Complete the following.

1. Cardiac arrhythmias result from abnormal impulse ________________, abnormal impulse ________________, or both mechanisms together.

2. ________________ is the ability of certain cardiac cells to spontaneously depolarize and initiate an electrical impulse without external stimulation.

3. ________________ conduction is the progressive decrease in conduction velocity of an impulse as it travels through a region of myocardium and occurs when an action potential loses its ability to stimulate the tissue ahead of it.

4. When a cell is stimulated during phase 3 of the action potential, conduction is __________ because the membrane has not yet returned to its resting level.

5. Phase 4 block, also called ________________ or bradycardia-dependent block, occurs late in diastole when fibers are stimulated at reduced membrane potentials, secondary to spontaneous phase 4 depolarization.

6. __________ is a type of conduction abnormality that leads to the occurrence of premature beats or sustained tachycardias rather than to a block. Reentry means that an impulse can travel through an area of myocardium, depolarize it, and then reenter the ___________ to depolarize it again.

7. ________________ reentry involves an anatomic obstacle around which the circulating wave of depolarization can travel.

8. ________________ reentry does not require an anatomic obstacle but depends on local differences in conduction velocity and refractoriness among neighboring fibers that allow an impulse to circulate repeatedly around the area.

9. ________________ reentry is caused by structural differences among adjacent fibers that cause variations in conduction velocity and repolarization between these fibers.
10. An impulse conducts more ____________ when it travels along the length of fibers than it does when it travels in the transverse direction across fibers.

11. When an impulse travels the reentry loop only once, a single _______________ ________ results.

12. A single impulse could travel the loop numerous times, resulting in a run of premature beats or in a _______________ ______________________.

13. Reentry that occurs in small loops of tissue, such as the AV node or Purkinje tissue, is called ________________________.

14. If the reentry loop involves large tracts of tissue, such as AV bypass tracts of the bundle-branch system in the ventricles, it is called ________________________________.

15. Many clinical arrhythmias are thought to be due to ____________, including most VT, AF, atrial flutter, and some AT.

16. Arrhythmias that are known to involve discrete ____________ circuits are atrial flutter, AVNRT, circus movement tachycardias (CMT) using an _____________ pathway in Wolff-Parkinson-White (WPW) syndrome and bundle-branch reentry VT.

17. Multifocal Atrial Tachycardia (MAT) (also known as chaotic AT) is rapid firing of several ____________ ________ ________ at a rate faster than 100 beats/min.

18. MAT is most commonly seen in elderly patients and is associated with ________________ but can also occur in the presence of HF, hypokalemia, hypomagnesemia, hypoxia, _____________ ________, and mitral stenosis.

19. MAT is often misdiagnosed as _____ because it shares many of the ECG features of this arrhythmia.

20. Treatment of MAT is directed toward eliminating the causes. Antiarrhythmic therapy is often _________________. Beta blockers, verapamil, flecainide, amiodarone and magnesium have been reported to be ________________ in the treatment of MAT.
21. If MAT is chronic and unresponsive to drug therapy, ______________________
_________________ of the AV node and insertion of a permanent pacemaker may be
necessary to control the ventricular rate.

22. Chronic tachycardias produce complex structural changes and “_________________”
of both the atria and the ventricles.

23. ______________________ ________________  ______________________ of the
flutter reentry circuit has become the treatment of choice for chronic or recurrent atrial
flutter and is an alternative to chronic drug therapy.

24. Treatment for AF is directed toward eliminating the cause, controlling ventricular
_______, restoring and maintaining _______  ___________, if possible and preventing
thromboembolism.

25. Two management strategies are available for patients in AF: rate control or rhythm
control. _______ __________ means that ventricular rate is controlled with drug
therapy with no intent to restore sinus rhythm and ___________ __________ means that treatment is aimed at restoring and maintaining sinus rhythm.

26. Technically, ST, AT, Aflutter, AF, JT, AVNRT, and CMT utilizing an accessory pathway in
WPW syndrome can all be called _______.

27. AV reciprocating (or reentrant) tachycardia (AVRT) is also known as __________
______________ ________________.

28. Nonpharmacologic therapy for recurrent VT includes radiofrequency catheter ablation
and the __________________ ______________________ ______

29. ________________ ______________ is similar to VT, but the rate is faster.
Hemodynamically, it is more dangerous because there is virtually no cardiac output. It is
fatal unless treated immediately by defibrillation.

30. Second-degree AV block occurs when _____ _______ impulse at a time fails to be
conducted to the ventricles.

31. Type II block is less common but more _____________ than type I block.
32. ______________________  ____ ________ (also called advanced AV block) is present when two or more consecutive atrial impulses are blocked, the atrial rate is reasonable (less than 135 beats per minute), and conduction fails because of the __________ itself and not because of interference from an escape pacemaker.

33. ______________________ refers to early activation of the ventricular myocardium by supraventricular impulses entering the ventricles through accessory pathways. The most common accessory pathway is an AV bypass tract, the __________ __ ________, which originates in the atrium and inserts in the ventricle, bypassing the entire conduction system.

34. The most common type of preexcitation syndrome is __________ ________________.

35. Premature ventricular stimulation forms a characteristic slurring of the initial portion of the QRS complex, called a __________ _________ in WPW.

36. Accessory pathways can be located in multiple places around the ________ rings, the ____________ and the free walls of both _____________________.

37. Preexcitation does not require treatment unless it is associated with ________________ tachyarrhythmias.

38. __________ is the most common mechanism of SVT and is responsible for up to two thirds of regular, narrow QRS tachycardias. In AVNRT, a ____________ circuit is set up in the AV node, using one pathway (usually the slow pathway) for the _________________ limb and the other pathway (usually the fast pathway) as the ________________ limb.

39. In AVNRT is a narrow QRS tachycardia because the ventricles are activated through the normal Purkinje system. P waves are either not visible at all or are seen peeking out at the end of the ______ ________________ because the atria are activated in a ________________ direction at the same time as the ventricles are being depolarized in an anterograde direction.
40. AVRT or CMT is a SVT that occurs in people who have accessory pathways, also called ______________ ______________, allowing impulses to conduct directly from atria to ventricles. In CMT, the reentry circuit involves the atria, AV node, ventricle and accessory pathway.

41. ________________ is used to describe the most common type of CMT, in which the AV node is used as the anterograde limb and the accessory pathway is used as the retrograde limb of the circuit.

42. ________________ is a term used to describe a rate form of CMT in which the accessory pathway is used as the anterograde limb of the circuit and the AV node is used as the retrograde limb.

43. _____ can be one of the most serious arrhythmias encountered in cardiac patients and often requires immediate treatment to prevent hemodynamic collapse and possible deterioration into VF.

44. Three types of VT are commonly seen in patients with cardiac disease, ______________ ____, ______________ ___ and ________.

45. ______________ __ refers to VT that occurs in people with no structural heart disease.

46. ______________ PVT is a genetic disorder that causes adrenergic-dependent PVT and sudden death in otherwise healthy people.

47. _______ ___ ________________ also called short-coupled TdP is a cause of sudden cardiac death (SCD) in otherwise healthy children and young adults. It is a genetic disorder in which patients have a corrected QT interval less or equal to 340 milliseconds, sometimes with a measured QT interval as short as 210 milliseconds.

48. ______________ __ _____________ is a special type of PVT in which the QRS complexes display continuously changing morphologies with the underlying cause being delayed ventricular repolarization, which is manifested on the ECG as abnormally prolonged ____ ________________. QT prolongation can be acquired or _________
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49. __________________ syndrome is a common cause of sudden cardiac death (SCD). Most commonly found in young men in Southeast Asia but now also being found in Europe and United States. It is an ________________ dominant genetically transmitted abnormality in a gene that is responsible for proper operation of the _______________ channel in the cardiac cell membrane. The clinical significance of Brugada syndrome is its association with ___________ ventricular arrhythmias and sudden cardiac death (SCD). Patients may present with unexplained ___________ that is most likely due to self-terminating episodes of PVT which occur more at night and during sleep.

50. There are three major causes of wide QRS beats or tachycardias: _______________ origin of the beat or rhythm, _______________ conduction of a supraventricular beat or tachycardia through the bundle-branch system and ________________ of the ventricle through an accessory pathway.

51. ___ ________________ means that the atria and ventricles are under the control of separate pacemakers and are beating independent of each other. AV dissociation is not a primary arrhythmia but is always _______________ to some other disturbance that results in dissociation.

52. _______________ ________________ occurs when one chamber is occasionally depolarized by the other chamber’s pacemaker.

53. AV dissociation can result from the acceleration of a subsidiary pacemaker, either _________________ or _________________, that fires faster than the SA node and thus assumes control of the ventricles.

54. _______________ __ __________ is a form of AV dissociation because none of the atrial impulses conducts to the ventricle and the atria and ventricles are under the control of separate pacemakers. Every complete AV block is AV dissociation, but ____ __________ AV dissociation is complete AV block.