

Following the sensitive medical emergencies such as cardiac arrest is closely correlated with unit response time, especially when basic EMTs have been trained in defibrillation. In layered-response systems, paramedics are held in reserve for such critical or life-threatening incidents, where their advanced skills may provide definitive or stabilizing care to patients. Many systems have advanced-level first responders, such as engine companies manned with paramedics. These responders can provide the same interventions as ambulance-based paramedics but lack the means to transport patients. These assets can be additional resources in the single complex patient or in the multiple-patient incident.

Upon arrival at the emergency scene, EMS personnel undertake patient assessment and examination. EMT-paramedics in most cases are authorized by standing orders to proceed with patient care. Following patient evaluation and treatment, the EMS unit contacts the supervising emergency medical physician (or, in some states, a nurse) at the base station hospital by radio or telephone to describe the patient's condition and any treatment undertaken. The physician may give specific instructions for further treatment at the scene or request transport to the hospital for care.

#### D. TRANSPORT

The mode of transport (ground or air, with or without stairs or lighs) depends on availability, stability of the patient's condition, transport time and distance, risks, and the like. Hospital destination decisions are often guided by local protocols, with critically ill patients directed to the closest, most appropriate facility. For example, a community hospital may be bypassed in favor of the nearest designated trauma center in the case of a severely injured patient. Noncritical cases may be transported to the hospital of the patient's choice.

1. **Ground transport**—Most patients are transported in surface ambulances. These vehicles vary slightly from state to state in their configuration and on-board equipment, but all follow guidelines set by the DOT. Emergency vehicle operators usually are allowed by local and state laws to violate certain traffic laws while responding to an emergency or carrying a patient in a life-threatening emergency. In the vast majority of cases, however, the patient's life is not in danger and posted speeds and traffic laws should be obeyed. The time gained in using red lights and sirens to get to the hospital is often outweighed by the additional risk of death and disability associated with rapid transport.

In most EMS systems, the responding unit is also the transporting unit. In others, especially layered-response systems, the responding unit may primarily evaluate and stabilize the patient and may summon a lower-level unit to provide transport.

2. **Air transport**—Some EMS systems and regional trauma hospitals, particularly those serving large outlying rural areas, use helicopters or fixed-wing aircraft with trained medical teams on board as additional resources for prehospital care and transportation. The majority of these aircraft are hospital based, but some are operated by municipal or state governmental agencies. Where these services are unavailable, or when search-and-rescue missions are required, aircraft equipped for medical evacuation may be sent from local military bases, operating within the Military Assistance to Safety and Traffic program.

Air ambulances are usually integrated into the EMS system and are activated according to certain locally established criteria. The decision to transport a patient by air requires careful consideration of the risks and benefits of air versus ground transport (see below).

### Medical Supervision

### A. ON-LINE MEDICAL DIRECTION

On-line medical direction is the direction given by radio to EMS personnel at the scene while care is being provided. It is usually given by emergency physicians or nurses at the base station hospital or receiving hospital. In most systems, the use of standing orders is allowed (Figure 2-2). This approach allows treatment to begin as soon as possible. Systems that have changed over from on-line medical control to standing orders have not shown a decrement in medical care but have shown an increase in EMS provider morale.

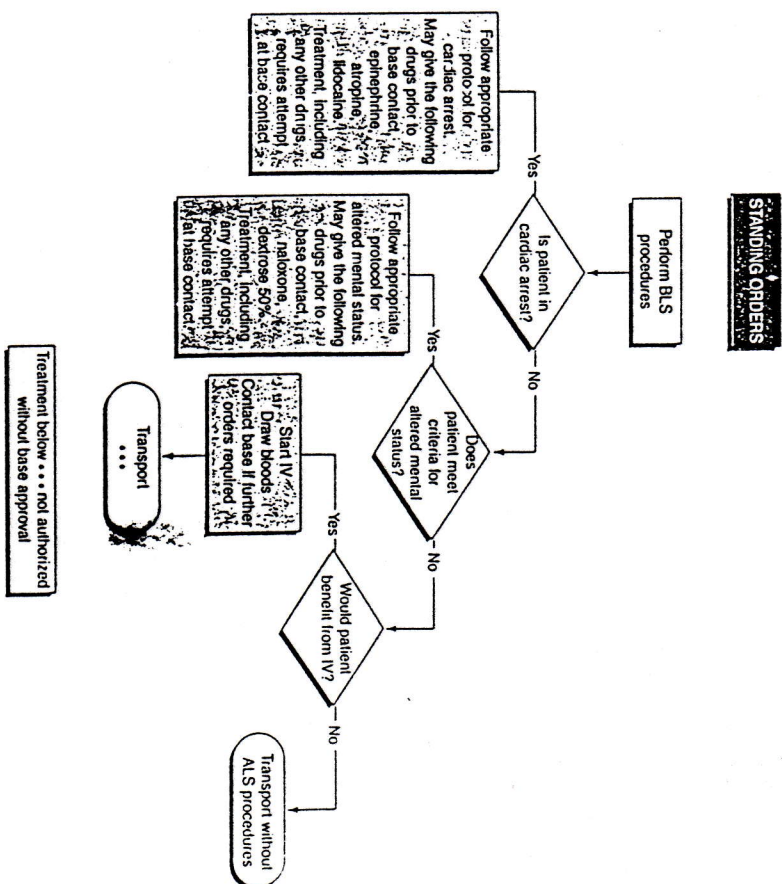
Even in systems that operate nearly exclusively by standing orders, some exceptions may require on-line direction. These may include cessation of CPR in a nonviable patient or the administration of restricted medications such as narcotics or paralytics. Systems that employ standing orders require effective monitoring, training, and quality assurance mechanisms.

### B. OFF-LINE MEDICAL DIRECTION

by a physician experienced in emergency services, or by an agency in which physicians play an active role, and, if necessary, by a physician experienced in emergency services, reviewing patient care records and voice and tapes retroactively, and reviewing performance and outcome data. Off-line medical direction is usually provided by a physician experienced in emergency services, or by an agency in which physicians play an active role, and, if necessary, by a physician experienced in emergency services, reviewing patient care records and voice and tapes retroactively, and reviewing performance and outcome data.

## Performance Evaluation

System performance evaluation has many aspects, including the evaluation of input resources and operating guidelines (eg, protocol validation, personnel review, training assessment), evaluation of the process of deliv-



**Figure 2-2.** Standing orders for treatments and procedures that may be performed without prior attempt at base station contact by radio. ALS = EMT-P ambulance; BLS = EMT-A ambulance.

ering care in the field (eg, response times, service volume, treatment audits for adherence to protocols), and evaluation of the outcome of prehospital care (eg, complications, complaints, success in the performance of procedures, and patient survival). Outcome data are the most difficult to obtain.

## PREHOSPITAL SKILLS & TECHNIQUES

## Field Assessment

EMTs responding to a call usually have certain dispatch information, including the location, the nature of the complaint, and the number of patients. Upon arrival, they must quickly determine the presence of hazards to

themselves and the patient, ascertain the probable mechanism of injury, and identify other patients, if any. Support can be summoned for hazard suppression or additional medical assistance. Patients who are conscious and in minimal distress may be able to provide historical information. Information may also be obtained from witnesses or family members.

Patients who are very ill may require that interventions be performed simultaneously with assessment. Interventions aimed at stabilizing airway, breathing, or circulation (the ABCs) will take precedence over secondary assessment. The receiving physician should expect that, if the patient is seriously ill or injured, only life-saving measures may be performed prior to arrival.