

Defibrillator electrode pads – where are we really placing them?

An audit review of how accurately the defibrillator electrode pads are positioned by the front-line ambulance service personnel. Standard used: ERC/RCUK guidance.

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Introduction

The European Resuscitation Council (ERC) and the Resuscitation Council UK (RCUK) guidelines place substantial importance on the early defibrillation of patients in cardiac arrest and highlight that an incorrectly placed set of pads is likely to result in electrical current failing to depolarise a critical mass of myocardium, resulting in inefficient defibrillation.

Although the guidelines state the exact landmarks for the defibrillation electrodes (pads), the illustrations supplied on the Zoll CPR Stat-padz defibrillator electrode pads information leaflet (Figure 1) differ from these guidelines.

We set to review whether this inconsistency affects the placement of the pads, in particular of the front-line ambulance staff.

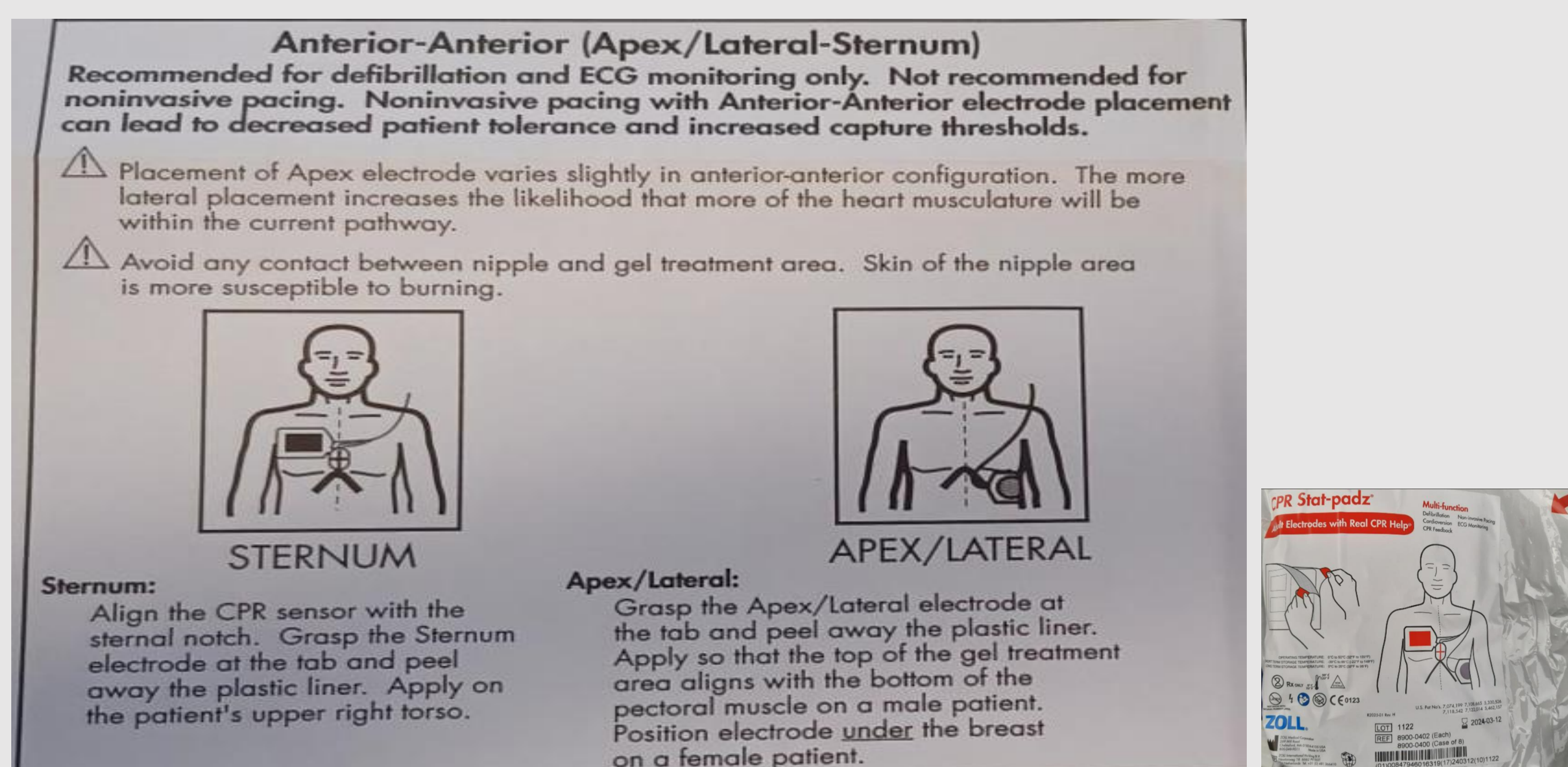


Figure 1. Zoll CPR Stat-padz defibrillator electrode pads information leaflet

Methodology

We asked 161 frontline ambulance staff to place the defibrillator pads on a unisex adult manikin torso (Laerdal). The sternal CPR sensor feedback accessory was removed.

We measured the distance and direction from the centre of each pad placed by the staff (black dot on Figure 2 and 3) to the centre of the pad which position was recommended in the ERC/RCUK guidelines (red dot on Figure 2 and 3).

The respondents were not made aware of the purpose and nature of the audit, however they were told that the manikin is in presumed cardiac arrest.

Results

- Variances in the placement of the defibrillation pads were measured when compared to the ERC/RCUK guidelines recommended locations.
- There was no comparable difference between where the pads were placed by participants in the following categories:
 - NHS band (3-8)
 - Registration status (HCPC/NHS (n =73) and non-registrants (n =83))
 - The length of the front-line ambulance service (< 2 years, 2-5 years, 5-10 years, >10 years).
- The *anterior pad* was often placed too cranially (on average of 32 mm; n =118; 73%).
- The *lateral pad* was often the most misaligned from the ERC/RCUK guidelines.
 - The most prominent misplacement was carried out by those using the Zoll Stat padz illustrations to guide their final position on the torso (n =40; 25%; Figure 2). In comparison, those who completed the Advance Life Support (ALS) resuscitation training by an approved provider (n=25; 16%; Figure 3) had least variations in placement of this particular pad.
 - In general, the lateral pad was often placed too caudally (on average of 43 mm; n=126; 78%) and too medially (on average of 48 mm; n=151; 94%).

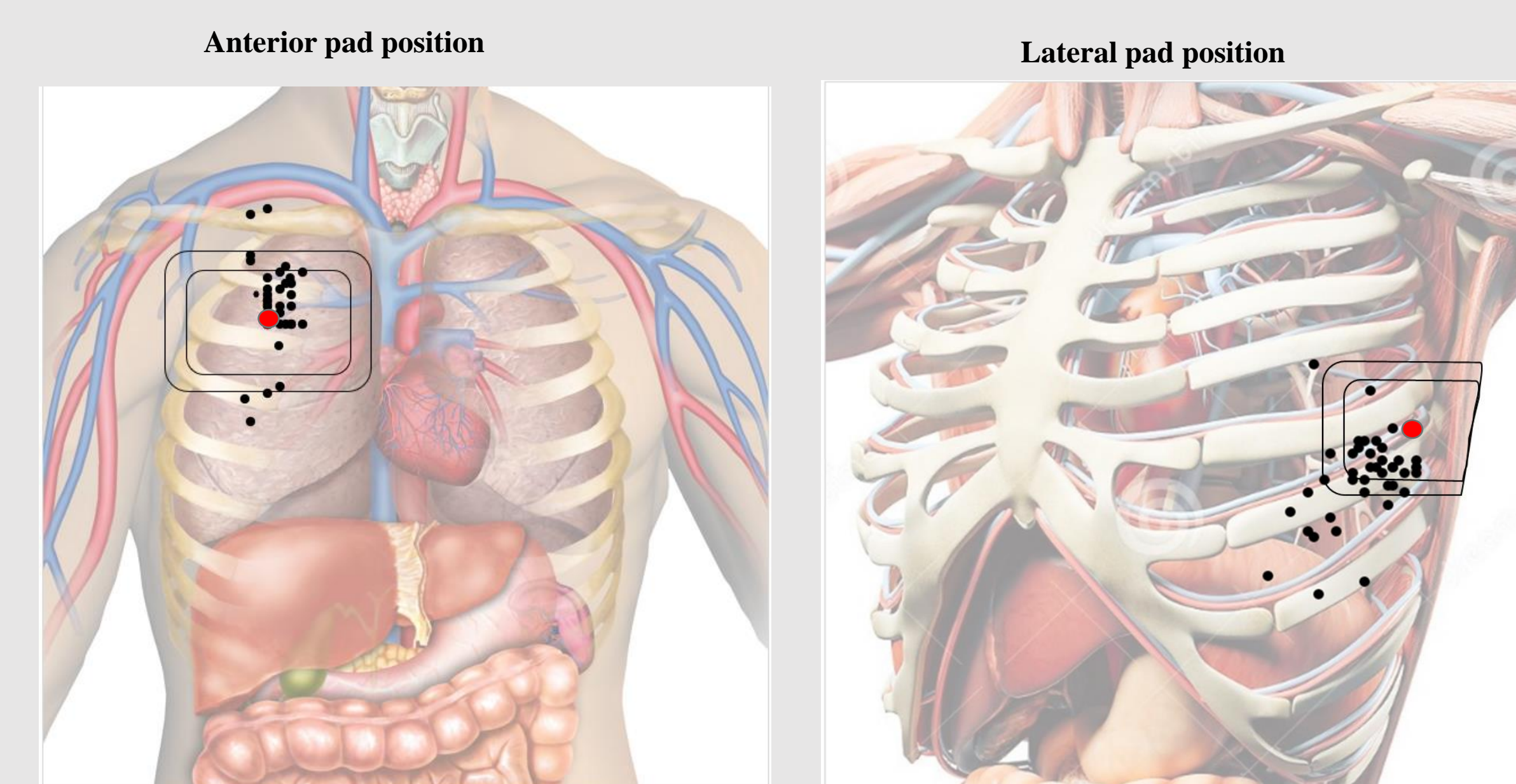


Figure 2. Placement of pads by staff who declared that they followed the illustration instructions on the Zoll Stat-padz (n =40; 25%).

● Ideal centrum position of the pad, according to the ERC/RCUK guidelines
● Centrum position of a pad placed by a member of staff
Small oblong outlines – area of the pad that generates electrical current
Large oblong outlines – outer edges of the defibrillator pad

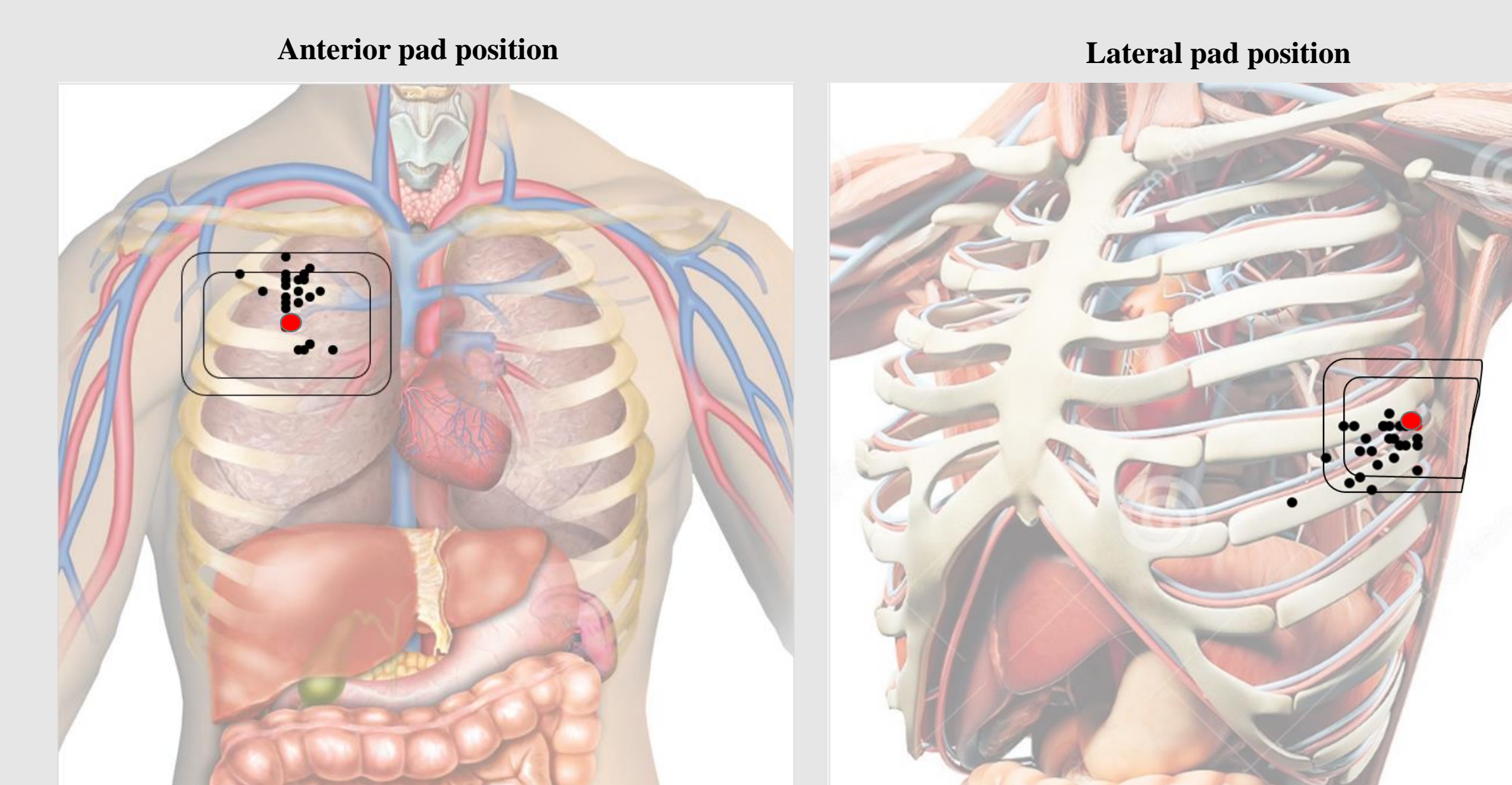


Figure 3. Placement of pads by staff who declared a completion of the ALS resuscitation training from an approved provider (n =25; 16%).

Conclusion

In general, the paired anterior and lateral pads were placed in acceptable positions to generate an efficient defibrillation route for the electrical current to depolarise the myocardium.

Recommendation

We recommend improving front-line staff awareness of the ERC/RCUK guidelines text and of the discrepancy with the illustrations on the Zoll Stat padz instructions via:

- Educational small-scale meetings such as interactive workshops and training courses where the participants take an active hands on part in learning and discussion.
- Booklets, leaflets, slide-sets, notice boards, e-learning and e-training.
- Animations and videos featuring an exact ideal locations of the defibrillation pads according to the European Resuscitation Council (ERC) and the Resuscitation Council UK (RCUK) guidelines.