

Breath marking in Adobe Premiere Pro

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Instructions for our panelists: Initial setup

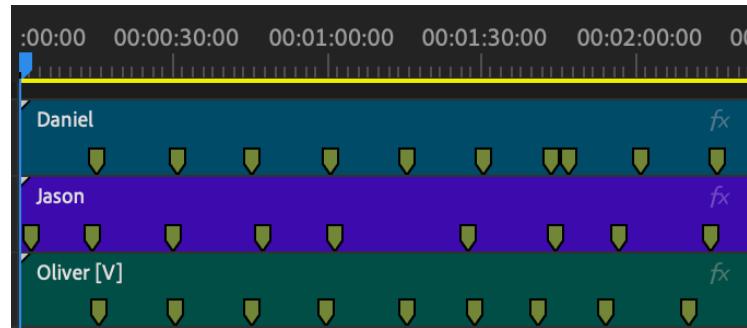
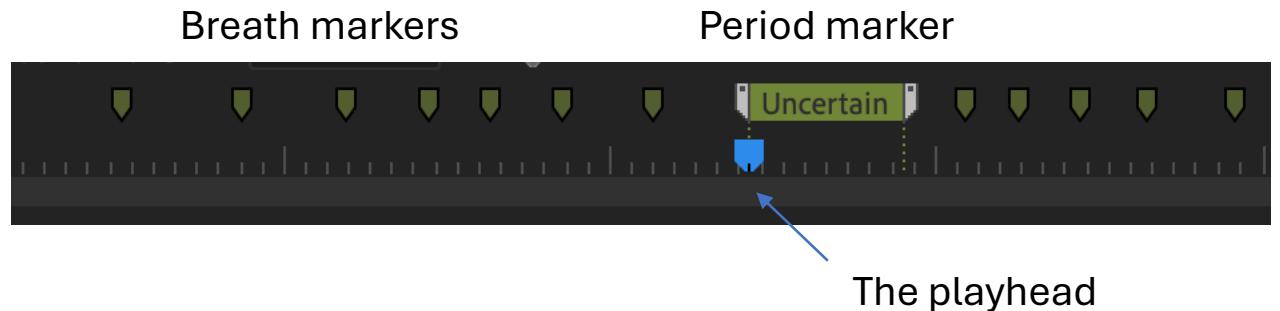
Overview

Using Adobe Premiere Pro's **markers**, you will create two types of annotations:

- The start of each breath
- Any periods of uncertainty or other problems

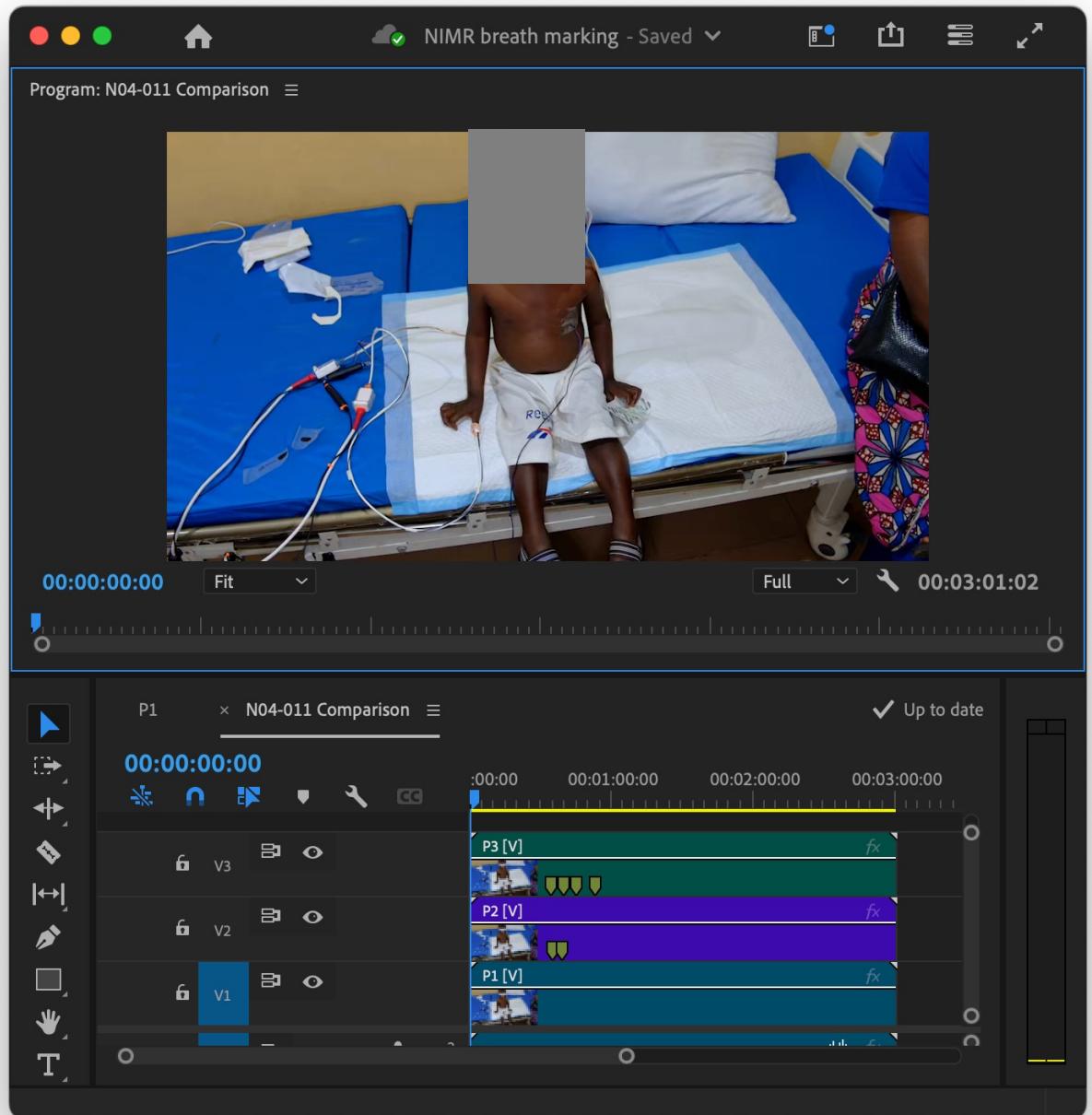
Using Premiere's **multi-camera** tools, you can toggle between the two cameras as you work.

After everyone has labeled a trial session, we can visually compare your markers and make any changes before finalizing.



Setup

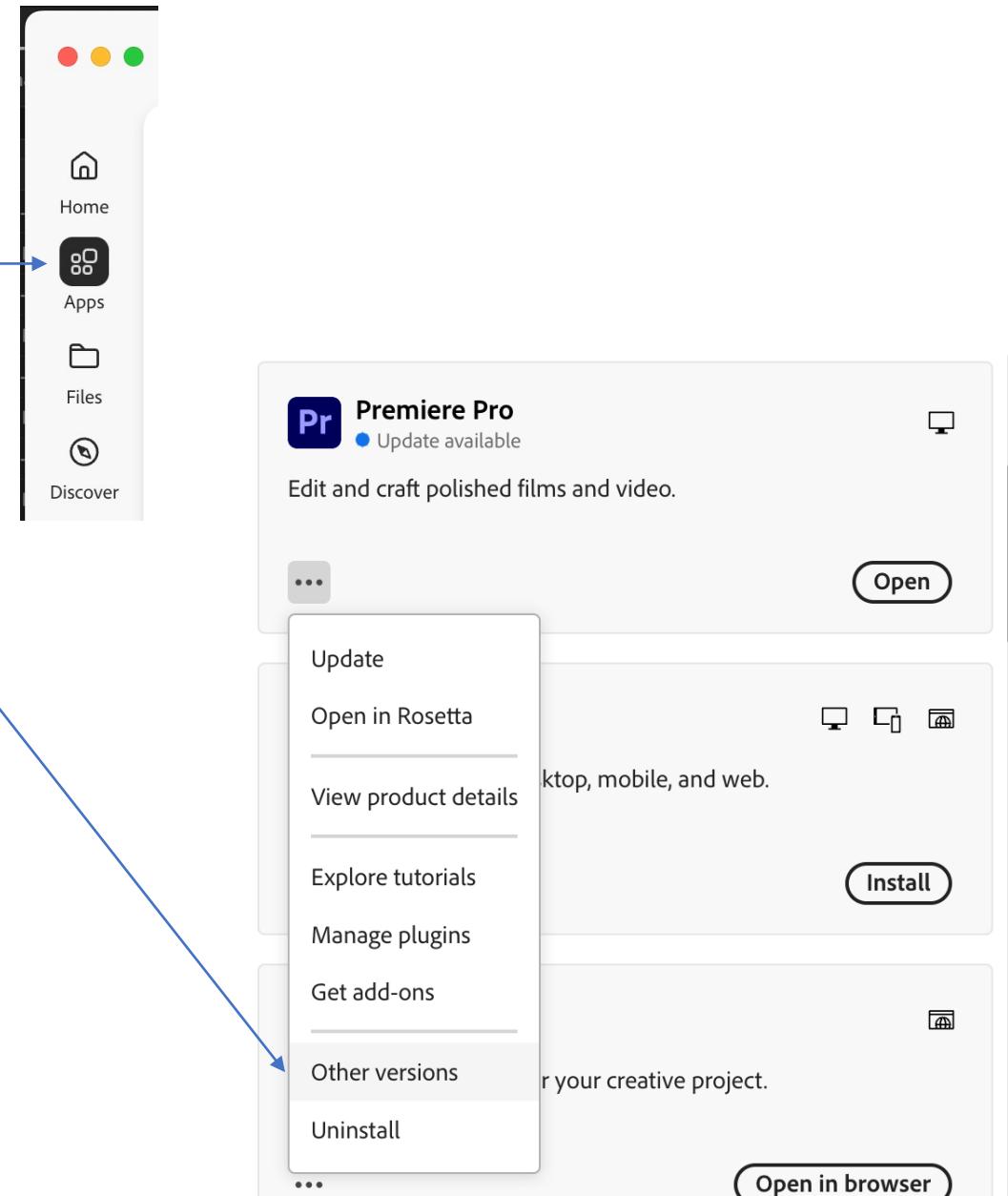
Premiere is a big, complex app. We're using only a few of its features, but some are advanced. Setting up your computer will take some time, but then Premiere should be efficient and effective for this job.



Installing Adobe Premiere Pro

1. Browse to **adobe.com** and log on with your provided account.
2. On the left, below Home, click **Apps**.
3. Install **Creative Cloud Desktop**, which is how you'll install Premiere Pro.
4. In Creative Cloud Desktop, click **Apps**.
5. On Premiere Pro's tile, open the overflow menu (...) and click **Other versions**.
6. Click to install the latest version of **Premiere 2024**, currently **24.6.3**.

Later, Adobe will probably encourage you to update to Premiere 2025 (release 25.x). **Do not upgrade** unless we as a team all agree to upgrade. Files are not compatible across releases.



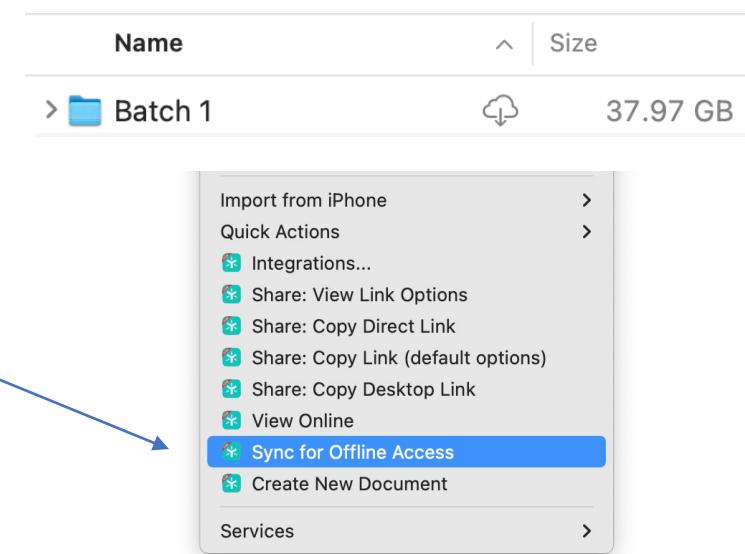
Setting up the project's files

We will use two sets of files, hosted separately:

1) Premiere Pro's native files will be on Adobe's cloud service. See the next slide.

2) The video files will be hosted on Egnyte. Adobe doesn't offer hosting for such files and they're big, so things are slightly complicated:

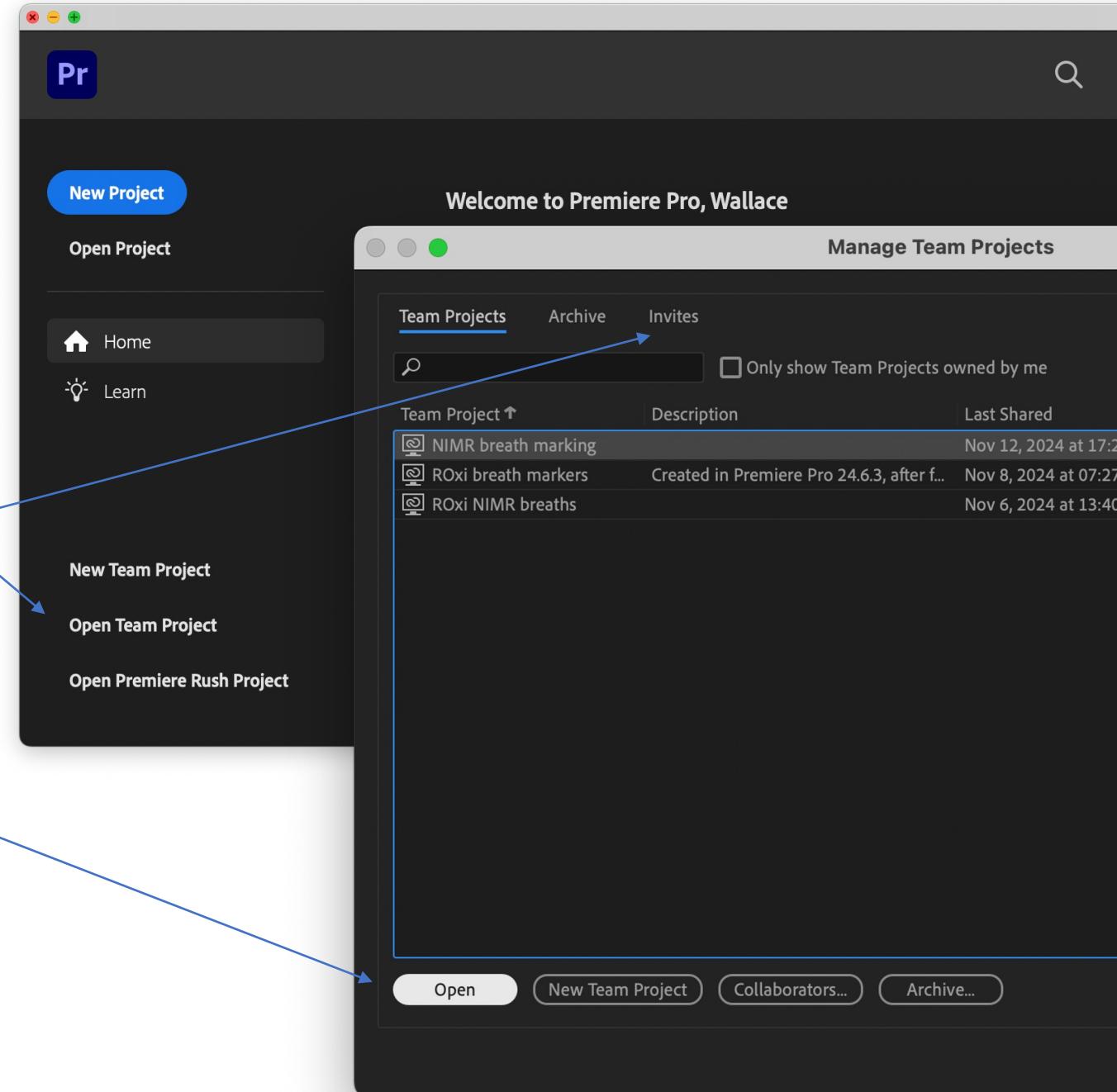
- Use the [Egnyte desktop app](#) to sync them to your computer. Once you pick a location, avoid moving them or Premiere will ask you for their new location—or maybe the Egnyte app won't give you a choice anyway.
- Like Dropbox and other sync services, the Egnyte app will download files to your computer as needed, but in Premiere you'll have to wait for "media pending." For the best experience, especially on a slow or unreliable connection, tell Egnyte to [sync the folder for offline access](#) before you start in Premiere. When you're done, tell Egnyte to remove offline access to release your disk space. (On a Mac, the right-click's "Download Now" is different: your Mac might remove the downloads.)



Using the Team Project

Adobe calls a shared, Adobe-hosted Premiere project a **Team Project**. Unlike a traditional Premiere project file, a Team Project allows concurrent access without risk of overwriting or losing work. Old versions are kept. You choose when to publish your changes and receive other people's updates. Theoretically, you can work offline.

1. When you start Premiere Pro, at bottom left click **Open Team Project**.
2. At the top of the next dialog, click **Invites**.
3. You should have an invite. Click the invited NIMR project and click **Accept**.
4. Click Team Projects if necessary.
5. Click on the project if necessary and click **Open**.

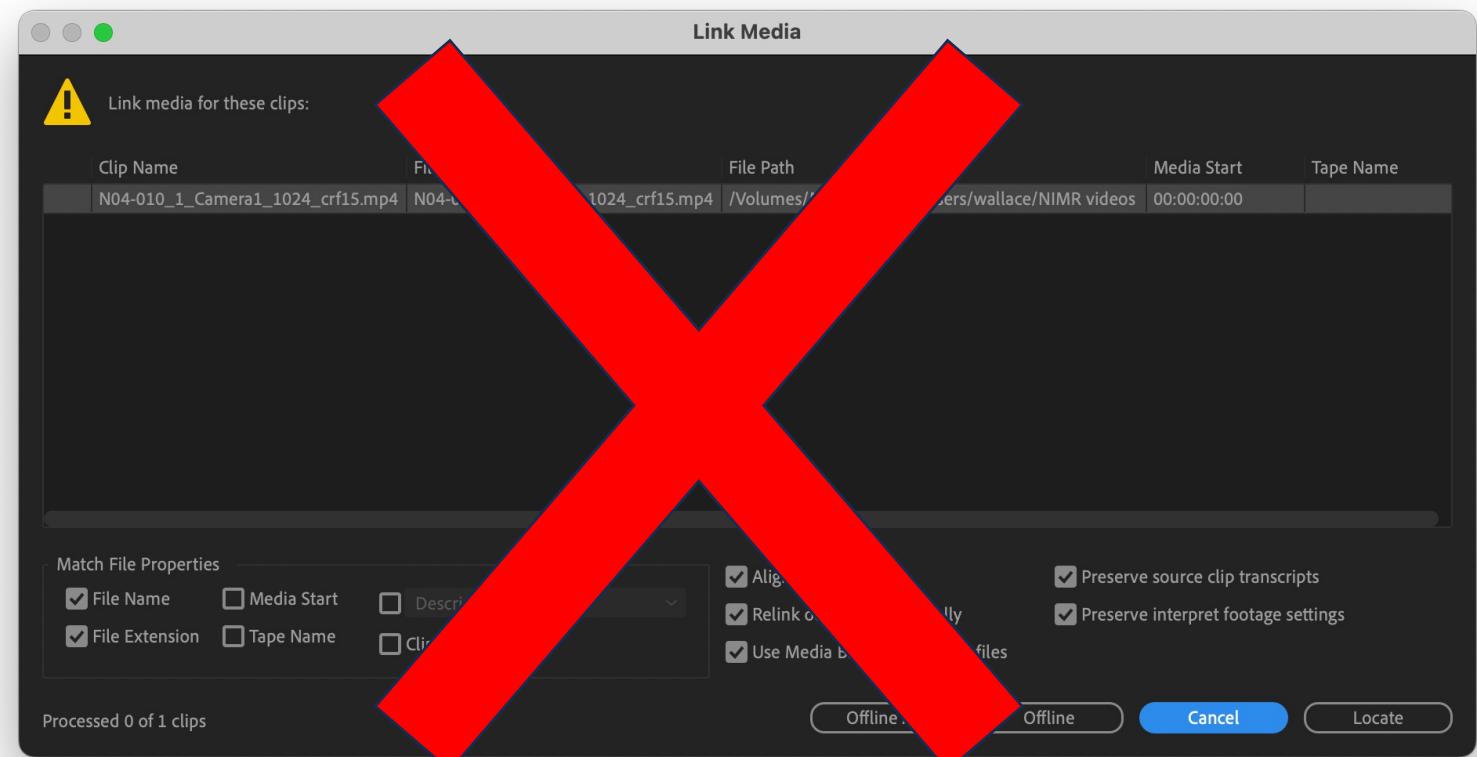
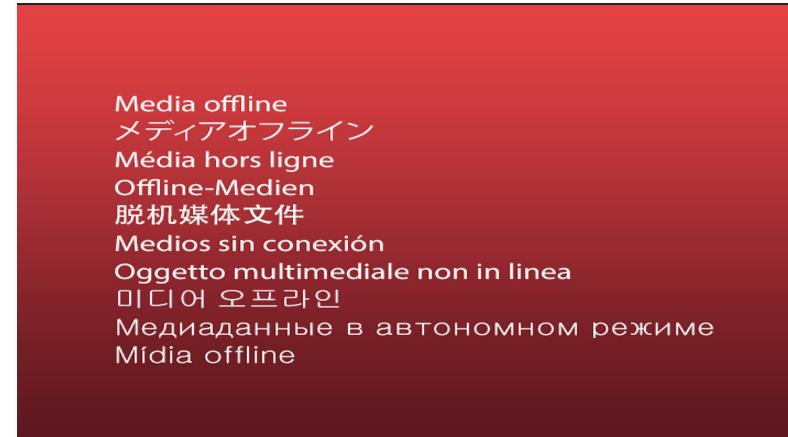


Media mapping (1)

The first time you open the Team Project, you'll need to show Premiere where you've stored the video files on your computer. Until you do, Premiere will show a Rosetta's stone of "Media offline" in place of the video.

Premiere may prompt you to relink the media. **Do not use the Link Media tool.** Press **Cancel**. (In spite of what Adobe's help says, relink the media would break everyone else's links to their copies of the media.)

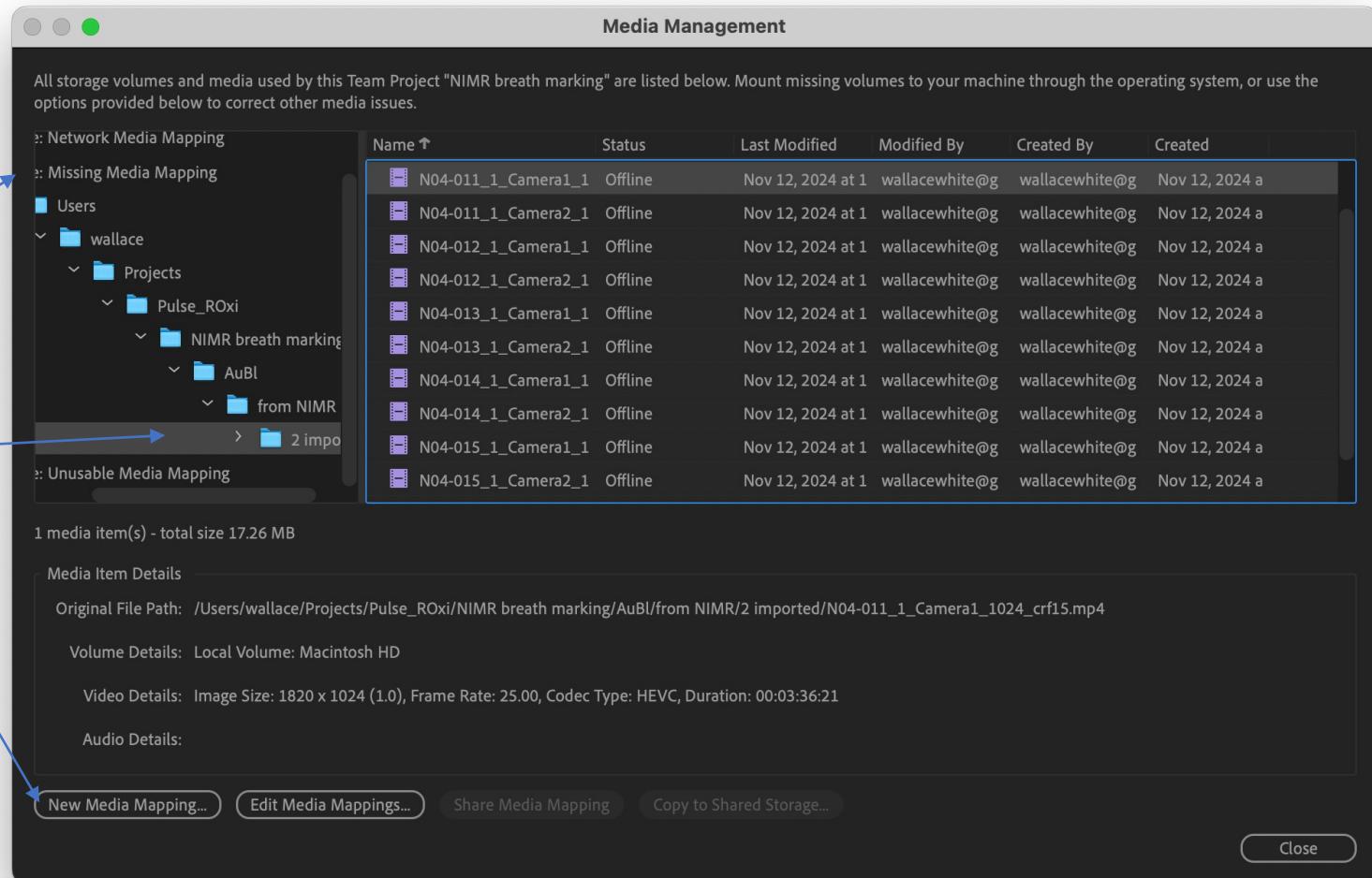
On the next slide, we'll instead fix the issue for your computer without affecting anyone else's.



Media mapping (2)

Here's the right way, creating a machine-specific mapping for yourself:

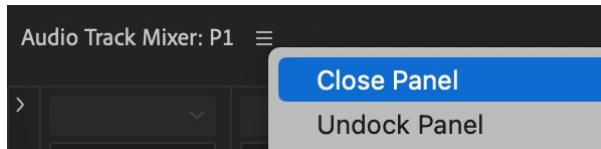
1. In the pull-down menus, click Edit > Team Project > **Media Management...**
2. In the dialog, keep drilling down into the path under **Offline Missing Media Mapping** until you see video files, as shown at right.
3. Click on that **folder**, probably named "Batch 1" (do not click on any of the video files).
4. Click **New Media Mapping...**
5. **Navigate** into your local copy of that folder and click **select folder** or **OK**.
6. Premiere should now list all the video files under "Online: Local Media Mapping," with no offline files. **Close** the Media Management dialog.



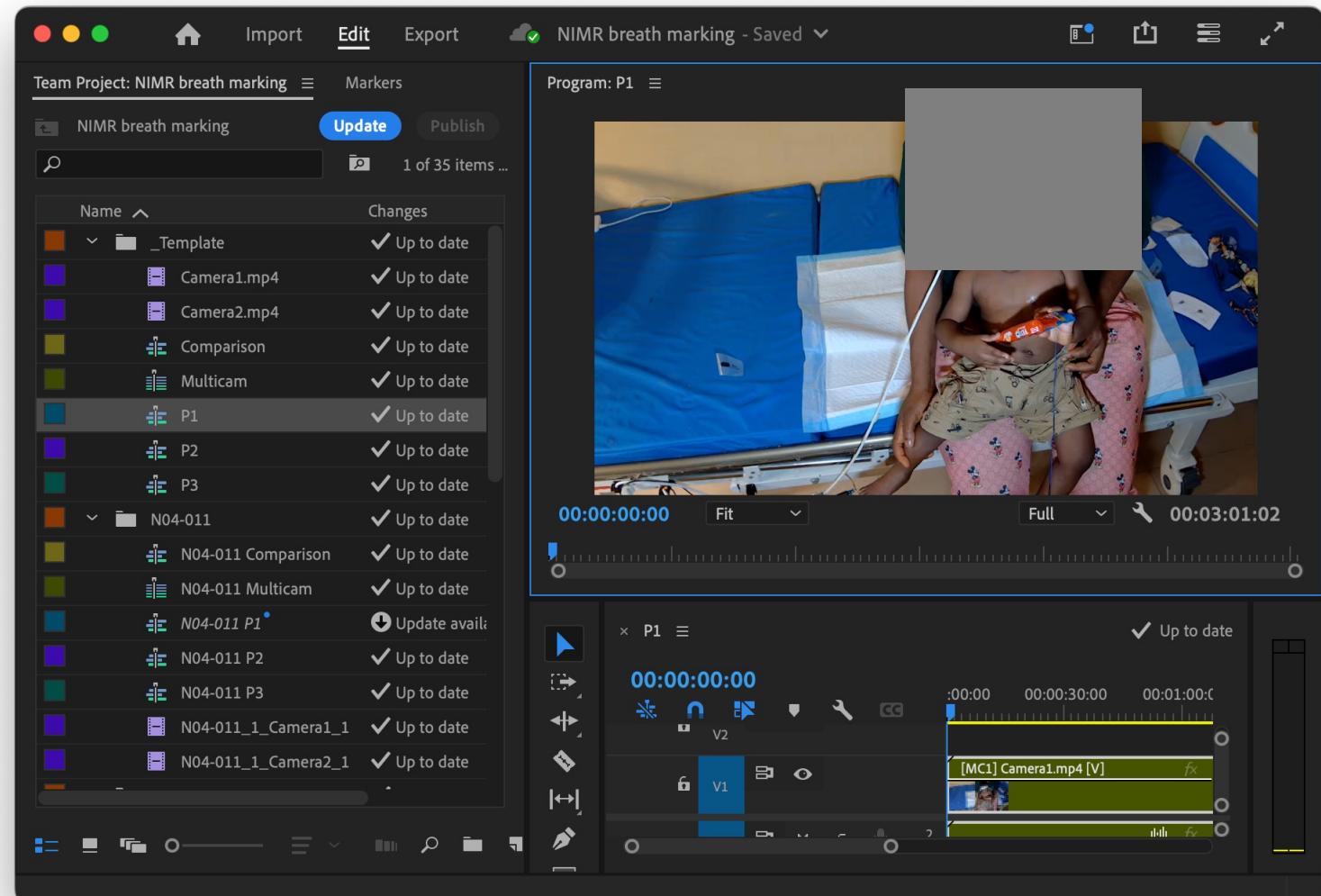
Configuring your workspace

To make your work easier and avoid confusion, let's simplify your **workspace**, which is what Premiere calls your configuration of on-screen panels. (Unfortunately [Adobe's import workspaces](#) didn't work for me, so this must be done on each computer.)

1. In the menu bar, click **Window > Workspaces > Assembly**. This is a decent starting point.
2. On any panels that aren't shown at right, right-click and **Close Panel**.



You may want to save your workspace so that if you accidentally mess it up you can re-open it.



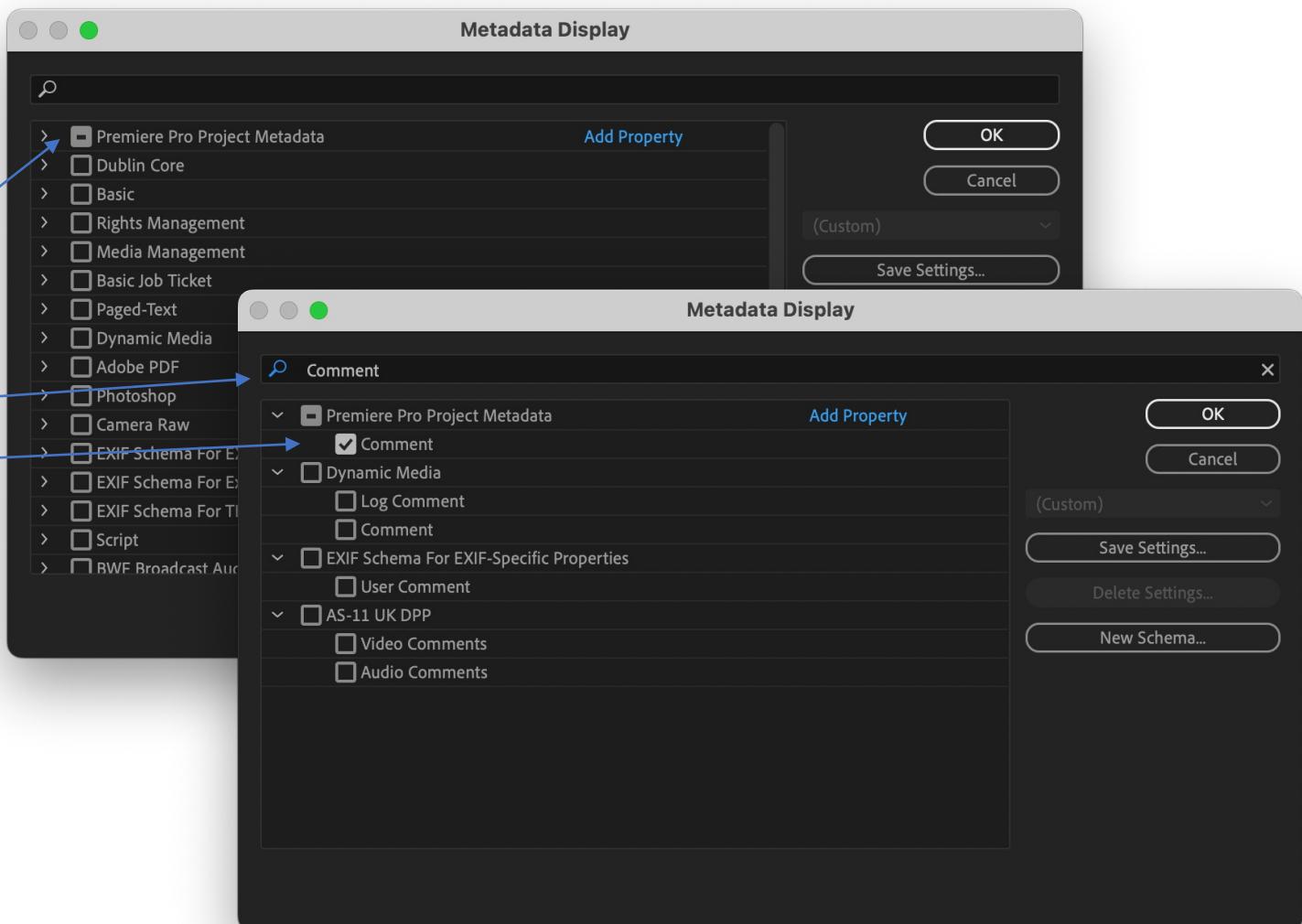
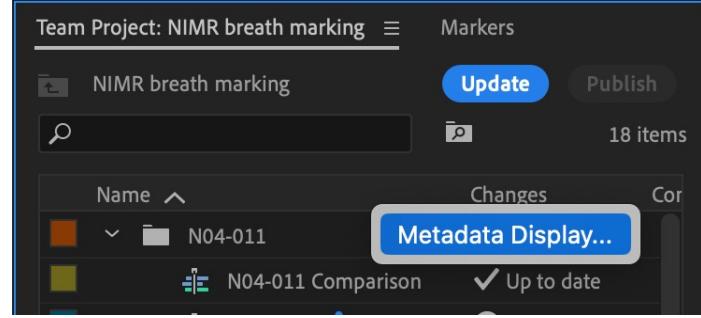
Configuring the metadata

In the Team Project panel's table, let's remove most fields and add one.

1. Right-click on the header and click **Metadata Display...**
2. Remove as many fields as possible by **clearing all top-level checkboxes** that are checked or partially checked with a dash. The first group, however, will still show a dash; that's fine.
3. In the search box, type “**comment**” and check **Premiere Pro Project Metadata/Comment**.
4. Do the same to check “**Changes**” and “**Label**”.

The Team Project table should then look like this:

Name	Changes	Comment
N04-011	✓ Up to date	
N04-011 Comparison	✓ Up to date	
N04-011 P1	⬇ Update availa	
N04-011 P2	✓ Up to date	
N04-011 P3	✓ Up to date	Here's a comment
N04-012	✓ Up to date	

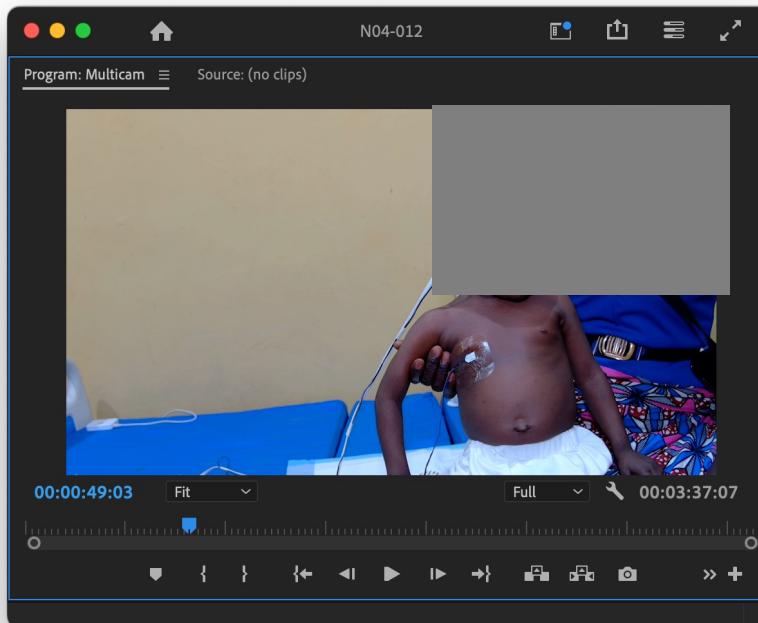


Optional: Configuring the Program Monitor

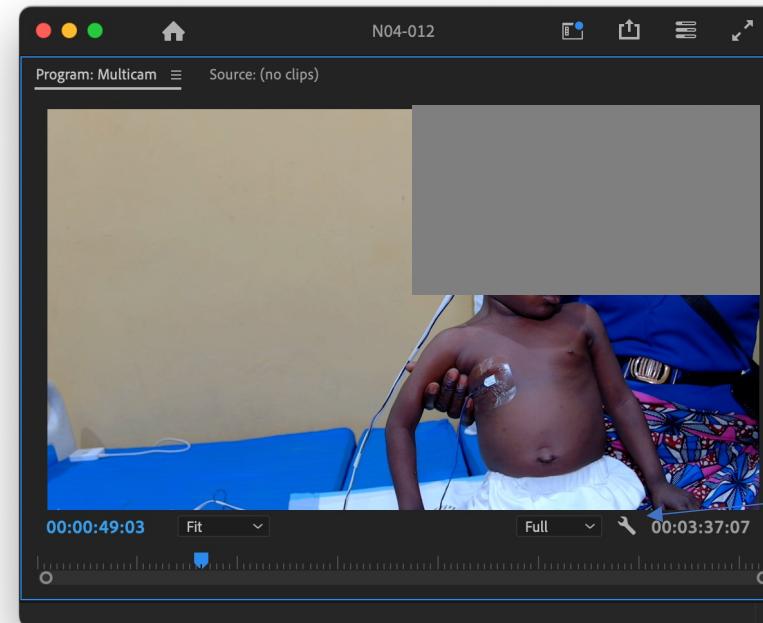
First open a sequence to allow these steps.

You can make more space for the video by clicking the wrench and unchecking **Show Transport Controls**. We don't need those, since we'll use keyboard shortcuts.

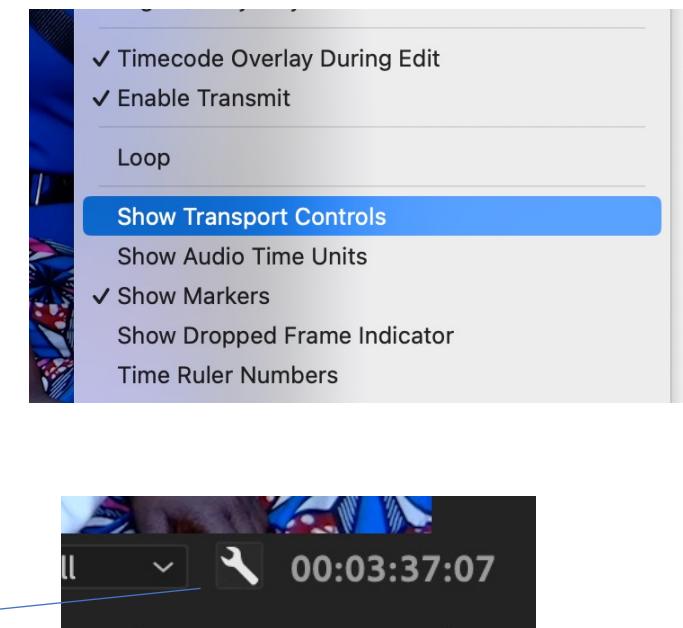
Also check "Timer Ruler Numbers" if you'd like to see times along the time axis. The playhead's time is always shown in blue at lower left, like in most video players.



Showing transport controls



Not showing transport controls



Instructions for our panelists:
Routine use

The project's items

We'll work on many trial sessions (maybe all) within a **single Team Project**.

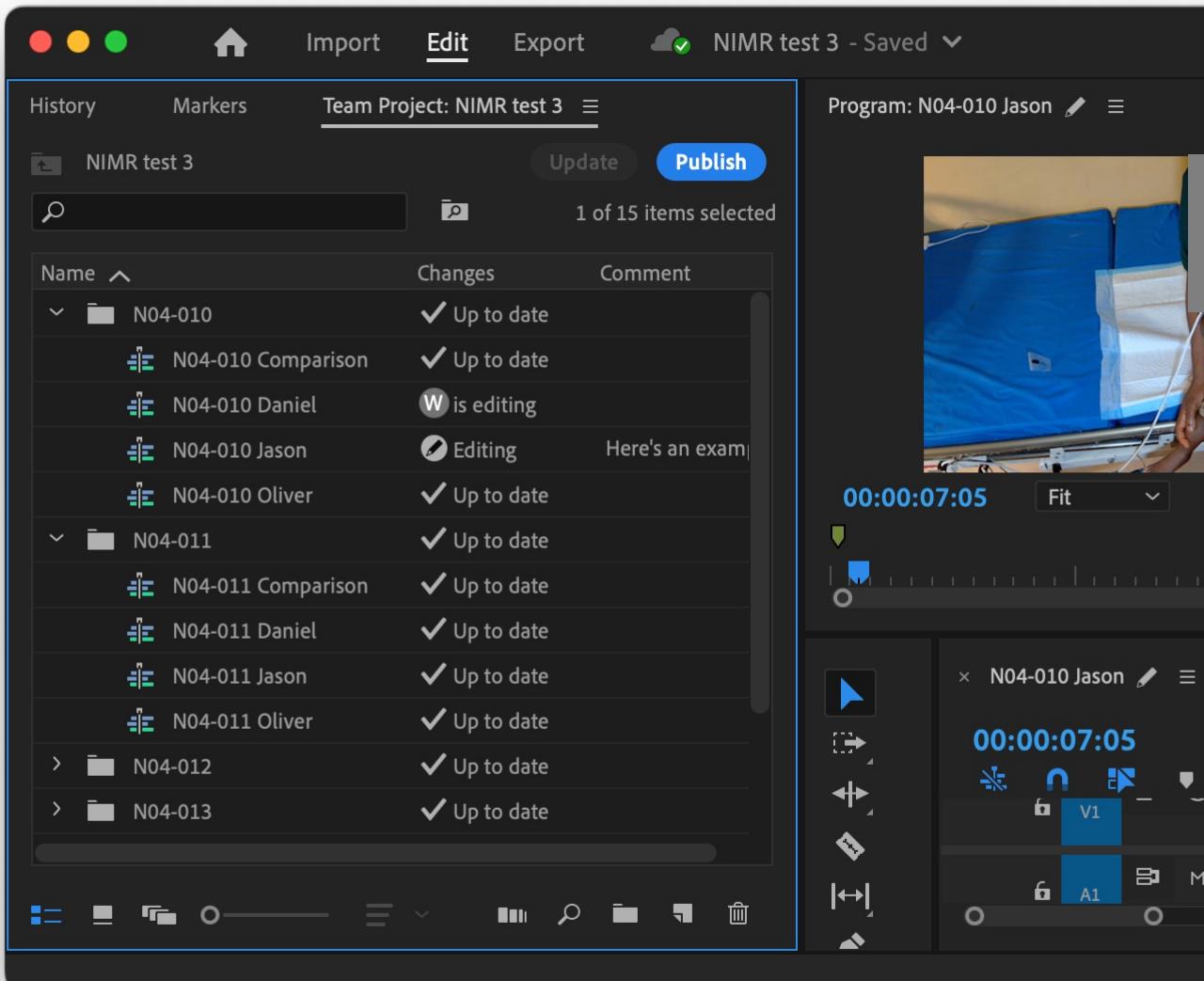
Each **session** has its own bin (a folder in Premiere speak). All item names begin with the session ID.

For each session, each of you will label breaths in **your own sequence**, with your name on it. Type your name into the search box to filter to only show your sequences.

Be careful not to view or edit other people's sequences. The app wouldn't prevent that.

The **Changes** column shows each item's multi-user status. Only one person can edit an item at a time, which should suit us fine. Your edits are automatically saved, but they aren't shared until you click **Publish**. To receive others' edits, click **Update**.

If you like, you can write informal notes about a session in the **Comment** column, but this field is awkward for longer notes and won't be exported.



Interacting with the multi-camera sequence

Whenever these *instructions* say “press,” use the keyboard.

In the Project panel, double-click one of your sequences to begin marking breaths.

If the Program pane isn’t already maximized, click in it to activate it and then press ` (below Esc) or double-click the Program heading.

To play or pause, press **space**.

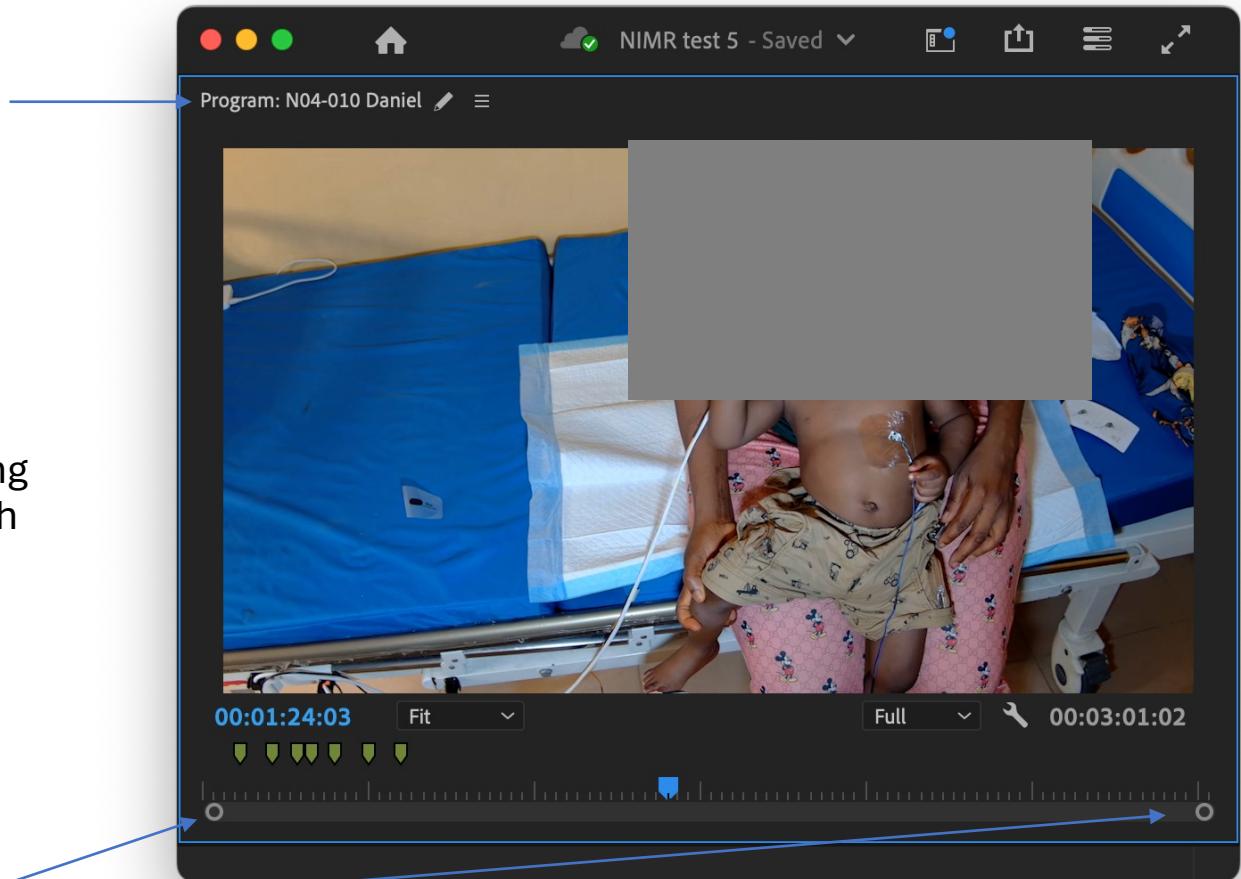
To switch cameras, press **1** or **2**. The video may stutter. Pausing first avoids that. (You could use multi-camera view to see both cameras at once, but it makes each view small and disables zoom, so stick with the default Composite view.)

To zoom in on the video, on the touchpad pinch or two-finger drag up or down.

To pan around the video, press **H** to enable the hand tool and then click and drag. To return to the pointer, press **V**.

To zoom in or out on the timeline, drag its circular ends.

You can’t easily change playback speed, but you can move frame by frame by pressing **Left** (backward) or **Right** (forward).



Marking breaths and problems

Ensure that the Program panel is active and maximized, as explained earlier. Otherwise, your markers may go onto the clip within your sequence, which won't work the way we need.

Press **M** to create a marker at the *playhead*, the currently active time in the video. (I've seen a bug here. If nothing happens, try restarting Premiere and let me know.)

For a breath marker, that's all. To adjust its time, drag it or delete it and mark again.

For a problem marker, to capture that you cannot mark breaths because of a video problem:

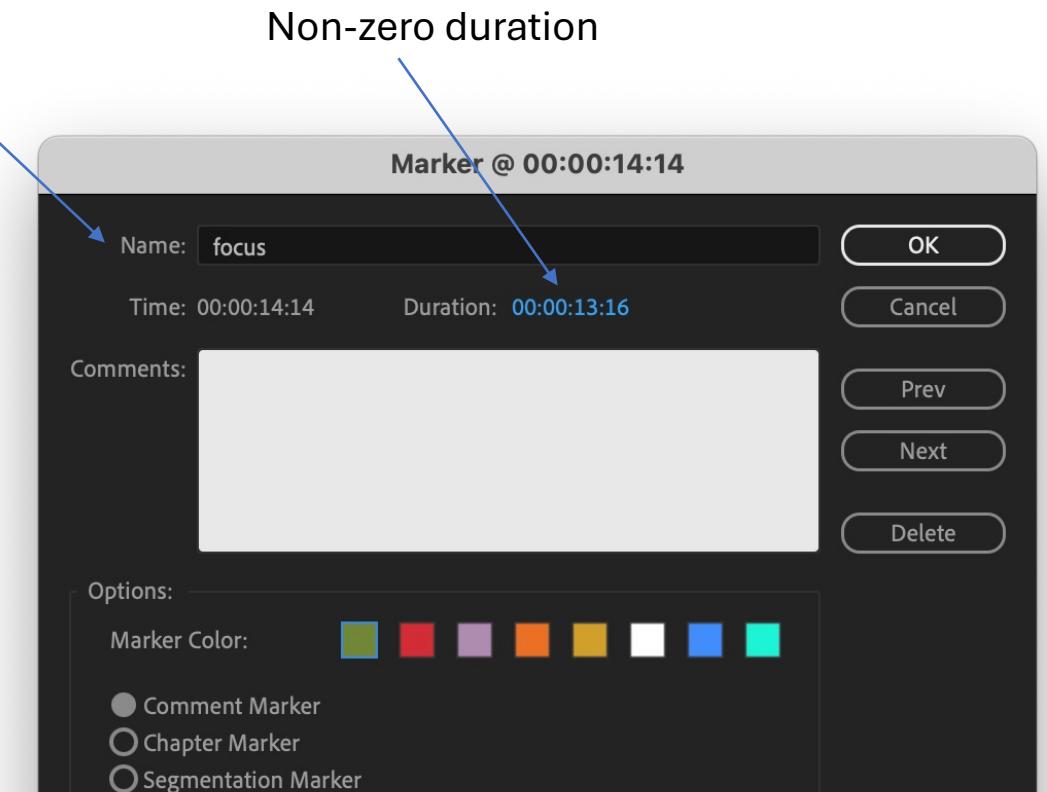
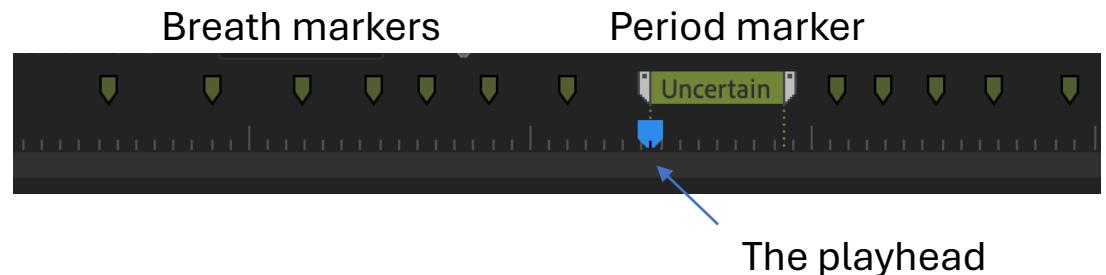
1. Press **M** a second time or double-click the marker to show the dialog at right.
2. Enter a **Name** (more about that below).
3. Make the **Duration** non-zero by typing or dragging the value right. (At this step, the value doesn't matter.) Click **OK**.
4. If marking a problem for just this portion of the video, drag the edge of the marker to cover the duration of the problem.

For batch 1 (the first 100 sessions), we used the following scheme:

- To exclude this portion of the session: **uncertain**
- To exclude the entire session: **focus** or **framing** or anything else. (The marker's duration doesn't matter so long as it is greater than zero, but it's good to make it at least 10 s so that you can read the marker's name in the timeline.)

Starting with batch 2, we used a revised scheme:

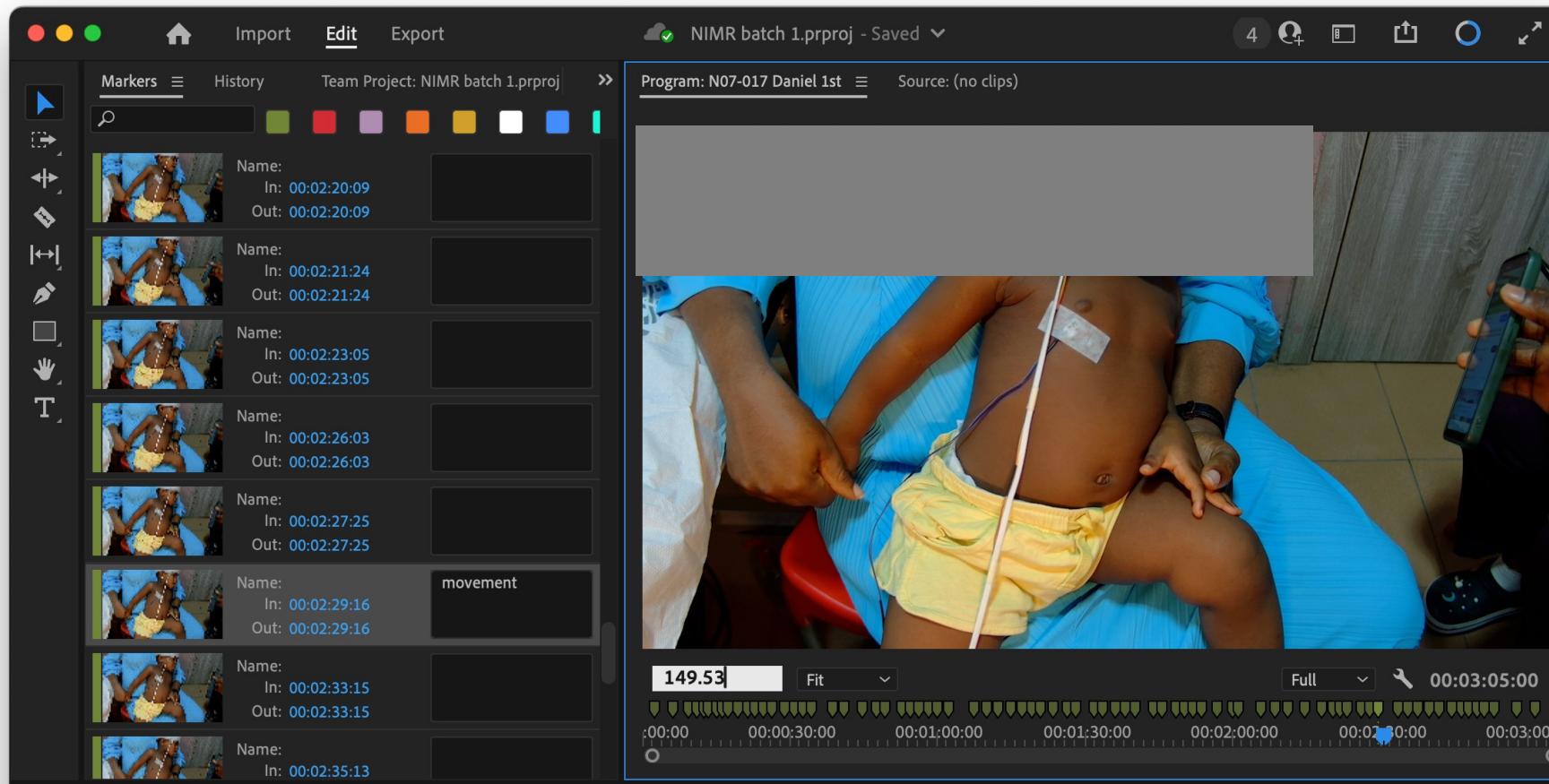
- Set the duration of each exclusionary marker, regardless of its name, to cover the portion you want to exclude. As before, name the marker **focus**, **framing**, or whatever the problem is.



The Markers pane

If desired, you can also work with your markers in the Markers pane. If it isn't already showing, use the pulldown menus: Window >> Markers.

And you can find a particular marker by clicking on the blue time and entering the marker's time (even in decimal seconds, which Premiere will convert), and pressing enter.



- Workspaces >
- Find Extensions on Exchange...
- Extensions >
- Maximize Frame
- Audio Clip Effect Editor
- Audio Track Effect Editor
- Audio Clip Mixer ▾ 9
- Audio Meters
- Audio Track Mixer ▾ 6
- Effect Controls ▾ 5
- Effects ▾ 7
- Essential Graphics
- Essential Sound
- Events
- ✓ History
- Info
- Learn
- Libraries
- Lumetri Color
- Lumetri Scopes
- ✓ Markers
- Media Browser ▾ 8
- Metadata
- Production
- Program Monitor >
- Progress
- Projects >
- Reference Monitor
- Review with Frame.io
- ✓ Source Monitor
- Text
- Timecode
- Timelines >
- ✓ Tools

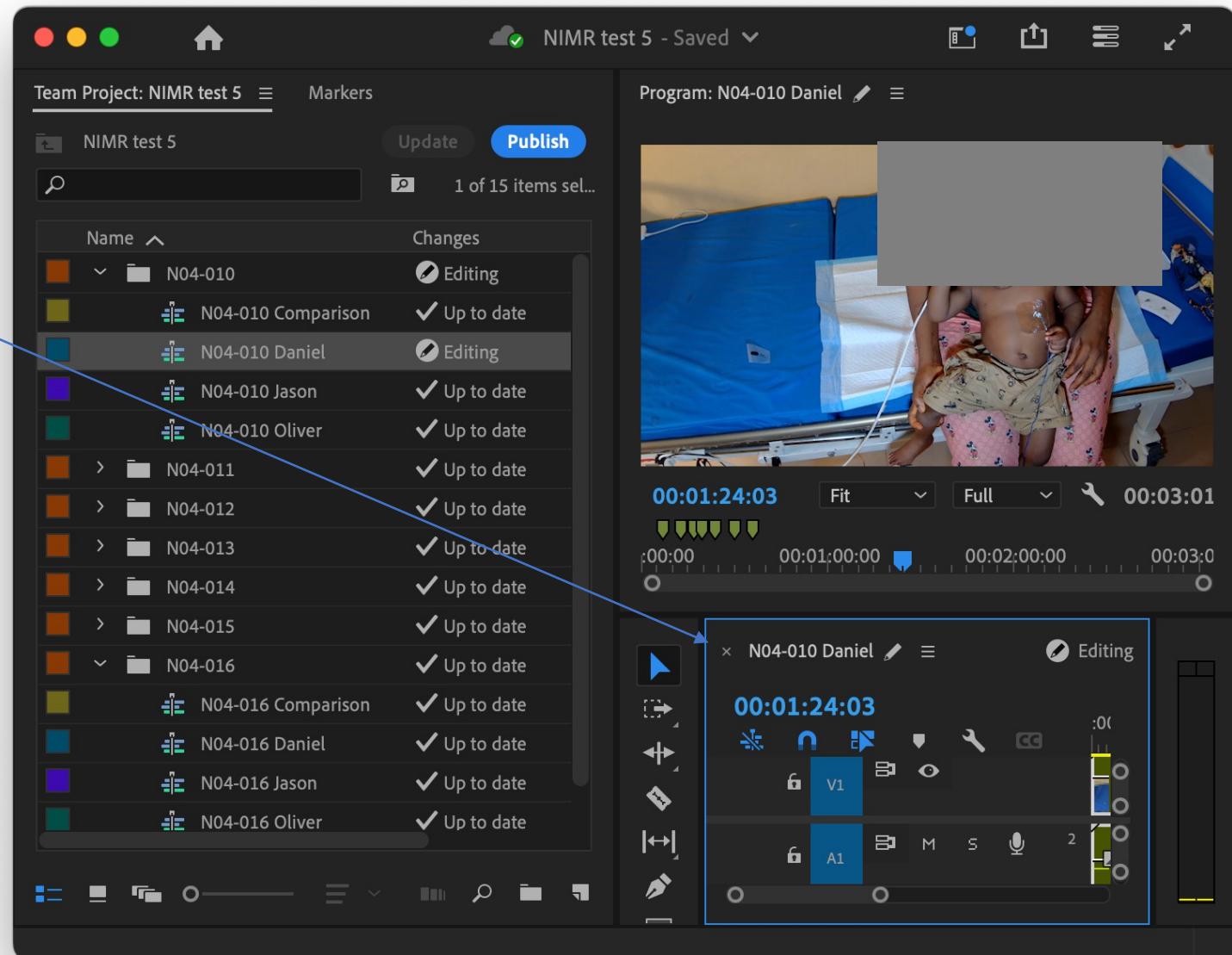
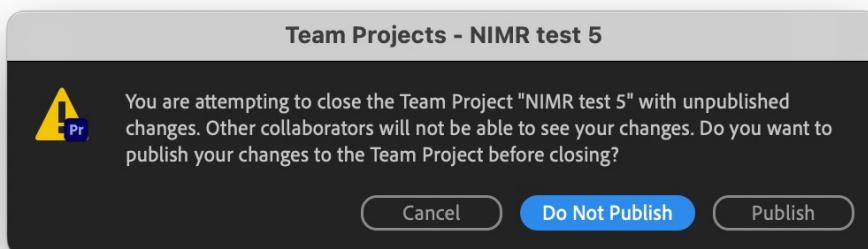
Finishing one session

Once you're satisfied with your markers:

1. Toggle out of maximized Program view by again pressing ` or double-clicking the Program panel title.
2. Close the sequence by clicking its X in the lower-right timeline panel (not essential but avoids clutter and confusion).

Then you can open and work the next session.

Periodically click **Publish** to post your changes. If you quit Premiere without doing so, it will prompt you. If you don't publish, your changes will still be saved but only locally.



Instructions for our panelists: **Reviewing breath marks**

to reduce disagreement

Full-text version

Reviewing breath marks: Overview

After all panelists have finished their initial markings, we'll review and compare them in several rounds, starting small and working up to the final all-panel comparison:

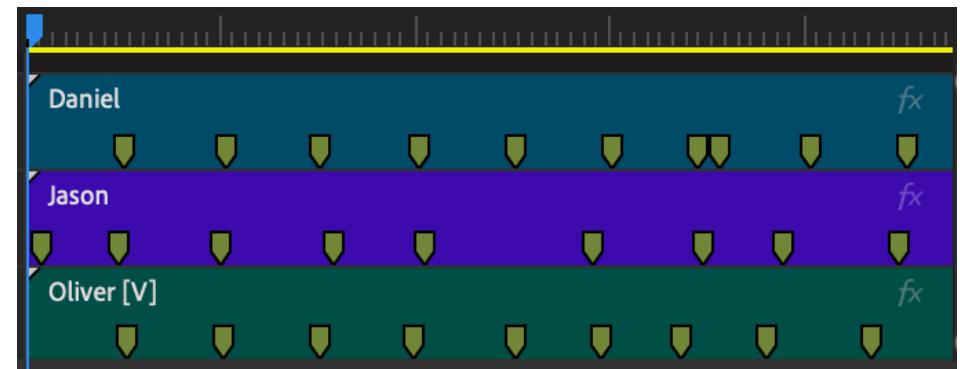
1. 2nd passes on 10% of sessions, selected by stratified randomization of age group and site, and the same sessions for all panelists
2. Check of full-session exclusions and windows excluded by only one panelist
3. Intra-rater check: very short breaths (possibly accidental)
4. Intra-rater agreement: rates across all passes by one panelist
5. Inter-rater agreement: rates across all panelists' averages

The final three of these rounds will be explained next.

The purpose of this review process is to reduce disagreement to an acceptable level (still tentatively ≤ 3 bpm) for as much of the data as possible. When we evaluate the PPG-based algorithm's accuracy, any windows (segments) with higher disagreement must be excluded, since those windows lack a reliable reference rate.

During revision, you won't need to preserve your original markers. I'll make a backup copy beforehand.

Mock data



Reviewing breath marks: 3. Intra-rater check

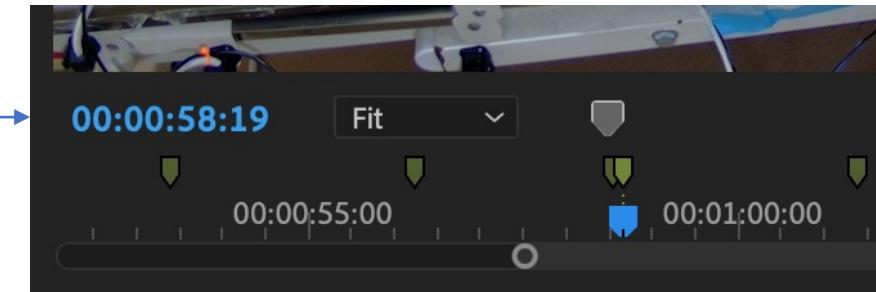
I will email each of you a report of any suspiciously short breaths. Currently, I'm using 0.33 s [180 bpm] as the threshold. It's easy to accidentally make two marks that are nearly on top of each other.

All panelists have had them. For example for D:

N04-012 D 1: Panelist-marked breath ending at 0:58:19 is only 4 frames [0.13 s] long

N04-013 D 1: Panelist-marked breath ending at 0:05:18 is only 2 frames [0.07 s] long

N04-016 D 1: Panelist-marked breath ending at 0:33:12 is only 2 frames [0.07 s] long



You may need to zoom in to see two distinct markers. The pull-down menu and the keyboard shortcuts to go to the next or the previous marker can also help.

To **zoom** in or out on the time axis, you can drag the circles at the ends of the scroll bar on the bottom, or you can press = or - (basically plus or minus without pressing shift). To toggle zoom to fit, press \.



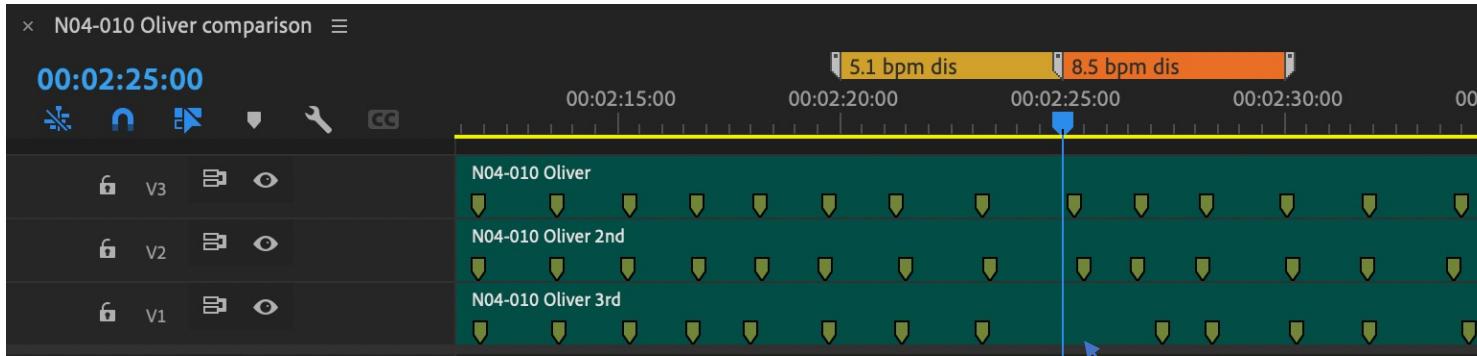
In each stage, after you've reviewed and revised if needed, publish your changes and email me.

Reviewing breath marks: 4. Intra-rater agreement

I will email you if you made multiple passes on one trial and the rates substantially disagree. (In the real study, we'll only ask you to make a second pass occasionally, perhaps one trial in 10.)

Open your **comparison** sequence for that trial and look at the timeline or sequence pane at the bottom. You'll see your passes and color-coded duration markers with the disagreement values. Small disagreements aren't marked.

$\geq 12 \text{ bpm}$
$\geq 6 \text{ bpm}$
$\geq 3 \text{ bpm}$



These disagreement values are calculated using each pass' average respiratory rate during each 5 s period. Because these averages include the rates of breaths that extend beyond the 5 s period, you may see disagreements even when the marks within the period are well aligned, because of disagreement in the mark just before or, as in this example, after the period.

Unfortunately, adjusting your markers while viewing the comparison sequence is impossible. Instead, note the time and **open that pass** by double-clicking it. You'll be back in that sequence, just like when you originally marked breaths. Adjust the markers there. The disagreement markers will not update until I run the scripts again.

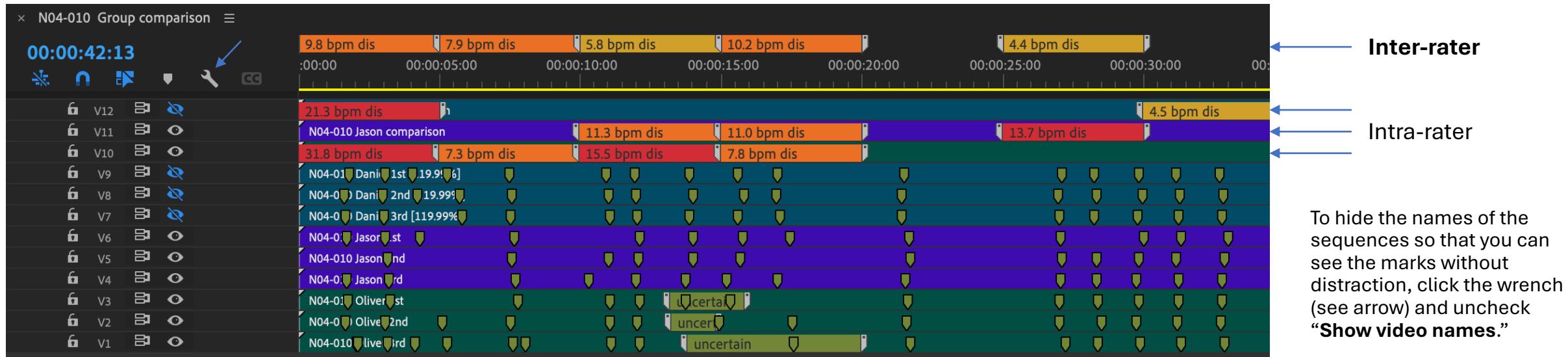
In each stage, after you've reviewed and revised if needed, publish your changes and email me.

Reviewing breath marks: 5. Inter-rater agreement

I will email the panel about any trials with substantial disagreement across the panel.

The process is similar to the intra-rater process. This time, open the **Group comparison** sequence. You'll see everyone's passes and, again, color-coded duration markers with the disagreement values. In case helpful, you'll also see the intra-rater disagreements, or shorten the pane to hide those.

≥ 12 bpm
≥ 6 bpm
≥ 3 bpm



To hide the names of the sequences so that you can see the marks without distraction, click the wrench (see arrow) and uncheck "Show video names."

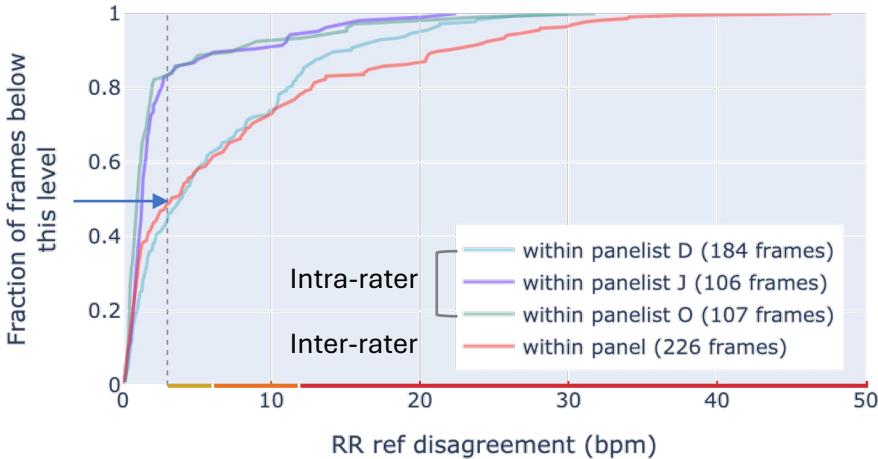
Keep in mind that inter-rater disagreement is calculated from each panelist's average of all their passes, so to resolve a group disagreement, a panelist may need to revise more than one pass.

As with the intra-rater process, to adjust markers, take note of the time and open that pass' sequence.

In each stage, after you've reviewed and revised if needed, publish your changes and email me.

Disagreement before review of disagreement

Cumulative distribution of RR ref disagreement



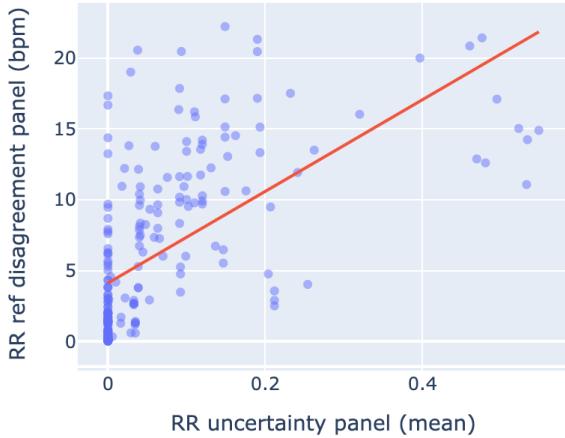
For the seven trials we've marked (N04-010 – 016), using 5 s non-overlapping windows, only 49% of windows had inter-rater disagreement ≤ 3 bpm, our goal. 21% exceeded 12 bpm.

When using only the final pass by each panelist, instead of averaging all passes, the results didn't change much.

Intra-rater disagreement was better for Jason and Oliver, who only made multiple passes on the first three trials, than for Daniel, who made three passes on all trials. I haven't assessed whether that was related, but all panelists said the later trials were harder.

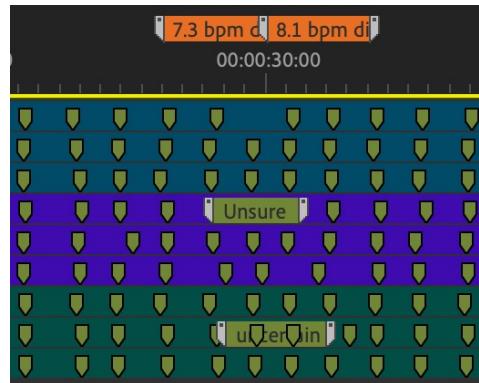
We hope that the review process will improve these metrics so that more of our data can be used.

The uncertain marker



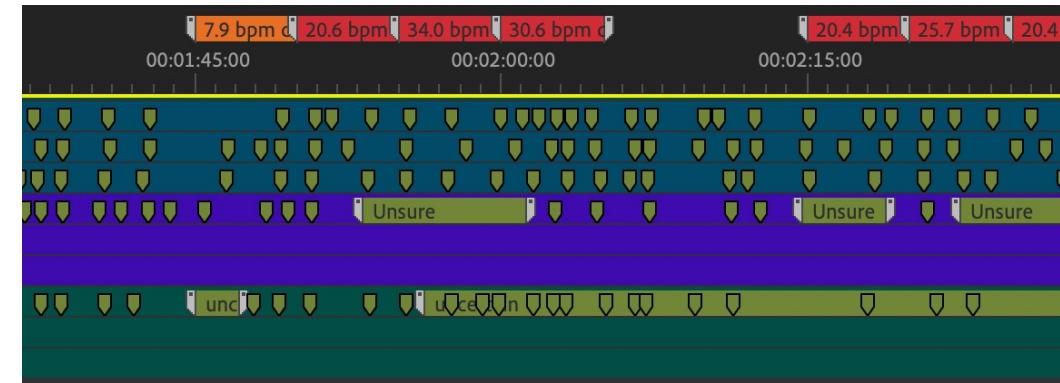
Uncertainty and disagreement are somewhat correlated. Using 30 s windows and an uncertainty index from 0 (none) to 1 (all panelists all the time), the windows with no uncertain marks had much less disagreement than those with (mean: 2.5 vs. 9.8 bpm), but 25% of the certain windows still had disagreement > 3 bpm. And almost as many windows were uncertain (51%) as had disagreement > 3 bpm (55%), so we shouldn't just discard all of either category.

N04-012



When only some panelists made an uncertain mark and did not mark any breaths, disagreement was of course high. It might have been better to not use uncertainty marks and instead try to mark every breath.

N04-014



But some segments were obviously hard to mark. Maybe it's appropriate and efficient to mark such segments uncertain and, above a threshold of uncertainty, not bother trying to mark breaths and reconcile disagreement? We would need to formalize them for consistency.

Before starting the real trial, we decided to stop using uncertain markers in any formal sense. Disagreement alone would determine whether we review a segment and ultimately discard it. But we found that panelists left long blank segments, which could match across the panel, so we brought exclusionary markers back.

Administration

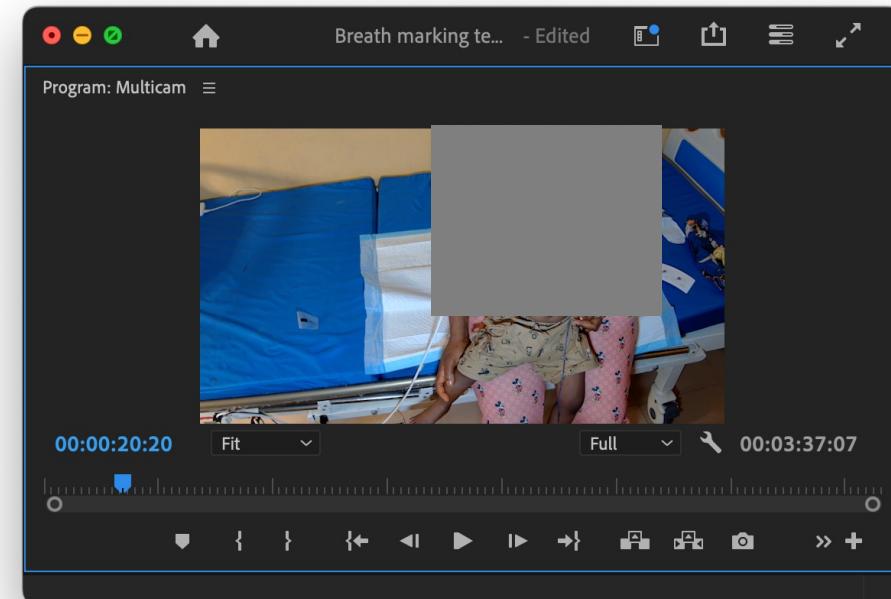
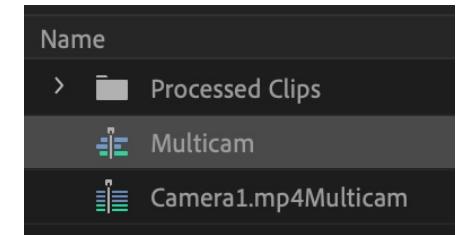
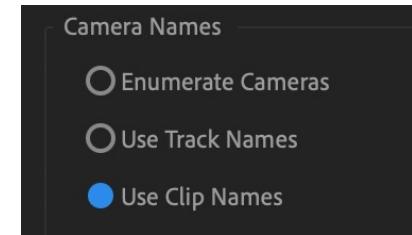
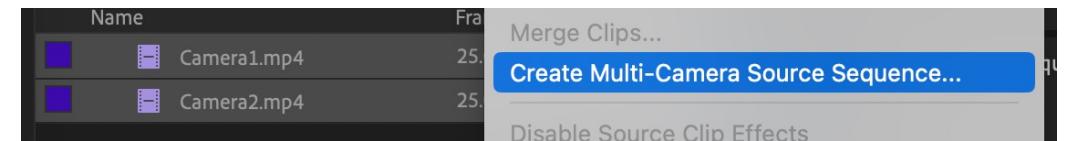
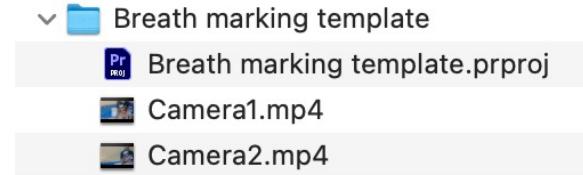
Creating the template project

(Slightly out of date: doesn't cover comparison sequences)

Once created, this template can be copied for each rater and each trial (explained later). And it can be revised for the next batch of trials.

The placeholder videos should have the same properties as the real videos (resolution, frame rate), and they must be as long as any of the real videos. If your real videos are longer, the multicam clips cannot be extended, unfortunately. So, I'm using 5m00s.

1. Create a new project with them, saved in the same folder as the pair of video files.
2. Select both videos, right-click, and click “Create Multi-Camera Source Sequence”.
3. Use the defaults except click “Use Clip Names.”
4. In the Project pane, drag the new “Camera1.mp4Multicam” clip to the Timeline pane to create a sequence.
5. Rename the new “Camera1” sequence to “Multicam” for clarity.



Managing the video files

Use .mp4 files. Macs don't do well with .avi files.

Keep all the video files in two folders:

“1 to import”: Place new videos here.

“2 imported”: Our script will move the videos here. Send these to the panelists, who can put them anywhere.

Rationale: When each panelist opens the project and must show Premiere where to find a local copy of the video files, the panelist only has to locate one video file. Premiere will then find all the other video files in that folder. With a Team Project, Premiere takes care of each panelist's machine-specific mapping.

To import videos into Premiere:

1. Prepare the template project (as a local project; convert to Team Project later).
2. Run “NIMR import videos” in the extension [Automation Blocks for Pr \(\\$60\)](#). Revise the inputs to the script if needed to suit your folder locations and such.
3. Don't save the template. Convert the project to a Team Project and share it.

The template is hidden inside your new file, in case you lose the template file.

Template before import,
View Hidden checked

Template
Group comparison
_Multicam
Camera1
Camera2
Daniel 1st
Daniel 2nd
Daniel 3rd
Daniel comparison
Jason 1st
Jason 2nd
Jason 3rd
Jason comparison
Oliver 1st
Oliver 2nd
Oliver 3rd
Oliver comparison
Placeholder generator

After import of one trial,
View Hidden unchecked

N09-025
N09-025 Group comparison
N09-025 Daniel 1st
N09-025 Daniel 2nd
N09-025 Daniel 3rd
N09-025 Daniel comparison
N09-025 Jason 1st
N09-025 Jason 2nd
N09-025 Jason 3rd
N09-025 Jason comparison
N09-025 Oliver 1st
N09-025 Oliver 2nd
N09-025 Oliver 3rd
N09-025 Oliver comparison

Showing disagreement values in Premiere

I created scripts in Python and Automation Blocks (for Premiere) to create duration markers in each Comparison sequence.

1. In Python:

1. Run “evaluate_dataset.ipynb” with `rate_at_frame_edge = “beyond_frame”` and a short `window_size` (5 s seems right) and equal `window_increment`.
2. From the console output, send each panelist any short breaths.
3. Run “export_panel_disagreements.ipynb” to generate .csv files of disagreement markers.

2. In Automation Blocks within Premiere:

1. Run “NIMR import disagreement to markers.xml” to import those .csv files as markers. This script will first erase any existing markers in those comparison sequences.

Then the panel can review, as explained to them on an earlier slide, and we can repeat the cycle if needed.

