Atrial Dysrhythmias

7

Learning Outcomes

- **7.1** Summarize the similarities and differences among atrial dysrhythmias.
- **7.2** Analyze premature atrial complexes and their effect on the patient, including basic patient care and treatment.
- **7.3** Analyze wandering atrial pacemaker and its effect on the patient, including basic patient care and treatment.
- **7.4** Analyze multifocal atrial tachycardia and its effect on the patient, including basic patient care and treatment.
- **7.5** Analyze atrial flutter and its effect on the patient, including basic patient care and treatment.
- **7.6** Analyze atrial fibrillation and its effect on the patient, including basic patient care and treatment.

Key Terms

atrial kick
automaticity
biphasic
cerebrovascular accident (CVA)
embolism
ectopic foci
ectopic impulse
focus (plural: foci)
myocardial infarction (MI; heart attack)
neurological
pulmonary embolism
renal infarction
thrombus
trigeminy
underlying rhythm

7.1 Introduction to Atrial Dysrhythmias

ectopic impulse
An electrical impulse that comes from outside of the normal pacemaker site or electrical conduction pathway.

Atrial dysrhythmias are caused by an **ectopic impulse** in either the right or the left atrium or both. The ectopic atrial origin is outside the SA node, which interrupts the inherent rate of the SA node. The heart works on the principle that the fastest impulse will control the heart rate. If the atrial ectopic beat is generating electrical impulses faster than the sinoatrial node, it will override the sinoatrial node impulse and cause the atria and ventricles to depolarize. Dysrhythmias that are caused by one or more atrial ectopic sites include premature atrial complexes, atrial tachycardia, atrial flutter, and atrial fibrillation. Because the P wave occurs as a result of atrial depolarization, rhythms in this category primarily affect the P wave.

Atrial dysrhythmias can be the result of conditions such as damage to the atrium from myocardial infarction, valvular problems, or **neurological** influences. When cells within the heart are damaged, or neurologically influenced, the change in their electrical state may cause depolarization to occur more easily.

neurological Pertaining to the nervous system, its diseases, and its functions.

Checkpoint Question (LO 7.1)

1. Which wave is most affected by a change in electrical activity within the atria?

_____

_____

7.2 Premature Atrial Complexes

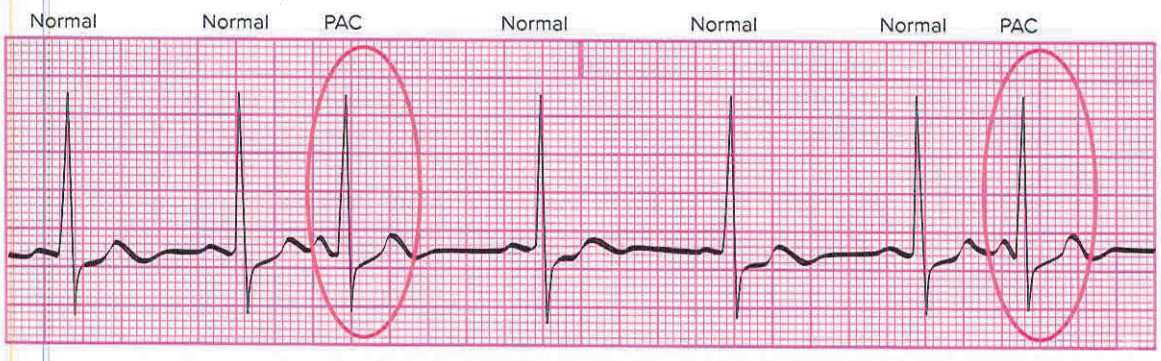
Premature atrial complexes (PACs) occur as a result of early electrical impulses that originate in the atria, interrupting the inherent regular rhythm (Figure 7-1).

Criteria for Classification

- ***Rhythm:*** The P-P and R-R intervals are constant with the exception of the early complexes. The presence of this early complex will make the overall rhythm irregular.
- ***Rate:*** The rates of the atria and ventricles are usually within normal limits of 60 to 100 bpm, depending on the frequency of the PACs.
- ***P wave morphology:*** The P waves associated with the normal complexes are normal in appearance and have the same morphology. The P waves associated with the early complex have a different morphology. The abnormal P waves may be flattened, notched, **biphasic** or equiphasic, peaked, or otherwise unusual. They may even be hidden within the T wave of the preceding complex. Evidence that the P wave is hidden within the T wave includes a notch in the T wave, a pointed shape, or being taller than the other T waves.
- ***PR interval:*** The PR interval measures within normal limits of 0.12 to 0.20 second. The early complexes will have a different PR measurement and may be within normal limits.
- ***QRS duration and morphology:*** The QRS duration will be within normal limits of 0.06 to 0.10 second.

biphasic A waveform that has positive (upward) and negative (downward) deflections (phases) on the ECG tracing. When both deflections are approximately equal, a biphasic waveform is said to be equiphasic.

Figure 7-1 Premature atrial complex.



Interpret-TIP

Premature Atrial Complexes

A PAC is a cardiac complex that occurs too soon and has a positively deflected P wave. Other than being "early," with a likely change in P wave morphology, this complex does not typically possess any abnormal features. If other changes are present, they would indicate other cardiac abnormalities.

underlying rhythm The heart rhythm that would be present if the abnormal impulses were ignored or removed from the tracing.

trigeminy Pattern in which every third complex is a premature (PVC).

When PACs are present, you must determine whether the **underlying rhythm** is normal sinus rhythm, sinus bradycardia, sinus tachycardia, or sinus dysrhythmia. The rhythm strip must be labeled with this underlying rhythm and the type of PAC. An example of this terminology is "sinus rhythm with trigeminal PACs" (**trigeminy** refers to a pattern in which every third complex is a premature). Refer to the chapter *Ventricular Dysrhythmias* for more information about types and patterns of premature complexes.

How the Patient Is Affected and What You Should Know

Although PACs are usually a benign condition, with each PAC, the atria do not have as much time to fill completely prior to contraction. This causes less volume in the ventricles prior to ventricular contraction and may cause a decrease in cardiac output. Therefore, frequent PACs can cause the patient to experience signs and symptoms of low cardiac output.

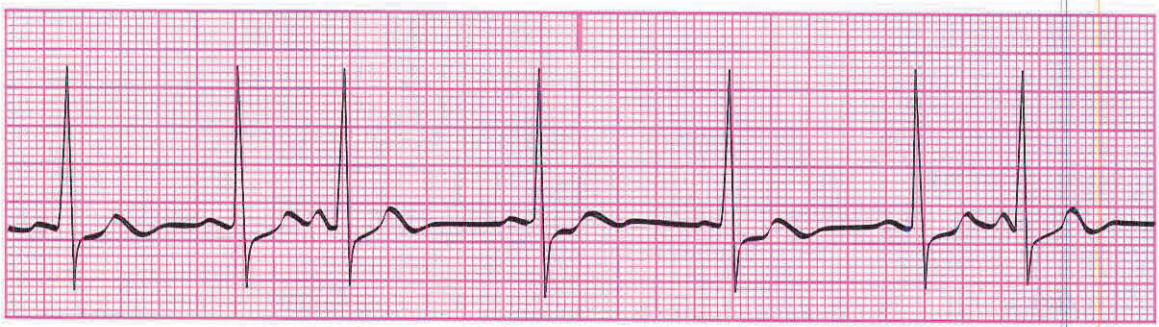
When caring for a patient with PACs, observe the patient for signs and symptoms of low cardiac output as found in Table 6-1 **Signs and Symptoms of Decreased Cardiac Output.** Monitoring the number or frequency of PACs is essential. The patient may complain of palpitations from the early beats. The severity of the patient's complaints is related to the frequency of the PACs. In addition, frequent PACs may indicate that a more serious atrial dysrhythmia may follow. The more frequent occurrence indicates that the ectopic **focus** may continue and take control of the heart rate. Any observation of low cardiac output should be communicated to a licensed practitioner for appropriate treatment.

focus (pl. foci) A cardiac cell or group of cells that produces an ectopic beat; cells that are notably different or abnormal in some manner.

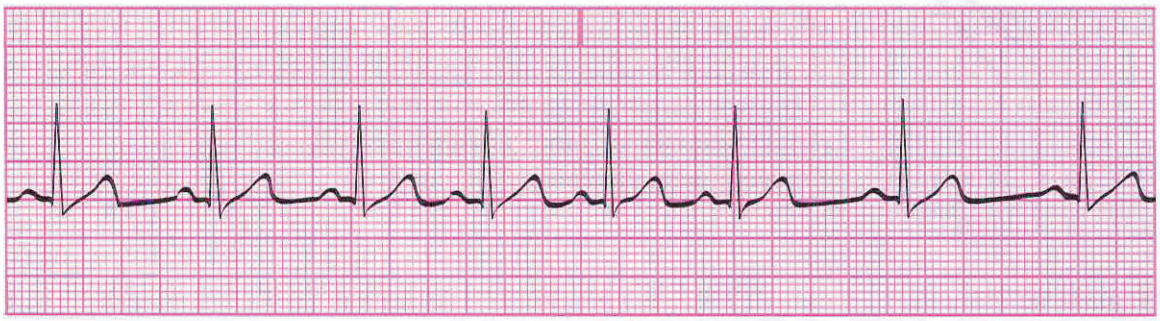
Checkpoint Question (LO 7.2)

Using the criteria for classification, select the rhythm that most closely resembles premature atrial complex (PAC).

A.



B.



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

_____

_____

_____

7.3 Wandering Atrial Pacemaker

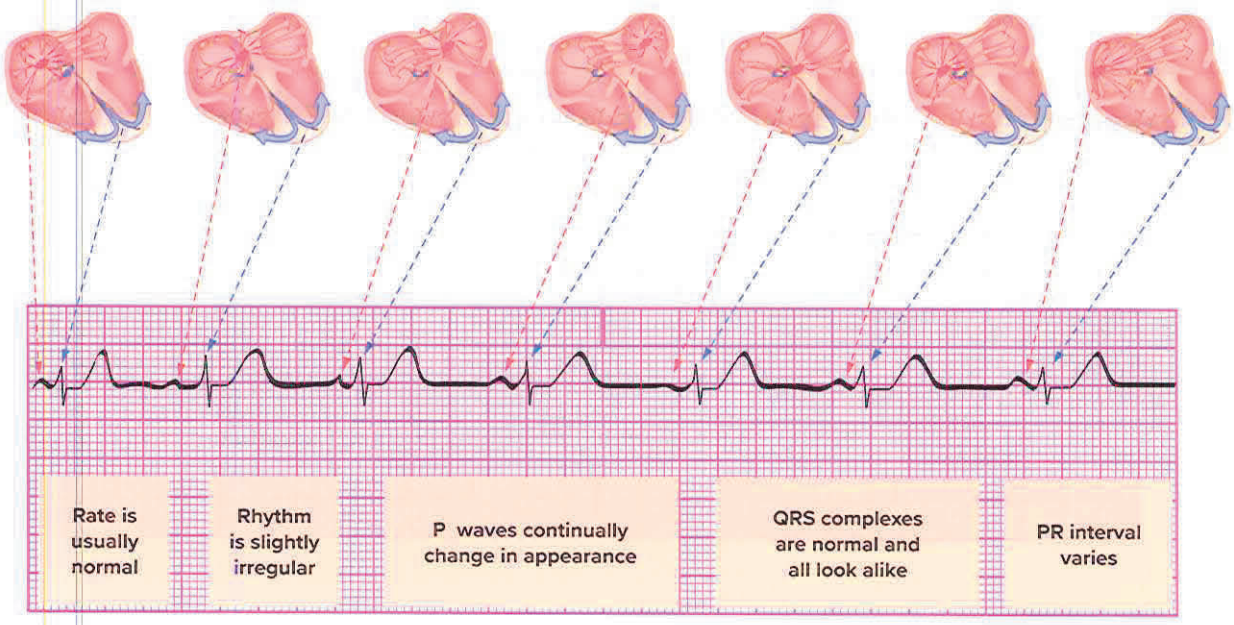
Wandering atrial pacemaker (WAP) is a rhythm in which the pacemaker site shifts between the SA node, other sites in the atria, and/or the AV junction. The P wave morphology is different for each pacemaker site. At least three different P wave morphologies in the same lead indicate a wandering atrial pacemaker (Figure 7-2).

Criteria for Classification

- ***Rhythm:*** Slightly irregular
- ***Rate:*** Should be within normal limits of 60 to 100 beats per minute

Figure 7-2 Wandering atrial pacemaker.

Impulses in wandering atrial pacemaker arise from different sites in the atria.



- ***P wave morphology:*** Continuous change in appearance with at least three different shaped P waves
- ***PR interval:*** Varies
- ***QRS duration and morphology:*** Within normal limits 0.06 to 0.10 second

How the Patient Is Affected and What You Should Know

WAP is a normal finding in children, older adults, and well-conditioned athletes and does not usually cause clinical signs and symptoms in these populations. However, it may also be related to some types of organic heart disease and drug toxicity.

Interpret-TIP

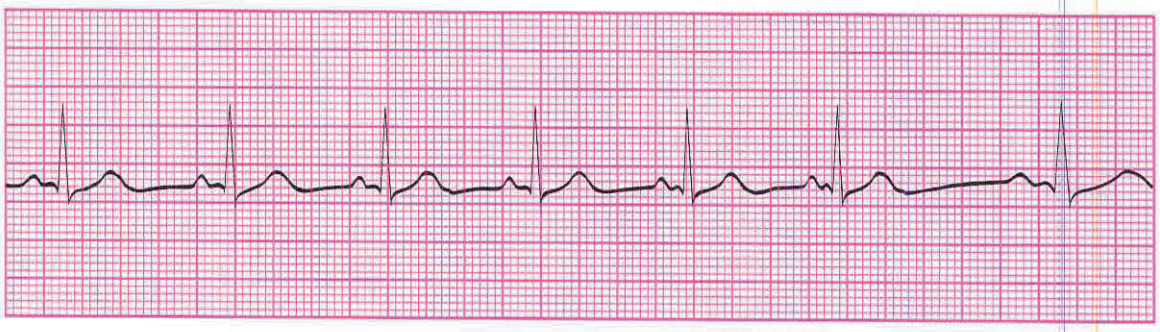
Wandering Atrial Pacemaker Rhythm

WAP has a changing P wave morphology with at least three variations in one lead over a 6-second strip. The rhythm may be irregular.

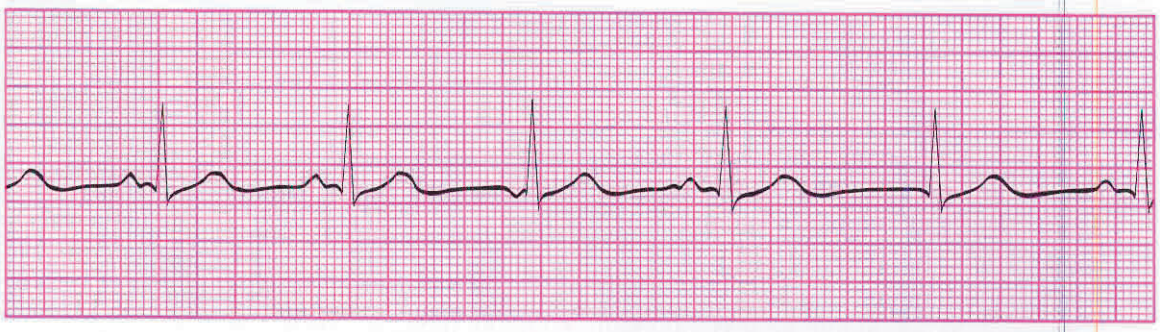
Checkpoint Question (LO 7.3)

Using the criteria for classification, select the rhythm that most closely resembles the wandering atrial pacemaker (WAP) rhythm.

A.



B.



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

7.4 Multifocal Atrial Tachycardia

Multifocal atrial tachycardia (MAT) has a P wave that changes from beat to beat and a heart rate of 101 to 150 (Figure 7-3). It has the same characteristics as wandering atrial pacemaker (WAP), except that the rate is in excess of 100 beats per minute. It can be distinguished by looking closely for visibly changing P waves.

Criteria for Classification

- ***Rhythm:*** Irregular
- ***Rate:*** Between 101 and 150 beats per minute
- ***P wave morphology:*** P waves change in appearance from beat to beat. They may be upright, rounded, notched, inverted, biphasic, or buried in the QRS complex.
- ***PR interval:*** Varies due to the changing origin of the electrical activity
- ***QRS duration and morphology:*** Normal in duration (0.06 to 0.10 second) and all complexes look alike

Interpret-TIP

Multifocal Atrial Tachycardia

MAT has a clearly changing P wave and a heart rate of 101 to 150 beats per minute.

How the Patient Is Affected and What You Should Know

MAT is usually triggered by an acute exacerbation of emphysema, congestive heart failure (CHF), or acute mitral valve regurgitation. This rhythm should be reported to the licensed practitioner, and the patient's vital signs and condition should be monitored. Note that MAT is occasionally confused with Uncontrolled Atrial Fibrillation (UAF) due to the similarities of rapid rate, irregular R-R intervals, and a changing P wave morphology.

Figure 7-3 Multifocal atrial tachycardia.

Checkpoint Question (LO 7.4)

Using the criteria for classification, select the rhythm that most closely resembles multifocal atrial tachycardia (MAT).

A.

B.

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

_____

_____

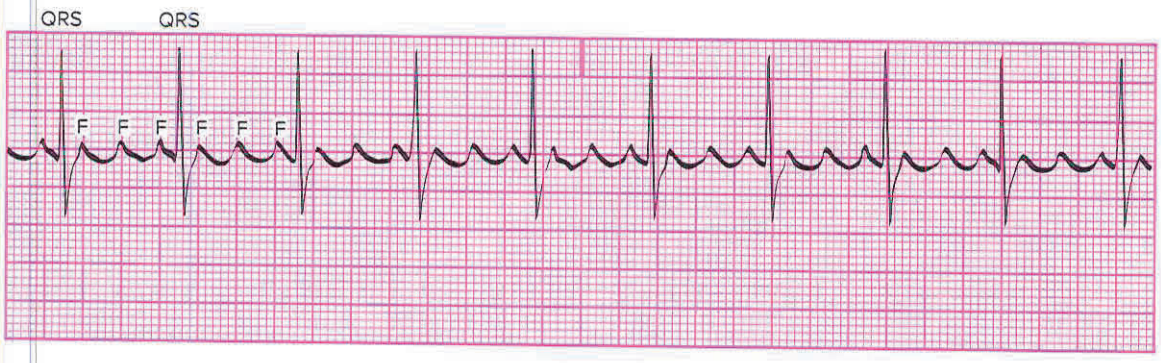
_____

7.5 Atrial Flutter

automaticity The ability of the heart to initiate an electrical impulse without being stimulated by an independent source.

Atrial flutter (A-flutter) occurs when a rapid impulse originates in the atrial tissue. The ectopic focus may be originating from ischemic areas of the heart with enhanced **automaticity** or from a reentry pathway. A reentry pathway is an extra electrical pathway that has developed in which a group of cells are generating an impulse faster than the SA node. This impulse then follows a route that allows the impulse to reach the AV node quicker than the normal conduction pathway. The reentry pathway is similar to finding a shortcut to work or school to bypass the normal traffic route to get you to your destination faster. The electrical current or rhythm has a characteristic sawtooth or picket fence pattern (Figure 7-4). This atrial activity is called flutter (F) waves. Most often this is a transient dysrhythmia that leads to more serious atrial dysrhythmia if not treated.

Figure 7-4 Atrial flutter.



As shown in Figure 7-4, F waves are often seen in a ratio of 2, 3, 4, and even 5 F waves to each QRS complex. Each F wave represents an atrial depolarization. The ratio of F waves to QRS complexes tells how many times the atria depolarize between each ventricular depolarization. When interpreting this rhythm, the ratio of F waves to QRS complexes is usually included; for example, the rhythm in Figure 7-4 would be reported as atrial flutter 3:1.

In Figure 7-4, because the rhythm is regular, use the 1500 method to determine the ventricular rate. There are 15 small boxes between R waves, and 1500 divided by 15 equals 100 bpm. To get the atrial rate, multiply the ventricular rate by the ratio of F waves to QRS complexes. In this case, with a 3:1 flutter, 100 multiplied by 3 equals an atrial rate of 300 bpm.

Ventricular Rate: 1500 ÷ 15 small boxes = 100 bpm
Atrial Rate for 3 to 1 flutter: 100 bpm × 3 (F waves) = 300 bpm

Criteria for Classification

- ***Rhythm:*** Each atrial depolarization or flutter-to-flutter wave interval is regular. The interval set with the calipers will stay constant throughout the rhythm. The R-R interval is usually regular, but occasionally it may be irregular. The regularity of the R-R interval depends on the ability of the AV node to limit impulses to the ventricles.
- ***Rate:*** The atrial rate is between 250 and 350 beats per minute.
- ***P wave morphology:*** P waves are not seen, and only flutter (or F) waves are present. These flutter waves resemble a "sawtooth" or "picket fence." They are most easily seen in leads II, III, and aVF. The one-to-one correlation between P waves and QRS complexes no longer exists. There are more flutter waves than QRS complexes.
- ***PR interval:*** No identifiable P wave exists, so the PR interval cannot be measured.
- ***QRS duration and morphology:*** The QRS duration is within normal limits of 0.06 to 0.10 second.

Interpret-TIP

Atrial Flutter

Atrial flutter has a "sawtooth" atrial pattern between the QRS complexes.

How the Patient Is Affected and What You Should Know

atrial kick Blood that is ejected into the ventricles by the atria before ventricular contraction. Atrial kick contributes a 10%–30% increase in cardiac output.

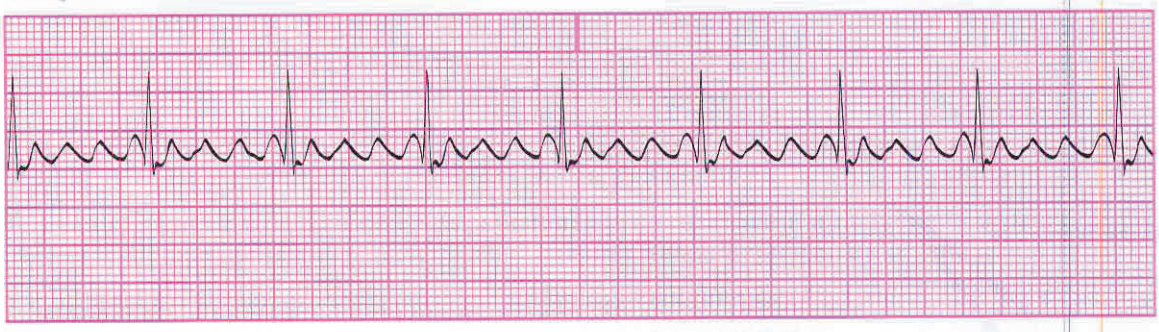
The **atrial kick,** which occurs when the atria eject blood into the ventricles immediately prior to ventricular systole, is no longer present because the atria do not contract completely, followed by a delay in the ventricular contraction. The loss of atrial kick may decrease cardiac output by 10% to 30%. Some patients may tolerate this if the heart rate is within normal limits of 60 to 100 beats per minute. However, at higher heart rates, the patient may demonstrate signs and symptoms of low cardiac output.

When a patient shows signs and symptoms of low cardiac output, notify the licensed practitioner, who may implement a treatment plan which may include oxygen therapy to ensure adequate supply to the vital organs. The patient is monitored continuously to determine whether the rhythm converts to a sinus rhythm or progresses to atrial fibrillation. A continuous rhythm strip is needed to document whether any changes occurred as a result of the medical intervention. Always indicate on the rhythm strip the type of intervention that is being implemented. The ECG tracings are saved in the patient's electronic medical record. In some cases, the rhythm strip is printed, mounted, and saved as part of their paper chart.

Checkpoint Question (LO 7.5)

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

A.



B.

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

7.6 Atrial Fibrillation

ectopic foci Abnormal cells that cause electrical impulses in the heart.

Atrial fibrillation (A-fib) occurs when electrical impulses come from areas of reentry pathways or multiple **ectopic foci** (abnormal cells causing multiple electrical impulses). Each electrical impulse results in depolarization of only a small group of atrial cells rather than the whole atrium. This results in the atrium not contracting as a whole. Instead, it quivers, in a similar way to a bowl of Jell-O® when shaken. The result of this disorganized electrical activity is that the atria do not pump blood as they normally do. This ineffective electrical activity often results in a loss of atrial kick off between 20% and 30% in patients with an otherwise normal heart. Multiple atrial activities are recorded as a chaotic wave, often with the appearance of fine scribbles (Figure 7-5). No P wave can be identified. The chaotic waveforms seen, also known as *f* waves, are a reflection of the electrical chaos occurring within the atria.

Criteria for Classification

- ***Rhythm:*** The P-P interval cannot be determined because of the fibrillatory (*f*) waves. The R-R interval is irregular.
- ***Rate:*** The atrial rate cannot be determined due to the chaotic nature of the waveforms. The atria are not contracting and pumping blood due to this activity. The numbers referred to are electrical impulse activity, not contractions. Electrical impulse activity often is in the range of 375–700.
- ***P wave morphology:*** The P waves are not present. What remains is evidence of electrical chaos within the atria, called *f* waves.
- ***PR interval:*** The PR interval cannot be measured because the P wave is not identifiable.
- ***QRS duration and morphology:*** The QRS duration is within normal limits of 0.06 to 0.10 second and irregular.

Interpret-TIP

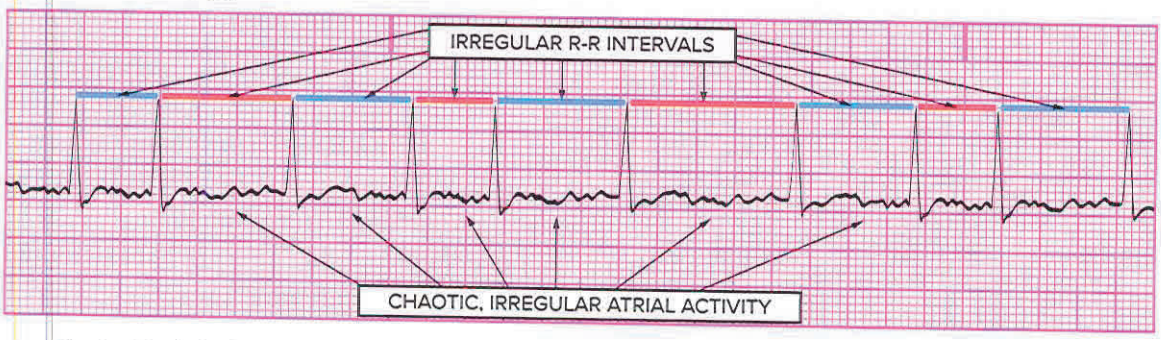
Atrial Fibrillation

Atrial fibrillation shows chaotic atrial electrical activity with irregular R-R intervals.

How the Patient Is Affected and What You Should Know

The patient typically exhibits signs and symptoms of decreased cardiac output. The patient usually has limited cardiac function because of preexisting cardiac conditions, so with the loss of atrial kick, the patient's cardiac

Figure 7-5 Atrial fibrillation.



thrombus A blood clot that forms on the wall in a diseased area of the endocardium or on the wall of an injured blood vessel.

embolism A traveling blood clot.

cerebrovascular accident (CVA; brain attack, stroke) A stroke. Caused by a hemorrhage in the brain or more often by a clot lodged in a cerebral artery.

myocardial infarction (MI) (heart attack) Occlusion (blockage) of one or more of the coronary arteries causing lack of oxygen to the heart and death of the muscle tissue.

pulmonary embolism A blocked artery in the lungs, usually caused by a blood clot.

renal infarction A lack of oxygen to kidney tissue due to a blocked blood vessel.

output decreases significantly. When patients first present with atrial fibrillation, the ventricular response is often over 100 beats per minute. This is referred to as "uncontrolled" A-fib. Patients with "new onset" A-fib often complain of dizziness, nausea, and other signs of low cardiac output. The initial goal in the treatment of uncontrolled A-fib is to stabilize the patient by slowing the ventricular response via the use of medications first, then cardioversion if necessary. Once the heart rate is controlled within the range of 60 to 100 beats per minute, the patient may be able to tolerate the loss of the atrial kick.

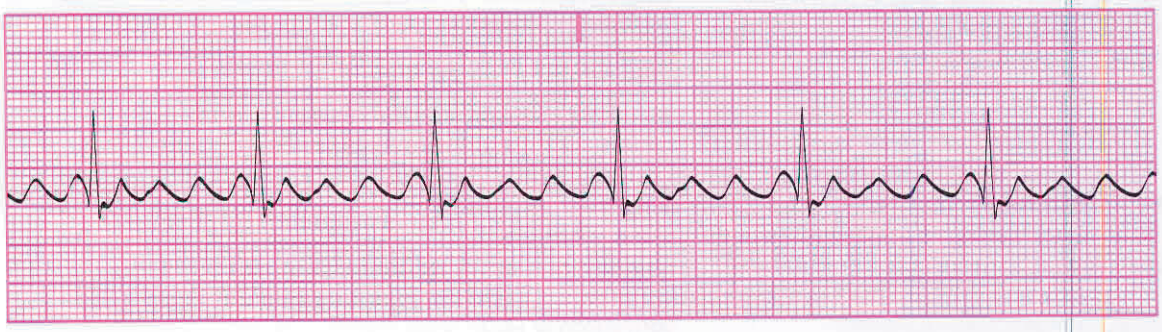
During A-fib, blood begins to collect in the atria because they are not contracting completely, allowing the opportunity for a clot or **thrombus** to form. Therefore, the patient has an increased risk of developing and sending an **embolism** into the body's pulmonary or systemic circulation, which can then migrate to other vital organs, such as the lungs or brain. The patient may develop a **cerebrovascular accident (CVA, stroke), myocardial infarction (MI; heart attack), pulmonary embolism, renal infarction,** or an embolism in any place that the arterial blood is transported. There is no way to predict where the embolism will travel in the body to cause serious damage or even sudden death.

Patients who exhibit atrial fibrillation must be observed for low cardiac output. The rhythm needs to be monitored closely as the medication or electrical cardioversion is attempted. Report any complications or vital sign changes to the licensed practitioner immediately.

Checkpoint Question (LO 7.6)

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

A.



B.

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

Chapter Summary

Learning Outcomes	Summary	Pages
7.1 Summarize the similarities and differences among atrial dysrhythmias.	Atrial dysrhythmias are caused by an ectopic impulse in either the left or right atria. Dysrhythmias can be PACs, or atrial tachycardia, flutter, or fibrillation.	**165–166**
7.2 Analyze premature atrial complexes and their effect on the patient, including basic patient care and treatment.	Premature atrial complexes (PACs) are electrical impulses that originate in the atria and initiate an early impulse that interrupts the inherent regular rhythm. Entry-level technicians should be aware of what to observe in these patients and when to call for assistance.	**166–168**
7.3 Analyze wandering atrial pacemaker and its effect on the patient, including basic patient care and treatment.	A wandering atrial pacemaker (WAP) is a rhythm in which the pacemaker site shifts between the SA node, other sites in the atria, and/or the AV junction. The P wave morphology changes in appearance during the pacemaker shift. This is a normal finding in children, older adults, and well-conditioned athletes.	**168–169**
7.4 Analyze multifocal atrial tachycardia and its effect on the patient, including basic patient care and treatment.	Multifocal atrial tachycardia (MAT) has a P wave that changes from beat to beat and a heart rate of 101 to 150 beats per minute. It is usually triggered by emphysema, CHF, or mitral valve regurgitation. The rhythm should be reported to the practitioner and the vital signs and condition should be monitored.	**170–171**
7.5 Analyze atrial flutter and its effect on the patient, including basic patient care and treatment.	Atrial flutter (A-flutter) occurs when a rapid impulse originates in the atrial tissue. This dysrhythmia presents with a classic sawtooth or picket fence appearance known as flutter or F waves. Close monitoring for low cardiac output and conversion to either sinus rhythm or progression to atrial fibrillation is necessary.	**171–173**
7.6 Analyze atrial fibrillation and its effect on the patient, including basic patient care and treatment.	Atrial fibrillation (A-fib) occurs when electrical impulses come from areas of reentry pathways or multiple ectopic foci. Each electrical impulse results in depolarization of only a small group of atrial cells rather than the whole atrium. This dysrhythmia presents with classic chaotic ("f" or fibrillatory) waves between the irregular R-R intervals. Patients require monitoring for low cardiac output and complications. Medications and cardioversion may be required.	**174–176**

Chapter Review

Matching

Match the terms on the left with their definitions on the right.

_____ **1.** ectopic (LO 7.1)
_____ **2.** trigeminy (LO 7.2)
_____ **3.** focus (LO 7.2)
_____ **4.** neurological (LO 7.1)
_____ **5.** automaticity (LO 7.5)
_____ **6.** atrial kick (LO 7.5)
_____ **7.** thrombus (LO 7.6)
_____ **8.** biphasic (LO 7.2)
_____ **9.** cerebrovascular accident (LO 7.6)
_____ **10.** renal (LO 7.6)
_____ **11.** pulmonary embolism (LO 7.6)
_____ **12.** myocardial (LO 7.6)

a. pertaining to the heart
b. pertaining to the kidneys
c. outside the normal pacemaker site
d. blood is ejected completely by the atria prior to ventricular systole
e. abnormal cell that produces an ectopic impulse
f. every third complex is premature
g. pertaining to the nervous system
h. ability to self-generate an electrical impulse
i. stroke
j. traveling blood clot in the lungs
k. blood clot
l. having two opposite deflections

Multiple Choice

Circle the correct answer.

13. What is the rate of wandering atrial pacemaker rhythm? (LO 7.3)
- **a.** 60 to 100 beats per minute
- **b.** 50 to 90 beats per minute
- **c.** 101 to 150 beats per minute
- **d.** 60 to 80 beats per minute

14. Which dysrhythmia is similar to wandering atrial pacemaker, except that the rate exceeds 100 beats per minute? (LO 7.4)
- **a.** Sinus tachycardia
- **b.** Multifocal atrial tachycardia
- **c.** Atrial flutter
- **d.** Atrial fibrillation

15. What is the major health risk for patients who have atrial fibrillation? (LO 7.6)
    a. Hypertension
    b. Thrombus formation and embolization
    c. Bundle branch block
    d. Bleeding problems

16. Which atrial dysrhythmia has capital F waves and a classic sawtooth or picket fence appearance? (LO 7.5)
    a. PACs
    b. Multifocal atrial tachycardia
    c. Atrial fibrillation
    d. Atrial flutter

17. Which atrial dysrhythmia has lowercase *f* waves, chaotic atrial electrical activity, and irregular R-R intervals? (LO 7.6)
    a. PACs
    b. Multifocal atrial tachycardia
    c. Atrial fibrillation
    d. Atrial flutter

18. Wandering atrial pacemaker rhythm must have _____ or more differently shaped P waves. (LO 7.3)
    a. two
    b. three
    c. four
    d. none of the answers are correct.

19. When premature complexes occur in a rhythm, they interrupt the underlying rhythm, causing it to be _____ when analyzing it. (LO 7.2)
    a. regular
    b. irregular
    c. a wider QRS complex
    d. bradycardic

20. Which of the following is a common sign of low cardiac output? (LO 7.1)
    a. High blood pressure
    b. Alert and oriented
    c. Increased perfusion of vital organs
    d. Low blood pressure

Fill in the Blank

21. Multifocal atrial tachycardia may occasionally be confused with _____. (LO 7.4)

22. When analyzing atrial flutter, you note that there are four F waves for each QRS complex. You will represent this pattern in your interpretation as _____. (LO 7.5)

Short Answer

23. The patient has coronary artery disease. How would you expect PACs to affect this patient? (LO 7.1)

_____

_____

24. What treatment is usually indicated for patients with atrial flutter? (LO 7.5)

_____

_____

25. What is the best way to describe the rhythm pattern for atrial fibrillation? (LO 7.6)

_____

_____

26. Which rhythm is considered more serious, MAT or WAP, and why? (LO 7.3, 7.4)

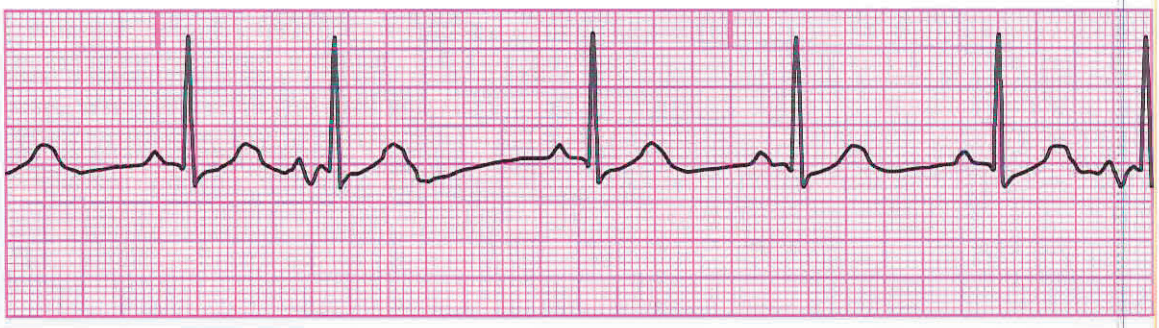
_____

_____

Critical Thinking Application *Rhythm Identification*

Review the dysrhythmias pictured here and, using the criteria for classification provided in the chapter as clues, identify each rhythm and provide what information you used to make your decision. *Note:* Be certain to include the ratio for atrial flutter rhythms. (LO 7.2–7.6)

27.

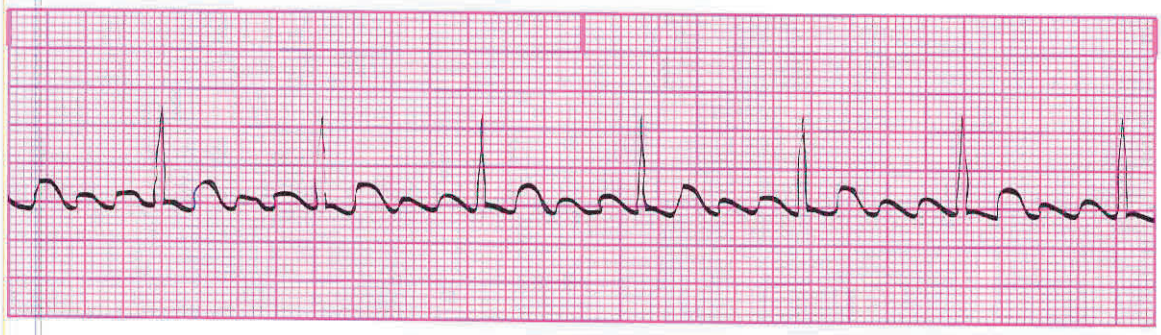


Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

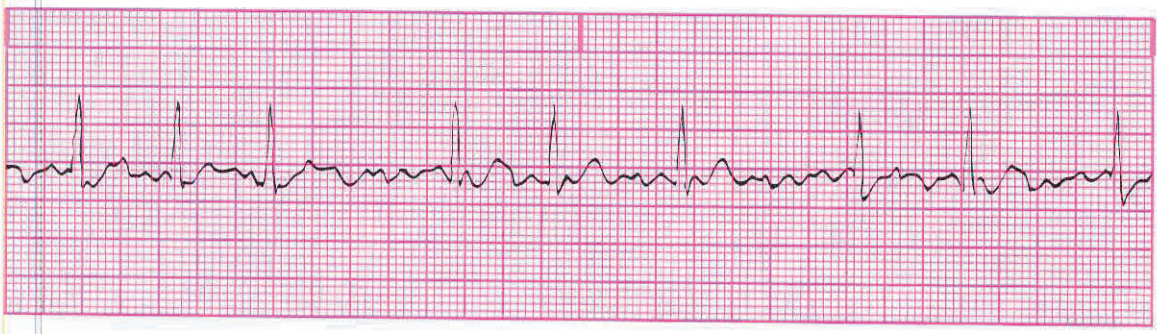
P wave: _____ Interpretation: _____

28.



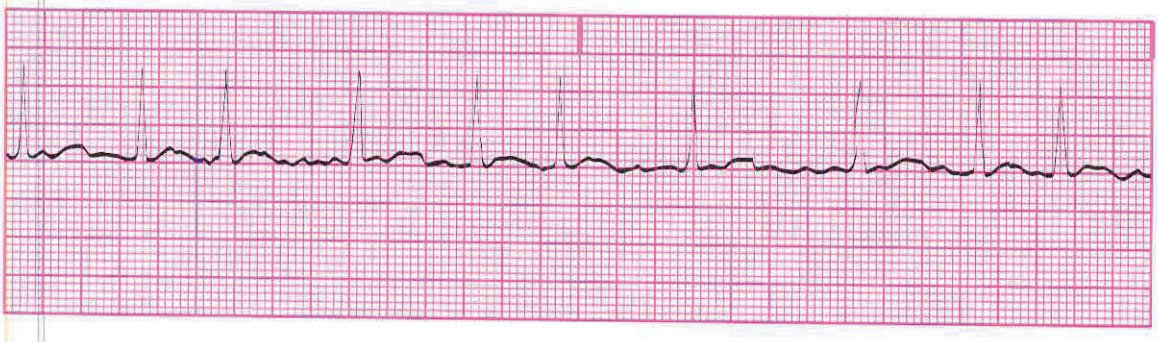
Rhythm (regular or irregular): _____ PR interval: _____
Rate: _____ QRS: _____
P wave: _____ Interpretation: _____

29.



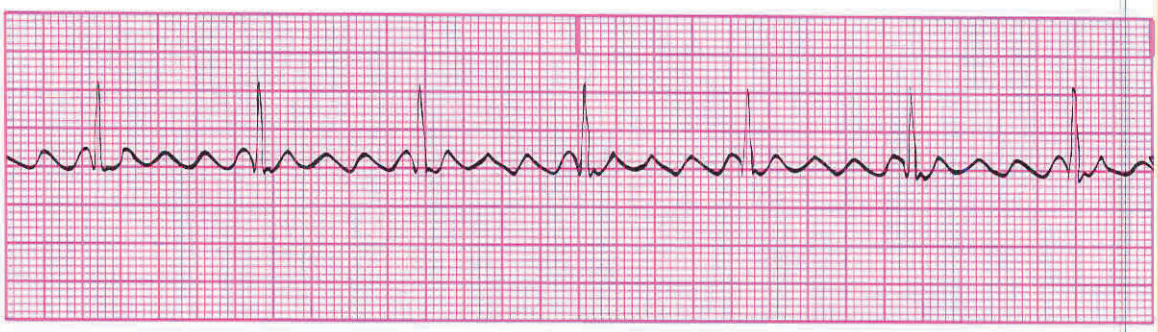
Rhythm (regular or irregular): _____ PR interval: _____
Rate: _____ QRS: _____
P wave: _____ Interpretation: _____

30.



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

31.

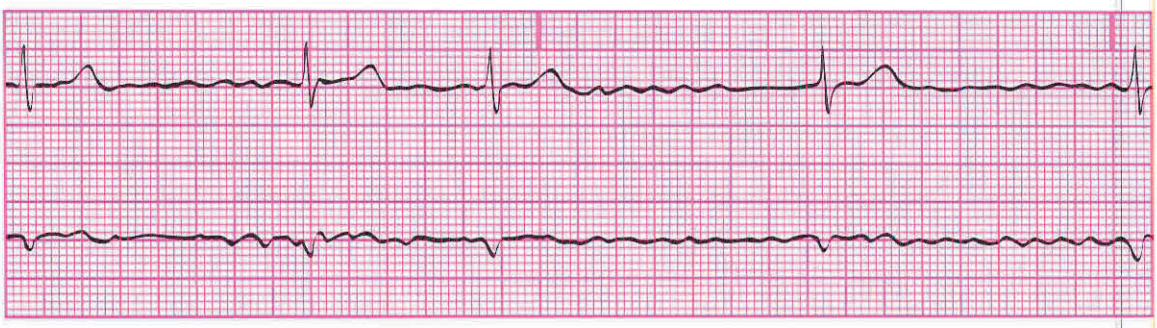


Rhythm (regular or irregular): _____ PR interval: _____

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

32.



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

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

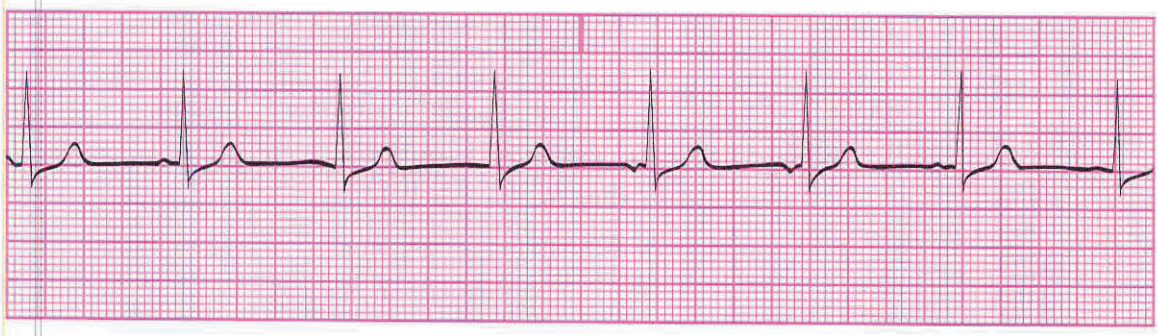
33.

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

Rate: _____ QRS: _____

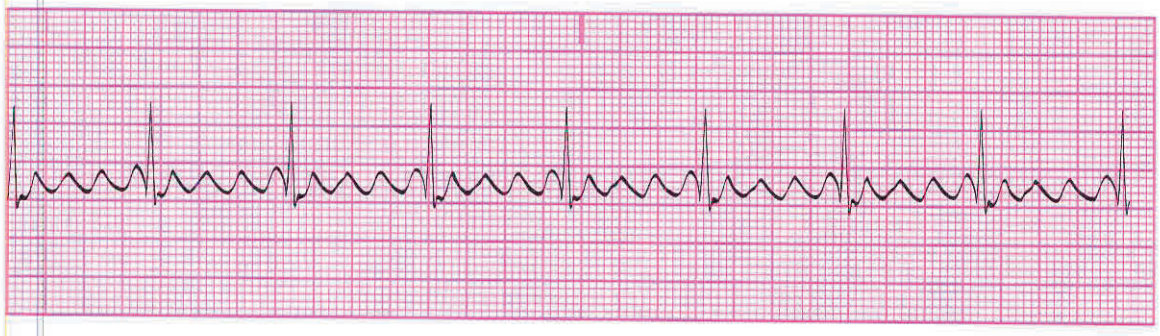
P wave: _____ Interpretation: _____

34.



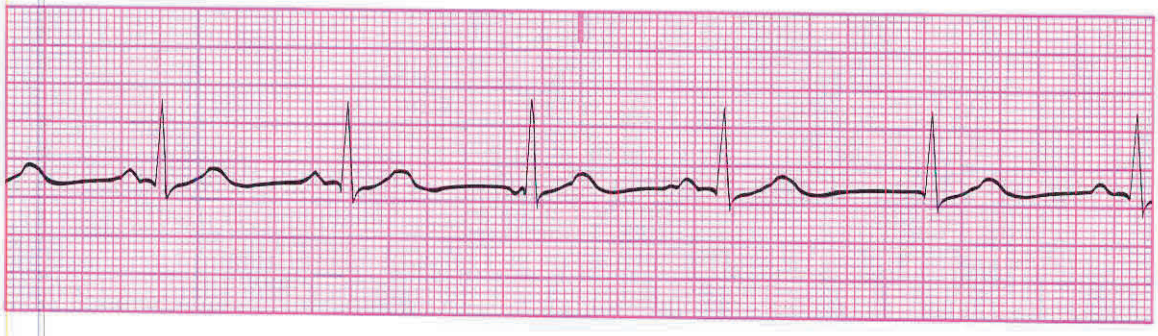
Rhythm (regular or irregular): _____ PR interval: _____
Rate: _____ QRS: _____
P wave: _____ Interpretation: _____

35.



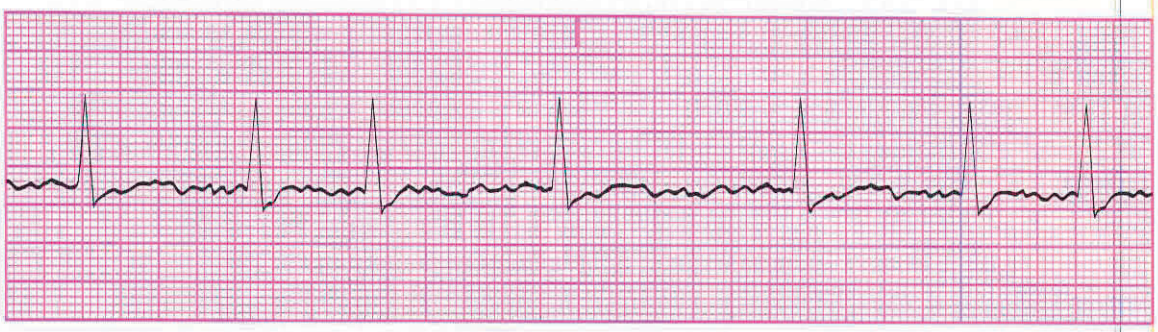
Rhythm (regular or irregular): _____ PR interval: _____
Rate: _____ QRS: _____
P wave: _____ Interpretation: _____

36.



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

37.



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

Rate: _____ QRS: _____

P wave: _____ Interpretation: _____

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

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