NIBP (91343 only)

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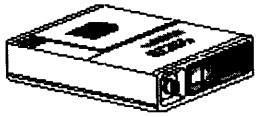
Overview



90217 ABP Monitor

The 91343 digital telemetry multi-parameter transmitter sends NIBP patient data, acquired by the 90217 ambulatory blood pressure (ABP) monitor, to the 90478 digital telemetry receiver. The 90478 displays the patient's episodic NIBP data and trigger alarms based on thresholds set at the patient monitor.

The 90217 ABP monitor is a small, lightweight, battery-powered unit designed to take blood pressure measurements. Refer to the *90207/90217 ABP Monitors Operations Manual* (070-0137-xx) and the *90121 ABP Report Management System Operations Manual* (070-0529-xx) for more detailed information on this product, its initialization by a direct PC interface, patient preparation, and event codes.

NIBP uses oscillometric monitoring to measure systolic (S), diastolic (D), and mean (M) arterial blood pressures. The pressure readings are sent from the 90217 ABP monitor to the 91343 transmitter by a connecting cable. The 91343 transmitter then includes the NIBP readings in the communications to the 90478 receiver using the radio frequency data link. Received NIBP measurements are checked to eliminate the possibility of erroneous readings and valid measurements are displayed on the patient monitor and stored in the patient monitor for trending. The Ultraview monitor displays valid measurements and the time the measurement was acquired. The most recent reading is displayed by the Ultraview monitor. The most recent 120 readings are stored and may be displayed by the monitor.

- *The 90217 ABP monitor is intended for use with adult patients only and, when used with the 91343 Digital Telemetry System, must also involve ECG monitoring.*
- *The ECG lead wires of the 91343 must be connected to the patient in order to perform ECG and NIBP monitoring.*
- *The 90217 ABP monitor, when used with the 91343 Digital Telemetry system, purges its measurements as they are successfully sent. This operation differs from when the 90217 ABP monitor is used in a stand-alone manner and stores a maximum of 240 NIBP readings and event codes.*
- *NIBP readings which are not successfully transmitted by the 90217 to the 90478 within twenty-four hours of their measurement are unavailable for patient monitor display or trending.*
- *When the battery voltage in the 91343 falls below 5.5 volts, the NIBP measurement zone will read **???**.*

Setting Up NIBP Monitoring

To set up NIBP monitoring:

1. Configure 91343 DIP switch 5 to ON (refer to *Figure 4-4* on page 4-7).
2. Initialize 90217 with 90121 ABP report management system using the ABP Remote Management System adapter cable (P/N 700-0015-00).
3. Apply appropriate cuff to patient.
4. Attach cuff to 90217 monitor.
5. Connect NIBP adapter cable (012-0588-00) between 90217 and 91343.
6. Touch ECG.
7. Touch CHANNEL FORMAT.
8. Select NIBP ON.

Proper cuff selection and application is critical in ensuring the accuracy of NIBP readings. To ensure proper cuff selection, first measure the circumference of the limb at its midpoint. Match the limb measurement to the range of appropriate circumferences (in centimeters) specified on each cuff. If the cuff bladder is too wide for the patient, the reading will be falsely lowered; if it is too narrow, the reading will be falsely elevated. Undersizing the cuff results in the greatest chance of error, so a variety of cuff sizes should be available to accommodate your full patient population.

Apply the cuff snugly. When the cuff is properly applied to an adult, you should be able to insert one finger between the cuff and the arm. If you can insert two fingers, the cuff is too loose, which may result in falsely elevated readings. Ensure that the hose is not kinked when the cuff is applied.

During blood pressure measurement, the inflated cuff reduces blood flow to the limb to which it is applied. Do not apply a cuff to a limb that has restricted blood flow. Check the patient periodically.

- *Do not apply a blood pressure cuff to a limb being monitored with a pulse oximetry sensor, because SpO_2 is affected during NIBP readings. Avoid applying a cuff to a limb that has an intravenous line in place. Do not apply a cuff to a limb that has restricted blood flow.*
- *Use only single hose cuffs to ensure proper operation. Spacelabs Medical's hoses are non-conductive with respect to defibrillator discharge effects.*

Patient Factors Affecting Readings

Excess patient movement, speech, or muscle contractions as a result of severe pain or shivering can interfere with automated NIBP readings. Ensure that the patient is quiet and not moving during NIBP readings just as you would manual readings. The patient must avoid applying external pressure to the cuff during readings. Institute measures to minimize shivering and alleviate pain.

Some arrhythmias may cause beat-to-beat pressure fluctuations that can make obtaining NIBP readings more difficult. If it becomes difficult to obtain readings in the presence of arrhythmia, pressure should be temporarily verified using another method (i.e., ausculatory, oscillometric, Doppler). Pressure also varies cyclically with normal respiration. With deep respirations or in certain patients this effect may be enhanced, increasing reading variability.

For patients in shock, indirect methods of measuring pressure (auscultatory, oscillometric, Doppler) may not be reliable because of peripheral vascular changes. These changes include peripheral vasoconstriction and diminished peripheral circulation resulting from shunting of blood to central organs. In some cases, peripheral pulses or Korotkoff sounds may be diminished or disappear in spite of adequate blood pressure. In such cases, measuring a cuff pressure may be impossible or give misleading results. Direct blood pressure measurements (invasive) should be considered in patients with signs of shock or any patient who rapidly becomes unstable for unknown reasons.

Setting Up the ABP Monitor

The 90217 ABP monitor must be initialized prior to the monitoring of each patient. Initialization is accomplished using the 90121 ABP report management system. (Refer to the *90207/90217 ABP Monitors Operations Manual*, 070-0137-xx.)

CAUTION:

- **Failure to initialize the 90217 as specified may result in the display and storage of measurements that are incorrect or that were acquired from a prior patient. The operator must initialize the 90217 before each patient use.**

After the monitor has been initialized, prepare the patient for monitoring as follows:

1. Turn on the monitor and wait for the monitor to perform self-tests. When the LCD displays the current time, the monitor is ready for operation.
2. Strap the monitor to the patient on the hip opposite the side on which the cuff is worn. Secure the monitor using the patient's own belt or the ABP pouch strapped over the opposite shoulder. When using the shoulder strap, use the belt supplied with the monitor, or the patient's belt, to provide additional security.
3. To select the proper cuff, measure the circumference of the limb at the point where the cuff is to be applied. Match the limb measurement to the range of appropriate circumferences (in centimeters) specified on each cuff (refer to *Table 1* on page 4-4).

Table 1: Cuff Size by Limb Circumference

Cuff Size	Limb Circumference
Pediatric	13 to 20 cm
Small adult	17 to 26 cm
Average adult	24 to 32 cm
Large adult	32 to 42 cm
Extra-large adult	38 to 50 cm

4. Position the cuff so that the center of the inflatable bladder is directly over the brachial artery. The center of the bladder location is marked on the outside of the cuff. Once the proper position is determined, the cuff must be tightened to ensure that it is equally snug at the top and bottom edges and that it is not kinked. This is especially important on larger arms. Insert a finger between the cuff and the limb to ensure it is not too tight. It may be necessary to wrap the cuff with its tail at an angle to achieve uniform tightness. If the cuff is not equally snug at the top and bottom edges, the number of readings available will be limited and the monitor may indicate that the cuff is improperly applied.

- *Use only Spacelabs Medical cuffs with this monitor. Using other manufacturer's cuffs may result in inaccurate readings, even if the manufacturer's recommended size is observed.*
- *If the cuff is too small, pressure readings may be falsely high; a cuff that is too large produces a falsely low reading. The bladder can be positioned in the cuff for either the left or right arm.*

CAUTION:

- **Avoid compression or restriction of pressure in the NIBP patient connector tubes. Check that operation of the equipment does not result in prolonged impairment of circulation.**
- **Do not apply cuff to areas of breached or injured skin.**
- **Cuff hose connections use luer fittings. Be careful not to connect the ABP monitor into an intravenous fluid line when working close to them.**
- **This product contains natural latex rubber components to which some people may be allergic. These components include the bladder and the first four inches of tubing extending from the cuff.**

5. Once the cuff is applied, the arm should be relaxed at the patient's side. To avoid reading errors due to hydrostatic pressure differences, the level of the cuff on the arm should be near the level of the heart.

6. Lead the hose up the arm with the cuff and place it across the back of the patient. Drape the hose so it does not cause the patient discomfort and is not pinched shut by too tight a radius. *Figure 4-1* shows the most common positions for the cuff hose.

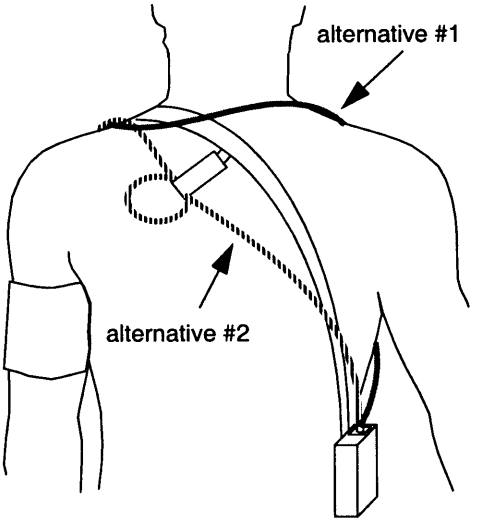


Figure 4-1: Common Cuff Hose Positions

7. Connect the hose to the monitor.
8. To verify proper monitor operation, take one or more blood pressure readings. Push the START/STOP key to begin a measurement.
9. The 91343 transmitter must be configured for use with the 90217 ABP monitor by opening the battery compartment door, removing the battery, and setting DIP switches 5 ON and 8 OFF. Refer to *Figure 4-4* on page 4-7.
10. The 90478 receiver must be configured for operation with the 91343 transmitter and attached 90217 ABP monitor. Touch the monitor ECG key to display the main menu. Touch CHANNEL FORMAT, then NIBP ON. The monitor will display the NIBP measurement in a numeric format in the display zone. The values of the measurement are displayed as **???** until a valid NIBP measurement has been taken.

11. Interconnect the adapter cable between the communications port on the 90217 and the NIBP port on the 91343 as shown in *Figure 4-2.*

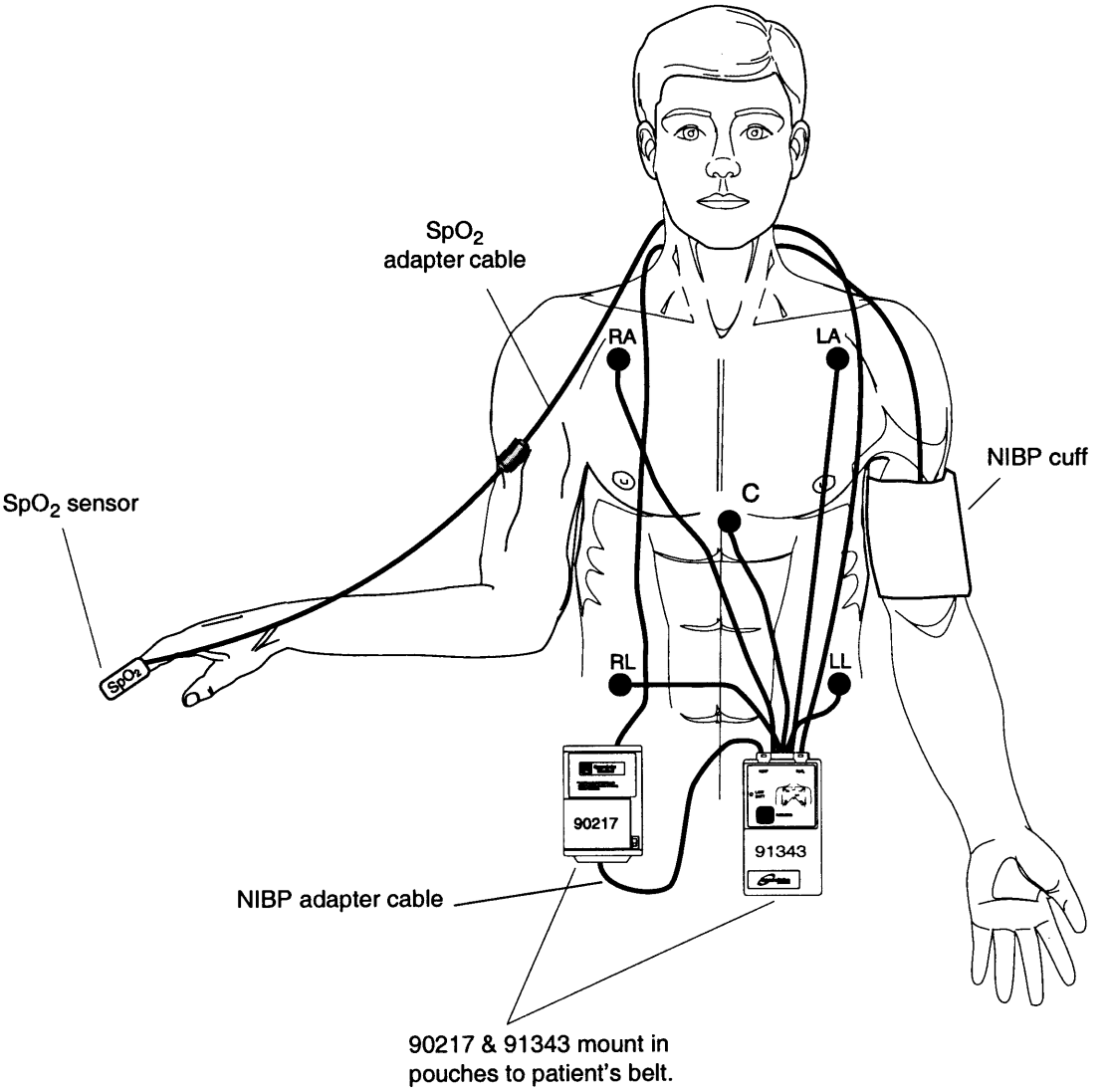


Figure 4-2: Transmitter ECG, SpO_2, and ABP Monitor Connections

Figure 4-3 and *Figure 4-4* on page 4-7 illustrate typical NIBP displays. You can view NIBP readings from any Ultraview bedside or central monitor on a network. NIBP displays on a split screen central monitor appear in a format slightly different from that of bedside or full screen central monitors. Depending on the patient monitor's display size, the title "NIBP" may not appear.

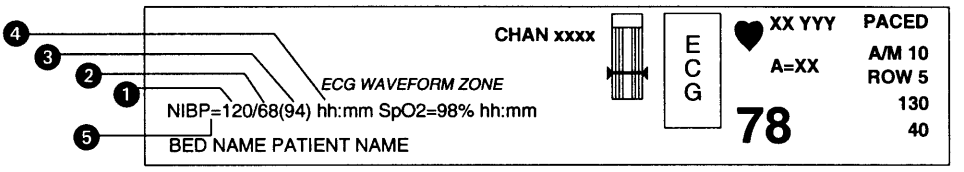


Figure 4-3: Display Zone — Full Screen

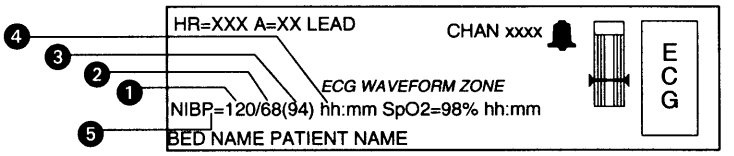


Figure 4-4: Display Zone — Split Screen

1. Last systolic reading
2. Last diastolic reading
3. Last mean reading
4. Hour and minutes of last reading
5. Equal sign becomes bell symbol when NIBP alarms are enabled

Setting or Adjusting Alarm Limits

To set or adjust NIBP alarms:

1. Touch ECG.
2. Touch ALARM LIMITS.
3. Touch NIBP ALARM LIMITS.
4. Select NIBP ALM ON.
5. Select SYS, DIA, or MEAN.
6. Select HI= or LO=.
7. Use arrow keys to adjust.

You can define pressure alarm limits for systolic, diastolic, and mean values. The default setting for alarms is OFF. Refer to the *Alarms* chapter in the *UCN Operations Manual* for Ultraview system alarm functions.

When any NIBP alarm is detected, the displayed parameter value (refer to *Figure 4-3* and *Figure 4-4*) blinks yellow if the alarm priority is Low or Medium and blinks red if the alarm priority is High. This is done independently of any other ECG or SpO2 alarm indications.

When NIBP alarms are enabled and the Systolic, Diastolic or Mean is exceeded (high or low), the corresponding SYS=XXX, DIA=XXX or MEAN=XXX alarm key blinks in the color of the highest priority alarm present. More than one alarm condition may be simultaneously present causing multiple alarm keys to blink. Refer to the *Directory of Keys - UCW and Ultraview 1700* on page 1-1.

Table 2 shows the alarm limit defaults.

Table 2: Alarm Limits

	High		Low	
Systolic	180 mmHg	(24.0 kPa)	100 mmHg	(13.3 kPa)
Diastolic	120 mmHg	(16.0 kPa)	60 mmHg	(8.0 kPa)
Mean	130 mmHg	(17.3 kPa)	80 mmHg	(12.0 kPa)

Refer to the *Module Configuration Manager* chapter in the *UCN Operations Manual* for NIBP parameter tables that list available user settings and factory defaults for this parameter.

- *The following ECG alarm messages take priority over other ECG and NIBP alarm messages for display. Other ECG and NIBP alarm messages can be adjusted in priority by using the Module Configuration Manager.*

  LEADS OFF

  NOISY SIGNAL

  ECG ALARMS SUSPENDED

Displaying New or Previous Readings

The current (or latest) NIBP reading taken may be displayed when the NIBP parameter is enabled and the 90217 ABP monitor is correctly set up. The current reading is displayed just below the isoelectric line showing systolic, diastolic, and mean values with the time of the reading. The displayed values are replaced by **???** when no valid values have been acquired from the 90217.

The previous NIBP readings may be displayed using the Tabular Trend or Graphic Trend monitor functions. The parameter trend information is collected from the module on a minute-by-minute basis and stored in system memory for retrieval. The collected NIBP trend readings may be displayed in the same manner as any other monitored parameter. Refer to the *Trends* chapter in the *UCN Operations Manual* for details.

To display previous readings in tabular format (1030/1050):

1. Touch SPECIAL FUNCTIONS.
2. Select LOCAL TRENDS or REMOTE TRENDS.
3. Select subnet and bed number.
4. Touch TABULAR TRENDS.
5. Select TIME INTERVAL or ARROWS to adjust the time interval and period.

(UCW and 1700):

1. Touch SPECIAL FUNCTIONS.
2. Touch TABULAR TRENDS.
3. Select LOCAL BED or REMOTE BED.
4. Select bed number.
5. Select TIME INTERVAL or ARROWS to adjust the time interval and period.

To display previous readings in graphic format (1030/1050):

1. Touch SPECIAL FUNCTIONS.
2. Touch LOCAL TRENDS or REMOTE TRENDS.
3. Select bed number.
4. Touch GRAPHIC TRENDS.
5. Touch TOP GRAPH of BOTTOM GRAPH.
6. Touch desired parameter to graph.

(UCW and 1700):

1. Touch SPECIAL FUNCTIONS.
2. Touch GRAPHIC TRENDS.
3. Select LOCAL BED or REMOTE BED.
4. Select bed number.
5. Touch desired parameter to graph.

Tabular Trends Display

Bed: ICU1	Patient: John Smith			Date: 26 FEB 2001					
Time		11:32	11:33	11:34	11:35	11:36	11:37	11:38	11:39
HR (ECG)	b/min	60	60	59	60	61	60	59	60
ABN	b.min	0	0	0	0	0	0	0	0
SpO_2	%	96	97	97	96	97	96	96	96
SpO_2 PR	b/min	70	70	70	70	70	70	70	70
SpO_2 (WFI)		363	364	362	365	367	285	300	340
NIBP/s	Time	11:32					11:37		
	mmHg	100					102		
NIBP/d	Time	11:32					11:37		
	mmHg	72					70		
NIBP/m	Time	11:32					11:37		
	mmHg	80					79		

NIBP Alarm Message Summary

The 90217 ABP monitor provides an extensive set of result codes that indicate the status of the monitor and the potential causes of an inability to take a valid reading.

When any alarm message is displayed, the NIBP parameter value is immediately changed to ??? and an alarm is triggered. If your module has been configured for an alarm using the Module Configuration Manager, the parameter display will blink yellow for Low and Medium priority alarms, and will blink red for High priority alarms. The alarm condition will persist until a new NIBP reading is taken. (Refer to the *Module Configuration Manager* chapter of the *UCN Operations Manual*).

The following messages are displayed on the UCN monitor to provide ABP status information to the caregiver. These messages summarize the 90217 event codes. Some of these messages include an event code in parentheses to provide more detailed analysis of the event. A complete list of the event codes can be found in the *90207/90217 ABP Monitors Operations Manual* (070-0137-xx).

NIBP UNAVAILABLE (xx)

Displayed when the 90217 ABP monitor has detected an internal condition, defined by the code (xx). Typically, this indicates a hardware or software failure that requires that the transmitter be removed from service.

NIBP READING FAILURE (xx)

Displayed when the ABP monitor was unable to make a reading. The code (xx) defines the cause of failure.

NIBP AIR LEAK

Displayed when an air leak has been detected in the pneumatic system, preventing a reading from being taken.

NIBP LOOSE OR NO CUFF

Displayed when the cuff was able to be inflated in a manner indicating that it was not attached to the patient correctly.

NIBP PATIENT CANCELLED

Displayed when the patient has pressed the START/STOP button on the 90217, halting a reading in progress.

NIBP LOW BATTERY

Displayed when the primary (3xAA) battery voltage is low. Replace with fresh batteries.

NIBP KINKED HOSE

Displayed when the pressure value increased too rapidly indicating a kinked hose or other restriction.

NIBP EVENT CODE (xx)

Displayed when the event code returned from the 90217 monitor is not defined into one of the other messages.

NIBP Troubleshooting Guide (continued)

Clinical Situation	Possible Cause	Solution
90217 ABP Display is incorrect	■ Data not retained.	■ Replace backup battery.
	■ Low or no power.	■ Check the batteries for a full charge; if needed, replace or recharge the batteries.
	■ May be one of the following: time-out, no reading due to air leak in the system, improper cuff size, cuff size not properly attached to the 90217 ABP monitor.	■ Isolate cause and correct.
No NIBP alarms are displayed	■ ECG "Leads Off" condition exists. ■ Higher priority alarm condition is present.	■ Re-attach ECG lead wires to the patient and resume ECG monitoring to clear pending ECG alarms. ■ Clear current alarm condition and/or re-prioritize NIBP alarms of interest in the Module Configuration Manager. ■ When NIBP alarms are set ON, all NIBP alarm conditions will cause the parameter value (or ???) to blink according to the alarm priority set by using the Module Configuration Manager.
Variable readings occur	■ Some arrhythmias may cause beat-to-beat pressure and NIBP readings.	■ Document arrhythmia, if present. Verify pressure using another method, then follow hospital procedure for care of this type of patient.
	■ Larger than normal influence of respiratory phases on blood pressure (inspiratory fall in blood pressure; expiratory rise).	■ NIBP software usually compensates for normal variation.
No NIBP readings or questionable values in the presence of shock	■ Peripheral vascular changes experienced during shock may reduce the reliability of blood pressure readings obtained with any indirect method. Peripheral pulses may be diminished or absent.	■ Consider invasive pressure measurements in patients with symptoms of shock or in any patient who rapidly becomes unstable for unknown reasons.
90217 displays "LLL" and alarm sounds	■ Low main battery condition.	■ Turn off and replace batteries within 60 seconds after removal to continue monitoring.
Cuff too tight	■ Cuff placed on patient too tightly.	■ Reposition the cuff.
	■ Air pump staying on too long.	■ Return unit to Spacelabs Medical for service.
Cuff too loose	■ Cuff placed on patient too loosely.	■ Reposition the cuff.
	■ Air pump not staying on long enough.	■ Return unit to Spacelabs Medical for service.

Alarms

Contents

Alarm Message Summary

Most of the alarm message priorities in the Ultraview Digital Telemetry system are user-preset choices in the Module Configuration Manager menus (refer to the *Module Configuration Manager* chapter of the *UCN Operations Manual*). These priorities are shown in the TONE column and allow selection of one out of four possible levels.

- HIGH
- MEDIUM
- LOW
- NONE

There are a few priority choices of alarm messages that are factory-preset and cannot be changed. When one of these choices is selected, a message displays indicating, "This setting cannot be changed."

The remaining alarms (and alarm messages) that can be prioritized by the user are observed according to these preset priorities when multiple alarms are concurrently active. The alarm with the HIGHER priority is activated and its associated alarm message is displayed. The alarm message(s) with a LOWER priority setting(s) in MCM is displayed when and only when the alarm message with the HIGHER priority is cleared.

Prior to any clinical monitoring session, the user is advised to configure these alarm priority settings in MCM and select those options that are best suited to the desired level of patient monitoring surveillance.

Unless otherwise specified in their description, the following messages are left on the top line (full screen monitors, medium font) or second line (split screen monitors, small font) of the waveform zone. They are displayed for the duration of the condition that caused the message or for the period specified in their description unless replaced by a higher priority message. The conditions under which these messages can be displayed are outlined below. During alarms, alarm messages flash unless alarms are suspended.

ECG Alarm Messages

The following messages apply when either the 91341, 91343, or 91347 is in use.

CHECK XX

Displayed in the waveform zone, where XX is the name of the faulted electrode. The message clears after 60 seconds for V1 – V6 and RL. It is not cleared for limb lead (RA, LA, LL) faults. If multiple electrodes have faulted, only the highest priority fault is displayed. The limb leads are highest, followed by RL, followed by the Vx leads.

ABNORMAL/MINUTE ALARM

Displayed whenever the abnormal in minute count (A=XX) initially exceeds the ABN IN MIN alarm setting. This message is displayed for 10 seconds.

ASYSTOLE

Displayed whenever no beat is detected for 5 seconds. This message is displayed for the greater of 10 seconds or the duration of the alarm.

COUPLET ALARM

Displayed whenever a couplet is detected and the ABN IN ROW alarm limit is ON and set to 2. This message is displayed for 10 seconds.

ECG ALARMS OFF

Displayed in reverse video whenever ECG alarms are OFF.

ECG ALARMS SUSPENDED

Displayed in reverse video whenever alarms have been suspended with the monitor's TONE RESET/ALM SUSPEND hard key.

ECG PROCESSING SUSPENDED

Appears whenever ECG and arrhythmia processing have been suspended with the SUSPEND PROCESSING key and menu. This message is displayed until processing is resumed.

ECG VOLTAGE TOO LOW

Displayed whenever the ECG signal is below the detection threshold. This message only applies to ADULT mode for QRS amplitudes in the range of 160 μV to 200 μV. After 10 seconds in this condition, an alarm tone sounds if ECG alarms are enabled and alarm tones have not been turned OFF or suspended.

HI RATE ALARM

Displayed during high rate alarms for the greater of 10 seconds or for the duration of the alarm.

IN LEARN

Displayed when the module is in learning mode.

CHAN 1 & 2 LEADS OFF

Displayed when lead failures preclude ECG monitoring in both ECG channels 1 and 2. The message in displayed in the waveform zone for the first ECG channel. An alarm tone sounds if the module has completed its initial period of learning and ECG processing has not been suspended.

CHAN 1 LEADS OFF

Displayed when a lead failure occurs on ECG channel 1 when automatic lead switching is disabled.

CHAN 2 LEADS OFF

Displayed when a lead failure occurs on ECG channel 2. The message is displayed in the waveform zone for both ECG channels 1 and 2.

LO RATE ALARM

Displayed during low rate alarms for the greater of 10 seconds or the duration of the alarm.

NEW DOMINANT

Displayed for one minute when a switch to a different dominant ECG morphology occurs.

NOISY SIGNAL

Displayed in ECG channel 1 when the ECG software suspends processing on either channel due to excessive noise on the ECG signal. After 10 seconds in this condition, an alarm tone sounds if ECG alarms are enabled and alarm tones have not been turned OFF or suspended. This message is displayed for the duration of the noisy signal condition plus approximately three seconds.

RUN ALARM

Displayed whenever a RUN of three or more beats is detected and the ABN IN ROW limit is set lower than or equal to the number of beats in the run. This message is displayed for the greater of 10 seconds or the duration of the alarm.

V FIB

Displayed whenever ventricular fibrillation is detected. This message is displayed for the greater of 10 seconds or the duration of the alarm.

SpO_2 Alarm Messages

The following general messages apply only when the 91343 transmitter is in use and the SpO_2 option is enabled on the transmitter and receiver. When any SpO_2 alarm is detected, the displayed parameter value (refer to item 1 in *Figure 3-2* and *Figure 3-3* on page 3-3) will blink yellow if the alarm priority is Low or Medium, and will blink red if the alarm priority is High. This is done independently of any other ECG or NIBP alarm indications.

SpO_2 UNAVAILABLE

The 91343 has reported and internal error or the communications from the 91343 transmitter contain an excessive number of errors.

SpO_2 FAULTY SENSOR

The 91343 SpO_2 processor has detected a defective sensor that will require replacement.

SPO_2 SENSOR DISCONNECTED

The sensor is not connected properly to the adapter cable or the adapter cable is not connected properly to the 91343 transmitter.

SpO_2 AMBIENT LIGHT INTF.

The ambient light present is causing interference with the signal from the sensor. Attempt to reduce the amount of ambient light.

SENSOR OFF PATIENT

The sensor is not properly applied to the patient. (This alarm is available only with non-disposable, finger-clip type sensors.)

SpO_2 INSUFFICIENT SIGNAL

The signal amplitude from the sensor is not sufficient.

SpO_2 NOISY SIGNAL

The signal is sufficiently disrupted that it may cause erroneous saturation or heart rate data. This may be caused by patient motion, electrical interference, or other cause.

NIBP Alarm Messages

The following general messages apply only when the 91343 transmitter is in use and the NIBP option is enabled on the transmitter and receiver. When any NIBP alarm is detected, the displayed parameter value (refer to *Figure 4-3* and *Figure 4-4* on page 4-7) will blink yellow if the alarm priority is Low or Medium, and will blink red if the alarm priority is High. This is done independently of any other ECG or SpO_2 alarm indications.

NIBP UNAVAILABLE (xx)

The 90217 ABP monitor has detected an internal condition that is defined by the code (xx). Typically this indicates a hardware or software failure that requires the transmitter being removed from service.

NIBP READING FAILURE (xx)

The ABP monitor was unable to make a reading. The code (xx) defines the cause of failure.

NIBP AIR LEAK

An air leak has been detected in the pneumatic system, preventing a reading from being taken.

NIBP LOOSE OR NO CUFF

The cuff was able to be inflated in a manner indicating that it was not attached to the patient correctly.

NIBP PATIENT CANCELLED

The patient has pressed the START/STOP button on the 90217, halting a reading in progress.

NIBP LOW BATTERY

The primary (3xAA) battery voltage is low. Replace with fresh batteries.

NIBP KINKED HOSE

The pressure value increased too rapidly indicating a kinked hose or other restriction.

NIBP EVENT CODE (xx)

The event code returned from the 90217 monitor is not defined as one of the other messages.

Telemetry Alarm Messages

The following are general telemetry messages and apply to the 91341, 91343, and 91347 transmitters.

INTERMITTENT SIGNAL LOSS

Displayed in the waveform zone whenever a minimum of the previous 100 samples were missed. A level 2/low priority alarm tone sounds after 10 seconds in this condition.

LOW BATTERY

Displayed in the waveform zone when the transmitter voltage is low. This message is accompanied by a level 2/low priority alarm tone if the SETUP menu's LOW BAT ON/OFF key is set to ON and displayed.

SIGNAL INTERFERENCE

Displayed in the waveform zone whenever a signal can no longer be detected because of interference from a stronger signal source lasting more than 0.5 seconds. A level 2/low priority alarm tone sounds whenever this message is displayed.