

User Manual

Cloud-Based AI Tool for PERCIST Analysis of PET/CT Studies



RECOMIA

Digital PERCIST version 1.0

Research Consortium for Medical Image Analysis (RECOMIA)

Lund, Sweden

<https://www.recomia.org>

Table of Contents

1. Login to the RECOMIA Platform
2. Upload PET/CT Studies
3. Prepare Study for Analysis
4. Analyse Baseline Study
5. Analyse Follow-up Study
6. Viewing Tools

1. Login to the RECOMIA Platform

The RECOMIA platform uses **two-factor authentication** to ensure secure access.

1. Enter your **email** and **personal password**.
2. A one-time **6-digit verification code** will be sent to your registered email address.
3. Enter this code in the login window to complete authentication.

Note:

Users participating in multiple clinical trials must select the desired **trial** before proceeding.



Figure 1. Login screen showing two-factor authentication process.

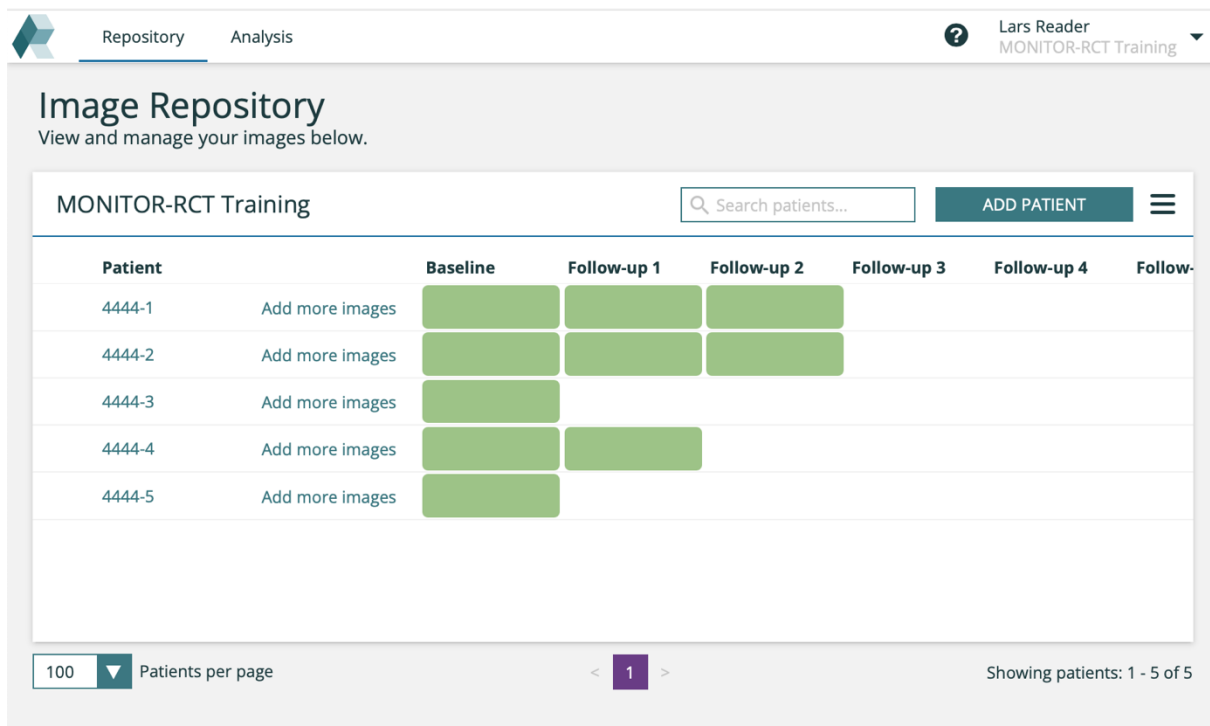
2. Upload PET/CT Studies

2.1 Export and Preparation

Ensure that **axial PET and CT images** are exported from your clinical system. Images **do not need to be de-identified**—RECOMIA automatically performs DICOM-compliant de-identification upon upload.

2.2 Adding or Updating Patient Records

- For a **new patient**, click **Add Patient** in the **Repository** window.
- To add a new study for an **existing patient**, click **Add more images** next to the patient entry.



The screenshot shows the 'Image Repository' interface. At the top, there are tabs for 'Repository' and 'Analysis'. A user profile for 'Lars Reader' is visible in the top right. The main heading is 'Image Repository' with the subtitle 'View and manage your images below.' Below this is a search bar labeled 'MONITOR-RCT Training' and a button 'ADD PATIENT'. A table lists five patients (4444-1 to 4444-5) with columns for 'Baseline', 'Follow-up 1', 'Follow-up 2', 'Follow-up 3', 'Follow-up 4', and 'Follow-up 5'. Each patient row has an 'Add more images' link and a green bar indicating the status of the study. At the bottom, there is a pagination control showing '100 Patients per page' and 'Showing patients: 1 - 5 of 5'.

Patient		Baseline	Follow-up 1	Follow-up 2	Follow-up 3	Follow-up 4	Follow-up 5
4444-1	Add more images						
4444-2	Add more images						
4444-3	Add more images						
4444-4	Add more images						
4444-5	Add more images						

Figure 2. Repository view with “Add Patient” and “Add more images” buttons.

2.3 Uploading Studies

1. **Drag and drop** the PET/CT study into the browser window.
 - Upload **only one PET** and **one CT** series per visit.
 - Assign the appropriate **visit label** (default: *Baseline*).
2. Verify that the correct series have been selected.
 - Click **DICOM tags** to review metadata that will be altered during de-identification.
3. During de-identification and compression, images remain **on the local computer**.
 - Once complete, they are securely uploaded to the RECOMIA server.
4. For new patients, select the correct **Trial ID** from the dropdown list.

After upload, the study is automatically processed for **PERCIST AI analysis**, which typically completes within **5–10 minutes**.

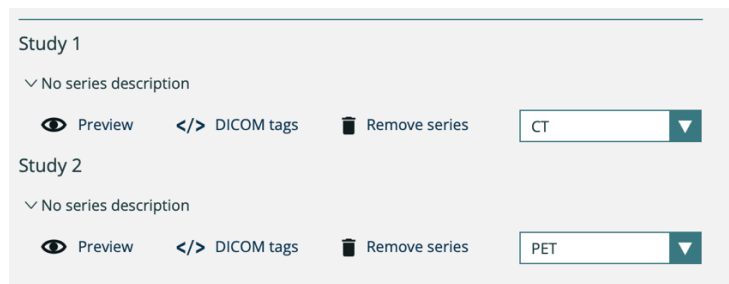


Figure 3. Upload window showing images before de-identification.

3. Prepare Study for Analysis

3.1 Preparing the Study

1. In the **Repository**, select the study and click **Preview Image**.
2. Click **Prepare for Analysis** in the left column.
3. Click **Create** to initiate preparation.

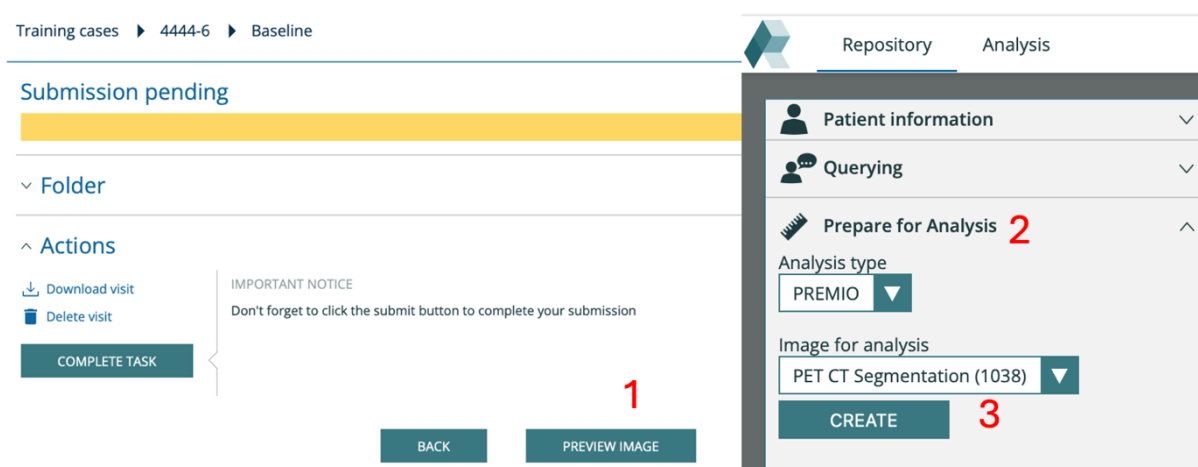


Figure 4. Preparing the Study.

3.2 Assigning Readers

1. Assign one or more **readers** to the study for PERCIST analysis.
2. Click **Create** when all readers are added.
3. Close the preview using the **X** in the upper-right corner.
4. Click **Complete the task**, then **Back** to return to the Repository.

The study box will turn **green**, indicating it is ready for PERCIST analysis.

Type of Analysis

PREMIO

Lars Reader —

CREATE

Figure 5. *Assigning Readers.*

4. Analyse Baseline Study

4.1 Overview

The **Analysis List** displays all studies assigned for analysis.
A **red dot** indicates a new study awaiting review.

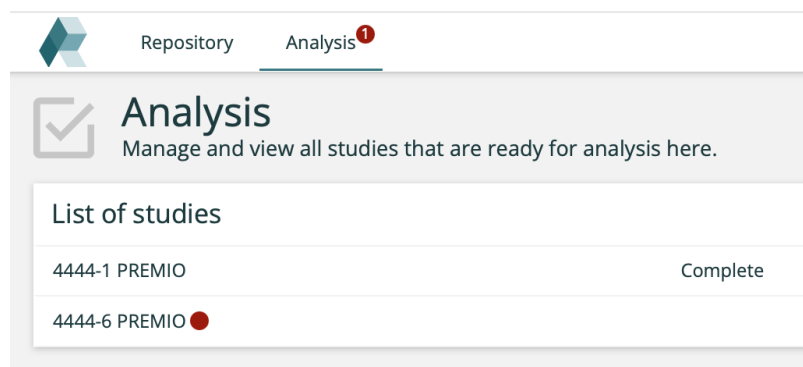


Figure 6. *Analysis List view highlighting new (red dot) studies.*

4.2 Automatic AI Preprocessing

- The **liver** is automatically segmented, and a **spherical VOI** is positioned in the most representative region.
- The **aorta background** is calculated using a **cylindrical VOI**.
 - Click **Switch to aorta** to toggle between background reference

Step 1: Set background activity

Liver

SUL: 1.4 SD: 0.24 Threshold: 2.6

Switch to aorta

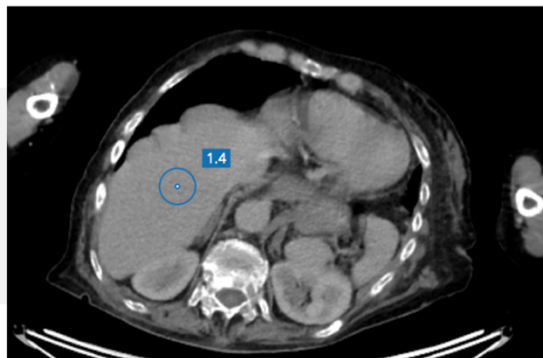


Figure 7. Automatic liver background segmentation.

4.3 Lesion Detection and Review

- AI identifies all potential hypermetabolic volumes exceeding the liver or aorta thresholds.
- Volumes are listed **from highest to lowest SULpeak**.
- Physiological uptakes (brain, heart, urinary tract) are marked **green**.
- Suspected tumor-related volumes are marked **red**.
- Click an entry to highlight it in the image viewer.
- Use the **X** shortcut to toggle segmentations on or off.

AI Assist ☒

Step 1: Set background activity

Liver

SUL: 1.4 SD: 0.24 Threshold: 2.6

Switch to aorta

Step 2: Select lesion

Click here for historical data

No lesion

74.31	Urinary tract
21.56	Urinary tract
9.97	Urinary tract
8.28	Urinary tract
7.24	Urinary tract
5.94	Brain activity
5.47	Bone mets
5.34	Urinary tract
5.07	Bone mets
4.98	Bone mets
4.54	Bone mets
4.51	Bone mets
4.48	Bone mets
4.48	Urinary tract
4.38	Soft tissue tumor
4.31	Hip bone left
4.23	Bone mets
4.23	Bone mets
4.21	Bone mets
4.15	Bone mets

Finalize form

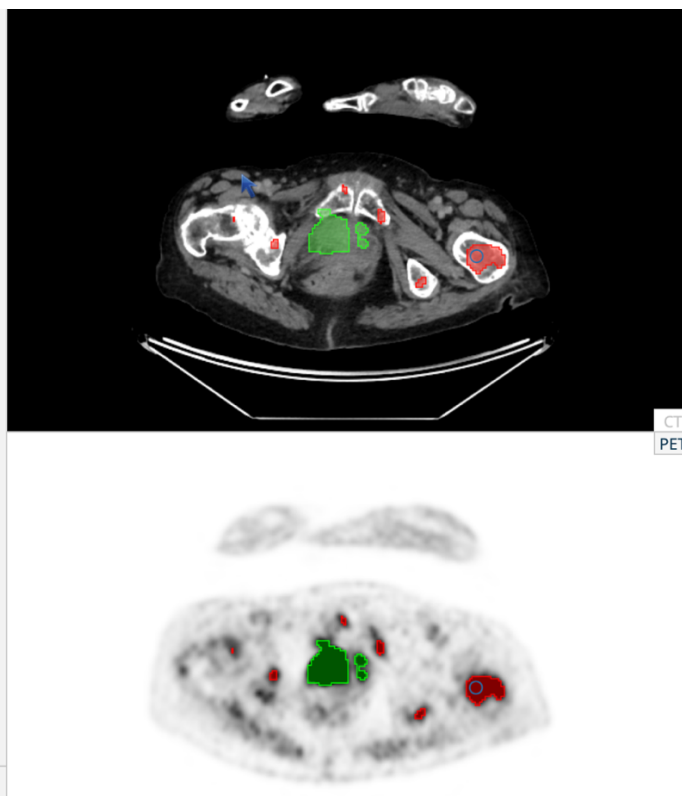


Figure 8. Lesion detection list with green and red VOI classifications.

4.4 Adjusting Thresholds

If no lesion exceeds the threshold:

- Click the **cogwheel icon** to reveal the threshold slider.
- Adjust as necessary to identify potential target lesions.



Figure 9. *Threshold adjustment slider.*

4.5 Target Lesion Selection

- Select the target lesion by checking its box.
- If no measurable lesion is present, select **No lesion**.
- To correct a mistake, click the **trash icon** next to the lesion's SULpeak value.
- Manual target definition can also be performed using the **Target Lesion circle tool**.

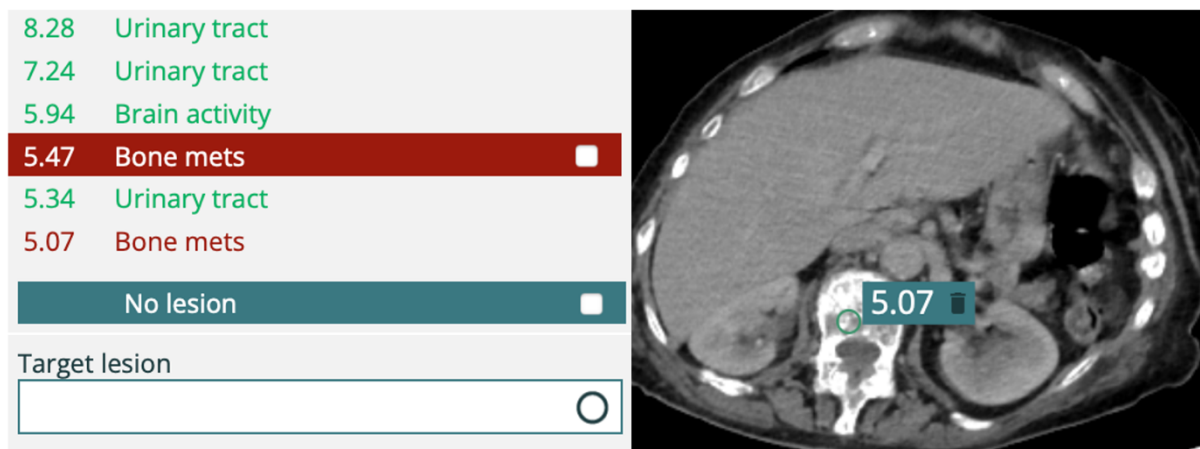


Figure 10. *Target lesion selection and manual measurement tool.*

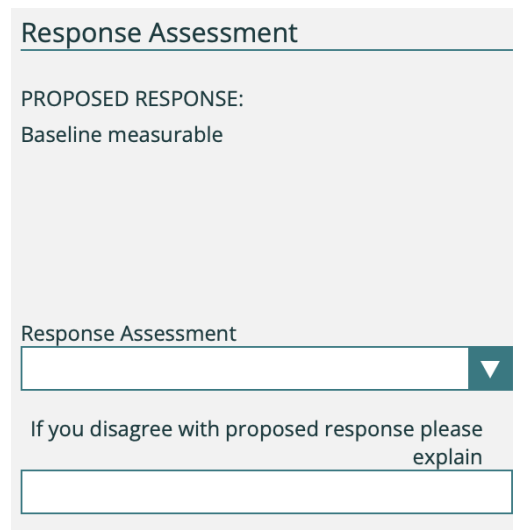
4.6 Response Assessment

The **Digital PERCIST** system proposes a response classification. For baseline studies, available options are:

- *Baseline measurable*
- *Baseline not measurable*

Users may accept or override the proposed classification.
If overridden, a short **explanation** must be entered in the text box.

Click **Complete form** to save the analysis to the server.



The form is titled "Response Assessment" and is set against a light gray background. It contains the following elements: a label "PROPOSED RESPONSE:" followed by the text "Baseline measurable"; a dropdown menu labeled "Response Assessment" with a downward arrow icon; and a text input field preceded by the label "If you disagree with proposed response please explain".

Figure 11. *Response assessment form for baseline studies.*

5. Analyse Follow-up Study

5.1 Overview

In the analysis window:

- The **current (follow-up)** study is displayed on the **left**.
- The **previous (reference)** study is displayed on the **right**.
- The default reference is the **baseline** study, but previous follow-ups can be selected from the dropdown.
- Click **Click here for historical data** for an overview of earlier analyses.

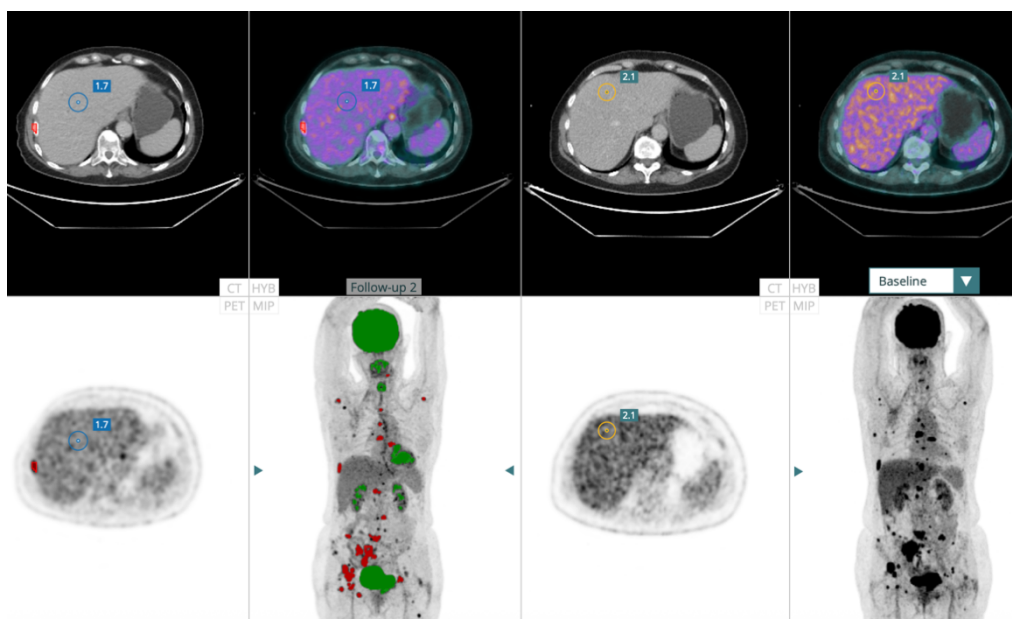


Figure 12. Follow-up analysis interface showing baseline (right) and follow-up (left).

5.2 Comparative Analysis

- The **SULpeak change** relative to the reference study is displayed for each red lesion.
- Click the small **arrow icon** to sort the list by the greatest increase.

Green (physiological) volumes do not display changes unless manually reclassified. Double-click a green lesion to toggle it to red and include it in the comparison.

Step 2: Select lesion		
Click here for historical data		
⚙️		
▼	No lesion	▼
5.50	Bone mets	+487%
15.36	Urinary tract	
5.30	Heart activity	
3.04	Heart activity	
10.78	Brain activity	
5.76	Bone mets	+199%
4.30	Heart activity	
3.14	Urinary tract	
3.45	Bone mets	+121%

Figure 13. Sorted lesion list showing SULpeak change compared to baseline.

5.3 Identifying New or Progressing Lesions

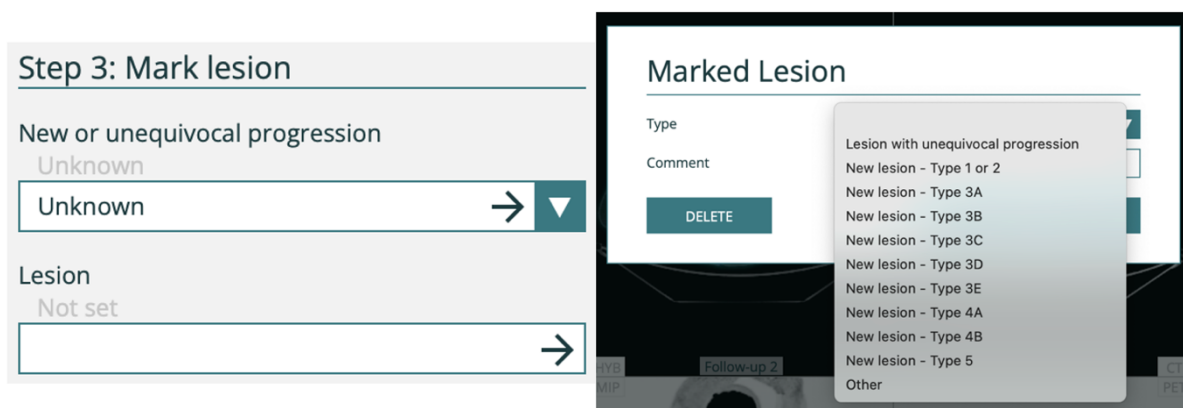
Use the dropdown menu to indicate the presence of:

- **New lesions**
- **Unequivocal progression** (*Yes / No / Unknown*)

You may also **mark lesions** directly on the image with an arrow and add **comments**.

These inputs influence the **system-proposed PERCIST response**.

After confirming the final **response assessment**, click **Complete form** to save results.



The image shows a software interface for marking lesions. On the left, under 'Step 3: Mark lesion', there are two dropdown menus. The first, 'New or unequivocal progression', has 'Unknown' selected. The second, 'Lesion', has 'Not set' selected. On the right, a 'Marked Lesion' panel is open, showing a 'Type' dropdown with a list of options: 'Lesion with unequivocal progression', 'New lesion - Type 1 or 2', 'New lesion - Type 3A', 'New lesion - Type 3B', 'New lesion - Type 3C', 'New lesion - Type 3D', 'New lesion - Type 3E', 'New lesion - Type 4A', 'New lesion - Type 4B', 'New lesion - Type 5', and 'Other'. A 'DELETE' button is also visible in the panel.

Figure 14. Tools for marking and classifying lesions.

5.4 Generate Report

After completing the analysis, click **Report** to generate a summary.

The report includes quantitative data and response classifications for all patient studies.

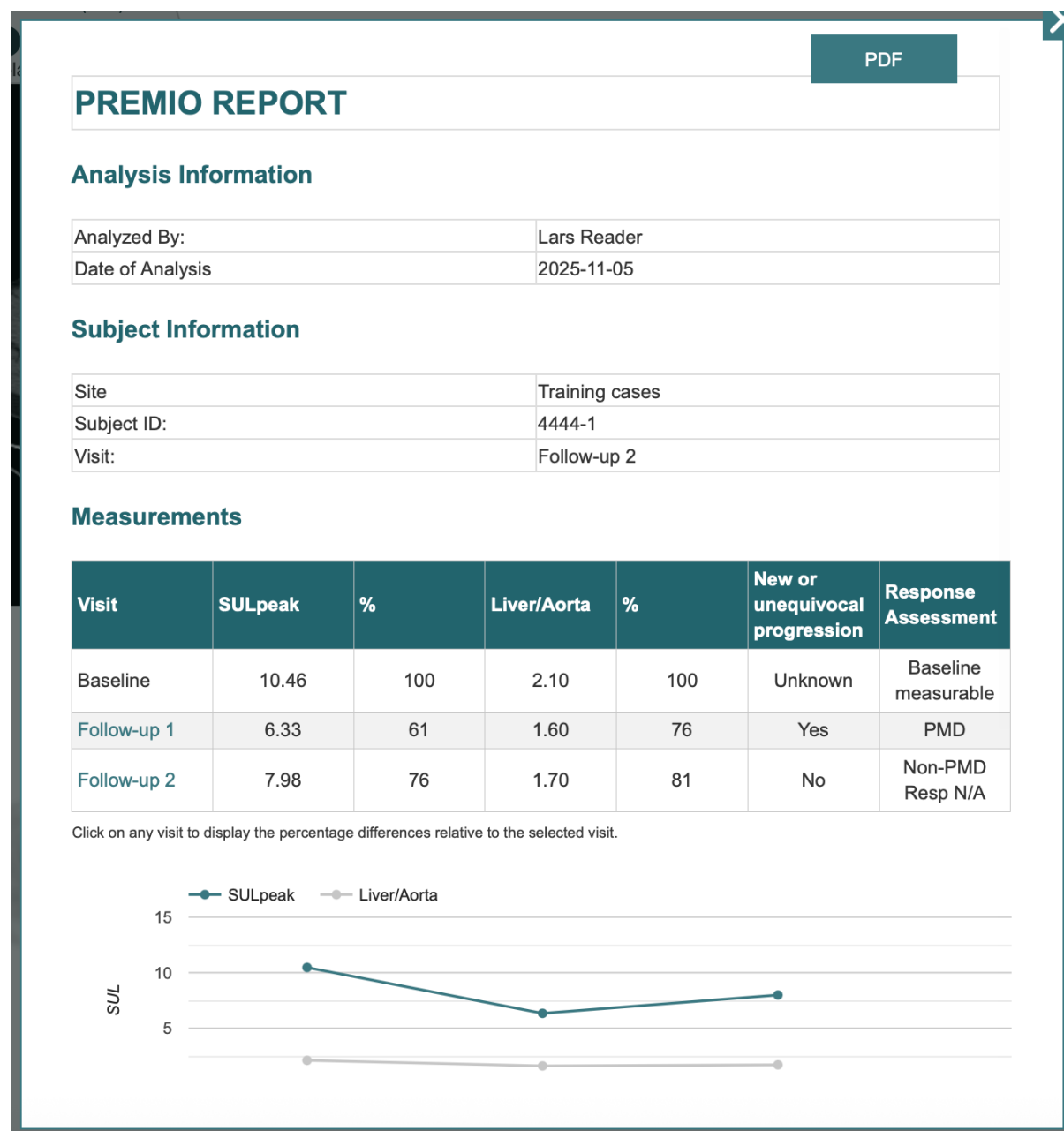


Figure 15. Example of the PERCIST summary report.

6. Viewing Tools

Function	Mouse / Keyboard Shortcut
Move image	Left mouse + drag
Zoom in/out	Right mouse + move up/down
Reset zoom	R
Change slice up	W / Scroll up
Change slice down	S / Scroll down
Toggle PET/CT image	C
Toggle planes (axial, sagittal, coronal)	V
Full screen	F
Exit full screen	Esc
Measure distance (A–B)	M
Change CT window preset	1–7
Adjust CT window length	Scroll click + move up/down
Adjust CT window width	Scroll click + move left/right
Toggle smoothing (none/medium/high)	O
Measure SUVmax in circular ROI	N
Toggle segmentation opacity	X

Figure 16. *Overview of mouse and keyboard viewing tools.*