



MOVESHelf®



MOVESHelf®

MANUAL

Questions?

support@moveshelf.com



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1. Terminology

Application	This is what we call our product: 'Moveshelf application'. In the user manual referred to as 'the application'.
Comparison	A comparison is an overview of two or more trials, with or without reference data, where numeric data is combined and overlaid in graphs.
Condition	A condition is a state in which a subject has been recorded, e.g., barefoot, or with shoes. It can include multiple trials.
Dashboard	The dashboard holds an overview of all projects of which you are a member.
Enterprise customer	As a Moveshelf customer you have an 'Enterprise' account type, which gives you access to Moveshelf's application and all its released features as a user. Your account type is visible in your profile.
Member	A member is a user who has been granted access to a project. A member can have different roles: Admin, Editor or Viewer.
Project	A project is a space where subjects and their data are stored, and where you can collaborate with the members of that project.
Reference data	Reference data is data that can be created within your project, based on (a selection of) your data and can be used to compare trials with e.g., data of healthy subjects.
Role - Admin	An admin is a member that has the rights to add others to a project, delete projects, edit data, and view data.
Role - Editor	An editor is a member that has the rights to edit and view data (e.g., lab operators).
Role - Viewer	A viewer is a member that only has the right to view data (e.g., clinicians).



Session	A session is an overview of all recorded measurements done in one 'visit' of a subject. It can include multiple conditions and trials.
Trial	A trial contains all data that was captured of a subject during one recording. It can include multiple data types that have been recorded synchronously, e.g. C3D, video, forces and EMG.
User	A user is a person of your organization who has an account on Moveshelf.

2. Introduction

Moveshelf integrates movement analysis tech with clinical systems so that you and your team can take better decisions, together. On [our website](#) we set forth the most important and distinguished properties of the Moveshelf application. This includes:

- Our ability to import all golden standard movement data types (and some more).
- A uniform workflow and interface in a web browser with interactive multi-media visualizations.
- Build insights within a subject to view progress over time, or compared to your own reference dataset.
- Dependent on the level of integration in your organization's IT system, uploading the data after capture can be automatized and accessed from a simple URL from the patient file in your Electronic Health Record (EHR).
- A compliant data management flow to local national regulations (e.g., GDPR or HIPAA) and organization-specific information security protocols.

With Moveshelf, we aim to create more efficient workflows for both the movement laboratory operators who process the data and the medical staff who apply these insights in a treatment plan of their patients. Removing the boundaries of static movement databases and the adoption/integration of new measurement technologies in clinical setting, we envision that more patients with movement disorders can receive better and more personalized treatments.

In this user manual we explain how to work with Moveshelf. If your question is not answered after reading the manual, please feel free to send an email to support@moveshelf.com.



3. How to access Moveshelf

The Moveshelf application is customized for each of organization (customer) that we work with. This allows us to guarantee data security and organization specific preferences. Each organization has their own Moveshelf subdomain (<subdomain>.moveshelf.com) with their separate data storage, which is access controlled. Your organization's account is set up to only allow access to predefined email domains.

To access the Moveshelf application, click on the link you have received in your email or in the Electronic Health Record (EHR). This link will redirect you to all multi-media movement data of the subject in question. Before you can access this data, you will have to login on Moveshelf (see chapter [3. How to access Moveshelf](#)). If you are already logged in and have access to the provided link, continue reading [4. Viewing Moveshelf](#) to learn more about how to work on Moveshelf.



3.1 Password login

Login with your business email address and password you have signed up with.

- **Reset password**

Did you forget your password? Click on **'Forgot password?'** to reset your password. You will receive an email within a few minutes to set a new password. Please also check your spam folder for the email.

- **New to Moveshelf?**

If you don't have access yet, please contact your Organization's Moveshelf admin to receive an invitation.

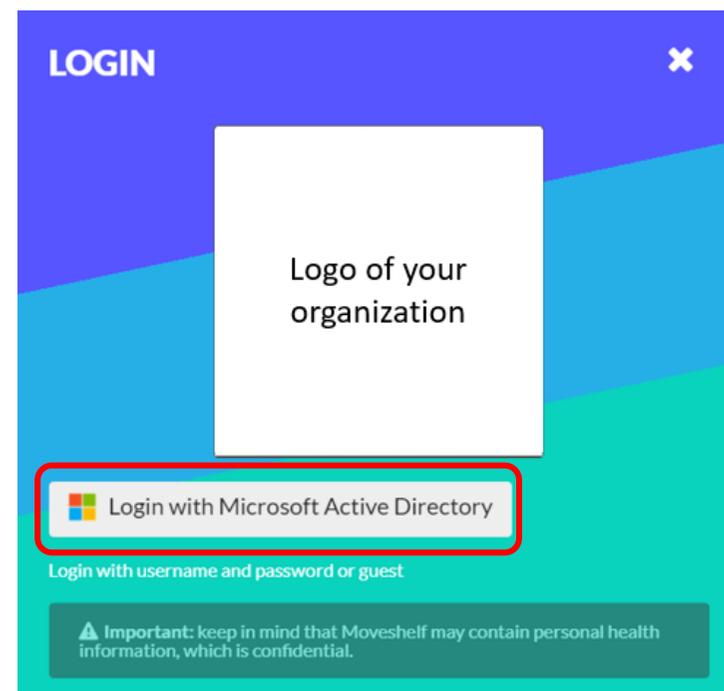
The screenshot shows a login modal window with a blue header containing the word "LOGIN" and a close button (X). Below the header are two input fields: the first is labeled "email" and the second is labeled "password". To the right of the password field is a link that says "Forgot password?". At the bottom of the modal are two buttons: "REQUEST ACCESS" and "SIGN IN".



3.2 SSO Login^(Optional)

SSO login is a Single Sign-On for enterprise customers using Microsoft Active Directory. Through SSO your organization is in control of access and editing/viewing rights for all employees. To login with SSO on Moveshelf you use the same credentials as you use for accessing Microsoft Outlook 365 and other software that your organization uses. This way, you are logged in to your Microsoft environment and you'll have automatic access to Moveshelf with only one click.

- Click on '**Login with Microsoft Active Directory**' to login with your Microsoft account.
- If you want to login manually, click on '**Login with username and password or guest**'.

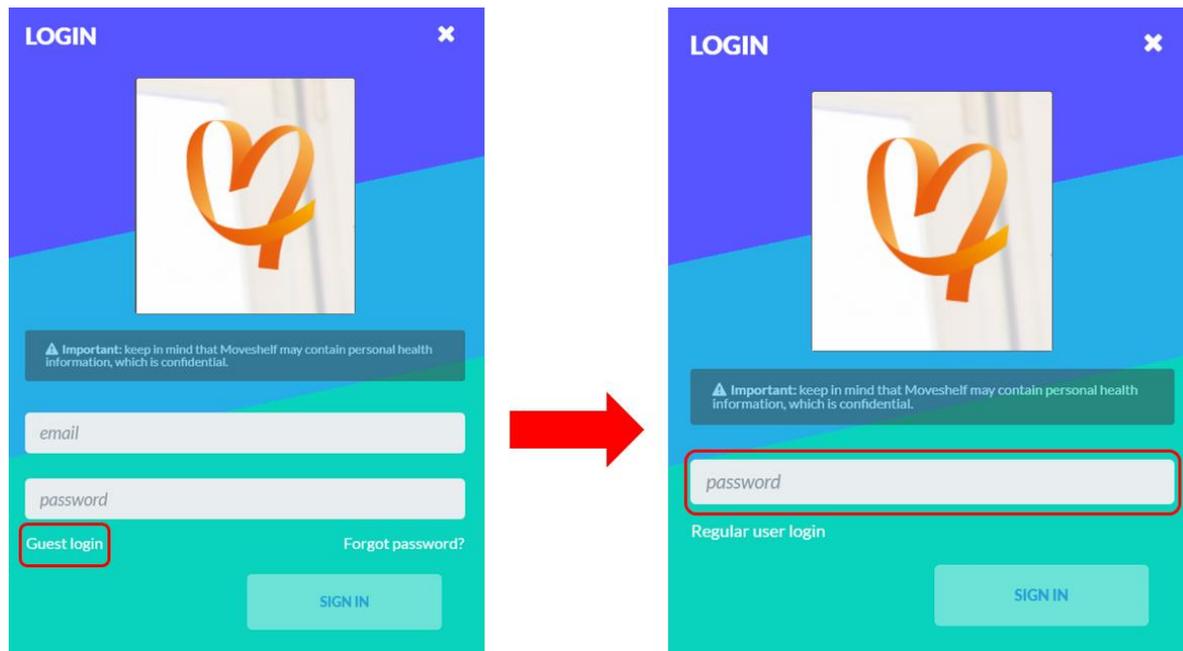


Optional feature: availability depends on how Moveshelf is configured for your organization



3.3 Guest Login^(Optional)

A guest login can be created by Moveshelf as a way to give temporary access to a group of people. This feature is frequently used by participants in for example gait courses. Click on **'Guest login'** and insert a password you have received from your organization to access Moveshelf.



4. Viewing Moveshelf

4.1 Interpretation of data

The received link will direct you to all multi-media data of the subject in question. After clicking on the link you will land on a specific Moveshelf page. On this page you can easily switch between trials, conditions and sessions (please see chapter [4.1.3 Navigation menu](#)), but if a numeric comparison is preferred, the operator will have created a comparison, please see chapter [4.1.2 Comparison](#).



4.1.1 Trial

A Moveshelf link can direct to a *Trial*. A trial contains all data that was captured of this subject during one recording. What is shown in this overview depends on the measurement equipment that was used and the lab operator's choice. For example, a trial can contain:

- 2D video
- 3D data (avatar)
- Kinematics
- Moments
- Powers
- EMG
- Force plates

The screenshot displays the MOVESHelf interface for a trial. The top navigation bar includes 'MOVESHelf', 'DASHBOARD', and 'EXPLORE'. The main content area shows subject information: 'Subject: Adams, D.', '79 [kg]', 'Jun 4, 2018', and 'Date of Birth: 2001-08-04'. Below this, there are filters for 'Data' with options for '2018-03' and '2018-06 Follow-up'. The trial title is 'Trial: Sagittal right', created by 'Martina' on 'May 31, 2021'. The central part of the screen features two video thumbnails labeled 'Video (2)'. To the right, there is a '3D' panel showing a 3D avatar model with red and green lines representing kinematics. Below the 3D panel, there are sections for 'Data', 'Comments', and a 'Share your feedback on the' button. At the bottom, there are expandable sections for 'Kinematics', 'Powers', 'EMG', and 'Force plates'.

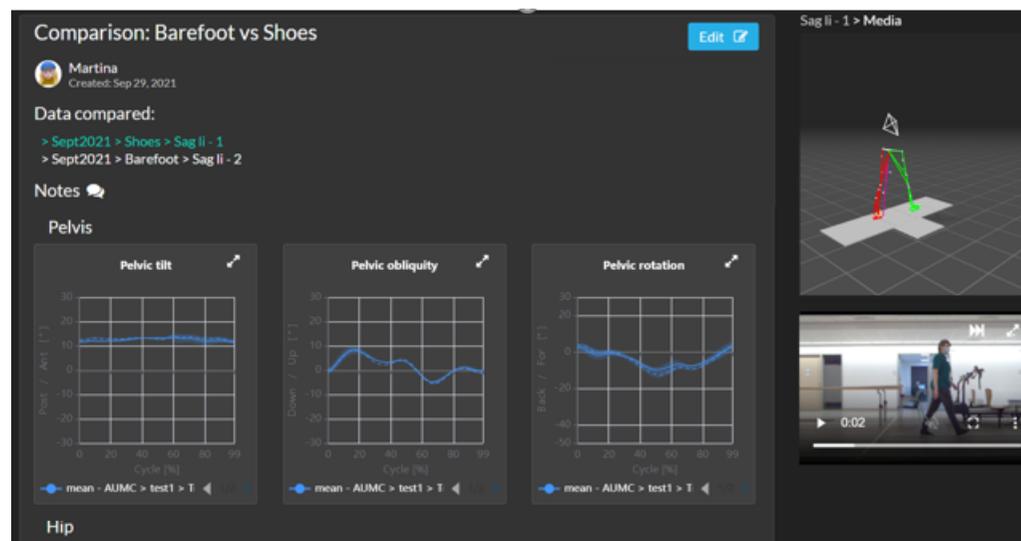


Click on the headers of the data type you would like to view. Specifically, the 3D data can be found in the panel on the right side of the screen, if available for this trial.

4.1.2 Comparison

A Moveshelf link can direct to a *Comparison*. A comparison is an overview of two or more trials, where numeric data is combined and overlaid in graphs. The operator also could have prepared a comparison of the trial with reference data, like healthy age-matched peers or other. Under the header '**Data compared:**' you will see all trials and optional references that are included in this comparison.

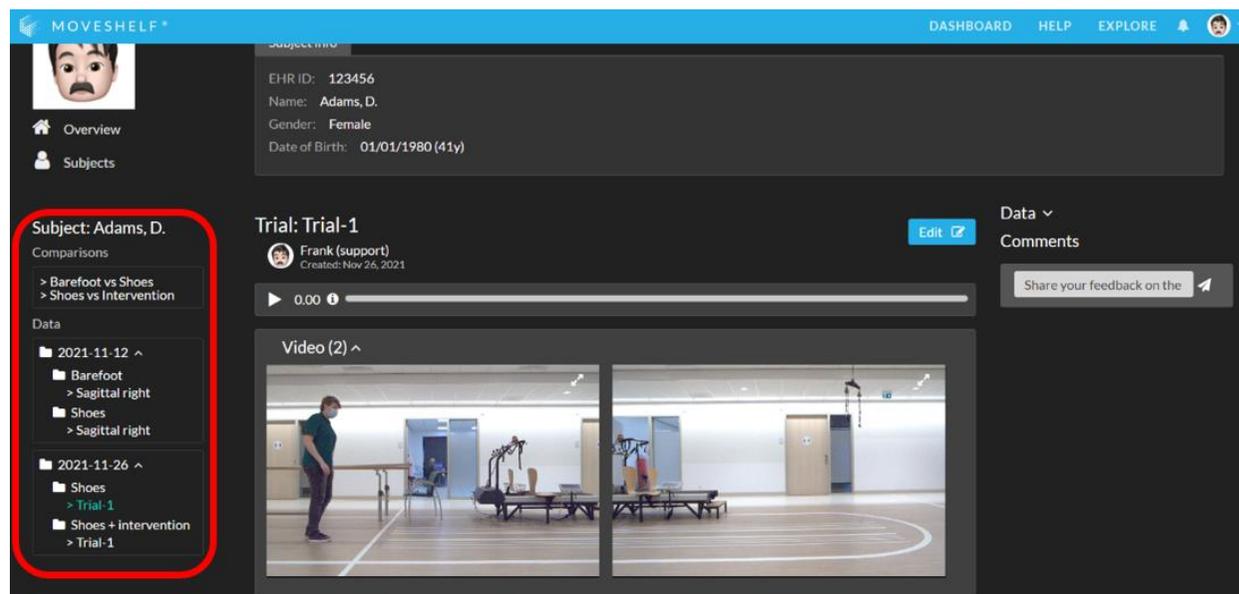
- To view the 2D video and/or 3D avatar of one of the trials, click on the trial name below the header '**Data compared:**' (highlighted in the screenshot in green). The videos and/or 3D avatar will be shown on the right side of the page.
- Click on  in the 2D video to go to the next video of the selected trial.





4.1.3 Navigation menu

In the menu on the left side of the screen you can click on the session name. It will drop down and display all trials and conditions within this session. This menu will allow you to easily switch between trials of different conditions and sessions. However, comparisons can be more user friendly to visualize numeric differences between 2 or more trials. Under the header '**comparisons**' in the menu on the left side of the screen you will find all comparisons that have been created for this subject.

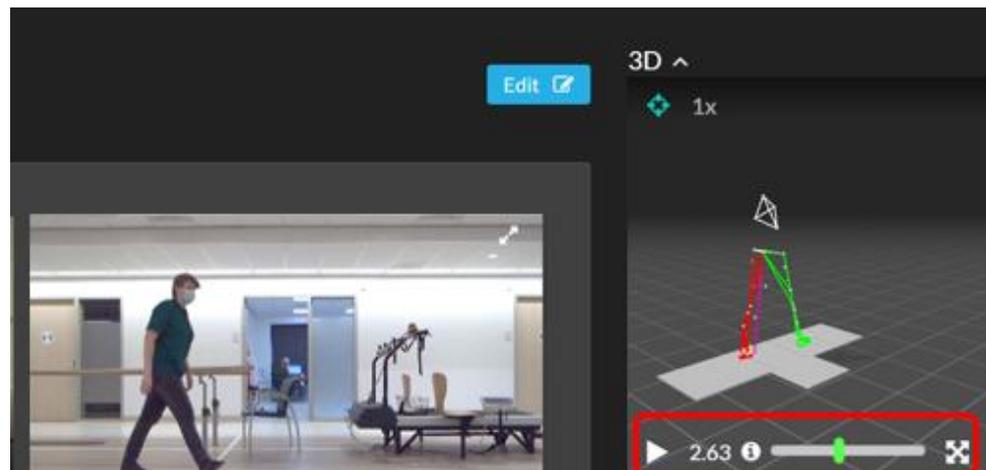




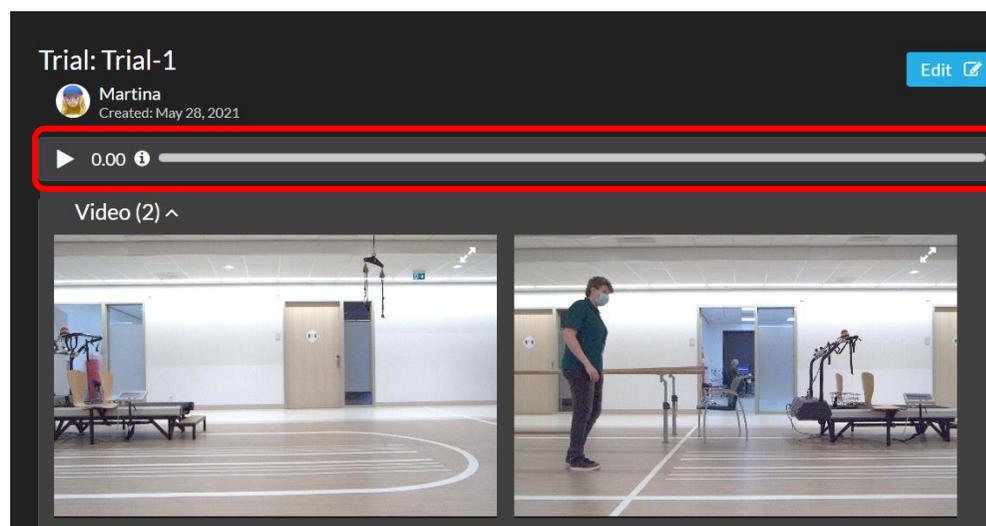
4.2 Features

4.2.1 Video 2D/3D avatar

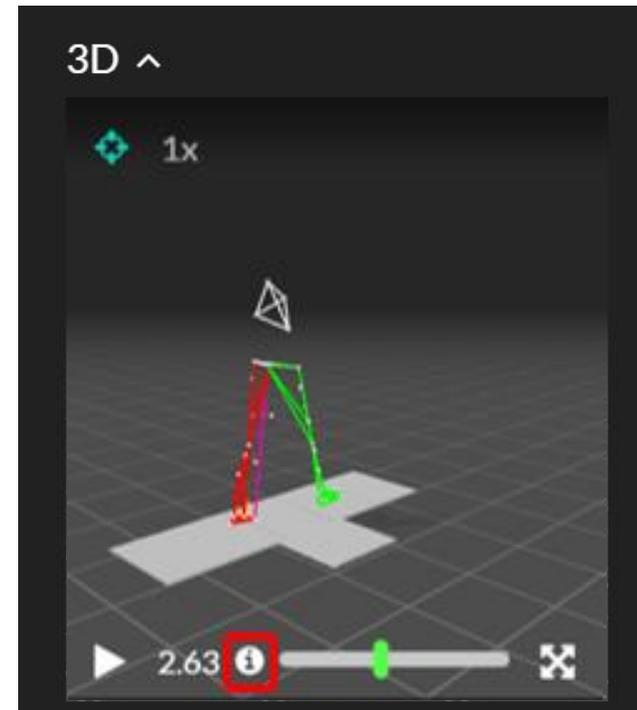
- All media can be played in sync using either:
 1. The time bar of the 3D viewer, when 3D data is present in the trial.



2. The time bar on top of the page in case there are only videos present (next to optional numeric data), without 3D.



- Click on  to open a video in full screen full screen.
- Hover over the  in above mentioned time bars to view all playback and viewport controls.
 1. Playback controls:
 - **Tap** or **click** on time bar: jump to time
 - **Shift + hover** on time bar: jog
 - **J** or **left-arrow**: jump – 20ms
 - **L** or **right-arrow**: jump +20ms
 - **K** or **spacebar**: play/pause
 - **Shift + i**: set selection start
 - **Shift + o**: set selection end
 - **Hold, then drag**: select region (if enabled)
 - **Double tap**: clear selection (if enabled)





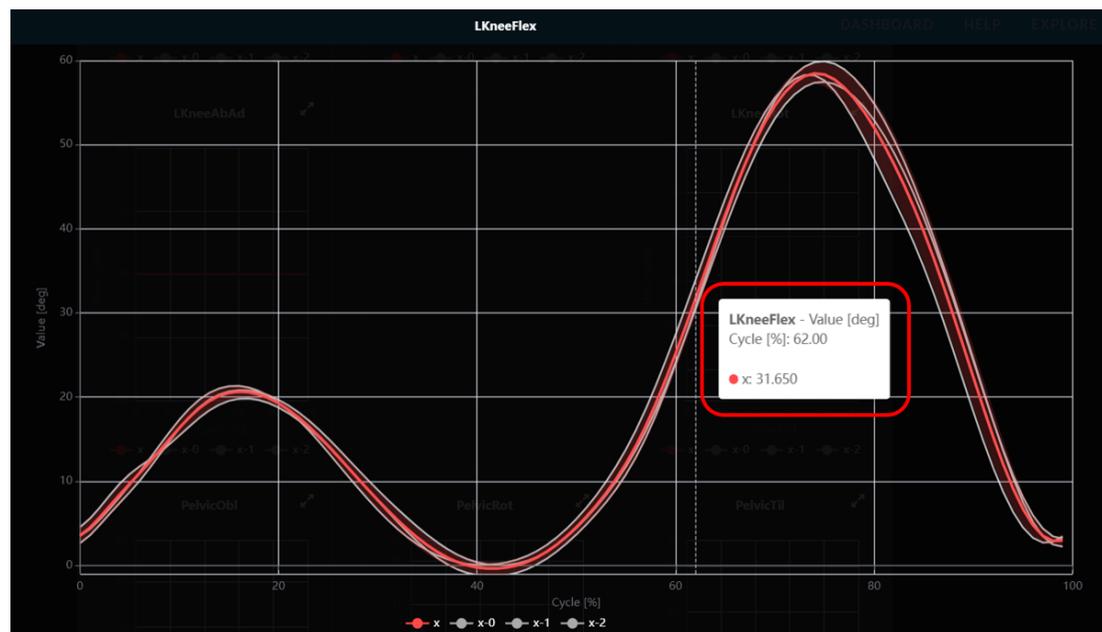
2. Viewport controls:

- **Left click:** orbit camera
- **Right click:** pan camera
- **Mouse wheel:** zoom
- **f:** toggle follow camera
- **Shift + l:** show/hide optical segments
- **Shift + m:** show/hide markers
- **Shift + h:** toggle GRF visualization
- **Shift + >:** show/hide markers trajectory
- **Shift + t:** show/hide technical mesh
- **Shift + f:** select next chart
- **Shift +):** ortographic/perspective camera
- **Shift + n:** select next take



4.2.2 Graphs

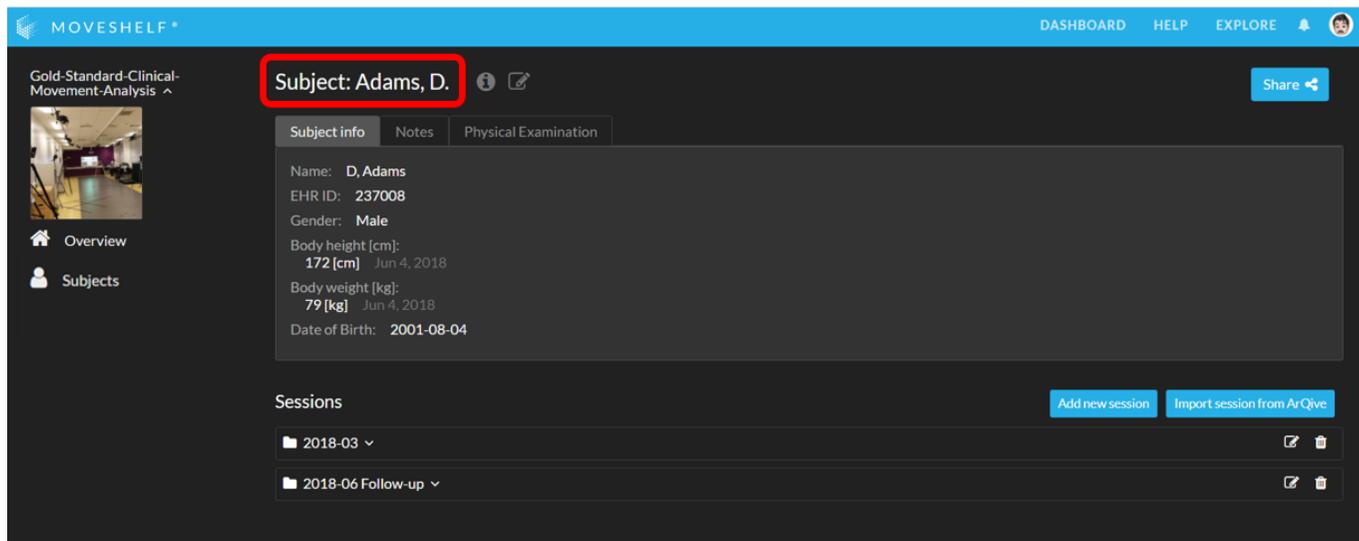
- The graphs and histograms are interactive. Hover over the curves and you will see the values of that point of the curve.
- Click the legend of a line below the graph to switch on/off this line (handy with a lot of gait cycles in a trial)
- Click on  to open a graph or histogram in full screen.



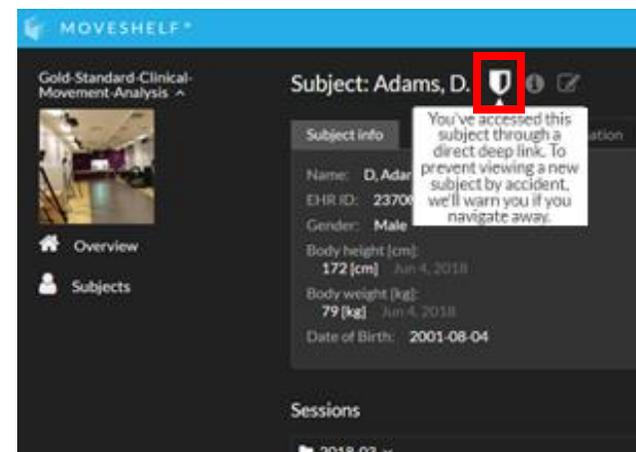


4.3 Subject Home Page

To see the history of a subject, click on the subject's name on top of the page. This will open an overview of all sessions that have been created for this subject. Every session has its own drop down menu. This menu includes all conditions and trials that have been captured. Click on a trial to navigate to it.



Note: an optional feature for Enterprises with an EHR integration is to produce a warning if you are navigating away from your subject, by clicking on Subjects in the left navigation menu e.g.. This feature is present for your organisation when you see a 'shield' icon next to the subject's name.

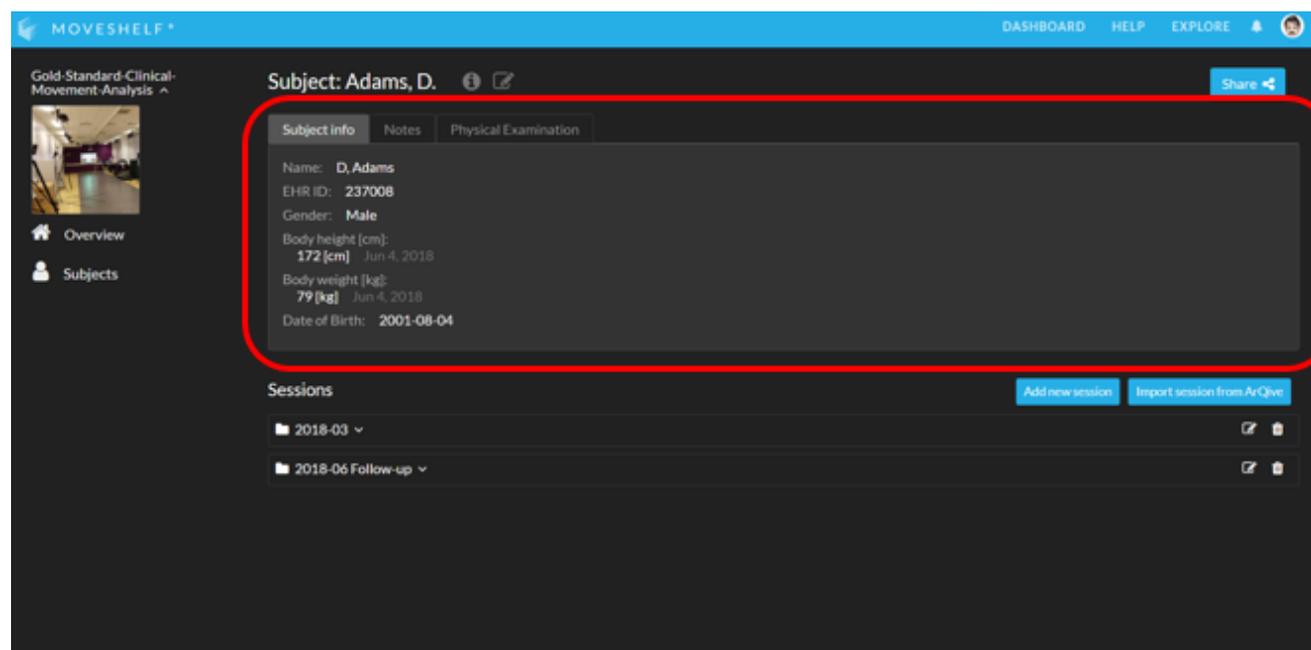




4.3.1 Subject information^(Optional)

In the subject home page subject information will be displayed.

- Click on **'Subject info'** to view the specific subject information.
- Click on **'Notes'** to view the notes that are shared by the lab operator.
- Click on **'Physical examination'** to see all outcomes of the physical examination that has been done.

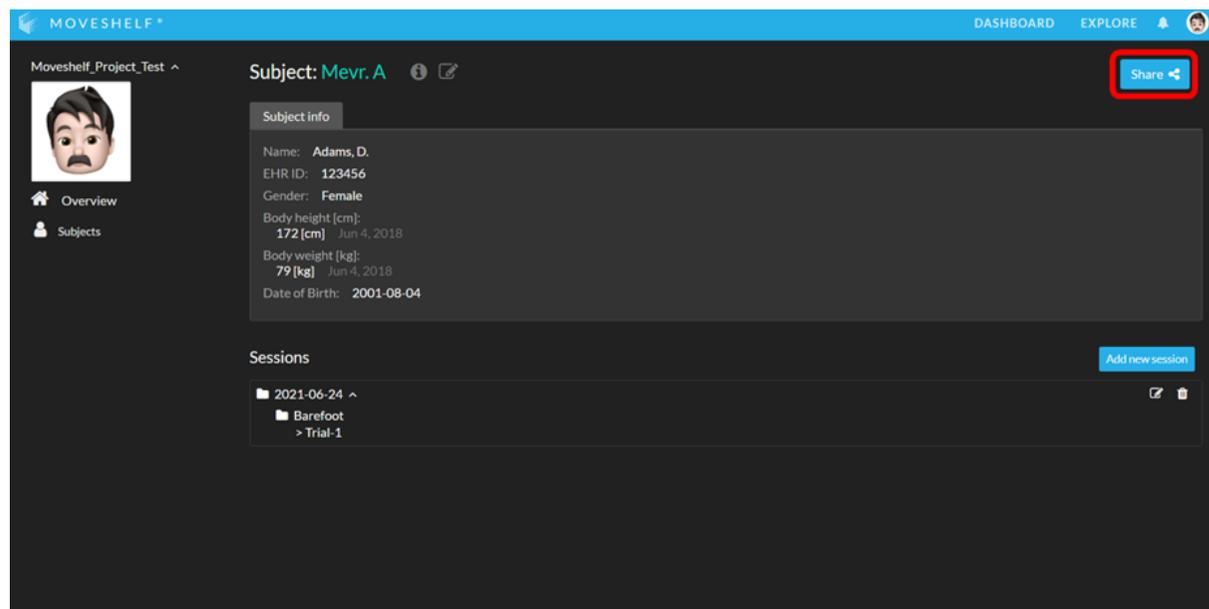




4.4 Share with others

You can share a Moveshelf link with others who have been granted access by your organization's settings.

- Click on **'Share'** to share a trial or comparison with others.
- Select **'Copy link'** or click on **'Send email'**.



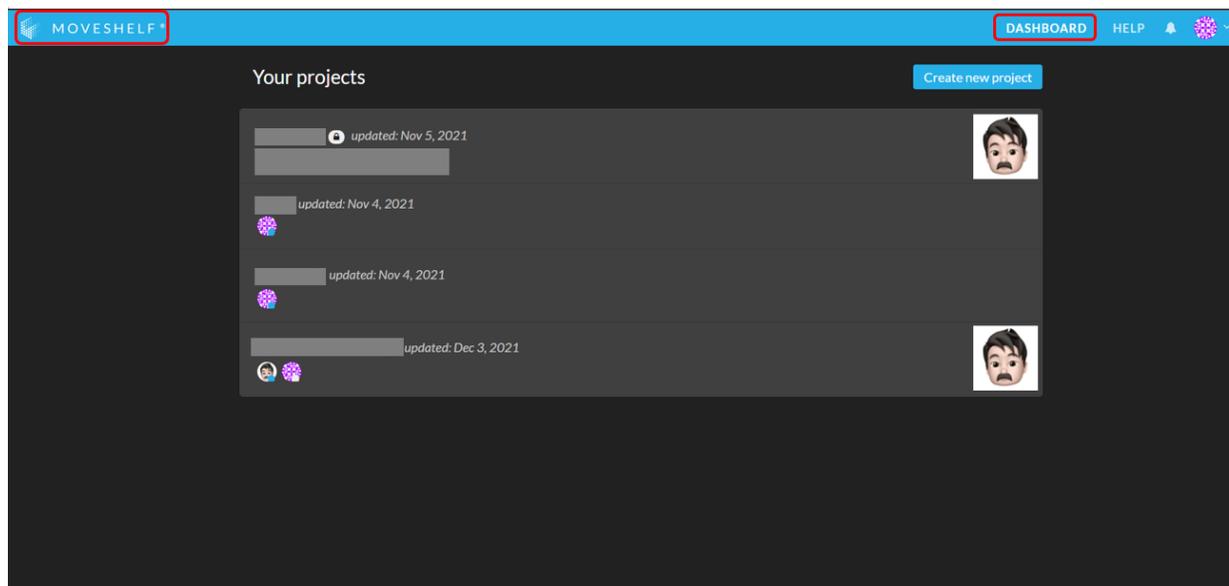
Note: Sharing the link is secure. Only people that have been granted access to this specific Moveshelf project can open the link.

4.5 Account

4.5.1 Dashboard

Every user has his own personal homepage, called '**Dashboard**'. Your dashboard holds an overview of all projects of which you are a member.

- Click on the Moveshelf logo or click on '**Dashboard**' in the menu bar on top of the page to navigate to your personal overview.

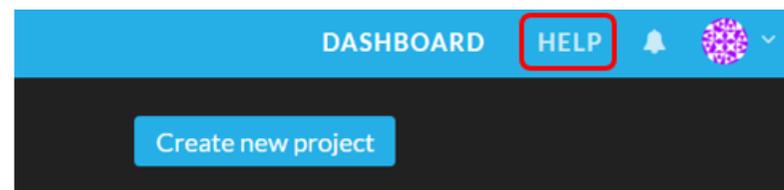


4.5.2 Help

If you need help;

- Click on **'HELP'** to open the manuals.

- Or send an email to: support@moveshelf.com

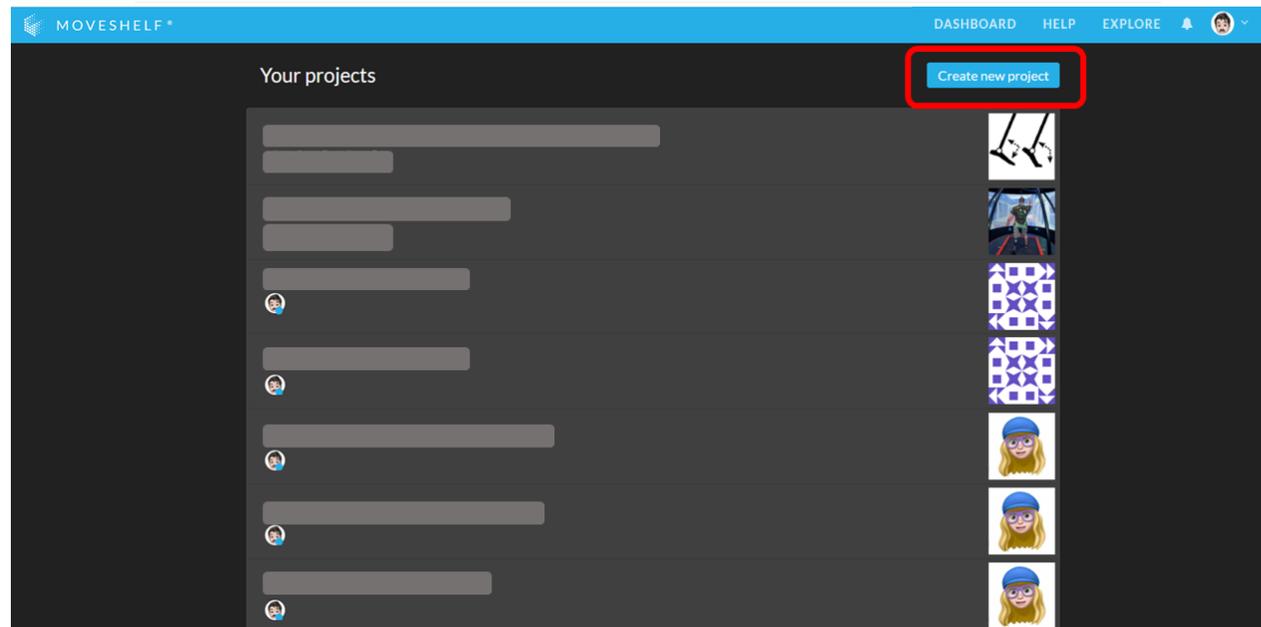


5. Editing Moveshelf

5.1 Create project

You can add new projects to your *Dashboard*. A project is a space where all your subjects and their data are stored, and where you collaborate with your team (members of your project). You can create multiple projects, for example to create separate databases and work with different teams.

- Click on **'Create new project'** to add a new project to your Moveshelf dashboard.



- Insert a project name, select your organization and click on **'Create'**. You are automatically an Admin in the projects that you create.

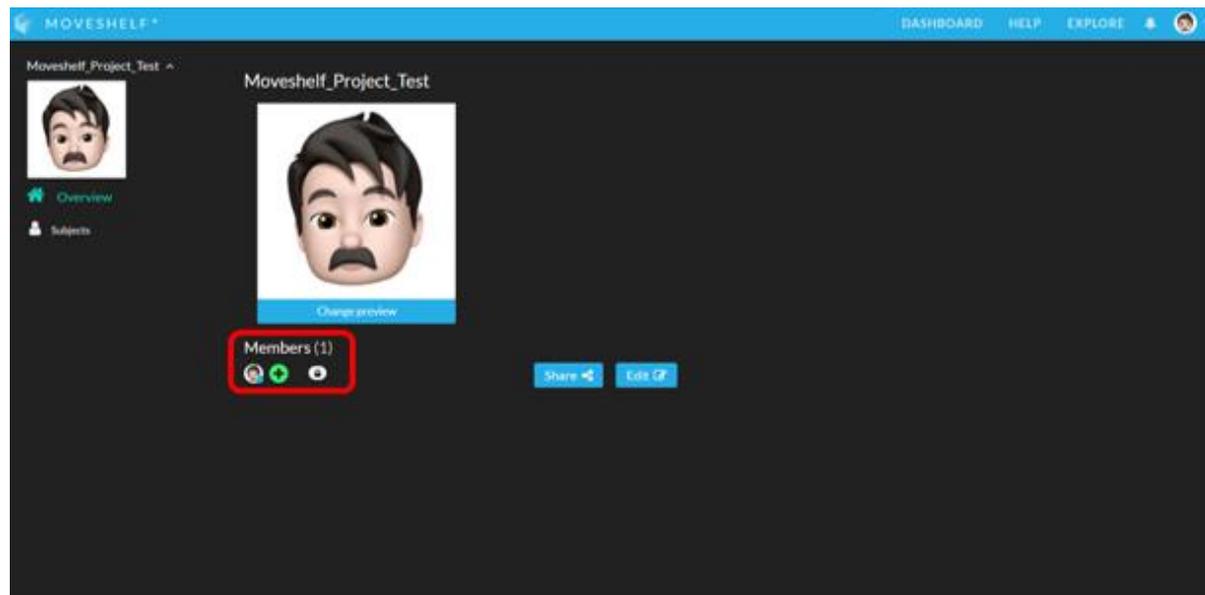
Note: Every single project has his own private and separate space. This means that the data is only accessible for the people that are member of this project.



5.1.1 Add members to your project^(Optional)

A project can have multiple members, as a way to give access to its contents to a selected group of people. Only project Admins can add members to their project(s). Members can be given different roles (viewer, editor or admin).

- Click on  to add a member to your project.
- Insert a business email address or Moveshelf username, select a role, and click on **'Add'**.



Note: Email invites are limited to certain configured email domains for each organization.

	Admin	Editor	Viewer
Add members	X		
Delete project	X		
Edit data	X	X	
View data	X	X	X

Table 1. User roles and their viewing/editing rights



- **Add a new member that does not has an account on Moveshelf (and your organization does not have SSO)**

As an admin of a project you have the rights to add members to the project. To invite someone without an account on Moveshelf, insert the business email address, select a role and click on **'Add'**. The invited user will receive an email to activate their account. Please let this new member know that their account has been added to your project and provide them with a link to your Moveshelf project through email or point out that they can access the Moveshelf links in your EHR in case of an IT integration from now on, to help them get started.

- **Add a new member with SSO** ^(Optional)

Insert the Microsoft Office 365 email address of the member you want to add to the project, select a role and click on **'Add'**. Note that this new member will not receive a notification in their outlook inbox. Please let this new member know that their account has been added to your project and provide them with a link to your Moveshelf project through email or point out that they can access the Moveshelf links in your EHR in case of an IT integration from now on.

- **Add a member that already has a Moveshelf account**

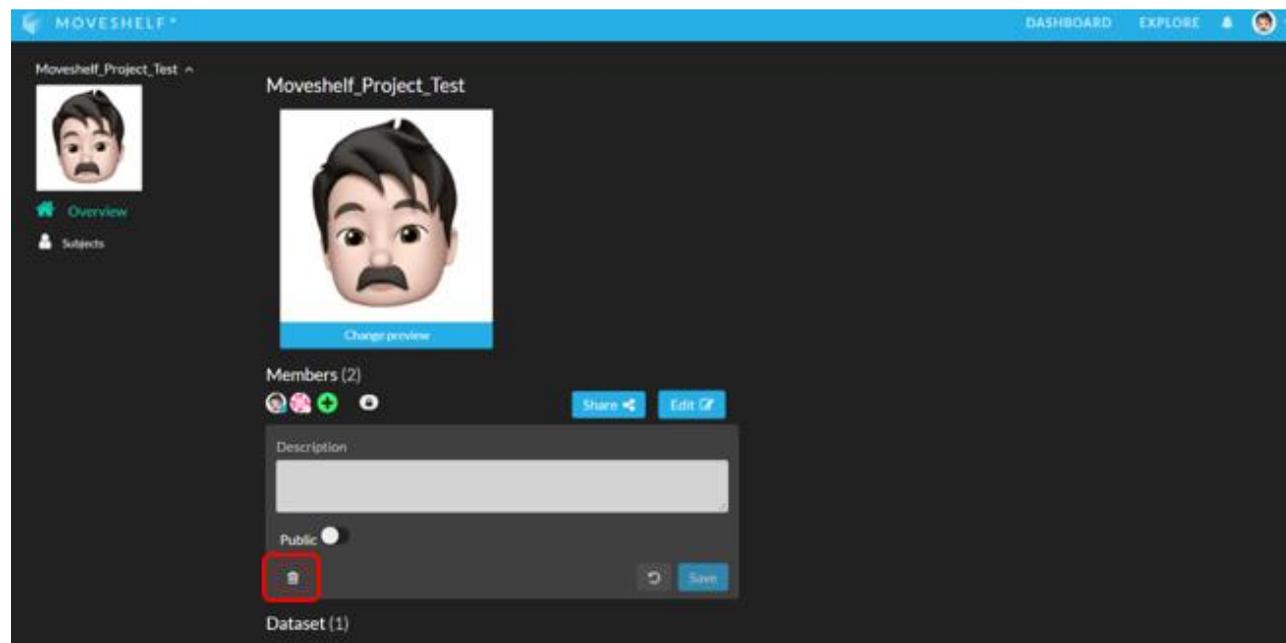
If a person already has a Moveshelf account, you can choose to enter their email address or their Moveshelf username to add this member to a specific project. Insert the email address/username, select a role, and click on **'Add'**. Note that this new member will not receive a notification in their outlook inbox. Please let this new member know that their account has been added to your project and provide them with a link to your Moveshelf project through email or point out that they can access the Moveshelf links in your EHR in case of an IT integration from now on, to help them get started.



5.1.2 Delete projects

Projects can be deleted by the project's Admin.

- Go to the project overview and click on **'Edit'**.
- Click on  to remove this project from your dashboard. If you delete this, all data of this project will also be deleted.

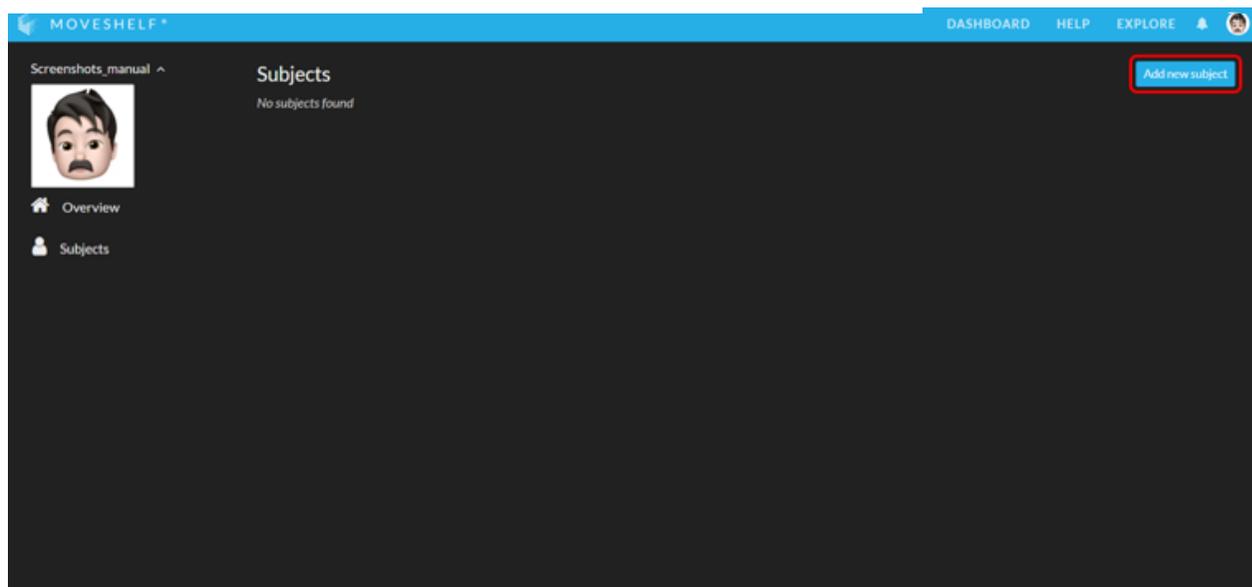




5.2 Create subjects

Populate a project manually by creating subjects. If your organization has a deep IT integration it is possible that this process is automated and does not require you to manually create subjects. Within a project, multiple subjects can be created:

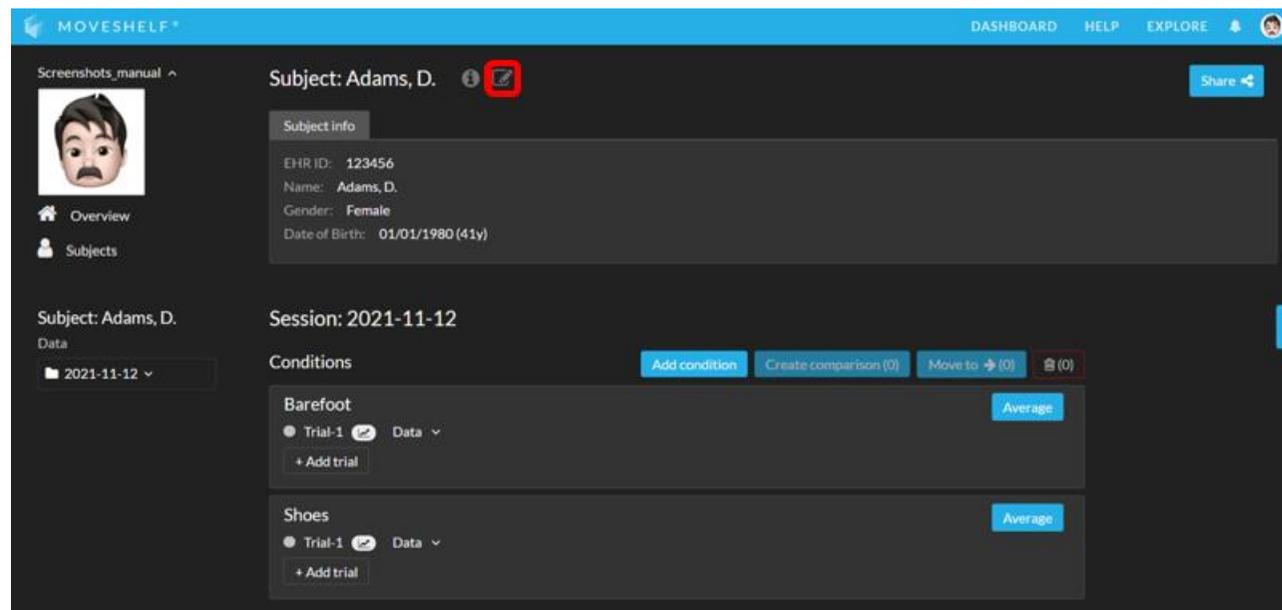
- Click on **'Add new subject'** to create a new subject.
- Insert a subject ID and click on **'Add'**.





5.2.1 Add subject information^(Optional)

If your organization is setup to allow for additional subject information, click on  to insert subject information. You can insert subject information in two different ways;

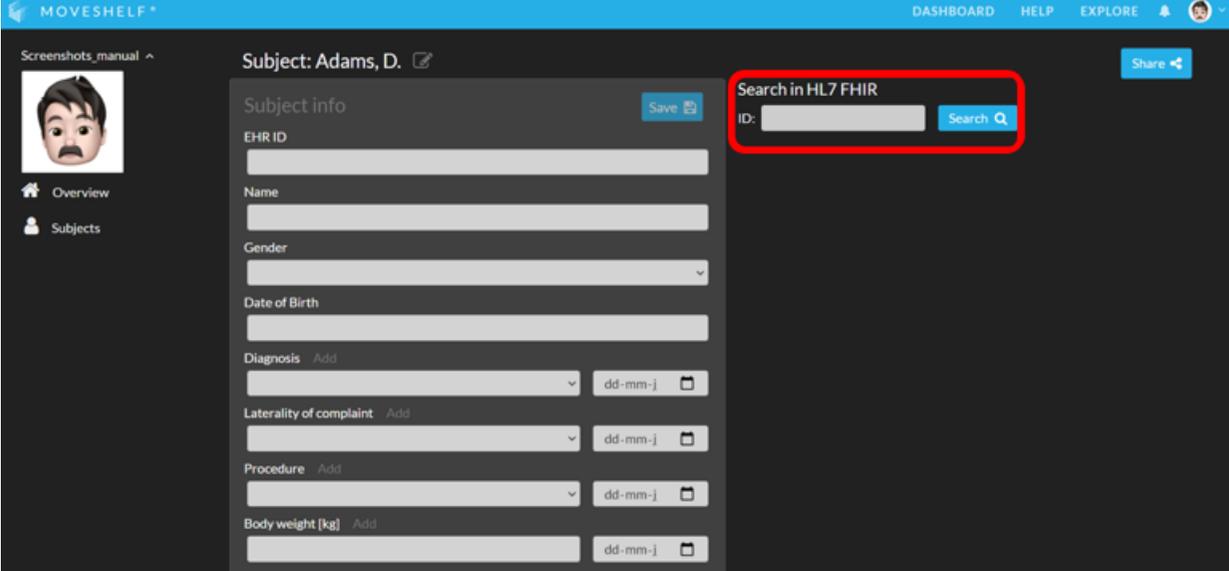


1. Manually

- Fill in the form manually and click on **'Save'**.

2. Use the connection between Moveshelf and the Electronic Health Record (EHR) of your organization^(Optional)

- Search for the subject using EHR ID.
- Click on  to copy the subject information from the EHR to Moveshelf.
- Click on **'Save'** to save the subject information.

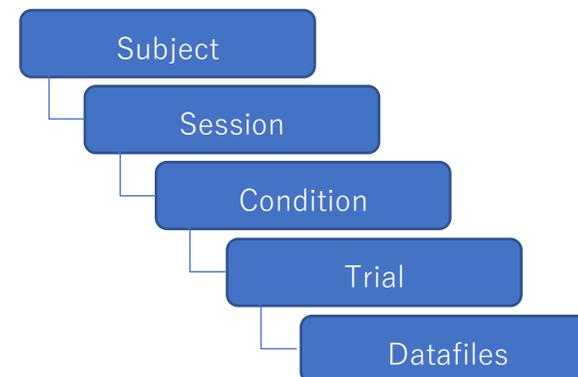


The screenshot shows the Moveshelf web application interface. At the top, there is a navigation bar with 'MOVESHelf', 'DASHBOARD', 'HELP', and 'EXPLORE'. The main content area is titled 'Subject: Adams, D.' and contains a 'Subject info' form. The form includes fields for EHR ID, Name, Gender, Date of Birth, Diagnosis, Laterality of complaint, Procedure, and Body weight [kg]. A 'Save' button is located at the top right of the form. To the right of the form, there is a search bar labeled 'Search in HL7 FHIR' with an 'ID:' input field and a 'Search' button. This search bar is highlighted with a red rectangle. On the left side of the interface, there is a sidebar with a user profile and navigation options for 'Overview' and 'Subjects'.

5.3 Add data to Moveshelf

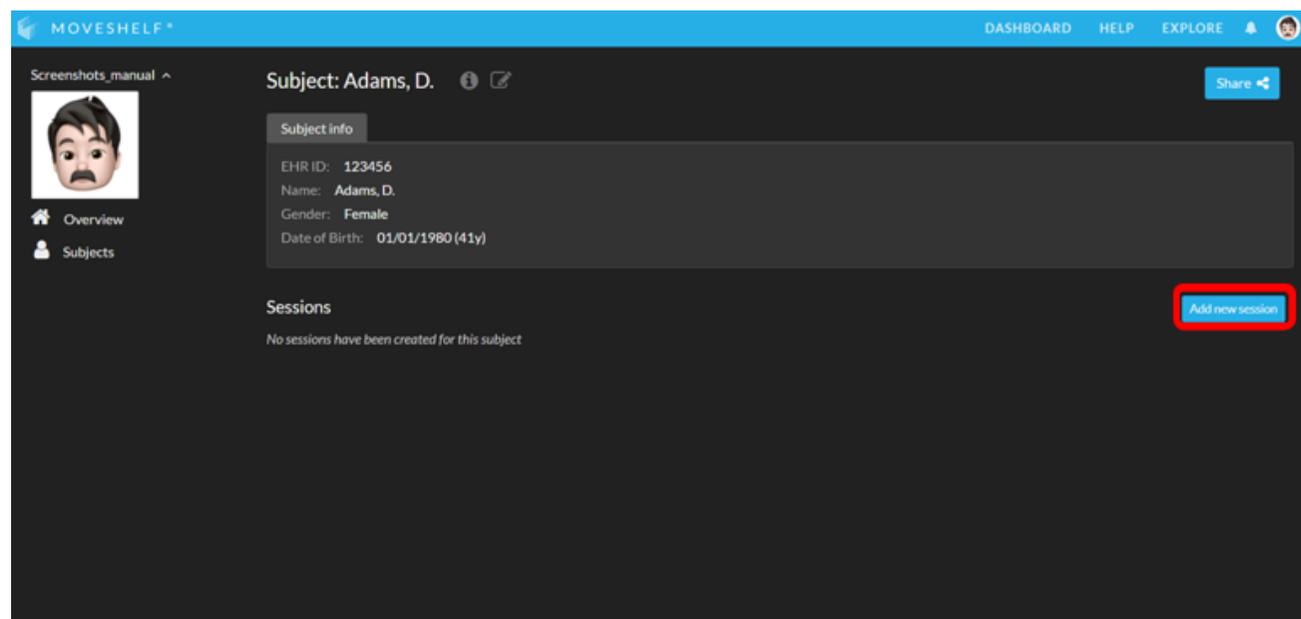
5.3.1 Manual workflow

Moveshelf has a subject oriented data structure. The structure looks like this: Sessions can be added to a subject. Within each session, conditions can be defined and trials can be uploaded and categorized in these conditions.



Add session

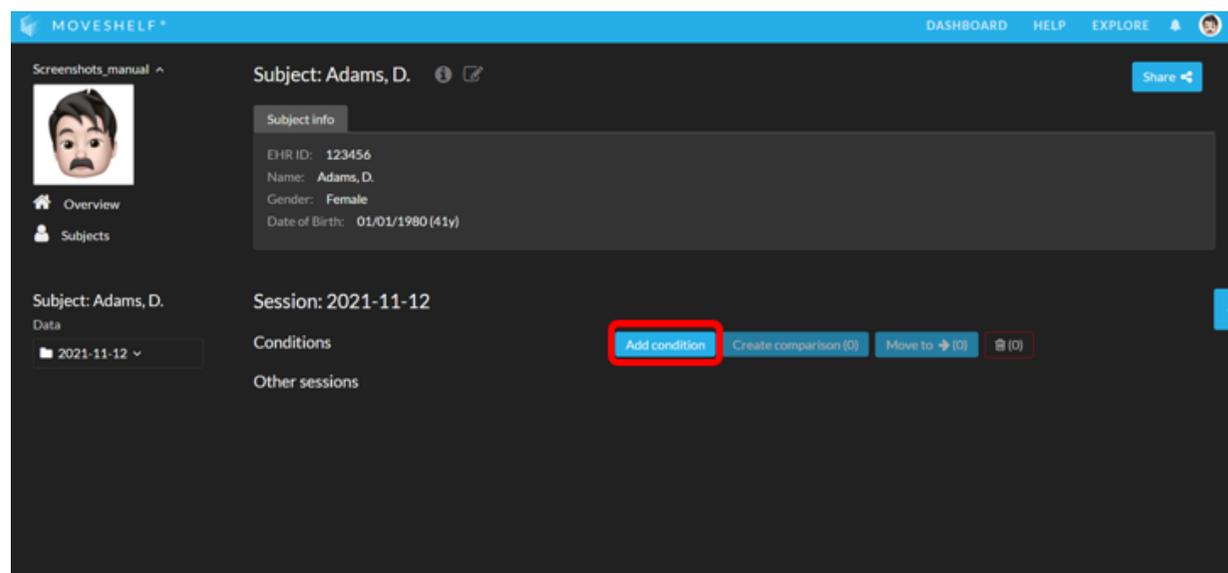
- Click on **'Add new session'** to add a new measurement session.
- Insert a session name and click on **'Add'**. Example of a session name can be the date of measurement, or the date and a follow up mention (e.g. "2021-11-29 3month post-op").





Add condition

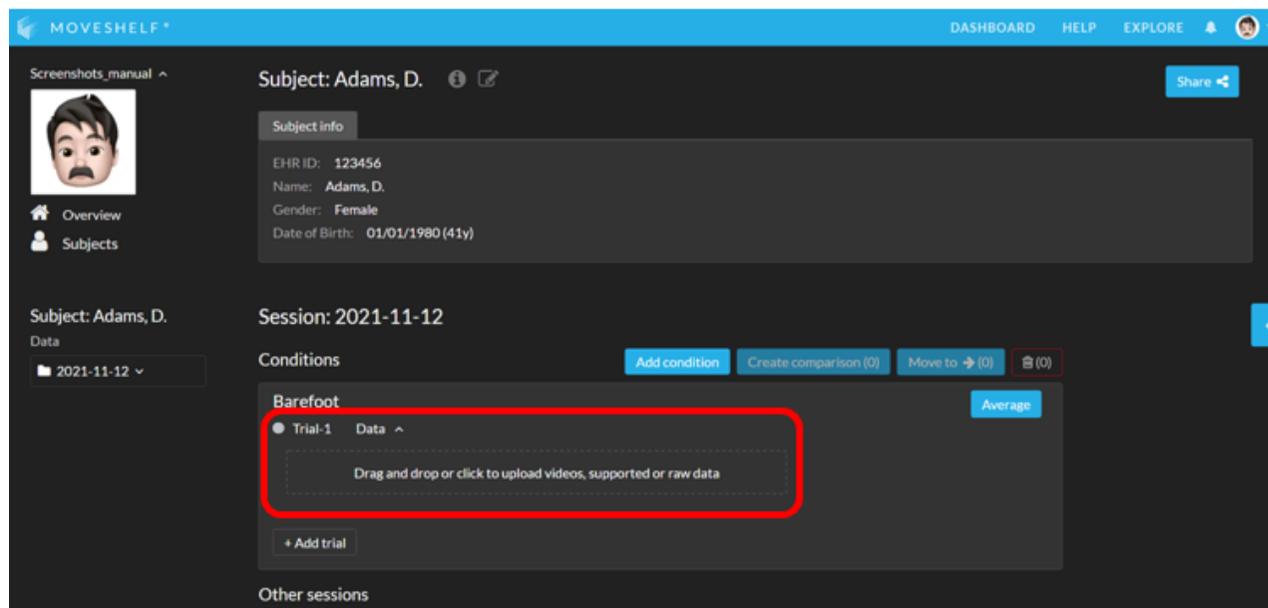
- Click on **'Add condition'** to add a new condition to this session.
- Insert a condition name (e.g., barefoot, intervention or clinical test) and click on **'Add'**.





Add trials

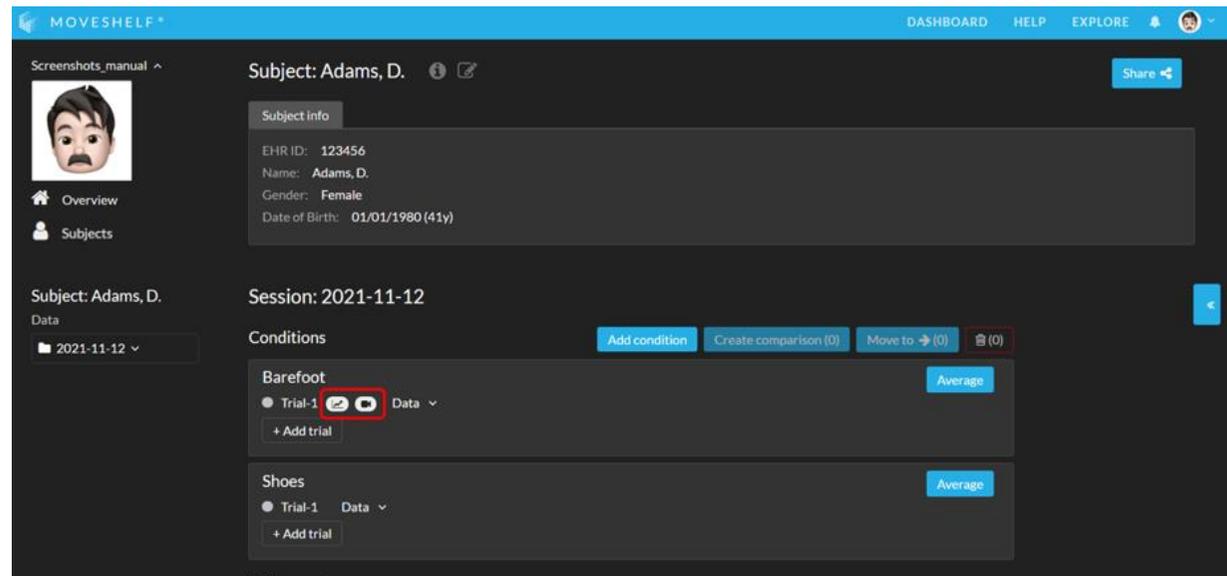
- The first trial is automatically shown when you have added a condition. In one trial you can upload different types of data that belong to one, synchronized capture (e.g. c3d and video). Different captures should be uploaded as separate trials.
- Click on '+ **Add trial**' to add more trials within one condition.



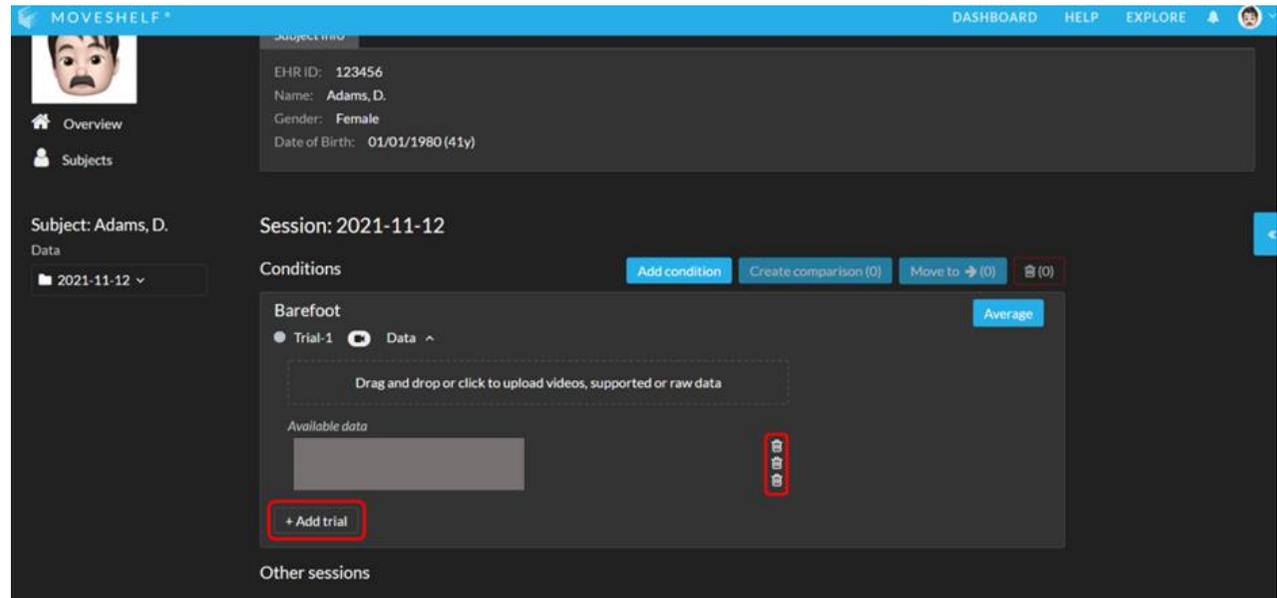


Upload data

- Upload data in a trial by dragging and dropping it from your file explorer or click and upload. The files will show up underneath the trial in 'Available data'.
 - While uploading you will see a green bar next to each file. Please do not leave the page while the green bar is still visible.
 - Once uploading is complete, an orange bar will appear to indicate the processing of the data. It is safe to navigate again to other pages as this is a process that is performed in the backend and will not be disturbed by navigating away from the page.
- After processing is done, Moveshelf will show what kind of data is uploaded in the trial, using different icons (e.g. graphs, video). Now your trial is available for viewing and editing.



- Click on '+ **Add trial**' to add more trials within one condition.
- Click on  to remove files from a trial.



The screenshot displays the MOVESHelf user interface. At the top, there is a navigation bar with 'MOVESHelf', 'DASHBOARD', 'HELP', and 'EXPLORE'. Below this, a subject profile is shown for 'Adams, D.' with details: EHR ID: 123456, Name: Adams, D., Gender: Female, and Date of Birth: 01/01/1980 (41y). The main area is titled 'Session: 2021-11-12' and contains a 'Conditions' section. Under the 'Barefoot' condition, there is a 'Trial-1' entry with a 'Data' dropdown and an 'Average' button. A dashed box indicates the area for uploading videos or raw data. Below this, an 'Available data' section shows a greyed-out area and a trash icon. At the bottom of the trial management area, there is a '+ Add trial' button. The interface also includes a sidebar with 'Overview' and 'Subjects' tabs, and a 'Data' section with a date filter set to '2021-11-12'.



Edit trial name

- If you are on the trial page, you can change the trial name by clicking on **'Edit'**.

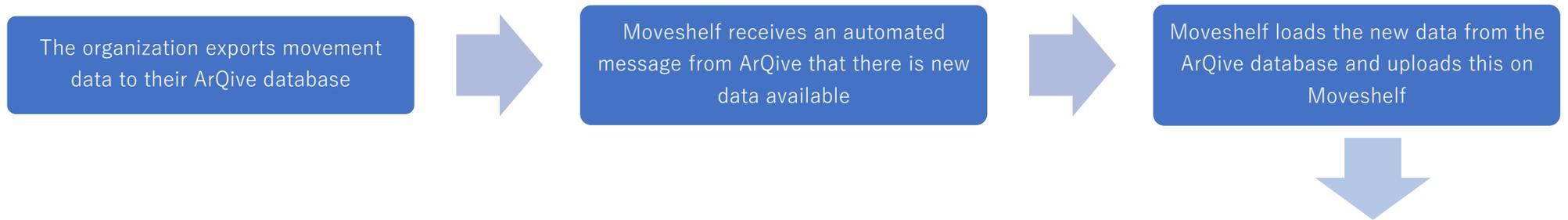
The screenshot displays the MOVESHelf interface for a trial page. The top navigation bar includes 'MOVESHelf', 'DASHBOARD', 'HELP', 'EXPLORE', and a user profile icon. The main content area is divided into several sections:

- Subject: Adams, D.** (with a share button)
- Subject info** (EHR ID: 123456, Name: Adams, D., Gender: Female, Date of Birth: 01/01/1980 (41y))
- Trial: Trial-1** (Created by Frank (support) on Nov 12, 2021) with an **Edit** button highlighted in a red box.
- Video (3)** (Three video thumbnails showing a person in a clinical setting).
- 3D**, **Data**, and **Comments** sections.
- Share your feedback on the** (with a feedback icon).

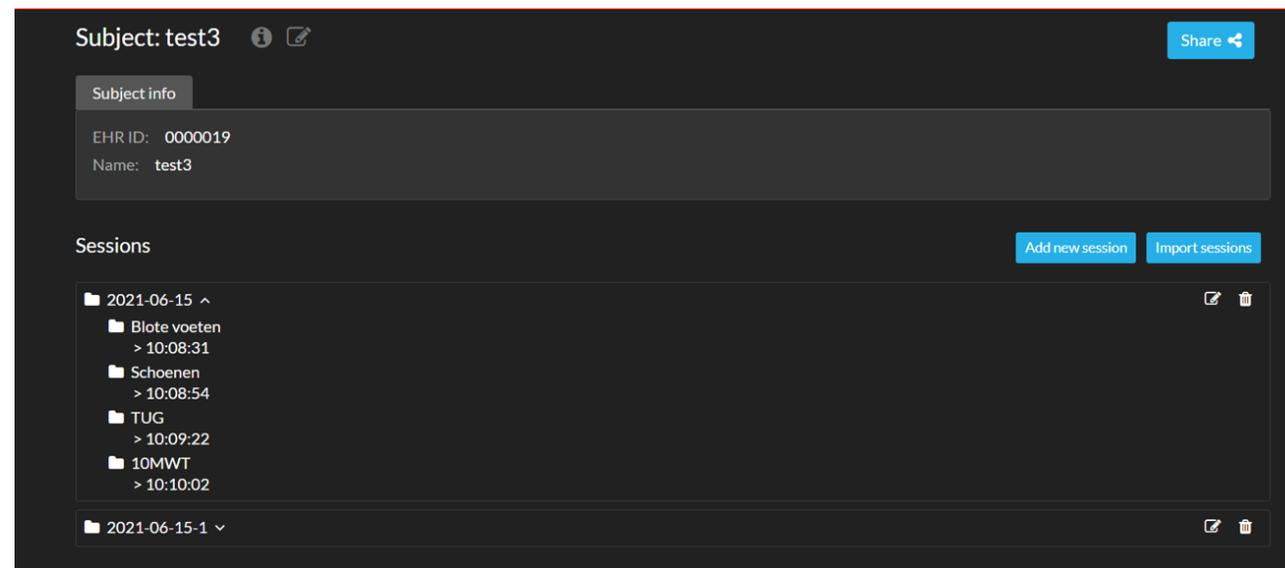
On the left sidebar, there are options for 'Screenshots_manual', 'Overview', 'Subjects', and a date filter for '2021-11-12'.

5.3.2 Moveshelf + ArQive^(Optional)

There is an automatic workflow created for customers who are working with ArQive and the Moveshelf application. Just below, you will see an overview of the workflow.



The only manual step in this workflow is to add the captured data to ArQive. Subjects, sessions, conditions and trials are automatically populated from the (meta)data in ArQive and the uploaded files.

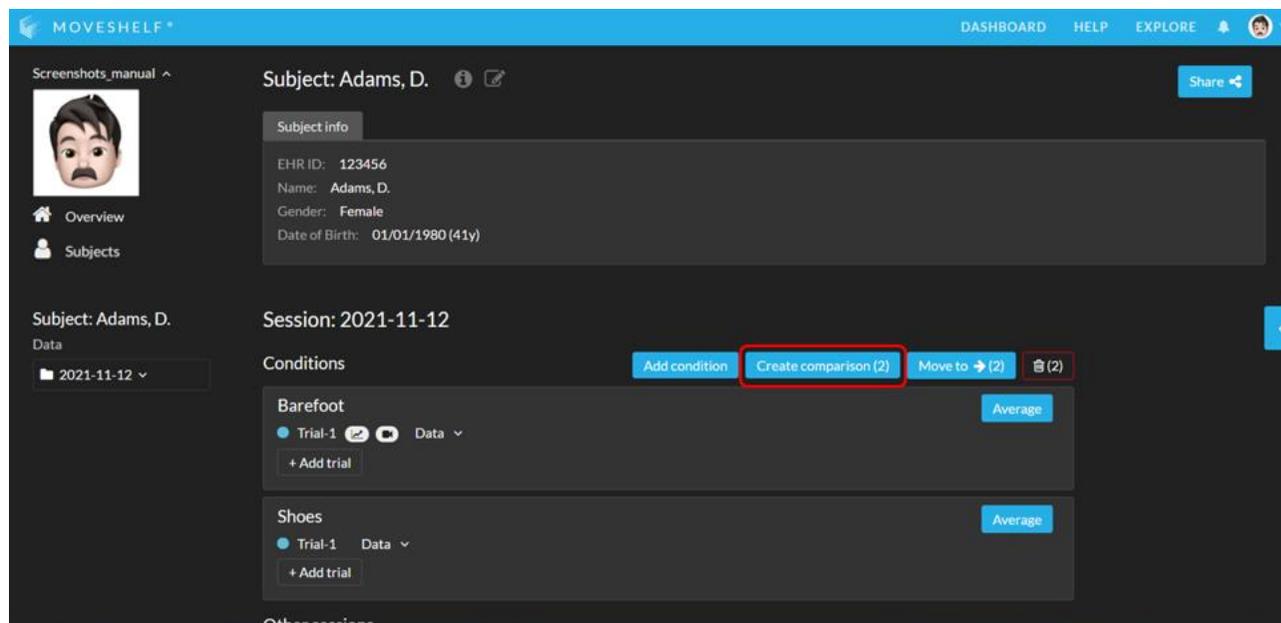


5.4 Features

5.4.1 Comparisons

Create comparison

- Click on the subject's name to navigate to the subject home page and click on  of a session to start the process for creating a comparison between different trials.
- Select the trials you want to compare and click on **'Create comparison'**.





Add reference data

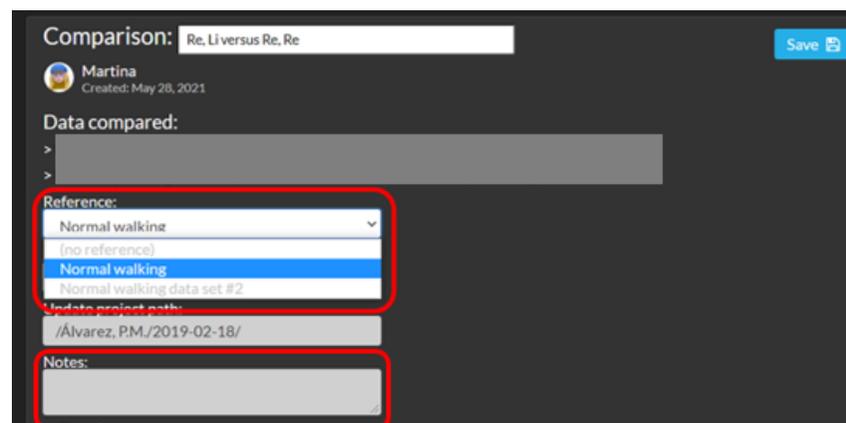
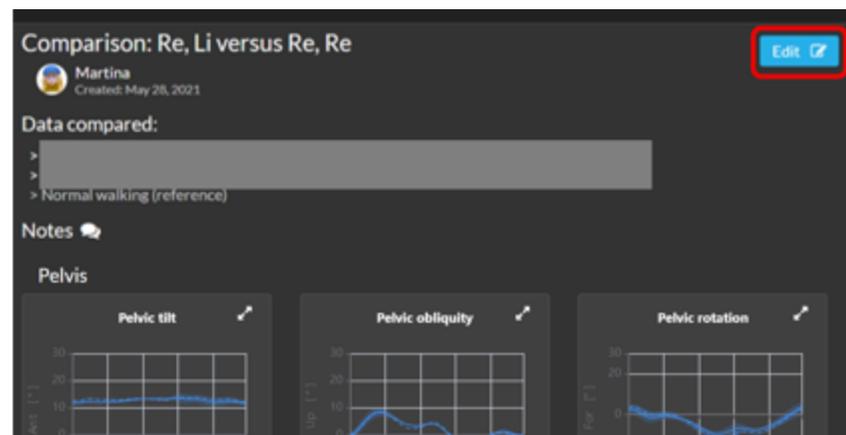
- Within your comparison, click on **'Edit'** to add reference data. Reference data can be created within your project, based on (a selection of) your data. It is possible to have multiple reference datasets in one project, like age grouped or matched by movement disorder e.g.

Edit comparison

Click on **'Edit'** within the comparison to add notes to the comparison at the bottom of the edit options. You can also change the name of the comparison on top of the screen when in editing mode.

Note:

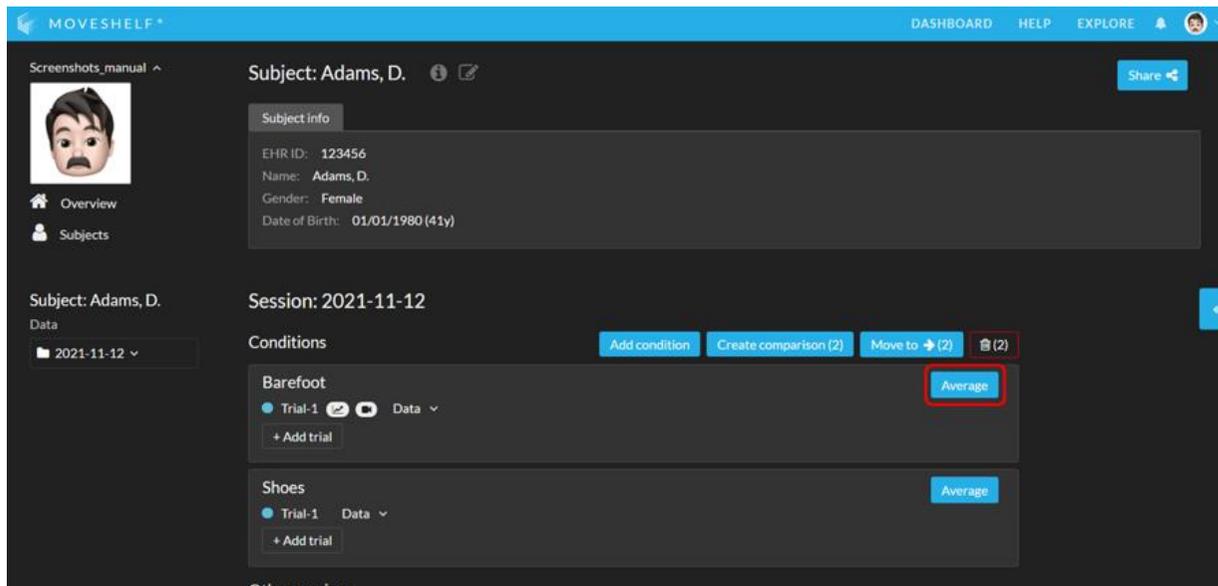
- 1. You can compare trials within one condition, between different conditions or between different sessions of the same subject.*
- 2. You can compare 2 or more trials.*
- 3. The comparison name has a limited amount of characters you can use. When the interface does not create your comparison, try making the name of your comparison shorter.*



5.4.2 Create average

Calculate average

- Go to the subject home page and click on  to go in editing mode and start the process for creating an average over several trials within one condition.
- Select all trials you want to average and click on **'Average'**.



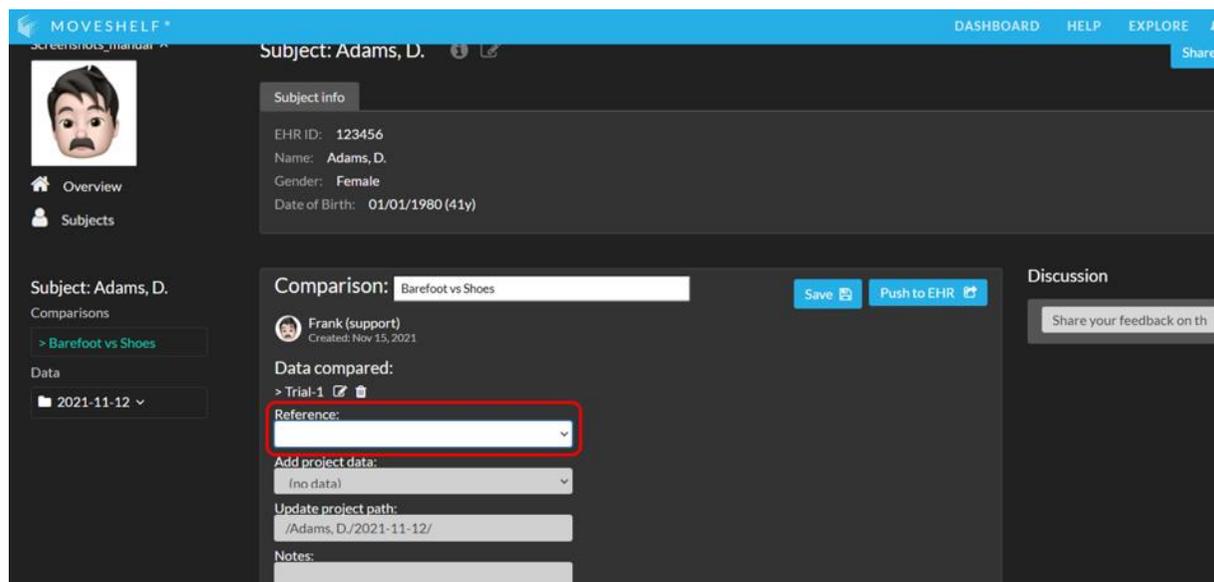
The screenshot shows the MOVESHelf interface for a subject named Adams, D. The page is titled 'Subject: Adams, D.' and includes a 'Share' button. The subject information section displays: EHR ID: 123456, Name: Adams, D., Gender: Female, and Date of Birth: 01/01/1980 (41y). The session is identified as 'Session: 2021-11-12'. Under the 'Conditions' section, there are two conditions: 'Barefoot' and 'Shoes'. Each condition has a list of trials (e.g., Trial-1) and an 'Average' button. The 'Average' button for the 'Barefoot' condition is highlighted with a red box.



Add average to a comparison

You can now add the calculated average to a comparison. Please note that for now, an average is added to the comparison similar to a reference set.

- Open the comparison and click on **'Edit'**.
- Open the drop-down Reference menu and add the average as reference data to the comparison.
- Click on **'Save'**.



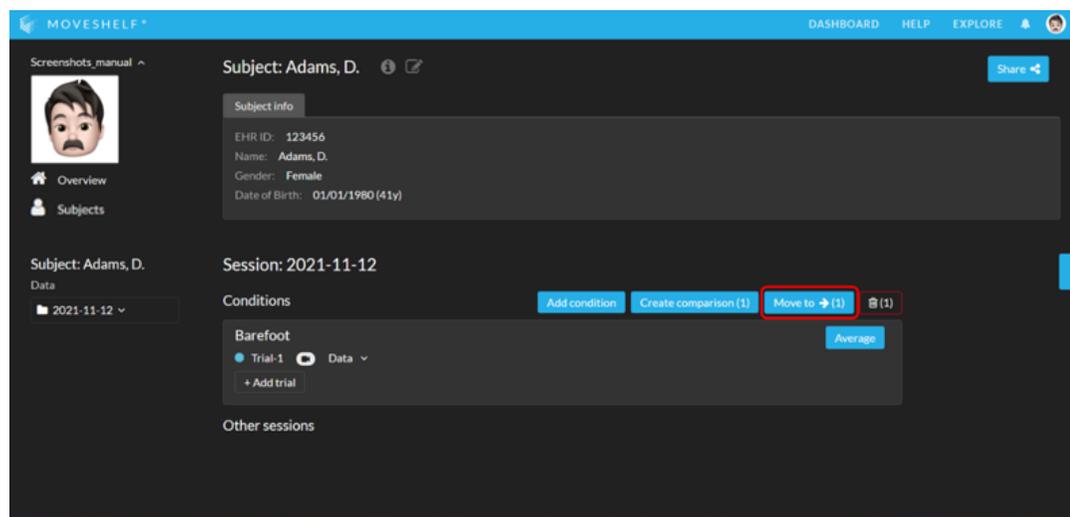


5.4.3 Reorganize trials

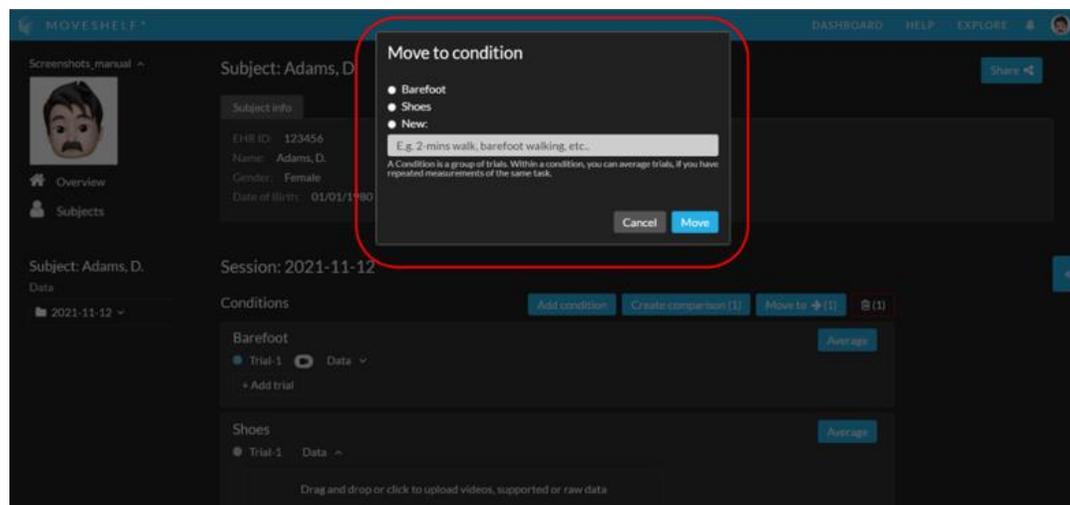
You can reorganize your data by using the button

‘Move to’:

- Select all trials you want to include in a new or existing condition.



- Click on ‘Move to’ and select a condition or create a new condition you want to move the files to.

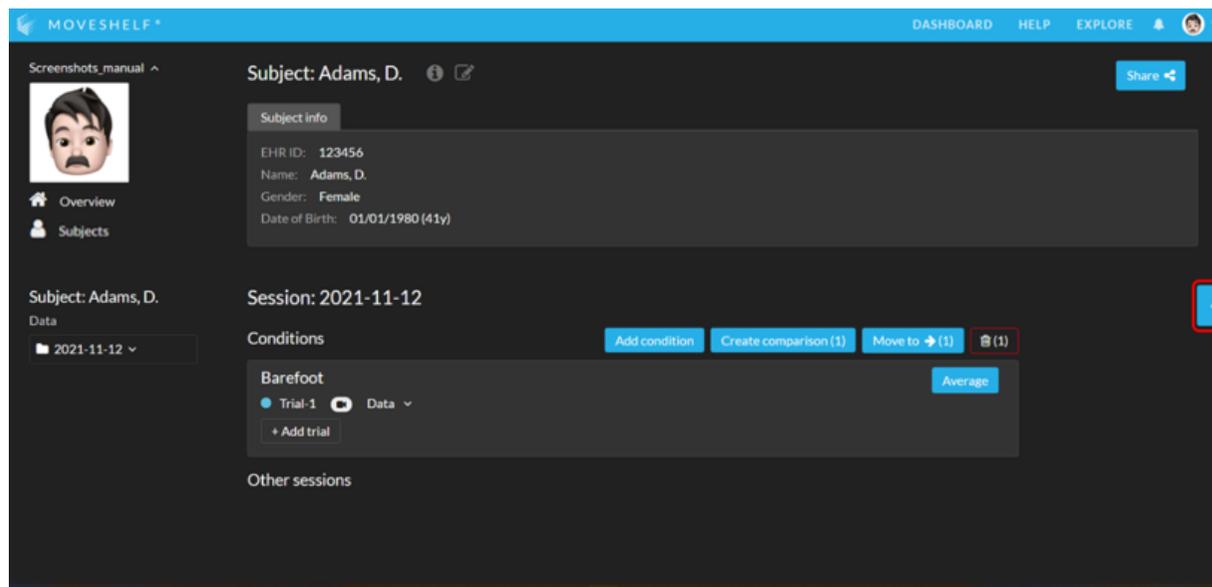




5.4.4 Anonymize videos^(Optional BETA)

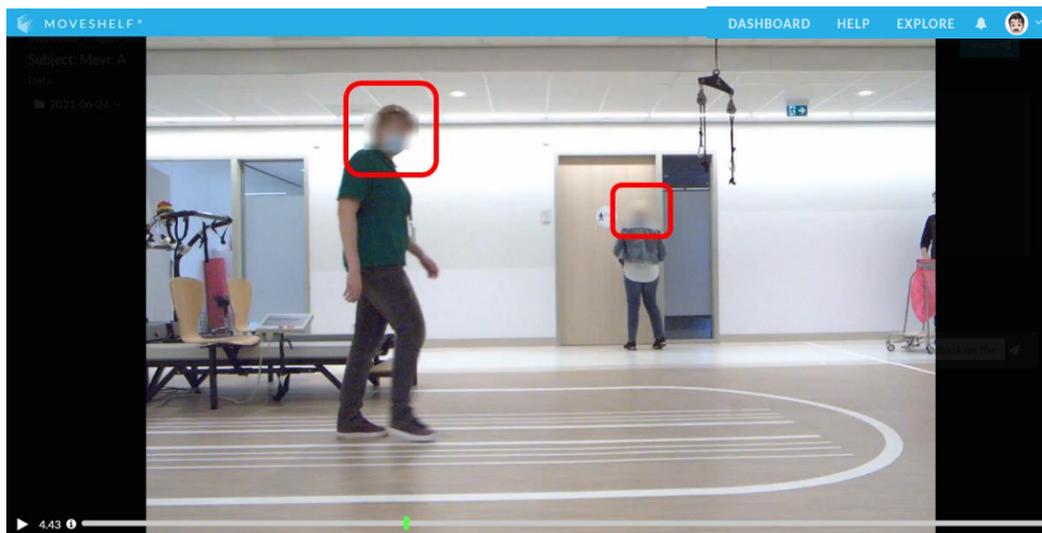
If this feature is available for your organization, you can anonymize 2D videos by processing your videos through an image recognition algorithm that automatically blurs all faces clearly visible in the videos.

- Select a trial that includes 2D videos and click on  to open a multiple-choice menu.
- Select video anonymizer and click on **'Run'**.



Note: this is a BETA feature. The quality of the results is expected to be good, but please check your videos after processing. Please let us know if you think the anonymization did not perform well enough.

- After processing, face blurring is applied to all people in the videos.



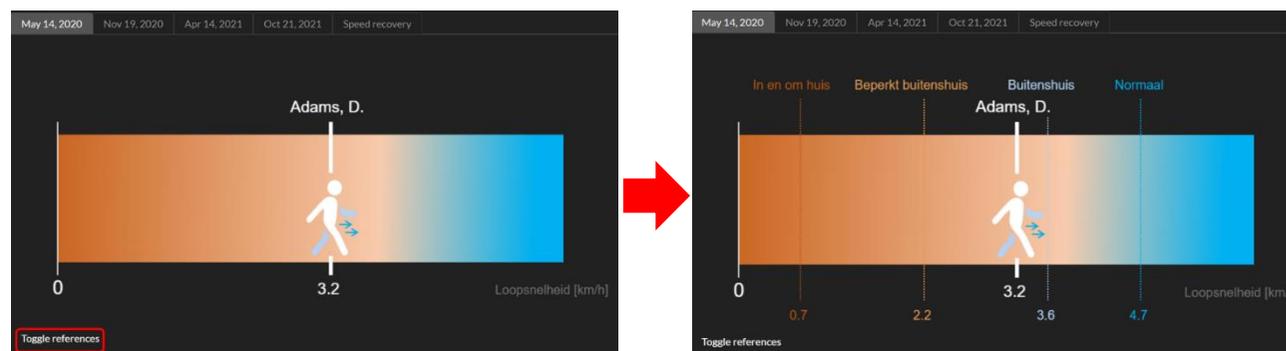
5.4.5 Longitudinal overview^(Optional)

Currently, gait speed is a parameter available for longitudinal evaluation. Add gait speed to the subject information (see [5.2.1 Add subject information^{\(Optional\)}](#)) and Moveshelf will automatically create a longitudinal overview.

- Go to the subject information and click on **'Add'** to add multiple gait speed measurements and add the measurement date.

Gait speed [m/s]	Date
0.8	02-11-21
1.1	09-12-21
0.9	03-03-21
1.3	28-06-21

- A longitudinal overview will automatically be created and shown at the subject home page. Click on **'Toggle references'** to add pre-programmed reference data to the graph.



- Click on ‘**speed recovery**’ to view the complete longitudinal overview of all measurements that have been done, which in this case is an overview of the subject’s progress over time.
- This graph will show you the mobility recovery journey, including reference data from healthy peers and patient group peers.

