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1. Connect manikin's ECG cable to simulator's color-coded ECG snaps. See Figure 1. This is the only cable needed for connecting simulator to manikin.

2. Connect defibrillation cable to manikin's defibrillation sites. (If you have a separate pacer cable, attach it to defibrillation sites for pacing.)

3. Connect monitor's ECG cable to manikin's ECG snaps. If monitor ECG cable has right leg lead, but manikin does not have right leg ECG snap, connect right leg lead to simulator's green-labeled ECG snap.

4. Press ON-OFF key to power-on simulator. Observe that NSR and Adult indicators are illuminated. Power-on monitor/defibrillator. Observe that NSR at 72 bpm is displayed.

Using Simulator without Defib Manikin

1. Connect monitor's ECG cable to simulator's ECG snaps. See Figure 1.

2. Using your pad adapters or pad adapter cable, connect defibrillation cable to simulator's defibr cable receptacles. See Figure 2.

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Battery Saver Feature

The simulator powers-off automatically about 30 minutes after a key was last pressed, or after defib or pacer energy was last detected. This is normal operation. To allow simulator to remain powered-on after 30 minutes, follow these instructions:

1. Power-off simulator.

2. Press and hold down convert key, then press and release ON-OFF key.

3. Observe NSR indicator. When indicator blinks on and off, release convert key. NSR indicator continues to blink for about one second.

The battery saver feature is now disabled. When you power-off the simulator, it will return to normal battery saver operation.

Service

The Simulaid ECG Simulator is warranted to be free of defects in material or workmanship for three years from date of purchase. If the simulaids need servicing, or if you have questions about its operation, please contact Simulaid customer service, or your authorized dealer.

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Study Guide

Networks and Computer Systems

1. The study guide is a comprehensive overview of the course.

2. It covers the main topics and provides explanations, examples, and exercises.

3. The guide also includes notes on important concepts and theories.

4. It is designed to help students understand and retain the material.

5. The study guide is an essential resource for anyone taking the course.

Operating Instructions

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### Controls and Indicators

The Simulads Interactive ECG Simulator is an easy to use training tool that allows you to practice defibrillation and pacing procedures with or without a defibr manikin. For arrhythmia recognition, you can select fibrillations, tachycardias, and brady- cardias in either adult or pediatric format.

![Simulads ECG Simulator Image](https://www.simulads.com)

| Convert | The convert feature allows you to convert automatically from one rhythm (running rhythm) to another rhythm (waiting rhythm) when a defibr discharge is sensed. If defibrillating into Simulads manikin, set defibr energy to 2J or more. If defibrillating directly into simulator, set defibr energy to 50J or more.
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>ON/OFF</strong></td>
<td>Press to power-on and to power-off.</td>
</tr>
<tr>
<td><strong>LOW BATT</strong></td>
<td>Red indicator illuminates when battery needs replacement.</td>
</tr>
<tr>
<td><strong>DEFIB DISCHG</strong></td>
<td>Green indicator illuminates for two seconds when defibr discharge is sensed. If defibrillating into Simulator manikin, set defibr to 2J or more. If defibrillating directly into simulator, set defibr to 50J or more.</td>
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<td><strong>convet</strong></td>
<td>Simulate cardioversion by activating convert feature. Simulator responds to defibr discharge.</td>
</tr>
<tr>
<td><strong>Adult Ped</strong></td>
<td>Yellow indicators tell which rhythm set is being simulated - adult or pediatric.</td>
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<td><strong>age group</strong></td>
<td>Press to select adult rhythm set or pediatric rhythm set.</td>
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<td><strong>PACER PULSE</strong></td>
<td>Green indicator flashes when external pacem pulse is sensed. (Captured beat is simulated, too.) Sensing occurs when external pacemaker current set to 60mA - 100mA or more.</td>
</tr>
</tbody>
</table>

### Adult Rhythms

**for Defibrillator training**

- **VF** Ventricular Fibrillation.  
- **VT fast** Ventricular Tachycardia. Wde QRS. Rate: 185.  
- **VT slow** Ventricular Tachycardia. Wde QRS. Rate: 140.  
- **VT poly** Ventricular Tachycardia. Fluctuating QRS axis.  
- **AFIB** Atrial Fibrillation. Ventricular rate: 120 to 160.  
- **AFLTR** Atrial Flutter (2:1). Ventricular rate: 150.  
- **SVT** SVT alternates with NSR, then remains in SVT. SVT rate: 216.  
- **S TACH** Sinus Tachycardia. Rate: 120.  
- **NSR** Normal Sinus Rhythm. Rate: 72.  
- **ASYS** Asystole.  
- **SINUS PVC** Sinus Rhythm with PVCs. Sinus rate: 72.

**for External Pacer training**

- **S BRDY** Sinus Bradycardia. Rate: 40.  
- **J BRDY** Junctional Bradycardia. Rate: 42.  
- **2nd I** 2nd deg. type I AV Block (4:3). Atrial rate: 60.  
- **2nd II PVC** 2nd deg. type II AV Block (4:3). PVCs. Wide QRS. Atrial rate: 60.  
- **3rd** 3rd deg. AV Block. Wide QRS. Ventricular rate: 37.

### Pediatric Rhythms

**for Defibrillator training**

- **VF** Ventricular Fibrillation.  
- **VT slow** Ventricular Tachycardia. Wide QRS. Rate: 148.  
- **AFLTR** Atrial Flutter (2:1). Ventricular rate: 150.  
- **SVT** Supraventricular Tachycardia. Inverted P follows QRS. Rate: 240.  
- **S TACH** Sinus Tachycardia. Rate: 165.  
- **NSR** Normal Sinus Rhythm. Rate: 90.  
- **ASYS** Asystole.  
- **SINUS PVC** Sinus Rhythm with PVCs. Sinus rate: 90.

### Defibrillation Exercise

Connect simulator to defib or defib manikin. For help, see Getting Started, page 5. 

**Exercise:** Convert VF to NSR using manual defibrillator. 

- **at simulator:**  
  1. Press VF key. VF indicator glows steadily. Confirm VF is displayed on monitor.  
  2. Press convert key. VF indicator pulses brighter.  
  3. Press NSR key. NSR indicator blinks on and off. VF indicator glows steadily again.  
  6. Press both Discharge buttons (3) simultaneously.

### Defibrillation Exercise (cont.)

7. After discharge observe that:  
   - On monitor, NSR is displayed. At simulator, NSR indicator glows steadily, and VF indicator is off. 

---

Deliver defibrillation discharge to convert automatically.

![Defibrillation Illustration](https://www.simulads.com)
Adult Rhythms

for Defibrillator training

VF Ventricular Fibrillation.

VT fast Ventricular Tachycardia. Wide QRS. Rate: 185.

VT slow Ventricular Tachycardia. Wide QRS. Rate: 140.

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SINUS PVC SINUS PVC Sinus Rhythm with PVCs. Rate: 72.

for External Pacer training

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1st 2nd deg. type I AV Block (4:3). Atrial rate: 60.

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3rd 3rd deg. AV Block. Wide QRS. Ventricular rate: 37.

Pediatric Rhythms

for Defibrillator training

VF Ventricular Fibrillation.


VT slow Ventricular Tachycardia. Wide QRS. Rate: 148.


AFLTR Atrial Flutter (2:1). Ventricular rate: 150.

SVT Supraventricular Tachycardia. Inverted P follows QRS. Rate: 240.

S TACH Sinus Tachycardia. Rate: 165.

NSR Normal Sinus Rhythm. Rate: 90.

ASYS Asystole.

SINUS PVC SINUS PVC Sinus Rhythm with PVCs. Rate: 90.

for External Pacer training

S BRDY Sinus Bradycardia. Rate: 50.

J BRDY Junctional Bradycardia. Rate: 60.


2nd II PVC 2nd deg. type II AV Block (5:4) with PVCs. Atrial rate: 60.

2nd II 2nd deg. type II AV Block (5:4). Atrial rate: 60.

3rd 3rd deg. AV Block. Ventricular rate: 60.

Defibrillation Exercise

Connect simulator to defib or defib manikin. For help, see Getting Started, page 5.

Exercise: Convert VF to NSR using manual defibrillator.

at simulator:
1. Press VF key. VF indicator glows steadily. Confirm VF is displayed on monitor.
2. Press convert key. VF indicator pulses brighter.
3. Press NSR key. NSR indicator blinks on and off. VF indicator glows steadily again.
4. Select 360 using Energy Select switch (1).
6. Press both Discharge buttons (3) simultaneously.

Defibrillation Exercise (cont.)

7. After discharge observe that:
   - On monitor, NSR is displayed.
   - At simulator, NSR indicator glows steadily, and VF indicator is off.

Deliver defibrillation discharge to convert automatically.
### Controls and Indicators

The Simulads Interactive ECG Simulator is an easy to use training tool that allows you to practice defibrillation and pacing procedures with or without a defibr manikin. For arrhythmia recognition, you can select fibrillations, tachycardias, and brady- cardias in either adult or pediatric format.

- **ON-OFF**
  - Press to power-on and to power-off.
- **LOW BATT**
  - Red indicator illuminates when battery needs replacement.
- **DEFIB DISCHG**
  - Green indicator illuminates for two seconds when defibr discharge is sensed. If defibrillating Simulads manikin, set defib to 2J or more. If defibrillating directly into simulator, set defib to 50J or more.
- **convert**
  - Simulate cardioversion by activating convert feature. Simulator responds to defib discharge.
- **Adult**
  - Yellow indicators tell which rhythm set is being simulated - adult or pediatric.
- **age group**
  - Press to select adult rhythm set or pediatric rhythm set.
- **PACER PULSE**
  - Green indicator flashes when external pacer pulse is sensed. (Captured beat is simulated, too!) Sensing occurs when external pacer current set to 60mA - 70mA or more.

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### Defibrillation Exercise (cont.)

7. After discharge observe that:
   - On monitor, NSR is displayed. At simulator, NSR indicator glows steadily, and VF indicator is off.

- **Deliver defibrillation discharge to convert automatically**

![Image of defibrillation discharge](image-url)
Getting Started

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The battery saver feature is now disabled. When you power-off the simulator, it will return to normal battery saver operation.
The simulator is powered by a 9 volt alkaline battery. To replace the battery, turn simulator over, then slide open battery compartment door.

Service
The Simulaids Interactive ECG Simulator is warranted to be free of defects in material or workmanship for three years from date of purchase.
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Press ECG cable connectors onto simulator snaps (match colors). Left to right: green (FL), white (RA), black (LA), red (LL).

ECG signal is obtained with either 3- or 4-lead ECG cable.

WARNING: SHOCK HAZARD!
Be sure defibrillation cable is securely attached to simulator.

Insert pad adapters, or pad adapter cable, into adapter receptacles. Connect defibrillation cable - APEX to left, STERNUM to right.
Pacing Exercise

Connect simulator to pacer or defib manikin. For help, see Getting Started, page 5.

To simulate paced beats, pacer Rate must be greater than rate of selected rhythm, and paced Output must be greater than simulator capture level.

Exercise: Paced 3rd degree AV block at rate of 70 ppm.

1. Press Adult key, then press 3rd key. Confirm 3rd degree AV block is displayed on monitor.
2. Select Pacer On. Verify sense markers are displayed with each R wave. (If not, press ECG Size button until R wave markers are observed.)
3. Select rate of 70 ppm using Rate control.
4. Press Start/Stop button to start pacing.
5. Increase pacer current, using Output control, until you observe paced beats on monitor. Pacer current setting should read 60mA - 70mA.

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Figure 1

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Figure 2

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