Approved 9/2/26, Effective 1/15/27, replaces all prior versions

5B – ACQUIRING & TRANSMITTING 12–LEAD ECGs ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER

EMT

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

Indications:

1. Respiratory Arrest
2. Dyspnea – Uncertain Etiology
3. Dyspnea – Chronic Obstructive Pulmonary Disease
4. Dyspnea – Congestive Heart Failure
5. Dyspnea – Apparent Life-Threatening Event
6. Post Return of Spontaneous Circulation from Cardiac Arrest
7. Chest Pain – Uncertain Etiology
8. Acute Coronary Syndrome
9. Bradycardia
10. Tachycardia – Stable
11. Tachycardia – Unstable
12. Premature Ventricular Contractions
13. Hypertensive Emergency
14. Stroke
15. Syncope
16. Poisonings
17. Conductive Energy Weapon Related Management
18. “Less Lethal” Weapon Related Management
19. Lightning/Electrical Injury

Contraindications:

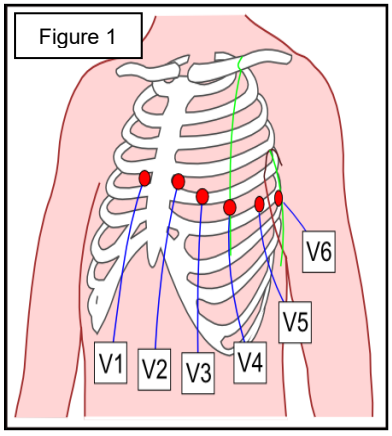
If transferring facility has already obtained 12-Lead ECG confirming STEMI prior to EMS arrival, transport is not to be delayed in an effort to obtain additional 12-Lead ECG by arriving EMS professionals. Serial 12-Lead ECG(s) for transmission to receiving facilities is/are to be obtained during transport.

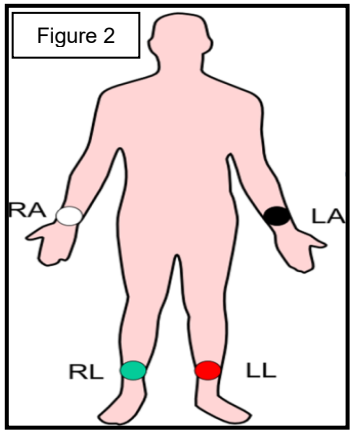
Protocol 5B: Acquiring & Transmitting 12–Lead ECGs – Adult & Pediatric, cont.

Technique (applicable to all 12-Lead ECG devices):

1. Prepare skin for electrode application. This may include hair removal with razor and/or rubbing the skin with a gauze (sterile or non-sterile) to remove oil and sweat. Both actions contribute to better electrode adhesion, leading to better quality 12-Lead ECGs.

2. For standard 12-Lead ECG, apply leads/electrodes as follows (Figures 1 & 2):
   a. RA lead on right upper extremity, preferably distal on the extremity near the wrist on the palm side.
   b. LA lead (mirror image of RA) on the left upper extremity, preferably distal on the extremity near the wrist on the palm side.
   c. RL lead on the right lower extremity, preferably distal on the extremity near the ankle on the outside of the leg.
   d. LL lead (mirror image of RL) on the left lower extremity, preferably distal on the extremity near the ankle on the outside of the leg.
   e. V1 lead to the right of the sternum in the 4th intercostal space.
   f. V2 lead (mirror image of V1) to the left of the sternum in the 4th intercostal space.
   g. V4 lead is placed next and in the mid-clavicular line in the left 5th intercostal space.
   h. V3 lead in the middle of the line now created between leads V2 and V4.
   i. V5 lead in horizontal line with V4 at anterior axillary line of the left axilla.
   j. V6 lead in horizontal line with V5 at mid-axillary line of the left axilla.





Protocol 5B: Acquiring & Transmitting 12–Lead ECGs – Adult & Pediatric, cont.

3. For a "right-sided" 15-lead ECG to evaluate for right ventricular myocardial infarction in the setting of suspected left ventricular inferior wall ST segment elevation, place the three accessory ECG wires (A1, A2, A3) in a mirror image position on the right side of the chest: V3R (midpoint between V1R and V4R), V4R (5th intercostal space, right mid-clavicular line), V5R (5th intercostal space, right anterior axillary line) (Figure 3) Move Lead V6 to the 5th intercostal space, right mid-axillary line to create V6R. Be sure to label these leads appropriately via the LifePak 35 (V3R, V4R, V5R, V6R) (Figure 4):

Figure 3

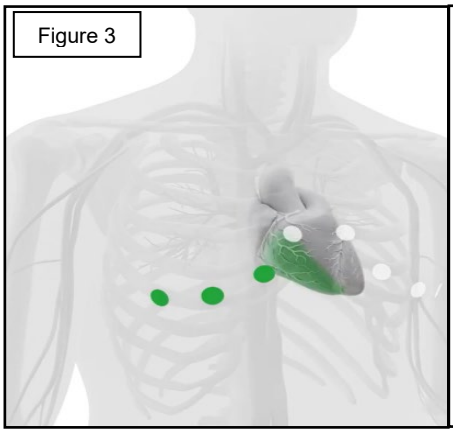
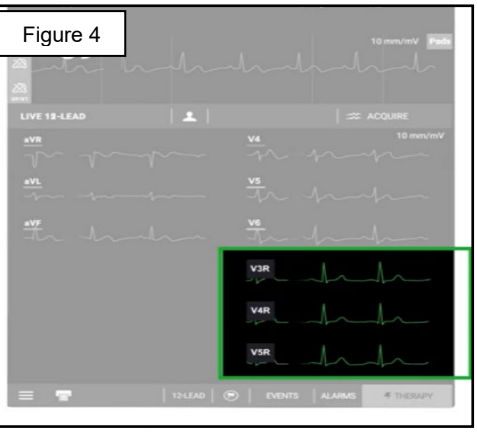


Figure 4



4. For a "Posterior Wall" 15 Lead to further evaluate for left ventricular myocardial infarction, place the three accessory ECG Wires (A1, A2, A3) horizontally along the same plane as V6: V7 (posterior axillary line), V8 (tip of the left scapula), and V9 (left paraspinal border) (Figure 5). Be sure to label these leads appropriately via the LifePak 35 software (V7, V8, V9) (Figure 6):

Figure 5

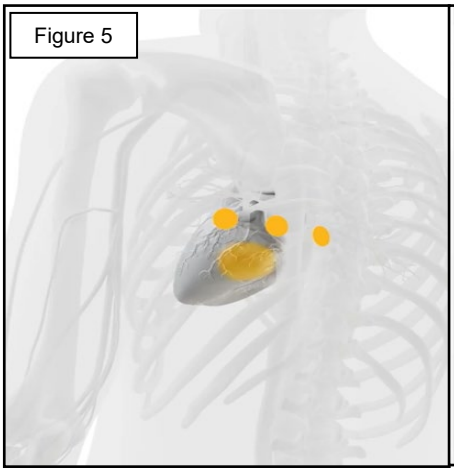


Figure 6



Protocol 5B: Acquiring & Transmitting 12–Lead ECGs – Adult & Pediatric, cont.

Technique (Physio-Control LifePak® 15):

To acquire and transmit a 12-lead ECG:

1. Press **ON**. (Figure 4)
2. Insert the lead attachments into the main cable. (Figure 5)
3. Insert the cable connector into the monitor's green ECG connector. (Figure 6)
5. Prepare patient's skin as described above.
6. Apply leads/electrodes as described above.
7. Instruct patient to remain still as possible during 12-Lead ECG acquisition to reduce movement artifact (to improve quality of 12-Lead ECG sent to emergency department).
8. Press **12-LEAD** to acquire ECG and enter patient demographic information of last name, first name, age, sex (gender), incident number (if applicable) using the speed dial. (Figures 7 & 8)
9. Once 12–Lead ECG acquired, press **TRANSMIT**. (Figure 9)
9. In the TRANSMIT window, select 12-Lead **REPORT** to be sent. (Figure 10)
10. In the TRANSMIT window, select **SITE**.
11. In the SITE window, select desired transmission destination, typically a hospital's emergency department. (Figure 11)
12. In the TRANSMIT window, select **SEND**. (Figure 12)
13. The Physio-Control LifePak®15 should connect to the selected destination.
14. Once the transmission is completed a transaction message is automatically printed.
15. If the transmission fails, make at least one additional attempt at transmission.

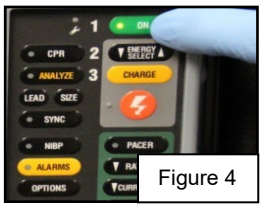


Figure 4

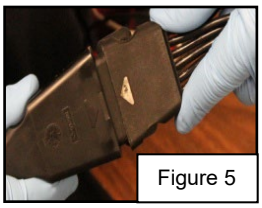
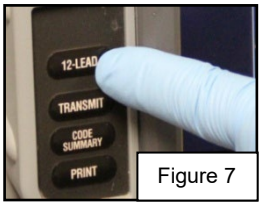


Figure 5



Figure 6



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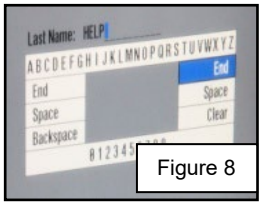

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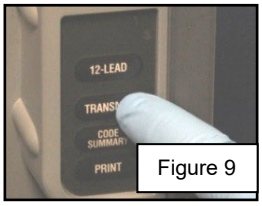

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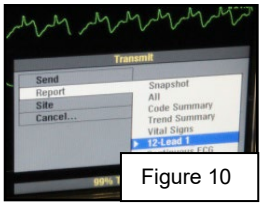


Figure 10



Figure 11

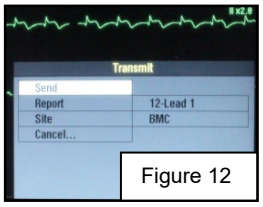


Figure 12

Protocol 5B: Acquiring &Transmitting 12–Lead ECGs – Adult & Pediatric, cont.

NOTE: There are limitations with transmitting data by telecommunications. Successful transmission depends on the access to public or private network services that may or may not always be available. This is especially true for cellular communication that is influenced by many factors, such as:

- Geography
- Location
- Weather
- Cellular service activity load (volume of active users)
- Cellular service availability

Treatment protocols take into account the fact that data transmissions cannot be assured with the use of cellular communications. Therefore, early voice communication with the receiving facility is an essential contingency plan for interrupted data transmissions.

Multiple methods of transmitting 12-Lead ECG data exist (proprietary cellular/satellite network systems, data fax transmission, cellular transmission of images, e.g. photographs of the 12-Lead ECG sent via smartphone). Check with local EMS administration officials and medical oversight physician(s) to ensure local practices are understood and follow all applicable laws relating to protected health information.

Protocol 5B: Acquiring & Transmitting 12–Lead ECGs – Adult & Pediatric, cont.

Technique (Physio-Control LifePak® 35):

To acquire and transmit a 12-lead ECG:

1. Press **ON**. (Figure 1)
2. Insert the lead attachments into the main cable. (Figure 2)
3. Prepare patient's skin as described above.
4. Apply leads/electrodes as described above.
5. For the first 12/15-Lead, use the touch screen to select **MAIN MENU**, then select **CARE RECORD**. Enter patient demographic information of First Name, Last Name, Incident number, Birth Date, Age, sex (gender), weight. (Figure 5)
6. Instruct patient to remain still as possible during 12-Lead ECG acquisition to reduce movement artifact (to improve quality of 12-Lead ECG sent to emergency department).
7. Press **12-LEAD** to enter live view 12/15 - Lead to evaluate the quality of the ECG signal prior to acquiring a 12/15 - Lead ECG (Figure 4). Within the live view, you can change the labels to indicate where the lead is placed. When the 10 Lead cable is attached, Leads V4-V6 can be assigned alternate labels to reflect actual wire location. When the additional wires are used, leads A1-A3 can be assigned labels to reflect actual wire location. These alternate labels will appear in printed and transmitted reports. (Figure 5)



Figure 1

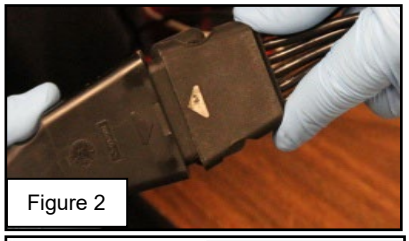


Figure 2

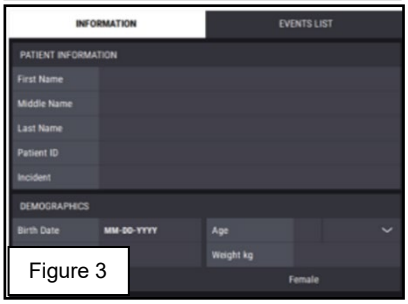
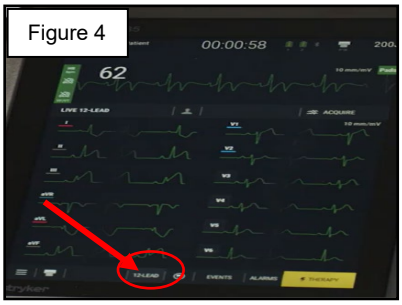


Figure 3

Figure 4



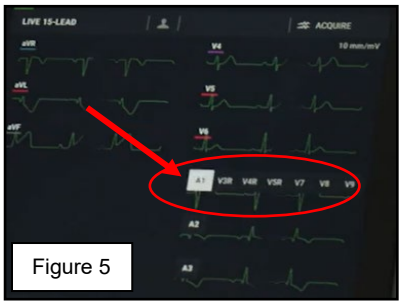


Figure 5

Protocol 5B: Acquiring & Transmitting 12–Lead ECGs – Adult & Pediatric, cont.

8. To acquire the 12/15-Lead, press the **ACQUIRE** button on the middle right hand side of the screen. (Figure 6)

9. Once 12–Lead ECG acquired, press **TRANSMIT**.(Figure 7)

10. In the **TRANSMIT** window, select **SITE**. Select desired transmission destination, typically a hospital's emergency department **OR** a secondary EMS system communication process, such as PULSARA. (Figure 8)

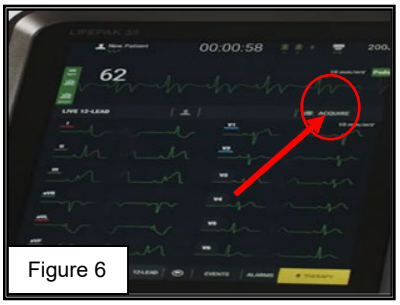
11. In the **TRANSMIT** window, select 12-Lead **REPORT** to be sent. (Figure 9)

12. In the **TRANSMIT** window, select **SEND**. (Figure 10)

13. The Physio-Control LifePak® 35 should connect to the selected destination.

14. Once the transmission is completed a transaction message is shown on the LifePak® 35 screen.

15. If the transmission fails, make at least one additional attempt at transmission. Should the additional attempt fail, utilize additional EMS system communication processes such as PULSARA to take a photo of the 12/15-Lead to relay the information to the receiving facility.



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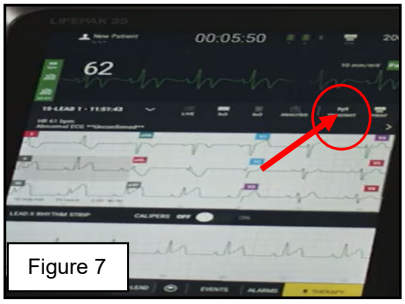
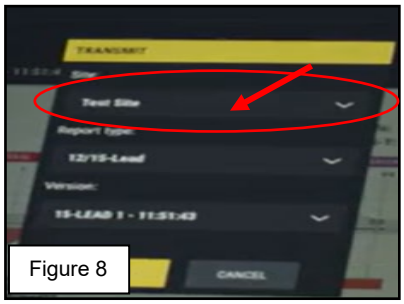


Figure 7



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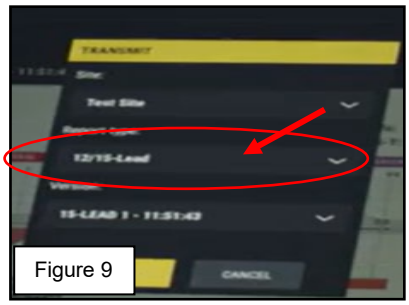

Figure 9

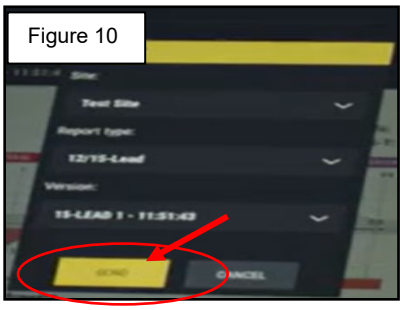

Figure 10

Protocol 5B: Acquiring &Transmitting 12–Lead ECGs – Adult & Pediatric, cont.

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