ZENMED+

Guidebook

CPR Simulator

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Chapter 1: Introduction

1.1 About This Guidebook

This operating manual provides installation, operation, and maintenance instructions for first aid instructors in accidents or other parties who use this CPR simulator as a teaching tool and assessment of the process of providing CPR.

The instructions in this book contain important information for the use of the product good and right. read all the way through the guide to be able to use this CPR simulator correctly.

1.2 Use of Guidebook

This tool allows users to do simulation of giving CPR to people who need first aid, with the tool's ability to provide feedback in the form of compression depth, compression speed, as well as ventilation speed and ventilation volume, it is hoped that the user can perform CPR properly and correctly, by reading this book it is hoped that the reader will be able to operate and maintain tools properly and correctly.

Chapter 2: Intended Use and General Information

2.1 The intended use

Purpose of use this CPR Simulator is to be used as a training tool for performing CPR, so it is hoped that users can be trained to perform CPR according to existing standards, apart from that this tool can also be used as an assessment tool for professionals in performing CPR.

2.2 Tool Capability

a. *Feedback* Compression and Ventilation Data

The tool is able to provide feedback in the form of compression speed, compression depth, ventilation speed, and ventilation volume, with various indicators to provide information on whether the CPR carried out was good and correct. All this information can be viewed on the android device connected to the doll.

b. *Multi Devices*

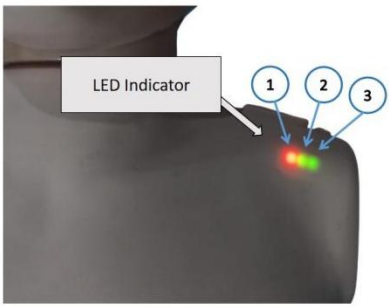
One android/ IOS the device can be connected to several dolls at once, so that teachers can monitor and assess several people at once in the class.

Chapter 3: Interfaces on tools

3.1 Interface parts on dolls

The CPR Mannequin has several parts. This book explains the parts of a mannequin, including the head, body and bottom parts which are explained in the following picture.

Picture1. Head part



Picture2. Body parts

There are 3 LED indicators on the body of the CPR simulator, here is a description of the three LEDs based on the picture above.

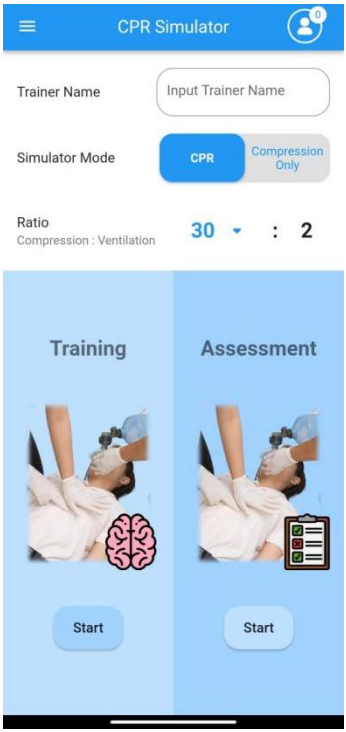
Table1. LED indicator

LED number	Information
1	Battery Indicator
2	Compression speed indicator
3	Compression depth indicator

Picture3. Low part

3.2 Interface on Android Devices

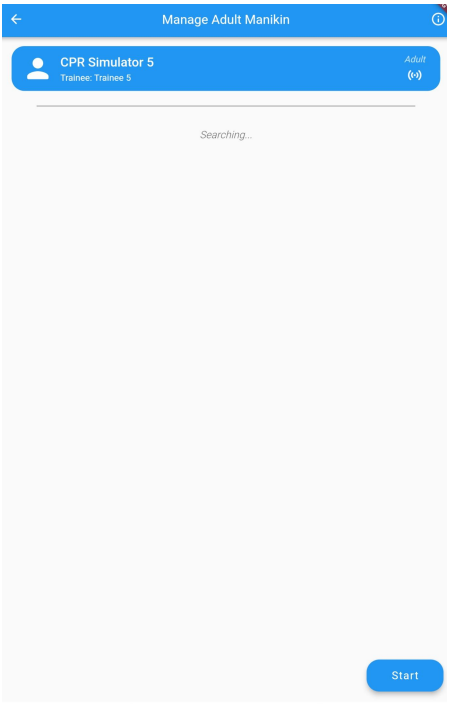
In this section there is an application start page which contains the patient's height, the patient's gender which can be selected between female or male, CPR section or just compression, and is intended for training or exam processes.



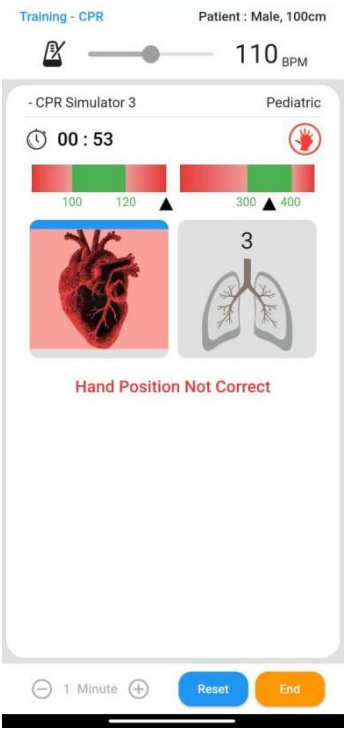
Picture4. Application start page

On this page, the application will display the section that was previously selected on the home page. Perform management on the simulator. Connecting the simulator to the application can be done using a Bluetooth network.

If the connection has been connected, the name of the connected simulator will be displayed on the application monitor screen. After the connection process is complete, the user can press the "start" section. The page described is shown in the following image.



Picture5. Bluetooth connection page

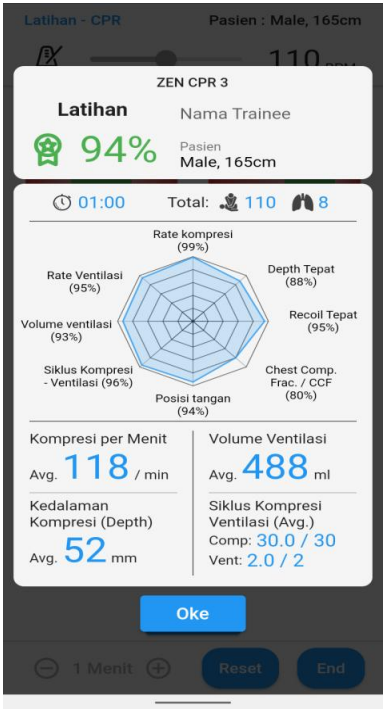


Picture6. Simulation page

On this page there are the results of the CPR process that has been carried out, in the form of training percentages and information displayed in the form of a spider graph.

Each user can see and compare the accuracy in carrying out the training process. When the training process has been completed, the user can press "okay". The results of the training

data will be saved in the application which can be viewed or saved in PDF format as an following image.



Picture7. Assessment page

Chapter 4: Setting Up and Operating the CPR Simulator

4.1 Turning on and Setting Up the Doll

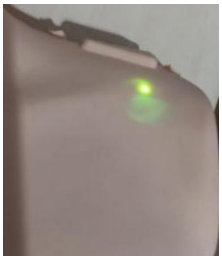
1. Turn on the simulator by pressing the power located under the simulator body, next to the charger port.

Picture8. Power button

2. After turning on the simulator, wait a moment until the speed and compression depth indicator LEDs turn red alternately, indicating that the simulator is ready to be connected.

Picture9. The simulator is ready to be connected

3. To ensure that the battery is sufficient, look at the battery condition on the LED indicator in the simulator body, where if the LED blinking red means the battery is in critical condition, and the LED will light green when the doll is charging.



Picture10. Charging

Picture11. Battery out

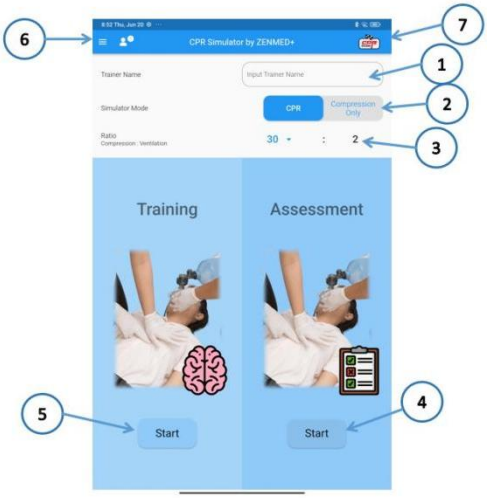
Table2. Meaning of Battery indicator

No.	Information	Instruction
1	Flashing red	Battery is almost run out
2	Constant red	Battery safe
3	Green	Charging Condition

4.2 Using Applications

a. Connecting Apps To Puppet

When you first open the application before connecting to the doll, the settings page will appear as follows.



Picture12. Initial operation

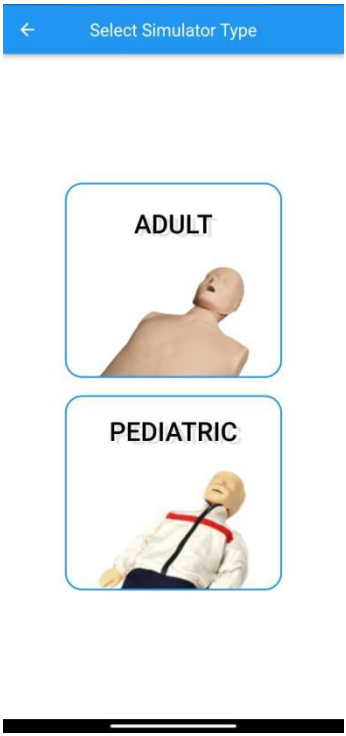
there is a start page This users can set the Simulation according to their training needs.explanation of the above picture can be seen in the following table.

Table3.Explanation of operation part 1

No.	Name	Function
1	Trainer's name	The trainer's name can be seen in the report results.
2	Simulator Mode	Choose a simulation method, between compression only or breathing.
3	Ratio	To set the ratio mode between compression and breathing.

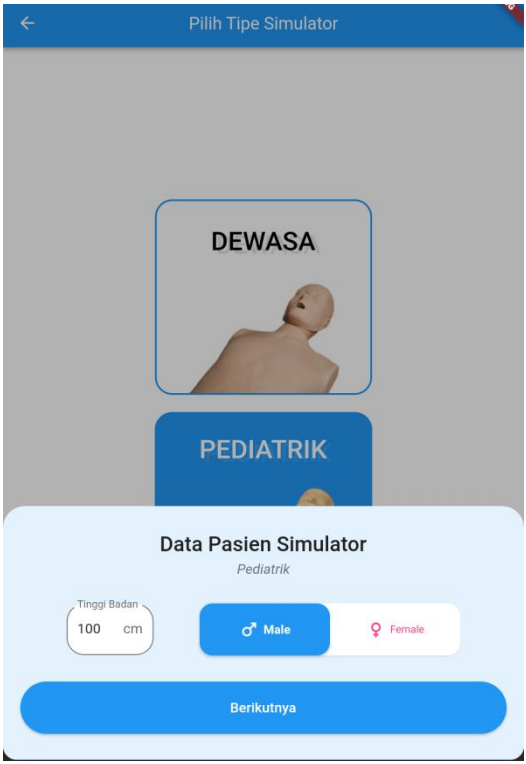
4	Exam Mode	Mode for testing CPR capabilities, in this mode the CPR guide is removed.
5	Training mode	Mode for conducting CPR training, in this mode CPR guidance is provided.
6	Others	Functions in the application include application descriptions, language changes, and viewing saved data
7	Game Modes	Used to access games

After finishing setting up the simulation can be started by pressing the start button, then you can Select the type of simulator you will use, for the P1 model choose the pediatric model.



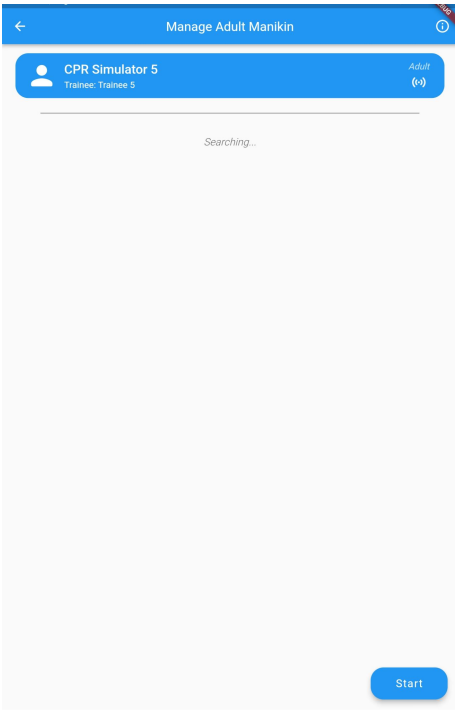
Picture13. Simulator type selection page

Then a dialog for filling in patient data will appear, fill in the estimated height and gender of the patient, or just leave the options as default, namely male with a height of 100cm, the data entered will be used to calculate the appropriate lung volume. Press the next button to enter the connection page.



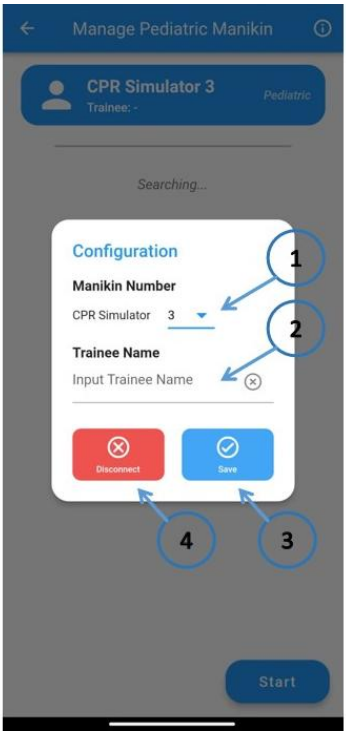
Picture14. Patient data entry page

On the connection page, a list of P1 CPR simulators that can be detected by the user's device will be displayed. You can connect up to 12 devices depending on the capabilities of your device. This page can be seen as shown in the image below.



Picture15. Connection page

Click on the simulator that you want to connect to your device, if it is successfully connected, the simulator will be blue as in the image above, and the compression depth and speed indicator LED will stop flashing, to set the identity of the simulator, click again on the device you want to connect and input will appear. simulator identity configuration, according to the following image.



Picture16. Simulator data configuration

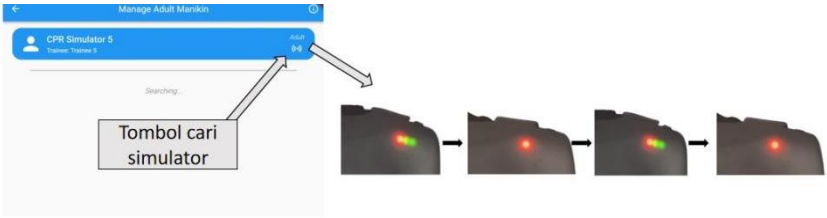
Table4.Explanation of operation part 2

No.	Name	Function
1	Simulator number	Enter numbers in this section to provide an identification number for the simulator
2	Trainee name	Enter the trainee's name in this dialog, this name will be printed on the test results.

3	Save	Save the data that has been entered.
4	Severing ties	Disconnect the simulator you selected.

When all settings have been completed press the start button to start the simulation.

You can also search for which simulators are connected to your device and what number is connected to that device, by pressing the search simulator button, which when pressed will make the compression speed and compression depth LEDs flash green.

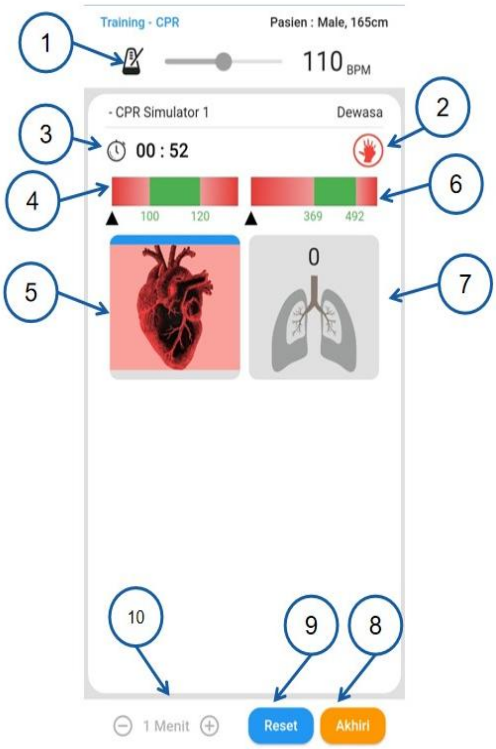


Picture17. Search simulator button

b. Carrying out the Simulation Process

The simulation process can be carried out in training or assessment mode, with differences in the assessment mode, the guidance provided will be limited.

During the simulation process, a page like the page below is displayed.



Picture18. Training process on the simulator

There are several information that make it easier for users in the training process for various indicators as explained in the table5.

Table5. Explanation of operation part 3

No.	Name	Function
1	Metronome	used to adjust the metronome beat speed, used as a tool to train the correct compression speed, can be set from 100 - 120 bpm.
2	Hand position indicator	If the indicator is green then the hand is in the right position, if it is red it means the hand is in the wrong position.
3	Remaining time	displays the remaining time available.
4	Compression speed indicator	If the needle is in the green area then the compression speed is correct.
5	compression depth indicator	compression depth indicator, if the background color is green the compression is being carried out correctly, and if it is red then there is an error in the compression. Information about this indicator is below.

6	Ventilation volume indicator	If the needle is in the green area then the volume given is correct, the green area is influenced by the height and gender that has been entered, if the needle is red then apply pressure until the ventilation volume reaches the green area.
7	ventilation indicator	contains a symbol of expanding lungs, and displays the number of ventilations carried out, apart from that the background color also indicates whether or not the ventilation given is appropriate.
8	*End*	To end the simulation process.
9	Reset	To repeat the simulation from the beginning.
10	Timing	used to set the length of the simulation time.

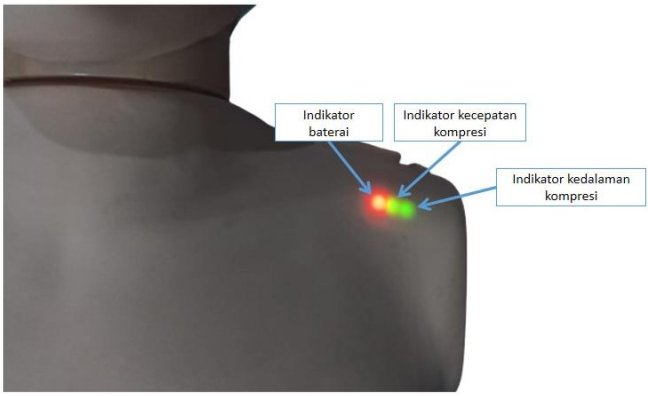
Below is a more detailed explanation of the compression and ventilation depth indicators. Users can pay attention to the change indicator for each color change displayed.

Note the arrows for compression depth, and the background color for excessive or insufficient ventilation. Explanations are shown in the table6which aims to be an indicator of compression and ventilation, so as to achieve accuracy in the training process.

Table6. Compression and ventilation depth indicators

Picture	Explanation
	The compression depth is not deep enough
	Recoil not yet available
	insufficient or excessive ventilation provided, the number shows the amount
	The ventilation provided is appropriate, the number shows the amount

During the simulation, the LED indicator will provide visual assistance to the user through the color of the LED indicating the quality of CPR being performed. This feature will be turned off in assessment mode.



Picture19. LED indicator description

Table7. Indicator description Compression speed

No	Color	Information
1	Yellow	Compression is not fast enough
2	Green	Correct compression speed
3	Red	Compression too fast

Table8. Compression depth indicator description

No	Color	Information

1	Yellow	Compression is not deep enough
2	Green	Correct compression depth
3	Red	Compression too deep

c. Evaluation

After the CPR training process is complete, the training results will be displayed on the application, in the form of a spider graph. There are information and percentages according to the depth of compression and ventilation carried out during the process.

Images of training results on a mannequin are shown in the following image.

Picture20. Simulator training results

An explanation regarding the assessment of training results can be shown in the table9.

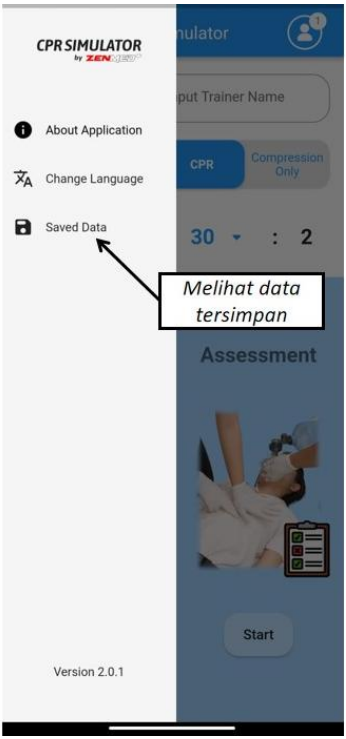
Table9. Explanation of training results

No.	Name	Function
1	Identity and final value.	Contains the identity of the doll user, the identity of the doll, as well as the overall value of the simulation process (the value is taken from all existing data, by comparing the percentage of correct and

		incorrect actions)
2	CPR Summary.	Contains the total compressions performed, total ventilations performed and the length of time CPR was performed.
3	CPR assessment.	Contains graphs regarding the percentage of accuracy of each CPR component, presented in the form of a spider graph.
4	Average summary.	Contains average compressions per minute, average ventilation volume, average compression depth, and average ventilation compression cycle.
5	*Exit*	Closing the assessment results.
6	Save data	Save data on the device.
7	View and print PDFs	View, save PDFs and print files on the printer

d. Saving, Viewing, and Printing Assessments

1. Make sure you have saved the data you want to see at the end of the CPR simulation process, on the assessment page.
2. Press the more button in the top left corner of the application home page.
3. Then select saved results on the tab that appears.



Picture21. View patient data

A table of data that has been saved will appear. To see detailed values, click on the data you want to view, a detailed table of values will appear.

The stored data table is shown in the figurefollowing

Picture22. Stored data

to access the PDF file of the assessment, click on the PDF icon below the assessment graphic.

Picture23.Valuation Chart

Then the saved PDF will appear, which is shown in the following image.

Picture24. Saved PDF

4. The function of the icon is explained in the following table.

Table10. PDF icon function

No.	Name	Function
1	Print PDF	Print PDF files
2	Share files	Share files via Bluetooth, or various other ways
3	Download PDF	Download PDF to your device

e. Game Mode menu

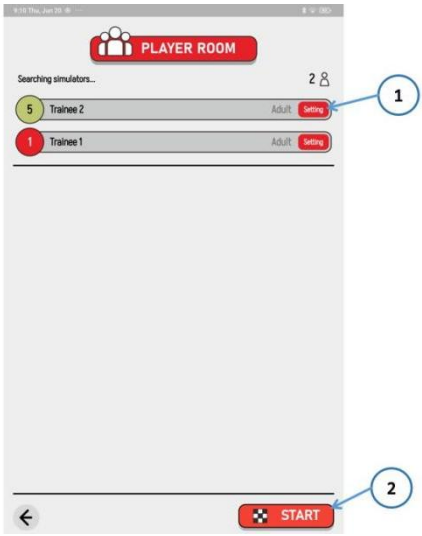
To access game mode, press the game button on the home page (button number 7 in figure 12), then we will be redirected to the game page with the following information.

Picture25. Game start page

Table11. icon function on the game start page

No.	Name	Function
1	Play	Go to the game page
2	High score	View saved high scores
3	Go out	Exit to the main page

To enter the game, press the play button, and connect the simulator you want to use, change the name or number if necessary.

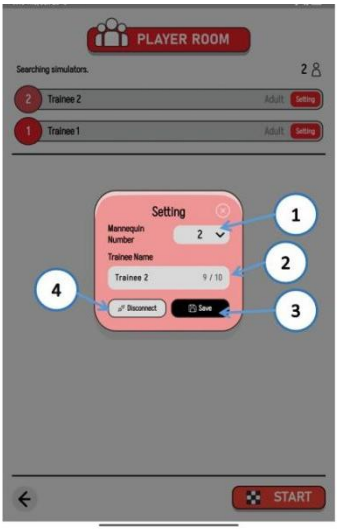


Picture26. Game connection page

Table12. Game connection function

No.	Name	Function
1	Settings	Manage simulator settings
2	start	Enter the game page

When you press the settings button, a settings page will appear with the following function.



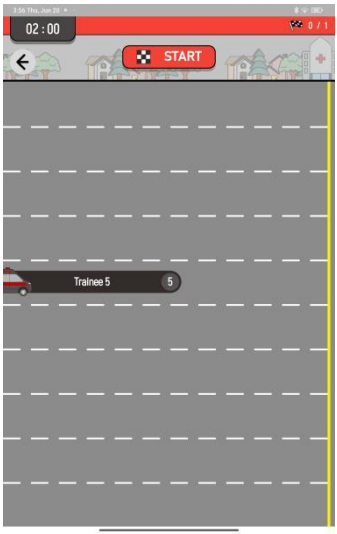
Picture27. Simulator settings page for the game

Table13. Game simulator settings function

No.	Name	Function
1	Simulator number	Enter numbers in this section to provide an identification number for the simulator
2	Trainee name	Enter the trainee's name in this dialog, this name will be printed on the test results.
3	Save	Save the data that has been entered.
4	Severing ties	Disconnect the simulator you

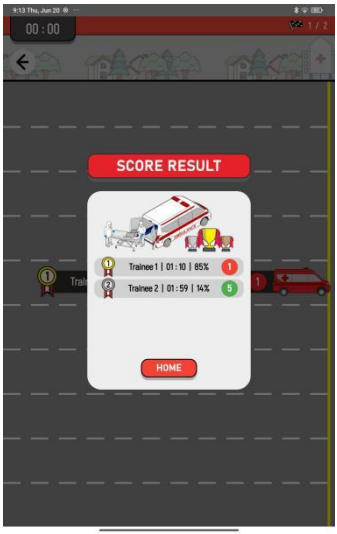
		selected.

After entering the game page press the start button to start the game.



Picture28. Game page

When all players have reached the finish line or the time has finished, all players' scores and finishing times will be displayed.



Picture29. The game page is complete

Chapter 5: Specifications

Table14. Mannequin specifications

Specification	Information
Processor	Xtensa dual-core 32-bit LX6 microprocessor 240 MHz
Connection	Bluetooth: v4.2 BR/EDR
Supply voltage	4.3V
Battery	2200mah
Product dimensions	62cm x 34cm x 12cm
Lung Capacity	600 ml

Table15. Minimum smartphone specifications

Specification	Information
Processor	Snapdragon 680, Mediatek Dimensity 6080, or processor with more capabilities
RAM	6 gb
Bluetooth	Blunt 5.0

In accordance with the cellphone specifications and table 15, we recommend the following cellphones, or smartphones with above specifications:

1. Xiaomi Note 10s

2. Oppo a78

3. Xiaomi Note 13

4. Samsung Galaxy A34

5. Vivo y200e

6. Oppo Reno 8

And for tablets, here are the tablets with the minimum specifications that we recommend.

1. Xiaomi Pad5

2. Lenovo Legion Y700

3. Oppo Pad Air

4. Huawei Metapad 10.4

Chapter 6: Maintenance and Troubleshooting

6.1Maintenance

The following are recommended treatments to keep your CPR simulator in the best condition.

a. Store in a dry area, at room temperature, and keep away from devices with high voltage, high frequency and high magnetic fields.
b. Turn off CPR simulator when not in use.
c. Recharge the battery when the battery indicator shows low level.
d. A full battery will last for 21 hours of use, and the charging time is 3 hours to full for direct charging to the simulator, and 5 hours for an external charger.
e. Clean the doll regularly, use water or soapy water, do not use alcohol or other strong liquids.
f. If the dummy's lungs haven't been inflated for a long time, replace the lungs with new ones, or inflate them first outside the simulator's body so that the plastic doesn't stick.

6.2 Troubleshooting

The following are solutions to problems that you may encounter. If the solutions below cannot solve your problem, contact the nearest distributor.

a. When The doll can't connect to your application, try turning the doll on and off again, and bringing your Android device closer to the doll.
b. When The mannequin won't turn on, make sure the battery is not empty, and if it is empty, recharge it, or replace your battery with a charged battery.
c. If the reader feels that the lung expansion is not correct, make sure that the plastic position of the lung is in the correct position, and the position of the sensor cross section is straight according to the position indicator.
d. If you feel the compression depth reading is not correct, try turning the dummy on and off, and if the problem is still there, make sure the sensor position and cross-section are straight.