

## COMMENTARIES

## Rapid-sequence Intubation: A Safe but Ill-defined Procedure

In its growth and maturation as a specialty, emergency medicine (EM) has frequently faced claims from other disciplines that certain procedures should not be performed or certain drugs not administered in the ED. Emergency physicians (EPs) have responded vigorously to this challenge by attempting to prove that these practices are safe and of benefit to their patients. Nowhere is this process of defending our practice more apparent than in the ED use of drugs and procedures previously limited to the practice of anesthesia. When EM first developed training programs in the mid-1970s, residents received only limited exposure to the use of neuromuscular-blocking agents, short-acting anesthesia induction agents, or high-potency opioids. Midazolam was not yet in clinical use. As EP use of these drugs became more commonplace in the mid-1980s, articles began appearing in the EM literature documenting the extent to which the drugs expanded the scope and complexity of emergency practice, and more importantly, how their use benefited ED patients.<sup>1-4</sup> Safety was always a concern, but in reality, the pharmacologic profile and side effects of these drugs were well known before their use in the ED. There has seldom been reason to believe that drugs and procedures used safely by anesthesiologists could not be used with an equal degree of safety by EPs, provided they possessed sufficient training and understood the indications and contraindications. Moreover, safety could not have been demonstrated satisfactorily in most of these studies, given the small number of cases typically re-

ported and the frequent use of retrospective designs. Thus, these reports served the primary purpose of educating and reassuring the practitioners of a young and evolving discipline, while simultaneously defining and defending the scope of that discipline, both for EPs and their colleagues in other specialties.

In this issue of *Academic Emergency Medicine*, Tayal and coauthors add to this literature, reporting their experience with rapid-sequence intubation (RSI) in 417 ED patients.<sup>5</sup> These data, collected retrospectively from an internal quality assurance audit, demonstrate a relatively small number of adverse effects related to neuromuscular blockade and intubation. The results are important and consistent with both the published and anecdotal experiences of other EPs. They should encourage those physicians not using rapid-sequence intubation to adopt a more sophisticated approach to airway management and may help overcome the "interdepartmental resistance" cited by the authors. It is my contention, however, that EM has reached a stage in its development as a specialty in which it can no longer expect to advance either scientifically or politically simply by reporting the results of everyday experiences in clinical practice. Enhanced recognition of EM's expertise in airway management will require adding to the body of knowledge through rigorous, prospective, hypothesis-driven research.

Future research on rapid-sequence intubation must scrutinize its multiple components and, more fundamentally, must begin with a precise definition of the process. In recent years there

has been a tendency to use the term for any intubation performed with the aid of neuromuscular-blocking agents. The term "rapid-sequence intubation" is in fact a modification of the term "rapid-sequence induction," described in the anesthesia literature as a precise 13-step process for safe and rapid anesthesia induction preceding intubation in patients presumed to have full stomachs.<sup>6</sup> Exactly when this modification in terminology occurred is uncertain, but "rapid sequence intubation" began appearing in the literature in the mid-1980s, initially as an abbreviation for "rapid-sequence induction and endotracheal intubation."<sup>7</sup> Most commonly the term referred to induction of short-term anesthesia coupled with neuromuscular blockade in order to facilitate intubation. This differs in some subtle ways from rapid-sequence induction as described in the anesthesia literature, but primarily there is a difference in endpoint; anesthesiologists intubate as one step in the process of anesthesia administration, while EPs administer anesthesia induction agents as one step in the process of intubation. Despite this fundamental difference in ultimate goals, the two processes are more similar than different, and both imply appropriate use and dosing of anesthesia induction agents.

Is this quibbling over semantics, or is there some benefit associated with more precise definitions of terminology? I believe there is substantial benefit, particularly when evaluating the merits of a complex medical procedure, in establishing standardized definitions linked to objective and measurable interventions and outcomes. It should be noted that in the Tayal study, rapid-sequence intubation was defined as including "preoxygenation, adjunctive medications, an induction agent, and a neuromuscular blocker followed by

tracheal intubation." This definition was considered met if patients received any one of ten different induction drugs (including haloperidol and diazepam). In 15% of the cases patients received no induction agent at all. Doses of the induction agents are not reported except in complicated cases, and in some of these cases the doses of midazolam are substantially less than effective induction doses.<sup>8,9</sup> Neurologic outcomes following administration of induction agents are also not reported. This is unfortunate because other than failed or incorrectly performed intubation, the most serious risk of rapid-sequence intubation is related to the use of the induction agent. Proper selection and dosing of the induction agent are essential components of rapid-sequence intubation, if the complications of both over- and underdosing are to be avoided. Although the former is potentially more serious, I suspect that underdosing is far more common and generally goes unrecognized. Thus, while readers can be reassured that patients intubated in this study survived the procedure and had few of the documented complications, it is impossible to know whether adequate anesthesia was achieved and how many of the patients endured substantial pain and anxiety.

Despite the limitations imposed by imprecise terminology, practitioners should be reassured that rapid-sequence intubation is safe when properly performed and has the potential to add substantially to the quality of their patients' care. Our colleagues in anesthesia already know this but they will probably continue to challenge the use of certain drugs and procedure by EPs. This is a healthy process that should stimulate EM to perform research that is increasingly precise and sophisticated. Ultimately success in research will establish the specialty's ex-

pertise in airway management and resolve some of its political struggles.

Emergency medicine has been well served in the past by publishing reports of our clinical successes. However, the specialty has matured to a level of sophistication that demands more critical, meticulous, and focused analysis at the core of our research endeavors. As a first step in that process, it is essential to adopt standardized terminology based upon objective and reproducible data.—STEVE DRONEN, MD, *Department of Surgery, Division of Emergency Medicine, University of Michigan, Ann Arbor, MI*

**Key words.** rapid-sequence intubation; terminology; nomenclature; research; emergency medicine.

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## The Problem of Ambulance Misuse: Whose Problem Is It, Anyway?

Perhaps coincidentally, the same week I read "Inappropriate use of emergency medical services transport: comparison of provider and patient perspectives"<sup>1</sup> by Richards and Ferrall was my last week as the medical director of a large, urban, fire-based emergency medical services (EMS) system. Certainly it is in such systems that the problems of ambulance misuse are most obvious and most critical.

One of my last duties that week was to review the case of Johnny S, a 22-year-old part-time college student and employee of a local retailer. On a recent Friday night he decided to go out with his friends, as his live-in girlfriend was working late. She arrived home from her

waitressing job shortly after midnight and was somewhat surprised to find Johnny home asleep in bed despite the fact that his pickup was not on the street in front of their apartment. She was also surprised to find that she could not arouse him.

She called 9-1-1 and a fire department ambulance staffed by two state-certified emergency medical technician-paramedics responded. They examined Johnny and also found him with a depressed mental state, although they could get him to respond to painful stimuli. After obtaining the history from Johnny's girlfriend, they concluded that he was drunk and/or suffering from the effects of the gamma hydroxybutyrate (GHB)