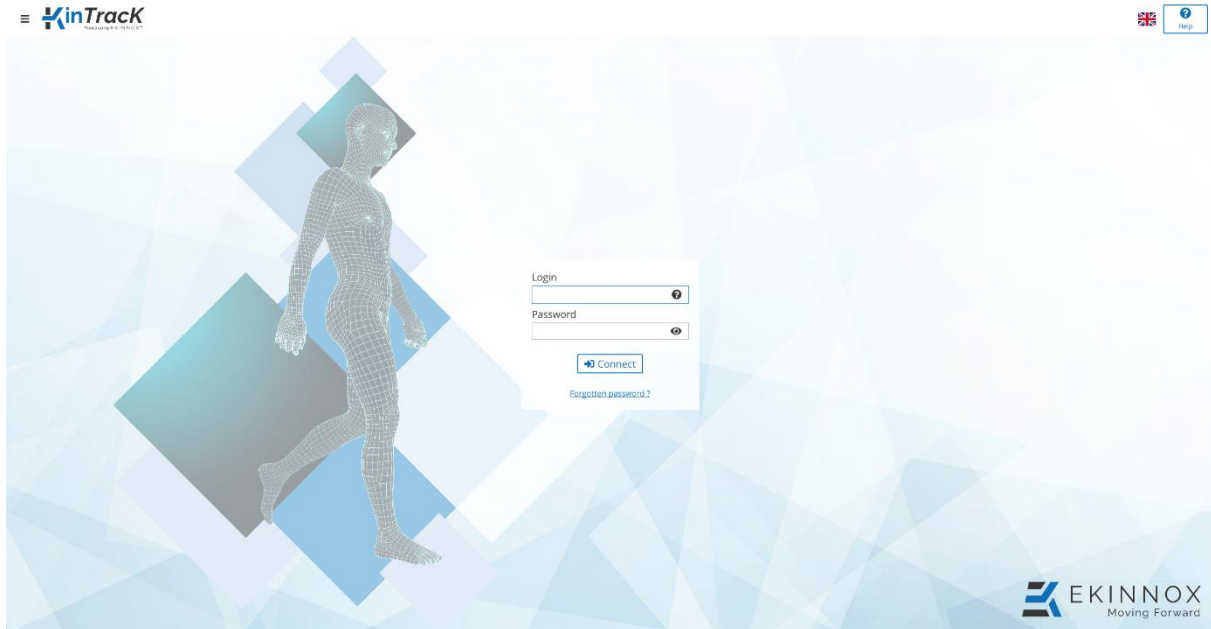



Figure 2: Login page

- Please enter your login and password in the corresponding fields to login. Clicking on  next to the login will give you instructions on how to find your login. Clicking on the eye icon in the password field will display the password you entered in plain text.

Click on "Forgotten password" if you have forgotten your password: a window will give you the list of administrators to contact to reset your password.



- Click on the flag in the upper right corner to change the language of the software (only applicable to the web version)
- Click on  to:
 - Turn off the machine (not applicable on the web version).
 - Have access to the "About" window which gives the version of the device and contact information.



Figure 3: « About » window

- Click on  at the top right of the screen to access the user manual:

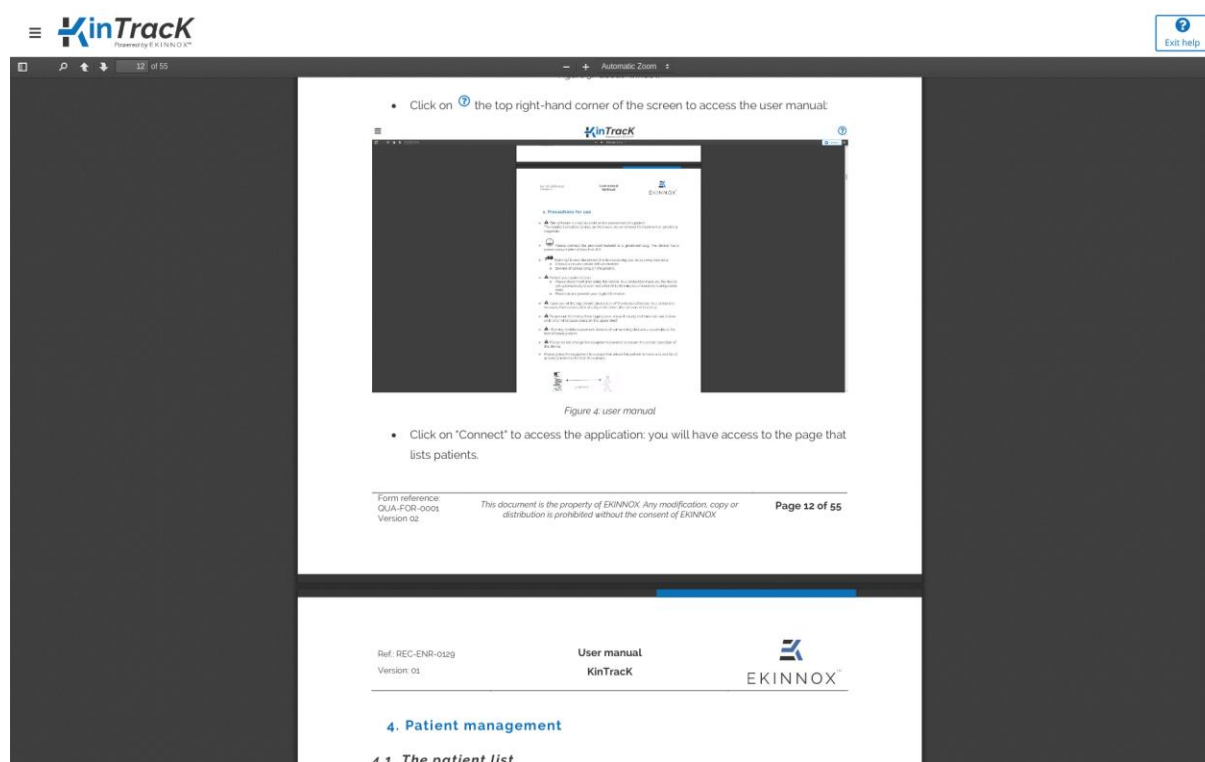


Figure 4: User's manual

- Click on **“Connect”** to access the application: you will be taken to the page that lists the patients.

4. Patient management

4.1. Presentation of the patient list

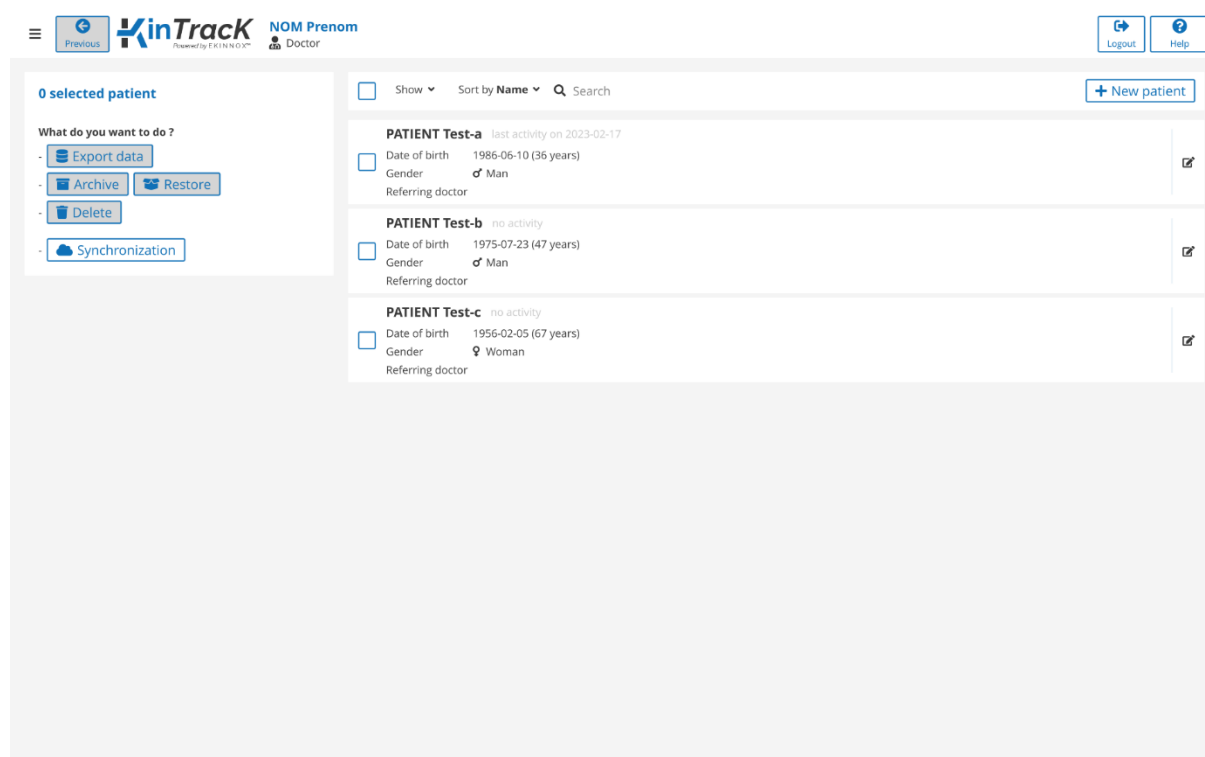



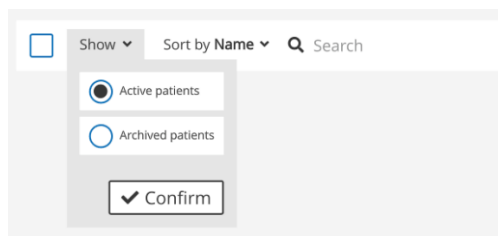


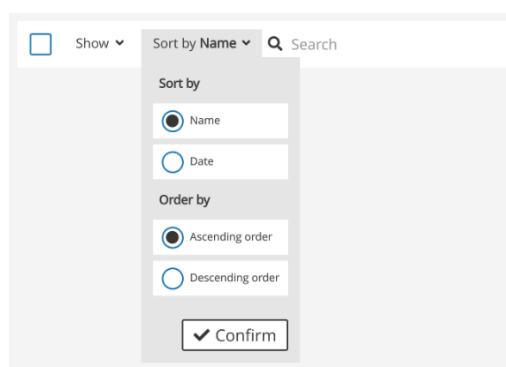
Figure 5: Patient list

The page that lists the patients allows you to:

- Add a new patient: 
- Search for an existing patient:  Rechercher
- Select a patient: ☐
- Modify a patient: 
- Show active or archived patients:



- Sort patients:



- Clicking on ☰ allows to:
 - Turn off the machine.
 - Access the **"About"** window. See 3.2.
 - Change your password (see 11.2).




- Click on  allows you to disconnect from the application.




- Click on  to access the user manual. See Login page.


- A list of buttons is available on the left side of the page.

Note: If the buttons are greyed out the actions are not available.

 **Synchronization** : allows to synchronize the patient data with the remote database. See Chapter 10.

 **Refresh** : on the web version, allows to update the patient data with the database. See Chapter 10.

- **If one or more active patients are selected:**

 **Export data** : allows you to export the gait parameters of a frontal analysis in .csv format. See Chapter 9.



: allows you to archive patients.

➤ **If one or more archived patients are selected:**



: allows you to restore an archived patient.



: allows you to delete an archived patient (not applicable on the web version).

For archiving and deleting operations, see chapter 4.6 Archive and delete a patient.

4.2. Enter a new patient

- From the list of patients, click on : you have access to the patient file.

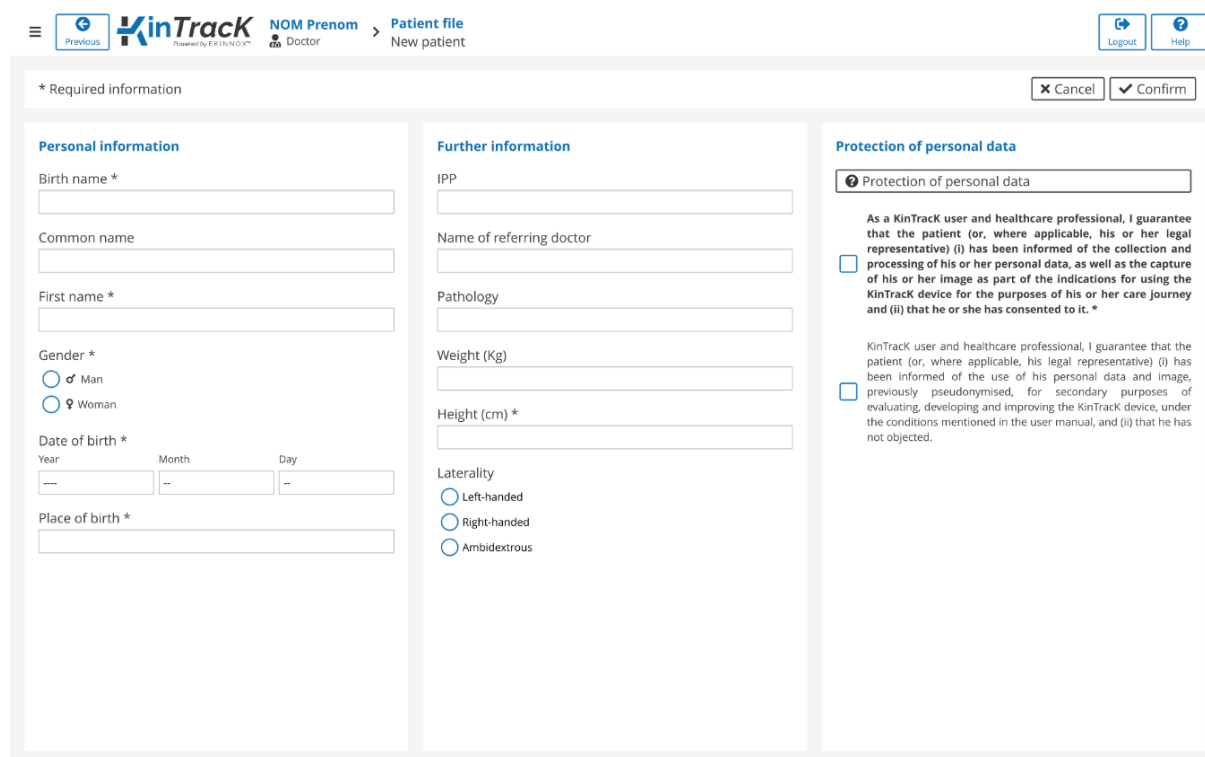


Figure 6: Patient file

In the patient file, enter personal and additional information.

Note: Birth name, first name, gender, height, date, and place of birth are mandatory.
The IPP and common name are optional.



- Enter optional information if you wish: IPP, common name, referring doctor, pathology, weight, and laterality.
- Ask the patient's consent before using his/her personal information.

Note: *To use the device on a patient, the patient must give consent for the processing of his/her personal data on this particular device. This consent is mandatory to use the device and is recorded by the operator by ticking the following option:*

☐ As a KinTrack user and healthcare professional, I guarantee that the patient (or, if applicable, his/her legal representative) (i) has been informed of the collection and processing of his/her personal data, as well as of the capture of his/her image as part of the intended use of the KinTrack device for the purpose of his/her care and (ii) that he/she has consented to it.

In addition, to enable EKINNOX to collect usage data on its device and to use this data to improve its device, the patient can give his/her consent for his/her data to be processed not only by the device for the analysis of his/her walk, but also by EKINNOX for the improvement of the device. This consent is not mandatory and is recorded by ticking:

☐ As a KinTrack user and healthcare professional, I guarantee that the patient (or, if applicable, his/her legal representative) (i) has been informed of the use of his/her personal data and image, previously pseudonymized, for secondary purposes of evaluation, development and improvement of the KinTrack device, under the conditions mentioned in the user manual, and (ii) that he/she has not objected.

- Click on the corresponding box(es).
- Click on « **Confirm** »: you have access to the patient page which allows you to record an activity.
- If the patient already exists, a window will show you the line of the corresponding existing patient. You can then:
 - Return to the patient creation page by clicking on "**Cancel**".
 - Open the existing patient page either by clicking on the row or by clicking on "**Restore**" if the patient was archived.



4.3. *Protection of personal data*

This chapter provides information about the confidentiality and protection of personal data collected and processed when using the KinTrack device. The healthcare professional user is responsible for providing this information to the patient and, where applicable, to his/her legal representative, at the time of the data collection in the KinTrack application, so that the patient or, where applicable, his/her legal representative, can consent to the processing of these data in a free and informed manner.

4.3.1. *The collected data*

KinTrack allows the collection of the following data:

- Personal information: last name, first name, sex, age, pathology, weight, height, and laterality
- Patient videos
- Snapshots from the videos
- 3D reconstructions of his/her silhouette
- The spatiotemporal parameters of the patient's gait: speed, cadence, step length/width, foot support times, knee, and hip angles
- The results of quantitative analyses of the standard Timed Up and Go and Tinetti tests.

4.3.2. *Why is this data collected?*

This data is collected for the following purposes:

- For the gait analysis to be carried out by the healthcare professional as part of the patient's care.
- For the assessment, development, and improvement of the KinTrack device, thus helping to provide better patient care. In this context, this data will make it possible to:
 - Test new algorithms.
 - Carry out retrospective studies to assess the relevance of the made measurements.

4.3.3. *Who has access to this data?*

- Personal data processed as part of care:

The collected data is under the responsibility of the healthcare professional who performs the gait analysis and who guarantees the protection of this data as part of the medical practice.



The healthcare team may need to access the patient's personal data processed in the KinTrack application, for the purpose of providing medical care to the patient.

As the publisher of the KinTrack device, EKINNOX, through its technical team, may need to access to the patient's personal data to maintain the operating software of the KinTrack device. EKINNOX acts as a subcontractor of the healthcare professional, under the contractual conditions concluded between the healthcare professional and EKINNOX, in the strict compliance with the regulations applicable to the protection of personal data.

- Personal data processed for secondary purposes of evaluation, development, and improvement of the KinTrack device:

As part of the secondary use of data for the evaluation, development, and improvement of the KinTrack device, the development team of the EKINNOX company will have access to the patient's personal data, after pseudonymization of these data (i.e. which do not allow the direct identification of the patient, first and last names will not be accessible and faces will be blurred on videos and other images). EKINNOX is responsible for the processing of personal data in this context.

EKINNOX is a limited company with a Board of Directors, registered in the Antibes Trade and Companies Register under number 828 971 192, whose registered office is located at Bioparc - 2400, route des Colles, 06410 BIOT, FRANCE.

4.3.4. *Retention period*

Personal data is retained by the health professional for the legal period of conservation of the medical file.

EKINNOX shall retain this data for a maximum period of 10 years from the date of collection, after which time the company undertakes to anonymize it.

4.3.5. *Data protection*

EKINNOX implements all technical and organizational measures appropriate to the nature of the data and the risks presented by their processing, to preserve the safety and confidentiality of patients' personal data and to prevent it from being distorted, damaged, or accessed by unauthorized third parties.

As part of secondary use of the data for evaluation, development and improvement of the device, this data will be strictly confidential and exclusively reserved for the use of the EKINNOX development team, and will under no circumstances be distributed, in any way whatsoever outside the company without prior consent. Any statistical and/or scientific publication that may be carried out by EKINNOX based on the collected data, in accordance with the purposes set out in Article 4.3.2, shall be exclusive of any personal data of the patient.

EKINNOX expressly refrains from disclosing data collected to third parties, other than those expressly provided for in Article 4.3.3 above.



4.3.6. *Patients' rights to their personal data*

If applicable, in accordance with the provisions of Regulation (EU) No. 2016/679 of April 27, 2016, known as the General Data Protection Regulation, and Law No. 78-17 of January 6, 1978, as amended, relating to data processing, files and individual liberties, A patient (or, where applicable, his/her legal representative) has a right to access, modify, delete, and transfer his/her personal data. He/she also has the right to request the limitation of the processing under the conditions provided for by law, as well as the right to object to the processing of his/her personal data by EKINNOX. Finally, the patient has the right to file a complaint with the Commission Nationale de l'Informatique et des Libertés (CNIL, French personal data protection authorities) if he/she considers that the data processing carried out by the healthcare professional and/or EKINNOX constitutes a violation of his/her personal data.

The patient (or, if applicable, his/her legal representative) may exercise his/her rights at any time by contacting the healthcare professional who performed his/her gait analysis.


4.3.7. *Image rights*

For the healthcare professional to use the KinTrack device, the patient's image can be captured by video and snapshot.


These images are made unidentifiable by masking the face and/or distinctive signs, before being sent to the EKINNOX development teams for the needs of the evaluation, development, and improvement of the KinTrack device. In this regard, EKINNOX may reproduce the patient's image on any medium whatsoever (paper, digital) and for any means of distribution whatsoever (newspapers, internet, etc.), throughout the world, for the duration provided for in article 4.3.4 above.

EKINNOX shall refrain from any illicit use, or use not provided for above, of the recording of this image that may affect the dignity, reputation or privacy of the patient and any other harmful use according to the laws and regulations in force.


4.4. ***Find an existing patient***

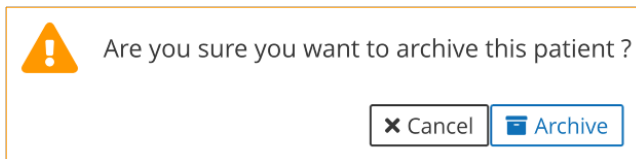
- Click on  Search above the list of patients and type the first few letters of the patient's first or last name.
- Click on the line of the patient you are interested in: you reach the patient page (Chapter 5.) where you can record a new activity or generate a report.




4.5. ***Modify a patient***


- In the list of patients, click on  on the line of the concerned patient.
- You can modify the personal and additional information of the patient record (see Figure 6).

4.6. Archive and delete a patient

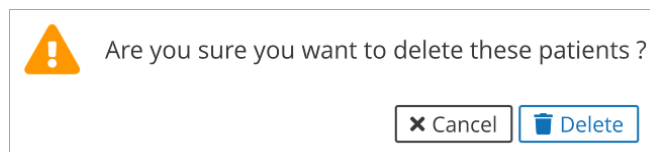
- In the list of patients, select the relevant patient by checking the corresponding box ☐.
- Click on .
- A message asks if you really want to archive this patient.



- Click on  : the patient disappears from the list of active patients.
- Show archived patients and:
 - Click on  to cancel the archiving operation.
 - Click on  to delete the patient (not applicable on the web version).

 **Deleting a patient deletes all data and video recordings of the patient, no information is stored.**

- A message asks if you really want to delete this patient.



- Click on "Delete".

4.7. Show patients

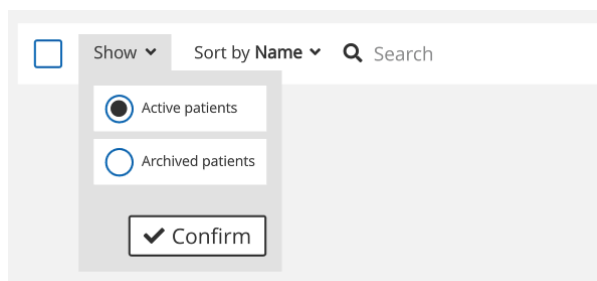


Figure 7: Show patients

- Click on **"Show"**: a filter allows you to display only active patients or archived patients. By default, only active patients are listed.

4.8. Sort patients

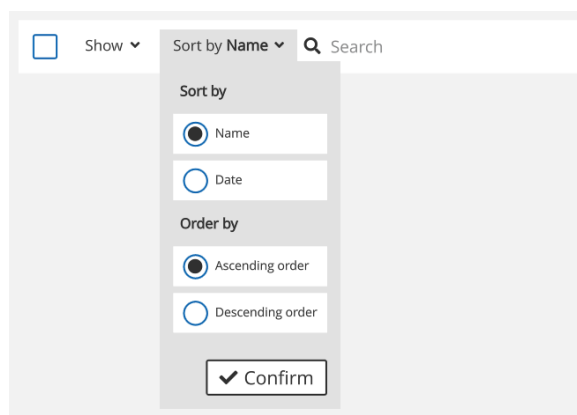


Figure 8: Sort patients

- Click on **"Sort by"**: patients can be sorted by Name (alphabetical order) or by date of last activity, in ascending or descending order. By default, patients are sorted by name, in ascending alphabetical order.

5. Patient page

- When you click on the line of an active patient in the list of patients, you arrive on the patient page.

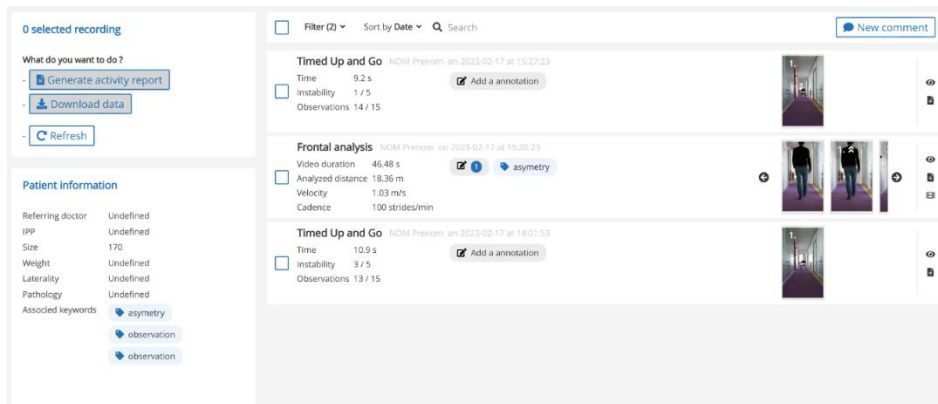


Figure 9: Patient page

5.1. Filtering and sorting

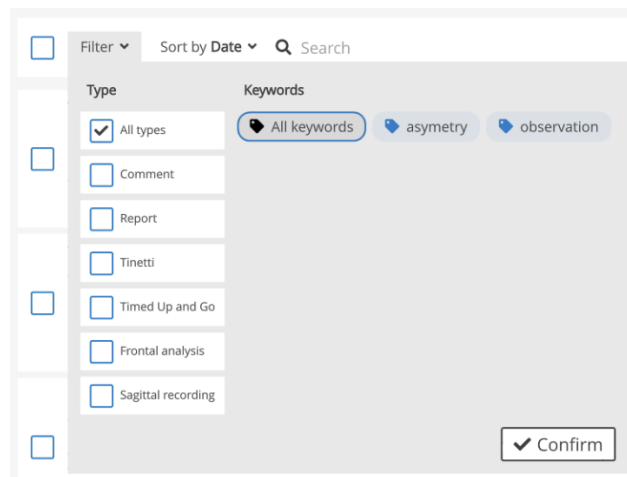


Figure 10: Filtering activities

- Click on **"Filter"**.
- You can filter the list of patient activities by type by checking the corresponding box(es).
- You can filter by keyword by clicking on the corresponding keyword(s).

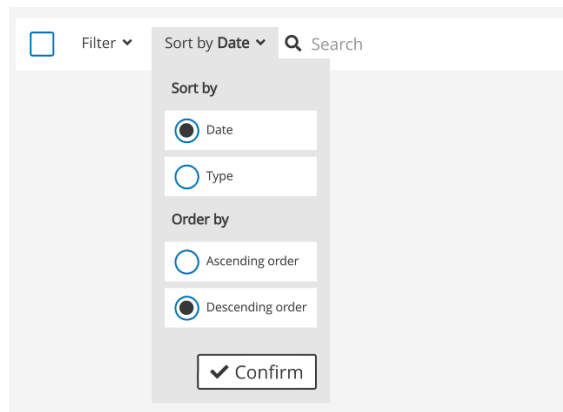


Figure 11: Sorting activities

- Click on "**Sort by**".
- You can sort by date or type (Observations, Frontal Analysis, Sagittal Recording, Timed Up and Go or Tinetti) by ticking the corresponding box.
- You can sort in ascending or descending order (date or type in alphabetical order) by ticking the corresponding box.

By default, the activities are sorted by date, in descending order.

5.2. Selection of activities

- By default, no activities are selected. You can select all the patient's activities and observations by ticking the box at the top of the patient page.

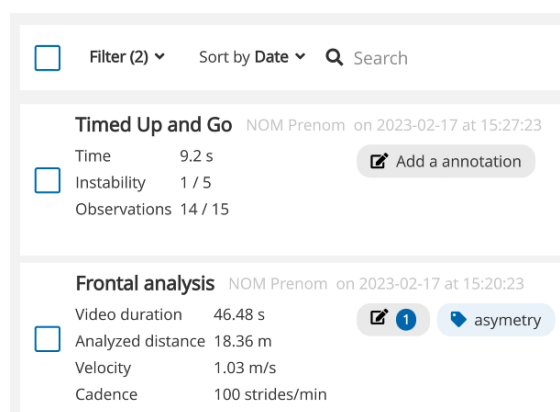
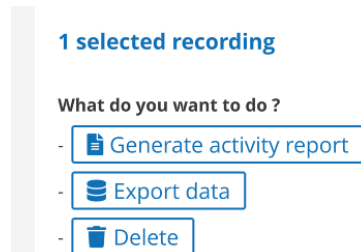


Figure 12: Selection of activities

- You can select certain activities that you want to include in the general report by ticking the corresponding activity box.

5.3. Actions on selected activities


Actions are possible and listed on the left side of the screen:

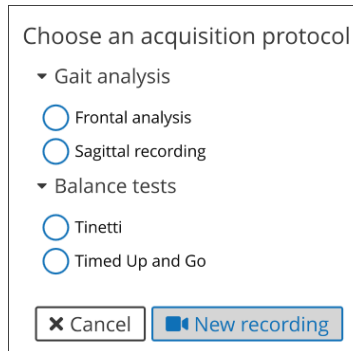


- Depending on the selected activities, the actions are activated (white) or deactivated (grey).
- **"Generate an activity report"** is active when:
 - Only 1 activity of type Observations, Frontal Analysis, Tinetti or TUG is selected.
- **"Generate a general report"** replaces **"Generate an activity report"** and is active when:
 - At least 2 activities of type Observations, Frontal Analysis, Tinetti or TUG are selected.
- **"Export data"** (or **"Download data"** for the web app) is active when:
 - At least one Frontal Analysis, Sagittal Recording, Tinetti or TUG activity is selected.
 - At least one Frontal Analysis is selected for the web version which only allows downloading .csv files.
- **"Delete"** is active when at least one activity is selected (not applicable on the web version).

6. Recording

⚠ This entire section is not applicable to the web version.

- In the patient page click  to access the video recording page.
- A window asks you to choose the video recording protocol you want to use:



Choose an acquisition protocol

- ▼ Gait analysis
 - ☐ Frontal analysis
 - ☐ Sagittal recording
- ▼ Balance tests
 - ☐ Tinetti
 - ☐ Timed Up and Go

Figure 13: Choosing an acquisition protocol

- Choose then click on  : you arrive on the calibration page.

6.1. Recording protocols

6.1.1. Frontal analysis

- If you have chosen the acquisition protocol "Frontal analysis", you can make the corresponding recording. This protocol allows you to calculate the spatiotemporal and kinematic gait parameters.
- This protocol requires a configuration of the exercise area prior to the recording, to allow the calculation of the parameters and the 3D display.

6.1.1.1. Calibration of the exercise area

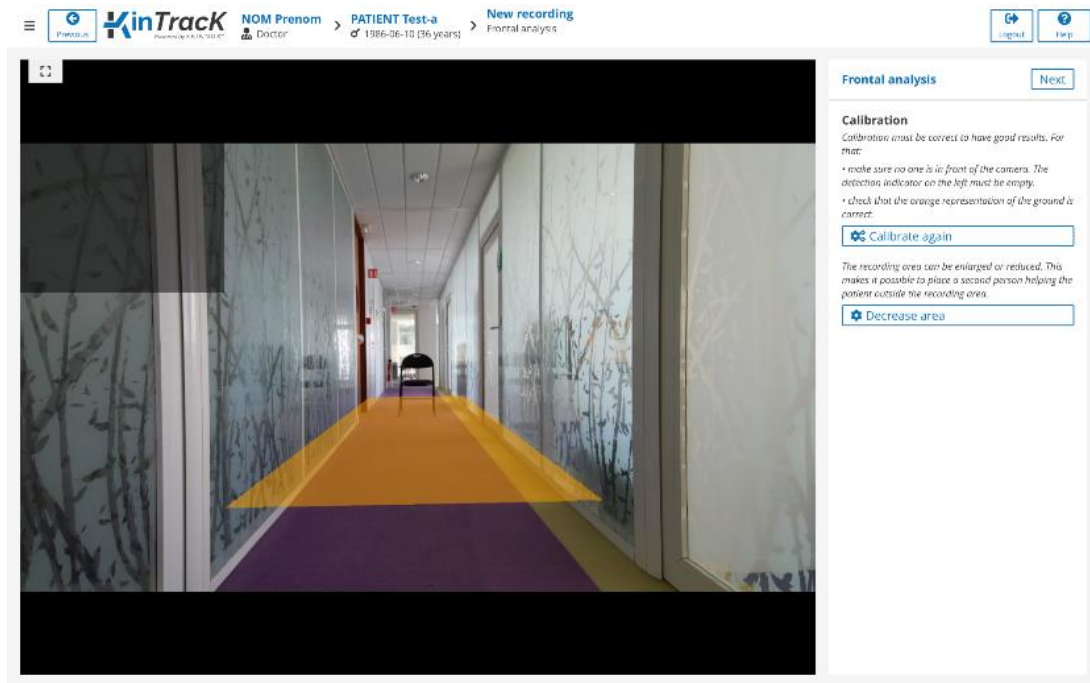



Figure 14: Calibration page (frontal analysis, TUG or Tinetti)

- The calibration page displays the camera's field of view as well as:
 - A yellow area that represents the ground detected by the device.
 - A gray screen in the upper left corner that will display the patient's silhouette in pink when the patient is detected.
- To calibrate the exercise area:
 - Make sure that the patient's walking area in front of the camera is completely clear.
 - Set up the exercise area by pressing the button:


- The yellow area on the image is recalculated and corresponds to the area on which the patient's gait can be analyzed.

⚠ The patient should not be in front of the camera at this point.

⚠ It is essential to configure the exercise area before recording an activity, even if the yellow area representing the ground detected by the device is present.

- You can reduce the width of the exercise area by clicking on

 Decrease area

- By clicking on this button, the exercise area is both reduced and configured.

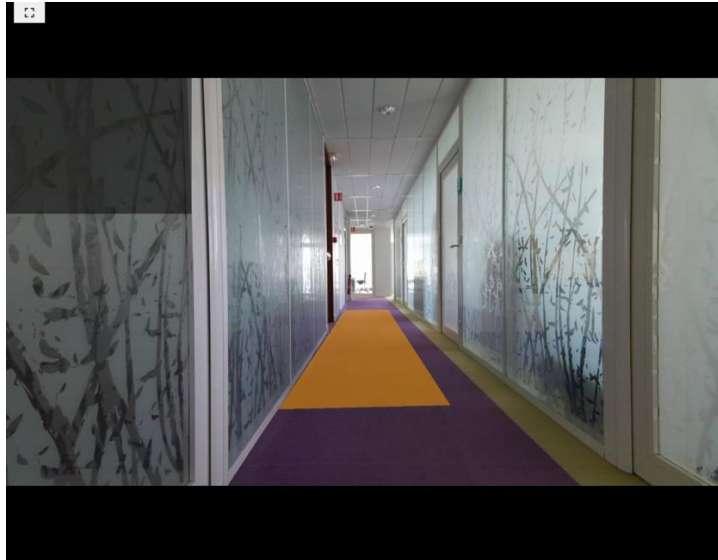


Figure 15: Reduced exercise area

6.1.1.2. Patient detection

- Place the patient in the camera's field of view, at the end of the yellow zone (see figure below).
- Verify that only the patient's silhouette appears in pink on the top left detection indicator.

⚠ If the patient's silhouette does not appear, ask the patient to move forward until the silhouette appears in pink.

⚠ To obtain good results, the patient must be detected at least at 5 m in front of the camera.

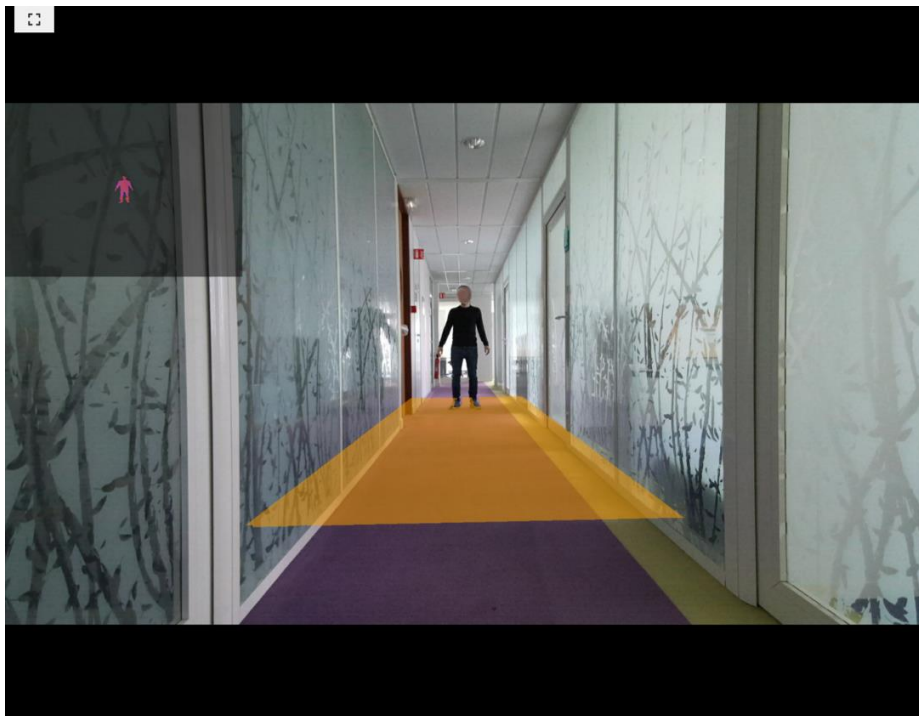


Figure 16: Patient positioning

- If you are recording with a caregiver support, reduce the exercise area so that the caregiver's silhouette does not appear on the detection indicator.

Note: You can place cones to define the boundary between the patient and the caregiver and prevent the caregiver from entering the exercise area.

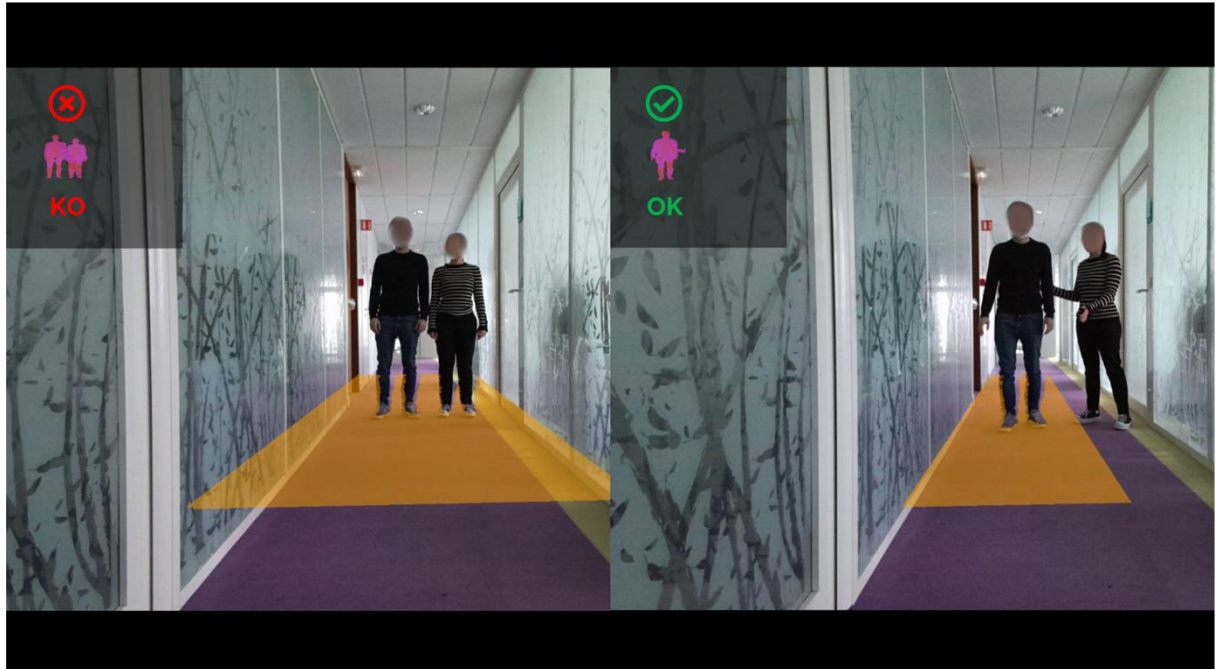


Figure 17: Reduced area benefit for a gait analysis with a caregiver support

- Once the exercise area is calibrated, you can access the recording page corresponding to the protocol you have chosen by clicking on: [Next](#).

6.1.1.3. Recording

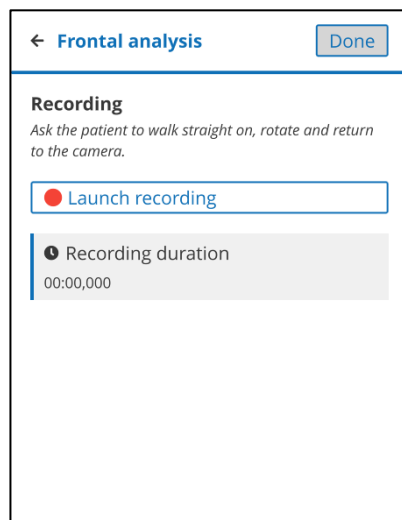






Figure 18: Recording of a frontal analysis

- Start the recording by clicking on 
- Ask the patient to walk as many go and return as desired (one way minimum), making sure that:
 - The patient starts walking outside the exercise area, either from the camera side or from the end of the exercise area.
 - The patient makes the U-turns outside the exercise area.
- Stop the recording by clicking on 
- You can then redo the recording by clicking on: 

 **The previous record will be deleted.**

- When the recording is complete, click  to return to the patient page.

 **To get parameters, you need to have at least one walking sequence (one way or back) with:**

- A duration of at least 3 seconds
- A walking distance of at least 2 m

Otherwise, you will have a video recording without walking sequences and without parameters.

6.1.1.4. Editing sequences

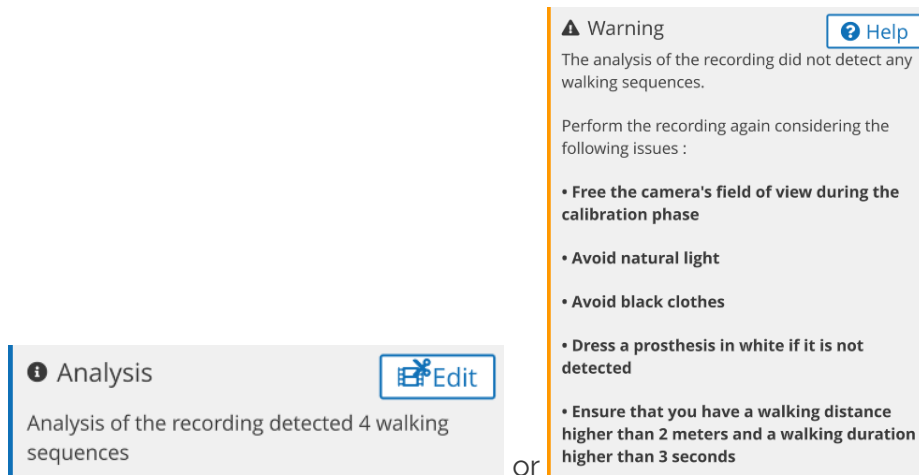


Figure 19: Sequence detection messages

- At the end of a recording in frontal analysis, a message indicates how many sequences have been detected or displays a message that reminds the user of the instructions for redoing the recording.
- If no sequence was detected, repeat the recording after having:
 - **recalibrated the floor:** during calibration, no one should be in the camera's field of view, especially the patient should not be in the exercise area.
 - Once the calibration is done, **the gray box in the upper left corner of the video should not contain any pink areas.** If it does, remove any infrared light sources, usually natural light, and redo the calibration.
 - Then verify that the patient is fully detected when in the exercise area:
 - **The whole silhouette appears in pink.**
 - If some parts of the silhouette do not appear (lower body, prosthesis, ...), it is due to clothing or materials that absorb infrared radiation, typically if they are black.
- If sequences have been detected, it is possible to edit them by clicking on



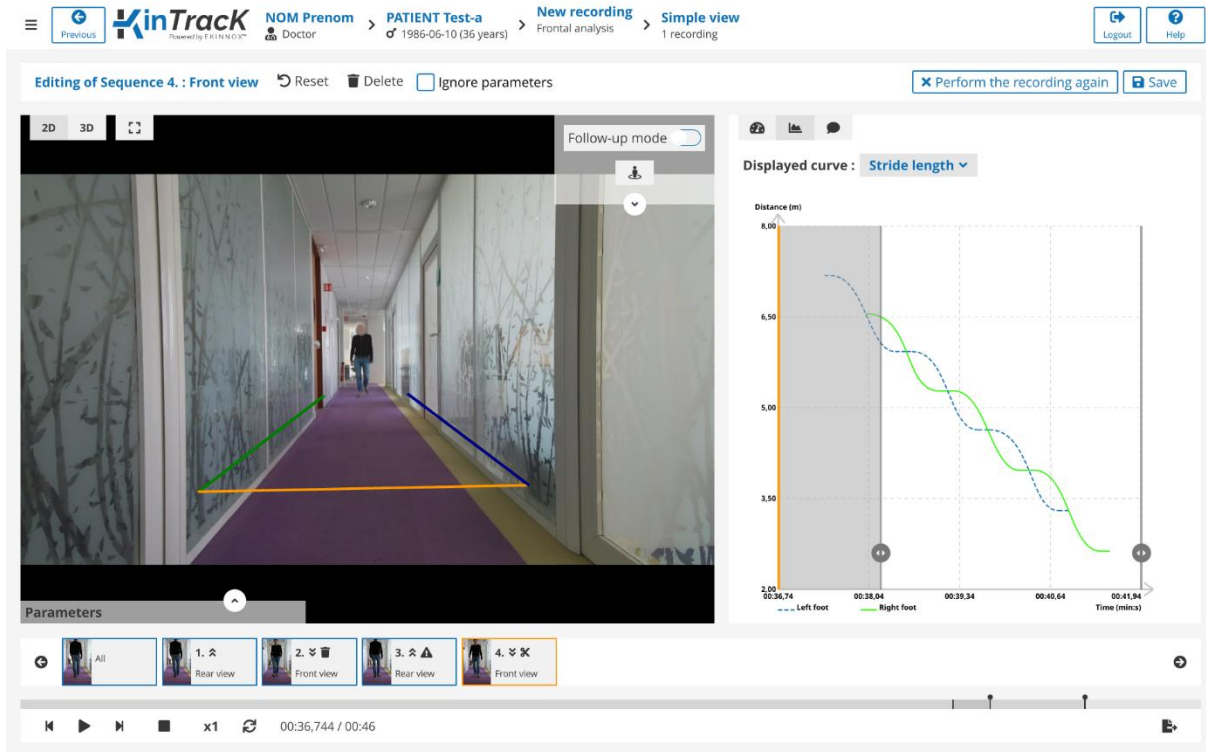




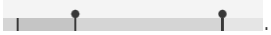



Figure 20: Sequence editing

- Click on  : the editing page appears.
- The first sequence is displayed. Click on one of the thumbnails below the images to display another sequence.
- Click on "Delete" to delete a sequence: a sign  appears on the corresponding thumbnail.
- Tick "Ignore parameters" if you want to keep a sequence for visualization but exclude its results for the calculation of the gait parameters: a sign  appears on the corresponding thumbnail.
- Move the round sliders on the graphs  , or reduce the walking sequence on the video player thread  to reduce the sequence: a sign  appears on the corresponding thumbnail.
- Click "Perform the recording again" to return to the recording page.
- Click "Reset" to undo changes made to a sequence.

- Click on "**Save**": a page lists the performed modifications.

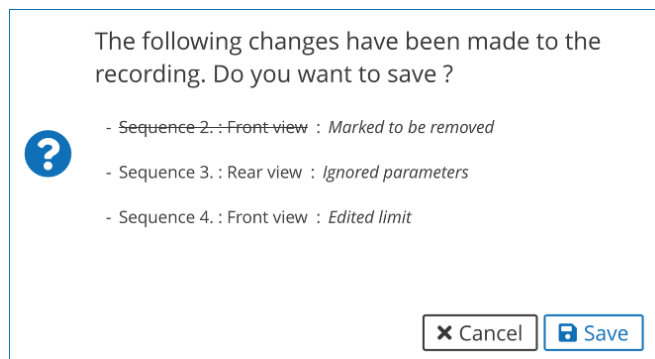


Figure 21: Confirmation of sequence editing.

- Click on "**Save**" to save the changes and return to the patient page.
- Click on "**Cancel**" to return to the editing page.

6.1.2. Sagittal recording

- If you have chosen the acquisition protocol 'Sagittal recording', you can make the corresponding recording. This protocol allows you to record a video of the patient seen from the side to visually appreciate the characteristics of his/her gait, and to visualize simultaneously with a frontal video if necessary.
- This protocol requires a configuration of the exercise area prior to the recording, to allow a 3D display.

6.1.2.1. Configuration of the exercise area

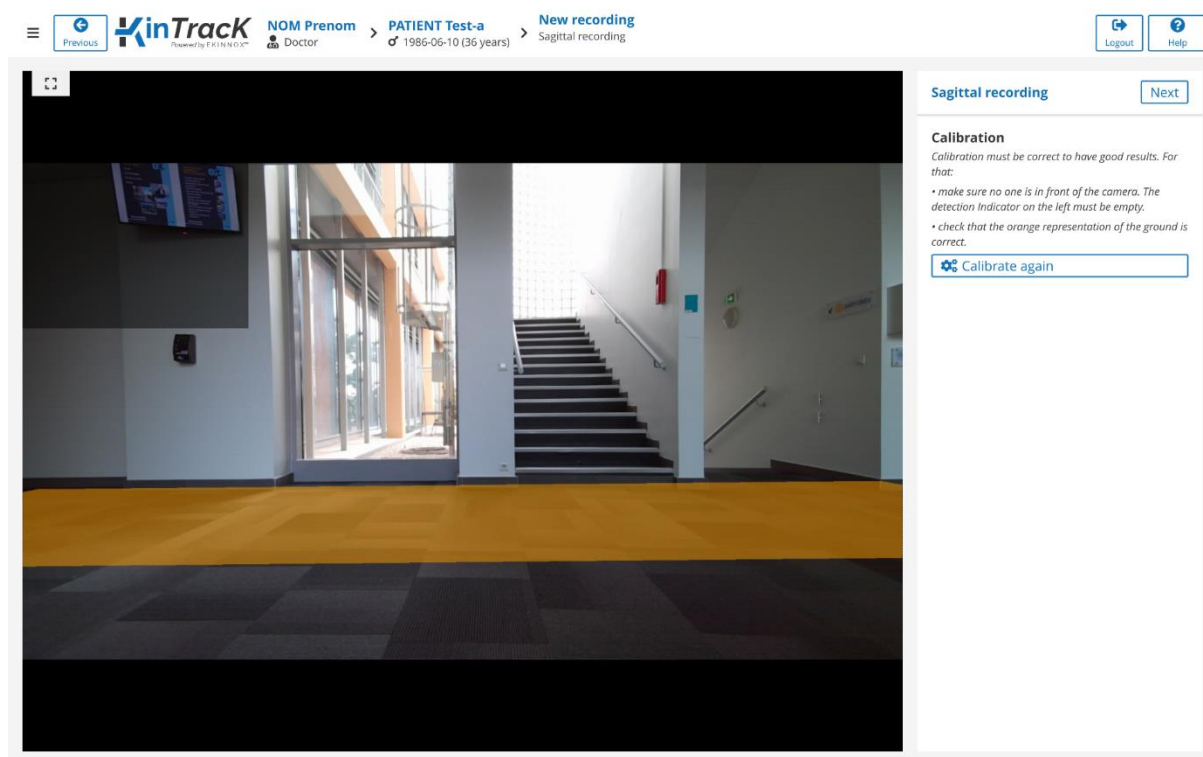



Figure 22: Calibration page, sagittal record

- The calibration page displays the camera's field of view as well as:
 - A yellow area that represents the patient's activity zone.
 - A gray screen in the upper left corner that will display the patient's silhouette in pink when the patient is detected.
- To calibrate the exercise area:
 - Make sure that the area of patient activity in front of the camera is completely clear.
 - Set up the exercise area by pressing the button:

 Calibrate again
 - The yellow area on the image is recalculated and corresponds to the area on which the patient's walk can be performed to have the 3D view of the patient.

6.1.2.2. Patient detection

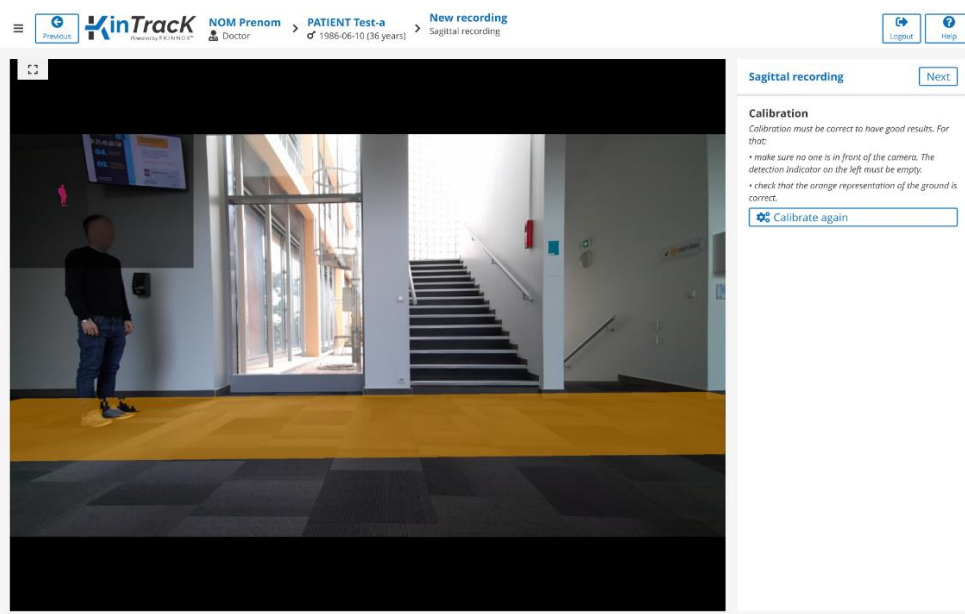


Figure 23: Patient detection, sagittal recording

- Place the patient at either the left or right end of the activity area.
- Verify that the patient's silhouette appears in pink on the detection indicator in the upper left corner.

⚠ If his/her silhouette does not appear, you can make the recording, but you will not have a 3D view of the patient nor the possibility to zoom on the patient's feet.

6.1.2.3. Recording

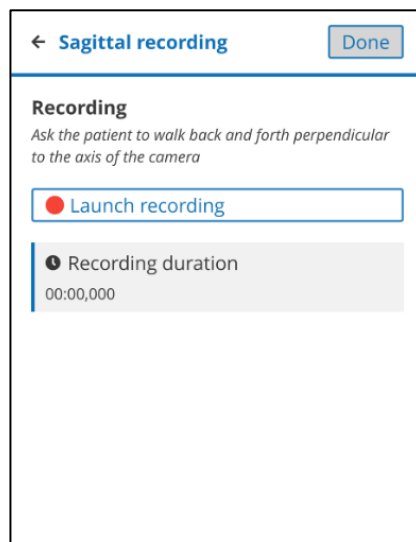





Figure 24: Sagittal recording

1. Give the instruction to the patient and click on 
2. Once the activity is completed, click on: 
- You can then redo the recording by clicking on: 

 **The previous record will be deleted.**

3. When the recording is complete, click  to return to the patient page.

 **To obtain sagittal gait sequences, a gait portion must have at least:**

- **A duration of 2 seconds**
- **A distance of 2 meters**

Otherwise, you will have a video recording of the patient without walking sequences.

6.1.3. Timed Up-and-Go (TUG)

- If you have chosen the 'Timed Up and Go' acquisition protocol, you can make the corresponding recording. This protocol allows you to perform a functional evaluation according to the 'Timed Up and Go' test and to simultaneously record the performed exercise.
- This protocol requires a configuration of the exercise area (see Calibration of the exercise area) prior to recording, to allow the 3D display.
- Once the exercise area has been calibrated, you can access the recording page by clicking on [Next](#).

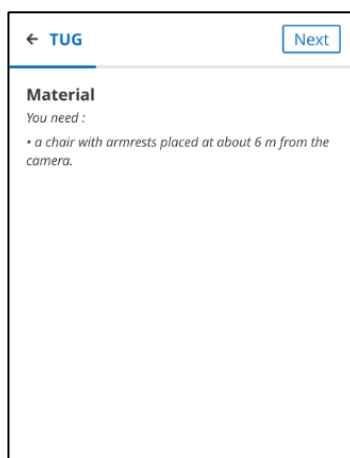


Figure 25: TUG, material window

- Set up the material as indicated and click on [Next](#).

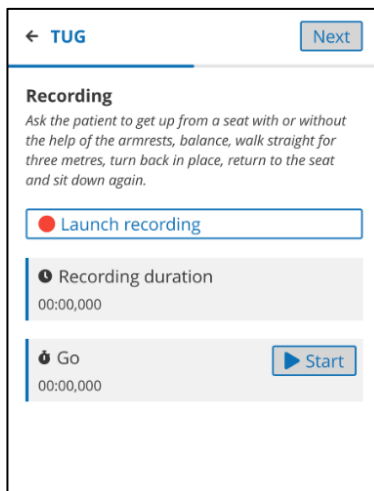






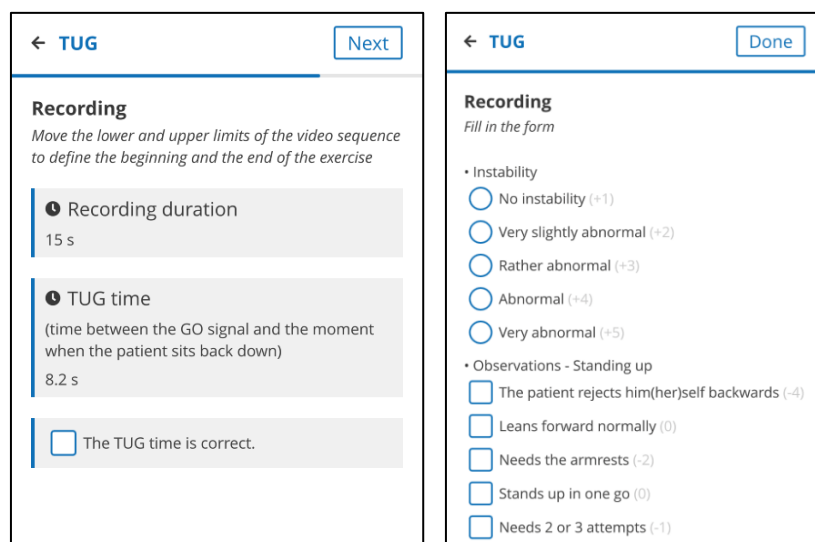


Figure 26: TUG, recording window

- Explain the instruction to the patient and then click .
- Say 'GO' and simultaneously click on .
- When the patient finishes the exercise, click on .

Note: you can skip the two previous steps because it will be possible to adjust the stopwatch time in the next step.

- After a few seconds click on .
- You can redo an exercise and its recording by clicking on . Otherwise click on  to access the forms.



← TUG Next

Recording
Move the lower and upper limits of the video sequence to define the beginning and the end of the exercise

Recording duration
15 s

TUG time
(time between the GO signal and the moment when the patient sits back down)
8.2 s

☐ The TUG time is correct.

← TUG Done

Recording
Fill in the form

• Instability

- ☐ No instability (+1)
- ☐ Very slightly abnormal (+2)
- ☐ Rather abnormal (+3)
- ☐ Abnormal (+4)
- ☐ Very abnormal (+5)

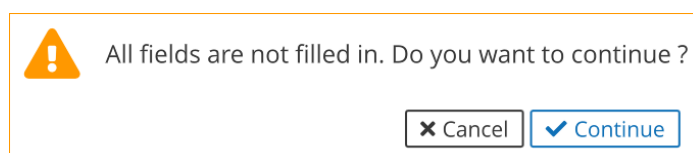
• Observations - Standing up


- ☐ The patient rejects him(her)self backwards (-4)
- ☐ Leans forward normally (0)
- ☐ Needs the armrests (-2)
- ☐ Stands up in one go (0)
- ☐ Needs 2 or 3 attempts (-1)

Figure 27: TUG, form windows

At this point, you can either:

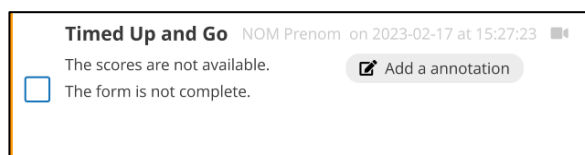
- Fill out the form directly (on the right) and adjust the time (with the markers on the feed below the video) with the help of the exercise video that you can watch simultaneously on the left of the form. You can give multiple answers for the square checkboxes. Once the form is filled, click on Done.
- Click directly on Done to complete the form later. A message will ask you if you really want to finalize without completing the form.



 All fields are not filled in. Do you want to continue ?

✕ Cancel ✓ Continue


If the forms have not been completed, the results will not be available.



Timed Up and Go NOM Prenom on 2023-02-17 at 15:27:23

☐ The scores are not available.

☐ The form is not complete.

 Add a annotation

Opening the activity will prompt you to complete the form. You can also adjust the time.

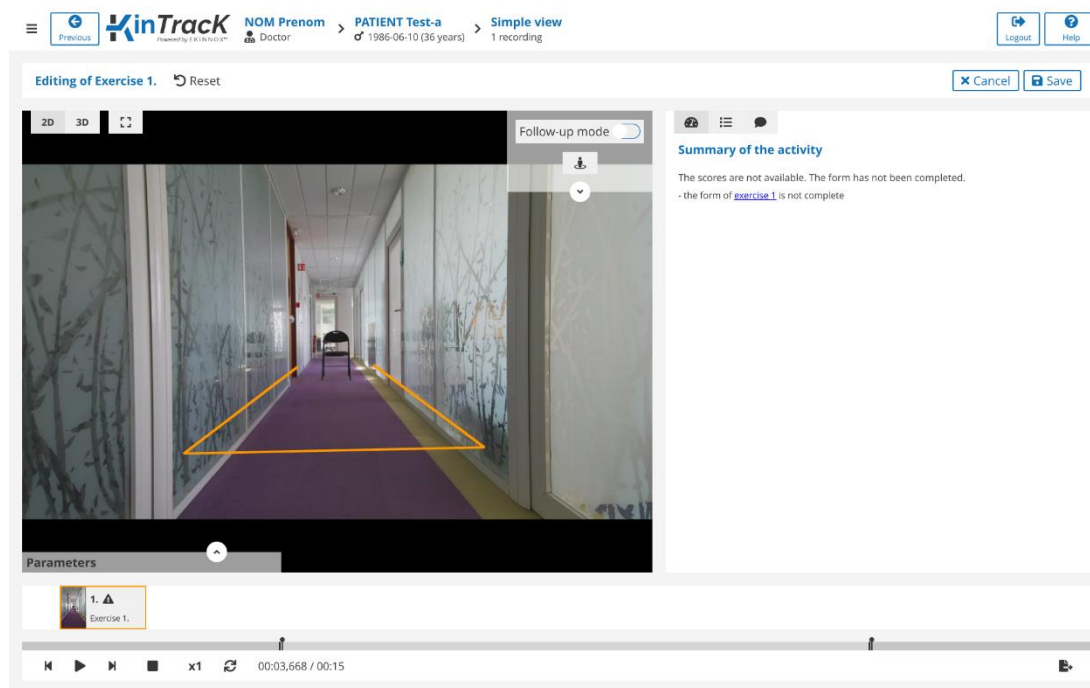


Figure 28: Window for visualizing an incomplete TUG activity

Once you have validated the time and completed the form, click on "Save". The score is then calculated, and the main results are available in the list of activities.

6.1.4. Tinetti

- If you have chosen the 'Tinetti' acquisition protocol, you can make the corresponding recording. This protocol allows you to perform a functional evaluation according to the 'Tinetti' test and to simultaneously record the exercises performed.
- This protocol requires a configuration of the exercise area (see Calibration of the exercise area) prior to recording, to allow the 3D display.
- Once the exercise area has been calibrated, you can access the recording page by clicking on [Next](#).

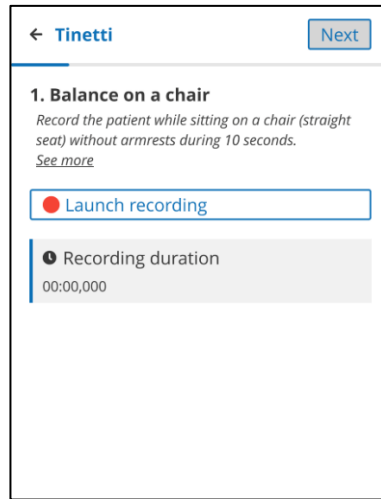






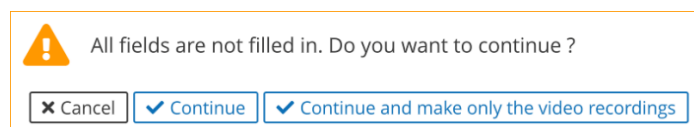
Figure 29: Tinetti, exercise 1

The test with the patient can then begin:

1. Give the patient the instruction and click .
You can view the form for each exercise by clicking on "See more".
2. Once the activity is completed, click on: 

You can then redo the recording by clicking on: 

3. Click on . The video that has just been recorded is then played in a loop and the form corresponding to the exercise is displayed. You then have 2 choices:
 - You can fill out the form and proceed to the next step,
 - You can click directly on  without filling in the form. A confirmation window will appear asking you if you want to fill in later:
 - Only this form, in this case, the forms will be displayed for the next exercises.
 - All the next ones, in this case, only the video recordings will be displayed for the next exercises.



4. Repeat steps 1 to 3 for each of the 6 exercises.

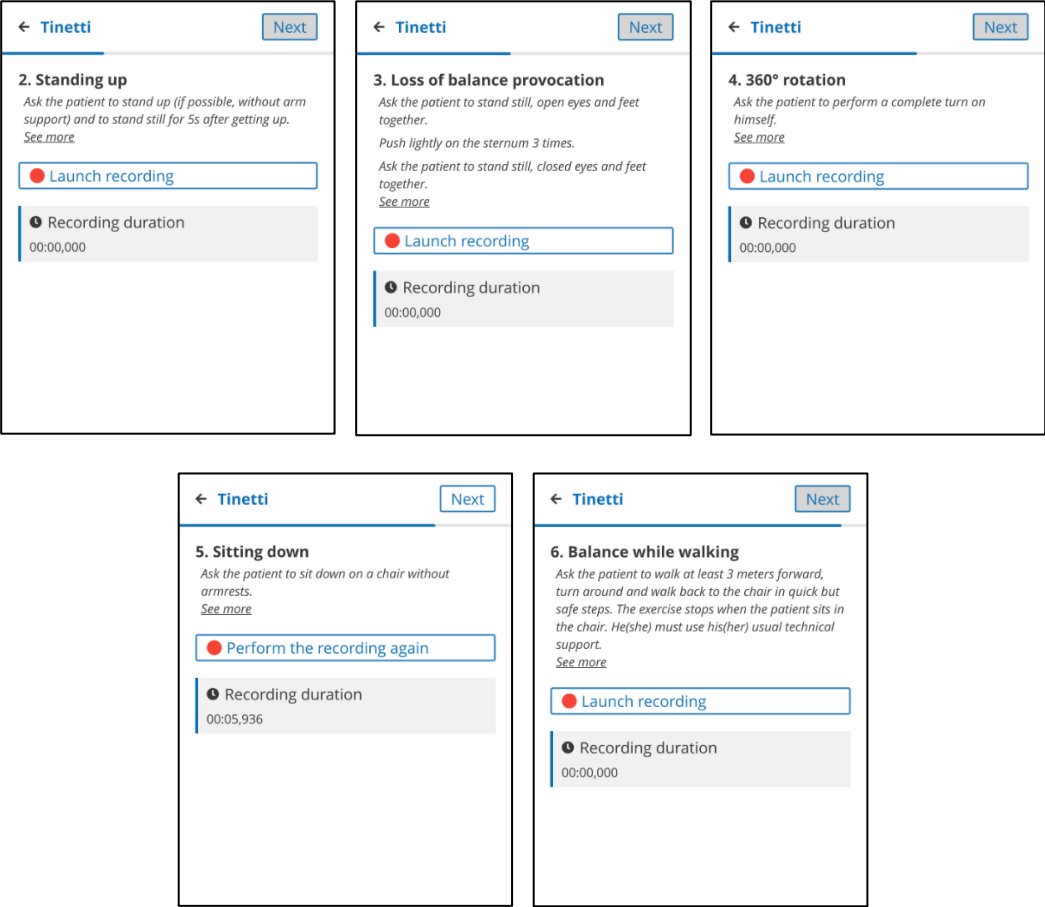



Figure 30: Tinetti, exercises 2 to 6

5. When the 6 records are complete, click **Done** to return to the patient page.

If some forms have not been completed, the results will not be available.



When the activity opens, you will be prompted to complete the forms by clicking on the links on the right side of the screen.

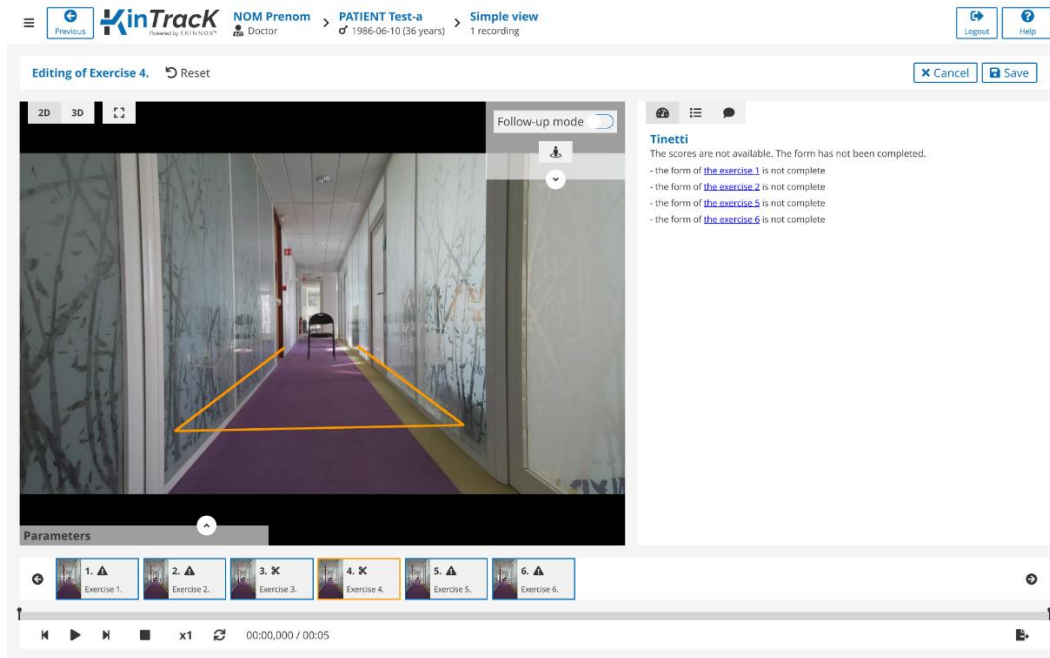



Figure 31: Uncomplete Tinetti visualization

Once all the forms are completed, click on "Save". The score is then calculated, and the main results are available in the list of activities.

6.2. Enter a comment for a patient

- To enter a comment about the patient, click on .
- Enter the text in the proposed input field:

New comment

 **Keyword**

Click here to enter a comment



✕ Cancel
Save

- You can define keywords. To do so, click on "**Keyword**" at the top left, or precede your word with a # sign.
- Save by clicking on the "**Save**" button.

- Your comment appears in the list of patient activities:



6.3. Enter annotations about the activity

- On the patient page, for an activity, click on  Add an annotation or . The visualization page opens with the annotation area.

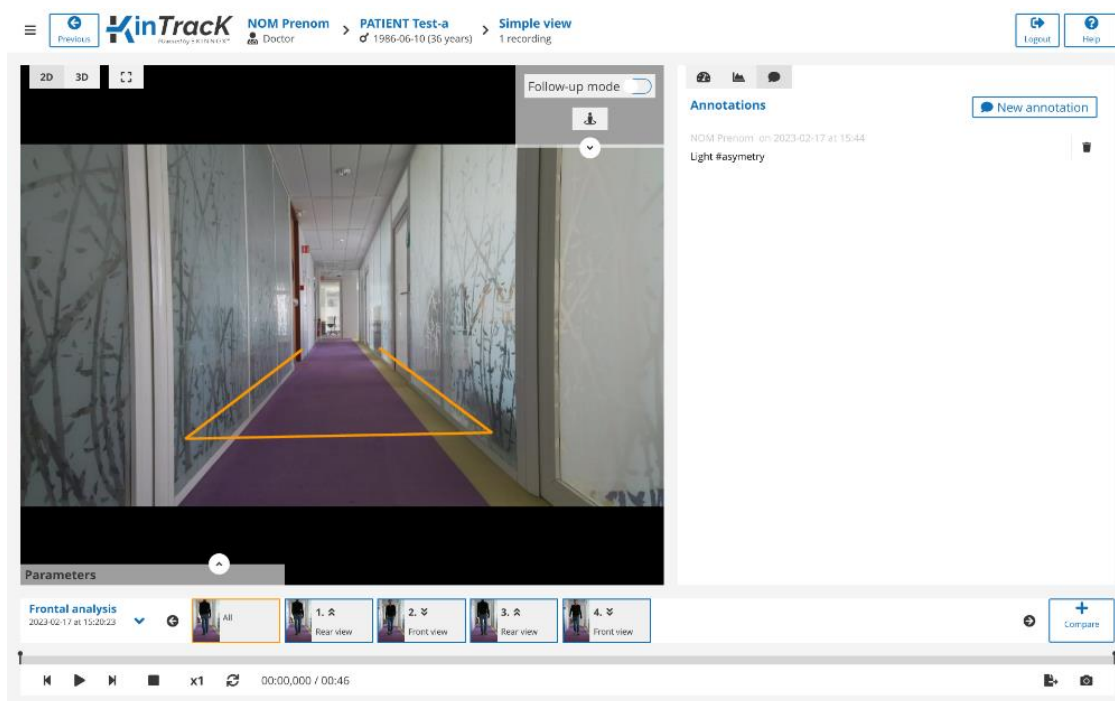
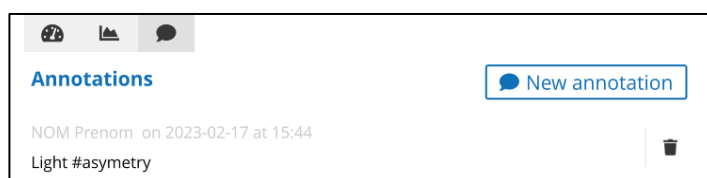



Figure 32: Visualization page with the annotation area

- Previously entered annotations appear if any:




- Click on "**New Annotation**" to write a new annotation.
- Enter the text in the proposed input field.



- You can define keywords. To do so, click on "**Keyword**" or precede your word with a # sign.
- The keywords will be visible in the patient page, in the patient information and in the activity line.

7. Visualize a video recording

7.1. Visualization tools


- From the patient page, to visualize a recording, click on  or directly on a thumbnail image.
- Depending on the type of activity, you will be taken to the corresponding viewing page and the following viewing tools are available at the bottom of the screen:

00:02,159 / 00:22 Current time/total time of the recording

 Single frame backward playback

 Play/Pause

 Single frame forward playback

 Stop the video and return to the first frame of the video.


x1 Slow motion. There are 3 reading speeds:


- Real speed
- 0.5 x real speed
- 0.25 x real speed

 Looped playback

 Take a screenshot (see 8.1 Screenshots for the inclusion of screenshots in reports)


- Additional tools are available on the top right of the image (open the menu of possible actions by clicking on the down arrow):

Follow-up mode  Change the visualization mode: "Follow-up mode" deactivated, the camera stays fixed, activated, the camera moves virtually at the same time as the patient.

 Return to initial position: allows you to reset the video view to its default configuration.

 Zoom buttons:

- With "Follow-up mode" disabled: zoom in on a fixed point in the image.
- With "Follow-up mode" activated: zoom in on the patient while virtually maintaining the distance to him/her.

 Allows you to move the viewing point on the video:

- With "Tracking Mode" disabled: vertically and horizontally, on any point of the video.
 - With "Tracking mode" activated: only vertically, along the vertical axis passing through the patient's center of gravity.
- Several display modes are available in the upper left corner.

3D 3D visualization (See 7.6 3D view)

2D Back to video viewing

 Full screen display

- A reading thread under the image allows:
 - to place yourself at a given moment of the video by clicking on the thread,
 - to restrict the part of the video you want to visualize by moving the sliders at each end of the thread with the mouse.
 - To visualize the position of each sequence on the entire recording.





- On the right side of the screen, different information can be displayed depending on the chosen icon:



Activity summary page



Functional assessment form



Annotations



Visualization of graphs

Note: *Graphs are only available for frontal analysis and functional assessment forms are only available for Timed up and Go and Tinetti assessments.*

7.2. Visualization of a frontal analysis

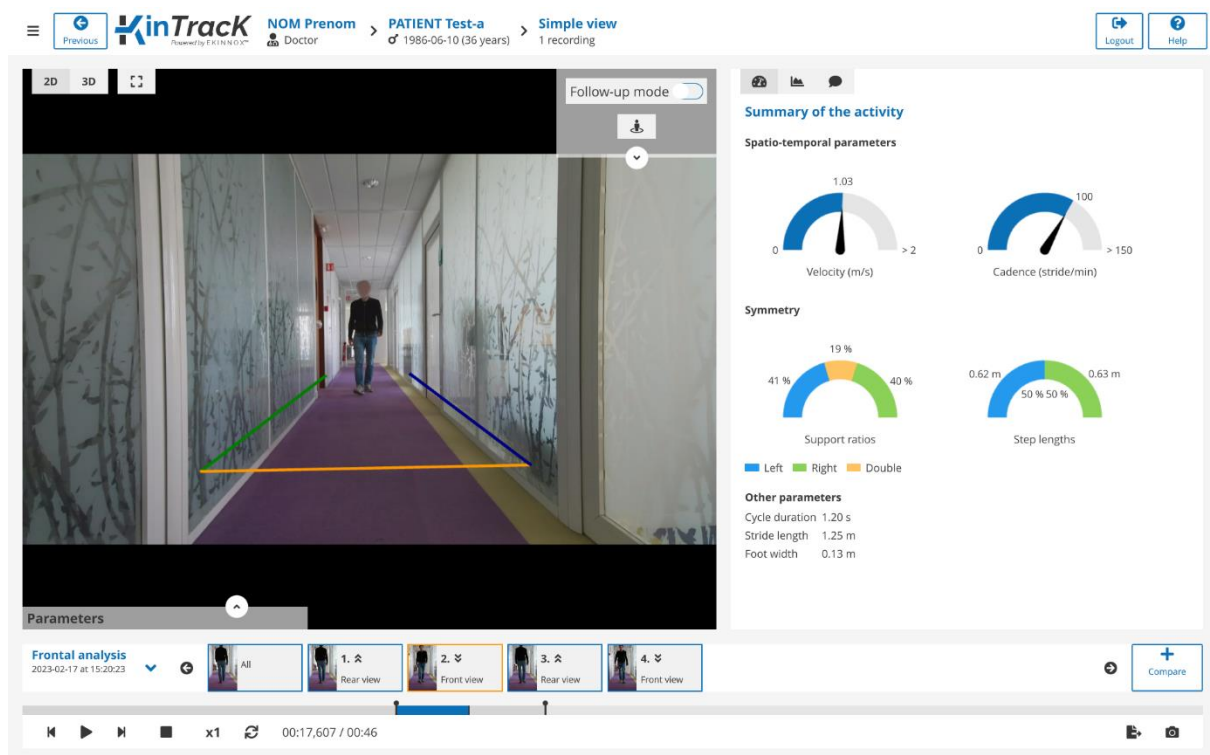
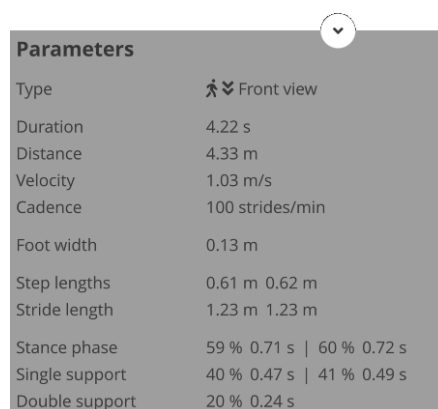


Figure 33: Visualization page, frontal analysis

- For a frontal analysis, the visualization page displays the first sequence extracted from the recording as well as the summary page of the activity, also accessible by clicking on .



- The sequences correspond to the different go and return performed by the patient, typically a trip to the camera (front view) or from the camera to the initial position (back view).
- Click on the desired sequence by clicking on one of the thumbnails at the bottom of the screen.
- For each sequence the gait parameters are calculated and displayed at the bottom left. Click on the up arrow to display them or on the down arrow to hide them.



Parameters	
Type	Front view
Duration	4.22 s
Distance	4.33 m
Velocity	1.03 m/s
Cadence	100 strides/min
Foot width	0.13 m
Step lengths	0.61 m 0.62 m
Stride length	1.23 m 1.23 m
Stance phase	59 % 0.71 s 60 % 0.72 s
Single support	40 % 0.47 s 41 % 0.49 s
Double support	20 % 0.24 s

Figure 34: Display of the gait parameters on the video

- Click on the "All" sequence thumbnail on the left to visualize the entire recording.

7.3. Visualization of a sagittal recording

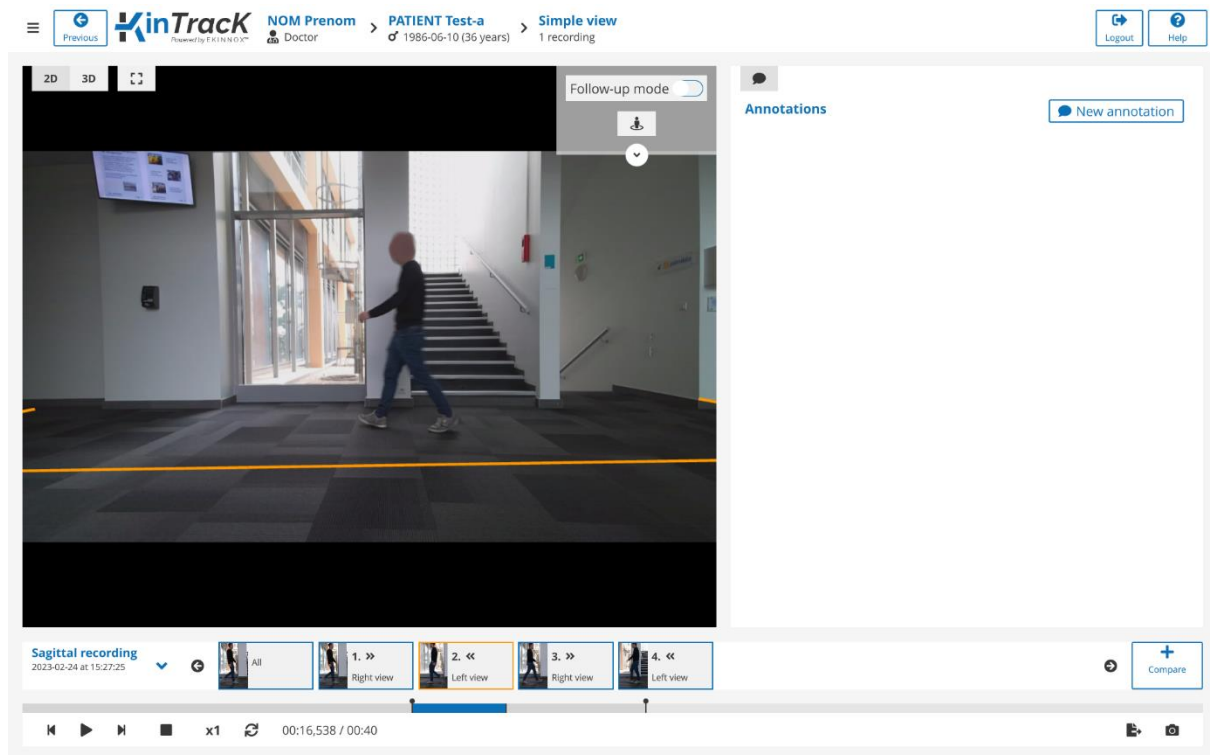


Figure 35: Visualization page, sagittal recording

- For a sagittal recording, the visualization page displays the first sequence extracted from the recording with the annotations on the right side.
- The sequences correspond to the different go and return performed by the patient, typically toward the right (right view) or toward the left (left view).
- Click on the desired sequence by clicking on one of the thumbnails at the bottom of the screen.
- Click on the **"All"** sequence thumbnail on the left to visualize the entire recording.

7.4. Visualization of a TUG evaluation

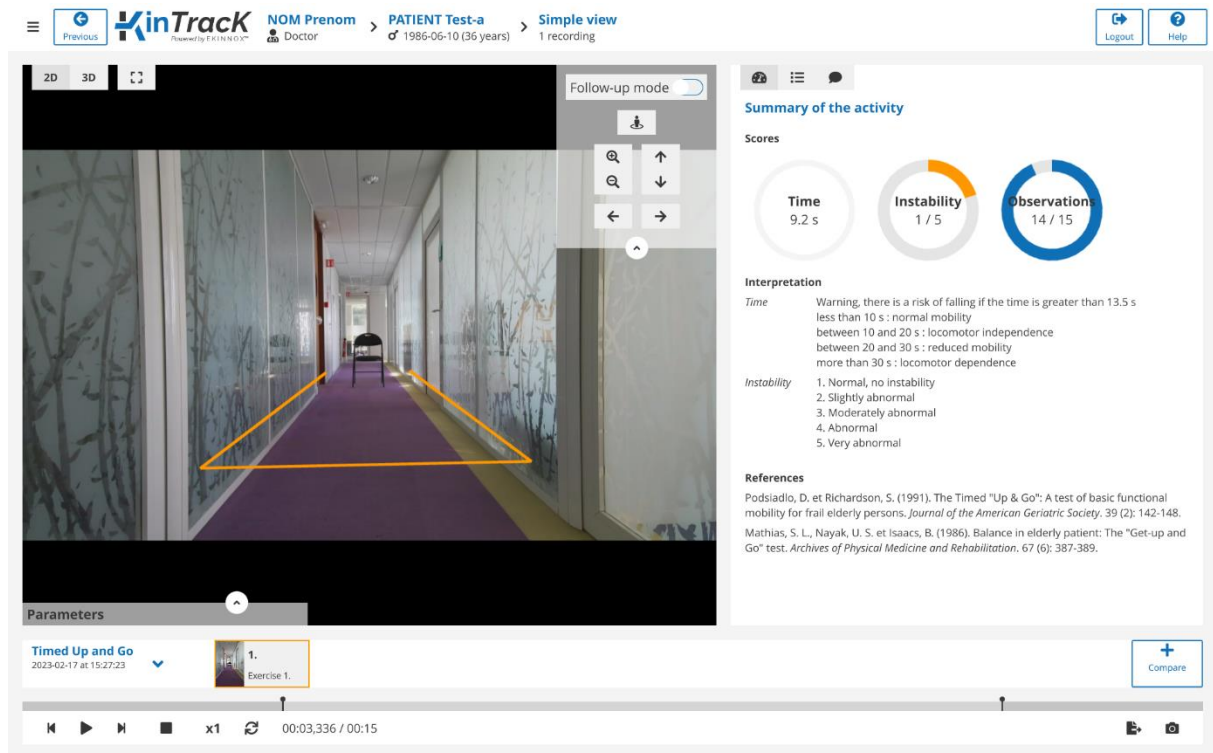




Figure 36: Visualization page, TUG summary

- For a TUG evaluation, the visualization page displays the video on the left and the summary on the right, also accessible by clicking on .
- The overall test result can be displayed in the lower left corner of the video by clicking on the up arrow.
- Click on  to display the form corresponding to the video:

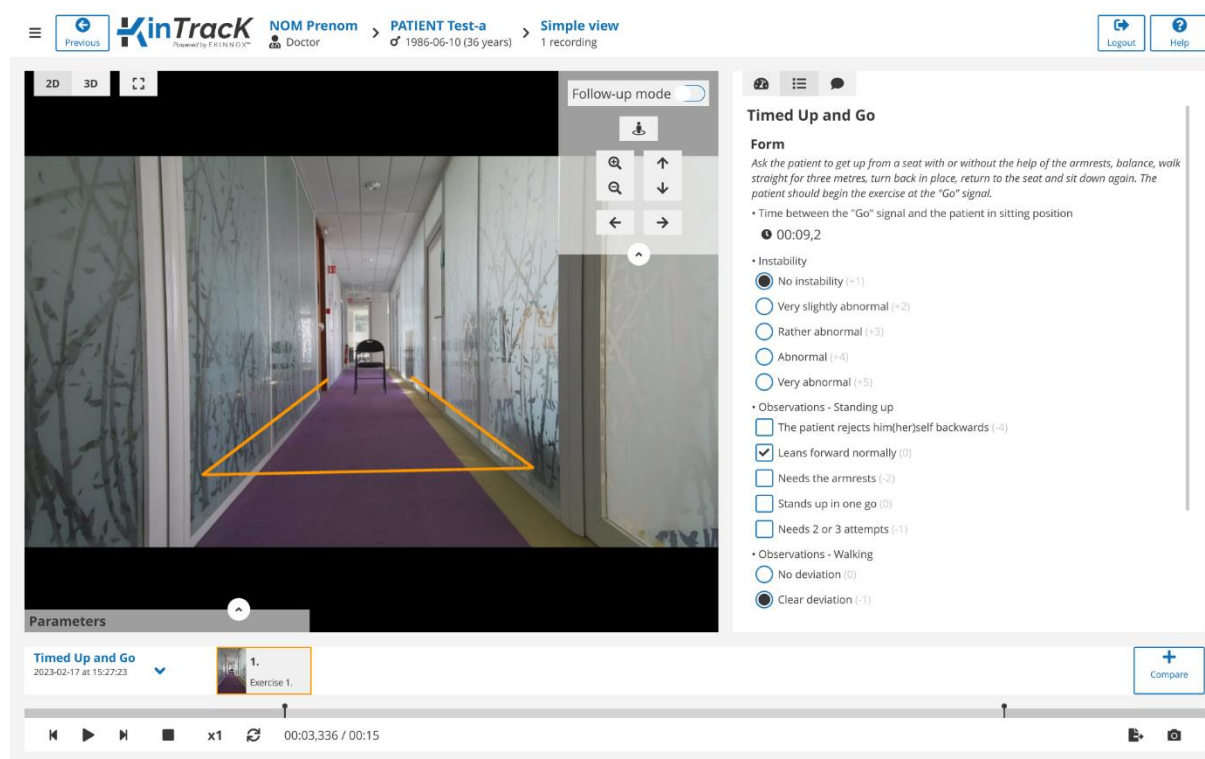


Figure 37: Visualization page, TUG form

⚠ If the evaluation form has not been fully completed, the activity will open in Edit mode, prompting you to finalize the evaluation and the results will not be available (see 6.1.3 Timed Up-and-Go (TUG)).



7.5. Visualization of a Tinetti evaluation

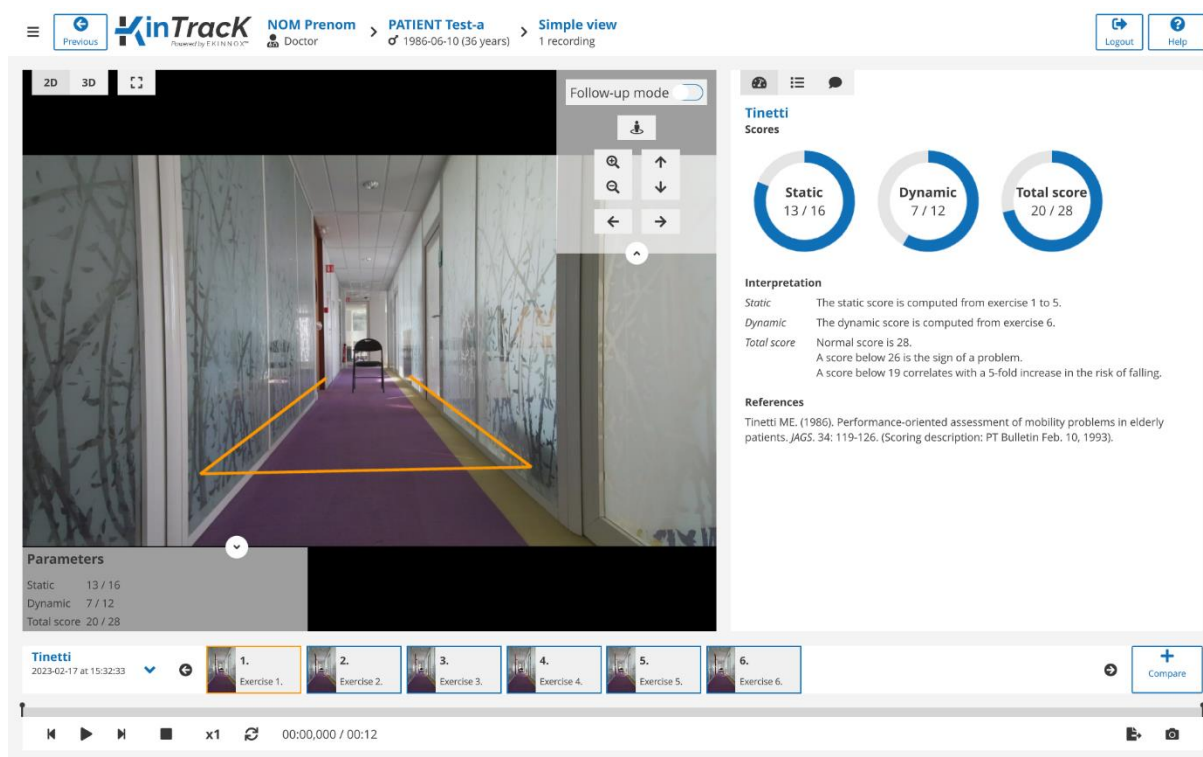


Figure 38: Visualization page, Tinetti summary

- For a Tinetti assessment, the visualization page displays the video of the first exercise performed on the left and the summary of the activity on the right, also accessible by clicking on 🕒.
- The overall test result can be displayed in the bottom left corner of the video by clicking on the up arrow.
- Click on the thumbnail of an exercise to display the corresponding video.
- Click on ☰ to display the form corresponding to the video.

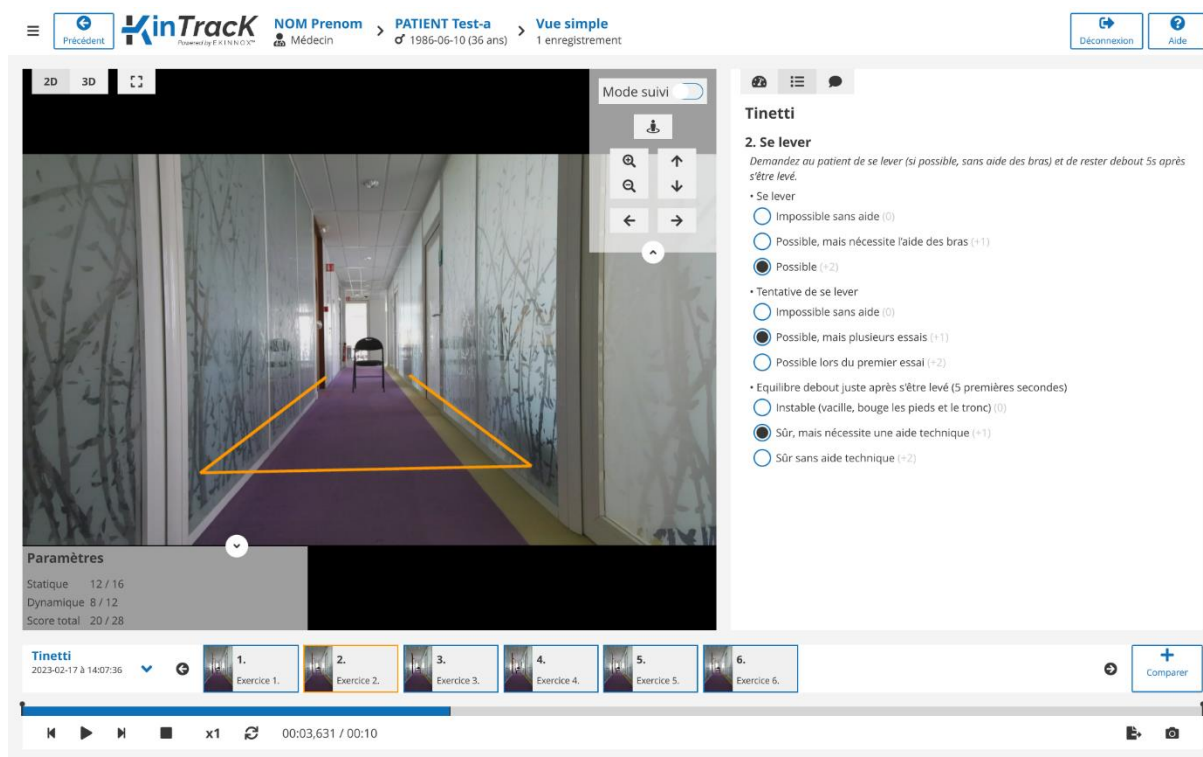


Figure 39: Visualization page, Tinetti form

⚠ If the evaluation forms have not been fully completed, the activity will open in Edit mode, prompting you to finalize the evaluation and the results will not be available (see 6.1.4 Tinetti).

7.6. 3D view

- To get a 3D view click on the button **3D**.
- Click on the **2D** button to return to the video mode.

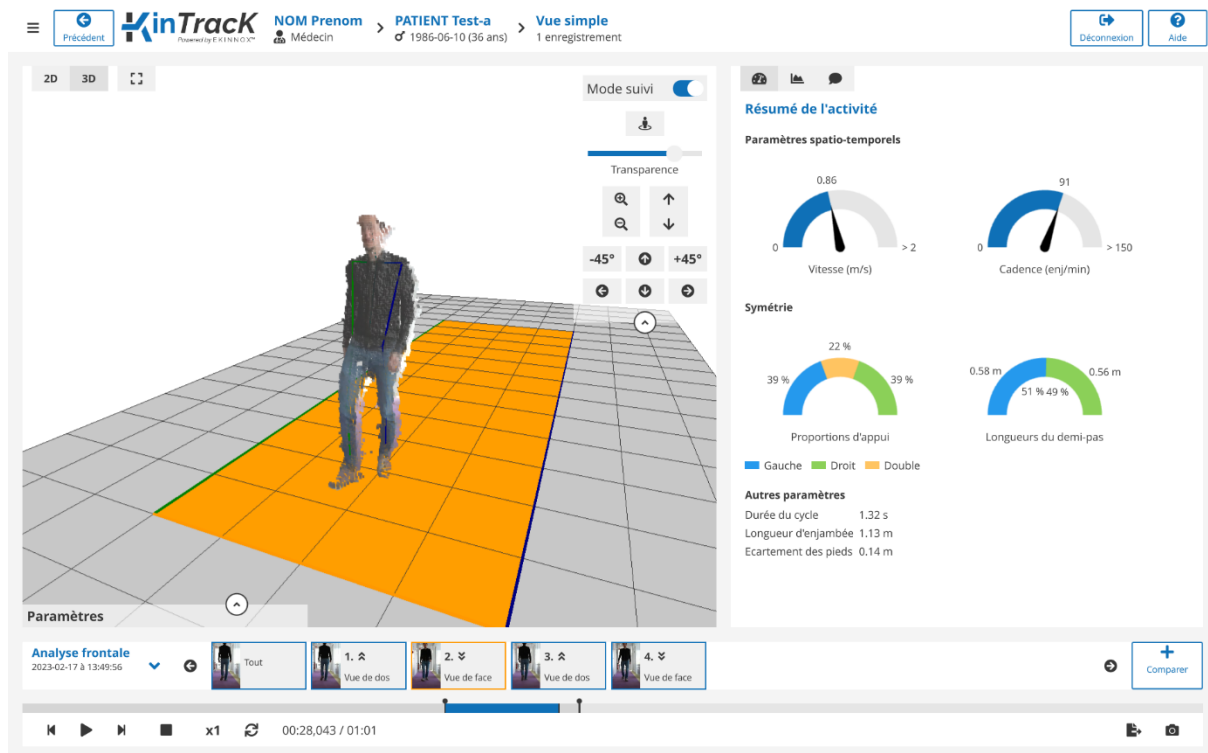


Figure 40: 3D view

- In 3D view, the patient is represented as a cloud of points.
- The possible interactions with this view are given by the buttons on the right of the view (open the menu of possible actions by clicking on the down arrow):

Note: *Hovering over these buttons with the mouse shows how to do the same actions with the keyboard and mouse.*

Follow-up mode ☐

Change the visualization mode: "Follow-up mode" deactivated, the camera remains fixed and follows the patient visually, activated, the camera moves forward at the same time as the patient.



Return to initial position: resets the 3D view to its default configuration.

**Transparency**

For frontal analysis, the 3D view also includes a representation of the skeleton. This slider allows you to modify the opacity of the point cloud to better see the skeleton. This skeleton is composed of:

- 3 segments for each side of the body, green for the right side, blue for the left side:
 - 1 shoulder - hip segment
 - 1 hip - knee segment
 - 1 knee - ankle segment
- 4 segments for the upper body:
 - A segment representing the shoulders
 - A segment representing the hips
 - A segment representing the trunk
 - A segment representing the neck

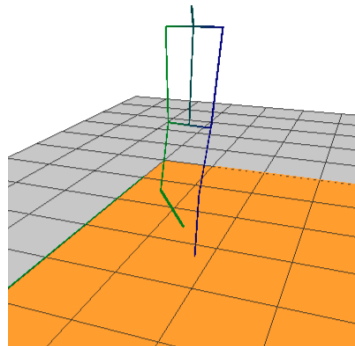


Figure 41: 3D view with representation of the skeleton

-45° and **+45°** : Move the point of view around the patient, to the next cardinal position among the 8 positions 45° apart. Caution, this button is not recommended in follow-up mode.



Zoom in/out by clicking. Warning: do not keep the mouse button pressed. With the keyboard and the mouse: Ctrl + Wheel.




Move the image up or down on the screen. With the mouse, right click and move the mouse up and down.



Rotate the 3D view around the patient. With the mouse, left click and move the mouse from top to bottom or from right to left.

7.7. Comparison

- Click on . The same record with the same visualization will open on the right side of the screen. To select a different record on the right or left, click on the bottom left of the visualization to open the drop-down menu to select a different record.

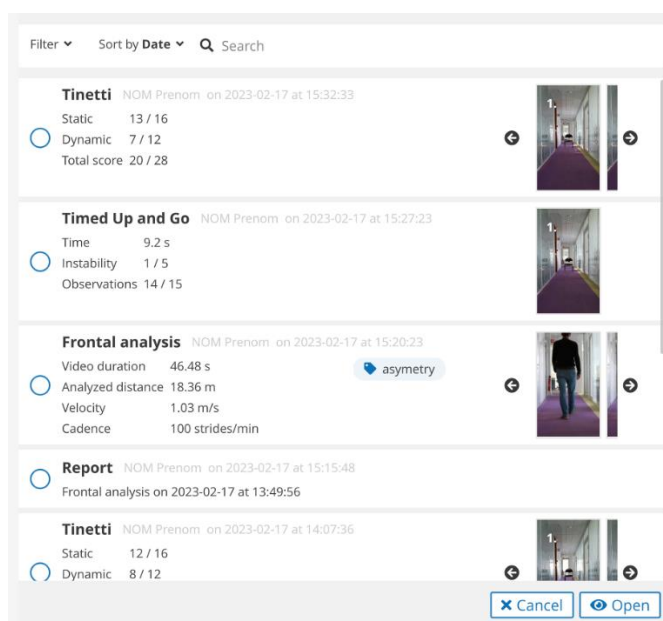


Figure 42: Selection of activities to be compared

- The video displayed on the other view is indicated by an orange bar.
- Check the corresponding box to select the desired record and click on the "Open" button.
- The comparison page is displayed.

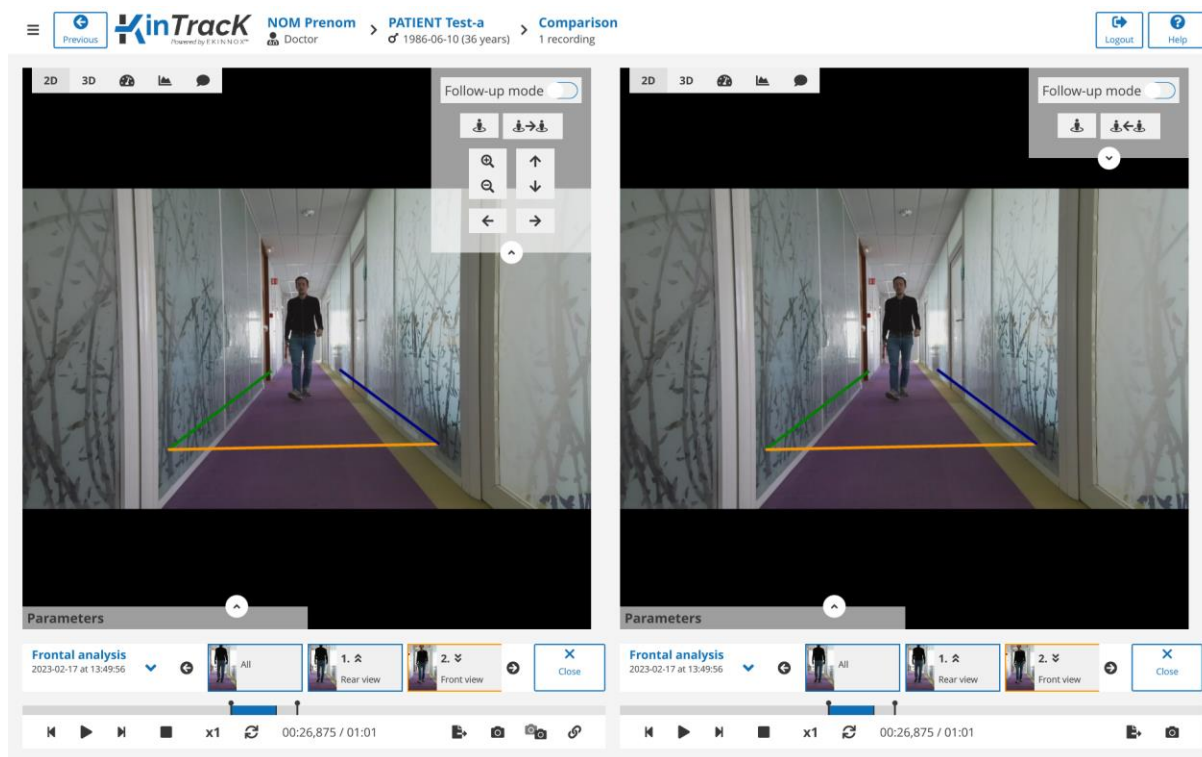






Figure 43: Comparison page

- Click **"Close"** to close one of the views and return to the simple visualization page.

- Click on  to choose another activity.
- On each of the displayed activities, it is possible to display:
 - The 2D video,
 - The 3D video,
 - The summary of the activity,
 - The forms (in the case of a Tinetti or a Timed Up and Go),
 - The graphs (in the case of a frontal analysis).
- To visualize 2 sequences in a synchronized way:
 - Choose a starting point for each video.
 - Click on .
 - Start playback or scroll frame by frame.
- The following buttons are used to synchronize the viewpoints:
 - Click on  on the right view to change the left view to the same viewpoint as the right view.



- Click on  on the left view to change the right view to the same viewpoint as the left view.

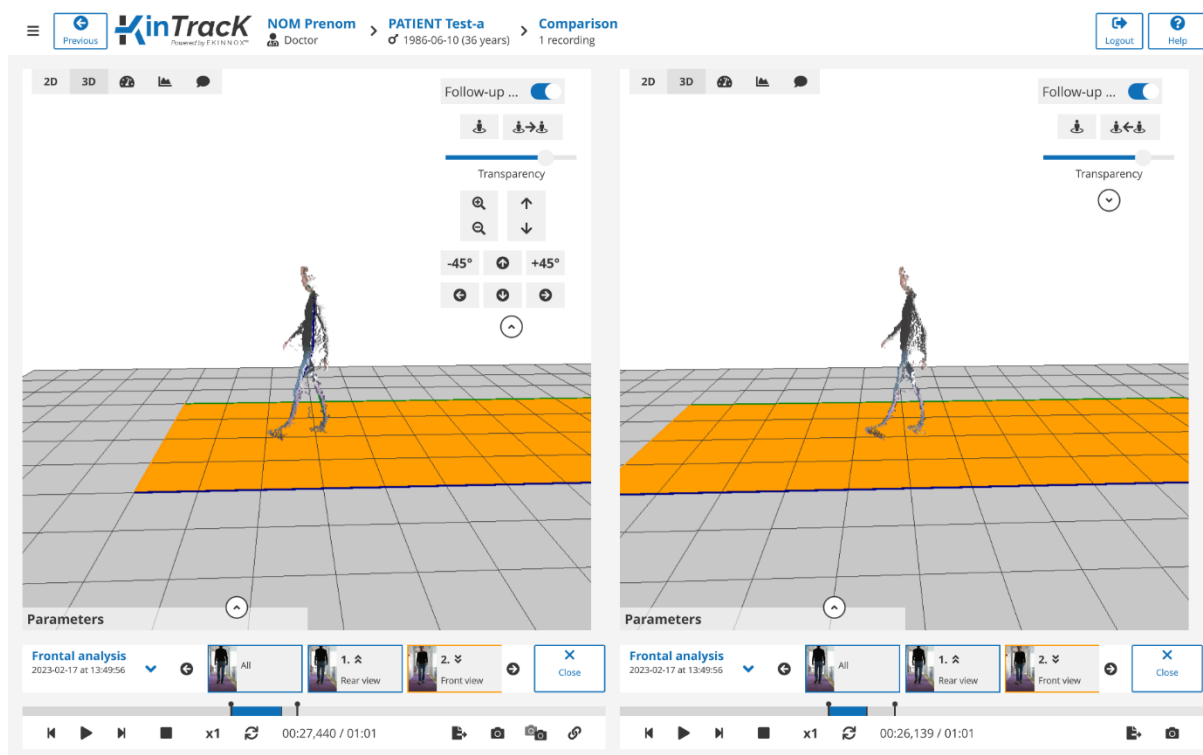



Figure 44: 3D view comparison

7.8. Graphs

The device allows to automatically generate several types of graphs, accessible by clicking on .

7.8.1. Stride length

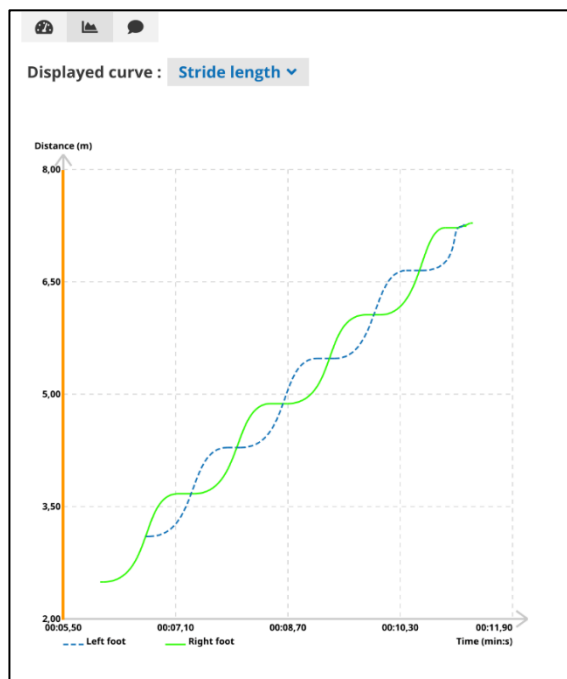


Figure 45: Stride length graph

The graph for the stride length represents:

- In green: the distance covered by the right foot as a function of time.
- In blue: the distance covered by the left foot as a function of time.
- The vertical orange line corresponds to the moment of the video represented on the left of the screen. A click on the curves allows you to position the video at a given moment.

7.8.2. Foot width

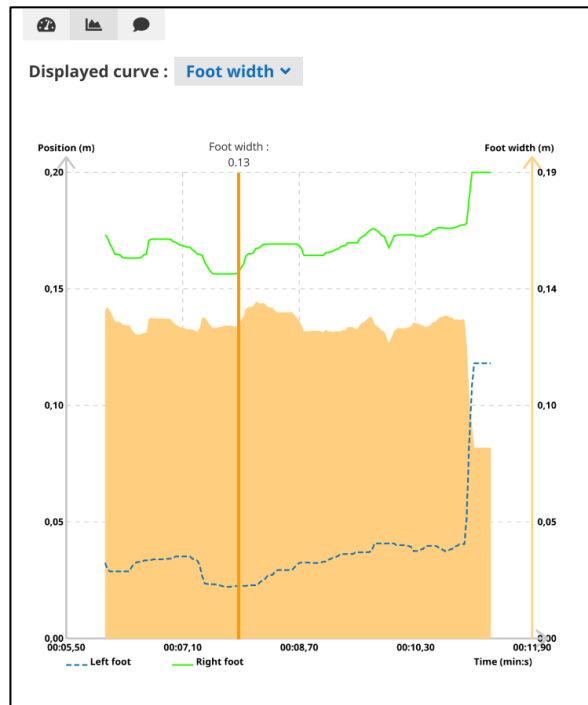


Figure 46: Graph for the lateral distance between the feet

The graph of the foot width represents:

- In green: the lateral position of the right foot as a function of time.
- In blue: the lateral position of the left foot as a function of time.
- In orange, the value of the lateral distance between the feet (foot width).
- The vertical orange line corresponds to the moment of the video represented on the left of the screen. Clicking on the curves allows you to position the video at a given moment and the corresponding foot width value is displayed at the top of the line.

7.8.3. Mean knee angle on a cycle

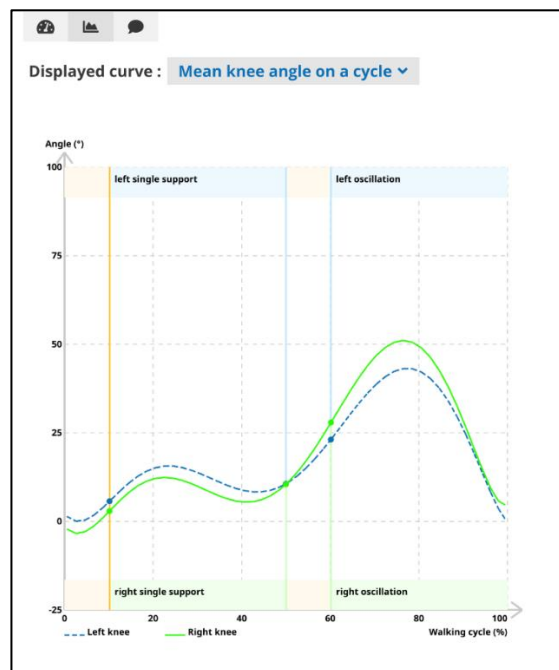


Figure 47: Mean knee angles on a cycle

The graph for the mean knee angle represents:

- In green: the average flexion angle of the right knee on a walking cycle.
- In blue: the average flexion angles of the left knee on a walking cycle.
- These curves give the average angles over the whole activity.

At the top and bottom of the graphs, different colored areas indicate the support phases of the gait cycle:

- In light orange, the double support phases.
- In light green, the right support and oscillating phases.
- In light blue, the left support and oscillating phases.

7.8.4. Mean hip angle on a cycle

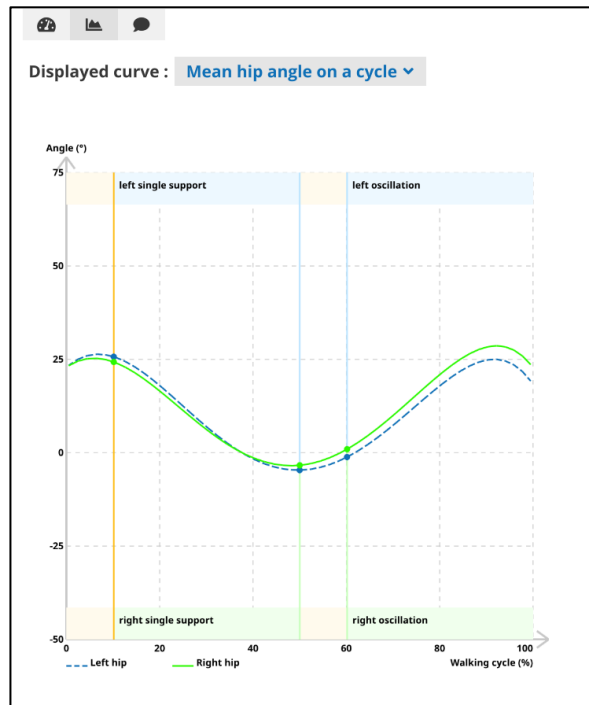


Figure 48: Average hip angle over one cycle

The graph for the mean hip angle represents:

- In green: the average flexion angle of the right hip on a walking cycle.
- In blue: the average flexion angle of the left hip on a walking cycle.
- These curves give the average angles over the whole activity.

At the top and bottom of the graphs, different colored areas indicate the support phases of the gait cycle:

- In light orange, the double support phases.
- In light green, the right support and oscillating phases.
- In light blue, the left support and oscillating phases.



8. Generate an analysis report

8.1. Screenshots

- You can take screenshots using the button on the visualization pages.
- These screenshots can be included in the activity report (see Activity report).
- In the comparison page, the button at the bottom of the screen allows you to take a total screen capture, containing the 2 images of the 2 activities present on the screen.

8.2. Activity report

- You can generate a report about an activity and select the sequences you want to include in this report:
 - On the patient page, for an activity, click on to get an overview of the activity sequences.

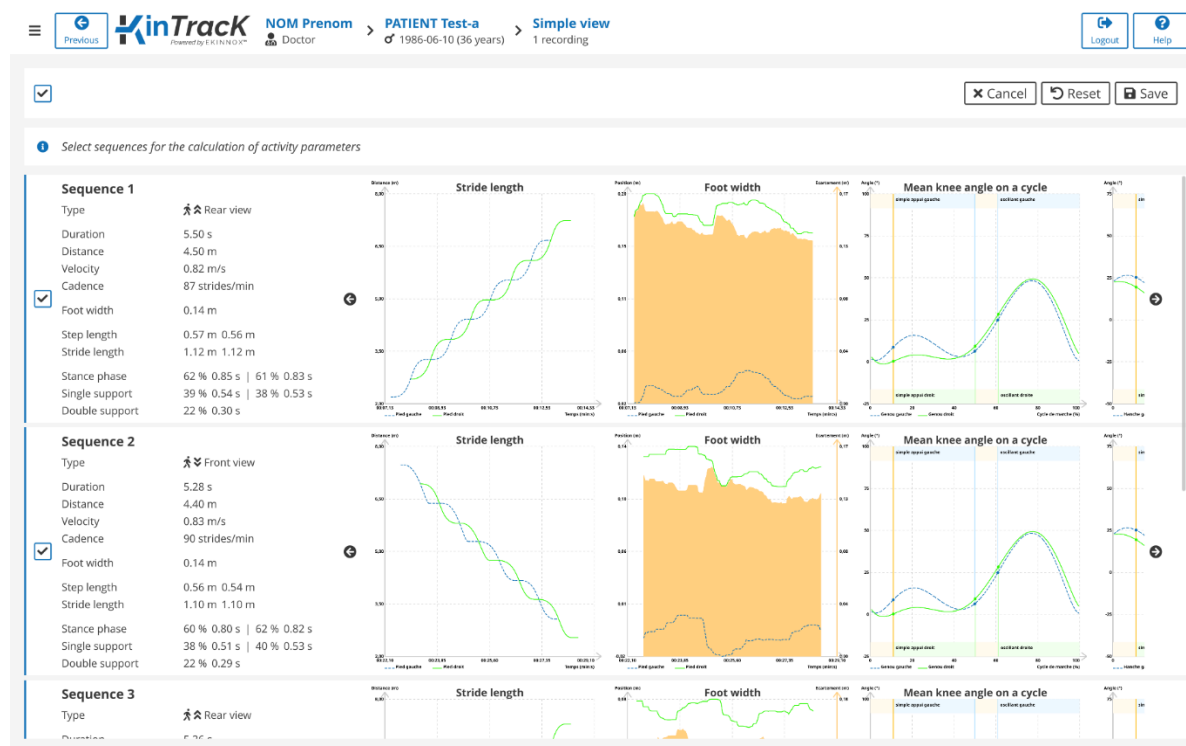
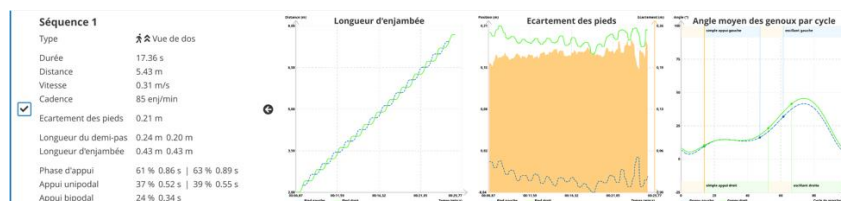


Figure 49: Overview of the sequences of an activity

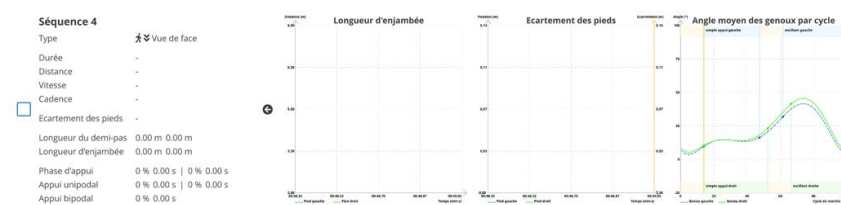


- For each sequence, the graphs are displayed, and a box indicates whether the sequence is selected. By default, only sequences with enough correctly detected gait cycles are selected.
- The graphs show the number of gait cycles:



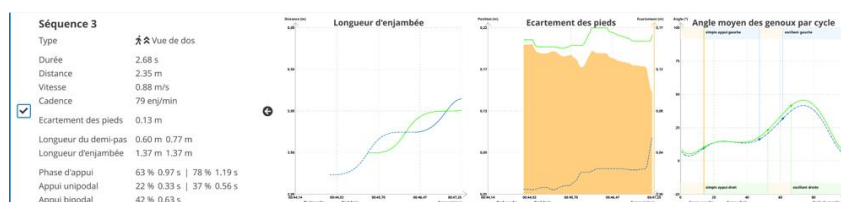
⇒ Example 1: Sequence with sufficient gait cycles

- the graphs have many points.
- the sequence is selected.



⇒ Example 2: Sequence without gait cycle

- the graphs are empty.
- the sequence is not selected.




⇒ Example 3: sequence with insufficient number of cycles to calculate all parameters:

- the graphs have few points.
- the sequence is selected but special attention must be paid to the data.

- You can change the default selection:

- Clicking on ☐ to keep a sequence even if not all parameters have been calculated.
- Clicking on ☒ to deselect a sequence that you do not want to have in the report, even if all parameters are calculated on this sequence.
- Clicking on ☐ to select or deselect all sequences.

- To generate a report for an activity, click on  on the patient page.
- A page asks you to choose the screenshots you want to insert in the report:

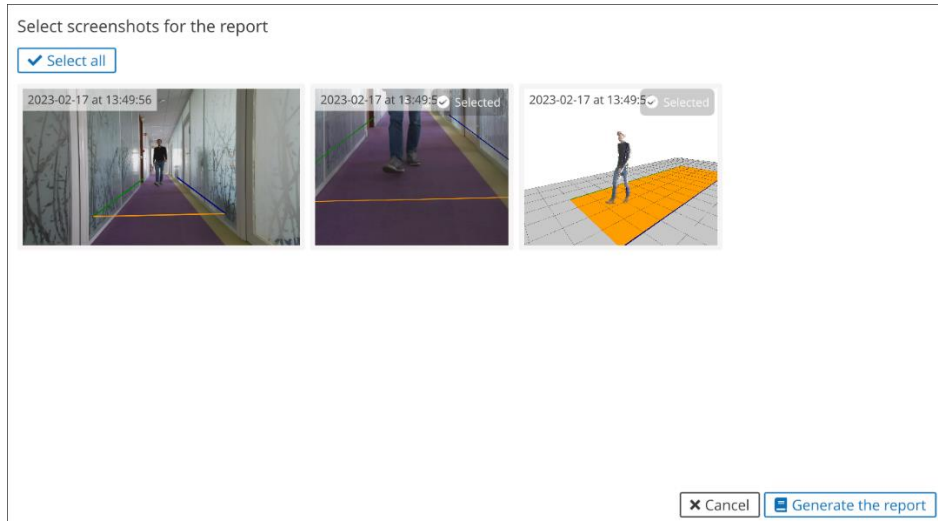


Figure 50: Selection of screenshots

- Select the screenshots you want to include and click on **"Generate the report"**.
- You can visualize the activity report which contains:
 - An activity summary similar to the summary on the visualization page, with average values of main gait parameters over the entire activity, graphically represented for:
 - Speed
 - Cadence
 - Support times symmetry
 - Step length symmetry
 - Graphs for each sequence:
 - Stride length as a function of time
 - Foot width as a function of time
 - Kinematic graphs of activity:
 - Average knee angles over a gait cycle
 - Average hip angles over a gait cycle
 - Details of the parameters for each selected sequence

8.3. General report

- You can generate a general report for a patient and select the activities you want to include in that report.
- By default, no activities are selected. You can select all the patient's activities and comments by checking the ☐ box at the top of the patient page (See chapter 5).
- You can select certain activities that you want to include in the general report by checking the corresponding ☐ box of the activity.



Figure 51: Activity selected for the general report

- To generate a general patient report of all selected activities, click on [Generate a general report](#).
- The general report appears in the visualization page and contains:
 - The list of selected activities.
 - A graph of the evolution of each gait parameter over all the activities.
 - The detail of the parameters, activity by activity.

8.4. Saving the report

- You can save a report by clicking on [Export the report](#) from the report viewing page.

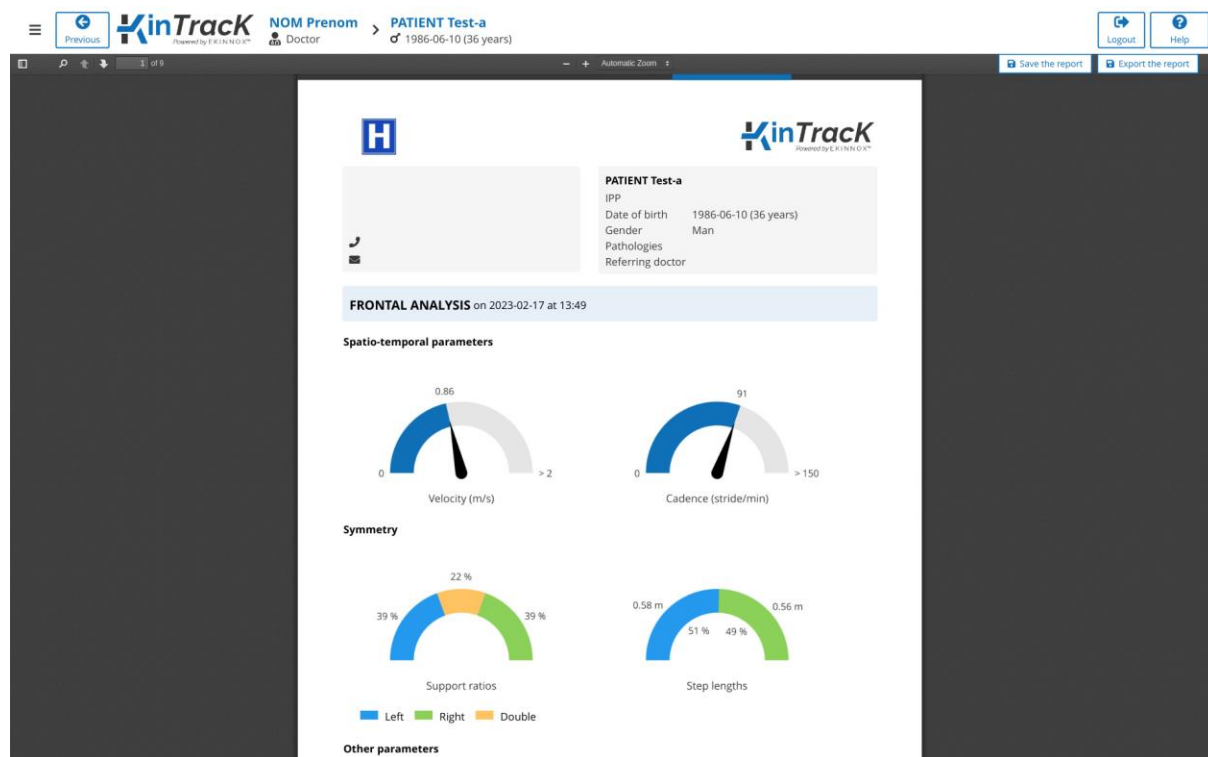


Figure 52: Report viewing page

- The saved report will appear in the list of activities:

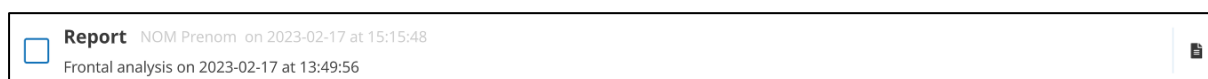


Figure 53: Saved report

8.5. Export to USB key and download

On the hardware version:

- Connect an EKINNOX USB key to the device.
- From the report visualization page, click on [Export the report](#).
- A message indicates that the export has been completed.


On the web version:

- From the report visualization page, click on [Download the report](#).
- The report will then be downloaded to your browser's download folder.



9. Export data

9.1. Selection and Export

- In the patient page, or in the patient list, you can choose to export data by clicking on .

Note: The exported data will correspond to the selected activities or patients. If no activities or patients are selected, the export data button is grayed out and disabled.

Note: Only gait analysis data (frontal analysis) are exported.

- Connect an EKINNOX USB key directly to the computer.
- Click on **"Export data"**, a message will appear asking you to choose the data to be exported:


What do you want to export ?

Anonymized data :

- analyses (CSV format) ☐

Unanonymized data :

- analyses (CSV format) ☒

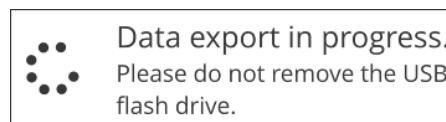
 - videos ☒

Attention: KinTrack user and healthcare professional, if I export **un anonymized** personal data of my patient, I guarantee that the patient (or, where applicable, his/her legal representative) (i) has been informed of the collection and processing of his/her personal data, as well as of the capture of his/her image, if any, and of the use that will be made of it, and (ii) that he/she has not objected.

☒ I certify that I have implemented all necessary measures to ensure the protection of my patient's personal data and image in connection with the intended use of the exported data.

Note: Video export is only available when you export data from a patient page.

- If you choose to export anonymized data, the data will be exported directly to the USB key:



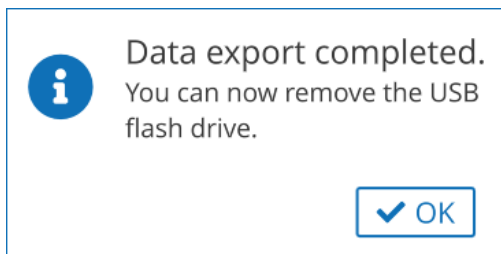


- If you choose to export non-anonymized data:
 - You can choose to export either the data of the spatiotemporal analysis in CSV format, or the videos of your patient, or both.
 - A message will appear. You must agree to protect the exported personal data by checking the corresponding box.

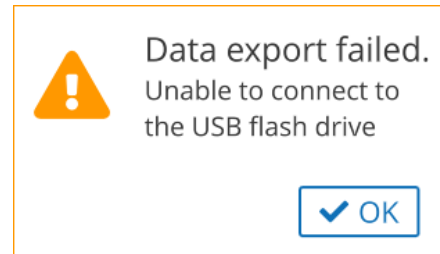
☒ I certify that I have implemented all necessary measures to ensure the protection of my patient's personal data and image in connection with the intended use of the exported data.

Note: You will not be able to export non-anonymized data without checking this box.

- A message will indicate that the export was successful or that the USB key is not connected:



or



9.2. Data format .CSV


Note: The .CSV files are spreadsheet type files that can be opened with Excel. The .CSV files produced by KinTrack use a specific separator to identify the columns (semicolon) and the data they contain are coded according to UTF-8. To correctly read all the characters they contain, it may be necessary to import the files rather than open them directly.

In the .CSV files, the data is sorted by column. Note the meaning of the following columns:

- Sequence_number: number of the sequence in the activity in chronological order
- Sequence_type:
 - 0 : front view
 - 1 : back view
- Sequence_selected:
 - t : selected activity
 - f : not selected activity

9.3. Export of video portions

From the visualization page, you can export the video of a sequence or a portion of a sequence:

- Adjust the video delimiters on the playback thread to select the portion of the video to be exported
- Click on  at the bottom right of the screen and follow the instructions related to personal data.

10. Data synchronization and web application

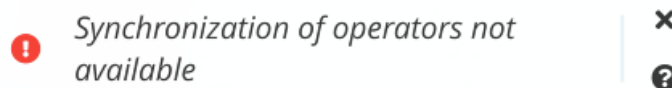
If you have chosen the Web App option for KinTrack, and if your machine is connected to a WIFI network, then you benefit from a synchronization of your data with a remote database, which allows you to:

- Save your data,
- Archive your data remotely to free up disk space on KinTrack,
- Have access to the data via a simple compatible web browser with a user license.
For the web application, the recommended configurations are:
 - Operating system: Windows 10 or MacOS 12 minimum
 - Explorer: Chrome or Edge version 110 minimum
 - Display: between 14" and 24"
- Access data from different KinTrack installations at your facility, if applicable.

10.1. At the start

When KinTrack starts, an automatic synchronization of the KinTrack users is done. A message indicates on the connection page the status of this synchronization.

If the following message appears:



- Your machine is not connected to the Internet.
- Please check your machine's internet connection or contact your facility's network administrator.



10.2. At login

As soon as you are connected to KinTrack, a complete synchronization of the database is automatically launched in the background.

- The progress of this synchronization is indicated on all pages of the software.
- When the synchronization is complete, you can refresh the display to possibly access new data from the remote database.
- You can voluntarily force the synchronization if you want to save or retrieve data from the remote database.

10.3. At disconnection or extinction

When you disconnect from KinTrack, or when you turn off the machine, a message will ask you if you want to synchronize before disconnecting.

- If you choose not to synchronize, you are disconnected immediately. Synchronization will be done automatically the next time you connect.
- If you choose to synchronize, the disconnection will only take place once the synchronization is complete.

 **For data protection, you should not leave the machine unattended during this synchronization phase.**

10.4. Archiving

If you have the Web App option, when you archive, the data is stored on the remote database only. This allows you to free up disk space.

If you have more than one KinTrack in your facility, the archive status of a patient is the same on all machines.

When the available disk space of your machine becomes too low (<15%), a message will prompt you to archive data to continue using KinTrack:

 Disk space is low. Do you want to archive the oldest recordings?

 No

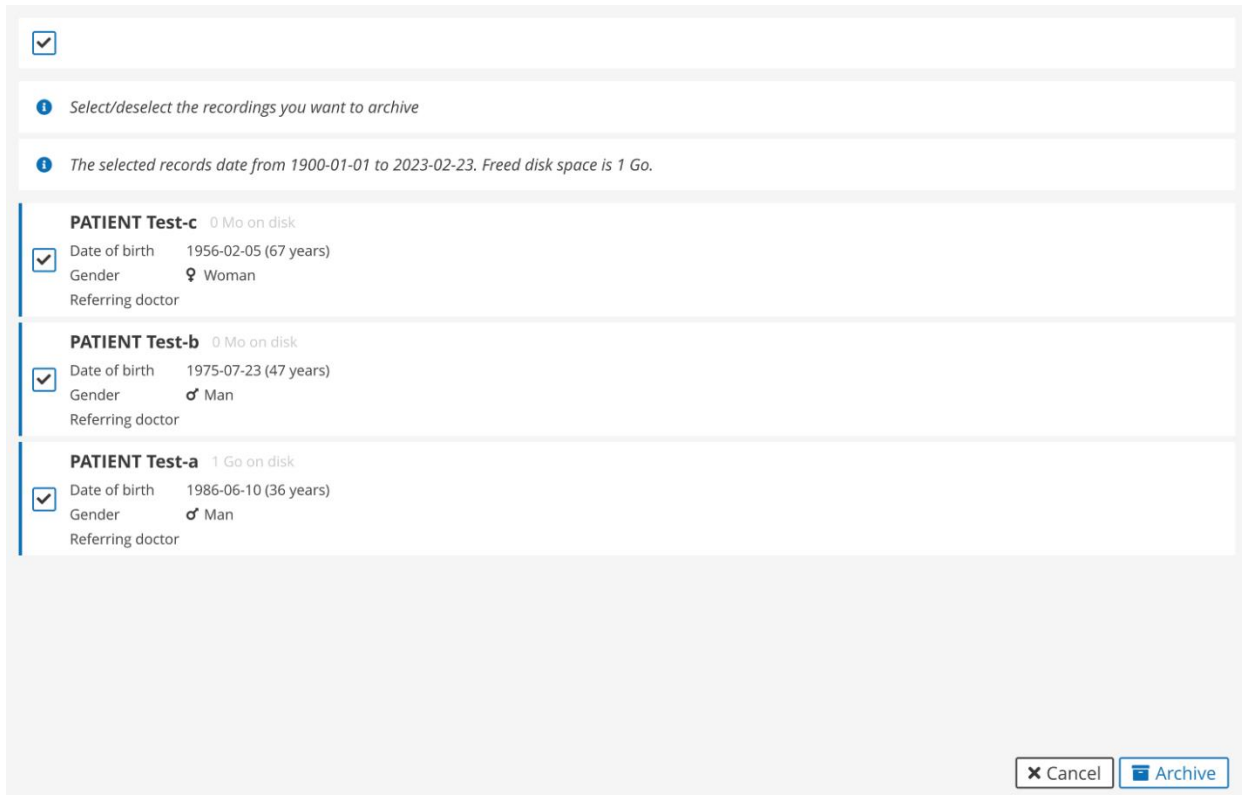
 Yes

If the disk space is so low (<10%) that it prevents the system from working, you will get the following message:

 The available disk space is insufficient for the system to work properly. Archive the oldest recordings or contact the EKINNOX customer service.

 Archive

If you choose to archive, you will be able to select the records you wish to archive, and the space freed up by the records will be indicated.



☒

Select/deselect the recordings you want to archive

The selected records date from 1900-01-01 to 2023-02-23. Freed disk space is 1 Go.

<input checked="" type="checkbox"/>	PATIENT Test-c 0 Mo on disk
	Date of birth 1956-02-05 (67 years)
	Gender ♀ Woman
	Referring doctor
<input checked="" type="checkbox"/>	PATIENT Test-b 0 Mo on disk
	Date of birth 1975-07-23 (47 years)
	Gender ♂ Man
	Referring doctor
<input checked="" type="checkbox"/>	PATIENT Test-a 1 Go on disk
	Date of birth 1986-06-10 (36 years)
	Gender ♂ Man
	Referring doctor

Figure 54: Archiving to free disk space

10.5. Delete patients

With the Web App option, if you delete a patient, he or she will completely disappear from your local database as well as from all machines in your facility.

However, if you recreate a previously deleted patient, you will find the deleted data.

10.6. Access to data via the web application

To access the data via the web application, in your browser, connect to the web address provided during the installation of KinTrack or contact the KinTrack system administrator.

You can then access the same functionalities as on KinTrack, except for the recording of new activities.

 Since no data is stored locally, the download of data (to access the login page or the videos) is done on demand and may require some waiting time.

 For security and data protection, please ensure that:

- You use a secure and up-to-date computer and browser,
- You use a secure connection,
- You log out of the software and close your browser after use.

 Use a reduced zoom factor (70-80%) on small screens (Laptop type) for better visibility of controls.


 Video playback may be slowed down depending on the performance of the hardware.

11. Administration

11.1. Synchronization

As an administrator, when I am connected to KinTrack, all the changes I make to the database are automatically and immediately synchronized.

11.2. Change your password

- Once connected to the application (See Login page), any operator can change his password by clicking on  and then **"Update your password"**:
- To change the password, enter the current password and choose a new password according to the instructions in the window.

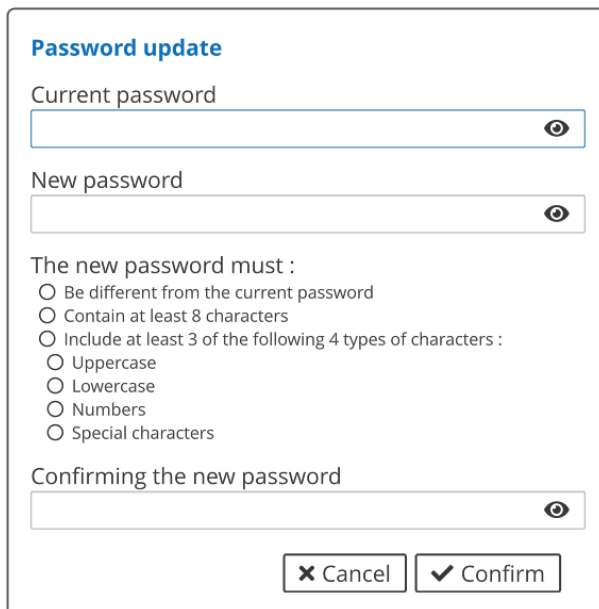


Figure 55: Update of the password

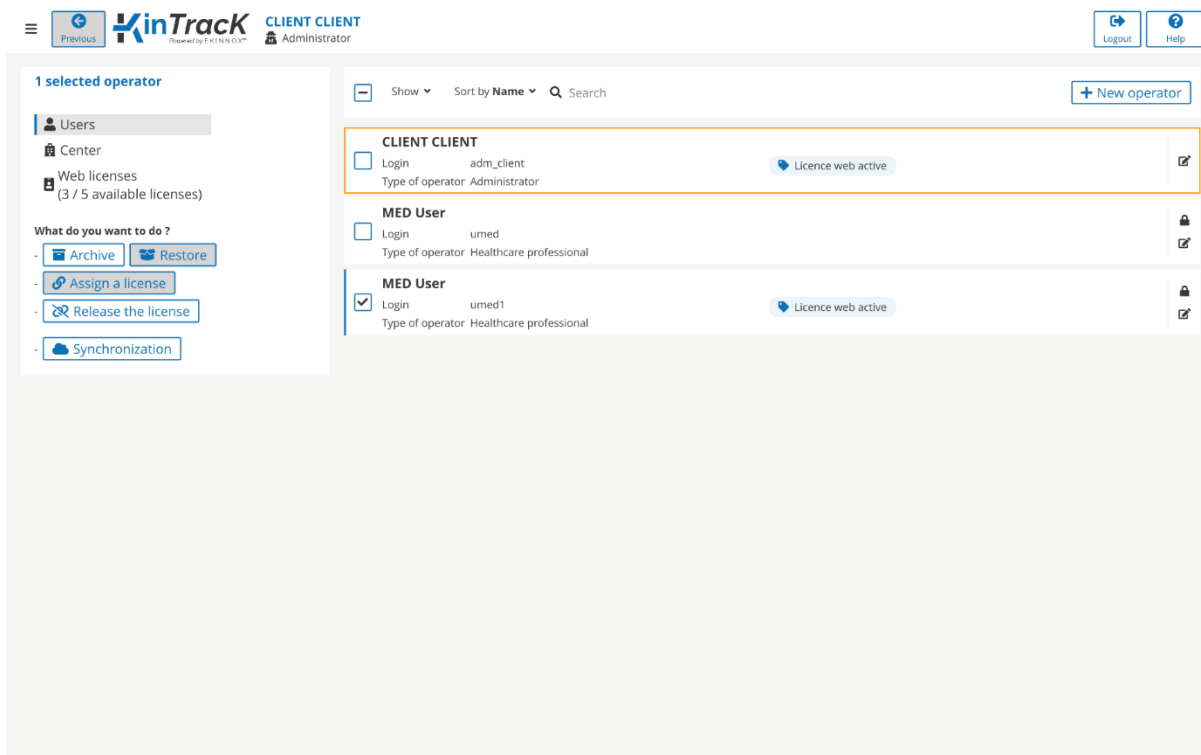
- Confirm.

11.3. Operators management

If you have an administrator account on the machine, you can manage user accounts.

11.3.1. Create an operator

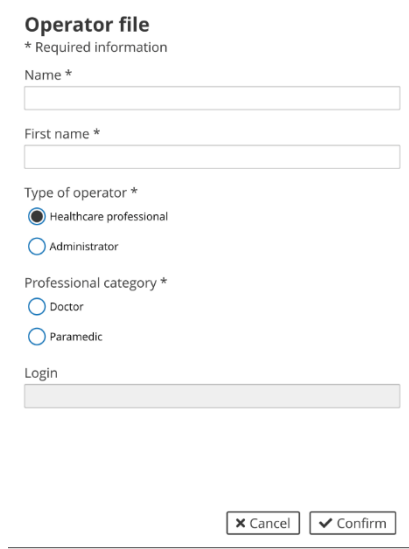
- Log in with your username and password.
- You have access to the list of operators.



The screenshot displays the 'Operators' page in the KinTrack application. The interface includes a sidebar on the left with navigation options: 'Users', 'Center', 'Web licenses (3 / 5 available licenses)', and 'What do you want to do?' with sub-options like 'Archive', 'Restore', 'Assign a license', 'Release the license', and 'Synchronization'. The main area shows a table of operators. The table has columns for selection, login, type of operator, and license status. The first operator is 'CLIENT CLIENT' with login 'adm_client' and type 'Administrator', with a 'Licence web active' status. The second operator is 'MED User' with login 'umed' and type 'Healthcare professional', with a 'Licence web active' status. The third operator is 'MED User' with login 'umed1' and type 'Healthcare professional', with a 'Licence web active' status. A '+ New operator' button is located in the top right corner of the operator list.

Figure 56: Operators page

- Click on [+ New operator](#)
- Fill in the operator form:



Operator file
* Required information

Name *

First name *

Type of operator *

☒ Healthcare professional
☐ Administrator

Professional category *

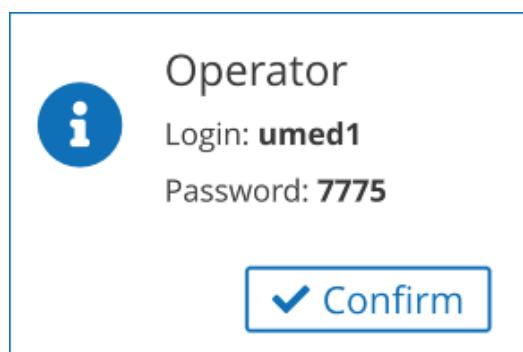
☐ Doctor
☐ Paramedic

Login

Figure 57: Operator's file

- If you select "Health professional", also fill in the professional category, doctor, or medical assistant.
- Validate: the connection identifier is automatically created, and a temporary password is generated.

Note: Keep a note of this temporary password and give it to the operator so that he can log in.



Operator


Login: **umed1**

Password: **7775**


Figure 58: Creation of an operator, login, and password

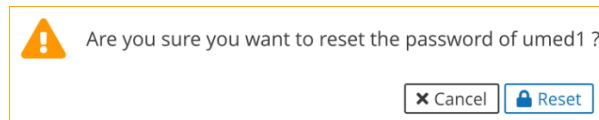
- Confirm.

11.3.2. Modify an operator

- To modify an operator, on the line of the concerned operator, click on  : you have access to the operator file (see 11.3.1 Create an operator).

11.3.3. Reset an operator's password

- To reset the password of an operator, on the line of the concerned operator, click on . The following message appears:

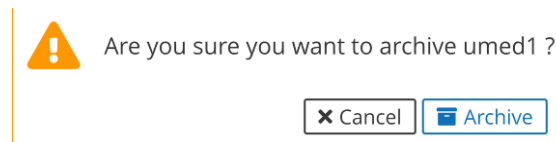


- Click on Reset: a new temporary 4-digit password is generated.

Note: Keep a note of this temporary password and give it to the operator so that he can log in.

11.3.4. Archive an operator

- To archive an operator, click on . The following message appears to confirm the archiving of this operator:



- Archive: the operator appears grayed out in the list of operators, just like an archived patient (see Archive and delete a patient).
- You can filter operators in the same way as patients (see 4.7), as well as according to the license allocation for the web application.

11.4. License management for the web application

If you have chosen the Web App option for KinTrack, then you will benefit from user licenses for the connection to the web application. The number of available web licenses is displayed on the left panel of the administration interface.

To assign/remove a license to a user:


- select the user using the checkbox,
- click on "Assign license"/"Release license" on the left panel.

You can assign/release multiple licenses simultaneously by selecting multiple users at once.

To see the list of assigned licenses, click on "**Web licenses**" on the left panel. The list of licenses appears, with the name of the operator to whom it is assigned. You can also

release licenses from this list by selecting the license(s) and clicking on **"Release license(s)"** on the left panel.

11.5. Other administrator actions

If you have an administrator account on the machine, you can perform various actions by clicking on .

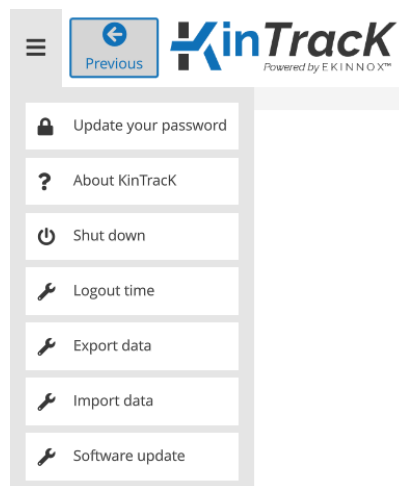


Figure 59: Other administrator actions

11.5.1. Update

You can update the KinTrack software.

- Insert the USB key provided by EKINNOX that contains the update.
- Click on  and then on **"Software Update"**.
- Enter the update key sent to you by EKINNOX and click on **"Update"**.


Software update

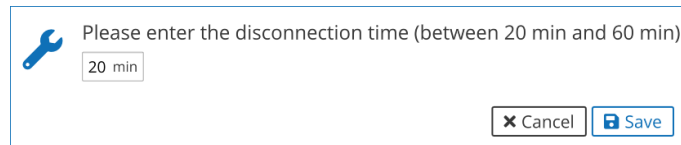
Please enter the update key

Figure 60: Update software window

11.5.2. Change the automatic logout time

Depending on their clinical practice, operators may want to change the automatic disconnect time, which is set to 20 minutes by default.


- To change the automatic logout time, click on  and then on **"Logout time"**.
- Enter the desired automatic logout time (between 20 and 60 minutes).

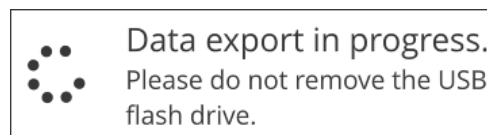


- Click on **"Save"**.

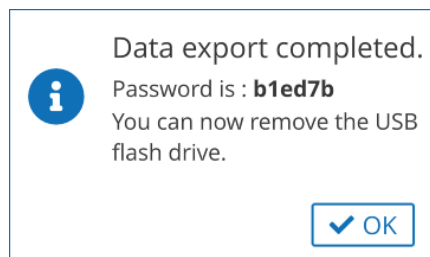
11.5.3. Exporting data

During important software or hardware updates, it may be necessary to export the data present on the machine in order to reimport them later.


- To export all the data on the machine, connect a USB hard disk to the machine
- Click on  and then on **"Export Data"**.
- Wait while the data is exported (this may take several minutes):



- Note the password provided at the end of the export, it will be requested when importing the data.



11.5.4. Importing data

- Click on  and then on **"Import data"**.
- Enter the password obtained during the data export.

Data import


Please enter the password obtained during the data export

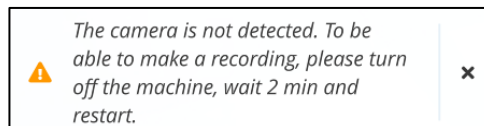
✕ Cancel 📄 Import


- Click on **"Import"**.
- Wait for the data to be imported (this may take several minutes)

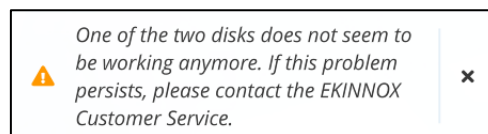
12. Assistance

 **KinTrack is a medical device. Any serious incident related to its use should be reported to EKINNOX and the relevant health authorities.**

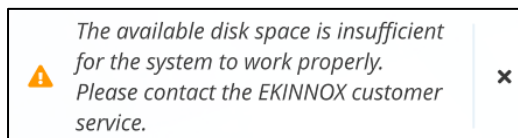
- A help module is available in the application: to access it click  on the top right of the screen.
- In the login page you may encounter the following error messages:



- This message indicates that the camera is not detected by the device, the **"New recording"** button will be grayed out and inactive. To solve the problem:
 - Turn off the device by clicking on  and then "Shut down". Wait 2 minutes and restart the computer by pressing the start button.
 - If the problem persists, contact support.



- This message indicates a default on one of the hard drives that store data. You may lose data, please contact support.



- This message indicates that your machine no longer has enough disk space to work properly (less than 5%). Please contact support to add more disk space.
- Contact:

EKINNOX

Bioparc - 2400 route des Colles

06410 BIOT

FRANCE

Phone: +33 (0) 6 37 74 03 38

support@ekinnox.com



13. Appendix 1: quantitative performances

For more information on the performance of KinTrack, contact EKINNOX:

Phone: +33 (0) 6 37 74 03 38

support@ekinnox.com

13.1. Success rate

KinTrackK was evaluated on 29 healthy individuals who performed 2990 walking sequences. 2975 of these sequences were successful in obtaining gait parameters, for a **success rate of 99.5%**.

13.2. Cadence, step lengths and step width

For these spatiotemporal parameters, measurement accuracy was evaluated on 29 healthy individuals who performed constrained walking sequences:

- Fixed foot spacing (5, 15, 25 and 35 cm respectively)
- Fixed step length (17, 31 and 59 cm respectively)
- Cadence set by a metronome (35 and 140 steps per minute respectively)

The gait parameters under these conditions were calculated by KinTrackK, and the following results were obtained.

(For each instruction of the graduated mat or the metronome, the average value and the standard deviation of the measurements obtained with KinTrackK on all the persons are given).

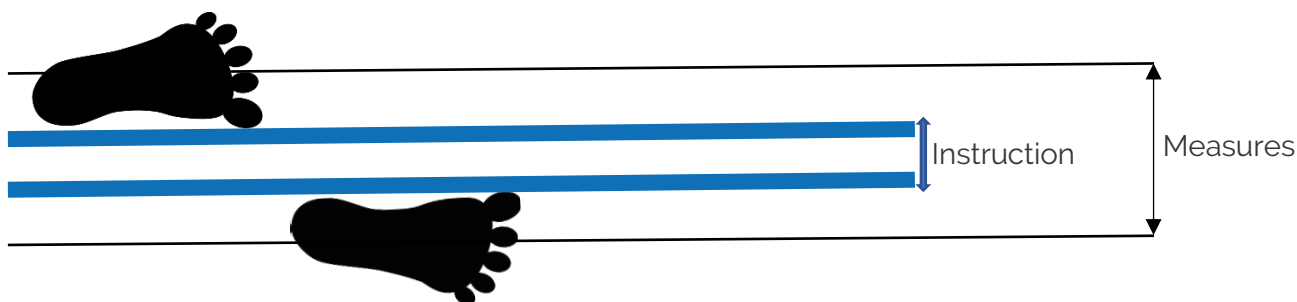
Step length

Instructions (cm) Measures (cm)	17	31	59
Average left step	16,86 +/- 0,96	30,59 +/- 1,26	58,30 +/- 1,46
Average right step	17,21 +/- 1,01	31,14 +/- 1,18	59,14 +/- 1,49
Average stride	34,08 +/- 0,48	61,74 +/- 0,94	117,44 +/- 1,09

Cadence

Instruction Measures	140 strides/min	35 strides/min
Average	136,87 +/- 4,84	35,85 +/- 2,45

Step width



The step width value given by KinTrack corresponds to the difference between the position of the center of gravity of each foot. This value takes into account the positions of the feet at any moment of the gait cycle, including the oscillating phase.

These values were measured while people were following instructions of 5, 15, 25 or 35 cm, corresponding to the distance between the inner edges of each foot during the stance phase, as in the diagram above.

Instruction Measures	5 cm	15 cm	25 cm	35 cm
Average	12,28 +/- 1,4	18,80 +/- 2,49	27,42 +/- 2,28	35,33 +/- 3,20

13.3. Speed, cadence, and support times

These parameters were evaluated in comparison with the Gaitrite system. This comparison was made on 39 healthy individuals who performed 427 walking sequences. For each sequence, the gait parameters were evaluated with both the Gaitrite and KinTrack systems.

For each parameter given by KinTrack, the average difference between the value given by KinTrack (KT) and the value given by the Gaitrite system (G) is calculated for each walking sequence. The results for speed, cadence and support times are given in the following table:



Parameter	Average deviation	% difference
Speed	3.57 cm/s	2,9
Cadence	2,42 /min	2,2
Duration of a cycle	25 ms	2,3
Left single support time	26 ms	6
Right single support time	24 ms	5,7
Double support time	40 ms	18,1
Time of left support phase	31 ms	4,8
Time of the right support phase	32 ms	4,9
Percentage of left single support	2,3 %	6
Percentage of right single support	2,2 %	5,6
Percentage of double support	3,6 %	17,3
Percentage of left support phase	2,3 %	3,7
Percentage of right support phase	2,4 %	3,9

13.4. Kinematics

KinTrack provides graphs of the average knee and hip angles over a cycle. These graphs are drawn from angular measurements that have been compared to the VICON system.

The comparison with the VICON system was made on 39 healthy individuals who performed 427 walking sequences. For each sequence, the gait parameters were evaluated with the 2 systems VICON and KinTrack.

For each measurement, the average difference between the value given by KinTrack (KT) and the value given by the VICON system is calculated.

	Average deviation (degrees)
Knee angle	
Left	5,71 +/- 1,62
Right	5,62 +/- 1,69
Hip angle	
Left	4,78 +/- 2,41
Right	4,45 +/- 2,09

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