+ trucorp

Smart Airway Adult User Manual

The Smart Airway Adult, featuring a head and torso, offers a sensor-driven simulation platform enabling validated assessment and personalised feedback for competency training across fundamental and advanced airway techniques.

Embedded sensors track key metrics and display on the app which include incisor force, patient head positioning, jaw thrust, cricoid pressure, cricothyroidotomy, oesophageal intubation, internal airway visuals, ventilation rate and volume (including left and right lung isolation).

A connected custom app offers fully customisable assessment sessions with detailed feedback reports generated after each session outlining performance, user technique and any recommended corrective practice(s). Such sessions include Direct Laryngoscopy & Intubation, Bag-Valve-Mask Ventilation, and Sellick Manoeuvre.

Contents

Product Specifications

Product Name: Smart Airway Adult

Product Code: SAA10001X

Full shipment weight: 12kg

Full shipment dimensions: 79(L) x 46(W) x 28(H) cms.

Package Contents

The package contains:

- **x1 Smart Airway Adult model (SAA10001)**
- **x1 USB C connection cable**
- **x1 Smart Airway Adult carrier case**
- **x1 100ml TruCorp lubrication (TL001)**
- **x1 Wrap Around Neck Skin (RSN2005)**
- **x5 Larynx Insert (NLX050) 1 attached, 4 extra**

Recommended Equipment Sizes

The recommended equipment sizes to be used with the Adult Smart Airway are as follows:

- **Size 6.0-7.0mm ID for nasal intubation**
- **Size 7.0-7.5mm ID for oral intubation**
- **Size 3 for LMA laryngeal masks**
- **Large Bag Valve Mask Size 6**
- **Similar respective sizes for other supraglottic devices**

Initial Product Setup

On removing the Smart Airway unit from the packaging, place on a flat, level surface. Plug in the supplied USB-C cable. Press the silver ON/OFF button to turn on the Smart Airway unit.

Note: The ON/OFF switch has 2 states:

1. **Flashing LED- in pairing mode.**
2. **Static LED- the device has paired with a manikin.**

Getting Started

The Smart Airway app is available to download from both the App and Google Play stores.

On initial installation after logging in, you will be prompted to install some media files which are embedded in the app. Note: The tablet must be connected to an active internet connection.

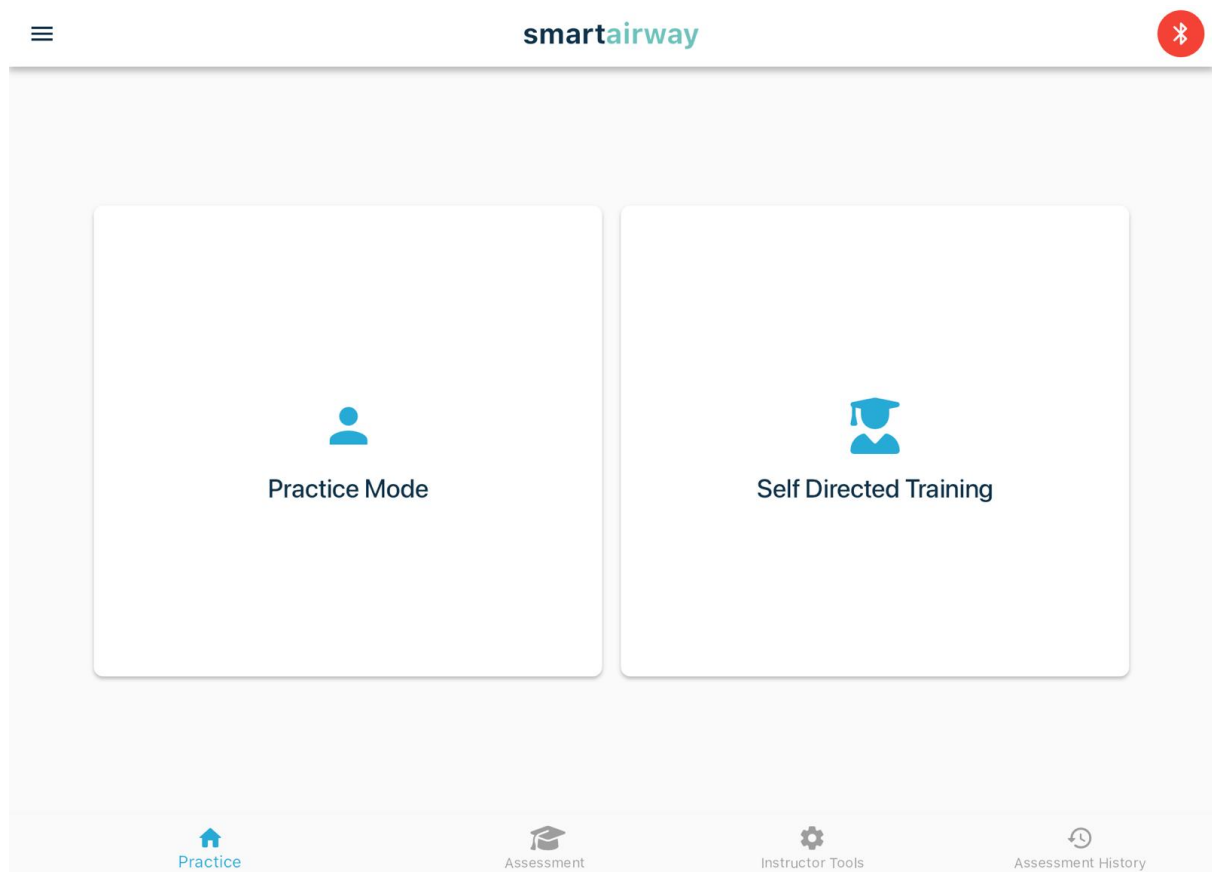On pressing "Start Download", media files will begin to download.
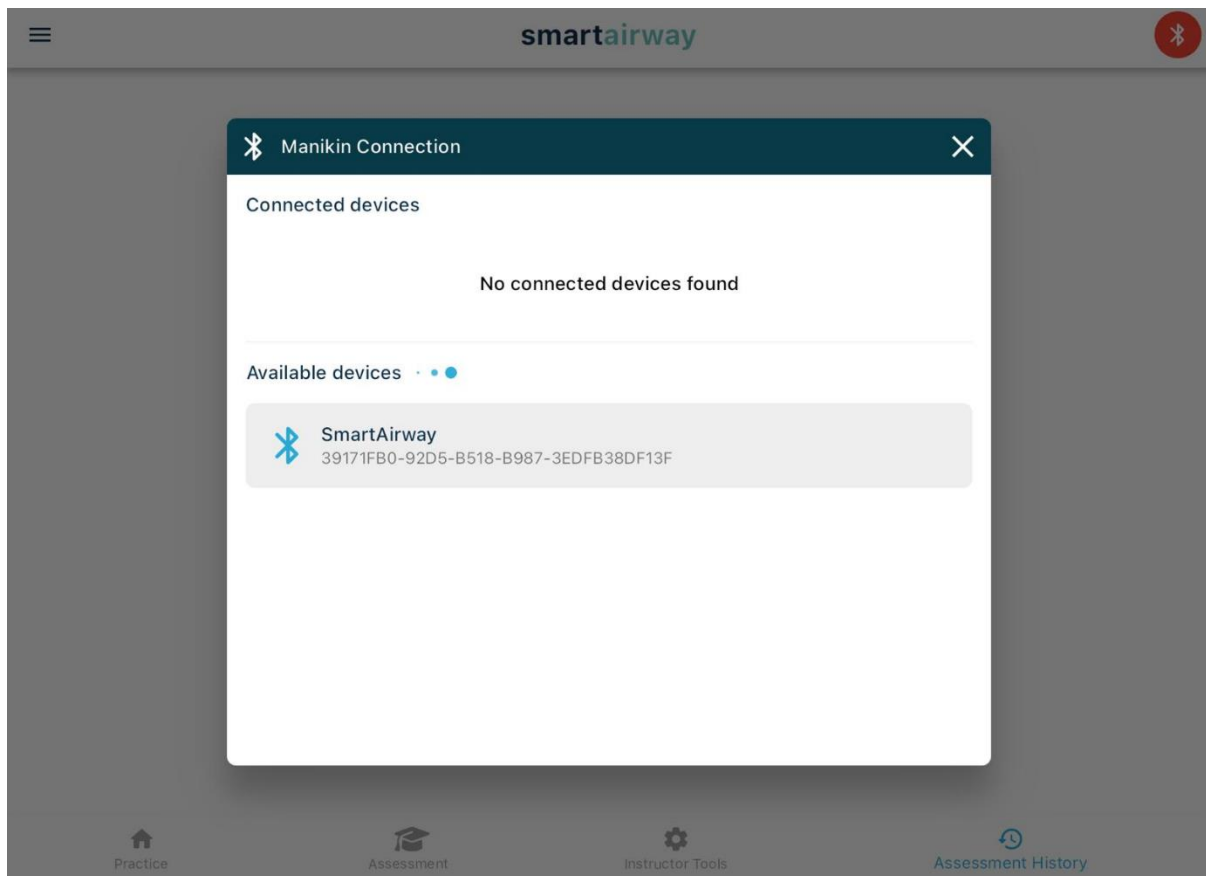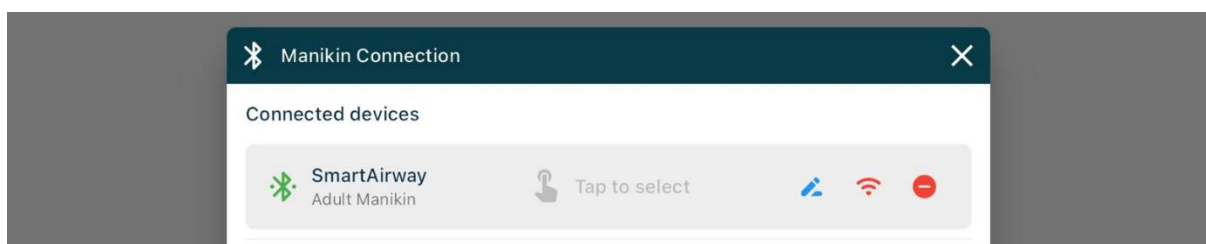

On completion, you will be brought to the home screen.

To connect to a manikin, press the connection icon on the top right. This will open the connection dialogue. Select from the list of available devices.


The manikin can be renamed by pressing the rename icon. Alternatively, press the Wi-Fi icon to configure the internal camera.

There are two methods:

1. Internal Access Point- in this mode, the manikin creates its own Wi-Fi network. This mode is most reliable where network dropouts are likely and internet speeds are low. Please note the app will perform in offline mode.
2. External Access Point- in this mode, the manikin will connect to your chosen network and remain online.
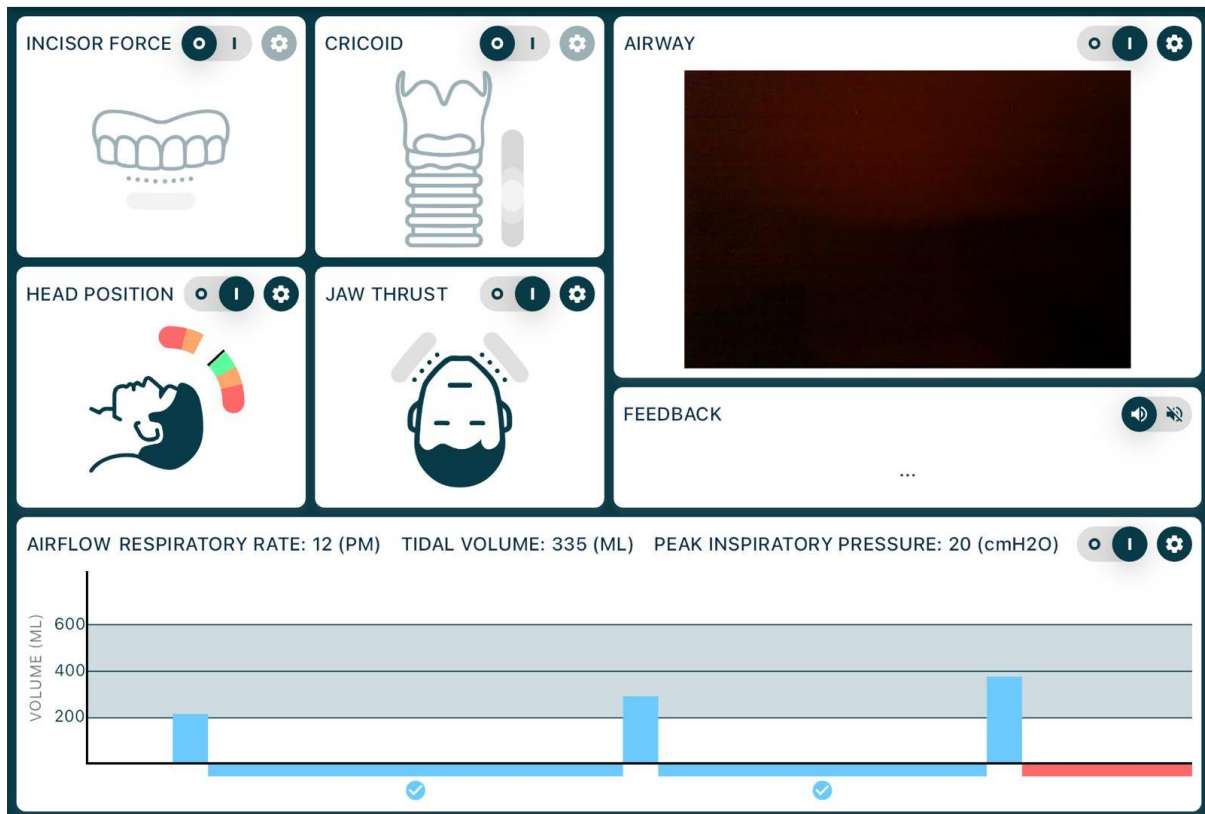
Enter credentials and press connect.
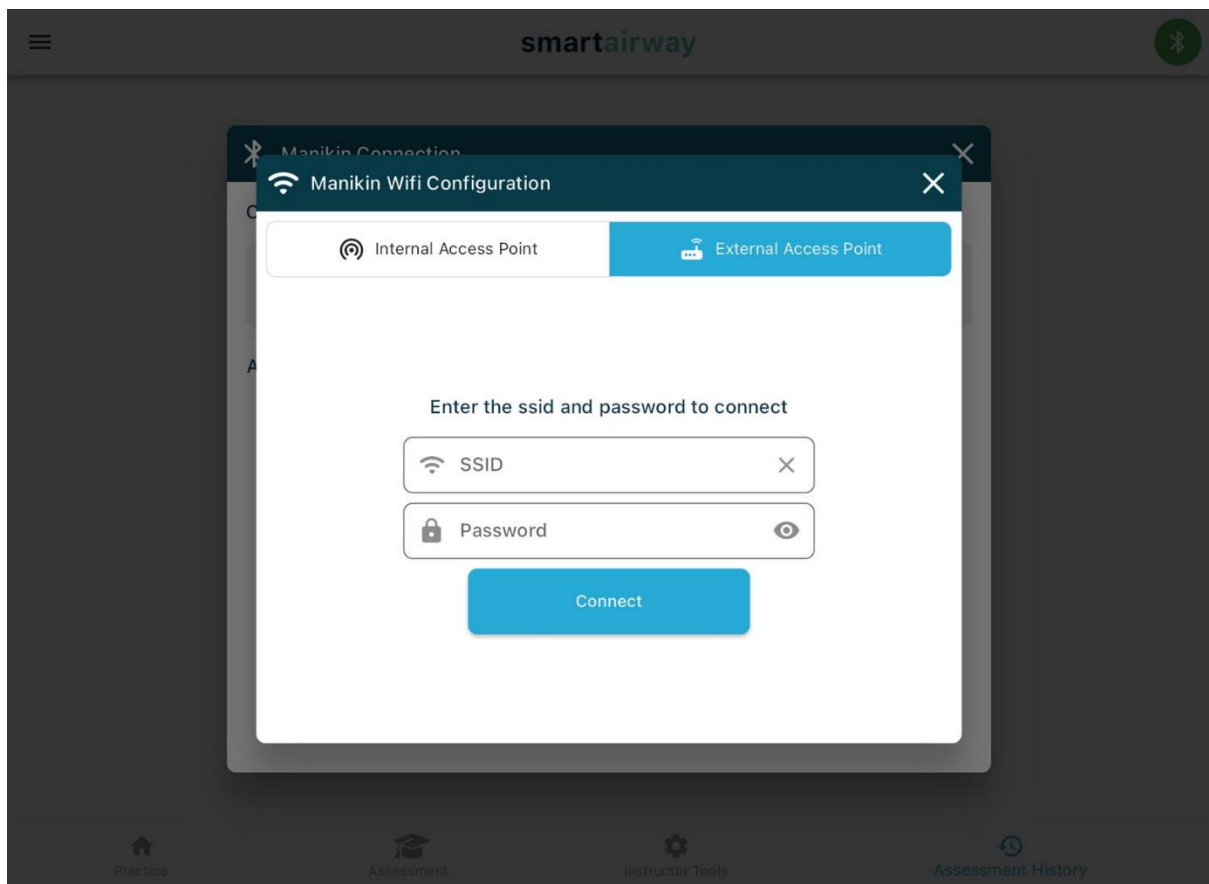
The app is now fully configured with the manikin and ready to use.

Icon Interface

The app features a range of icons in various states.

Icon Overview – In practice mode all features are displayed at one time. All features will be on as standard when starting this mode, with the 'eye' icon in the top right acting as a master switch that toggles all features from 'all on' to 'all off.'

In each icon grid, there are two icons are displayed in the top right.

- **The ON/OFF toggle switches the selected feature on or off. Note: this toggle only applies to that specific feature and won't affect any other. All icons when turned off will be greyed out and will not respond when interacted with.**
- **The settings icon opens to display a smaller pop-up window that allows the user to adjust the feature parameters, narrowing the parameters of features will increase difficulty while the widening the parameters will make the features easier. There is a 'Reset to Defaults' option to reset the parameters to default.**

Incisor Force

The incisor force is measured on the front two top teeth, this is highlighted in the icon with the dotted graphic. The bar below the teeth icon will turn orange to red depending on the amount of force applied on them. The amount of force used to trigger these can be adjusted in the parameter settings using the settings icon.

Cricoid

The cricoid icon measures the pressure location and the amount of pressure applied. When pressure is applied incorrectly, the icon will highlight red in the incorrect location, and pressure applied will not be displayed. Only when pressure is applied in the correct location will the amount be measured and displayed. The cricoid pressure is displayed as a sliding bar scale for red (sub-optimal) to green (correct) to red (excessive). In the settings icon, user will find the option to select awake or asleep mode.

Head Position

The head position value updates as the head is rotated. The rotation scale has 4 zones, like the other features it uses a sliding scale from green to red. Head position has a 4th zone which is resting, this is the position of the head in neutral when sitting naturally. On the sliding scale there are red zones at either end of the scale, these signify the points of hyperextension and hyperflexion. In the settings these parameters for sniffing, hyper flexion and hyper extension can all be altered to suit the users' preferences or skill level.

Jaw Thrust

The Jaw thrust icon display tswo bars, one for either side of the jaw. If both sides are activated the icon will display green on both sides. If there is an imbalance, red will show on the side where more lift is required.

Airway Camera

The airway camera pane shows real time views of the internals of the airway, focusing on the epiglottis, vocal cords, and vallecular space. On entry of the laryngoscope, the built-in light illuminates the areas mentioned, with the internal camera showing this and updating instantaneously. This allows the user to see a real time representation of the endotracheal tube as it is inserted for ventilation.

Airflow Graphs and Data

The Airflow section shows real time graphical representations of the ventilation profile on the y-axis. This can be shown as either a bar or line graph. The respiratory rate is also plotted along the x-axis in real time. Details of the Respiratory Rate, Tidal Volume delivered, and Peak Inspiratory Pressure are also shown within this icon grid.

Feedback

The Feedback pane displays text feedback based on user performance. Information on each skill set is displayed here, with a toggle ON/OFF to control the audio for each message. Example text/audio prompts include:

- Incisor- "Incisor force detected, reposition laryngoscope".
- Cricoid- "Pressure applied in incorrect position, palpate cricoid cartilage and try again".
- Head Position- "Optimum position achieved, well done".
- Jaw Thrust- "Please review jaw thrust technique".
- Airflow- "Increase ventilation rate".

App Modes

The Smart Airway app has three main operating modes:

1. Practice Mode
2. Self-Directed Training Mode
3. Assessment Mode

Practice Mode

This mode allows the user to familiarise themselves with the model and/or app and get real-time feedback on techniques such as incisor force, cricoid pressure, head position, jaw thrust, and BVM. Additionally, this allows the user to get visualisations of the lung volumes via bar graphs and pressure curves. This will give them feedback on Respiratory Rate (RR), Tidal Volume and Peak Inspiratory Pressure (PIP). The app can discern accurate adherence from inconsistencies in established best practices, creating transparent pathways for targeted refinement. Real time icons along with audio and text feedback provides feedback to the user, allowing them to help better their technique(s).

The screenshot below outlines Practice Mode from a top level:
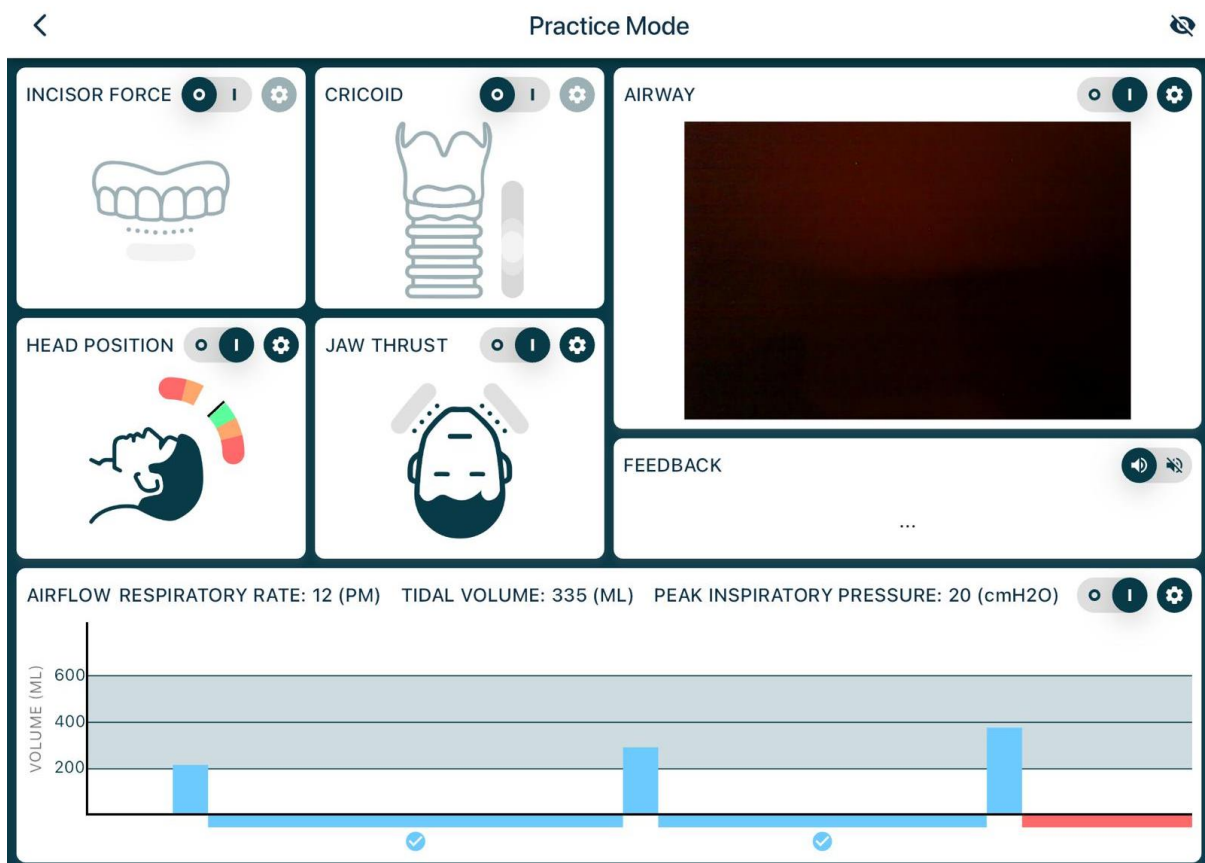
Features can be turned of independently, allowing the user to tailor their training accordingly.

Self-Directed Training

Self-Directed Training mode contains guided video tutorials on what each skill is, contradictions, background information, and audio and text feedback on the student's performance. This allows students to build and improve their knowledge of procedures, put the knowledge learned in practice mode to the test with an objective self-directed training session. The student can customise what skill they would like to focus on. Quantitative feedback is then provided on how well the student performed with results presented and feedback reports generated.

In real time, students will receive objective performance feedback helping them to improve their technique and become more confident in their abilities. Realtime audio and graphical feedback during the training will provide performance feedback and corrective actions where required.

On selection of Self-Directed Training Mode, the student is asked to complete 4 setup steps:

- **Step 1: Enter Learner Information-**

- **Step 2: Manikin Connection- Choose from the list of available manikins.**
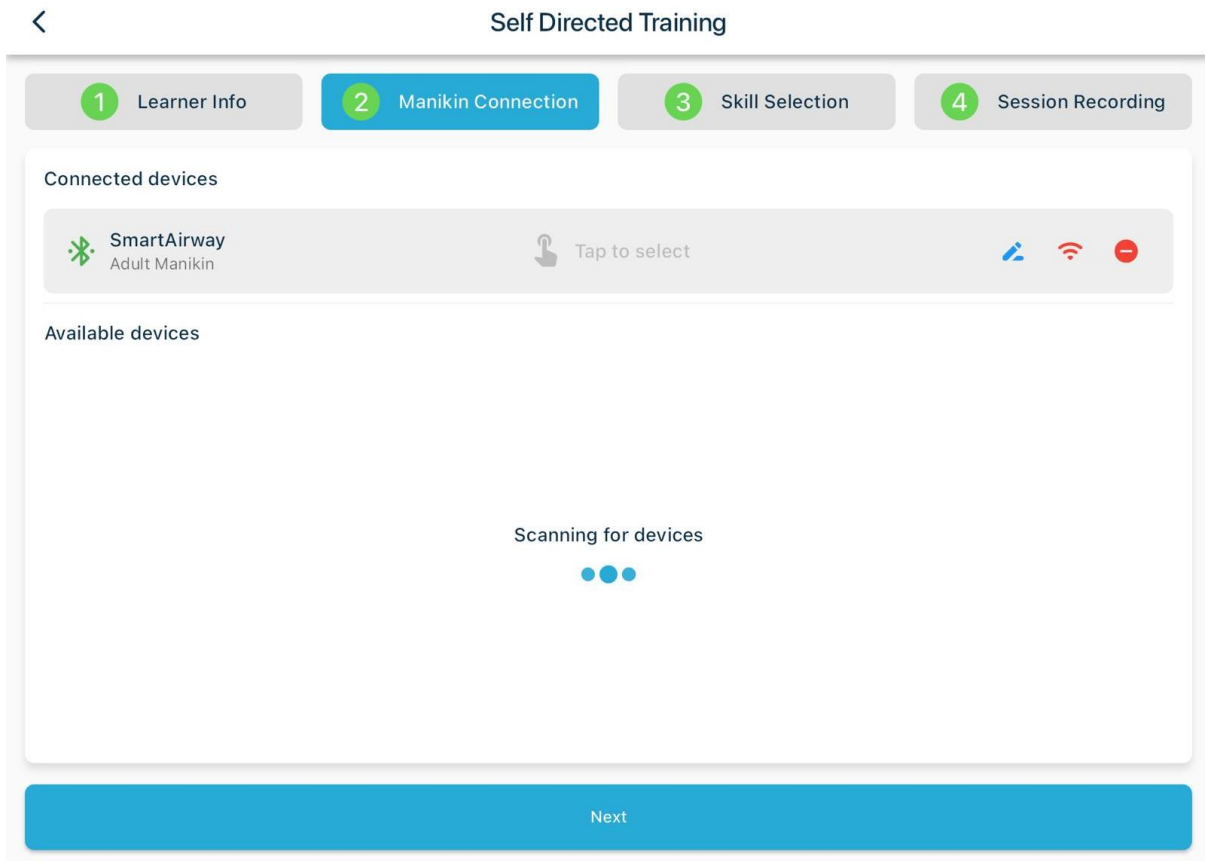

Once connected, the device will show under "connected devices".

Here, you may also rename the manikin, configure the internal Wi-Fi camera, and disconnect from the manikin if you wish to connect to a different manikin.

- **Step 3: Skill Selection-**

The user can pick from a variety of default and custom skills to practice. There are options to skip prelearning sections, as well as the option to pick the amount of ventilation breaths required to complete the objective during ventilation exercises.
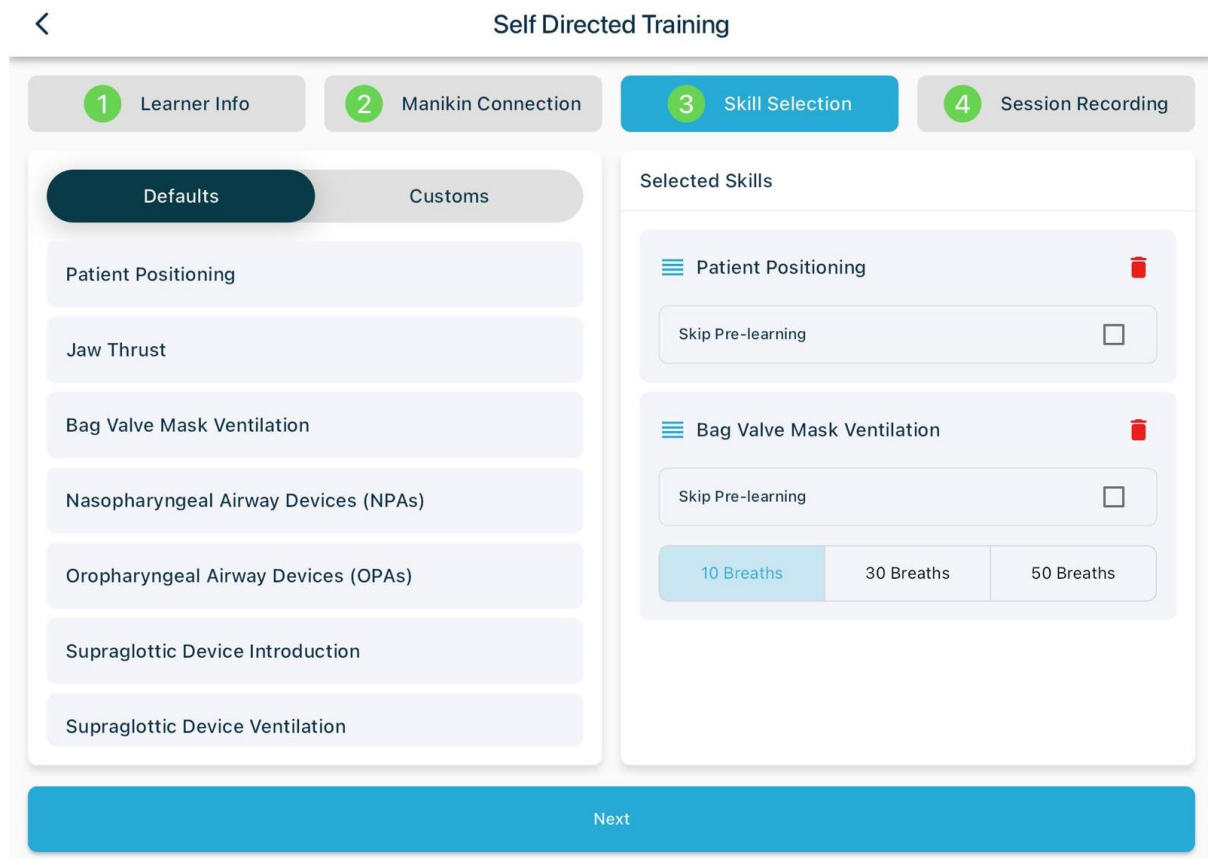

Selected Skills can be reordered by holding down over the list icon and dragging accordingly. Pressing the trash bin icon will remove the skill from the Selected Skill list.

- **Step 4: Session Recording-**

This allows the user to setup video recording of the upcoming session. Using either the rear or front camera on your chosen device, this functionality can be enabled. This recording will then appear in the results after completion of a skill, with malpractice events timestamped for review.

Note: Ensure that the full manikin is in frame before pressing Start.
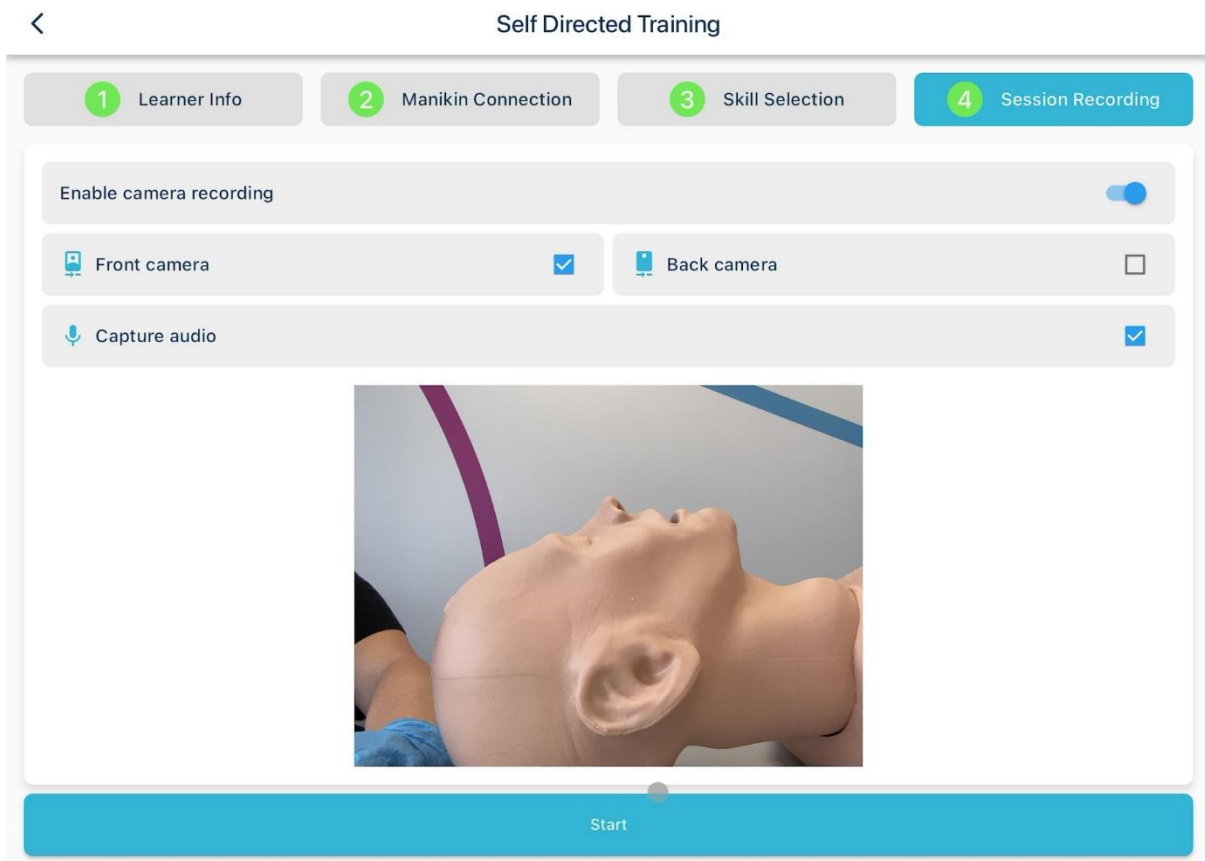
On pressing start, pre-reading information will be displayed linked to the skills chosen to be trained on. This includes information on procedure preparation, method, and complications. This is followed by a demonstration video for the chosen skill.

The practical part of the training will now begin. Pressing Start Objective will begin the objective, the countdown clock will start. In this mode, icons related to the chosen skill will be displayed.
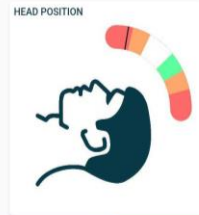
On completion, a summary of results will be displayed alongside session recordings (if selected during setup). These may be exported to pdf format using the "Share Report" button or emailed to the user via the 'Email Report' button.

Self Directed Training ✕

Jaw Thrust   ✉ Email Report   ❮ Share Report   ↻ Retry Session   ☰ Reselect Skills

| Summary | Results | Video |

Jaw Thrust

🏁 Demonstrate and carry out a jaw thrust manoeuvre on the Smart Airway effectively to open the airway, maintaining for 5 seconds.

🕐 You had 30 seconds to complete the objective

✓ Objective Completed in 21 seconds

💬 Head Position Feedback

Instances of hyper-extension: 1

Instances of hyper-flexion: 0

💬 Jaw Thrust Feedback

Incorrect technique on left: 1

Incorrect technique on right: 1

It took you 21 seconds to complete this objective.

Self Directed Training ✕

Jaw Thrust   ✉ Email Report   ❮ Share Report   ↻ Retry Session   ☰ Reselect Skills

| Summary | Results | Video |

〰️ Head Positioning

Time

〰️ Jaw Thrust

Results Interface buttons:

Reselect Skills- allows for the user to train on a different skill(s) without having to go through the full setup procedure again.

Retry Session- allows the user to repeat the training just completed.

Share Report- generates a PDF version of the results which can be shared or saved locally.

Email Report- allows the user to send a PDF version of the results to the email address they entered in Step 1 of self-directed training.

The 'X' icon exits the current session.

Assessment Mode

Assessment Mode offers a variety of both preset and custom scenarios whereby the instructor can setup and host a session for the student to join to. The instructor can modify scenarios and assessment criteria based on the user's level of experience. Additionally, pre-theory knowledge questions for each topic or procedure are provided and marked accordingly. Debrief video and quantitative feedback is provided post assessment, and the instructor can provide additional feedback on how they can improve their technique. A certificate of completion and summary of results will be provided at the end of the assessment which includes answers to the questions.

The instructor can host two types of assessment:

1. **Local-** both tablets must be connected to the same Wi-Fi network.
2. **Remote-** tablets may be connected to different networks, allowing for remote access.

Note: Two tablets of the same operating system are required for Assessment Mode.

On starting the session, the instructor will select an assessment for the student to complete.

< Supervised Assessment   💬 Chat

| 1 Assessment Selection | 2 Assessment Questions | 3 Camera Configuration |

| Defaults | Customs |

All Assessments ▼

○ 3. Patient Positioning

◉ 4. Jaw Thrust ⬤

○ 5. Jaw Thrust

○ 6. Jaw Thrust

○ 7. Bag Valve Mask Ventilation

○ 8. Bag Valve Mask Ventilation

○ 9. Bag Valve Mask Ventilation

Jaw Thrust

Description:
You encounter an unresponsive patient on the ground. Your objective is to perform the jaw thrust maneuver to open the patient's airway without risking further spinal injury.

Objective:
Perform the jaw thrust maneuver to open the patient's airway while minimizing movement of the cervical spine.

[Proceed]

< Supervised Assessment   💬 Chat

| 1 Assessment Selection | 2 Assessment Questions | 3 Camera Configuration |

Jaw Thrust
10 question(s)

[⤬ Random Selection] [✕ Clear All] [⊞ Select All]

? True or False: The jaw thrust maneuver is primarily used to open the airway by displacing the mandible forward without hyperextending the neck.
Answer: True ☑

? True or False: Jaw thrust is contraindicated in patients with suspected cervical spine injuries due to the risk of exacerbating spinal damage.
Answer: False ☑

? True or False: During the jaw thrust maneuver, the fingers are placed behind the angle of the mandible and pressure is applied upwards to lift the jaw.
Answer: True ☑

? True or False: Jaw thrust is commonly used in conjunction with head tilt-chin lift maneuver to maintain a patent airway in unconscious patients.
Answer: True ☑

? True or False: Jaw thrust can be performed with the patient in both supine and sitting positions to ensure adequate airway management.
Answer: True ☑

? Which of the following describes the primary objective of the jaw thrust maneuver?
Answer: Elevating the tongue ☑

? What is the recommended technique for performing the jaw thrust maneuver?

[Proceed]

The student will then be briefed and prompted to enter their information and connect to their preferred manikin.

Before the assessment, the student will be presented with a mix of True/False and open-ended quiz questions to complete. These will form part of the Certificate of Completion, along with session results.

The practical aspect follows. During assessment mode, no realtime feedback is given to the student, but the instructor will have full access to their performance in real time:

Student side:

← Supervised Assessment

Jaw Thrust   00:30 ⏱

🏁 Demonstrate and carry out a jaw thrust manoeuvre on the Smart Airway effectively to open the airway, maintaining for 5 seconds.

🕐 You have 30 seconds to complete the objective

Start Objective

Instructor side:

‹ Supervised Assessment   💬 Chat

Student 5454   Jaw Thrust   Finish Assessment
Student5454@trucorp.com

Jaw Thrust

🏁 Demonstrate and carry out a jaw thrust manoeuvre on the Smart Airway effectively to open the airway, maintaining for 5 seconds.   ⏱ 00:15

🕐 Student has 00:30 to complete this objective

Jaw Thrust   HEAD ANGLE

On completion of the assessment, the instructor will review the results and grade the performance. This can be done straight away or reviewed later in the Assessment History tab on the home screen. Answers to the quiz are shown under the "Exam" tab.

Instructor Tools

The Instructor Tools section contains tools which can be used to setup and configure many aspects of the app including:

- Assessment Manager- Setup, configure and design custom assessments.
- Certificate- Design and create custom certificates.
- Limit Editor- Generate custom limit settings for each feature.
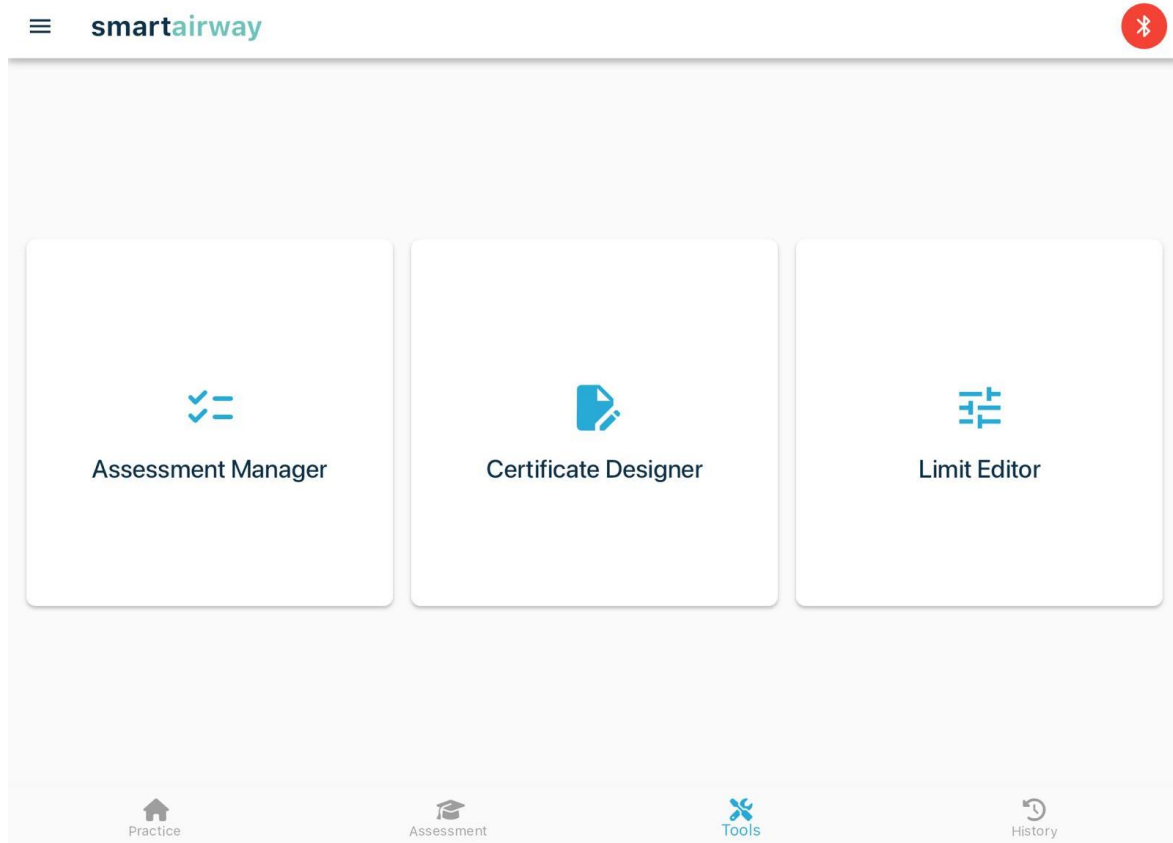
Assessment Manager

The Assessment Manager allows instructors to create custom assessment scenarios, with full flexibility on the Title, Description, Objective and Procedures involved. These can be saved for future use during Instructor Led assessments.
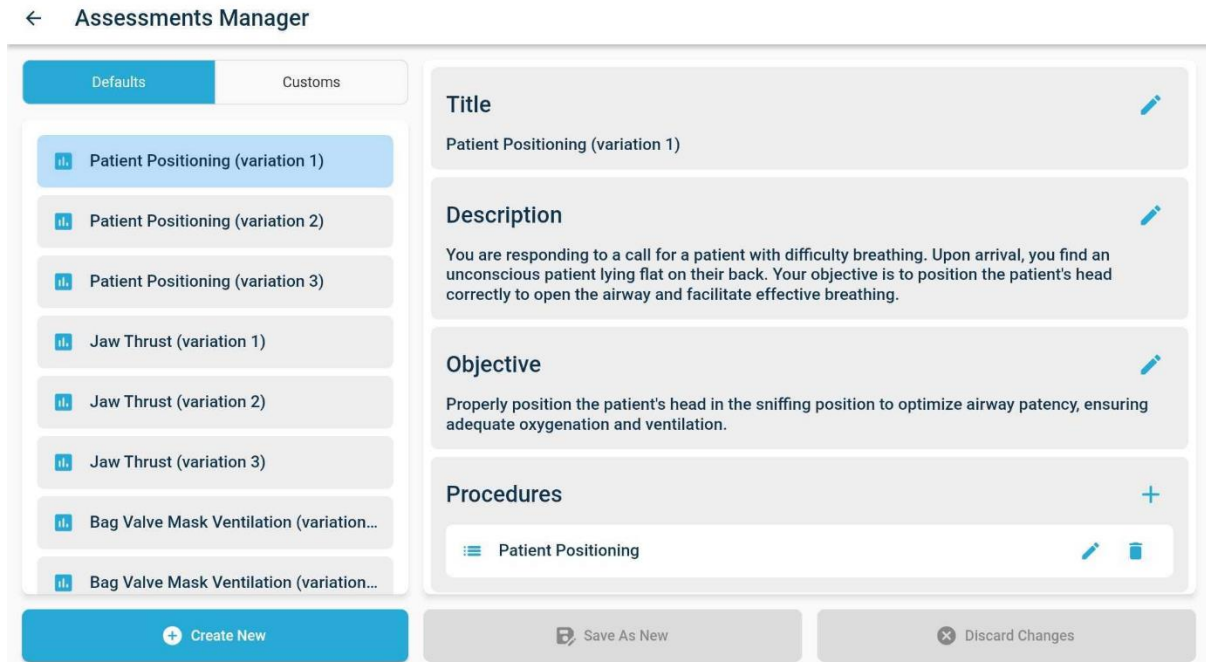
Certificate Designer

You have the ability to create custom certificates for your students once they have completed a session using the Assessment mode. It can show a variety of information tailored to your needs and represent your organisation. Have the ability to change the logo and colour to match your brand as well as change headings, scenario names, key scores, and statistics. Save these templates for easier access in the future.
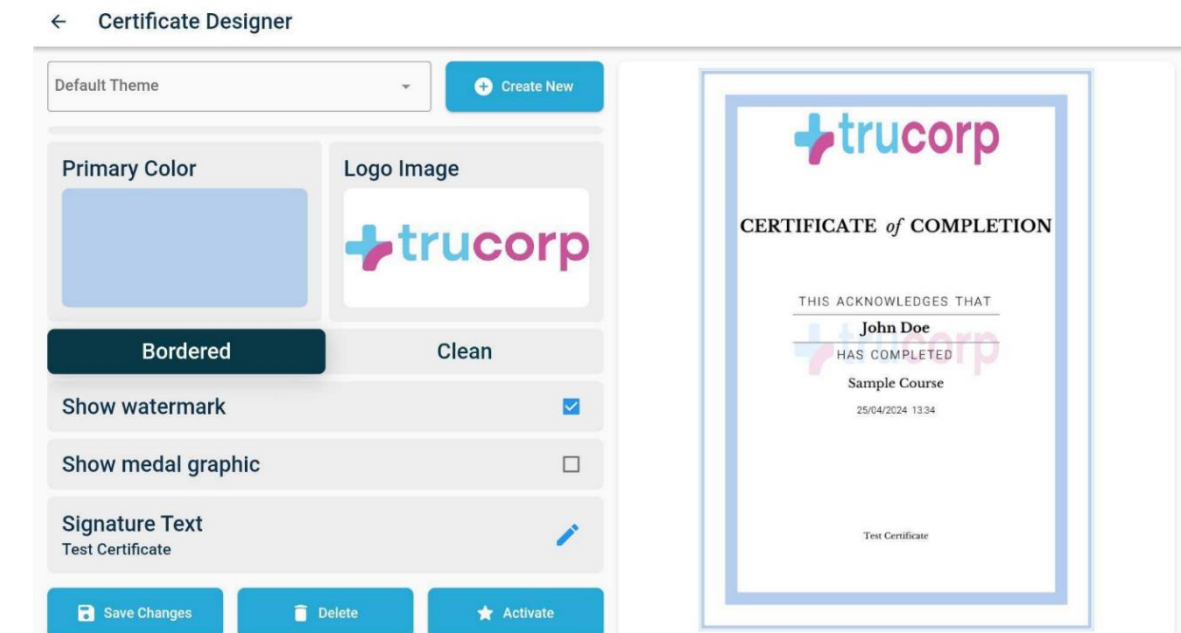
Limit Editor

Here, instructors can create new custom limits for each feature, narrowing or widening the level of difficulty for their students. These can be named and saved for future use in Assessments, Self-Directed Training exercises or during Practice Mode.

Assessment History

On the instructor side of the Smart Airway app, the instructor has the ability to review and grade past assessments carried out by connected students. This will allow the instructor to review their student performances' as they please, structured in one easy to access location.
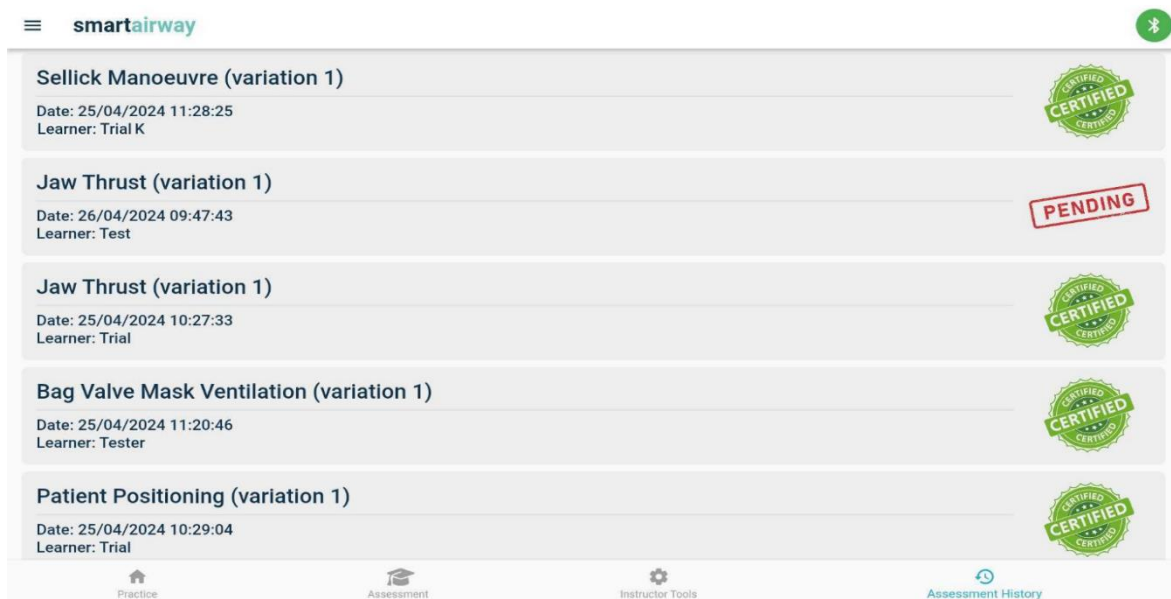
Troubleshooting and FAQs

Issues with connectivity/timeout?

- **Close the app, turn off the manikin and reconnect.**

Uneven chest rise during BVM/ correct intubation?

- **Give 3-5 excessive breaths to free the chest mechanics.**

Problems powering on the unit?

- **Ensure the USB-C power cable is plugged into the recommended adaptor.**

Issues with the Smart Airway app?

- **Ensure you have downloaded the latest release from the App Store or Google Play store.**

Issues with the internal camera view?

- **Ensure the laryngoscope in use has sufficient battery to provide adequate lighting.**

Issues with the cricoid pressure sensors?

- **Before turning on the unit, ensure the sensor clip is secured around the airway, with the larynx insert place correctly and markers aligned.**

Issues with a specific feature?

- **Contact TruCorp to discuss – info@trucorp.com**

Care and Maintenance

The model should be treated with care, as though it is a real-life clinical environment. When the product is not in use, please store in the black carrier case provided.

Store in clean, dry conditions away from heat and direct sunlight; avoid contact with metals, solvents, oils or greases and strong detergents.

Alcohol wipes (minimum 75%) may be used on the airway in accordance with the manufacturer's instructions.

Electronics:

Electrical Safety
Power Supply: The product operates at 5V with a USB-C to USB-A cable connected to wall adaptor or USB-A port. Using a power supply with a different voltage may cause the product to malfunction or cause damage and void the warranty.

Disconnect When Not in Use: If you do not plan to use the product for an extended period, unplug it from the power source.

Avoid Overloading: Do not connect the product to a power source that is already overloaded with other devices.

Operating Environment
Temperature: Operate the product in a well-ventilated area. Avoid placing it in direct sunlight or near heat sources as excessive heat can damage the internal components.

Humidity: Keep the product in a dry environment. High humidity can lead to condensation, which may cause electrical shorts or other malfunctions.

Dust: Keep the product away from dusty areas. Dust accumulation can affect the performance and cooling of the product.

Software Updates:
App Updates: Ensure that the Smart Airway app is up to date. Check the App Store/Play Store for updates.

Internal Access
No User Accessible Components: This product is designed without any user-accessible components inside. Please do not attempt to open the casing or access the internal parts.

Troubleshooting
Refer to the Manual: If you encounter any issues with the product, refer to the troubleshooting section of this manual for guidance or our product "How to" videos.

In response to the recent COVID-19 pandemic, we recommend this additional step to ensure the product is fully sanitised:

Use alcohol spray (minimum 75%) and wipe off. Repeat this for 3-4 times to ensure to kill the virus completely. This method can be used on both the silicone skin and the latex airway.

Warranty

TruCorp warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of 1-year from the date of delivery. This ensures that our customers receive maximum coverage on each product. If the unit should malfunction it must be returned to the factory for evaluation. Upon examination by TruCorp, if the unit is found to be defective it will be repaired or replaced at no charge.

TruCorp will pay for the freight/delivery and the actual parts needed free of charge if any part of the product fails within the 1-year period.

However, these warranties are VOID, if; the unit shows evidence of having been tampered with or shows evidence of having been damaged by excessive heat, the use of sharp instruments, misapplication, misuse or other operating conditions outside of TruCorp's control. Components that wear or are damaged by misuse are not warranted and will be charged for if repair has been approved. Warranty is void if third party products are seen to have damaged or caused failure of the TruCorp models. Please ensure to closely follow the recommend equipment sizes (please refer to page 6), if damage occurs due to misuse of equipment, your warranty will be void.

Please direct all warranty and repair inquiries to:

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