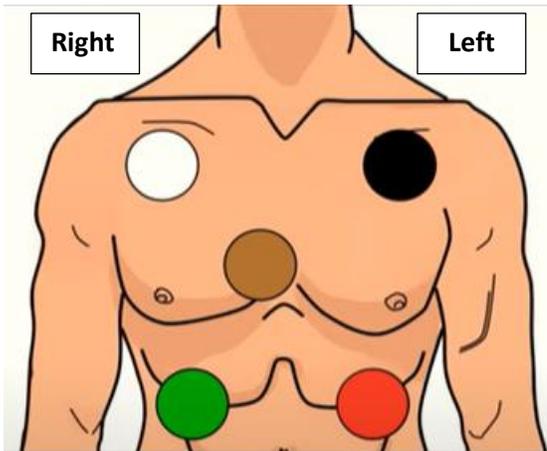# Telemetry Lead Placement

Below is a picture of proper placement of telemetry leads.

<table>
<tr><td>Right</td><td>Left</td></tr>
</table>

Tip to remember placement:

White on the right

Smoke over **fire**

Clouds over **grass**

I heart **chocolate**

Reference policy:

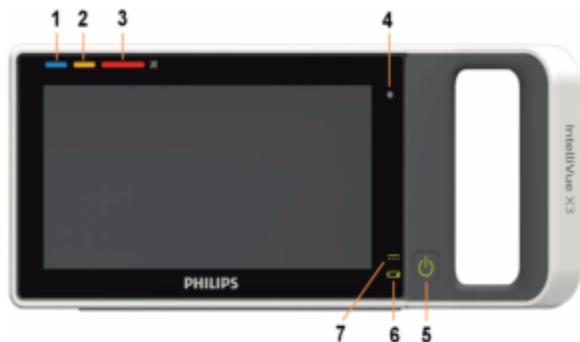- **PC 211: Inpatient Adult Cardiac and Pulse Oximetry Monitoring**

Philips X3/MX100

Click on the video title or scan the QR Code with a smart phone camera for quick access to an instructional video on Philips X3

X3 Basic Operation
(7 min)

Controls and Indicators

1 Active INOP lamp - lights continuously for light blue INOPs, flashes in the appropriate color for red and yellow INOPs. If no patient alarms are present, red and yellow INOPs will use both lamps (1 and 2).

2 Active alarm lamp - red or yellow, depending on the alarm level. The lamp flashes until the active alarm is acknowledged. For short yellow alarms, the lamp lights constantly for approximately six seconds and does not flash.

3 Alarms off lamp. When all alarms are off or paused, the lamp is red.

4 Light sensor used for ambient light adaptation - if the sensor is covered (for example by a sticker), the display cannot adapt to the ambient light conditions.

5 Power on/off switch with integrated LED:
    green – ON
    red - ERROR

6 Battery status indicator - green when full, yellow when charging, flashing red when the battery is empty.

7 External power indicator - green when the monitor is powered from an external power source.

Patient Connectors, Right Side

1 Pressure (purchase option)
2 Temperature (option, together with pressure)
3 CO2 (purchase option)
4 SpO2
5 ECG/Respiration
6 Noninvasive blood pressure

Connectors, Left Side

1 Loudspeaker (do not cover with labels or stickers as this will reduce the loudspeaker volume)

2 Device labeling area (do not cover with additional labels or stickers as the air input/output for the NBP pump is located here)

3 MSL Connector - a proprietary interface allowing interconnection of specified Philips devices.
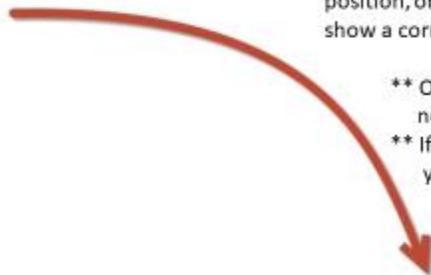
Swiping and Tapping on the Touchscreen

To scroll through lists, menus, and keys, **swipe** your finger over the Screen, similar to using a smartphone.

To switch to another Screen, swipe with **two** fingers across the Screen to pull it to the right or left, and display the next Screen. Or, simply touch the gray "Screens" key and select a different screen.

Rotating the Monitor

When the monitor is rotated from a horizontal to a vertical position, or back again, it will adapt to the new position and show a corresponding Screen

** Only the position with the handle pointing down is not allowed.

** If a menu is open when the monitor is rotated, you must close it to allow the Screen to adapt

Temporarily Stopping Automatic Screen Rotation
To temporarily stop the automatic Screen rotation:
1 Select the **Screen** permanent key.
2 Select the **Auto Rotation** key.
A padlock symbol appears on the key to show that rotation is locked.

- The **Silence** key, to acknowledge all active alarms and INOPs - it is yellow when one or more alarms or INOPs are active.

- The **Pause Alarms** key, to pause alarms or the Alarms Off key to switch alarms off, depending on your configuration. The alarms off lamp then lights and the corresponding message appears in the alarm status area.

The **Screen** key has three functions:
- To return you to the monitoring screen, closing any open windows or menus. The key is blue when any window or menu is open.
- To open a window to change to another Screen (when used in the monitoring screen).
- To *temporarily* disable touchscreen operation of the monitor. Touch and hold the key - a padlock symbol appears on the key. Touch and hold the key again to re-enable and CONFIRM touchscreen operation.

The **Keys** key displays all the SmartKeys and the Main Setup key - when you are in the monitoring screen.

Cardiac Monitoring TIPSHEET for Units **WITH** Tele Hub

Central Station Workflow
- Determine if patient will be tele box or bedside hardwire monitored   - Notify Tele Hub to admit patient and send telemetry box if needed.
- Adjust alarm limits, gain and lead selection for best rhythm analysis   - Default is lead II and V lead
Open Patient window to "record" current EKG strip
"Standby" at the Central Station will put bedside monitor in "standby" no monitoring is done   "Resume Monitoring" must be performed at Central Station.   - Notify Tele Hub when patient is put on "standby"
Event review allows review of specific alarms
Alarm Review reviews all red/yellow alarms
Wave review allows review of the actual ECG rhythm at specific time
Use "Discharge and Save" when ECG monitoring is discontinued
Arrhythmia Analysis trouble shoots inaccurately interpreted rhythms, Annotated rhythms: (N=normal, V=ventricular, S= Supraventricular, P=paced)   "Relearn" rhythms with patients with pacemaker/ICD

- "Pacer" function must be activated to recognize pacer spikes, the rhythm is updated/relearned

- Trends allow for review of patient heart rate/PVC rate/BP/pulse ox over past 4/8/ 24 hours

Bedside Monitor Functions

- Telemetry monitoring provides a 3 second delayed visual rhythm (**use tele overview on bedside monitor for telemetry monitoring)**

- **ALL** functions must be managed from the Central Station **(**alarm/rate adjustments, gain, standby)

- **Hardwired Monitoring** displays "real time" rhythm on bedside monitor (**use Horizon or 4 wave on bedside monitor)**

- ALL functions must be managed from the Bedside Monitor (alarm/rate adjustments, gain, standby)

- Blood pressure default is "Manual" Change to "Auto" and adjust frequency PRN

- Pulse Ox monitoring should be turned "Off" when not in use

- "Pause" turns all alarms off for 2 minutes, no alarms will be triggered during "Pause"

- Profiles: Adult profile is the default. Change to "Adult No ECG" or "Comfort Care" if needed

- Select NIBP change from "manual" to "auto" and set frequency/sequence for repeated measurements

Red Alarms

- **Cannot be adjusted**

- Red Alarms must be acknowledged at the bedside within 1 minute, use "silence"

- "Leads Off" and "No Signal" must be treated as asystole as a red alarm

Yellow Alarms

- **may be adjusted with provider orders**

- Yellow alarms are NOT transmitted through Emergin Pagers

- "Weak battery" is a yellow alarm, replace the battery within 10 minutes

Alarm Review

- Alarm review must be conducted at beginning & end of shift, and twice during the 12 hr shift,

- Delete nuisance alarms/artifact, interpret &document significant alarms

- Obtain orders from MD to adjust recurring alarms/insignificant alarms

- Perform/document baseline ECG strip analysis within 1 hour of start of shift, including PR, QRS, QT intervals, interpretation, and nurse signature. Verify/sign ECG strips send by the Tele Hub and place in medical record.   Document additional strips as arrhythmias occur.

Cardiac Monitoring TIPSHEET for Units **WITHOUT** Tele Hub

Central Station Workflow

- Admit patient from ADT list at the central station.   Use last name, initial and MRN

- Determine if patient will be tele box or bedside hardwire monitored

- Select "Sector SetUp" "Pair Unpair Equipment" to correctly link/unlink telemetry boxes and bedside monitors
- Green arrow = tele box, no arrow = hardwire, white arrow = incorrectly setup

- Adjust alarm limits, gain and lead selection for best rhythm analysis   Default is lead II and V lead

- Open Patient window to "record" current EKG strip

- "Standby" at the Central Station will put bedside monitor in "standby" no monitoring is done
- "Resume Monitoring" must be performed at Central Station

- Event review allows review of specific alarms

- Alarm Review reviews all red/yellow alarms

- Wave review allows review of the actual ECG rhythm at specific time

- Use "Discharge and Save" when ECG monitoring is discontinued

- Arrhythmia Analysis trouble shoots inaccurately interpreted rhythms, Annotated rhythms: (N=normal, V=ventricular, S= Supraventricular, P=paced)   "Relearn" rhythms with patients with pacemaker/ICD

- "Pacer" function must be activated to recognize pacer spikes, the rhythm is updated/relearned

- Trends allow for review of patient heart rate/PVC rate/BP/pulse ox over past 4/8/ 24 hours

Bedside Monitor Functions

- Telemetry monitoring provides a 3 second delayed visual rhythm
- **use tele overview on bedside monitor for telemetry monitoring**

- <u>ALL</u> functions must be managed from the Central Station   **(**alarm/rate adjustments, gain, standby)

- **Hardwired Monitoring**   displays "real time" rhythm on bedside monitor
- **use Horizon or 4 wave on bedside monitor**

- ALL functions must be managed from the Bedside Monitor (alarm/rate adjustments, gain, standby)

- Blood pressure default is "Manual" Change to "Auto" and adjust frequency PRN

- Pulse Ox monitoring should be turned "Off" when not in use

- "Pause" turns all alarms off for 2 minutes, no alarms will be triggered during "Pause"

- Profiles: Adult profile is the default. Change to "Adult No ECG" or "Comfort Care" if needed

- Select NIBP change from "manual" to "auto" and set frequency/sequence for repeated measurements

Red Alarms

- **cannot be adjusted**

- Red Alarms must be acknowledged at the bedside within 1 minute, use "silence"

- "Leads Off" and "No Signal" must be treated as asystole as a red alarm

Yellow Alarms

- **may be adjusted with provider orders**

- Yellow alarms are NOT transmitted through Emergin Pagers

- "Weak battery" is a yellow alarm, replace the battery within 10 minutes

Alarm Review

- Alarm review must be conducted at beginning & end of shift, and twice during the 12 hr shift,

- Delete nuisance alarms/artifact, interpret &document significant alarms

- Obtain orders from MD to adjust recurring alarms/insignificant alarms

- Perform/document baseline ECG strip analysis within 1 hour of start of shift, including PR, QRS, QT intervals, interpretation, and nurse signature. Document additional strips as arrhythmias occur.

Summary

Telemetry strips (i.e., EKG Waveforms) with their measurements and interpretation can go into Epic. It is **ESSENTIAL** to ensure the appropriate patient demographics are in the Philips Monitor. Contact Serial Number (**CSN** in Epic or **Visit Number** in Philips) will determine to which Epic record the strip will be exported. (**Note**: this is not bed-specific like vital sign validation. **Incorrect patient demographics will place EKG waveform in incorrect patient record within Epic**).

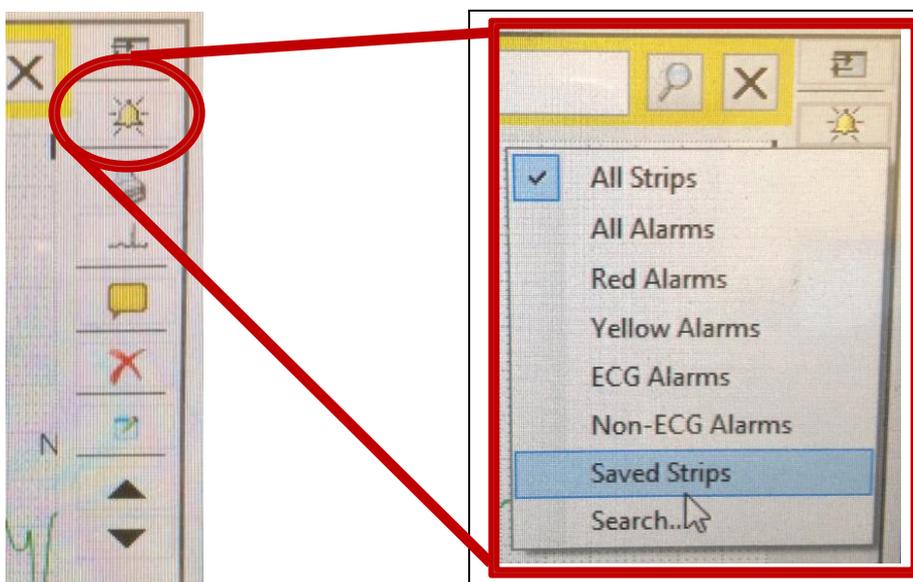## Step by Step: Retrieving Telehub Saved Strips on the Unit

The Teletechs will continue to admit patients to the Philips monitoring system. When retrieving waveform strips, **ensure and validate the demographics and interpretation is correct**. If it is not, the RN can **create a new strip**, or **change the details** on the existing saved strip from the Teletech.

1. **Click** on **Review** to access **Alarm Review** (includes manually **Saved Strips** and **Alarm Event** saved strips) or **General Review** (all waves with vital sign table, graphical trending, color-coded alarm events, and ECG tracings)


2. In **Alarm Review,** you will see a list of Alarms generated by Philips and also **Saved Strips** completed by the Teletech. Select a strip you would like to export to Epic.

    TIP: You can use the Filter tool on Philips to isolate only those **Telehub Saved strips** for quick identification of your shift's routine strip interpretation.
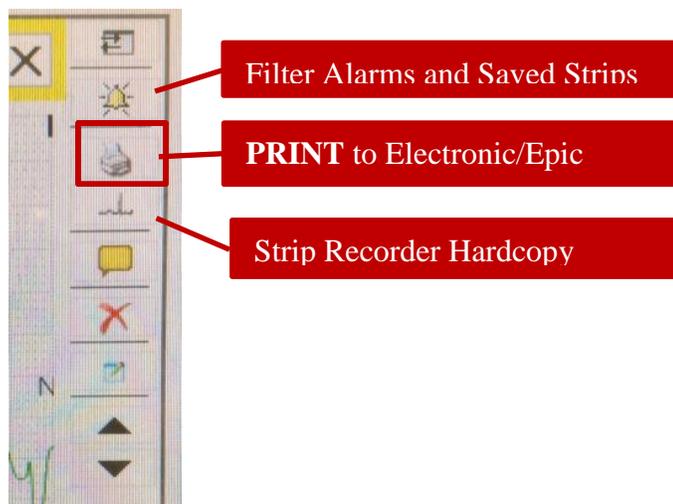
3. **Click** the **Calipers** check box to get the measurements window. If a **routine shift strip** by the **Telehub**, you will find the intervals, interpretation (**Re-label** drop down), and shift duration/initials of the Teletech. (i.e., **AM STRIP, XYZ**).

4. **If you agree with the interpretation**, use the **Free text field** to add at the end of the Teletech's annotation **your own initials and title** (do not delete the Teletech's annotation). Click **Save**. (**Note:** if you do not agree, follow Page 4)
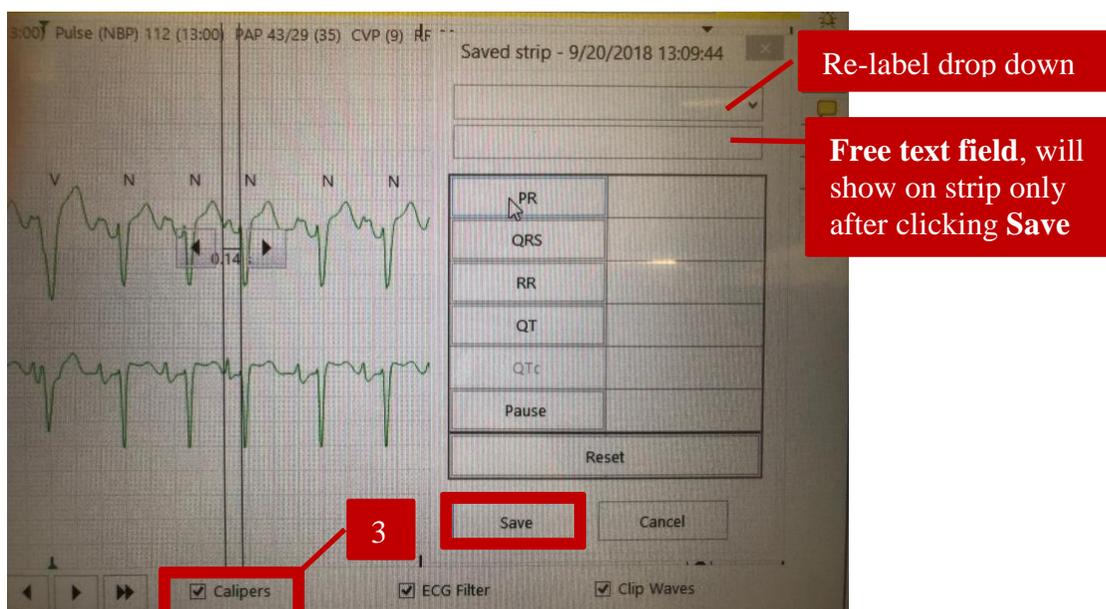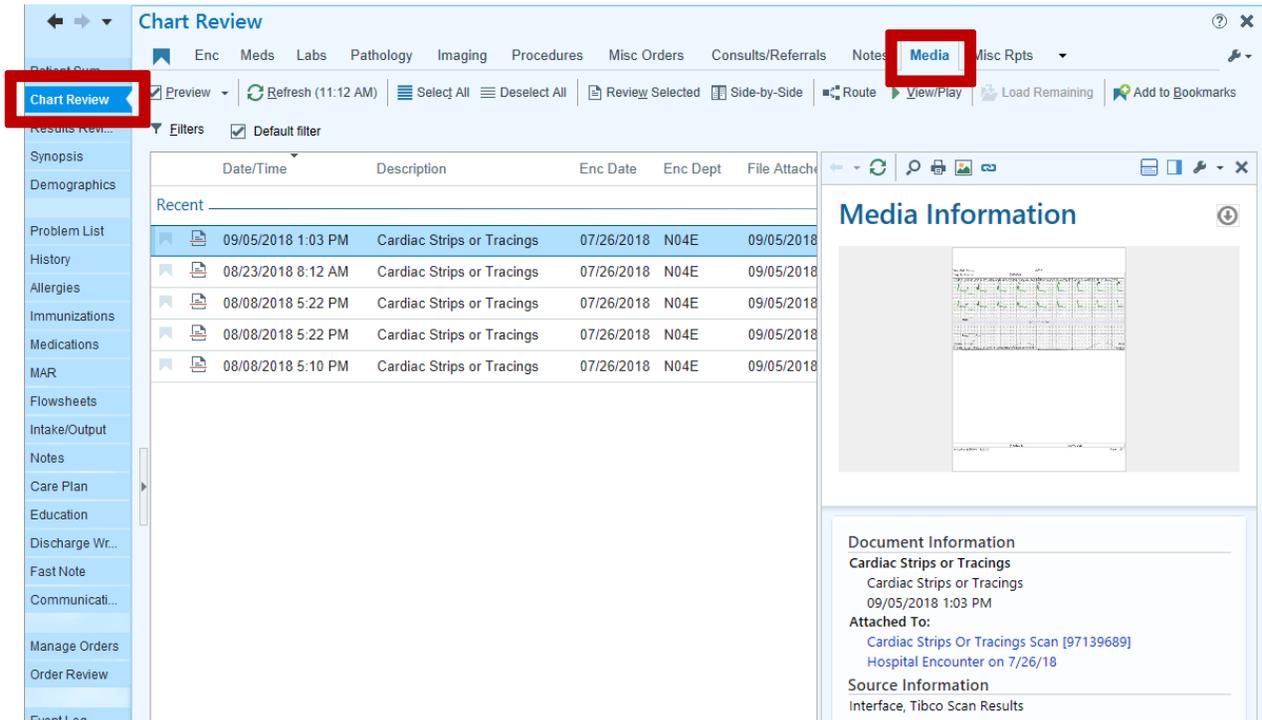

Step by Step: Waveform Export to Epic and Locating in EMR

1. **Click** on **Print Icon** within strip window, and choose **Print to Electronic** if given an option. A summary of the icons can be seen below. **Note:** The **Print Icon** will export into Epic for **Alarms** or manually created **Saved Strips**.

2. **In Epic,** navigate to **Chart Review→Media** to access these **Cardiac Strips or Tracings**. Single clicking a Cardiac Strip will show a preview, while double clicking will give full-size view. Annotations that are **Saved** will be viewable.

Note: In the case of an erroneously filed electronic strip, the HIM (Health Information Management) office will need to be contacted in order to fix the documentation error.

Produced by: Chicago Biomedical Information Services
Rev 8/23/2018

Philips Waveform Export to Epic

## Step by Step: Utilizing Philips PIIC iX E-Caliper Measurements

1. **Click** on **Review** to access **Alarm Review** (includes manually **Saved Strips** and **Alarm Event** saved strips) or **General Review** (all waves with vital sign table, graphical trending, color-coded alarm events, and ECG tracings)

2. **In General Review, hovering** in the wave section will show a pop-up time stamp to allow for appropriate ECG measurement time. **Click** to enlarge for strip window.
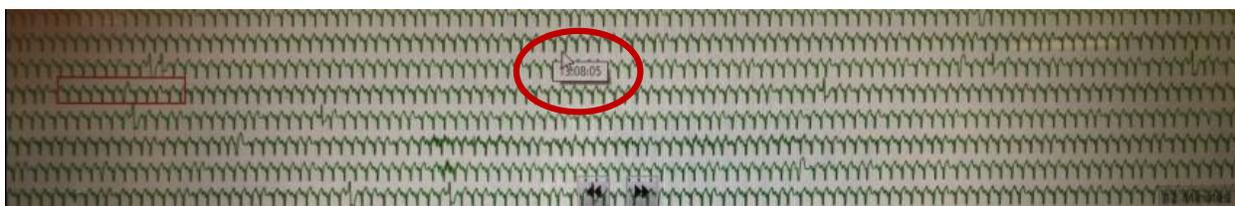
3. **Click** the **Calipers** check box to get the measurements window.

4. At desired location on the ECG wave**, left-click** and hold, then drag mouse to the left or right to open the calipers. Release mouse click at desired end location.

5. **Click** the correlating interval to assign value, (PR-Interval in the below example)

6. Use Comments field for additional free-text annotations, or **Re-label** drop down for quick identification of rhythm interpretation. **Click Save** in order to have values populate on **electronic strip.**
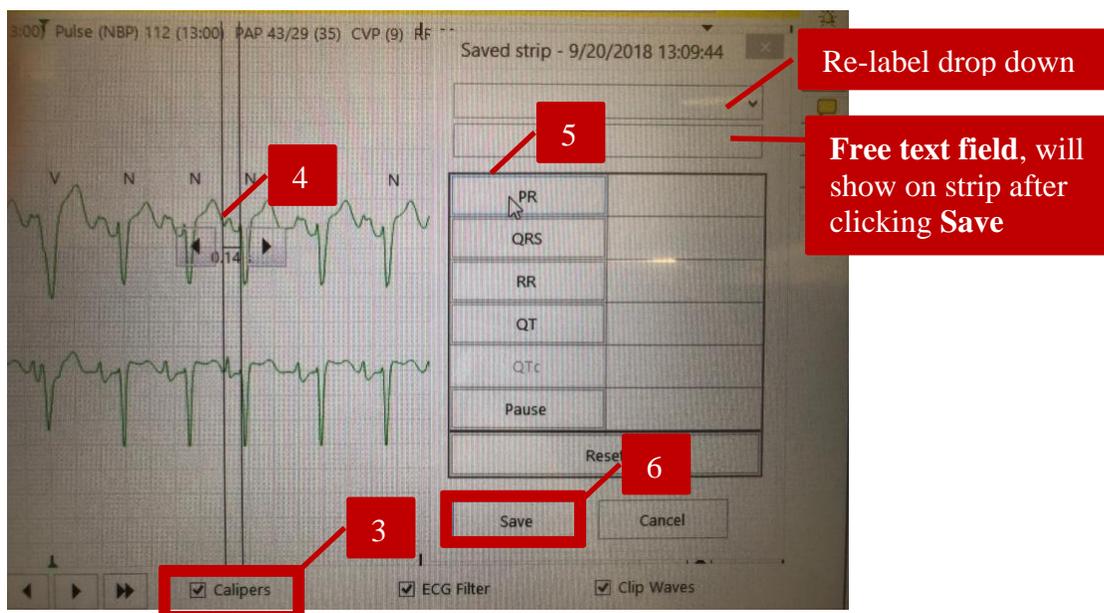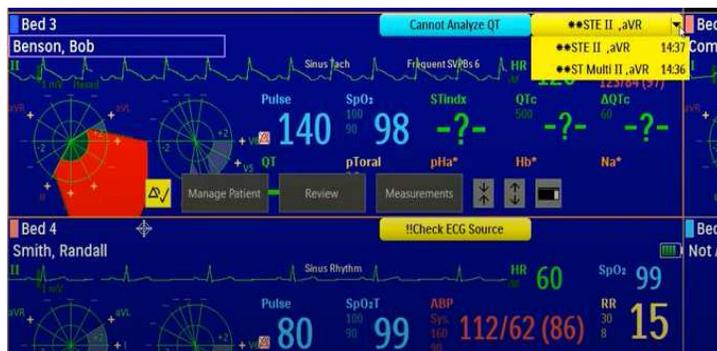
Click on the video titles or scan the QR Codes with a smart phone camera for Quick access to instructional videos on
Philips Patient Information Center iX (PIC iX)

PIC iX Overview (17 min)

Admitting a Patient (2 min)

Understanding Alarms (3 min)

Click on the video titles or scan the QR Codes with a smart phone camera for Quick access to instructional videos on
Philips Patient Information Center iX (PIC iX)

Acknowledging Alarms (1 min)

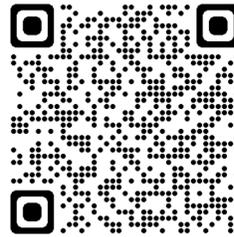

Creating a Saved Strip (4 min)

Click on the video titles or scan the QR Codes with a smart phone camera for quick access to instructional videos on Philips MX40

MX40 Overview (2 min)

MX40 Smart Keys (3 min)

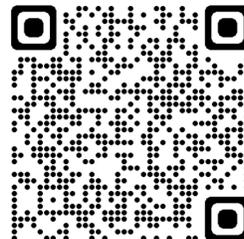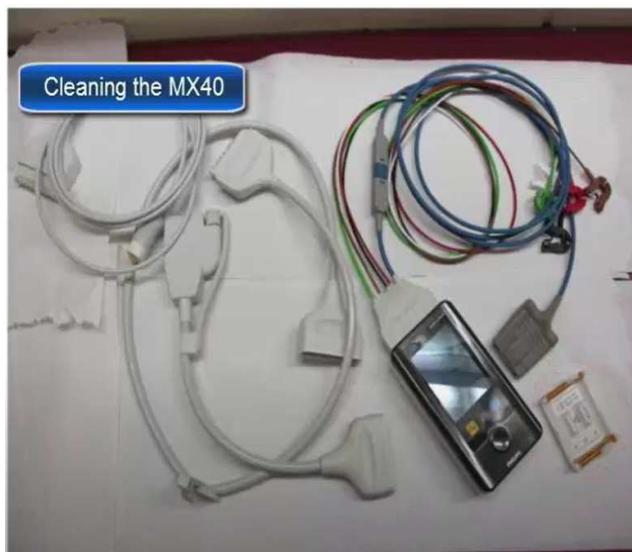**Click on the video titles or scan the QR Codes with a smart phone camera for quick access to instructional videos on Philips MX40**

**MX40 Alarms
(2 min)**

**Cleaning the MX40 and Using AA Batteries
(1 min)**

TIP SHEET: Zoll Life Vest for Inpatient Providers

Life Vest is a wearable cardioverter defibrillator. It is indicated as a bridge to therapy prior to getting an automatic implantable cardioverter defibrillator (AICD).

- For individuals at risk for sudden cardiac death
- Ventricular tachycardia (VT), ventricular fibrillation (VF)
- Ejection fraction (EF) less than 35%
- Therapy may last 2-3 months

#1 Tip Ask Licensed Independent Provider (LIP) prior to removing Life Vest

- Do not leave patient unattended while vest is off
  - Patient is unprotected without vest
- Worn 23 hours a day, only remove for bathing
- Remove electrode belt before gently washing garment
- Inpatient should wear Life Vest and telemetry

   #2 Tip Change battery on arrival to hospital and daily, battery has 72-hour lifespan

- Patients get two batteries, garments and electrode belts from Zoll
- If individual came to hospital without backup vest and battery
  - Ask family member to bring the patients supplies
  - Or contact Zoll to borrow
- Borrowed items must be returned to Zoll at discharge
  - Nurse should contact case manager or Zoll to request replacement items prior to discharging patient home (if patient does not have second set)


Positioned properly   Too high   Too low

#3 Tip Stand clear of the patient if shock will be delivered

- Life Vest will alert wearer when shockable arrhythmia is sustained for 15 seconds
- First vibration box will vibrate, then a verbal alert given, volume of verbal command increases – alerts bystanders not to touch person
- If alert and conscious; patient can disarm the treatment by depressing 2 buttons on the monitor at the same time
- The person has less than a minute to disarm

#4 Tip After 5 shocks, request another treatment pack from Zoll

- Life Vest will deliver biphasic shocks up to 150 joules a maximum of 5 times
- After 5 shocks, change the electrode box
- Blue gel is released from the paddles to prevent burn; cleanse skin after shocks

Garment   Electrode belt
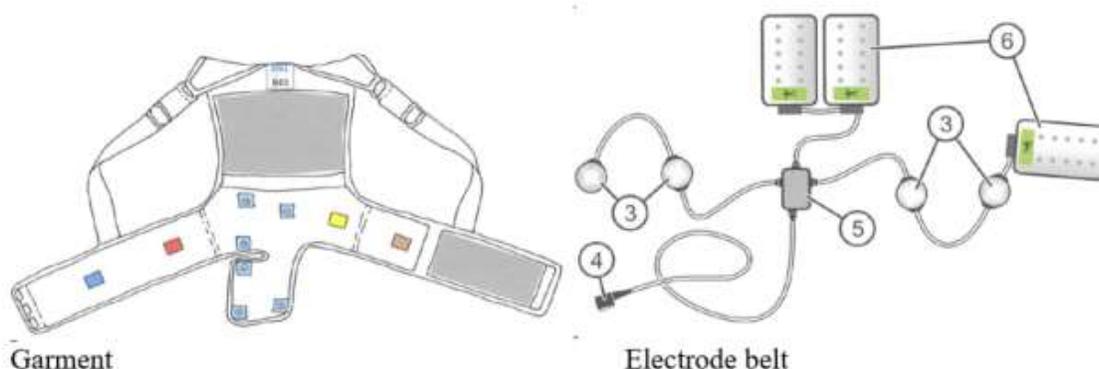
	Item	Description
1	Garment	Worn under your clothing to hold the heart sensors and therapy pads against your chest.
2	Electrode belt	Assembles to garment and contains heart sensors, vibration box, and therapy pads.
3	Heart sensors	Sense your heart's electrical signal for the monitor. Also called electrodes.
4	Connector	Connects to the monitor.
5	Vibration box	Notifies you that the device is preparing to give you a treatment.