quickly. Most of these patients will be unconscious. In the unlikely case in which a conscious patient needs cardioversion, sedation (usually with diazepam or midazolam) is a necessity. Wait an appropriate amount of time for the drugs to take effect before cardioversion. Should the patient become unconscious, sedation is no longer a concern. Be prepared for side effects of sedation medications used during cardioversion, mainly a drop in blood pressure or suppression of respiratory rate.

When a patient in tachycardia has limited or mild signs and symptoms, a slower but safer treatment regimen is recommended. In these cases, it becomes necessary to determine the origin of the tachycardia or the pacemaker site of the rhythm. Generally speaking, wide QRS complexes are presumed to be ventricular in origin, whereas narrow QRS complexes (< 0.12 s) are presumed to be supraventricular in origin. SVTs may originate in the SA node, elsewhere else in the atria, or in the AV node (junctional rhythms). The differentiation among these three pacemaker sites requires examining the P wave and rhythm. In tachycardias with rates exceeding 150 beats/min, however, the P waves may be difficult to visualise and are occasionally "buried" within the T wave of the preceding beat. The inability to see P waves limits us to labeling these tachycardias as supraventricular rather than giving a specific site of origin. In is important to identify sinus tachycardia, because this rhythm should not be treated specifically in the prehospital environment, but rather the underlying cause should be determined (eg, pain, fear, illness) and treated, if possible.

Occasionally, aberrant conduction of a supraventricularly originated beat will make it difficult to identify a tachycardia as truly ventricular or supraventricular. In most cases of uncertainty, a wide rhythm should be treated as VT. In either case, you should administer oxygen and establish an IV line for normal saline.

In SVTs, you can attempt to stimulate the patient's vagus nerve. Many vagal stimulation techniques exist, but the most common is having the patient bear down against a closed glottis. The patient is instructed to perform this technique as if attempting to have a bowel movement. The stimulation of the vagal nerve in turn stimulates the parasympathetic nervous system to slow the heart. If this technique is successful, the patient should still be transported for hospital evaluation because the condition is likely to recur. If it reappears, instruct the patient to repeat the vagal maneuver. If at any time the vagal stimulation proves unsuccessful, pharmacologic treatment should be attempted. Another vagal stimulation technique, carotid sinus massage, should not be performed without direct medical control authorization, because it has a risk of causing a stroke in a patient with atherosclerotic disease.

If the vagal maneuvers were unsuccessful, the next step is to administer adenosine, 6 mg, by rapid IV push. Adenosine is recommended in the initial diagnosis and treatment of stable, undifferentiated, regular, monomorphic, wide-complex tachycardia. Before you begin this treatment, you should always recheck the history for allergies and contraindications and advise the patient of the possible adverse effects of adenosine administration. Adenosine is contraindicated in patients with asthma, because it can cause bronchoconstriction. Adenosine is also contraindicated in patients with irregular, wide-complex tachycardia because it may cause degeneration of the rhythm to VF. Additionally, it typically causes the patients to experience a flush, slight chest pressure, and a feeling of "doom." To administer the medication, choose the closest IV site to the patient and insert the syringe of adenosine. In the same site, insert another syringe containing at least 20 ml of normal saline solution. After clamping off the IV line above the site, push the adenosine as rapidly as possible and then push the saline as soon as the adenosine plunger hits bottom. Be prepared to see a short run of asystole with the administration of adenosine (although this response does not always occur). If the first dose of adenosine is unsuccessful, you may administer it again in 1 to 2 minutes up to two times at 12 mg each. If the adenosine is unsuccessful in converting the patient's rhythm, transport expeditiously to the hospital without further treatment as long as the patient remains in stable condition. Adenosine frequently causes a transient slowing of the rhythm that allows easier identification rather than rhythm conversion, so ensure that the rhythm strip is being printed during drug administration to allow for careful review.

If at any time the condition of a patient with SVT becomes unstable, you should move to the "unstable" or cardioversion algorithm. Remember that when cardioversion of SVT is required, you should start at a lower energy setting than with a ventricular rhythm.

If the patient is in stable condition but the rhythm is ventricular in origin, the patient should be transported to the hospital while you watch carefully for the development of serious signs and symptoms. If they appear, the patient should undergo cardioversion according to the unstable tachycardia algorithm. If your transport time to the hospital is long, direct medical control may order the administration of a ventricular antiarrhythmic medication such as amiodarone or lidocaine. In cases involving a short transport time, administration of these medications may be delayed until hospital admission.

Any patient with a tachycardic rhythm should be monitored carefully Figure 27-85 ›. A heart that is stressed by the requirements of excessive tachycardia is very likely to become ischemic and is at high risk for arrest.

Techniques of Management in Cardiac Emergencies

This section profiles some of the devices and methods used in the treatment of patients with cardiac emergencies. Not all of the techniques or devices described are used in every EMS system, and not all are required for certification as a paramedic. Direct your attention to the material that is relevant to your local practice.

Defibrillation

Defibrillation is the process by which a surge of electric energy is delivered to the heart. Recall that when the heart fibrillates, its individual muscle fibres get "out of synch" with one another and begin contracting individually. As a result, the heart as a whole ceases any useful movement. Indeed, if you were to look