Alarm Management With Philips Monitoring Solutions

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January 25, 2016
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Philips End-To-End Alarm Management

Philips Clinical Overview

Primary Alarms

- Signal Quality
- Point of Care Surveillance & Early Warning Scoring
- Bedside Monitoring
- Central Station Monitoring
- Alarm Reporting

Secondary Alerts

- Alert & Staff Communications

On the patient...

...in their room

...on their unit

...to their care team

Consulting and Services

Philips Medical Consumables
- Skin Prep
- Sensor placement
- Sensor quality

IntelliSpace Guardian Solution (IGS) & Vital Signs
- Early Warning Scoring (EWS)
- Patient Deterioration
- EMR Documentation
- Vital Signs monitors

IntelliVue Monitors
- Advanced Event Surveillance
- ST Map
- Protocol Watch
- Horizon view
- QTc monitoring

PIIC iX Central Station
- CDS Tools
- ST Map
- STEMI Map
- Horizon view
- QTc monitoring
- Configurable display

PIIC iX Audit Log & IntelliSpace Alarm Reporting (IAR)
- Alarm reports
- Raw alarm data

IntelliSpace Event Management (IEM)/Care Event
- Alert Escalations
- Command Center
- Alert Data Reports
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Data Collection With PIIC Classic (Central Station)

What are your options?

**Manual Process**
- Utilize Event Review functionality
- Create Event Groups to capture arrhythmia and parameter alarms
- Alarms totals for each item in the Event Group will be provided for the preceding 24 hours for each individual patient
- Can add the alarms from the Event Groups for each patient to obtain unit totals
- Does not capture data for Inop alarms

**IntilliSpace Alarm Reporting (IAR) Tool**
- Separate software that can be installed to collect alarm data
- Used with PIIC Classic (SW K.0 or later) or PIIC iX
- Provides data on all monitoring alarm, including all of the inop/technical alarm signals
- May have some alarms labeled as ‘unknown’ if you have newer bedside SW and older PIIC Classic SW
Audit log

- incorporated into the product
- Can review alarm data directly at any time; or export data onto a thumb drive or obtain remotely
- Data is available for any PIIC iX device attached to the server
- Includes data for selected Inop alarms
- Depending on option, can download up to 50 days of alarm data
- Can download for an individual patient or a unit

Alarm Summary Report

- Makes it easy for the bedside clinical staff to access their patient’s alarms
- View of Shift/Period of Time
- Alarm Limit Changes for Patient
- includes the top 5 vital signs trends and associated high frequency alarms
- You can print and view this report or send a copy to the EMR
PIIC iX Audit Log

What data can be reviewed

Can view or export:
- When alarm was generated and ended
- The following alarms can be searched:
  - Red Alarms
  - Yellow Alarms
  - Logged Inops which include:
    - All severe, yellow or red Inops
    - All battery inops
    - ECG Leads Off
    - Transmitter Off
    - No SpO2T, Batt Low
  - Over 20 other additional search filters, for example:
    - Silence
    - Pause/Resume
    - Alarm Turned On/Off
    - Alarm Limit Change
What Monitoring Alarms Can Be Captured And Analyzed?

*The list will vary depending on your technology and what is being monitored*

|---|---|---|---|---|
| • Asystole  
  • Vfib/Tach  
  • Vtach  
  • Extreme Tachy  
  • Extreme Brad | • Ventricular  
  • Beat Detection  
  • Rate/Rhythm Alarms | • SpO2 Desat  
  • Apnea  
  • Invasive Line Disconnect  
  • Extreme Pressure Limit | • Low or High Limits for:  
  • SpO2  
  • Resp  
  • NBP  
  • Invasive Pressure  
  • Temp  
  • QTc  
  • CO2  
  • Others | • Leads Off  
  • Replace Battery  
  • (There can be approximately 90-100 different types of inop alarms) |

The list of alarms within each of the broader categories is not all inclusive. Data captured will vary depending on parameters monitored, age of devices, and whether PIIC iX or the IAR tool is utilized.
Alarm Data

*Samples of how the data can be depicted*

**Alarm Signal Totals by Unit**

**Alarm by Priority Level and Type**

**Alarms by Type**

**Alarm Frequency by Trigger Level**
Alarms Per Limit Trigger

Assessing the potential impact of limits settings
Alarms Per Patient: Patient Outliers?

Deep dives can provide information on process and customization

Summary
A total of 1,947 alarms were generated by one patient and the majority of the alarms for Low Heart Rate. The low limit was set at 75. Except for 12 of the alarm signals, all of the alarms that occurred were triggered by heart rates between 70 and 74.
Third Party Device Integration

*Can provide some data on alarms*

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**IntelliBridge Bedside Data Flow**

- SCP to EC10
- SCP to IntelliVue Patient Monitor
- ADT, Orders
- MDIL

**PIIC iX Device Data Flow**

- SCP to EC40
- MDIL
- ADT, Lab, Orders
- HL7 and Alerts

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SCP = Serial Communication Protocol/RS232
## PIIC iX and Alarm Management

<table>
<thead>
<tr>
<th>Supports silent ICU</th>
<th>Expanded Patient Data Storage</th>
<th>Configuration and Settings</th>
<th>Algorithms</th>
</tr>
</thead>
</table>
| • Enable silent bedside alarms (while connected to PIIC iX) | • During hospital stay:  
  • Up to 7 days  
  • All parameters, 12 ECG waves; 8 other waves  
  • Post discharge  
  • At least last 24 hours stored automatically, for 6 days for all patients | • Configure red alarms to require silence at monitor and patient  
 • Configure access and permissions - who can do what?  
 • 20 telemetry profiles with default alarm settings, same as monitor  
 • Change alarm limits at central station | • ST alarming on 2 contiguous leads  
 • SpO2 Smart Alarm Delay* |

*Not on MX40
Enhanced Access To Information

Access to any patient virtually anywhere

Hospital-wide overview

Patient history from prior units

Remote web access to review data for patients via laptop or mobile device (compatible with both Apple® and Android™ devices)

Apple is a registered trademark of Apple Inc.
Android is a trademark of Google Inc.
Enhanced Access To Information

Mobile care giver enhancements

- 8 waves/ 10 numerics
- Embedded web review application
- Available for iOS and Android platforms
- Smartphone and tablet platforms
- Customized views

*IOS is a trademark or registered trademark of Cisco in the U.S. and other countries*
Looking At Alarm/Alert Communication

**Alarm Data**
- Alarm data capturing and analysis
- **Focus:** Baseline alarm data
- **Addresses:** TJC 2014 NPSG 06.01.01
- **Delivers:** Pre-filtered Alarm reports data

**Alert Communications and analysis**
- **Focus:** Alert workflow and processes
- **Addresses:** TJC 2016 NPSG 06.01.01
- **Delivers:** Alert communications + alert workflow reporting data

**Comprehensive ‘end-to-end’ Alarm/Alert communications solution** from Philips
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Other Philips Technology Available

*Other functionality that could alert to changes in patient status*

**HORIZON TRENDS**

- Horizon Trends saves the time it takes to compare current with past measurements in a chart, while its visual cues make changes clear to see as they happen.

- Clinicians get instantaneous, visual answers to the questions of where a patient’s measurements stand in relation to baseline or target values, and in what direction the overall trend of measurements is moving.

- With patient profiles, screens can be created for specific clinical scenarios, like ventilator weaning or traumatic brain injury.
ADVANCED EVENT SURVEILLANCE (2004)

If You Set User-defined Deviation Triggers

- You can define event triggers that are independent of specific limits and based instead on deviations from the current values.

- You must set a deviation and a period of time in which the deviation occurs.

- There are three types of deviation available: ANY Deviation, UP Deviation where only changes in a positive direction are detected and DOWN Deviation where only changes in a negative direction are detected.

- The deviation can be defined either in relative terms as a percentage, for example 10%, or as an absolute value, such as 10 bpm.

EVENT NOTIFICATION

- You can be notified when an event is detected.

- For each event group you can define a type of notification depending on the severity of the event conditions.

- The notification can be a status message with a prompt tone or a standard *, **, or *** alarm notification.
Advanced Event Surveillance

*Examples of combining alarms*

- **SIRS/Sepsis**
  - (HR, MAP, SvO₂, Temp)

- **Sedation**
  - (HR, RR, etCO₂)

- **ARDS**
  - (RR, SpO₂, CO, PIP)

- **Fluid Balance**
  - (HR, ABP, CVP, PPV)

- **Apnea**
  - (HR, RR, SpO₂)

- **Arrhythmia**
  - (e.g. VT, SVT, AF)

- **Vent. Weaning**
  - (HR, RR, etCO₂, SpO₂)

- **Ischemia**
  - (ST, ST Index, HR)
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Thank you