10 Ventricular Dysrhythmias

Learning Outcomes

10.1 Describe the various ventricular dysrhythmias.

10.2 Analyze premature ventricular complexes (PVCs) and their effect on the patient, including basic patient care and treatment.

10.3 Analyze agonal rhythm and its effect on the patient, including basic patient care and treatment.

10.4 Analyze idioventricular rhythm and its effect on the patient, including basic patient care and treatment.

10.5 Analyze accelerated idioventricular rhythm and its effect on the patient, including basic patient care and treatment.

10.6 Analyze ventricular tachycardia and its effect on the patient, including basic patient care and treatment.

10.7 Analyze ventricular fibrillation and its effect on the patient, including basic patient care and treatment.

10.8 Analyze asystole and its effect on the patient, including basic patient care and treatment.

Key Terms

advanced cardiac life support (ACLS)
apnea
bigeminy
coupling
crash cart
frequent PVC
interpolated PVC
multifocal PVC
occasional PVC
paroxysmal event
premature ventricular complex (PVC)
quadgeminy
R-on-T PVC
run of ventricular tachycardia
salvo
Torsades de Pointes
trigeminy
triplet PVCs
unifocal PVC

10.1 Introduction to Ventricular Dysrhythmias

The ventricular pacemaker cells are found within the Purkinje fibers. This pacemaker is the last of the group of inherent pacemaker cells within the heart. The rate of automaticity is between 20 and 40 beats per minute. Current is initiated within the Purkinje fibers and spreads the electrical stimulation from one ventricular cell to the next. Because current is not traveling

down the normal ventricular conduction pathway to activate both the right and left ventricles simultaneously, it will take longer than normal to depolarize the ventricles. A QRS duration measurement of 0.12 second or greater suggests that this cell-by-cell stimulation of electrical current is occurring to depolarize the ventricles. Ventricular rhythms occurring within the range of the Purkinje network (20 to 40 beats per minute) are occasionally referred to as *ventricular escape rhythms*. Ventricular rhythms occur for one of these reasons:

1. The higher pacemaker sites within the heart fail or all atrial impulse activity is blocked from entering the ventricular conduction system.
2. The rate of automaticity from this portion of the heart is faster than the rate of any other impulses that may be present, so it takes over as the primary pacemaker within the heart.

Remember, the fastest electrical activity in the heart controls the heart rate.

Interpret-TIP

Ventricular Complexes and Rhythms

Ventricular complexes and rhythms share a conspicuous morphologic similarity—missing P waves and "wide and bizarre" QRS complexes that measure 0.12 or greater.

Checkpoint Question (LO 10.1)

1. Why does it take longer than normal to depolarize the ventricles during a ventricular dysrhythmia?

_____

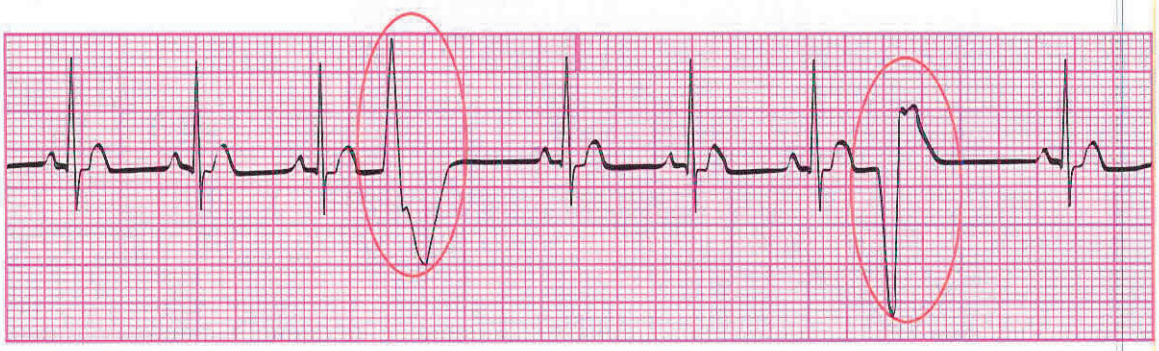
_____

10.2 Premature Ventricular Complexes (PVCs)

premature ventricular complex (PVC) An ectopic impulse originating in either ventricle that occurs too early in the cycle.

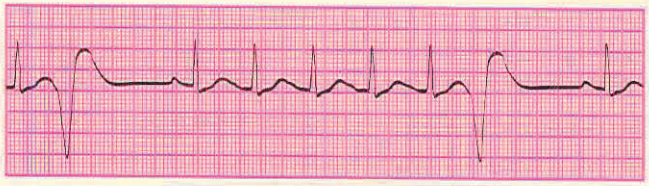
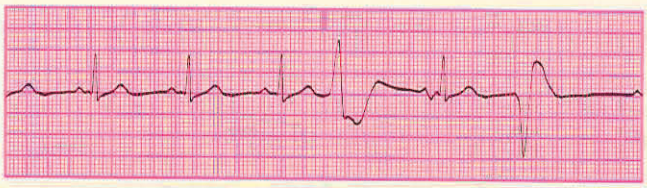
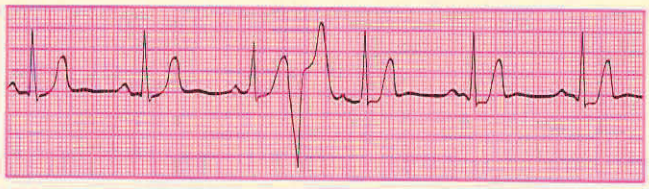
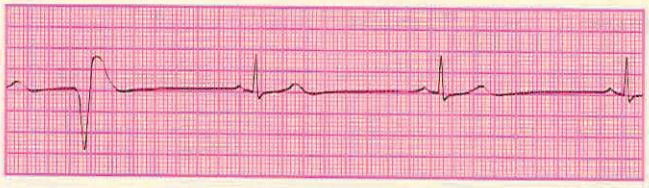
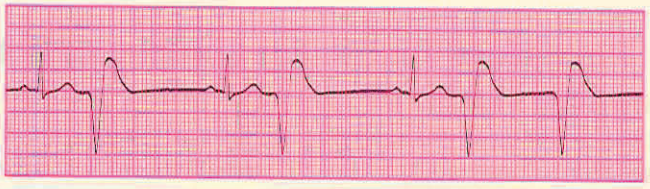
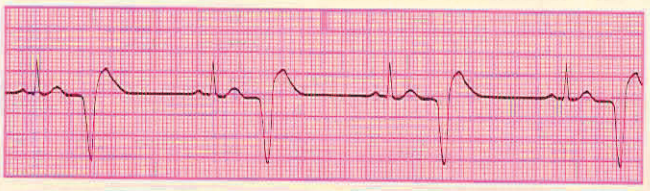
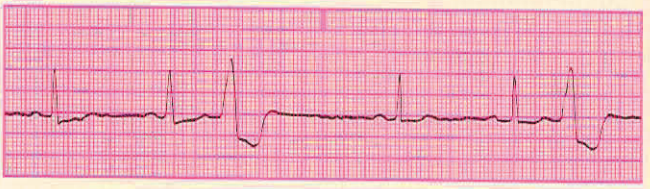
A **premature ventricular complex (PVC)** is caused by an ectopic impulse that occurs early in the cycle and originates from the ventricles (Figure 10-1). These ectopic events are often caused by an ischemic region within the ventricles. Ischemia increases excitability (irritability) of the

Figure 10-1 Premature ventricular complexes.



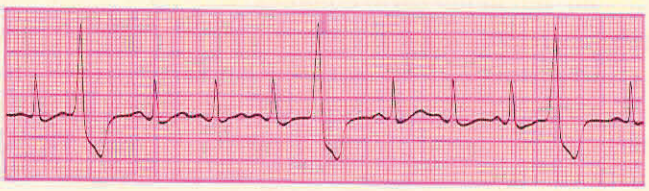
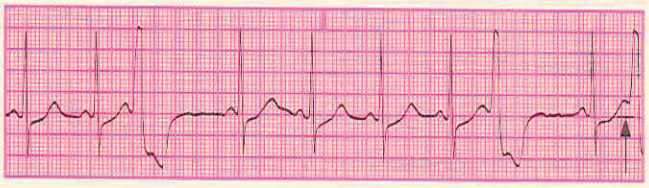
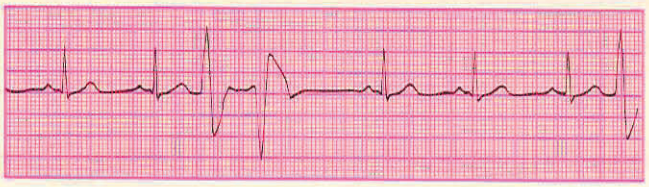
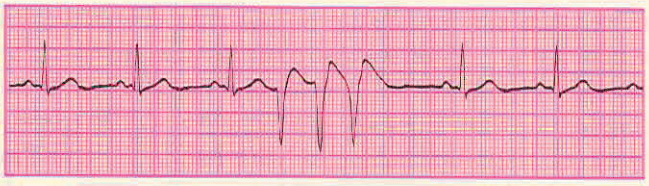
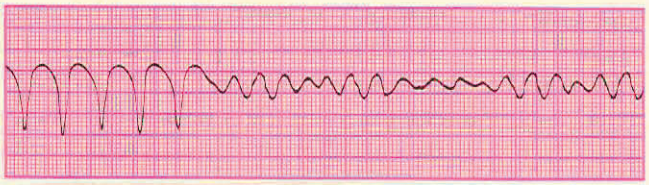
ventricular myocardium. PVCs can also be caused by things such as stress, caffeine, alcohol, or hormonal changes. Table 10-1 shows the various types of premature ventricular complexes.

TABLE 10-1 Types and Patterns of Premature Complexes

Unifocal PVC		All complexes have a similar shape, suggesting only one irritable focus present
Multifocal PVC		PVCs have varied shapes and forms, suggesting more than one irritable focus
Interpolated PVC		PVC occurs during the normal R-R interval without interrupting the underlying rhythm
Occasional PVC		Less than six PVCs per minute
Frequent PVC		Six or more PVCs per minute
Bigeminy		Every other complex is a PVC
Trigeminy		Every third complex is a PVC

(*Continued*)

(*Continued*)

Quadgeminy		Every fourth complex is a PVC
R-on-T PVC		PVC occurs on the downslope of the T wave, which signifies the vulnerable period or the relative ventricular refractory period
Coupling		Two PVCs that occur back to back (multifocal couplet pictured)
Run of ventricular tachycardia		Three or more PVCs in a row at a rate greater than 100 bpm. Also known as **triplet PVCs** or **salvo**
Paroxysmal event		Witnessed change in any cardiac rhythm, including starting, stopping, or both. A common example is a change from sinus rhythm to SVT or VT to VF. The tracing here shows a change from ventricular tachycardia to ventricular fibrillation.

triplet PVCs Three or more PVCs in a row at a rate exceeding 100 bpm; also called *salvo* or *run of ventricular tachycardia.*

salvo Three or more PVCs in a row at a rate exceeding 100 bpm; also called *triplet PVCs* or *run of ventricular tachycardia.*

Criteria for Classification

- ***Rhythm:*** The P-P intervals are regular, and the R-R intervals are regular with the exception of the early complexes from the PVCs. Tracings with PVCs may or may not have a compensatory pause. A compensatory pause means that two R-R interval periods are required before another electrical impulse can be conducted. A compensatory pause measures longer than the underlying R-R and a noncompensatory pause measures less than the underlying R-R. Regardless of the type of pause, the presence of the early complex will cause the tracing to exhibit an irregular pattern.
- ***Rate:*** Heart rate is influenced by the number of ectopic complexes (PVCs) present. This rhythm is irregular, so the 6-second method must be used to determine the rate. Count all complexes, including PVCs, and multiply by 10 to determine the rate.
- ***P wave morphology:*** The P wave assumes the shape of the underlying rhythm. P waves are not present for the early ventricular complexes.

- ***PR interval:*** The PR interval measurement follows the underlying rhythm, but in the early complex no P wave is present.
- ***QRS duration and morphology:*** The QRS morphology and duration must be analyzed for both the underlying rhythm and the premature complexes. Typically, the QRS complexes of the underlying rhythm measure within the normal range (0.06–0.10). The QRS morphology of the premature complexes may be of different shapes but share the descriptive characteristic wide and bizarre, measuring 0.12 second or greater. The T wave will be in the opposite direction of the premature ventricular depolarization (PVC).

Interpret-TIP

Premature Ventricular Complexes

A PVC is an early QRS complex that measures 0.12 second or greater and has a wide and bizarre appearance. There is no P wave.

How the Patient Is Affected and What You Should Know

The clinical significance of the PVCs depends on their frequency and the amount of decrease in cardiac output that occurs with each PVC. Because PVCs can occur in normal hearts, patients may tolerate PVCs without a noticeable change in their cardiac output and have no obvious symptoms. In fact, they may be unaware they are having PVCs. Other patients may complain of the "thump or skipping" sensation with each PVC. They may also experience dizziness and other symptoms of low cardiac output. More complex PVCs, such as frequent PVCs, multifocal PVCs, R-on-T PVCs, and coupling, indicate an increased risk of developing a more serious ventricular dysrhythmia (see Table 9-1).

Observe the patient for symptoms of low cardiac output. If symptoms exist, a licensed practitioner should be notified to begin appropriate treatment. Patients are provided oxygen because PVCs often occur due to hypoxic states (suffering from lack of oxygen). Blood samples are drawn to evaluate the hypoxic state as well as electrolyte values, specifically potassium and calcium levels.

Checkpoint Question (LO 10.2)

Using the criteria for classification, select the rhythm that most closely resembles a rhythm containing a premature ventricular complex (PVC).

A.

B.

1. Which distinguishing feature(s) led you to make the selection?

10.3 Agonal Rhythm

Agonal rhythms occur when essentially all of the pacemakers in the heart have failed. This is the last semblance of ordered electrical activity in the heart. The heart is dying. The impulses showing on the monitor are ventricular but are firing at a rate of less than 20 beats per minute. This dysrhythmia presents with wide and bizarre QRS complexes (0.12 second or greater) and an absence of P waves (Figure 10-2).

Criteria for Classification

- ***Rhythm:*** There is no P-P interval because there are no P waves. R-R interval may or may not be regular.
- ***Rate:*** Atrial rate cannot be determined due to the absence of atrial depolarization. The ventricular rate is less than 20 beats per minute.
- ***P wave morphology:*** The P wave is absent; therefore, no analysis of the P wave can be done.
- ***PR interval:*** The PR interval cannot be measured because the P wave is missing.
- ***QRS duration and morphology:*** The QRS duration and morphology measure 0.12 second or greater and have a wide and bizarre appearance.

Figure 10-2 Agonal rhythm.

Interpret-TIP

Agonal Rhythm

The agonal rhythm has an absence of P waves, a ventricular rate of less than 20 beats per minute, and wide and bizarre QRS complexes.

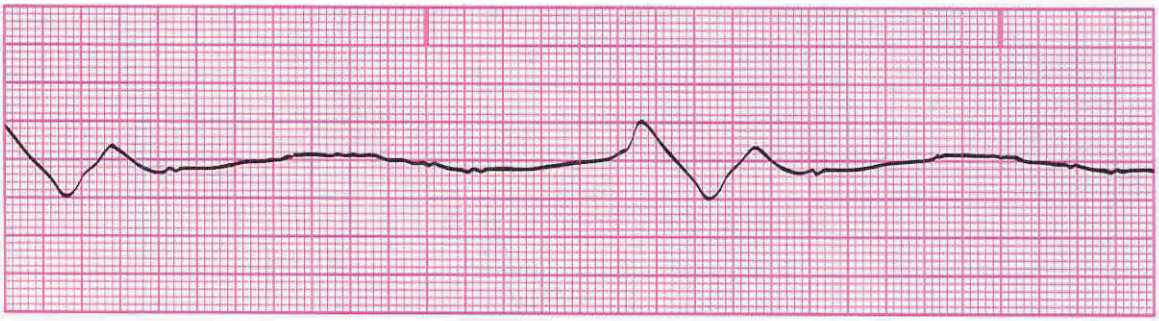
How the Patient Is Affected and What You Should Know

The patient has a profound loss of cardiac output due to the loss of atrial kick and the slow ventricular rate. The patient will be unconscious. You must notify a licensed healthcare practitioner immediately. This is a medical emergency that will likely require both basic life support and advanced cardiac life support interventions. ECG strips must be saved and added to the patient's medical record.

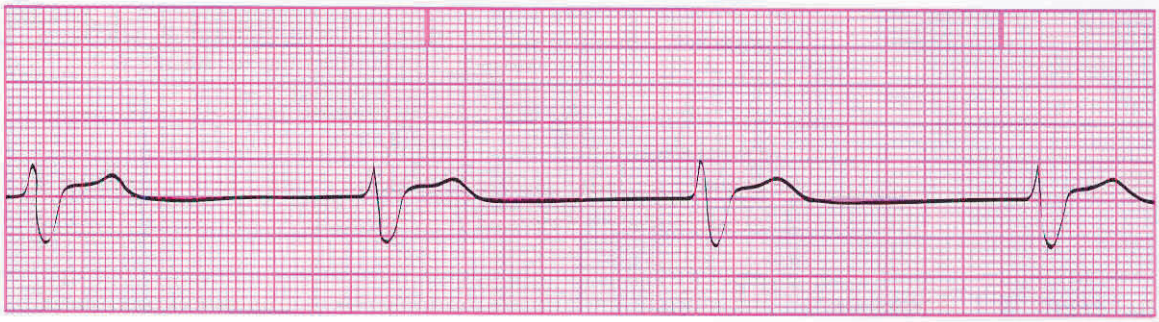
Checkpoint Question (LO 10.3)

Using the criteria for classification, select the rhythm that most closely resembles agonal rhythm.

A.



B.



1. Which distinguishing feature(s) led you to make the selection?

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10.4 Idioventricular Rhythm

Idioventricular rhythms occur when the sinoatrial and junctional pacemakers fail to initiate an impulse and all that remains is the slow ventricular pacemaker (20 to 40 beats per minute). Note that the prefix *idio-* means "distinct, separate, or by itself." This dysrhythmia presents with the classic "wide" QRS (0.12 second or greater), a slow ventricular rate (20 to 40 bpm), and an absence of P waves (Figure 10-3).

Criteria for Classification

- ***Rhythm:*** P-P interval cannot be determined; the R-R interval is regular.
- ***Rate:*** Atrial rate cannot be determined due to the absence of atrial depolarization. The ventricular rate is a slow 20 to 40 beats per minute.
- ***P wave morphology:*** The P wave is usually absent; therefore, no analysis of the P wave can be done.
- ***PR interval:*** The PR interval cannot be measured because the P wave cannot be identified.
- ***QRS duration and morphology:*** The QRS duration measures 0.12 second or greater and the QRS complex has a wide and bizarre appearance.

Interpret-TIP

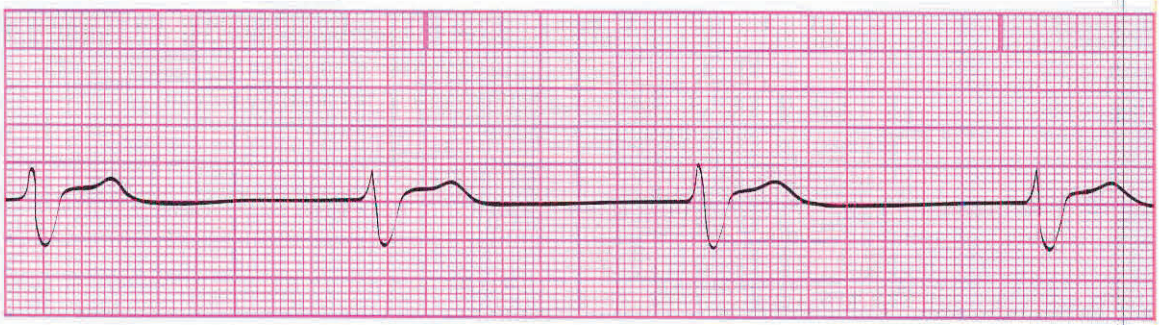
Idioventricular Rhythm

An idioventricular rhythm has an absence of P waves, a slow ventricular rate of 20 to 40 beats per minute, and wide and bizarre QRS complexes.

How the Patient Is Affected and What You Should Know

The patient has a profound loss of cardiac output due to the loss of atrial kick and the slow ventricular rate. The patient will likely be unconscious. You must notify a licensed healthcare practitioner immediately. This is a medical emergency that will likely require treatment with cardiac medications and/or pacing. ECG strips obtained must be saved and mounted in the patient's medical record.

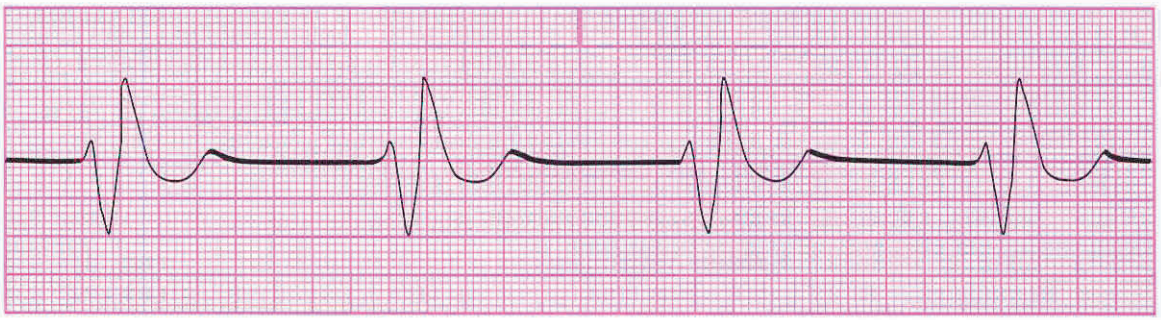
Figure 10-3 Idioventricular Rhythm.



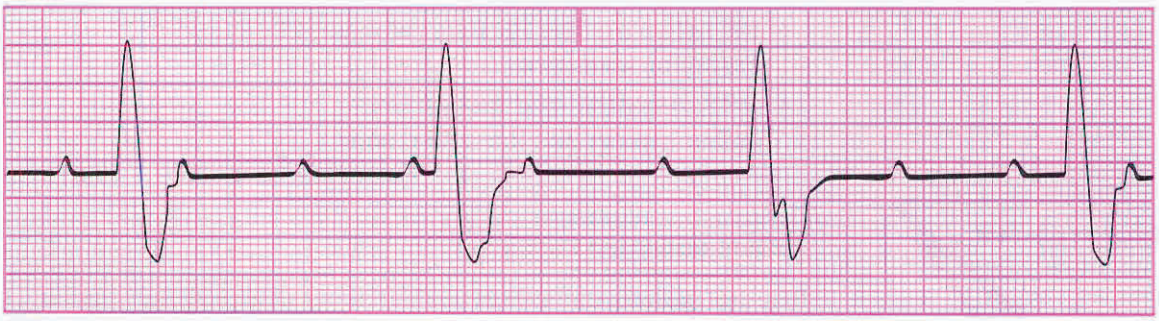
Checkpoint Question (LO 10.4)

Using the criteria for classification, select the rhythm that most closely resembles idioventricular rhythm.

A.



B.



1. Which distinguishing feature(s) led you to make the selection?

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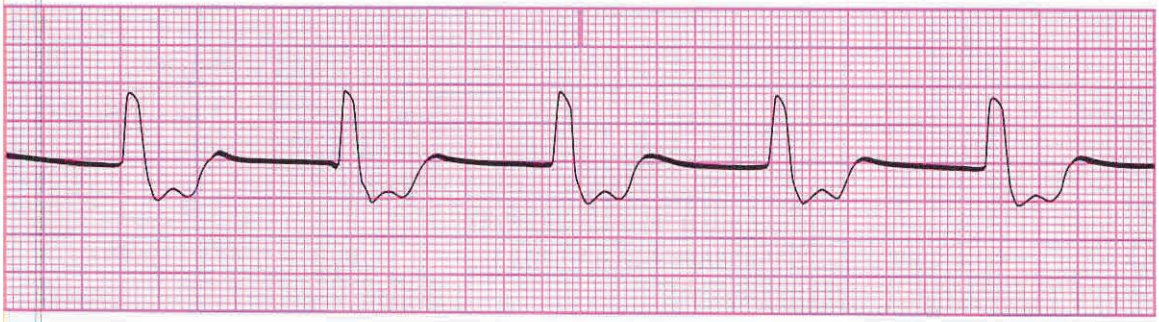
10.5 Accelerated Idioventricular Rhythm

Accelerated idioventricular rhythms occur when the sinoatrial and junctional pacemakers fail to initiate an impulse and all that is remaining is the slow ventricular pacemaker. The primary difference between accelerated idioventricular and idioventricular dysrhythmias is the heart rate. This dysrhythmia still presents with the classic "wide" QRS complex (0.12 second or greater) and an absence of P waves. The impulse rate for this dysrhythmia is 40 to 100 beats per minute. It is simply a faster idioventricular rhythm (Figure 10-4).

Figure 10-4 Accelerated idioventricular rhythm.



Criteria for Classification

- ***Rhythm:*** P-P interval cannot be determined; the R-R interval is regular.
- ***Rate:*** Atrial rate cannot be determined due to the absence of atrial depolarization. The ventricular rate is 40 to 100 beats per minute.
- ***P wave morphology:*** The P wave is usually absent; therefore, no analysis of the P wave can be done.
- ***PR interval:*** The PR interval cannot be measured because the P wave cannot be identified.
- ***QRS duration and morphology:*** The QRS duration measures 0.12 second or greater and the QRS complex has a wide and bizarre appearance.

Interpret-TIP

Accelerated Idioventricular Rhythm

The accelerated idioventricular rhythm has an absence of P waves, a ventricular rate of 40 to 100 beats per minute, and wide and bizarre QRS complexes.

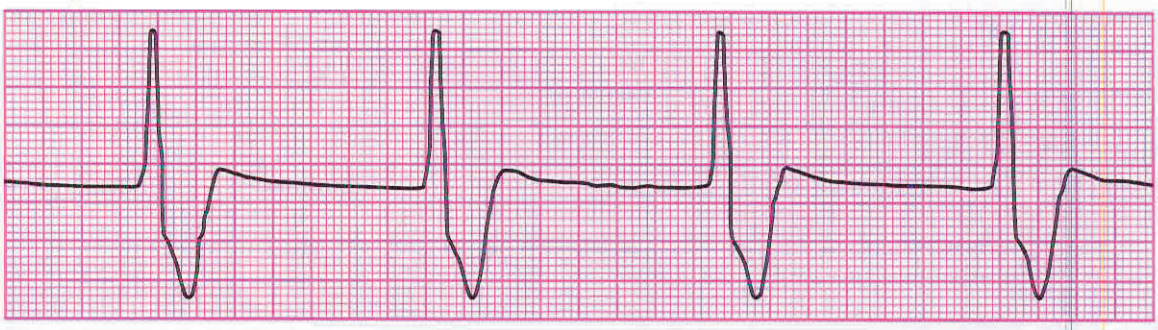
How the Patient Is Affected and What You Should Know

Some patients with accelerated idioventricular rhythm may sustain sufficient cardiac output when the heart rate mimics the normal rate of 60 to 100 bpm keeping the patient hemodynamically stable. However, other patients may not be able to tolerate this dysrhythmia. This is due to the decrease of cardiac output as a result of the loss of atrial kick and a slower ventricular response of less than 60. The patient may or may not be conscious. You must notify a licensed healthcare practitioner immediately. This patient may require treatment with cardiac medications and/or pacing. ECG strips must be saved in the patient's medical record.

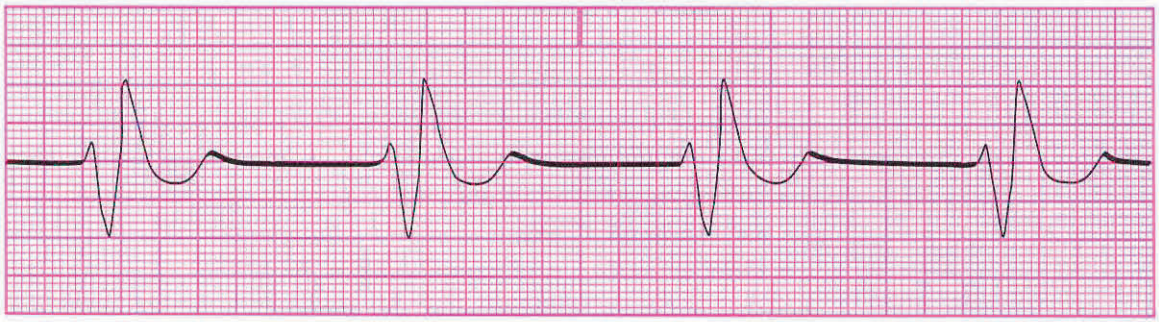
Checkpoint Question (LO 10.5)

Using the criteria for classification, select the rhythm that most closely resembles accelerated idioventricular rhythm.

A.



B.



1. Which distinguishing feature(s) led you to make the selection?

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10.6 Ventricular Tachycardia

Ventricular tachycardia occurs when three or more PVCs occur in a row and the ventricular rate is greater than 100 beats per minute (Figure 10-5). The ventricles are essentially in a continuous contraction–relaxation pattern and no period of delay exists between depolarizations (contractions).

torsades de pointes Type of ventricular tachycardia in which depolarization impulses move from one ventricle to the other, resulting in a "twisted ribbon" appearance on the ECG tracing.

Another type of ventricular tachycardia is called **torsades de pointes,** a French term meaning "twisting of the points." The difference between traditional ventricular tachycardia and Torsades de Pointes is in the morphology of the ventricular depolarization. Ventricular tachycardia has a consistent morphology. Torsades reflects changing voltages and durations due to the depolarization impulses in the ventricles moving to different locations in one ventricle, then the other. This tracing appears somewhat like party streamer paper as it twists and turns around the isoelectric line (Figure 10-6). This dysrhythmia usually occurs as a result of electrolyte deficiencies. The pharmacologic treatment of choice is magnesium sulfate. Other than this aspect of care, treatment remains the same as traditional ventricular tachycardia.

Figure 10-5 Ventricular tachycardia.

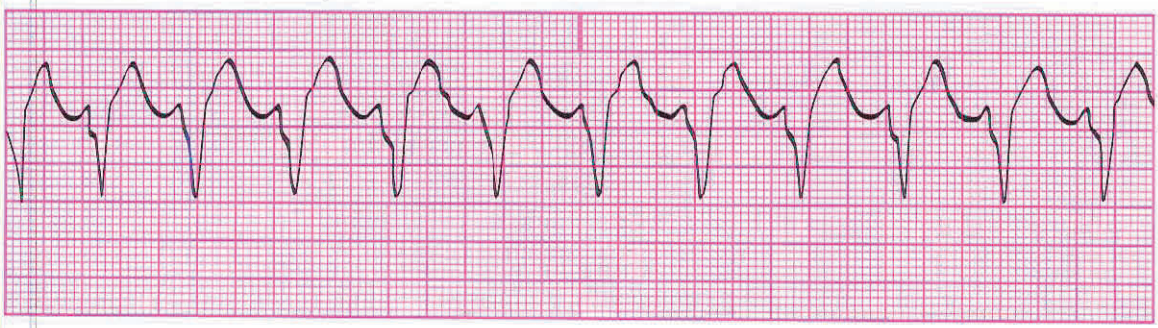


Figure 10-6 Torsades de Pointes.

Criteria for Classification

- ***Rhythm:*** The P-P interval is usually not identifiable. The R-R interval is usually regular, but it may be slightly irregular at times.
- ***Rate:*** Atrial rate cannot be determined because the P-P interval cannot be recognized. The ventricular rate is fast and between 100 and 200 beats per minute.
- ***P wave morphology:*** The P wave is absent; therefore, no analysis of the P wave can be done.
- ***PR interval:*** The PR interval cannot be measured because the P wave is not identifiable.
- ***QRS duration and morphology:*** The QRS duration and morphology measure 0.12 second or greater and have a wide and bizarre appearance with an increase in amplitude. The T wave is in the opposite direction (usually downward) from that of the QRS complex.

Interpret-TIP

Ventricular Tachycardia

Ventricular tachycardia has wide and bizarre QRS complexes with a classic "sawtooth" appearance, a rate in excess of 100 beats per minute, and no P waves.

How the Patient Is Affected and What You Should Know

The patient will have a decrease in cardiac output due to the decrease in ventricular filling time and the loss of the atrial kick. Some patients can tolerate the dysrhythmia for a short time—they have a pulse and remain conscious—whereas other patients will be unresponsive immediately. About 50% of patients become unconscious immediately, with no pulse or respiration.

As soon as you recognize ventricular tachycardia on the monitor or ECG equipment, you should notify a licensed practitioner because the patient needs to be assessed for unresponsiveness. If the patient is unresponsive, an emergency protocol or Code Blue is initiated, and CPR is begun. Emergency equipment such as a defibrillator, medications, and intubation equipment are necessary. Rhythm strips are saved to document the changes in rhythm that have occurred and should be filed in the patient's medical record. If the patient is responsive, the licensed practitioner may initiate a treatment plan of medications and electrical treatments.

Think It Through

PVCs

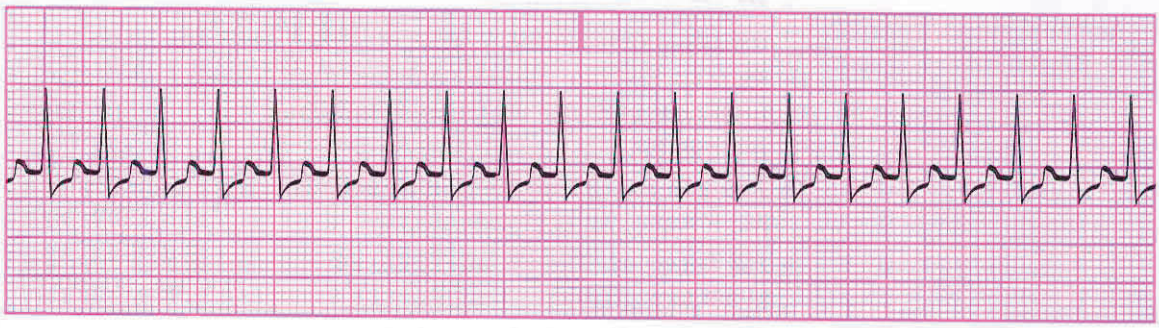
PVCs can often occur when the heart rate is less than 60 beats per minute. This is the heart's effort to pick up the rate. PVCs may also occur because of hypoxia or abnormal lab values, such as an electrolyte imbalance.

Explain why PVCs are also called *escape beats*.

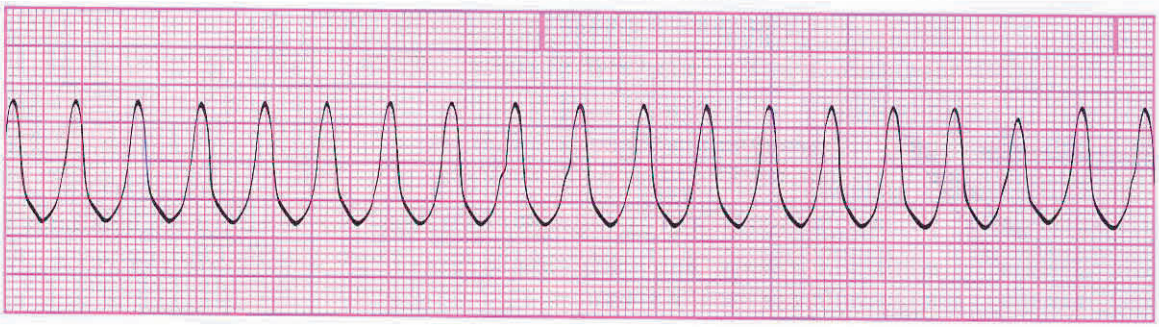
Checkpoint Question (LO 10.6)

Using the criteria for classification, select the rhythm that most closely resembles ventricular tachycardia.

A.



B.



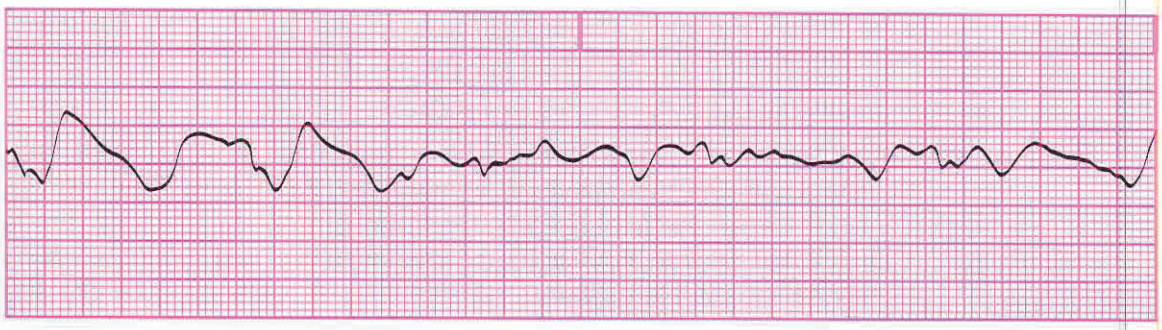
1. Which distinguishing feature(s) led you to make the selection?

10.7 Ventricular Fibrillation

Ventricular fibrillation is chaotic, asynchronous electrical activity within the ventricular tissue that results in the chaotic waveform seen in Figure 10-7. Small, isolated portions of the ventricles depolarize, causing the ventricular walls to quiver randomly instead of fully contracting. This prevents any ejection of blood out of the ventricles, so it results in no cardiac output. The entire myocardium quivers similar to a bowl of Jell-O® when shaken.

Generally, when ventricular fibrillation begins, the waveforms are larger and more chaotic. During this time a majority of the waveforms will

Figure 10-7 Ventricular fibrillation.



measure greater than 3 mm. This is referred to as "coarse" ventricular fibrillation. As ventricular fibrillation continues, the waveforms will become smaller and smaller. When the majority of waveforms measure 3 mm or less, this is referred to as "fine" ventricular fibrillation. If ventricular fibrillation is not treated or effectively reversed by advanced measures, the fine ventricular fibrillation will eventually become asystole.

Criteria for Classification

- ***Rhythm:*** The P-P and R-R intervals cannot be determined because neither P nor R waves are present on the rhythm strips.
- ***Rate:*** The atrial and ventricular rates cannot be identified because neither the atria nor the ventricles are fully depolarizing in a coordinated manner.
- ***P wave morphology:*** There are no P waves.
- ***PR interval:*** There is no PR interval.
- ***QRS duration and morphology:*** The QRS duration and morphology cannot be determined because only fibrillatory waves are present. No uniform depolarization of the ventricles occurs.

Interpret-TIP

Ventricular Fibrillation

Ventricular fibrillation is the absence of organized electrical activity. The tracing is disorganized or chaotic in appearance.

How the Patient Is Affected and What You Should Know

What appears to be ventricular fibrillation on the monitor may not be ventricular fibrillation at all. Remember to always check your patient first. Fibrillatory waveforms may be caused by a variety of different things, such as poorly attached or dried-out electrodes, broken lead wires, and excessive patient movement. If your patient is talking to you, the patient is *not* in ventricular fibrillation.

In true ventricular fibrillation, patients will be unresponsive when the ventricles are quivering without contracting. This will always be an emergency situation. Check your patient first, then initiate CPR and activate EMS or, in a healthcare institution, follow the protocol for the emergency. Every patient experiencing ventricular fibrillation will be unconscious, apneic (**apnea** means not breathing), and pulseless. CPR and emergency measures should begin immediately. It is recommended that appropriate personnel begin **advanced cardiac life support (ACLS)** measures to regain normal

apnea The absence of breathing.

advanced cardiac life support (ACLS) A set of clinical interventions for the urgent treatment of cardiac arrest and other life-threatening medical emergencies, as well as the knowledge and skills to deploy those interventions.

cardiac function. Rhythm strips are maintained and used as documentation in the patient's medical record.

Safety & Infection Control

crash cart A cart or tray containing emergency medication and equipment that can be easily transported to the location of an emergency for life support.

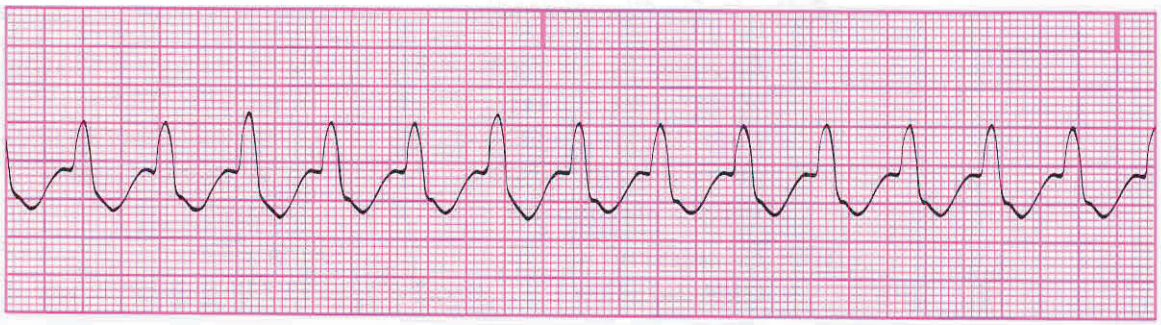
Crash Cart

Emergency equipment found on the **crash cart** must be ready when an emergency situation occurs. It is important that the cart be well stocked and the emergency equipment functioning properly. Each facility has a policy that requires regular inspection, inventory, and documentation of all emergency equipment and crash carts. Crash carts must be checked for outdated items and restocked on a regular basis.

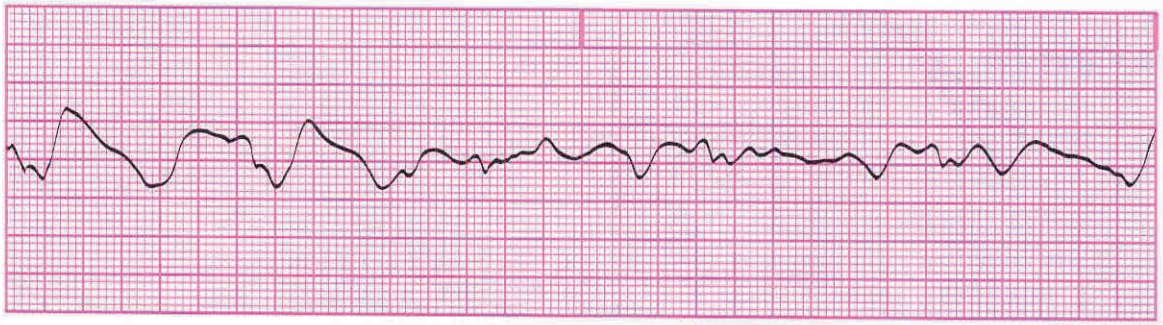
Checkpoint Question (LO 10.7)

Using the criteria for classification, select the rhythm that most closely resembles ventricular fibrillation.

A.



B.



C.

1. Which distinguishing feature(s) led you to make the selection?

10.8 Asystole

Asystole is absence of ventricular activity and depolarization. Often this is called the "straight line" or "flat line" of rhythms. No electrical activity is present in the myocardium (Figure 10-8).

Note: Asystole is always confirmed in at least two different leads to rule out "fine" ventricular fibrillation.

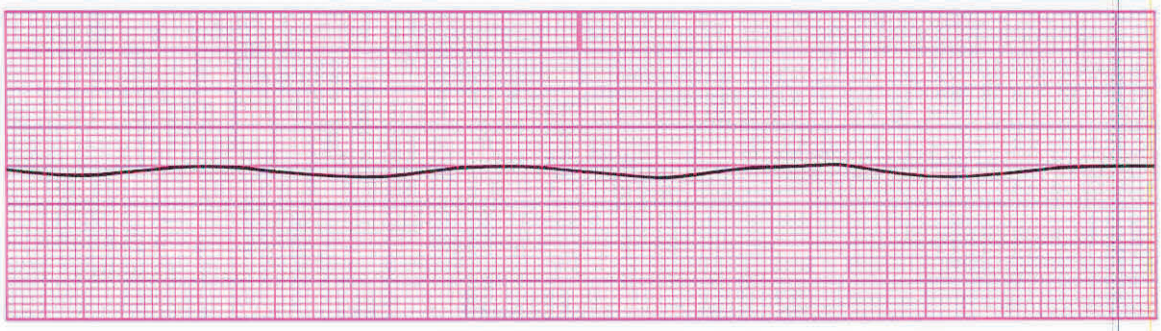
Criteria for Classification

- ***Rhythm:*** Because no waveforms are present, there are no P-P or R-R intervals.
- ***Rate:*** No atrial or ventricular rates are present.
- ***P wave morphology:*** No P waves are present.
- ***PR interval:*** The PR interval cannot be measured because no waveforms are being recorded.
- ***QRS duration and morphology:*** The QRS duration and morphology are not measurable because no QRS waveform is observed.

How the Patient Is Affected and What You Should Know

This rhythm is associated with life-threatening conditions. However, it can also be due to a disconnected electrode or damage cable or connector clip. Always check your patient for unresponsiveness. If the patient is unresponsive and the tracing shows asystole, quickly confirm the asystole in another lead. If asystole is confirmed initiate emergency notification per your facility. CPR must be started immediately, in addition to advance life support.

Figure 10-8 Asystole.



Communicate & Connect

Handling Emergency Situations

During an emergency, family, friends, and other patients will be apprehensive and curious regarding the situation. You should calmly explain that there is an emergency and that a licensed practitioner will speak to them concerning their loved one as soon as possible.

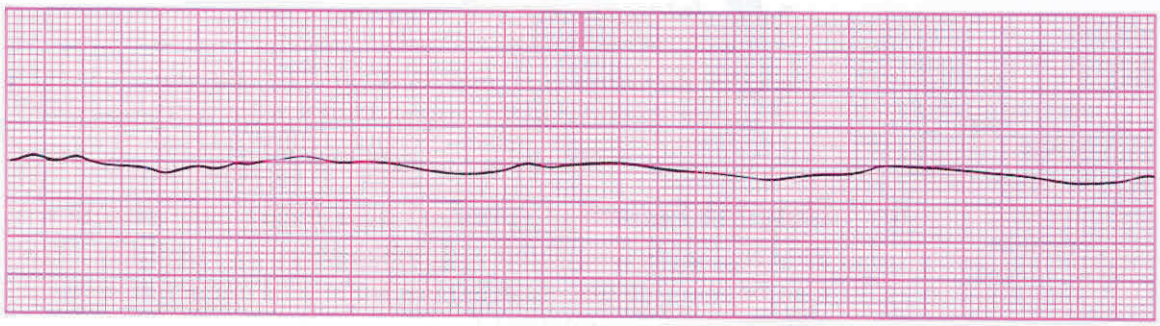
Per the 2020 ACLS guidelines, if family are present in the emergency situation and can remain out of the way of emergency personnel it is recommended that they stay. Allowing patient family to stay during the resuscitation has been found to decrease the length of the resuscitation effort as well as to decrease the incidence of litigation.

In some situations, you should escort individuals out of the immediate area and view of the situation. Local protocols differ. Remember to follow the rules of your organization.

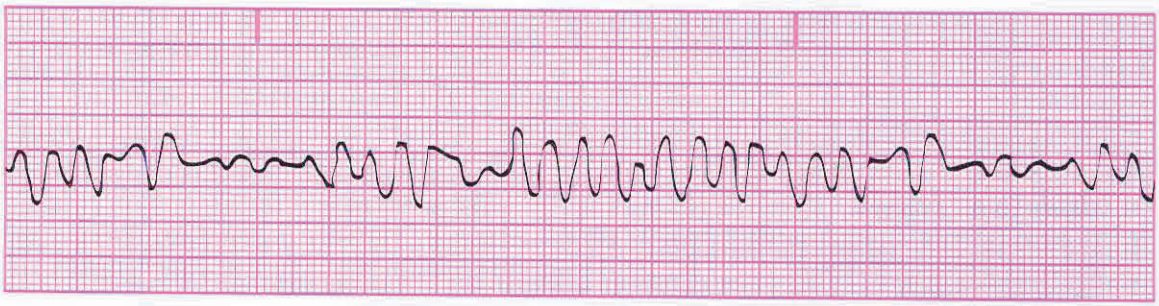
Checkpoint Question (LO 10.8)

Using the criteria for classification, select the rhythm strip that most closely resembles asystole.

A.



B.



1. Which distinguishing feature(s) led you to make the selection?

Chapter Summary

Learning Outcomes	Summary	Pages
10.1 Describe the various ventricular dysrhythmias.	Ventricular complexes and rhythms share a conspicuous morphologic similarity: unidentifiable P waves and wide and bizarre QRS complexes (0.12 second or greater).	224–225
10.2 Analyze premature ventricular complexes (PVCs) and their effect on the patient, including basic patient care and treatment.	A premature ventricular complex (PVC) is caused by an ectopic impulse that occurs early in the cycle and originates from the ventricles. Patient care depends upon the frequency and amount of decreased cardiac output. Oxygen may be administered and blood samples were taken for patients with symptoms.	225–229
10.3 Analyze agonal rhythm and its effect on the patient, including basic patient care and treatment.	Agonal rhythms occur when essentially all of the pacemakers in the heart have failed. This is the last semblance of ordered electrical activity in the heart. The impulses showing on the monitor are ventricular but firing at a rate of less than 20 beats per minute. The heart is dying, the patient will be unconscious and life support will be needed.	229–230
10.4 Analyze idioventricular rhythm and its effect on the patient, including basic patient care and treatment.	Idioventricular rhythms occur when the sinoatrial and junctional pacemakers fail to initiate an impulse and all that is remaining is the slow ventricular pacemaker (20 to 40 beats per minute). The patient will likely be unconscious and require emergency treatment including medications and a pacemaker.	231–232
10.5 Analyze accelerated idioventricular rhythm and its effect on the patient, including basic patient care and treatment.	Accelerated idioventricular rhythms occur when the sinoatrial and junctional pacemakers fail to initiate an impulse and all that is remaining is the slow ventricular pacemaker. The primary difference between accelerated idioventricular and idioventricular dysrhythmias is the faster heart rate (40–100 beats per minute) in the accelerated idioventricular rhythm. The patient may or may not be conscious depending upon tolerance. Medication and pacing will likely be required.	232–234
10.6 Analyze ventricular tachycardia and its effect on the patient, including basic patient care and treatment.	Ventricular tachycardia occurs when three or more PVCs occur in a row and the ventricular rate is greater than 100 beats per minute. This rhythm requires emergency protocols to be implemented.	234–236
10.7 Analyze ventricular fibrillation and its effect on the patient, including basic patient care and treatment.	Ventricular fibrillation is chaotic, asynchronous electrical activity within the ventricular tissue. The ventricle walls are quivering due to small, isolated portions of the ventricles depolarizing. P-P and R-R intervals cannot be determined because only chaotic waveforms are recorded on the rhythm strips. This rhythm requires emergency protocols to be implemented.	236–239
10.8 Analyze asystole and its effect on the patient, including basic patient care and treatment.	Asystole is absence of ventricular activity and depolarization. Often this is called the "straight line" or "flat line" of rhythms. No electrical activity is present in the myocardium. This rhythm requires emergency protocols to be implemented.	239–240

Chapter Review

Multiple Choice

Circle the correct answer.

1. Which ventricular dysrhythmia has no P waves? (LO 10.2–10.8)
   a. Accelerated idioventricular
   b. Idioventricular
   c. Accelerated idioventricular
   d. Ventricular tachycardia
   e. Ventricular fibrillation
   f. All of the answers are correct.
2. Which ventricular dysrhythmia has a heart rate between 40 and 100 beats per minute? (LO 10.5)
   a. Asystole
   b. Idioventricular
   c. Accelerated idioventricular
   d. Ventricular tachycardia
   e. Ventricular fibrillation
   f. Agonal
3. Which ventricular dysrhythmia has a heart rate less than 20 beats per minute? (LO 10.3)
   a. Idioventricular
   b. Accelerated idioventricular
   c. Ventricular tachycardia
   d. Ventricular fibrillation
   e. Agonal
4. Which ventricular dysrhythmia has a heart rate between 20 and 40 beats per minute? (LO 10.4)
   a. Asystole
   b. Idioventricular
   c. Accelerated idioventricular
   d. Ventricular tachycardia
   e. Ventricular fibrillation
   f. Agonal
5. What is unique about ventricular dysrhythmias with regard to the P-P intervals? (LO 10.1)
   a. They are irregular.
   b. They are biphasic.
   c. They are regular.
   d. There are no P waves, so the P-P interval cannot be measured.

6. QRS complexes that measure 0.12 second or greater with a rate between 20 and 40 beats per minute indicate that the impulses causing ventricular depolarization are coming from the _____. (LO 10.1)
   a. SA node
   b. interatrial pathways
   c. AV node
   d. Purkinje fibers (ventricles)

7. Ventricular fibrillation is typically described as "_____." (LO 10.7)
   a. regular
   b. absent
   c. chaotic
   d. None of the answers are correct.

8. Which of the following dysrhythmias is *not* considered to be a medical emergency? (LO 10.2)
   a. Agonal
   b. Asystole
   c. Ventricular fibrillation
   d. Occasional PVCs

Short Answer

9. What is the difference between idioventricular rhythm and accelerated idioventricular rhythm? (LO 10.4, 10.5)

10. How are agonal rhythm and asystole the same? (LO 10.3, 10.8)

11. What is the difference between ventricular tachycardia and ventricular fibrillation? (LO 10.6, 10.7)

Matching

Match the predominant type or pattern of premature complex with each of the images below. Some questions may have more than one correct answer. (LO 10.1, 10.2)

_____ **12.** bigeminy

_____ **13.** coupling

_____ **14.** interpolated PVC

_____ **15.** multifocal PVCs

_____ **16.** occasional PVC

_____ **17.** quadgeminy

_____ **18.** R-on-T PVCs

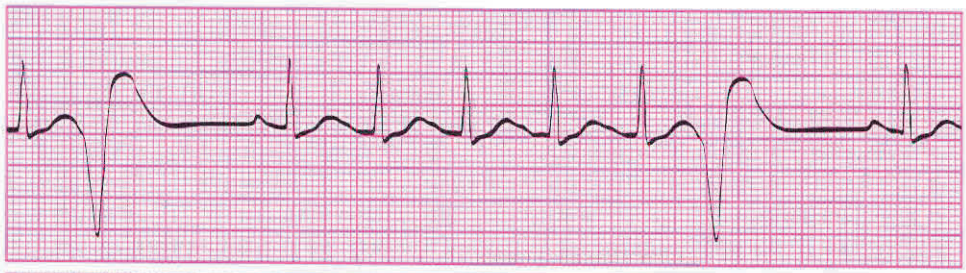
_____ **19.** trigeminy

_____ **20.** unifocal PVCs

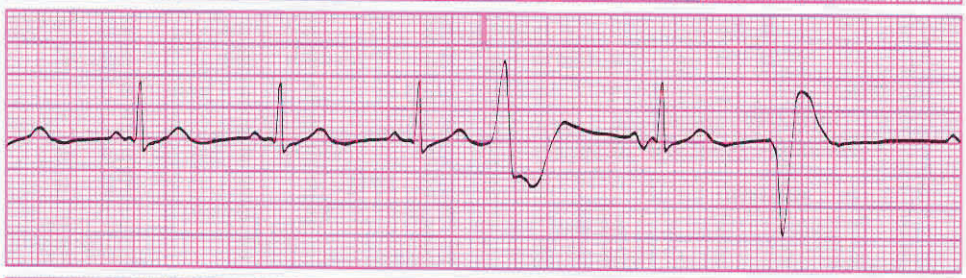
_____ **21.** run of ventricular tachycardia

_____ **22.** paroxysmal event

a.

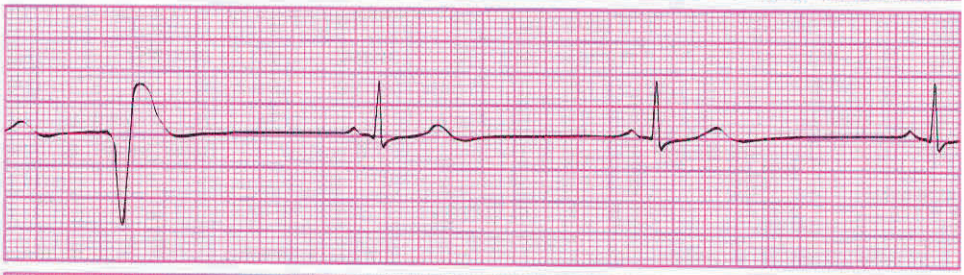


b.

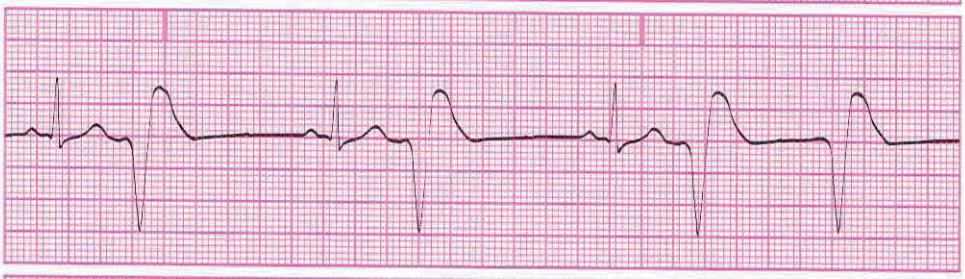


c.

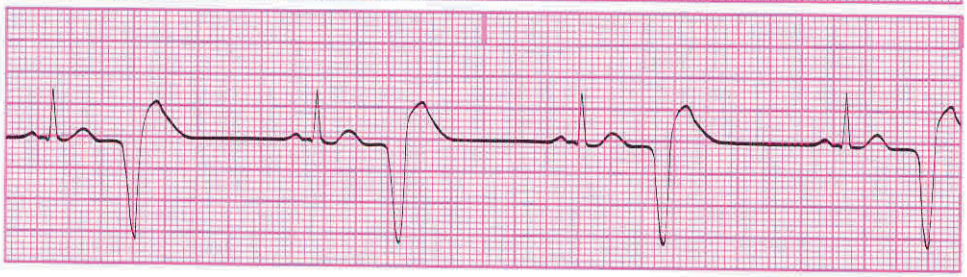
d.



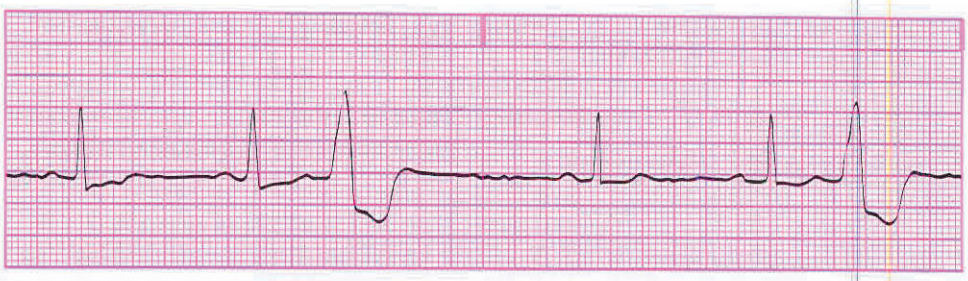
e.



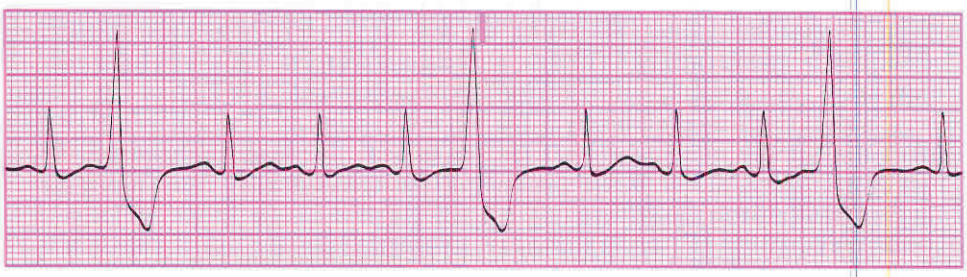
f.



g.

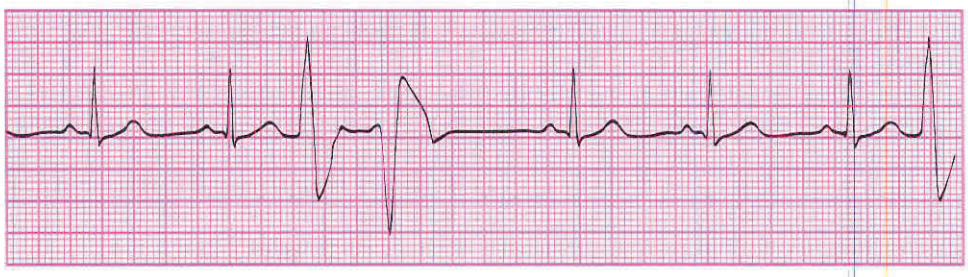


h.

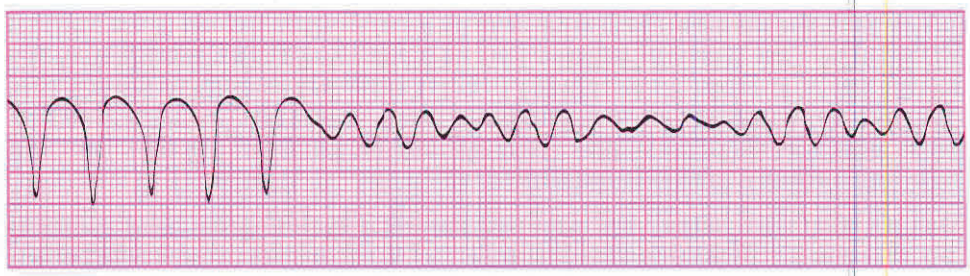


i.

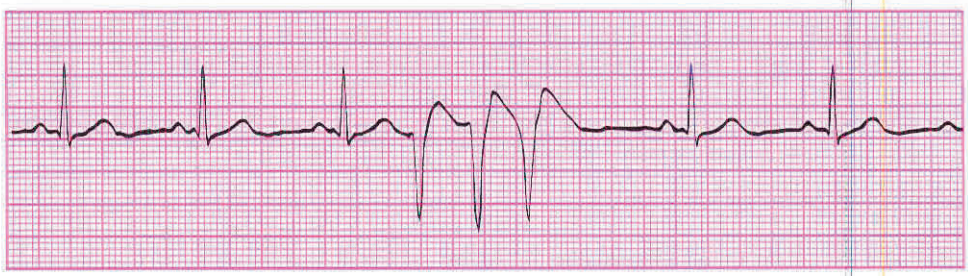
j.



k.



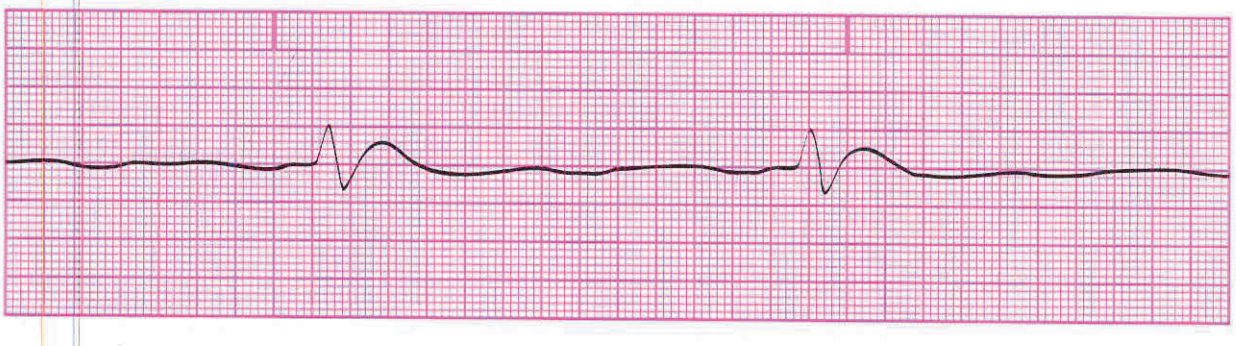
l.



Critical Thinking Applications *Rhythm Identification*

Review the dysrhythmias pictured here. Using the criteria for classification provided in the chapter as clues, identify each rhythm, and provide the information you used to make your decision. (LO 10.2–10.8)

23.

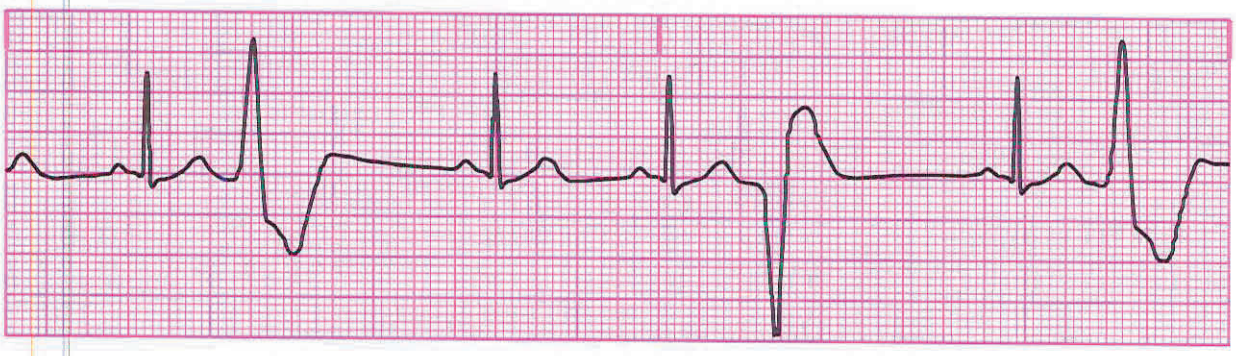


Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

24.

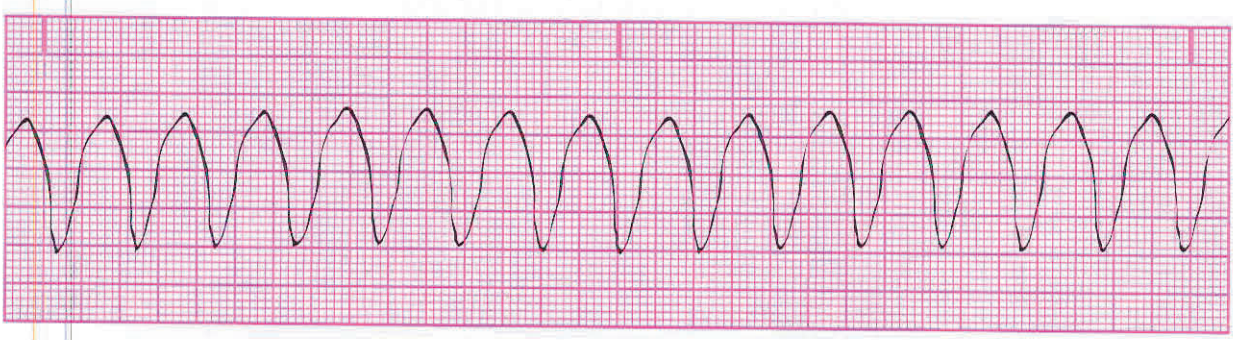


Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

25.

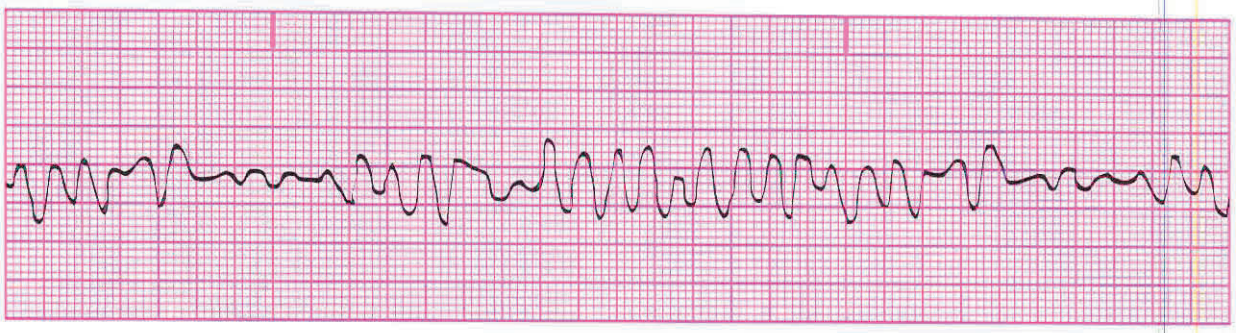


Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

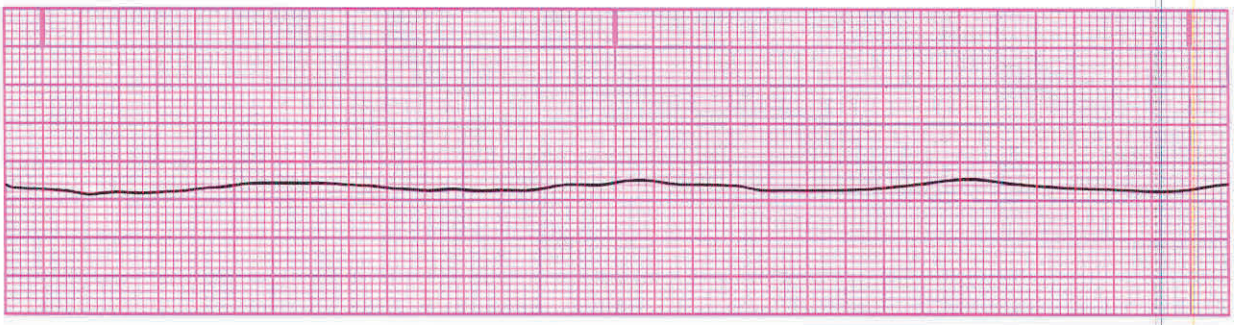
P wave: _____ Interpretation: _____

26.



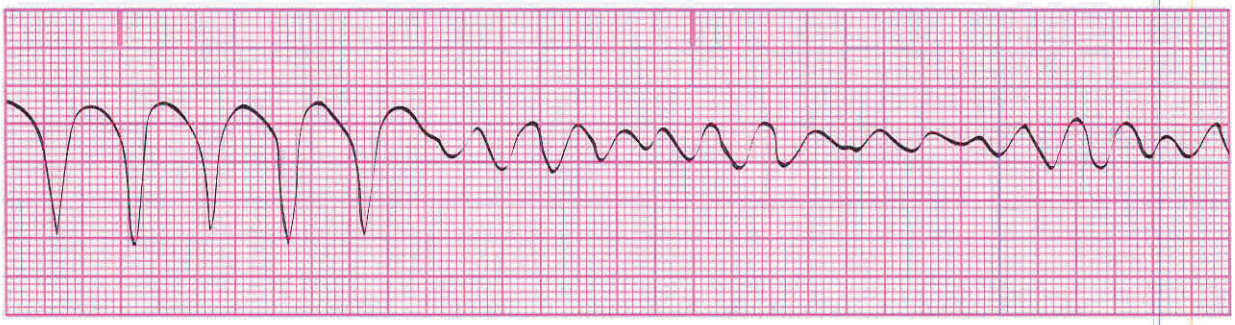
Rhythm (regular or irregular): _____ PR interval: _____
Rate: _____ QRS: _____
P wave: _____ Interpretation: _____

27.



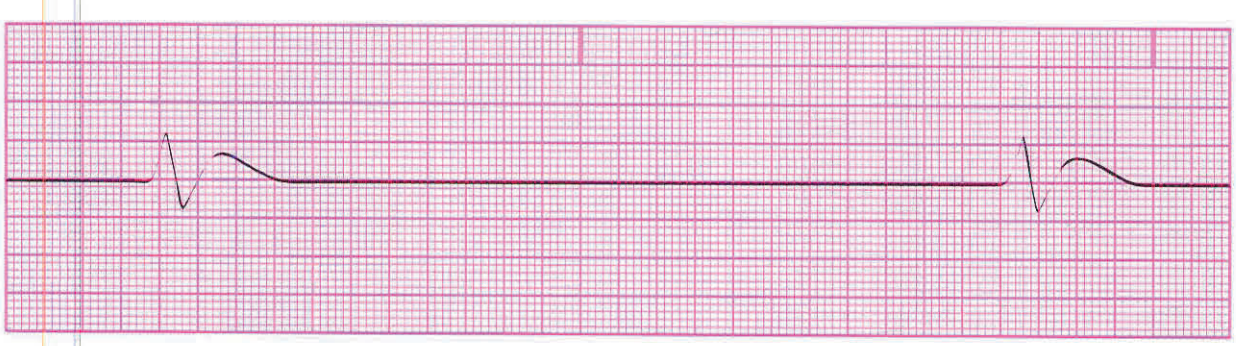
Rhythm (regular or irregular): _____ PR interval: _____
Rate: _____ QRS: _____
P wave: _____ Interpretation: _____

28.



Rhythm (regular or irregular): _____ PR interval: _____
Rate: _____ QRS: _____
P wave: _____ Interpretation: _____

29.

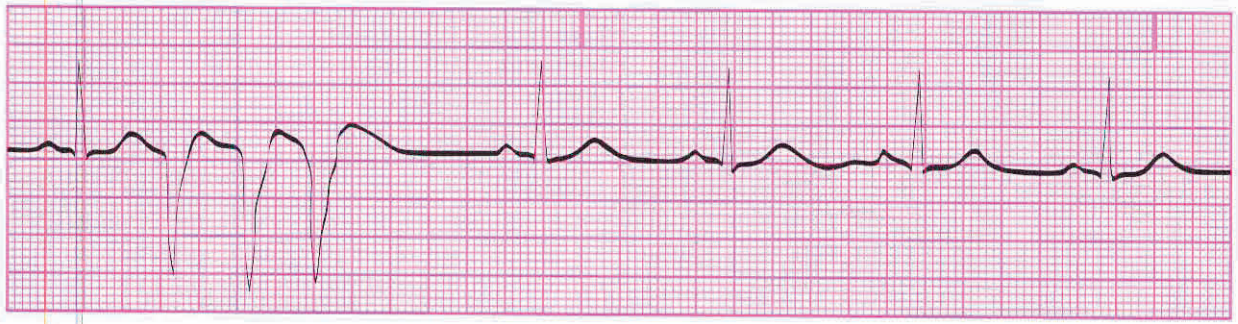


Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

30.

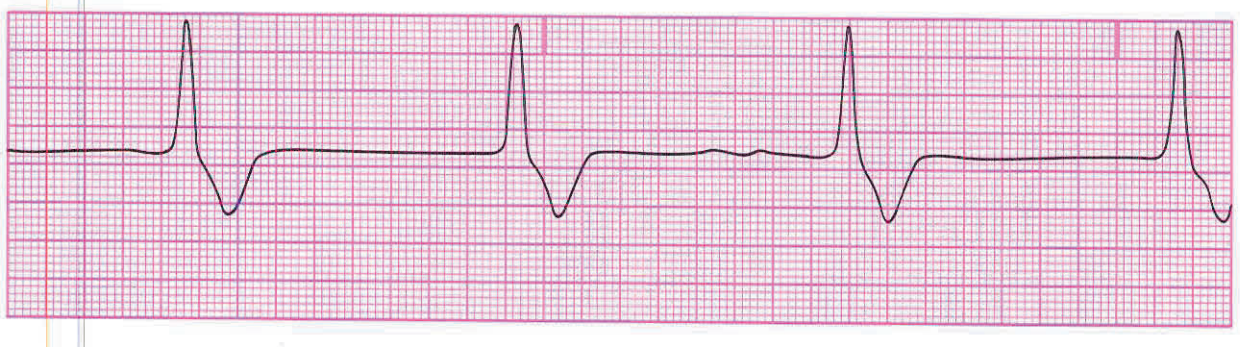


Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

31.

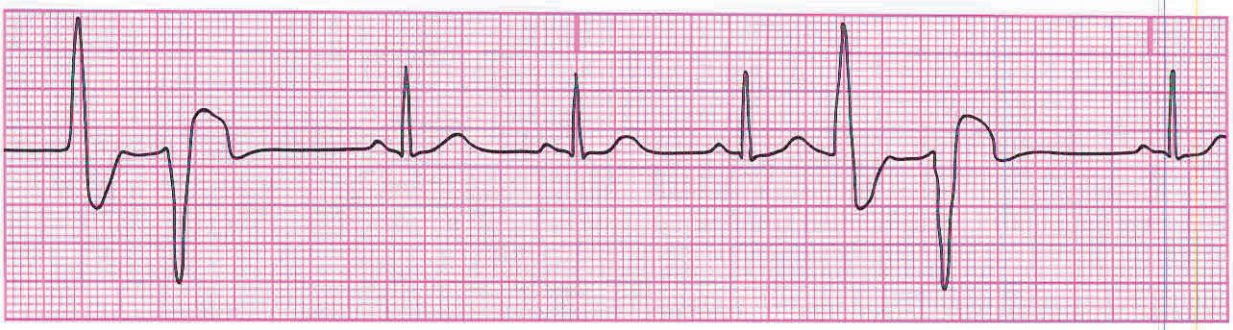


Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

32.

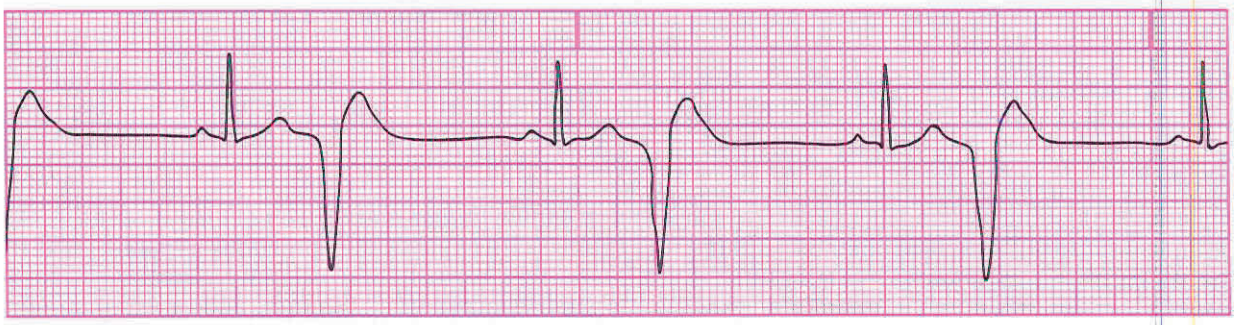


Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

33.

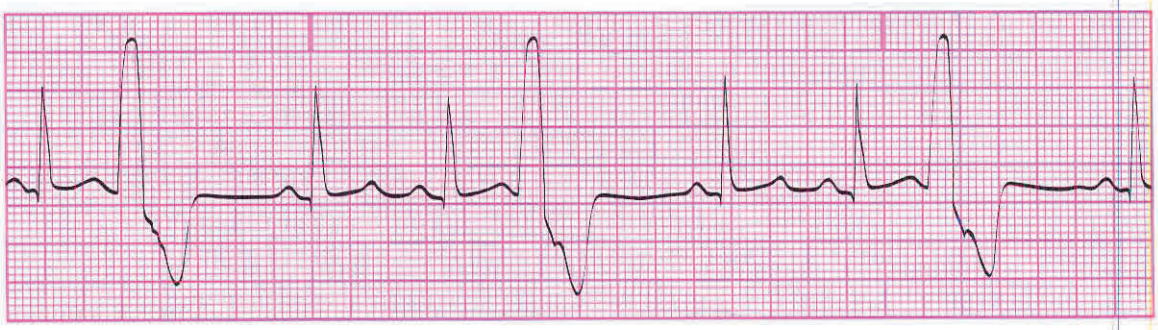


Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

34.



Rhythm (regular or irregular): _____ PR interval: _____

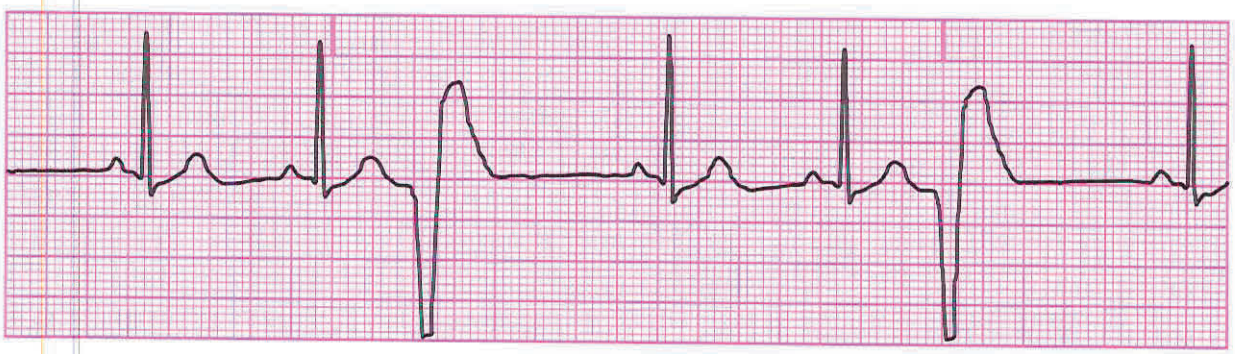
Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

35.

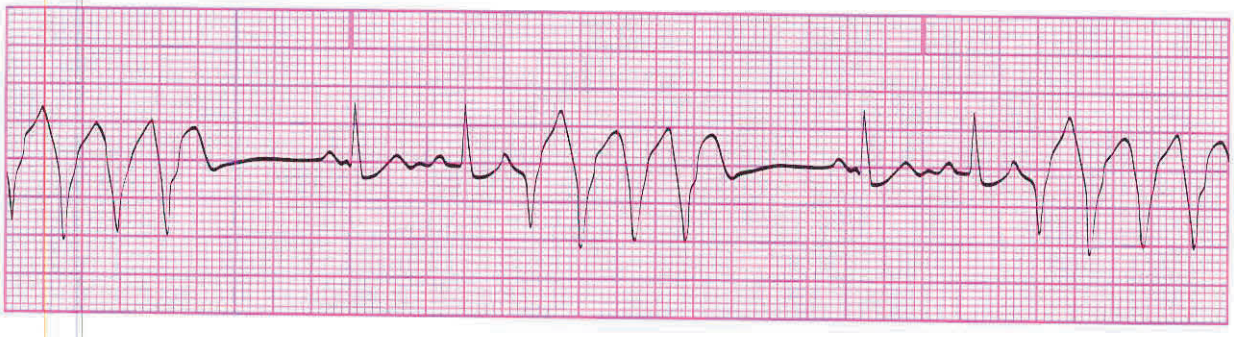
Rhythm (regular or irregular): _____ PR interval: _____
Rate: _____ QRS: _____
P wave: _____ Interpretation: _____

36.



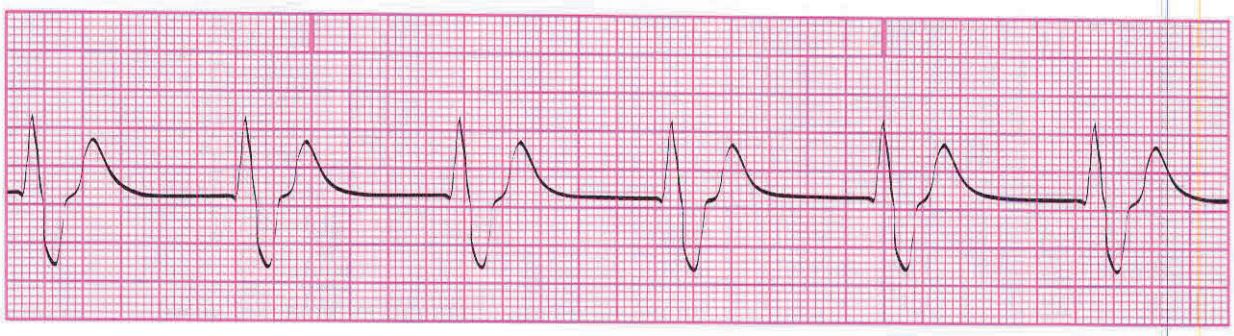
Rhythm (regular or irregular): _____ PR interval: _____
Rate: _____ QRS: _____
P wave: _____ Interpretation: _____

37.



Rhythm (regular or irregular): _____ PR interval: _____
Rate: _____ QRS: _____
P wave: _____ Interpretation: _____

38.

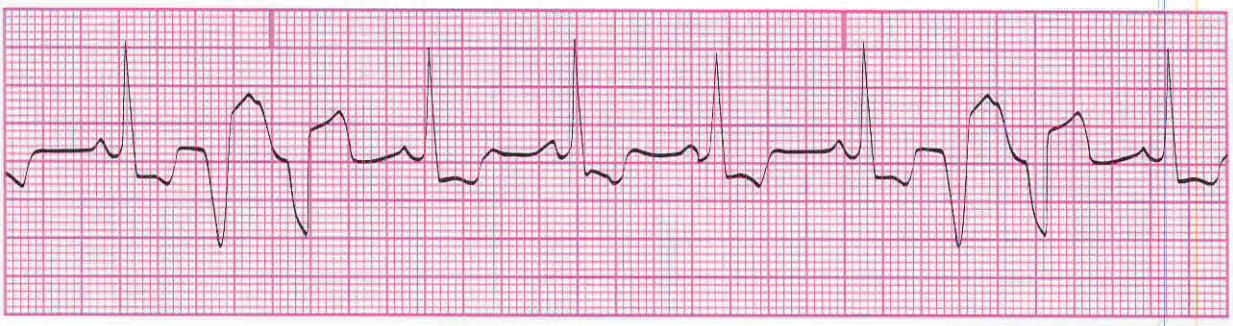


Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

39.

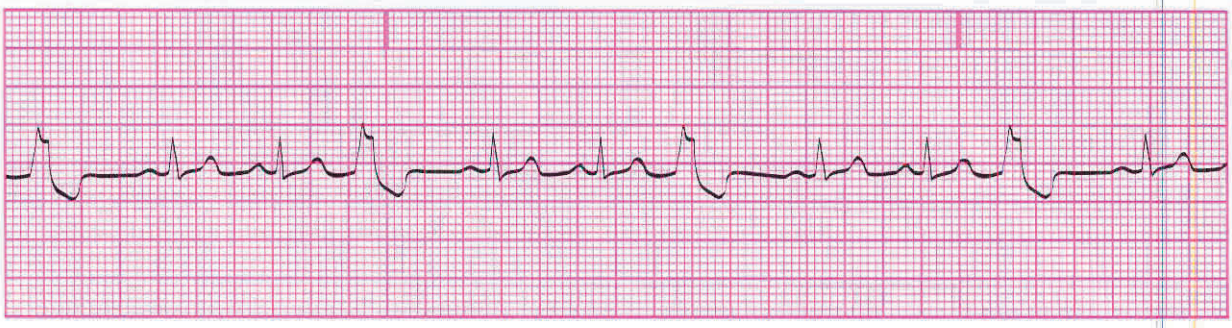


Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

40.



Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

41.

Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

42.

Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

43.

Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

Mc Graw Hill connect® Now that you have completed the material in the textbook, go to Connect and complete any chapter activities you have not yet done.