

Investigation of emergency medicine residents' skills in using external pacemakers

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SUPPLEMENTARY MATERIALS

Supplementary Table 1. The 16-question test administered to participants.

<p>Participant no. (your assistant shift number):</p> <p>Age:</p> <p>Gender:</p> <p>Year of assistantship:</p> <p>How many years have you been working in the emergency department?</p> <p>Have you seen external pacemaker application before?</p> <p>Have you applied external pacemaker?</p> <p>If yes, how many times?</p>
<p>1) Which of the following options correctly describes the indications for external pacemaker?</p> <p>I) Symptomatic or hemodynamically unstable bradycardia / AV block</p> <p>II) Severe sick sinus syndrome with prolonged asystole (>3 s) and syncope</p> <p>III) Ventricular fibrillation</p> <p>IV) Torsades de Pointes</p> <p>V) Unstable supraventricular tachycardia</p> <p>A) I-II-IV</p> <p>B) I-IV</p> <p>C) I-II-IV-V</p> <p>D) I-III-V</p>
<p>2) Which of the following is incorrect about external pacemaker application?</p> <p>A) The target heart rate (60-90 beats/min) is determined.</p> <p>B) Initially, adjustment is made by increasing the energy level starting from the lowest. Start with 30 mA and increase by 10 mA (between 0-200 mA).</p> <p>C) The current is gradually increased until the energy amount reaches the capture threshold (QRS generation) (or up to the patient's tolerance limit). When the capture threshold is reached, the current is finalized by increasing the current by another 5 mA.</p>

<p>D) The beats seen on the monitor should be carefully analyzed. Narrow QRS and high/wide T waves should be seen in true capture beats.</p>
<p>3) Which of the following pacemaker types is more commonly used in the emergency department?</p> <p>A) Transcutaneous pacemaker B) Transvenous pacemaker C) Transesophageal pacemaker D) Epicardial pacemaker</p>
<p>4) Which of the following is not a cause of failure of the external pacemaker?</p> <p>A) Inadequate current B) Tamponade C) Myocardial ischemia D) The patient has an ICD</p>
<p>5) Which of the following information about the pacemaker is incorrect?</p> <p>A) Anteroapical: One pad is placed just to the right of the sternum under the clavicle and the other laterally to the apex of the heart at the anterior or midaxillary line (V5-6). B) Anteroposterior: The anterior pad is placed on the precordium or apex and the posterior pad is placed posteriorly, just posterior to the first pad in the left infrascapular region. C) Stimuli in the pads are not affected by bone and muscle tissue. D) Patients who sweat or have wet skin should be wiped dry.</p>
<p>6) Which of the following information about external pacemaker is incorrect?</p> <p>A) Any transdermal medication on the chest should be removed. B) Pads should not be glued over ECG electrodes. C) In women, the pad should be placed under the breast. D) CPR cannot be administered over insulated pads during pacemaker application</p>
<p>7) What should be the distance between the electrodes in a patient with an ICD and a permanent pacemaker?</p> <p>A) 2 cm B) 4 cm C) 6 cm D) 8 cm</p>
<p>8) In which of the following is a temporary pacemaker not contraindicated?</p> <p>A) Asymptomatic 1st degree AV block B) Asymptomatic bradycardic patient</p>

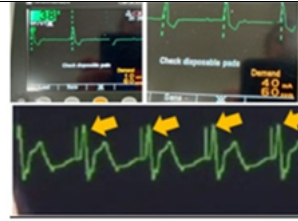
<p>C) Long QT syndrome due to reversible causes</p> <p>D) Recurrent monomorphic VT</p>
<p>9) Which of the following information is incorrect for external pacemaker?</p> <p>A) Cardiac monitoring with ECG is easy during external pacemaker application.</p> <p>B) Electrodes attached to the chest wall are used to stimulate the myocardium.</p> <p>C) Muscle contraction may be more noticeable and cause more pain with the external pacemaker, especially at high currents.</p> <p>D) Muscle contraction makes palpation of the radial, femoral, or carotid arteries difficult.</p>
<p>10) Which of the following information about Demand mode is incorrect?</p> <p>A) In this mode, the device detects the patient's heart rate and gives an electrical warning when it is less than the set rate.</p> <p>B) If the patient's heart rate is higher than the set rate, it stops the alerts.</p> <p>C) The risk of developing R on T is low.</p> <p>D) The risk of VF is higher than in fix mode.</p>
<p>11) Which of the following is not a complication of an external pacemaker?</p> <p>A) Burns</p> <p>B) Myocardial infarction</p> <p>C) Hiccups</p> <p>D) Pain</p>
<p>12) Which of the following options correctly defines overdrive pacing?</p> <p>A) Pacing the heart with a stimulus faster than its own rate.</p> <p>B) Pacing the heart with a stimulus slower than its own rate.</p> <p>C) Pacing with a stimulus independent of the heart rate.</p> <p>D) The cardiac conduction system does not need pacing.</p>
<p>13) Which of the following is not an indication for overdrive pacing?</p> <p>A) Torsades pointes</p> <p>B) SVT unresponsive to medical and cardioversion</p> <p>C) Recurrent monomorphic VT</p> <p>D) Sick sinus syndrome</p>
<p>14) Write the correct order in the stages of external pacemaker application</p>



I. Position the pads



II. Monitor the patient with a defibrillator



III. Increase output starting from minimum until capture beats are seen, check pulse if QRS is seen after each spike



V. Put the defibrillator in pace mode, select demand mode, set target heart rate.



IV. remove defibrillator paddle connection, insert pad connection.

- A) II-I-V-IV-III
- B) II-I-IV-V-III
- C) II-IV-III-V-I
- D) II-IV-I-V-III

15) Which of the following is not an indication for a temporary pacemaker?

- A) Digital intoxication
- B) AV complete block
- C) Sick sinus syndrome
- D) Asymptomatic sinus dysfunction

16) Which of the following is not a contraindication for temporary pacemaker?

- A) Hypothermia
- B) CPR performed over 20 minutes
- C) Hyperthermia
- D) Impaired skin integrity on the skin surface