Quality?

I’ll Know It When I See It

In this issue of Chest (see page 1499), Dr. Rivers and colleagues have presented a very well-written, elegant paper. While I have some minor concerns regarding the timing of the administration of the high dose epinephrine and the variability of the actual dose, my comment revolves around something which the authors probably have very little or no control.

A friend of mine is fond of saying, “I can’t define what critical care is, but I know it when I see it” (personal communication, 1994; D.G. Hanks, MD). Just as my friend has difficulty defining critical care, so have I trouble defining what an acceptable neurologically intact discharge rate is. But, I know that an intact survival rate of 3 patients out of 212 (1.4%), isn’t it. What is an acceptable out-of-hospital neurologically intact survival rate for cardiac arrest? I do not know and neither do you. Therein lies the problem.

With nearly two thirds of sudden deaths due to coronary artery disease occurring out of the hospital,¹ it is amazing that we have no national standard to refer to in order to evaluate our performance (continuous quality improvement [CQI] thresholds). There are many areas where emergency medical service (EMS) does not have widely agreed upon CQI thresholds, and this is not a problem unique to EMS. It exists in many other fields of medicine. But, EMS is my area of interest, so that’s the area that I would like to discuss.

Modern EMS was born of Gestalt. When Elam was asked why he performed mouth-to-mouth resuscitation on polio victims during power failures, he replied, “It seemed the right thing to do.”² Much of what we do today has been developed employing the same rationale, i.e., “it seems the right thing to do.” Realizing this and realizing how young EMS is,³ it should not be surprising that we have not yet formulated widely held, indisputable, performance standards based on solid outcome data. Emergency medical service is a complex business with many uncontrolled variables, including many participants working in uncontrolled environments facing time-dependent, accelerating emergencies. In addition, much of what we do is immeasurable or not considered important enough to be measured. An example of the latter would be pain control. Another would be as Dr. Ray Fowler, President of the National Association EMS Physicians, would say, “The hugging of aunt Minnie to reassure her as she strangles in congestive heart failure, such charity doesn’t make

CHEST / 106 / 5 / NOVEMBER, 1994  1315
any difference in whether she lives or dies.”

Add to this a lack of accepted scoring systems and mutually agreed upon data points, and one can readily appreciate the difficulty in setting quality standards. In light of these realities, it might be that we will never be able to agree upon what really determines quality in EMS.

This problem has become more acute with pending state and federal health-care legislation. Time and again it has been stated that health-care systems of the future will be evaluated based on performance thresholds (quality) and cost. I am afraid that if we cannot produce valid, unchallengeable performance thresholds based on solid outcome data, we will experience a continued ratcheting down of the quality of health care in this country. In other words, in spite of reassurances to the contrary, there is a real danger of future health care being delivered by the lowest possible bidder. Quality could get lost in the shuffle as being too vague and undefinable.

Until we get struck full force with all of the ramifications of health-care reform, we can still get away with knowing quality “when we see it.” Just how long we will have that luxury is anybody’s guess.

Ralph J. Frascone, MD
St. Paul, Minnesota

Medical Director, St. Paul Ramsey Emergency Medical Services.

REFERENCES
1 Emergency Cardiac Care Committee and Subcommittees, American Heart Association. Guidelines for cardiopulmonary resuscitation and emergency cardiac care: 1. Introduction. JAMA 1992; 268:2172-83
2 Eisenberg MS. The conception, birth, and growth of EMS. Presented at the EMS Today Conference, February 26, 1994

Electrocardiographic Changes Associated With Neurologic Events

It is certainly not rare for a patient to be admitted to the hospital with symptoms due to a neurologic event and a dramatically abnormal electrocardiogram. The more senior house physician or attending physician will point out to the more junior members of the team that these ECG changes, perhaps even calling them “cerebral Ts,” are not due to cardiac ischemia or infarction, but rather are a consequence of the CNS event. Perusal of a number of the standard internal medicine or cardiology texts, however, discloses that most fail to make any mention at all of ECG changes associated with CNS events in the index or the text,1-3 or note the occurrence of either “ECG changes”4 or “ST-T changes”5 in the section on subarachnoid hemorrhage. Clearly, the available literature is underrepresenting the growing awareness that the ECG changes are merely the “form fruste” of the interplay between the brain and the heart and occur with far more CNS events than just “strokes” or subarachnoid bleeds.

While almost every type of ECG abnormality has been reported with neurologic events, they can be divided into two major categories: cardiac dysrhythmias and repolarization abnormalities.6 The former may likely relate, in part, to the adverse prognosis of subjects with CNS events.7,8 The latter have been recognized for over 40 years. Although the deeply symmetrical T-wave inversions are often called “cerebral Ts,” Burch et al9 actually applied the term to a series of patients with tall, peaked Ts. A broad spectrum of ECG abnormalities has been noted including tall, peaked P waves, changes in PR intervals, and prolonged QT intervals, as well as “pathologic Qs.”6 The most notable and common abnormalities are those of repolarization: elevation or depression of the ST segment, peaked, flattened, or inverted Ts, and tall U waves.

Similarly, the precipitating events are far more diverse than just subarachnoid hemorrhages or even “strokes.” They have been reported in many other neurologic diseases, including neoplasms, infections, epilepsy, and psychiatric disorders.6 Indeed, we recently cared for a patient who presented with dramatic, new anterior T-wave inversion while experiencing manifestations of acute alcohol withdrawal syndrome. Myocardial ischemia and necrosis were excluded as was a focal CNS lesion. Wider appreciation of these changes has brought with it the recognition that it is not only the ECG that is perturbed: cardiac enzymes (MB-CK) are elevated in many but not all patients with presumed neurogenic ECG changes, and electron microscopy discloses widespread changes of myofibrillar degeneration.10

A number of experimental models have produced the same pathologic finding of myofibrillar degeneration as noted above: catecholamine infusion, stress plus or minus steroids, nervous system stimulation, and reperfusion of transiently ischemic myocardium.10 Each of these results in sudden calcium influx. The cardiac insult brought on by a neurologic event is likely to reflect large amounts of norepinephrine released into the myocardium from sympathetic nerve terminals,11 which in turn results in the opening of the calcium channel with influx of calcium and eflux of potassium. Understanding of this final piece of the puzzle naturally leads to consideration of