

VPAT Accessibility Conformance Report

(Based on ITI VPAT®)

Name of Product	Shadow Health Lab VR
Date Last Updated	July 21, 2026
Completed by	Jay Nemchik (Elsevier Digital Accessibility Team)
Applicable Standards/Guidelines	This document rates Shadow Health Lab VR according to the W3C WCAG 2.2 A and AA requirements.
Contact for More Information	Elsevier Digital Accessibility Team accessibility@elsevier.com
Testing Tools and Methods	• Hands-on keyboard operation • DevTools/Code inspection • Mozilla Firefox 128 and Chrome 124 on Windows 11 23H2 • NVDA screen reader 2023.3 • WAVE Browser Extension • Color Contrast Analyzer • W3C Web Accessibility Initiative (WAI) Pages • Elsevier Accessibility Checklist
Document Sections	This review document includes all WCAG 2.2 A and AA checkpoints, organized into 7 logical sections: • Visuals • Keyboard • Headings and Structure • Labeling • Multimedia • Usability • Mobile User Experience
Pages Covered	Virtual Reality Experience
Terms	• Supports: The functionality of the product has at least one method that meets the criteria without known defects or meets with equivalent facilitation. • Partially supports: Some functionality of the product does not meet the criteria. • Does not support: Majority of functionality of the product does not meet the criteria. • Supports (N/A): According to W3C on conformance, "If there is no content to which a success criterion applies, the success criterion is satisfied."
Notes/Terminology	• "AT" stands for Assistive Technology such as screen readers, voice input, etc.

Conformance Summary

WCAG 2.2 Success Criterion	Level	Evaluation
1.1.1: Non-text Content	A	Does not support
1.2.1: Audio-only and Video-only (Prerecorded)	A	Does not support
1.2.2: Captions (Prerecorded)	A	Does not support
1.2.3: Audio Description or Full Text Alternative	A	Does not support
1.2.4: Captions (Live)	AA	Supports (N/A)
1.2.5: Audio Description	AA	Does not support
1.3.1: Info and Relationships	A	Partially supports
1.3.2: Meaningful Sequence	A	Supports (N/A)
1.3.3: Sensory Characteristics	A	Supports
1.3.4: Orientation (2.1)	AA	Supports
1.3.5: Identify Input Purpose (2.1)	AA	Supports (N/A)
1.4.1: Use of Color	A	Partially supports
1.4.2: Audio Control	A	Supports
1.4.3: Contrast (Minimum)	AA	Partially supports
1.4.4: Resize text	AA	Does not support
1.4.5: Images of Text	AA	Supports
1.4.10: Reflow (2.1)	AA	Does not support
1.4.11: Non-Text Contrast (2.1)	AA	Supports
1.4.12: Text Spacing (2.1)	AA	Does not support
1.4.13: Content on Hover or Focus (2.1)	AA	Supports (N/A)
2.1.1: Keyboard	A	Partially supports
2.1.2: No Keyboard Trap	A	Supports (N/A)
2.1.4: Character Key Shortcuts (2.1)	A	Supports (N/A)
2.2.1: Timing Adjustable	A	Supports
2.2.2: Pause, Stop, Hide	A	Supports (N/A)
2.3.1: Three Flashes or Below Threshold	A	Supports (N/A)
2.4.1: Bypass Blocks	A	Supports (N/A)
2.4.2: Page Titled	A	Supports (N/A)
2.4.3: Focus Order	A	Supports (N/A)
2.4.4: Link Purpose (In Context)	A	Supports
2.4.5: Multiple Ways	AA	Supports
2.4.6: Headings and Labels	AA	Supports
2.4.7: Focus Visible	AA	Supports (N/A)
2.4.11: Focus Not Obscured (Minimum) (2.2)	AA	Supports (N/A)
2.5.1: Pointer Gestures (2.1)	A	Supports
2.5.2: Pointer Cancellation (2.1)	A	Supports
2.5.3: Label in Name (2.1)	A	Supports
2.5.4: Motion Actuation (2.1)	A	Supports
2.5.7: Dragging Movements (2.2)	AA	Supports

WCAG 2.2 Success Criterion	Level	Evaluation
2.5.8: Target Size (Minimum) (2.2)	AA	Supports
3.1.1: Language of Page	A	Supports (N/A)
3.1.2: Language of Parts	AA	Supports (N/A)
3.2.1: On Focus	A	Supports (N/A)
3.2.2: On Input	A	Supports
3.2.3: Consistent Navigation	AA	Supports
3.2.4: Consistent Identification	AA	Supports
3.2.6: Consistent Help (2.2)	A	Supports
3.3.1: Error Identification	A	Supports
3.3.2: Labels or Instructions	A	Supports
3.3.3: Error Suggestion	AA	Supports
3.3.4: Error Prevention (Legal, Financial, Data)	AA	Supports (N/A)
3.3.7: Redundant Entry (2.2)	A	Supports (N/A)
3.3.8: Accessible Authentication (Minimum) (2.2)	AA	Partially supports
4.1.1: Parsing	A	Supports (N/A)
4.1.2: Name, Role, Value	A	Does not support
4.1.3: Status Messages (2.1)	AA	Supports (N/A)

WCAG 2.2 A and AA Success Criteria

Visuals

WCAG 2.2 Checkpoint	Conformance Level	Remarks
1.1.1: Non-Text Content (A) Provide text alternatives for non-text content (e.g. images)	Does not support	Non-text content inside VR environments do not have text alternatives.
1.3.3: Sensory Characteristics (A) Do not rely on sensory characteristics of components such as shape, size, visual location, orientation, or sound	Supports	There are no instructions or areas of content which rely solely on sensory characteristics.
1.4.1: Use of Color (A) Color is not used as the only visual means of conveying info	Partially supports	Color is used at times to indicate differences between interaction areas or important visual information such as discoloration on a patient. There is no other means of communicating this information in most cases. Some interaction areas differ using color along with size and location.
1.4.3: Color Contrast (Minimum) (AA) Text has enough contrast with the background (4.5:1 for small text and 3:1 for large text)	Partially supports	Most text has enough contrast with the background in the VR simulations.
1.4.4: Resize Text (AA) Text can be enlarged up to 200% without loss of functionality.	Does not support	Manual text resizing is not supported.
1.4.5: Images of Text (AA) Text is used rather than images of text, except where the presentation of text is essential, such as logos	Supports	No images of text are used other than for logos or essential presentation.
1.4.10: Reflow (AA) Content can be presented without loss of information or functionality, and without requiring scrolling in two dimensions for:	Does not support	VR content does not reflow.

- Vertical scrolling content at a width equivalent to 320 CSS pixels; - Horizontal scrolling content at a height equivalent to 256 CSS pixels.		
1.4.11: Non-Text Contrast (AA) User interact components and graphical objects have a contrast ratio of at least 3:1 against adjacent color(s).	Supports	Visual presentation of the user interface components and graphical objects typically have a contrast ratio of at least 3:1 against adjacent colors. Note: Essential interaction elements of the VR experience are meant to replicate real-life scenarios and may not pass color contrast requirements.
1.4.12: Text Spacing (AA) In content implemented using markup languages that support the following text style properties, no loss of content or functionality occurs by setting all the following and by changing no other style property: - Line height (line spacing) to at least 1.5 times the font size; - Spacing following paragraphs to at least 2 times the font size; - Letter spacing (tracking) to at least 0.12 times the font size; - Word spacing to at least 0.16 times the font size.	Does not support	Text spacing properties are fixed in the VR experience.
1.4.13: Content on Hover or Focus (AA) Where receiving and then removing pointer hover or keyboard focus triggers additional content to become visible and	Supports (N/A)	Certain UI elements and interaction areas have popups that detail more information about the item. For example, a patient's medical wristband will have a popup with the wristband's information on it. The nature of VR exempts this criterion.

then hidden, the following are true: - Dismissible - Hoverable - Persistent		
2.3.1: Three Flashes or Below Threshold (A) No more than three flashes in a 1-second period, or the flashes are below the defined thresholds	Supports (N/A)	No flashing content exists.

Keyboard

WCAG 2.2 Checkpoint	Conformance Level	Remarks
1.3.2: Meaningful Sequence (A) The correct reading sequence can be programmatically determined	Supports (N/A)	The nature of VR technology results in not having any programmatic reading sequence.
2.1.1: Keyboard (A) All functionality is available from a keyboard, except for tasks such as drawing	Partially supports	VR is operated via Meta Quest controllers. No other input, including keyboard, is usable in VR.
2.1.2: No Keyboard Trap (A) The user can use the keyboard to move through page elements and is not trapped on a particular element	Supports (N/A)	Keyboard is not applicable to VR.
2.1.4: Character Key Shortcuts (A) If a keyboard shortcut is implemented in content using only letter (including upper- and lower-case letters), punctuation, number, or symbol characters, then at least one of the following is true: - Turn off - Remap - Active only on focus	Supports (N/A)	Character key shortcuts are not applicable to VR.
2.4.3: Focus Order (A)	Supports (N/A)	There is no focus order, as users must use the VR controllers to point and interact with content.

Users can tab through the elements of a page in a logical order		
2.4.7: Focus Visible (AA) The page element with the current keyboard focus has a visible focus indicator	Supports (N/A)	Focus indicators are not applicable to VR technology. Note: A highlight is applied to items in the VR space when they can be interacted with using the controllers.
2.4.11: Focus Not Obscured (Minimum) (AA) When a user interface component receives keyboard focus, the component is not entirely hidden due to author-created content.	Supports (N/A)	Not applicable to VR.
3.2.1: On Focus (A) When a UI component receives focus, this does not trigger unexpected actions.	Supports (N/A)	Focus in the sense described by this criterion is not applicable to VR.

Headings and Structure

WCAG 2.2 Checkpoint	Conformance Level	Remarks
1.3.1: Information and Relationships (A) Info, structure, and relationships can be programmatically determined	Partially supports	Relationships between elements in VR are conveyed visually and sometime via audio. There is no programmatic link between elements.
2.4.1: Bypass Blocks (A) Users can bypass repeated blocks of content.	Supports (N/A)	Not applicable to VR.
2.4.6: Headings and Labels (AA) Headings and labels are clear and consistent.	Supports	Headings and labels are presented in menus and are clear. VR technology will not semantically present these items as headings or labels.
3.1.1: Language of Page (A) The language of the page is specified	Supports (N/A)	The VR app is available only in English.
3.1.2: Language of Parts (AA) Specify the language of text passages that are in a different language	Supports (N/A)	There are no areas of text in a different language than the default.

than the default language of the page.		
4.1.1: Parsing (A) Use valid, error-free HTML	Supports (N/A)	Parsing is deprecated in WCAG 2.2 HTML and CSS typically pass concerning these 4 specific criteria: (i) elements have complete start and end tags, (ii) elements are nested according to their specifications (iii) elements do not contain duplicate attributes (iv) any IDs are unique, except where the specifications allow these features. Note: There may be other general HTML validation errors outside the scope of this criterion. WCAG 2.1 Errata notes: “This Success Criterion should be considered as always satisfied for any content using HTML or XML.”

Labeling

WCAG 2.2 Checkpoint	Conformance Level	Remarks
1.3.5: Identify Input Purpose (AA) The purpose of each input field collecting information about the user can be programmatically determined when: - The input field serves a purpose identified in the Input Purposes for User Interface Components section; and - The content is implemented using technologies with support for identifying the expected meaning for form input data.	Supports (N/A)	There are no forms of the kind described by this criterion in the application.
2.4.2: Page Titled (A) The page has a title describing its topic or purpose	Supports (N/A)	Not applicable to VR.
2.4.4: Link Purpose (In Context) (A) The purpose of each link can be determined from the link text or surrounding context.	Supports	Hyperlinks are not used in the traditional HTML sense. Equivalent UI elements have their purpose determined by their accessible name.

2.5.3: Label in Name (A) For user interface components with labels that include text or images of text, the name contains the text that is presented visually.	Supports	User interface components names match their visual labels.
3.2.4: Consistent Identification (AA) UI components used across the web site are identified consistently on every page.	Supports	Not applicable to VR.
3.3.1: Error Identification (A) Input errors are clearly marked and described to the user.	Supports	Form errors when logging into the simulation are presented visually. Errors of the type described by this criterion do not happen during the simulation.
3.3.2: Labels or Instructions (A) Items requiring user input are clearly labeled or have clear instructions.	Supports	Labels and instructions for form elements are provided during the login. User settings have forms that are labelled visually as well. Note: Programmatic labelling is not available in VR.
3.3.3: Error Suggestion (AA) When the user makes an input error, give suggestions for valid input.	Supports	The nature of content would largely not give rise to opportunities for error suggestions, but relevant helpful suggestions are occasionally provided in text.
4.1.2: Name, Role, Value (A) For all UI components, the name, value, and role can be programmatically determined.	Does not support	The VR application does not expose standard accessibility information to users such as element roles.
4.1.3: Status Messages (AA) In content implemented using markup languages, status messages can be programmatically determined through role or properties such that they can be presented to the user by assistive	Supports (N/A)	There are audio cues of things happening in the VR simulation, but status messages of the kind described by this criterion are not available in the VR simulations.

technologies without receiving focus.		
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Multimedia

WCAG 2.2 Checkpoint	Conformance Level	Remarks
1.2.1: Audio-only or Video-only (Prerecorded) (A) Provide alternatives for pre-recorded audio-only or video-only content.	Does not support	Patients speak using audio-only information. Some interactions have audio cues only. No alternatives for this information exist in the VR simulation.
1.2.2: Captions (Prerecorded) (A) Provide captions for pre-recorded audio	Does not support	Patients speak using audio-only information. Some interactions have audio cues only. No captions are available to the user while this happens.
1.2.3: Audio Description or Media Alternative (Prerecorded) (A) Provide alternatives for pre-recorded synchronized audio/video	Does not support	No audio or text descriptions of the VR environments or experiences are given to users.
1.2.4: Captions (Live) (AA) Provide captions for live audio in synchronized audio/video.	Supports (N/A)	There is no synchronized audio/video content nor live audio.
1.2.5: Audio Description (Prerecorded) (AA) Provide an audio description of pre-recorded video.	Does not support	No audio or text descriptions of the VR environments or experiences are given to users.
1.4.2: Audio Control (A) Audio can be paused and stopped, or the audio volume can be changed.	Supports	All audio that plays during the simulation can have the volume adjusted or muted.
2.2.2: Pause, Stop, Hide (A) Users can stop, pause, or hide moving, blinking, scrolling, or auto-updating information.	Supports (N/A)	There is no moving, scrolling, or auto-updating information for which the criterion is applicable.

Usability

WCAG 2.2 Checkpoint	Conformance Level	Remarks
2.2.1: Timing Adjustable (A) Users are warned of time limits shorter than 20 hours and time limits can be turned off or extended	Supports	There are time limits that can be set by a user's instructor, but these are not enforced by the application itself.
2.4.5: Multiple Ways (AA) More than one way is available to navigate to other web pages.	Supports	Not applicable to VR.
3.2.2: On Input (A) Changing the setting of a checkbox, radio button, or other UI component does not trigger unexpected changes in context.	Supports	User input, such as changing the values of form elements, does not initiate unexpected actions or changes in context.
3.2.3: Consistent Navigation (AA) Navigation menus are in the same location and order on every web page.	Supports	Not applicable to VR.
3.2.6: Consistent Help (A) Help mechanisms such as contact details or self-help options are in the same relative order across multiple web pages, unless the user changes them.	Supports	Help is available through support channels online, but not in the VR application itself. Instructors should be available to help during simulation use.
3.3.7: Redundant Entry (A) Previously entered information is either auto-populated or selectable for the user in the same process, except when re-entry is essential, needed for security, or the information is outdated.	Supports (N/A)	There are no forms of the kind described by this criterion.
3.3.8: Accessible Authentication (Minimum) (AA)	Partially supports	Users are given a code that must be entered into a form to begin the simulation. This is given by the instructor and must be entered manually.

A cognitive function test (such as remembering a password or solving a puzzle) is not required for any step in an authentication process unless that step provides at least one of the following: • Alternative • Mechanism • Object Recognition • Personal Content		
3.3.4: Error Prevention (Legal, Financial, Data) (AA) For web pages with legal or financial commitments, input can be reviewed and corrected before final submission, and submissions can be reverted.	Supports (N/A)	There are no submissions which require legal or financial commitments.

Mobile User Experience

WCAG 2.2 Checkpoint	Conformance Level	Remarks
1.3.4: Orientation (AA) Content does not restrict its view and operation to a single display orientation, such as portrait or landscape, unless a specific display orientation is essential.	Supports	Due to the nature of VR environments, the user is not restricted to any single view.
2.5.1: Pointer Gestures (A) All functionality that uses multipoint or path-based gestures for operation can be operated with a single pointer without a path-based gesture, unless a multipoint or path-based gesture is essential.	Supports	The path-based gestures that users must use with their controllers are considered essential to the simulation activity.
2.5.2: Pointer Cancellation (A)	Supports	Controller pointer cancellation is possible.

For functionality that can be operated using a single pointer, at least one of the following is true: • No Down-Event • Abort or Undo • Up Reversal • Essential		
2.5.4: Motion Actuation (A) Functionality that can be operated by device motion or user motion can also be operated by user interface components and responding to the motion can be disabled to prevent accidental actuation, except when: • Supported Interface • Essential	Supports	Some simulation interactions require movement, but this is considered essential as it replicated a real-life activity.
2.5.7: Dragging Movements (AA) All functionality that uses a dragging movement for operation can be achieved by a single pointer without dragging, unless dragging is essential or the functionality is determined by the user agent and not modified by the author.	Supports	Some simulation interactions require dragging, but this is considered essential as it replicated a real-life activity.
2.5.8: Target Size (Minimum) (AA) The size of the target for pointer inputs is at least 24 by 24 CSS pixels, with certain exceptions involving: • Spacing • Equivalent • Inline • User agent control • Essential	Supports	CSS pixel target size is not applicable to VR. Note: interaction targets will be larger the closer gets to the interaction element.

Chapter 3: Functional Performance Criteria

Criteria	Conformance Level	Remarks and Explanations
302.1 Without Vision	Does not support	Shadow Health Lab with VR cannot be completed without vision. Vision is essential to the VR experience and cannot be replaced.
302.2 With Limited Vision	Partially Supports	Users with limited vision may have trouble completing tasks within the simulations. Vision is an essential part of the experience.
302.3 Without Perception of Color	Partially supports	Color is used at times to indicate differences between interaction areas or important visual information such as discoloration on a patient. There is no other means of communicating this information in most cases. Some interaction areas differ using color along with size and location.
302.4 Without Hearing	Does not support	Users need hearing to complete several tasks within the simulations, as things like patient speech is entirely through audio.
302.5 With Limited Hearing	Partially supports	Users need hearing to complete several tasks within the simulations, as things like patient speech is entirely through audio. Users with limited hearing may have trouble completing some of these tasks.
302.6 Without Speech	Does not support	Speech is used to communicate with the simulated patient. There is no alternative currently.
302.7 With Limited Manipulation	Does not support	VR controllers are needed to interact with the simulation. If a user has trouble using the controllers, no alternative is available.
302.8 With Limited Reach and Strength	Partially supports	Users will need to move around the VR environment and interact often with the patient in nearby medical tools and devices. Limited reach or strength may hinder this.
302.9 With Limited Language, Cognitive, and Learning Abilities	Does not support	The VR experience offers no assistive technology tools to help those with cognitive disabilities.