



Caution

Do not mark on the model and its components with a pen or leave printed materials in contact with the model surface. Ink marks on the model are not removable.

MW2810

## Cardiology Patient Simulator "K" Plus Training System Ver.2

### Product Supervision

- Cardiology Patient Simulator  
Japanese Educational Clinical Cardiology Society
- Lung Sound Auscultation Trainer  
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Wakamatsu Hospital of the University of  
Occupational and Environmental Health,  
Japan

## Instruction Manual

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**NOTES**

**NOTES** The softwares include help menu for how to use the simulator.  
Tap the help menu for the details which are not described in this manual.



### ■ Before use

MW2810 Cardiology Patient Simulator "K" Plus Training System ver.2 is designed for medical education training. Please do not use the product for other purposes. Any other use not in accordance with the instructions on this manual as well as on the help menu in the system is strongly discouraged. The manufacturer holds no responsibility for any accidents or damages resulting from such use.

For questions regarding this simulator, please contact our distributor in your area or Kyoto Kagaku. Our contact information can be found on the back cover of this manual.

### ■ Features

Sounds are recorded from actual patients and are reproduced by using a high quality sound system.

- An actual stethoscope can be used.
- Up to five simulators can be controlled by one wireless tablet.
- The error indicator system facilitates maintenance of the system to keep Cardiology Patient Simulator "K" Plus Training System ver.2 in its best condition.



wireless operation



Touch-panel



Error check



multi-unit control



Playlist

### ■ Training skills

- Comprehensive cardiopulmonary physical examination training
- Obtaining reliable skills in bedside physical examination of the chest
- A thorough understanding with realistic physical findings of anatomy

#### Cardiology Patient Simulator:



1. 36 cases of total patient simulation
2. 52 cases of arrhythmia/ECG simulation
3. Observation of jugular veins
4. Palpation of cardiac impulses (RV, LV and DLV)
5. Palpation of arteries
6. Heart sounds and murmurs

#### Lung Sound Auscultation Trainer:



1. 36 lung sound cases: posterior & anterior, with & without heart sound as back ground
2. Sound volume, the rate of respiration and the operation time are controllable.












The safety rules below focus on the safety of the user; please read carefully before using the product.


- The signs below represent uses that may be dangerous or harmful.

 <b>WARNING</b>	This sign represents dangerous use that may lead to fire hazards or electrocution.
 <b>CAUTION</b>	This sign represents harmful use toward the simulator or its parts that may lead to permanent damage or disfiguration.

- The signs below represent strongly recommended uses for safety.

	A circle with a cross represents actions that are strongly discouraged. This sign asks users not to attempt taking the simulator apart.
	This sign represents rules that we strongly encourage users to follow.

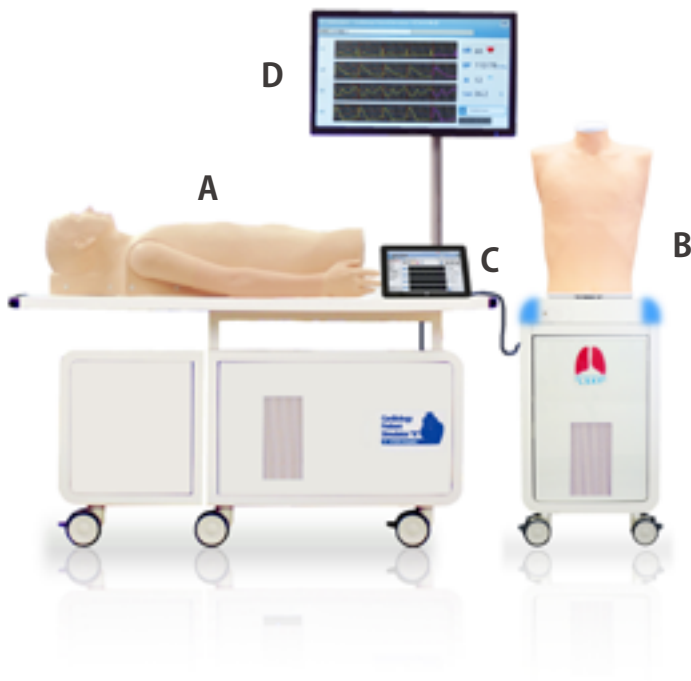
 <b>WARNING</b>	
<p><b>If the manikin or the control box becomes hot or begins to smoke, immediately unplug the power cord.</b></p> <p> This is a major fire hazard.</p>	<p><b>Unplug the power cord when the model is not in use.</b></p> <p> This will prevent electrocution or fire hazard that may cause burns and damages.</p>
<p><b>Remove any dust that has accumulated on the power plug and insert the plug completely into the power socket.</b></p> <p> Dust and incomplete connection can lead to a major fire hazard.</p>	<p><b>Keep the manikin, its machinery and power cord away from water or detergent.</b></p> <p> This can lead to fire hazard or electrocution.</p>
<p><b>Do not handle the power cord with wet hands.</b></p> <p> This is to avoid electrocution.</p>	<p><b>Keep flammable materials away from the product.</b></p> <p> Such materials can lead to fire hazard and damages to the model.</p>
<p><b>Use the designated power voltage.</b></p> <p> Misuse may lead to damages and fire hazard.</p>	<p><b>When unplugging the power cord, do it by holding the plug itself and pull it.</b></p> <p> Unplugging by the cord may lead to damages to the cord itself, fire hazards or electrocution.</p>
<p><b>Do not attempt to take apart or remodel the product.</b></p> <p> This could lead to fire hazards, electrocution and injury.</p>	<p><b>Do not bend, twist or damage the power cord.</b></p> <p> This is to avoid to fire hazard and electro cution.</p>

 <b>CAUTION</b>	
Do not apply excessive force or pressure onto the simulator.	Hold the handle when moving the simulator. It is dangerous to move the simulator by holding the manikin, the monitor, or its pole. Be sure to handle the unit at least 2 people when transferring the unit in the places with ramps or steps.
Do not mark the manikin with a pen or leave printed materials in direct contact with its surface. The inks marks on the manikin are not removable.	Discoloration of the surface may occur after being used during a long period of time. However, discoloration does not affect the function of the simulator.
Do not install other software in the computer; it may lead to system malfunctions.	Ensure to shut down your computer first. Then turn off the electricity power switch and unplug the power cord. Misuse may lead to damages.
Store the simulator in room temperature, away from heat, direct sunlight and moisture to prevent discoloration or other damages.	Use the simulator in a quiet environment.

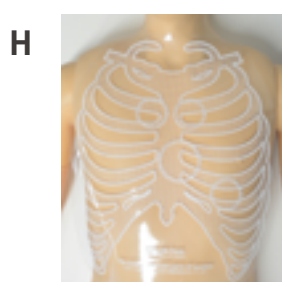
<p>Supply voltage: AC100-240V 50/60Hz 450VA</p> <p>Altitude: 2.000 meters from sea-level</p> <p>Environmental conditions: 5 degrees C. to 40 degrees C.</p> <p>Relative humidity: Less than 80 per cent (no condensation)</p> <p>Overvoltage Category: 2</p> <p>Pollution Degree: 2</p> <p>Power cord supply: Do not use power supply cords other than the one included in the original set.</p> <p>Clean-up: Clean the manikin with water or mild detergent and coat with baby powder. Be careful not to apply water or detergent on the internal machinery.</p> <p>Do not apply lateral force to the pole to prevent the simulation unit from getting unstable.</p>
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### ■ Set includes

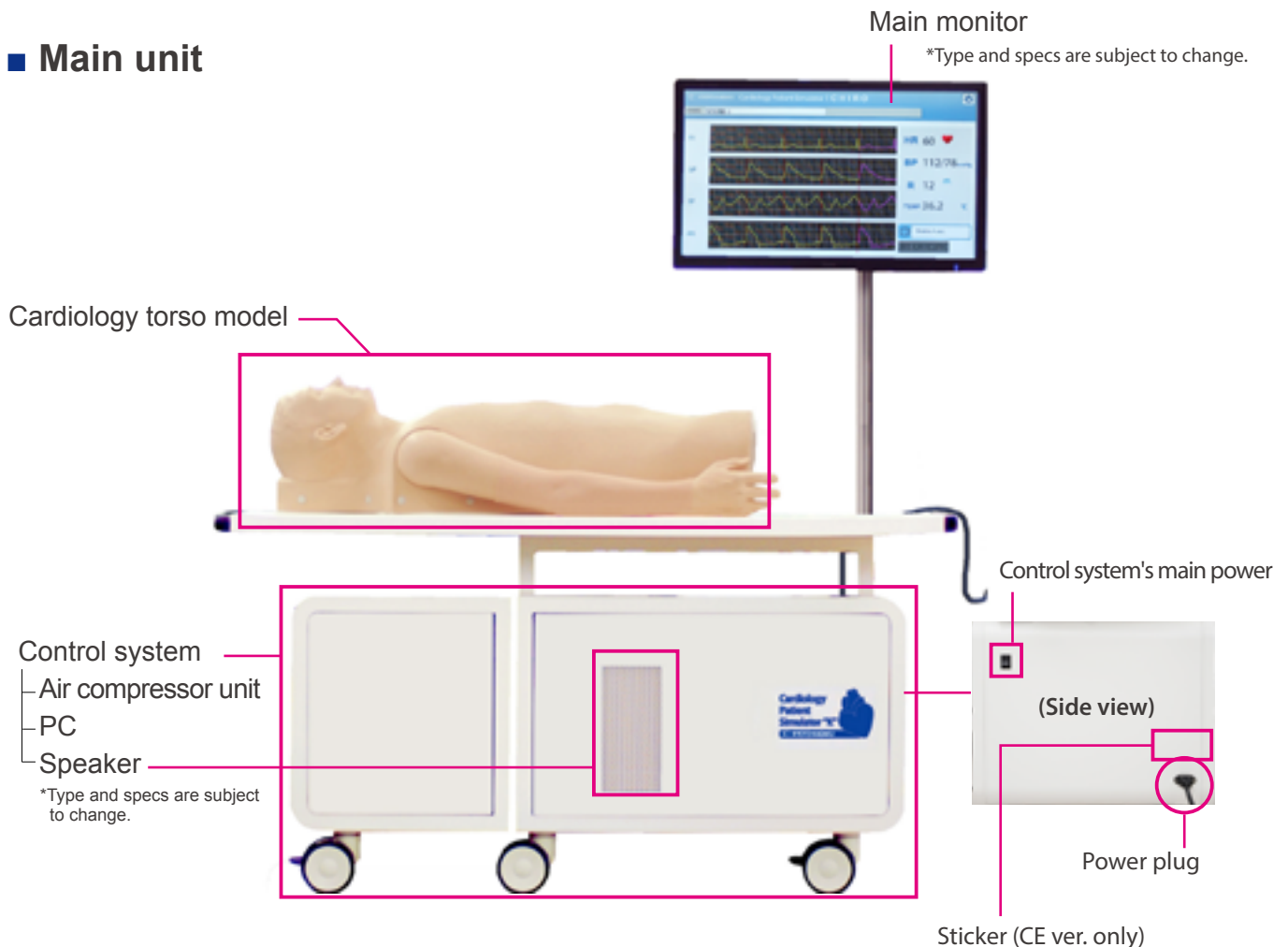
Before you first use the Simulator "K", ensure that all components listed below are included in the unit.



- A : 1 main unit with cardiology torso model (built-in the unit)
- 1 PC/ keyboard/ mouse
- 1 external speaker
- 1 air compressor unit
- 1 LAN cable
- 1 power cable for control PC
- B : 1 LSAT unit with respiratory torso model
- C : 1 control PC
- D : 1 main monitor
- E : 1 LAN adapter
- F : 1 connector cable
- G : 1 power cable (for unit)
- H : 1 rib sheet
- I : 1 cover (for cardiology torso)
- J : 1 lung T-shirt
- K : 4 textbooks
- 2 built-in help file of software operation instruction manual



### ■ Main unit

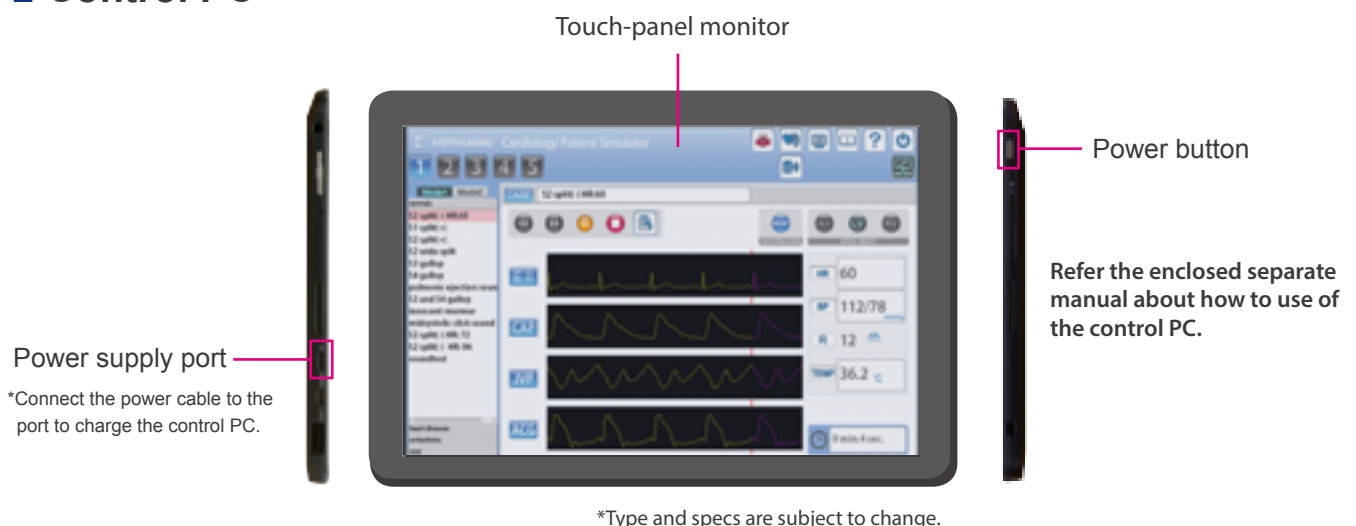


#### NOTES

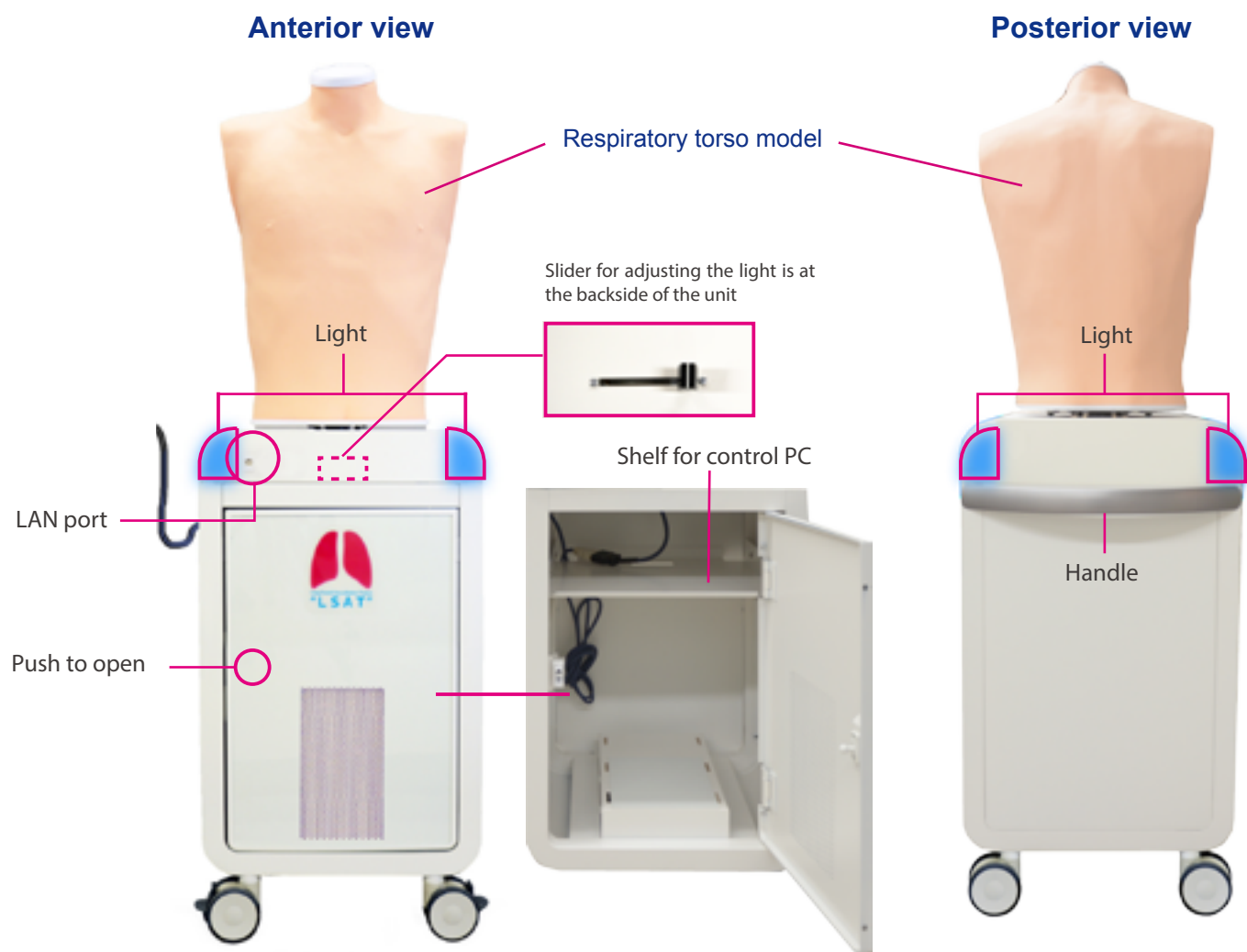
- The control PC and the control system are required to run either cardiology or respiratory simulators.
- Cardiology torso and respiratory torso cannot be operated concurrently.

Cardiology Patient Simulator  
Type2  
Model W110  
AC100V-240V  
50/60Hz 450VA  
© KYOTO KAGAKU CO., LTD. Made in Japan

### ■ Control PC



### ■ Lung Sound Auscultation Trainer (LSAT) unit



\*Specifications are subject to change

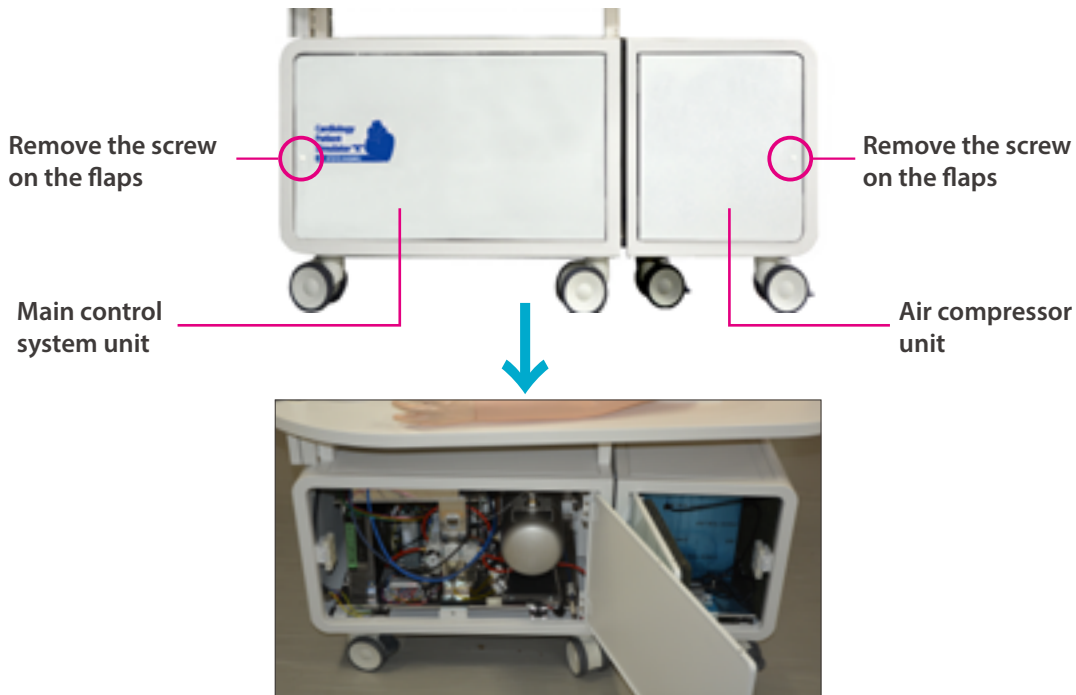
#### NOTES

Both posterior and anterior sounds are played simultaneously at one time.

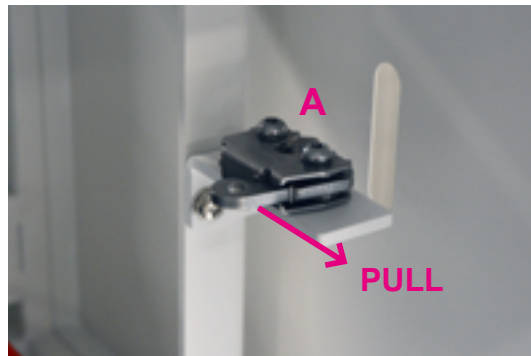


## ■ Connecting the control system

- 1 Open the flaps of the unit.



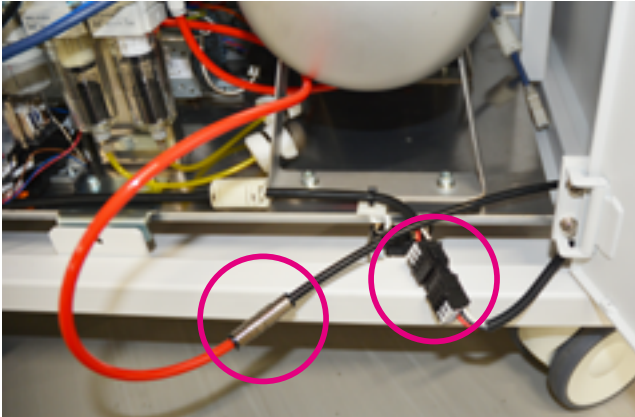
- 2 Separate the control system unit.  
Attachment can be removed by pulling the metal part as shown below.



- 3 Insert the cable for electricity and the air tube from the air compressor unit into the port on the wall of the main control unit



- 4 Connect the cable and air tube in the control system unit.

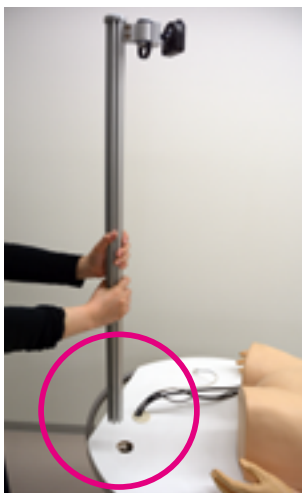


- 5 Align the main control system unit and the compressor unit so that the fixtures fit, and then carefully push the units toward each other until the fixtures lock.



### ■ Setting the monitor

- 1 Insert the monitor pole into the hole of the manikin table and fix it with a hex wrench.



- 2 Set the monitor on the holder of the pole and fix it with the screws included.



- 3 Connect the power cable and the monitor cable from the control system unit.



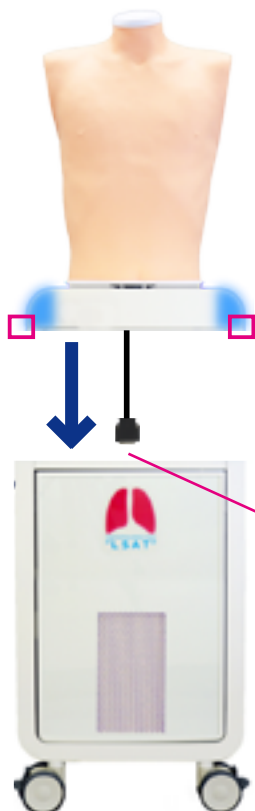
- 4 Completed.



## IMPORTANT

Be sure to work with more than two people.

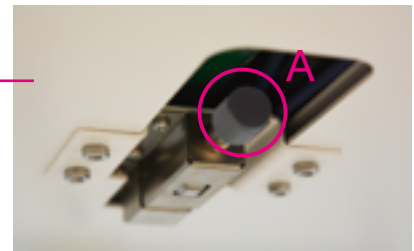
- 1 Pass the cable appearing from the upper unit through the hole of the lower unit.



## CAUTION

Hold both sides of the upper unit firmly and take it down slowly.

- 2 Push **A** knob to fix the upper and lower unit.



- 3 Connect the cable appearing from the table of the cardiology torso and the connector cable included in the set.



- 4 Pass the opposite side of the cable through the port on the side wall of the LSAT unit.



- 5 Connect the cable inside of the supporting wagon for LSAT.



- 6 Bundle up the redundant length of the cable.



## NOTE

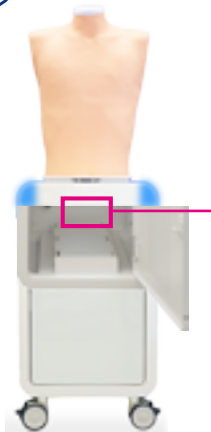
In case the main unit needs to be shipped, disassemble it with following procedure:

1. Remove the monitor
2. Remove the pole
3. Disengage the tube and the cable between the main control unit and the compressor unit
4. Disengage the compressor unit

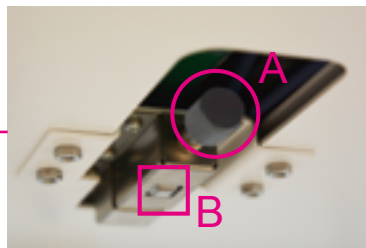
### POINT

The upper part of the LSAT unit (respiratory torso model), can be disengaged from the lower housing to be used on a table or other supporting structure.

1



To separate : Push **B** button  
To attach : Push **A** knob



2

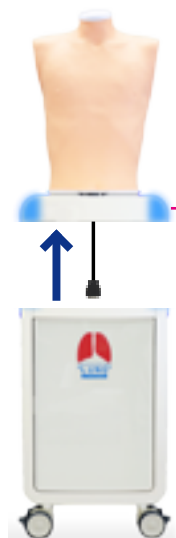
Detach the connector cable marked with red circles and take out the connector cable from the lower housing.



3

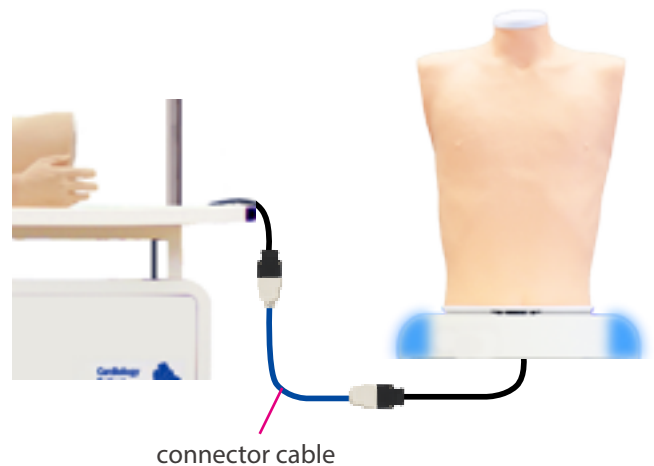
Hold the upper part by the handles at the both sides when separating it.

\* Verify the safety of the surroundings and move the unit with utmost care.



4

Connect the cable from the upper unit to the connector cable to start using it.



### NOTES

Reassemble the LSAT unit after training sessions. When not in use, always keep the upper part of the unit mounted on the supporting wagon.

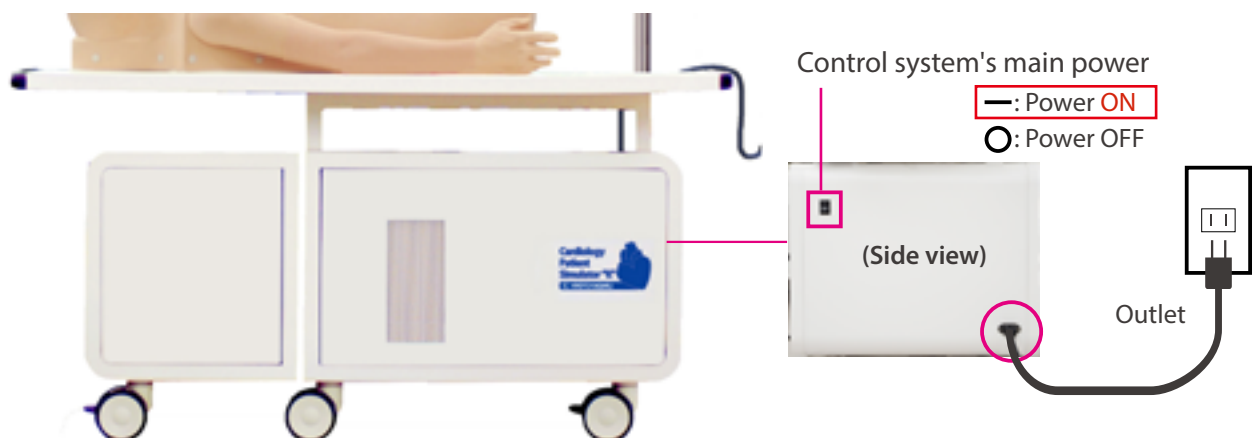
### IMPORTANT

When starting up the system follow the sequence of actions instructed below so that the wireless connection works correctly. The unit may not work correctly when being turned on with different order.

1 Connect the power cable to the electrical outlet.

2 Turn on the control system's main power.

\*Main power unit needs to be turned on when using either cardiology torso or LAST unit.



3 Turn on the control PC power.

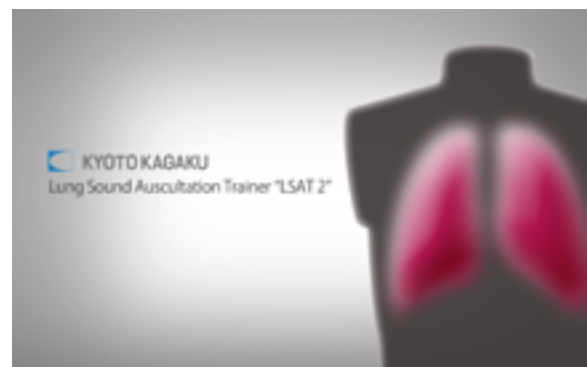
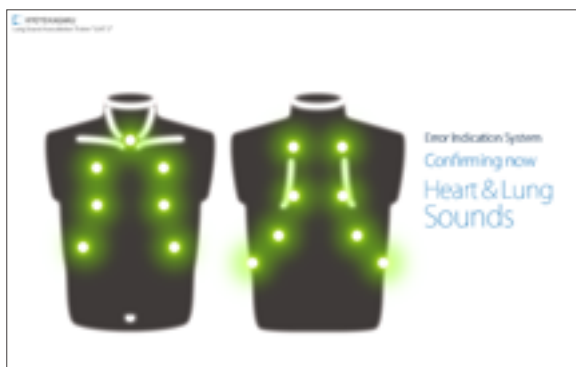
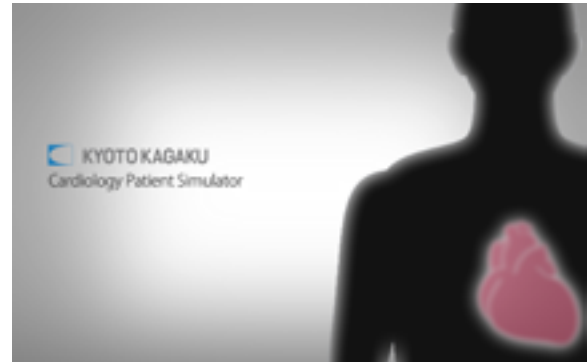
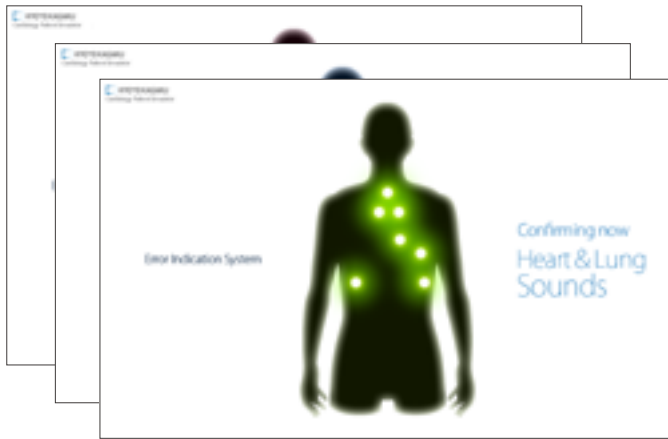


### NOTES

Before starting, be sure to charge the battery of the control PC. In case that the battery is low or empty, charge it by connecting the power cable of the control PC. The system can be used with the control PC being connected to the power.



- 1 Error indicator system : When activating the simulator software system's errors are automatically checked.



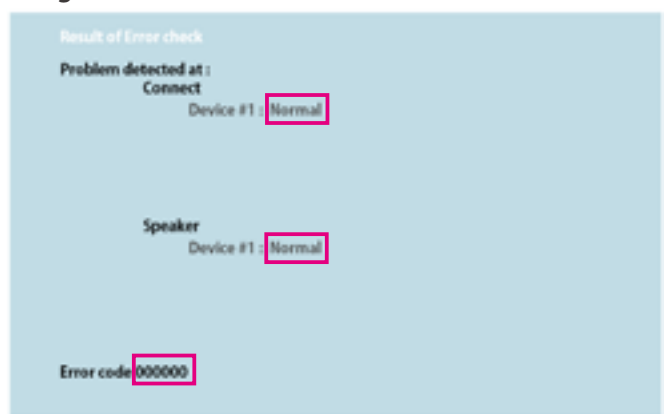
- 2 Error indication results

When the error check is finished, the result screen is displayed. Verify that all results are normal. When any error is detected, contact your local distributor or Kyoto Kagaku with the error code.

### Cardiology Simulation



### Lung sound auscultation

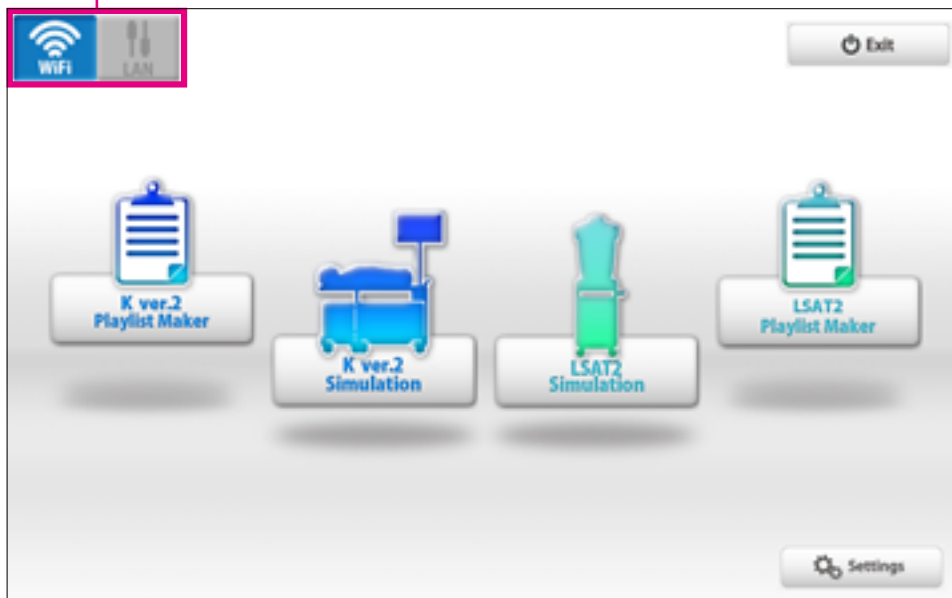


**CAUTION**

Do not operate the control PC when the error indicator system is working.

### 1 Verifying the connection of wireless systems

Verify the icon of the wireless connection. \* Default setting is: **wireless**.



### POINT

The softwares include help menu for how to use the simulator.  
Tap the help menu for the details which are not described in this manual.





### 2 Start up simulation software

From top menu, select "K2 simulation" or "LAST2 simulation".



#### Softwares



#### ■ Simulation Software

Use the software for simulation.

#### ■ Playlist Maker

"Playlist" of cases can be created.

To create a playlist, two approaches are available:

- 1) Using the Playlist Maker, select the cases, set the sequence and running time for each, then name and save the list.
- 2) Saving a session as a playlist on simulation software. In the Playlist maker, data of recorded playlists can be edited and modified.

### 3 Select units to operate

Tap the units to operate and then tap "OK."



The button color indicate the status of each unit.



"Blue": The units selected by this PC.



"Orange": The units already connected by another PC and not available to this PC.



"Green": The Cardiology units already connected to another control PC.



"Gray": The units unselected




Active (Power and Wifi are on)



Inactive

### Multi-unit operation

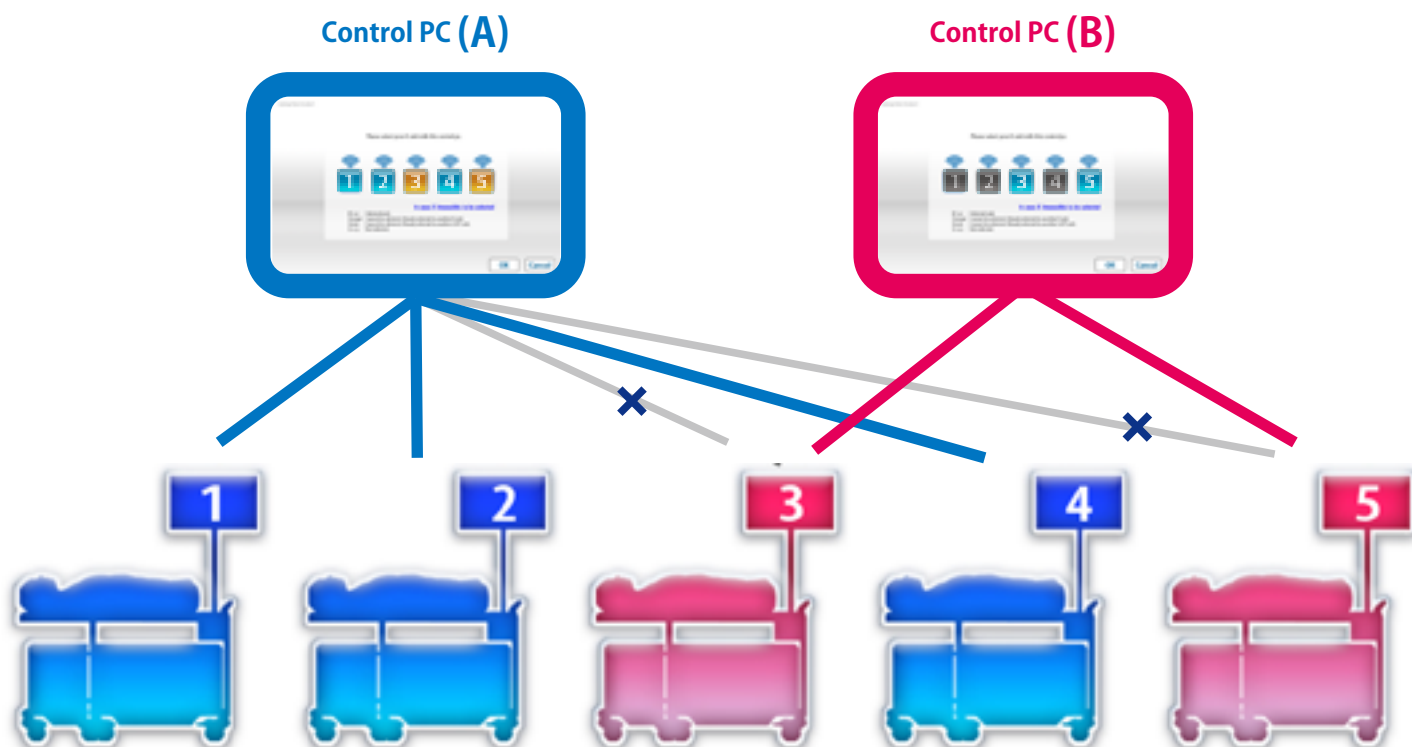
Up to 5 units can be selected by one control PC at a time.

Setting process varies between unison operations and multiple case operations. For details see incorporated HELP menu by tapping on the  mark on the top right of the screen.

#### ATTENTION

One simulator unit (torso) can be selected by only one control PC at a time. The connections are established in the order of selecting the units.

For example, while units #3 and #5 are selected by control **PC B**, the control **PC A** can not select these units. To connect them to control **PC A**, these units need to be unselected by control **PC B**.

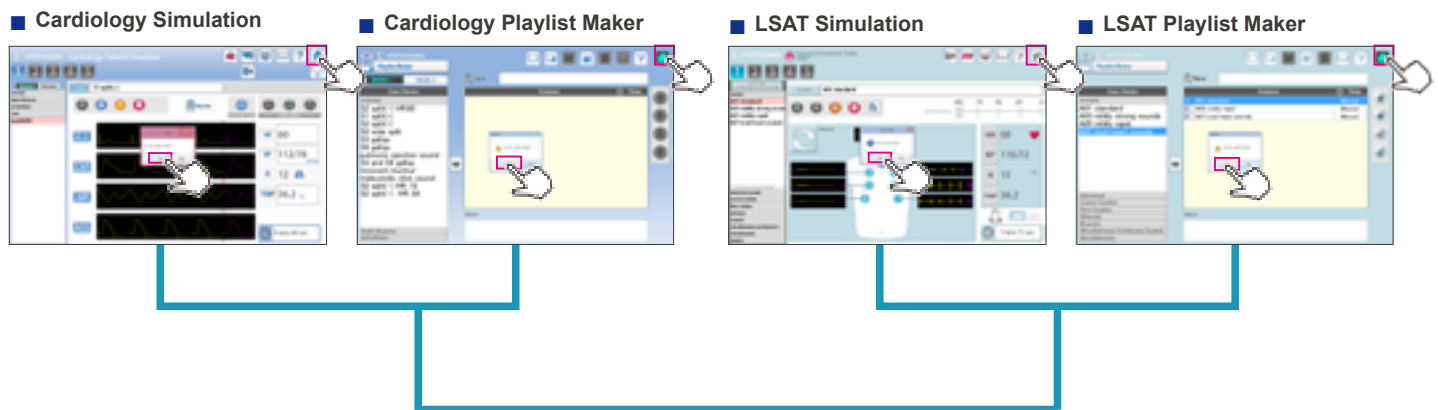


#### ATTENTION

By one control PC, up to five cardiology torsos or respiratory torsos (LSAT) can be operated at the same time. However, it is not possible to run both cardiology torso(s) and the respiratory torso(s) concurrently by one control PC.

### 1 Exit software

Tap on the "Home" icon at the right top.  
The message: "Do you want to exit?" appears, select "Yes."

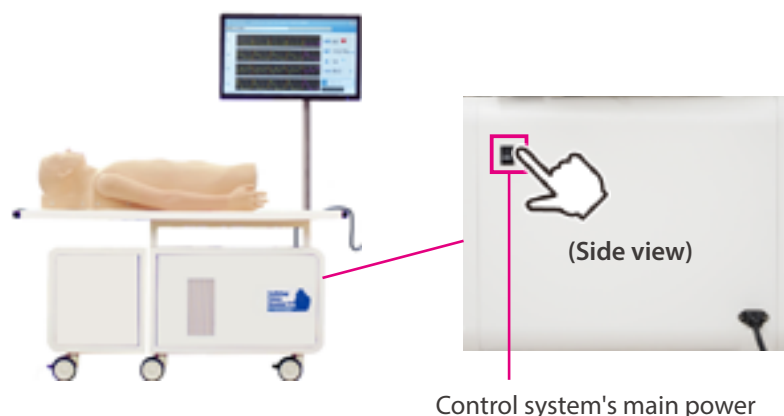


### 2 Turn off the control PC power

Tap on the "Exit" icon at the top menu.  
The message: "Do you want to exit?" appears, select "Yes."



### 3 Turn off the control system's main power



— : Power is ON  
○ : Power is OFF

# Cardiology Patient Simulator



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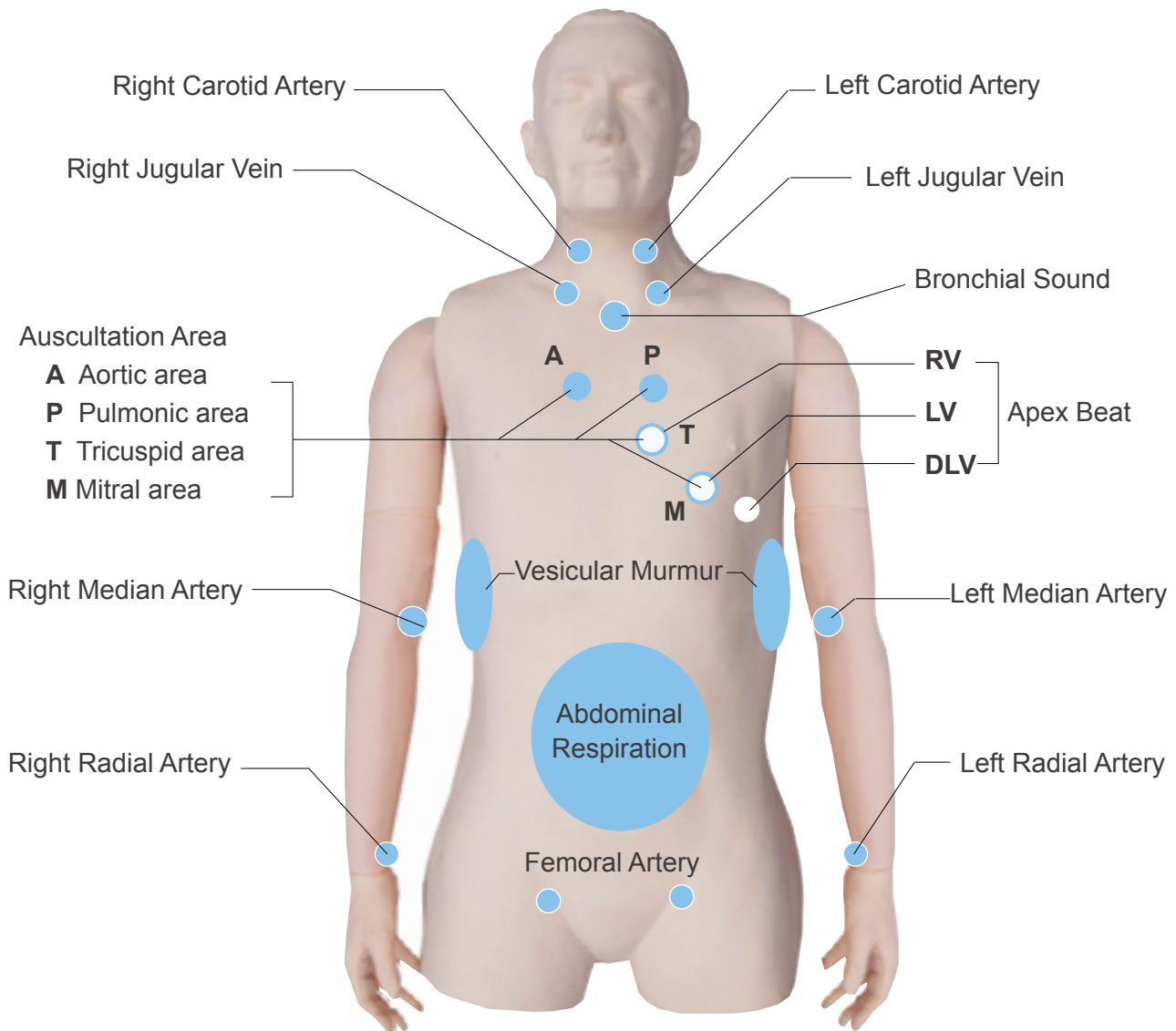
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### Training

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## ■ Training skills



## ■ Training modes

Cardiology Patient Simulator "K" has two variations of cardiological examination training systems, MODE 1 and MODE 2.

### MODE 1 (36 cases)

MODE 1 allows the trainings in bedside cardiology examination that are listed below. All physical findings are synchronized to simulate patients with reality.

1. Auscultation of heart sounds
2. Electrocardiogram (ECG)
3. Respiration (pulmonary sound, abdominal movement)
4. Arterial palpation
5. Observation of jugular vein
6. Apex beat palpation

### MODE 2 (52 cases)

MODE 2 is for arrhythmia simulation.

1. Auscultation of heart sounds
2. Electrocardiogram (ECG)

## Auscultation

In all cases, auscultation can be performed at the four primary cardiac auscultation sites (Aortic, Pulmonic, Tricuspid and Mitral). Auscultation of first sound (S1) and second sound (S2) can be learned in relation to synchronized electrocardiogram, arterial pulses and jugular venous waves.

### Auscultation Sites

- A** Aortic area
- P** Pulmonic area
- T** Tricuspid area
- M** Mitral area



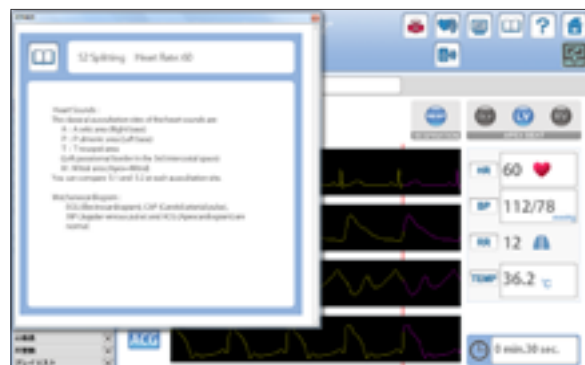
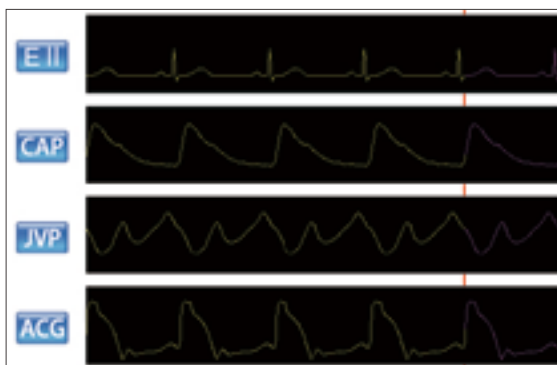
### POINT

Place the chest sheet matching the position of clavicae.  
The sheet facilitates the understanding of auscultation sites.



## Monitoring screen

Dynamic charts of electrocardiogram (ECG), jugular venous pulse (JVP), carotid arterial pulse (CAP) and apex cardiogram (ACG) can be displayed. Case explanation windows for self-directed learning are provided.

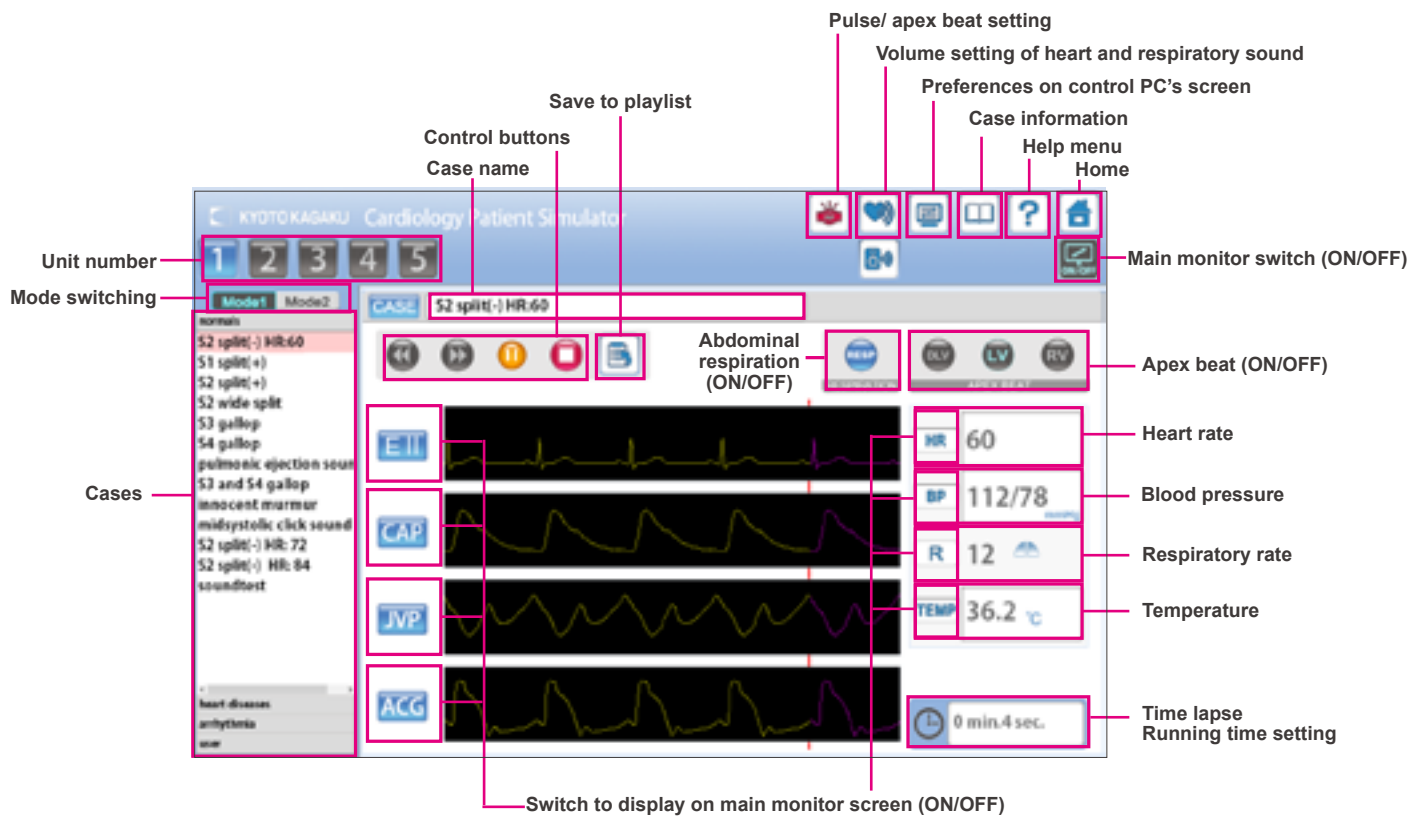


## Palpation and observation

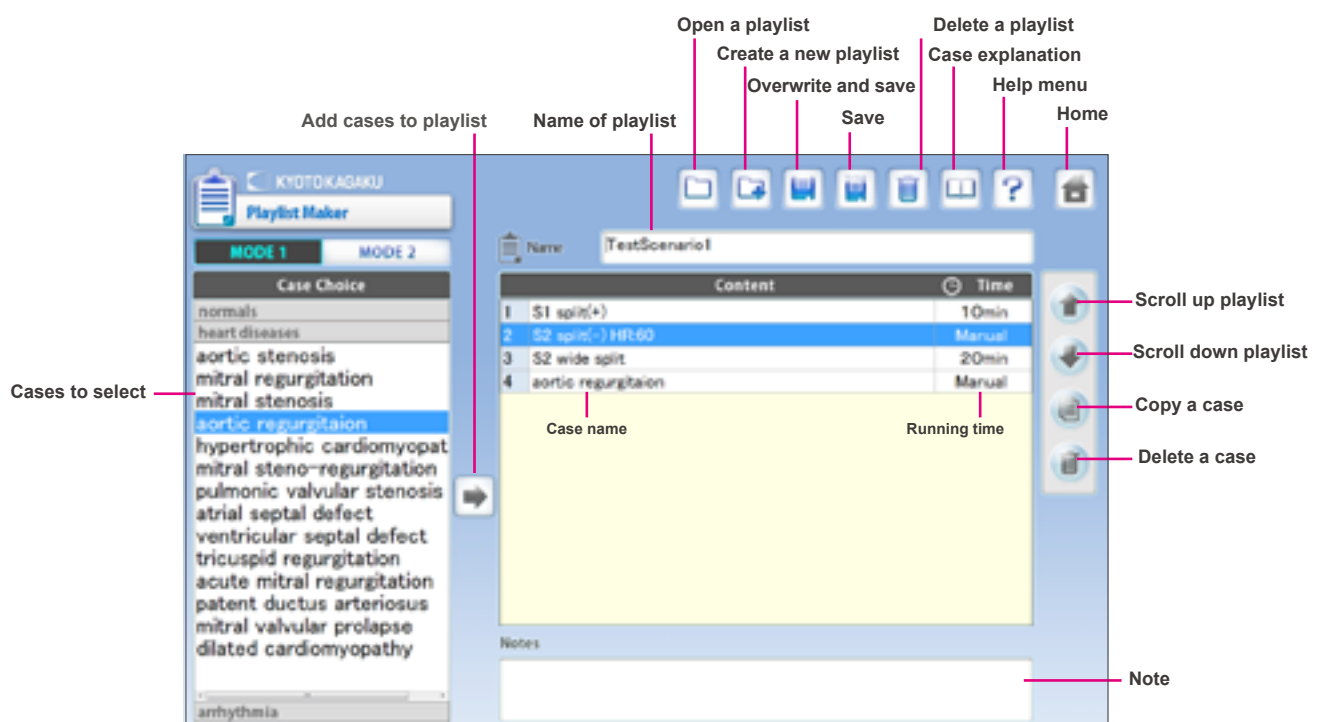
The carotid, median, radial and femoral arteries can be palpated at eight sites on the manikin. Slight variations of the arterial pulse waves under different cardiac conditions or arrhythmias can be detected by palpation. Pulsation of jugular venous waves can be observed on both sides. Cardiac impulses can be palpated at sites of right ventricle, left ventricle and dilated left ventricle.



## 1 K2 Simulation



## 2 Playlist Maker



# Lung Sound Auscultation Trainer



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### Introduction

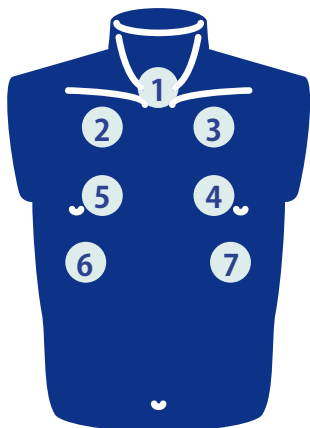
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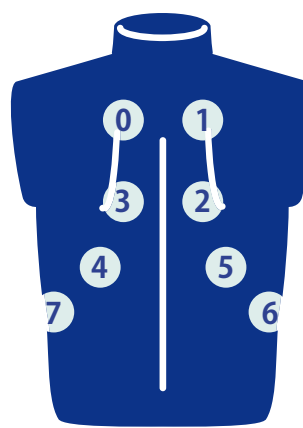


### Auscultation sites



**Anterior**

- 1. trachea
- 2. upper right lung field
- 3. upper left lung field
- 4. middle left lung field
- 5. middle right lung field
- 6. lower right lung field
- 7. lower left lung field



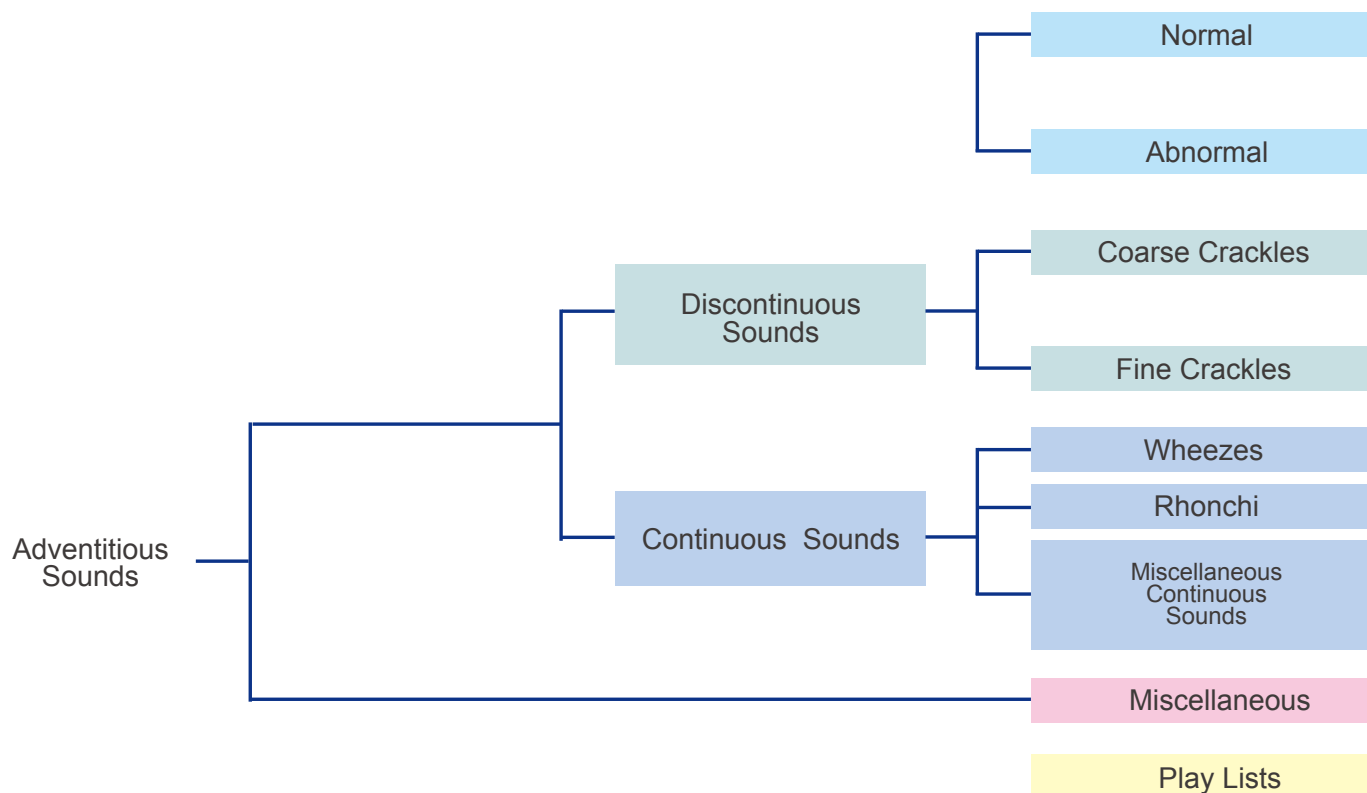
**Posterior**

- 0. upper left lung field
- 1. upper right lung field
- 2. middle right lung field
- 3. middle left lung field
- 4. lower left lung field
- 5. lower right lung field
- 6. right costophrenic angle
- 7. left costophrenic angle

### Cases 34 lung sound cases and one example of vocal fremitus are prepared.

Normal	Abnormal
A01 standard A03 mildly strong sounds A05 mildly rapid A07 loud heart sounds	B01 weak: left lower area B03 weak: left whole area(adhesion) B05 weak: left whole area(pneumothorax) B07 absent: right middle and lower areas B09 weak: right whole area B11 absent: right whole area B13 weak: whole area B15 bronchial breathing
Coarse Crackles	Fine Crackles
C01 right lower area C03 both lower area C05 right middle & upper area C07 left lower area C09 both upper area C11 whole area	D01 both lower area D03 both middle lower area D05 whole area(IPF) D07 whole area(NSIP)
Wheezes	Rhonchi
E01 upper area 600-700Hz E03 upper area 350-450Hz E05 upper area 200-1000Hz	F01 trachea and upper area 150-250Hz F03 trachea and upper area 150-450Hz (polyphonic) F05 trachea and upper area 80-120Hz F07 whole area 80-200Hz
Miscellaneous continuous sounds	Miscellaneous
G01 stridors G03 squawks	H01 pleural friction rubs: right lower area H03 pleural friction rubs: left lower area H07 Hamman's sign H09 Vocal fremitus

## ■ Classification of lung sounds



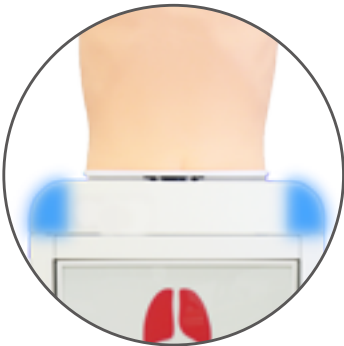
<b>Classification of lung sounds</b>	The American Thoracic Society developed a rational and clinically useful classification based on acoustic analysis of tape recordings and introduced the nomenclature. With this approach, lung sounds are categorized as continuous (wheezes, rhonchi, or stridor) or discontinuous (crackles). Crackles are further identified as fine or coarse. The terms “lung sounds” and “breath sounds” are usually used synonymously.
<b>Adventitious sounds</b>	Adventitious lung sounds are superimposed on the breath sounds in certain circumstances and usually indicate disease. They are categorized as continuous (wheezes, rhonchi, or stridor) or discontinuous (crackles). Crackles are further identified as fine or coarse.
<b>Discontinuous sounds</b>	Discontinuous adventitious lung sounds are intermittent, nonmusical, and brief (duration of less than 25ms) noises. They may be fine crackles (relatively high-pitched sounds usually heard at the end of inspiration as air enters the acinar unit) or coarse crackles (the low-pitched, bubbling sounds that result from the accumulation of secretions in larger bronchi and trachea).
<b>Continuous sounds</b>	Continuous adventitious lung sounds are usually louder than the underlying breath sounds. The word “continuous” in this context implies duration of more than 250 ms rather than meaning a sound that continues throughout the respiratory cycle. Continuous sounds may be wheezes, rhonchi, or stridor.

### ■ Anterior and posterior auscultation at the same time



Two or more trainees can work simultaneously.

### ■ Indication of inspiration and expiration with the LED light panel



Note the phase of breathing while listening to the lung sounds.

### ■ Case Information

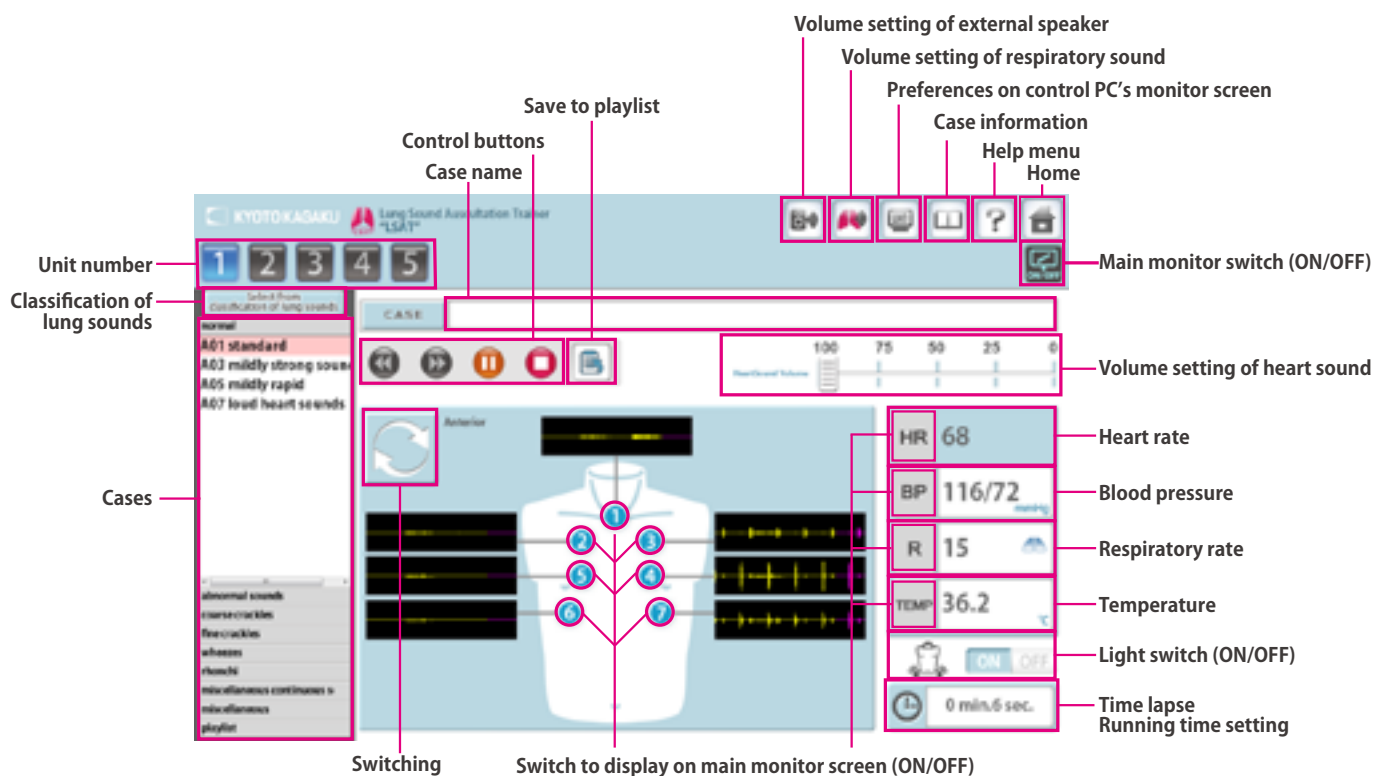


Images of plain X-ray, CT and bronchoscopy are included.

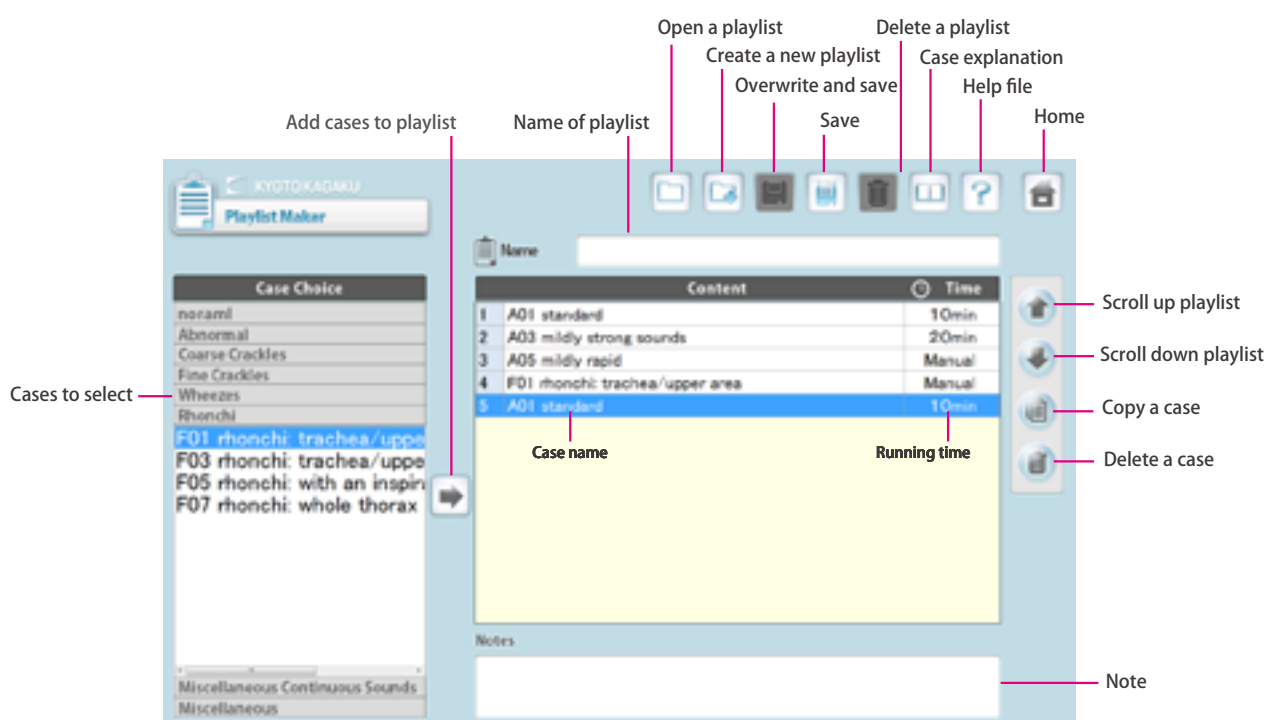
Lung sounds of each area can be played by tapping the plain X-ray image.

## 1 Simulation Software

Error indication has been completed, the simulation software is ready to begin.



## 2 Playlist Maker



Cases	Causes	Solutions
Unable to connect with wireless or unstable connection	Network interference occurred.	→ See page: <a href="#">Unable to Boot The Main Unit → (P.28)</a>
	There are physical obstructions for wireless connection such as a thick wall, metal objects or the control PC is too far from the unit.	Clear the obstructions or bring the control PC closer to the unit.
Unable to boot the main unit with wireless connection	The power cable of the unit is not connected.	Connect the power cable.
	The main power of the unit is off.	Turn on the main power of the unit.
	Network interference occurred.	→ See page: <a href="#">Unable to Boot The Main Unit → (P.28)</a>
	Others	
Unable to select the units for booting up	The control PC does not correspond to the unit.	Use the control PC corresponding to the unit.
	The main power of the unit is off	Turn on the main power of the unit.
	The power cable of the unit is not connected.	Connect the power cable.
	Network interference occurred.	→ See page: <a href="#">Unable to Select The Units → (P.29)</a>
	Others	
The session automatically shuts down with the message of "Connection Error", and then the connection becomes unavailable.	Network interference occurred.	→ See page: <a href="#">An Error Occurs During The Session → (P.30)</a>
Unable to hear the respiratory sounds from the manikin	The volume setting of the respiratory sound is "0"	→ <a href="#">Volume Setting of The Respiratory Sound</a>
	The speaker connection may have problems.	→ Contact Us
Unable to hear the heart sounds from the manikin	The volume setting of the heart sound is "0"	→ <a href="#">Volume Setting of The Heart Sound</a>
	The speaker connection may have problems.	→ Contact Us
Unable to hear the sounds from the external speaker	The volume setting of the external speaker is "0"	→ <a href="#">Volume Setting of The External Speaker's Sound</a>
	The speaker connection may have problems.	→ Contact Us

### Unable to boot the main unit

#### Attention

For the multi-unit operation, **be sure the control PC's own main unit is turned on.** The control PC is not able to operate when its own main unit is turned off.

#### ■ Case:

The screen shows the sign below repeatedly and it does not work despite several trials.

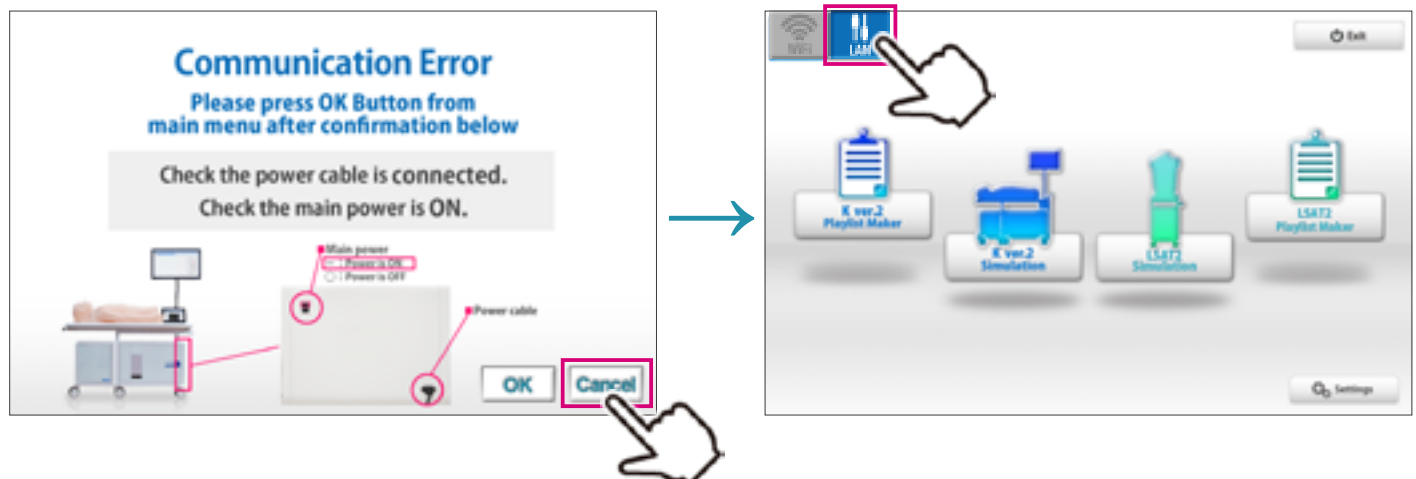


#### ■ Cause and solution:

1. The main units are not connected to power source.  
→Connect the cable to the power source and turn on the main unit.
2. The main units are not turned on.  
→Turn on the main units.
3. Interference from other wireless network  
→Follow the solution 2 below.

#### ■ Solution 2:

Tap on "cancel" to return to the top page and try with the wired connection mode.



### Unable to select the units

#### Attention

For the multi-unit operation, **be sure the control PC's own main unit is turned on.** The control PC is not able to operate when its own main unit is turned off.

#### ■ Case:

Units are not available to be selected.



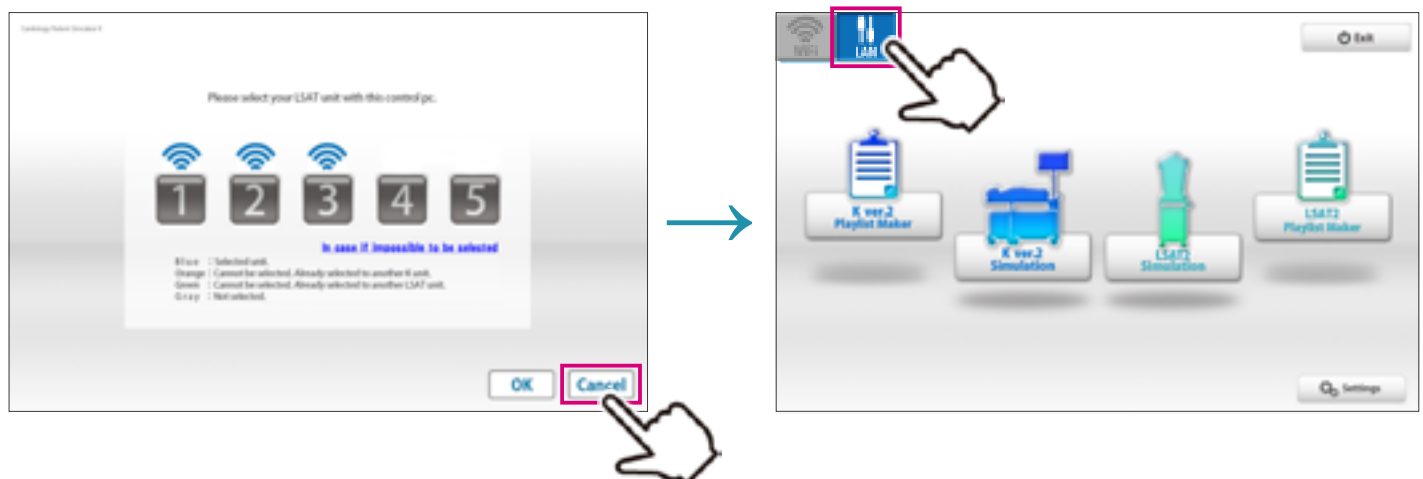
The buttons for the units intended to be used do not show connection indicators (Wifi mark).

#### ■ Cause and solution:

1. The main units are not connected to power source.  
→Connect the cable to the power source and turn on the main unit.
2. The main units are not turned on.  
→Turn on the main units.
3. Interference from other wireless network  
→Follow the solution 2 below.

#### ■ Solution 2:

Tap on "cancel" to return to the top page and try with the wired connection mode.



### An error occurs during the session

#### ■ Case:

The software closed automatically after showing the error display below.



#### ■ Cause:

Interference from other wireless network

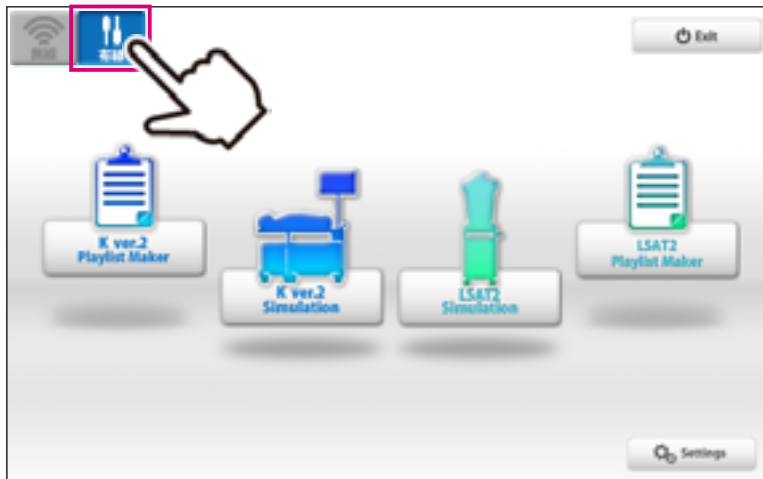
#### ■ Solution:

Try with the wired connection mode.

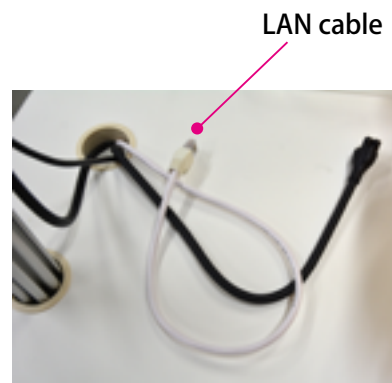
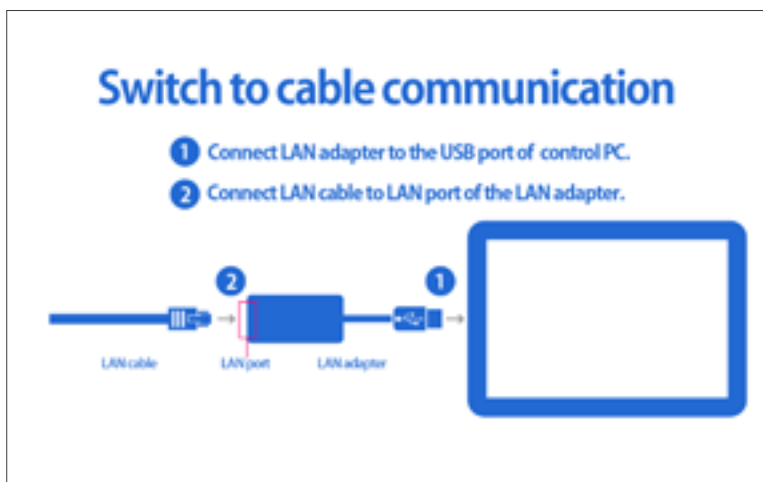




- 1 Tap the connection switch on the left upper display to change the connection mode.



- 2 Connect the control PC to the LAN cable from the main unit .



### Attention 1

With the wired connection mode, only the connected unit can be controlled.  
To control multiple units with the wired connection, use the control PC of each unit.

### Attention 2

The setting of connection will be automatically reset to the wireless mode after turning off the system. Change the connection into the wired mode each time when it is required.







## Caution

Do not mark on the model and its components with a pen or leave printed materials in contact with the model surface. Ink marks on the model are not removable.

**MW2810**

## Cardiology Patient Simulator "K" Plus Training System Ver.2

The contents of the instruction manual are subject to change without prior notice.

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