

Instructing With The HESS

Healthcare Education Simulation Station

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www.BetterNurseEducation.com

PLEASE READ

DISCLAIMER

The information in the HESS is not intended or implied to be a substitute for professional medical expertise, advice, diagnosis or treatment.

There is no representation and no responsibility for the accuracy of information contained within the HESS.

The HESS is only intended to be used as an instructional aide by qualified medical educational professionals.

The HESS (Healthcare Education Simulation Station)

Introduction

Where/When The HESS Is Used

- Active Learning/Simulation Style Exercises
- Classroom Visual & Active Content
- Virtual & On-Demand Educational Content



Some Things The HESS Does Very Well

- Portability to conduct active learning exercises "in situ" or in classrooms.
- Putting fake vitals on Standardized Patients.
- Adding high fidelity elements to low fidelity items.
- Creating nursing education materials integrated with online and virtual environments such as Zoom, YouTube, etc.

The HESS Simulated Device Apps

- | | |
|------------------------------|-----------------------------|
| • Pulse Ox | • Capnography |
| • Thermometer | • Fetal Monitor |
| • Digital Blood Pressure | • QBL |
| • Sphygmomanometer | • ICU Monitor |
| • Handheld Doppler | • Mid-Range Care Monitor |
| • Glucometer | • Laparoscopic Insufflation |
| • Body Sounds (Auscultation) | • Pacemaker Adjustment |
| • EKG | • Firefighter 4 Gas Meter |

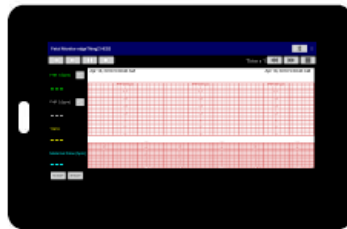
The HESS (Healthcare Education Simulation Station)

1. Instructor tablet



The **Instructor** app is used to transmit vital signs of a Scenario to the various HESS Device apps being used. It is also used to create and save sets of vitals to allow Scenarios to be pre-defined or shared with others.

2. Device tablets



The **Device** apps simulate various pieces of medical equipment that are used in a simulation – such as a handheld Pulse Ox or Glucometer - or a bedside ICU Monitor or Fetal Monitor.

3. Cables and Props

Cables and props help increase the realism of an exercise.

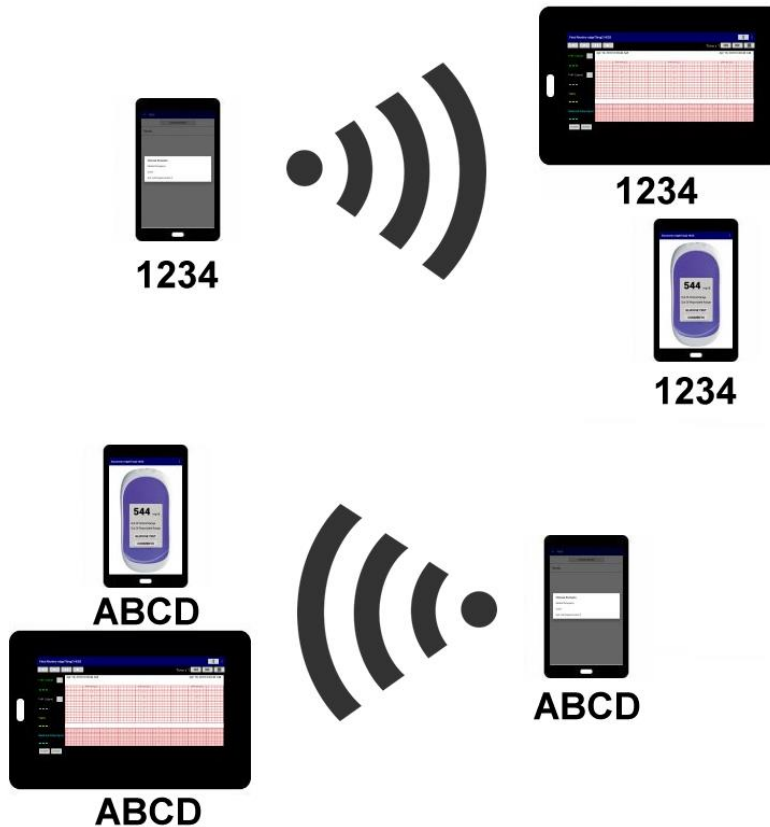
Fake Cables can help ensure learners are required to perform physical actions similar to actions they would need to perform in a real clinical situation.

For example, for the Pulse Oximeter, a finger clip cable can be attached to the tablet so that the learner can place the finger clip on a manikin or a standardized patient (actor) and then obtain pulse rate and blood oxygenation vitals from the HESS app.

Many cables used with actual medical devices such as finger clips, thermometer probes, blood pressure cuffs, EKG leads, etc. can be attached to the tablet with a piece of tape or by using a short (4" – 6") USB adapter cable to attach to the USB port of the tablet – to which the fake cable can then be taped.

Smart Cables such as the Smart Ink Sensor cable and the Smart Glucometer cable have special electronic functions built in. These smart cables are not required to use the HESS apps, but they can add realism and functionality to a learning exercise. Visit www.BetterNurseEducation.com for more information about Smart Cables.

How the HESS Transmits Vitals



The HESS Instructor tablet transmits vitals to the Device tablets using Bluetooth Beacons.

1. Bluetooth Transmission “bursts”

When the **Transmit** button is touched the Instructor tablet sends a “burst” of vitals that the Device tablets can receive.

2. Addresses

The Instructor tablet and the Device tablets have unique **Addresses** that match each other - and that can be changed - so that multiple HESS sets can operate in the same room at the same time.

Addresses are 4 characters made up of the characters 0-9 and A-F. **DO NOT USE** “0000” or “FFFF” as Addresses. “0000” and “FFFF” have special uses within the HESS. Using these special Addresses can cause unpredictable results.

HESS Device Apps



To Start and Use a HESS Device App:

BEFORE starting a learning exercise!!!

1. On the Android tablet Main Screen – touch the icon of the HESS Device App.
2. Touch the **Android Options Indicator** (3 dots in upper right).
3. Choose **Settings** from the Android Options menu.
4. Change the HESS Device Settings as needed (Device Address, Options, etc.)
5. Touch **Update Settings** to save changes.
6. Use the **Android “Back Button”** (left triangle) to go back to the Main Device App screen.

7. **Familiarize the learners** with any HESS Device Operational Buttons

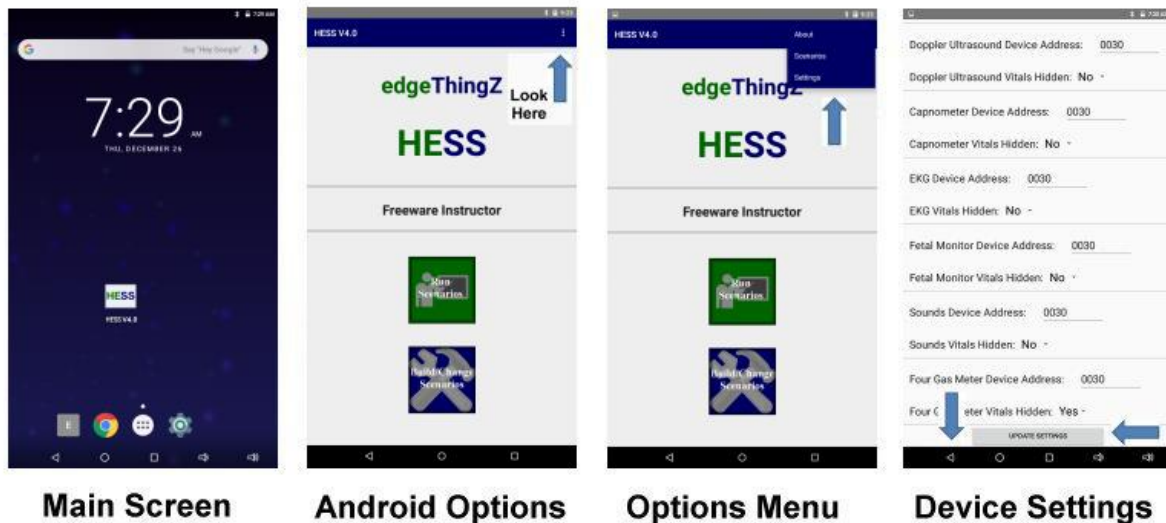
Typically they are simple buttons to obtain vitals on the HESS Device:

- either a **one time** reading like a Thermometer
- or an **on/off toggle** like a Pulse Ox

8. Keep **plugged in as much as possible!** Either the tablet power cord or a small power bank can be used to help keep the tablets charged during an exercise.



The HESS Instructor App



To Start and Use the HESS Instructor App:

BEFORE starting a learning exercise!!!

1. On the Android tablet Main Screen – touch the icon of the HESS Instructor App.
2. Touch the **Android Options Indicator** (3 dots in upper right).
3. Choose **Settings** from the Android Options menu.
4. Change the HESS Instructor Settings as needed (Device Addresses, Hidden, etc.)
5. Touch **Update Settings** to save changes.
6. Use the **Android “Back Button”** (left triangle) to go back to the Instructor App Start Screen.

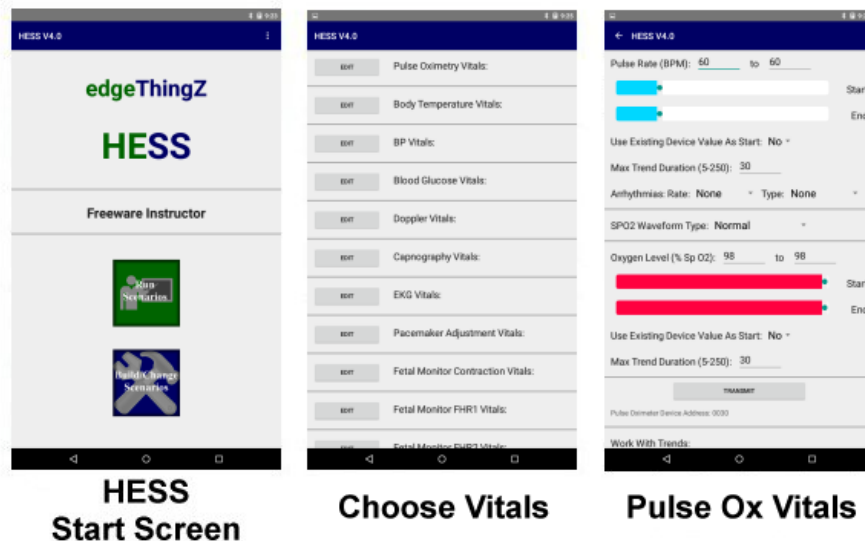
HESS Quick Example

Running this HESS Quick Example requires:

1. A HESS Instructor Tablet.
2. A HESS Device Tablet running the Pulse Ox Device App.
3. The HESS Instructor App Device Transmission Address for Pulse Oximetry is set to a unique value (see previous section).
4. The HESS Pulse Ox App Device Address is set to match the Instructor App Device Transmission Address (see previous section).

To Run The HESS Quick Example From The HESS Instructor App:

1. Touch the **Build/Change Scenarios** button on the HESS Start Screen.
2. Touch **Edit** next to Pulse Oximetry Vitals to bring up the Pulse Ox Vitals.
3. Touch **Transmit** to transmit the Vitals (watch for the Blue Text In the Pulse Ox App)



4. **NOTE THE TEXT AT THE TOP OF THE DEVICE APP**
It **TURNS BLUE** briefly when the Vitals are received

This is the HESS **Bluetooth Transmission Indicator**
- it lets Instructors know the Vitals have been sent

5. If the Vitals are not received.....
WAIT 2 SECONDS and touch **Transmit** again.



HESS Quick Example

6. Touch the **Power Button** on the Pulse Ox App

The Heart Rate and SPO2 values will appear on the Pulse Ox screen.

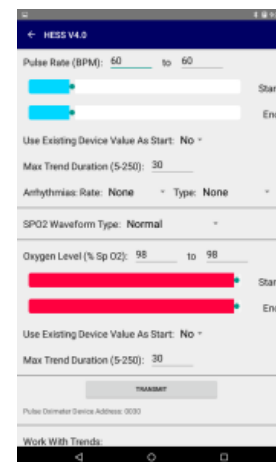
The **Power Button** can “toggle” the Pulse Ox on and off.



7. Change the **Start and End Pulse Rate** and **SPO2** Vitals in the Instructor App.

The **Start and End** values for the Vitals can be set either by using the slider controls OR by touching the numbers to be set to bring up the numeric keyboard. (If you enter numbers with the numeric keyboard the sliders will change to match after one of the buttons is pressed).

8. **Transmit** again (watch for the Blue Text in the Pulse Ox App)
9. The Display on the Pulse Ox will change to reflect the newly transmitted Vitals.



This Quick Example demonstrates the fundamental operation of the HESS. Vitals are set in the HESS Instructor App and then transmitted to one or more of the HESS Device Apps.

The HESS Instructor App allows Vitals to be saved for easy access during a learning exercise. Saving Vitals is done using the HESS Instructor App “**Scenario**” capabilities. Scenarios can be imported and exported to allow sharing with other HESS users. A quick Scenario example is included at the end of this guide, but much more about Scenarios can be found in the **HESS Scenario Tutorial**.

Tips For Instructing With The HESS

1. Bluetooth Reset Button



Next to the Android Options (3 dots)

Touch this button if you have been transmitting successfully – but then cannot transmit after numerous tries from numerous positions.

Bluetooth will try to recycle within 5-10 seconds to allow transmissions to resume without closing and restarting the Device app.



2. In general, **WAIT 2 SECONDS BEFORE touching Transmit again**. The transmit button text will turn red for 2 seconds after a transmission attempt – then back to black when it is ready again.

If transmissions are not getting through, move around a bit, change the tablet orientation and try transmitting again after 2 seconds. Rapid tapping **WILL NOT WORK!**

3. **Know if WiFi is On or Off** on the Device Tablet (in the Android Tablet Settings).

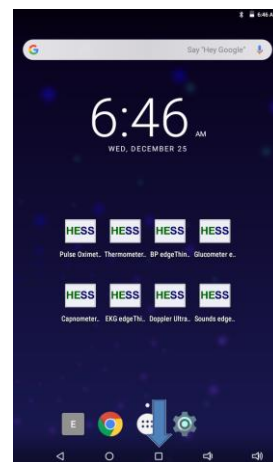


Wifi Status (On/Off) can affect the Bluetooth performance – and it depends on the Device tablet brand and model. “Usually” WiFi should be Off... but on a few tablet models WiFi should be On...

4. **Be sure ONLY ONE DEVICE APP IS RUNNING** on the device tablet.

Before beginning, use the little “square” at the bottom of the Android tablet to check for other apps running.

CLOSE ANY OTHER APPS RUNNING!



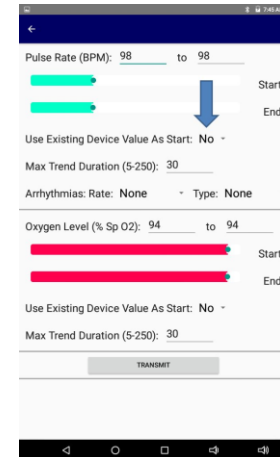
5. Smooth Vitals Transitions

(the Yes/No question in the Scenario Stages for **Use Existing Device Value As Start**)

This option prevents unexpected abrupt changes to the starting point of the vitals values when a new stage is transmitted.

If **“Yes”** – the starting point for the vitals in the new stage will be the values **ALREADY ON THE DEVICE APP**.

For an **INITIAL STAGE**, this is usually **“No”**. For **SUBSEQUENT STAGES**, this is usually **“Yes”** – unless an abrupt change to the starting vitals values is actually desired.....

The screenshot shows the HESS App interface for configuring vital signs. It features two sections: 'Pulse Rate (BPM)' and 'Oxygen Level (% Sp O2)'. Each section has a 'Start' and 'End' value, a 'Use Existing Device Value As Start' dropdown menu (set to 'No'), and a 'Max Trend Duration (5-250)' field (set to 30). A 'TRANSMIT' button is at the bottom. A blue arrow points to the 'Use Existing Device Value As Start' dropdown in the Pulse Rate section.

NOTE: If a transmission is sent with the **“Yes”** option, **AND** it is the initial transmission received by the **Device App** since starting up, the current values of the vitals on the **Device App** will be zeroes – and zeroes will become the starting point for the vitals – so it will then take time for the vitals values to “trend up” from zeroes to the target values.

More information about the **Use Existing Device Value As Start** option is available in the **HESS Scenario Tutorial**.

6. ALL VITALS SHOULD BE PROVIDED in a Scenario on any device used when possible.

Even if you “think” a vital is not relevant to the exercise, the learners may try to access it. So, if possible, send all the vitals for everything the Device App handles.

7. When done – **“Power Off”** the tablets – don’t just “suspend” them.

The Android tablets should be completely “powered off” when stored or the battery will drain to 0% charge. Completely drained batteries can then take 20-30 minutes of charging just to get the tablet to power up for usage. Even if the tablet screen is dark it can be misleading because the tablet may only be “suspended”. Pressing the power button for ½ second will indicate if the tablet is completely powered off – by either “unsuspending” the tablet screen if the tablet is only “suspended” – or remaining dark if the tablet is completely powered off.

8. Take advantage of **things generally available for Android tablets**.

The HESS Apps are just regular Android apps. There are many gadgets, solutions and information available for Android tablets and apps that can help with things such as problem resolution, taking screenshots, “casting” the tablet screen to a monitor or projector, letting the Android join a virtual meeting and share the screen (with the HESS App on it) with others, or recording the HESS App to use as a video. Visit www.BetterNurseEducation.com for ideas and suggestions.

HESS Scenario Example

Equipment needed to complete this Scenario Example:

1. A HESS Instructor tablet running the HESS Instructor App.
 2. Either:
 - A. A 7-inch HESS Device Tablet running the Thermometer Device App
 - B. A 10-inch HESS Device Tablet running the Care Monitor or ICU Monitor Device App
- Or -**
- A. A 7-inch HESS Device Tablet running the Thermometer Device App
 - B. A 7-inch HESS Device Tablet running the EKG Device App
 - C. A 7-inch HESS Device Tablet running the Pulse Oximeter Device App
 - D. A 7-inch HESS Device Tablet running the Blood Pressure Monitor Device App

If enough Device Tablets are not available, the Scenario Example can still be a good learning exercise about Scenarios – just use whatever Device Tablets are available and run the Device Apps one at a time.

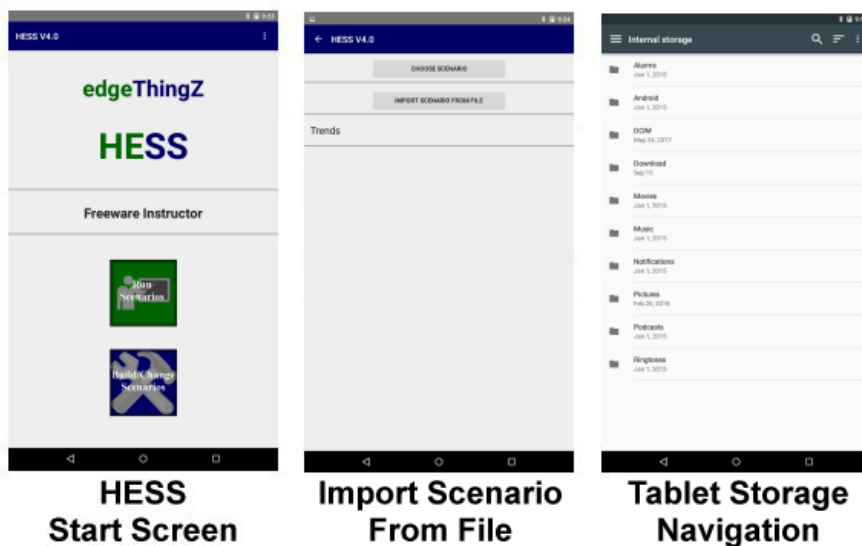
The Medical Emergency Tutorial Scenario:

The Scenario Example uses the Medical Emergency Tutorial Scenario to illustrate the usage of Scenarios. The Medical Emergency Tutorial Scenario can be downloaded from **www.BetterNurseEducation.com** and imported into the HESS Instructor App. The Medical Emergency Tutorial Scenario **can also be created directly** using the **Scenario Tutorial**.

Exported Scenario files are “.txt” files and the Medical Emergency Tutorial Scenario file is named “MedicalEmergencyTutorial.txt”.

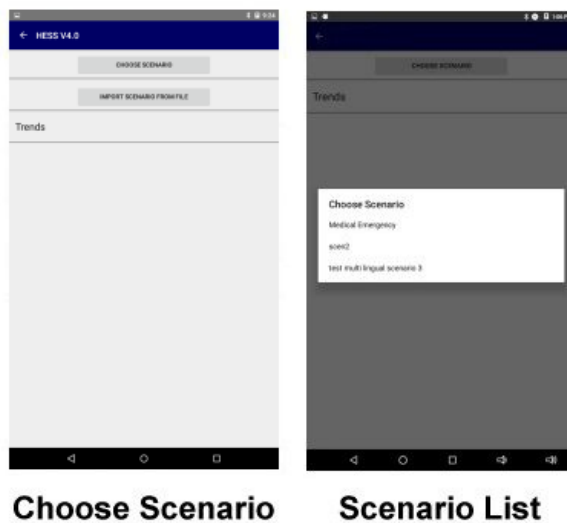
The “MedicalEmergencyTutorial.txt” file can be obtained in a number of ways including:

1. Visiting **www.BetterNurseEducation.com** using the Chrome browser on the HESS Instructor Tablet and downloading the “MedicalEmergencyTutorial.txt” to the tablet’s Internal Storage – for example into the /Download folder.
2. Downloading the “MedicalEmergencyTutorial.txt” file from **www.BetterNurseEducation.com** to a computer – then connecting the HESS Instructor Tablet to the computer with a USB cable and copying the file to the tablet’s Internal Storage - for example into the /Download folder.
3. Saving the “MedicalEmergencyTutorial.txt” file to a flash drive – then attaching the flash drive to the HESS Instructor Tablet with a suitable USB attachment cable. (Note: Some Android versions need to be the system that formats the flash drive to read it after saving the file – although many do not require this).



Importing The Medical Emergency Tutorial Scenario:

1. Touch the **Run Scenarios** button on the HESS Start Screen.
2. Touch the **Import Scenario From File** button to bring up the Tablet Storage Navigation.
3. **Navigate** to the location that contains “MedicalEmergencyTutorial.txt”.
4. Touch “**MedicalEmergencyTutorial.txt**” to import the Scenario.



To Run A Scenario From The HESS Instructor App:

1. Touch **Choose Scenario** to bring up the list of Scenarios.
2. Choose the Scenario from the list.



Scenario Stages

Transmit Vitals

Transmitting Scenario Stage Vitals to the Devices:

1. Touch the **Scenario Stage** name of the desired stage.
2. Touch **Transmit** to transmit the Vitals to the Devices (watch for the Blue Text)
3. Use the **Android "Back Button"** (left triangle) to go back to the **Scenario Stage** list.
4. Repeat for all **Scenario Stage** names within the current stage.

5. **NOTE THE TEXT AT THE TOP OF THE DEVICE APP**
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This is the HESS **Bluetooth Transmission Indicator**
- it lets Instructors know the Vitals have been sent

6. If the Vitals are not received.....
WAIT 2 SECONDS and touch **Transmit** again
7. You can **override** the Vitals if needed.....
It will **NOT** save the **overrides** in Scenario mode.

You can use the slider bars **or directly enter a value**
by touching the value.

8. Keep **plugged in as much as possible!**



The sample Medical Emergency Scenario is a multi-stage Scenario that uses vital signs involving Pulse Oximetry, EKG, Body Temperature, Capnography, and Blood Pressure.

Sample Medical Emergency Scenario Progression:

Initial Scenario Stage:

Patient complains of chest pain. Patient appearance is pale and diaphoretic.
Monitor shows sinus rhythm with elevated ST segment.
Vital signs: BP 164/72, HR 98, RR 22, Temp 98.9, Pulse Ox 94%

Expected Learner Actions:

Oxygen applied, nitro given, aspirin given.
Morphine ordered (held at this time).
Lab work drawn.
Alert called.

Progression of Scenario:

Vital signs: BP 120/68, HR 112, RR 22, Pulse Ox 96%
Cardiac monitor shows Sinus tachycardia with elevated ST segment
Chest pain continues.

Expected Learner Actions:

Nitro repeated after 3 minutes.

Progression of Scenario:

Vital signs: BP 102/60, HR 120, RR 24, Pulse Ox 96%
Cardiac monitor unchanged except rate

Expected Learner Actions:

Nitro repeated after 3 minutes.

Progression of Scenario:

Vital signs: BP 88/64, HR 130 irregular, RR 28 Pulse Ox 95%
Cardiac monitor shows sinus tach with PVCs

Expected Learner Actions:

Patient is transported to Cath Lab