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Image Feedback User Guide
Now With Automated Image
Assessment

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Performance Tracker Image Feedback Basics

The screenshot displays the 'Image Feedback' interface for a learner named Lauren Learner in the 'Upper Airway: Anatomy & Physiology' module. The interface is divided into a left sidebar and a main content area. The sidebar contains settings for Learner, Module, Image Order, and Features. The main content area shows four ultrasound images arranged in a grid, each with a 'Test Mode' label and a '3.0' grade. Below each image is a grading panel with subcategories: Overall Grade, Image View Grade, Depth Grade, and Gain Grade. Callouts 1-6 point to specific elements: 1 points to the Learner dropdown, 2 to the Module dropdown, 3 to the Image Order dropdown, 4 to the Expand Grading Options toggle, 5 to the Automated Image Assessment (AIA) toggle, and 6 to the image timestamp and description.

Select Learner, Module, & Image Order

To show saved SonoSimulator images, select a learner **1** and module **2** in the Settings **⚙️** section of the left sidebar. Below the image, the learner's annotation (if applicable) and the image timestamp will display **6**.

Note: The date and timestamps on the images will be converted to your current timezone. For example, if a learner saved an image on Aug 31 10:30am in New York City, NY, USA but you are located in Los Angeles, CA, USA and are viewing their image, the timestamp on the image would display Aug 31 7:30am. If you then traveled to New York City, NY, USA and looked at the same image, the timestamp would display as Aug 31 10:30am.

By default, images order from oldest to newest in numerical case order **3**. This means all the case 1 images appear first in ascending timestamp order, then all of case 2, and so on. Switching the image order to "Newest to Oldest" will keep the images in numerical case order (ascending from case 1) but will arrange the images in each case in descending timestamp order.

The Expand Grading Options toggle **4** determines whether the grading subcategories are visible. By default, the toggle is turned on to display the subcategories. Turning off the toggle will hide the subcategories.


Turn On Automated Image Assessment

The Automated Image Assessment (AIA) **5** feature **🔥** can be turned on in the left sidebar. AIA will grade how well the saved ultrasound images accomplish the corresponding image acquisition and/or interpretation task described in the SonoSim Assignment. Read the [How To Use Automated Image Assessment](#) section of this guide to learn more.

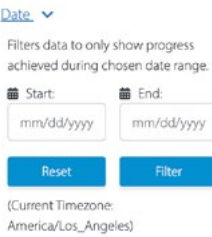
Performance Tracker Image Feedback Basics

Enable Filters

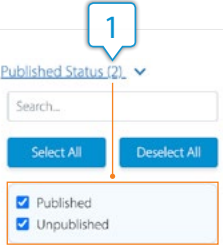
To filter out images you are not interested in grading, use the Filters  section of the left sidebar.

Numbers next to the filter titles  indicate the number of available filtering options. As the filters are activated, those numbers will change to indicate filters are applied.

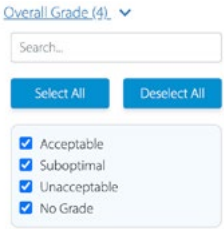
Filter Index



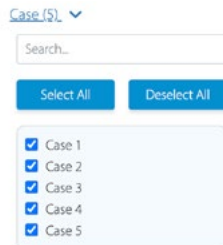
Filter down to images in a specified date range. For example, to view images from a particular month, enter a start and/or end date and click "Filter." Clicking "Reset" will erase applied date selections.



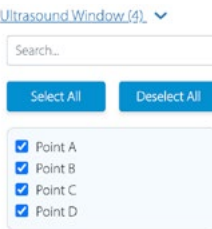
Filter images based on their published status, such as to only show unpublished images that require grading.



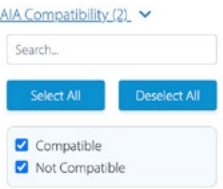
Filter images with a specific overall grade. For example, to only show unacceptable grades so you can spend more time evaluating and giving feedback on problem images. For more information see the [Grade Using Quick-Select Grades](#) section of this guide.



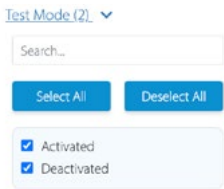
Filter down to specific cases of interest. For example, if your learners saved images from case 1 only, use the case filter to hide images from other cases.



Filter down to specific ultrasound windows. These windows correspond to the windows' names in the point navigation bar within the SonoSimulator.



Filter images based on compatibility status, i.e., it can hide images incompatible with AIA. For more information see the [How To Use Automated Image Assessment](#) section of this guide.



Filter images based on whether test mode was activated when the image was saved. Test Mode is a feature within the SonoSimulator® that turns off the virtual-assistance features - the Probe Guide, Layers, and Findings Video.

Performance Tracker Image Feedback Basics

The screenshot displays the Performance Tracker interface for 'Upper Airway: Anatomy & Physiology'. It shows four ultrasound images arranged in a grid. Each image has a 'Text Mode' label and a '3.0' grade. Below each image are grading controls: 'Apply AIA', 'Overall Grade', 'Image View Grade', 'Depth Grade', and 'Gain Grade'. A legend at the top right explains the grading symbols: 'Grading Options', 'Optimal' (blue checkmark), 'Suboptimal' (grey checkmark), 'Unacceptable' (orange X), and 'No Grade' (white circle). A callout '1' points to the grading controls for the first image, and a callout '2' points to the legend.

Grade Using Quick-Select Grades

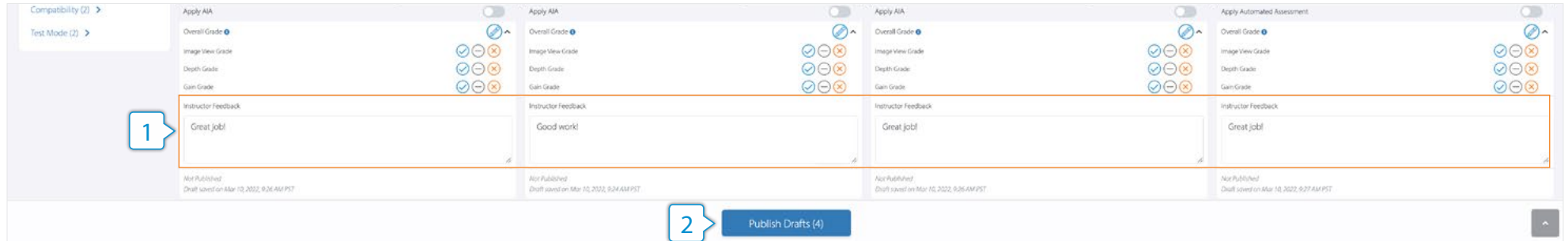
Now that filters are applied, you are viewing only images of interest, and you can use the quick-select grading options **1** to provide feedback.

The legend at the top right **2** explains each symbol grade. The quick-select grades consist of an Overall Grade and three Subcategories. The Image View grade assesses a learner's image acquisition and/or interpretation skills, such as the inclusion of all required anatomy. The Depth grade assesses image depth optimization. The Gain grade assesses overall image gain optimization.

Important Note: The Overall Grade will default to the lowest subcategory grade. For example, if the Image View and Depth grades are optimal but the Gain grade is suboptimal, the Overall Grade will be suboptimal. However, you can change the Overall Grade by clicking on the grade and selecting a new one.

Three close-up views of the grading controls for different images. Each view shows the 'Apply AIA' toggle, 'Overall Grade' dropdown, 'Image View Grade', 'Depth Grade', and 'Gain Grade' buttons. The first view shows the 'Overall Grade' dropdown menu open, with the 'Suboptimal' option selected. The second view shows the 'Overall Grade' dropdown menu open, with the 'Optimal' option selected. The third view shows the 'Overall Grade' dropdown menu open, with the 'Optimal' option selected.

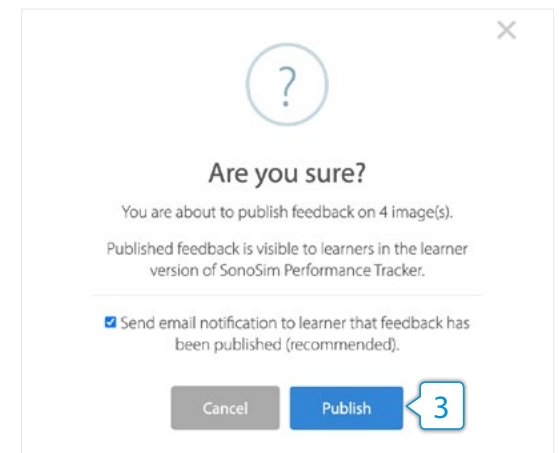
Performance Tracker Image Feedback Basics



Provide Text-Based Feedback & Publish to Learners

You can provide additional feedback via the text field **1**, such as why an image earned a specific grade. Your text feedback automatically saves work in progress as a draft so that if you need to leave the page, you can come back later to publish.

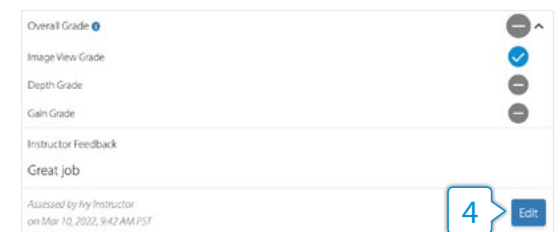
After grading images and providing feedback, click the Publish Drafts button **2** to make your grades and comments visible to learners. A message will pop up confirming you would like to publish and asking if you would like to notify the learner via email that they have new feedback. When ready, click Publish **3**. This will make your grades and feedback visible to the learner in their Performance Tracker reports.



Editing Feedback

After publishing, you still have the option of editing your grades and feedback via the edit button **4**.

After editing your feedback and selecting "Republish," you will be asked again if you would like to notify the learner that they have feedback.



How To Use Automated Image Assessment (AIA)

Background on AIA

AIA was created through the collaboration of leading ultrasound and artificial intelligence (AI) subject matter experts. It is an Expert-Systems AI - a computer program that uses a knowledge base and set of predefined rules to come to conclusions that mirror the decisions and judgments of human ultrasound experts. To create this system, our panel of ultrasound experts defined thresholds for what makes an optimal, suboptimal, and unacceptable image for each SonoSim Assignment image. Image grading agreement across subject matter experts was optimized by strictly defining image assessment criteria, provision of an optimal reference ultrasound image for each application, and training of reviewers on selected parameters. Based on those thresholds, our team was able to build an AI that can effectively grade a learner's image acquisition skills.

The screenshot displays the SonoSim interface for a learner named Lauren. On the left, the 'Settings' panel is visible, with 'Automated Image Assessment (AIA)' (marked as BETA) turned on, indicated by callout 1. The main area shows four ultrasound images, each with a '3.0' grade and an 'Apply AIA' toggle (callout 2). Below each image is a table of grading options: Overall Grade, Image View Grade, Depth Grade, and Gain Grade. Callout 3 points to the 'Image View Grade' dropdown, and callout 4 points to the 'Depth Grade' and 'Gain Grade' buttons. The interface also includes a 'Grading Options' legend at the top right, showing 'Optimal' (blue), 'Suboptimal' (grey), 'Unacceptable' (orange), and 'No Grade' (white).

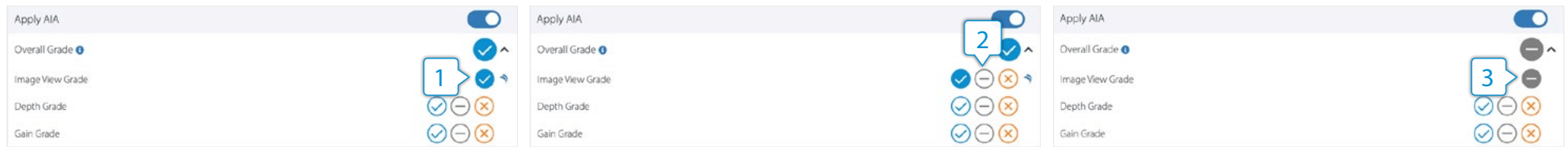
How It Works

By default, AIA is turned off. To turn on AIA, simply click the toggle 1. This will tell the system to automatically grade the Image View grade 3 for every AIA compatible image.

As a reminder, the Overall Grade will default to the lowest subcategory grade; so if no other grade has been set, the Overall Grade will resolve to the AIA Image View grade. Please see the [Grade Using Quick-Select Grades](#) section for more information.

AIA can also be turned on for a specific image via the individual image toggles 2. All images graded by AIA will have the SonoSim AIA symbol next to the grade 4.

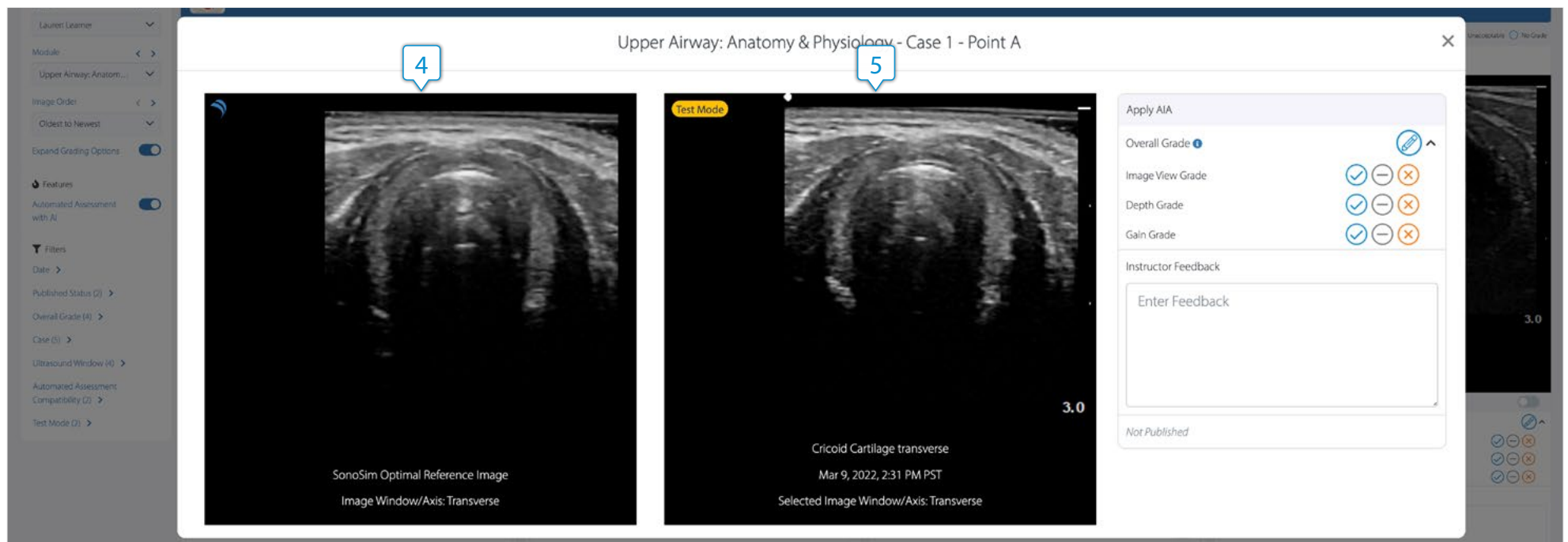
How To Use Automated Image Assessment



To modify the AIA grade, simply click on the Image View grade **1** and select a new grade **2**. If you override the AIA grade, the SonoSim AIA symbol will disappear **3** to indicate the grade is instructor-selected. Any AIA grade and/or instructor-selected grade will automatically save as a draft.

AIA was designed to pair with the SonoSim Module Assignments. Therefore, only images required by the SonoSim Assignments are AIA compatible; for more information on AIA compatibility, please see the [How to Save Automated Image Assessment Compatible Images](#) section of this guide.

To help instructors better understand the AIA grade, we've provided a SonoSim Optimal Reference Image for each AIA compatible image. The reference image is intended to demonstrate the best image that could be acquired in a particular case, in relation to the assigned scanning task. Simply click on a compatible image and a modal will pop up showing the SonoSim Optimal Reference Image **4** side-by-side with the learner's image **5**.



How To Use Automated Image Assessment

AIA Beta Scope

The beta version of AIA specifically assesses the Image View grade of compatible saved ultrasound images. **Currently, AIA Beta does not grade depth, gain, measurements, and annotations.** Additionally, AIA only grades images within the Anatomy & Physiology Module Assignments. We intend to make all SonoSim Assignments compatible with AIA in the future.

How to Save AIA Compatible Images

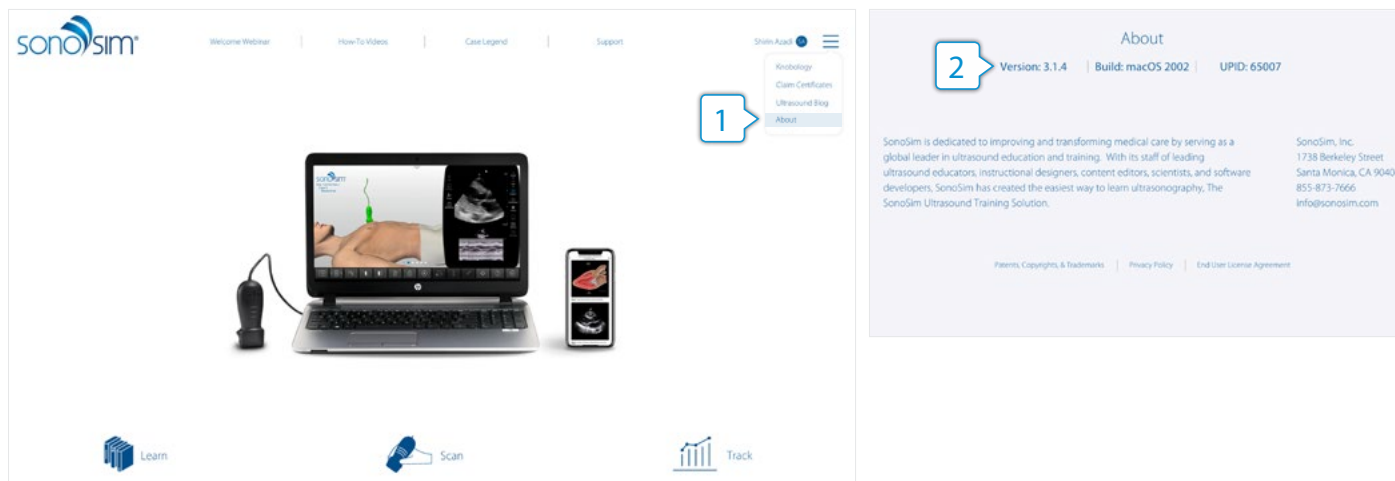
AIA is only able to grade compatible images. The four compatibility criteria are:

1. The SonoSim Software must be version 3.0.2 or higher.
2. All images must be saved in Test Mode within the SonoSimulator.
3. The images saved must be required by a SonoSim Anatomy & Physiology Module Assignment task.
4. All images must be saved on or after January 1, 2022.

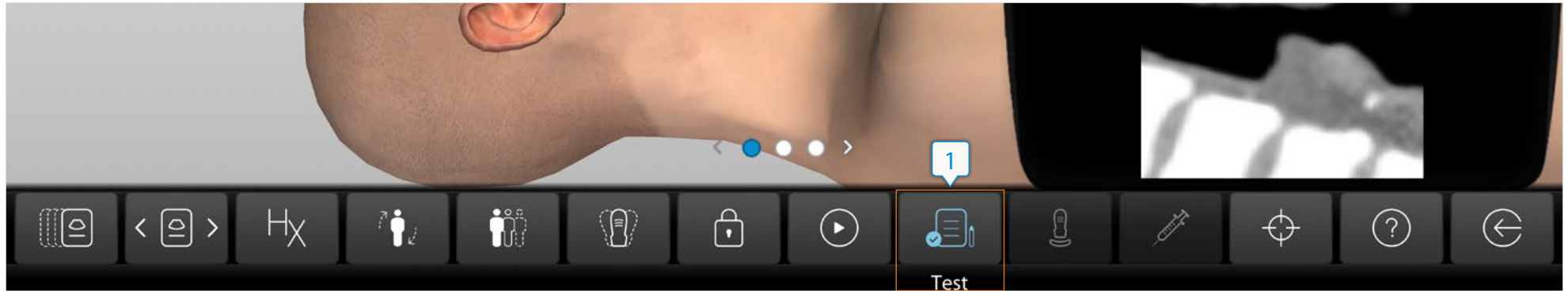
More detailed information on each of these criteria is included below:

1. SonoSim Software Compatibility Requirement

In order to save compatible images, all learners must have version 3.0.2 or higher of the SonoSim software. To check their SonoSim Software version, have your learners log into the desktop application, click the upper-right three bar menu, and select "About" 1. Their version number will appear in the upper left 2. If a learner is on an older version of software, they will need to upgrade to a newer version. To do this, have them go to sonosim.com/download and follow the instructions on the page.

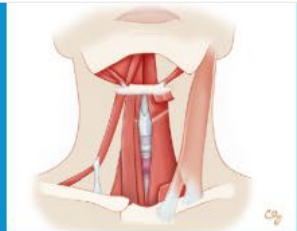


2. Test Mode Compatibility Requirement



Learners **must** save all images in Test Mode ¹ within the SonoSimulator. Test Mode turns off the virtual-assistance features - the Probe Guide, Layers, and Findings Video - ensuring learners' images were saved without assistance. **Only images saved in Test Mode are compatible with AIA.**

Learners are instructed to enter Test Mode within the SonoSim Assignments ².



Upper Airway: Anatomy & Physiology Module Assignments



I. Access the Upper Airway: Anatomy & Physiology course from the SonoSim® Course Library.

1. Review the entire course.
2. Complete the 20-question Mastery Test.

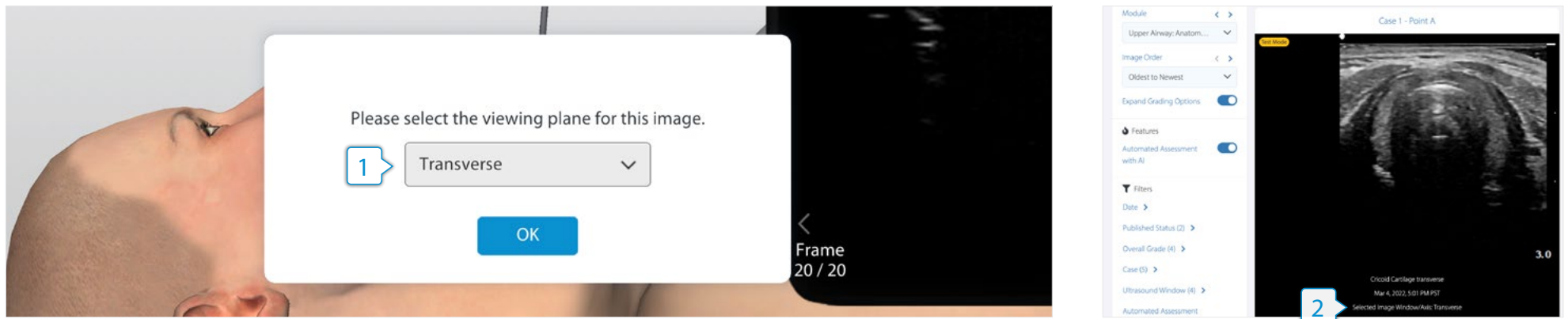
II. Access the Basic Upper Airway hands-on cases from the SonoSimulator®. From the 'Case List' menu, click 'Head/Neck' and then 'Basic Upper Airway' ²

From the toolbar, select the 'Test' button to enter assessment mode. Please save all images with the 'Test' button activated.

1. Case 1, Point A

How To Use Automated Image Assessment

After saving an image in Test Mode, learners must correctly document the imaging plane/view used to acquire the image ¹. The imaging plane/view should correspond to the task described in the Module Assignment and dictates the criteria AIA will use to grade the image. Selecting an incorrect imaging plane/view will result in an AIA grade of "Unacceptable." The selected imaging plane/view will populate on the image within Image Feedback ²; only images saved in Test Mode will have this additional information.



3. SonoSim Assignment Compatibility Requirement

All image views required by the SonoSim Anatomy & Physiology Module Assignments are compatible with AIA. For example, in the Upper Airway Anatomy & Physiology Module Assignment, the first task asks the learner to scan Case 1-Point A and save a transverse image of the cricoid cartilage.

This is the only image that is required from Case 1-Point A, meaning that within this case-point, only transverse-plane cricoid cartilage images are compatible; **no other images** from this case-point would be AIA compatible. For example, cricoid cartilage sagittal images from Case 1-Point A would NOT be AIA compatible as a cricoid cartilage sagittal image is not required by that case-point.

II. Access the Basic Upper Airway hands-on cases from the SonoSimulator®. From the 'Case List' menu, click 'Head/Neck' and then 'Basic Upper Airway.'

From the toolbar, select the 'Test' button to enter assessment mode. Please save all images with the 'Test' button activated.

1. Case 1, Point A

- Obtain a single best image of the cricoid cartilage in a transverse body plane, and click 'Freeze.' Click 'Annotate,' and in the text box, type "Cricoid Cartilage transverse." Click 'Save.'

4. Date Compatibility Requirement

Only images save on or after January 1, 2022, are compatible with AIA. Images saved prior to January 1, 2022, cannot be graded by AIA. Additionally, only images saved on or after March 11, 2022, will have SonoSim Optimal Reference Images for comparison.

Additional Questions?

For additional product questions or to request a virtual walkthrough with our Member Success Team, please email membersuccess@sonosim.com.

If you encounter any technical issues, please contact support@sonosim.com or call us at **855.873.7666 (M-F 6am-6pm, Sat 8am-4pm PT)**.