Dear EHRA Member, Dear Colleague,

As you know, the EHRA Accreditation Process is becoming increasingly recognised as an important step for clinical practices within Europe.

The following slides contain examples of questions from past EHRA Accreditation Exam in CP.

Correct answers are on the last slide so that you may test yourself.
1. A patient with intermittent high-grade atrioventricular block had a dual chamber pacemaker implanted. What was the underlying rhythm once the stored EGM was captured?

a. Accelerated idioventricular rhythm with 1:1 VA conduction  
b. Ventricular tachycardia  
c. Accelerated junctional rhythm  
d. Normal sinus rhythm with first degree AV block  
e. Pacemaker mediated tachycardia
2.- Which of the phenomena listed below may initiate a pacemaker-mediated tachycardia in a patient with a dual-chamber pacemaker and intact ventriculo-atrial conduction

a.- Ventricular premature contraction
b.- Atrial undersensing
c.- Atrial oversensing
d.- Atrial exit block
e.- All of the above are correct
3.- The figure demonstrates

a.- Magnet mode
b.- Loss of atrial capture
c.- Loss of ventricular sensing
d.- Loss of ventricular capture
e.- Loss of atrial and ventricular capture
4.- Based on the ISSUE-3 trial, pacing therapy is effective in reducing recurrences of syncope in the following subgroup of patients with neurally mediated syncope:

- Patients with nonsyncopal asystolic events ≥ 3 seconds
- Patients with nonsyncopal asystolic events ≥ 6 seconds
- Patients with syncopal asystolic events ≥ 3 seconds
- Patients with syncopal asystolic events irrespective of the duration of the index asystolic episode
- B+C are correct
5.- The patient has a DDD-R pacemaker and complains of palpitations (see figure). What parameters do you adjust to resolve the situation?

a.- Prolong the PVARP  
b.- Lower the upper rate limit  
c.- Increase the atrial sensitivity (program a lower setting)  
d.- Increase atrial output and prolong the PVARP  
e.- Increase the ventricular refractory period
6. A 69-year-old man had a DDDR pacemaker implanted for bradycardia-tachycardia syndrome. Why are some paced P waves not followed by a paced or spontaneous QRS complex in the tracing?

a. No output phenomenon
b. Programming of an algorithm to minimize ventricular pacing.
c. Ventricular oversensing
d. Programming of sinus rhythm overdrive algorithm
e. Increased ventricular threshold
7.- A 54-year-old patient has had a DDD pacemaker implanted 24 hours earlier. The pacemaker was temporarily programmed to 30 bpm to obtain the following ECG. The pacemaker function may be described as

a. Normal pacemaker function  

b. Loss of atrial and ventricular capture  

c. Ventricular safety pacing  

d. Oversensing  

e. Undersensing
8.- A 48 year-old male patient with a dual chamber ICD visits the outpatient clinic complaining of an episode of "regular" tachycardia lasting for a few minutes which was associated with dizziness. The patient received no shock. The stored electrogram of the index episode is presented in the attached figure. What is the most likely diagnosis?

a.- Polymorphic ventricular tachycardia
b.- Monomorphic ventricular tachycardia with 1 to 1 VA conduction
c.- Atrioventricular reentry tachycardia
d.- Atrioventricular nodal reentry tachycardia
e.- Typical atrial flutter
9.- In the following tracing the upper line shows atrial and ventricular marker annotations, the middle line shows atrial bipolar electrograms and the lower line shows ventricular bipolar electrograms. Which one of the following statements is correct?

a.- Appropriate detection of a ventricular tachycardia characterized by different electrogram morphology.
b.- Appropriate detection of a ventricular tachycardia followed by a supraventricular rhythm with similar ventricular rate.
c.- Ventricular tachycardia during ongoing regular supraventricular tachyarrhythmia.
d.- Inappropriate therapy delivery.
e.- None of the above statements is correct.
10.- A 68-year old lady with a dual-chamber dual coil ICD received two shocks three months following implantation. What does the printout from the device interrogation show?

a.- Appropriate shock  
b.- Suspected lead fracture  
c.- Atrial fibrillation  
d.- Ventricular fibrillation  
e.- Lead displacement
AR_2012_1
11.- A capacitor with a capacitance of 200μF is charging via a resistor of 20kΩ resistance. What is the calculated charging time of the capacitor?

a.- 4 sec
b.- 8 sec
c.- 12 sec
d.- 16 sec
e.- 20 sec
12.- These electrograms were detected in a patient who came to the outpatient clinic after having received a shock from his ICD. Which of the following is correct?

a.- The first part of the tracing shows a ventricular tachycardia
b.- The first part of the tracing shows atrial flutter with 2:1 conduction.
c.- The first part of the tracing shows an atrial tachycardia
d.- The ventricular arrhythmia is initiated by a spontaneous short-long sequence
e.- A pacemaker-mediated tachycardia is appropriately detected by the ICD.
13.- The rhythm strip is taken from a patient who has an implantable cardioverter-defibrillator. The tracing (the three panels are continuous from top to bottom) is most likely to represent which of the following sequence of events?

a. Spontaneous VT, first shock converts to VF, second shock terminates and restores paced rhythm
b. Dual chamber device, VF induction, successful defibrillation with first shock
c. Biventricular device, VF induction, successful defibrillation with first shock
d. Dual chamber device, VF induction, first shock failed, second shock successful
e. Inappropriate VF sensing, ATP during charging, first shock induces VF, second shock terminates and restores paced rhythm
14. What does the printout from a dual chamber ICD show?

a. Ventricular fibrillation
b. Ventricular tachycardia
c. Appropriate ATP (anti-tachycardia pacing) treatment
d. Therapies withheld appropriately
e. Therapies inappropriately withheld
15.- What does the present ECG show?

a.- Normal DDDR pacing mode  
b.- Mode switch to VVI  
c.- DDD pacing with an algorithm to avoid ventricular pacing  
d.- DDI mode  
e.- VDD mode
16. The figure shows a detail of a Holter ECG from a patient with a VDD pacemaker. The following can be diagnosed from the ECG:

a. No ventricular pacing because of myopotential oversensing
b. Normal behaviour, one P-wave falling into the PVARP-extension of a VPC
c. Wenckebach behaviour at upper rate limit
d. 2:1 behaviour at upper rate limit
e. Intermittent exit block

Programming:

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<th>Mode</th>
<th>VDD</th>
<th>PVARP:</th>
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<td>Lower rate:</td>
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<td>AV interval:</td>
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HR=129 P/m
17. - Which of the following drugs is known to increase chronic pacing thresholds and to decrease chronic defibrillation thresholds?

a. Amiodarone  
b. Flecainide  
c. Sotalol  
d. Propafenone  
e. Carvedilol
18.- A 63-year-old male patient with dilated cardiomyopathy and permanent atrial fibrillation received a dual-chamber pacemaker with the atrial channel connected to the RV lead and the ventricular channel connected to the LV lead. The presented tracing shows

a.- Intermittent inhibition in ventricular channel due to sensing of atrial fibrillation in LV lead
b.- Inhibition due to far field R-wave sensing in the atrial channel
c.- Exit block in ventricle
d.- Exit block in atrium
e.- b + d are correct
19.- All of the following favour initiation and/or maintenance of pseudo-atrial undersensing (AR-VS sequence) and loss of AV synchrony in CRT patients EXCEPT:

a.- Fast sinus rate but below the programmed upper rate
b.- Relatively fast intrinsic AV conduction
c.- Relatively long PVARP
d.- Ventricular premature beats
e.- Activation of PVARP extension after ventricular premature beat
20. - Which of the following statements commenting on the findings of the MADIT-CRT trial is INCORRECT?

a.- The findings of MADIT-CRT support the efficacy of CRT-ICD therapy in reducing the risk of heart failure events in relatively asymptomatic patients with low ejection fraction (EF≤30%) and wide QRS complex (≥130 msec).

b.- The benefit derived from CRT-ICD therapy was similar in both ischemic and non-ischemic cardiomyopathy patients.

c.- CRT-ICD did not result in a significant reduction in the overall risk of death in comparison to ICD group.

d.- Patients randomized in the CRT-ICD group showed a significantly greater improvement in the ejection fraction in comparison to the ICD group.

e.- Patients with QRS duration of 150 msec or more and those with QRS duration of less than 150 msec had a similar benefit from CRT-ICD therapy.
## ANSWERS

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