Language Validation of the Air Transport Minimum Data Set: Time-Related Terms

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Introduction: Transport times, such as time of call, are an essential part of the patient record. The purpose of this study was to validate a previously proposed minimum data set of time-related terms.

Methods: A stratified sample of 508 nurses, physicians, paramedics, pilots, and communication specialists was selected to participate in the validation survey. Subjects indicated their agreement/disagreement with the proposed terms and their definitions on a scale of 1 (low) to 3 (high). In addition, subjects indicated whether they currently collect the data elements or could do so easily. Finally, subjects said whether they were willing to release aggregate data for benchmarking purposes.

Results: One-hundred-eighteen subjects (23.2%) responded to the survey with usable data. Agreement to include the terms (level 3) ranged from 71.2% to 95.8%. Agreement with the proposed definition ranged from 72.9% to 95.8%. Seventy-eight of the respondents were willing to release all the data elements.

Conclusion: Fourteen of the 19 terms are recommended for inclusion in a minimum data set for rotor-wing transport. Most persons expressed willingness to release data for benchmarking efforts.

Introduction

Demonstration of the impact of air transport on patient morbidity and mortality requires access to valid and reliable patient and transport data. Not only must these data be valid and reliable within the context of a single transport program, but data also should be comparable across programs. Minimum data sets consist of collections of data elements with specified definitions. These data elements are grouped together for specific purposes[1] and can facilitate data sharing.

The creation of one or more minimum data sets directed at the information needs of air transport professionals will facilitate research studies and quality improvement programs. Aggregated data from several programs within a single research study provide increased statistical power because of increased sample size. Equivalent data terms and definitions ease comparisons of research results across multiple studies.

Several data set development efforts have been directed at emergency medical services (EMS). In 1973, the Emergency Medical Services System Act specified that EMS maintain a standardized patient record-keeping system. The federal government commissioned an original minimum data set from Macro Systems, Inc., but it was not widely implemented. Subsequently, the National Highway and Traffic Safety Administration (NHTSA) funded a grant to the University of

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Table 1.

SURVEY RETURN RATE

Professional Role	*Surveys Mailed*	*Surveys Returned**
Communication specialists	41	13 (31.7%)
Nurses	282	75 (26.6%)
Paramedics/EMTs	108	18 (16.7%)
Physicians	41	6 (14.6%)
Pilots	36	10 (27.8%)

**Professional role based on person to whom the survey was mailed, even if completed by someone else. Includes 4 returned surveys without data related to terms.*

Pittsburgh to develop an advanced life support minimum data set, which again met with limited success. An attempt by the American Society for Testing and Materials (ASTM) to develop an EMS minimum data set in the late 1980s also was unsuccessful.[2]

In the early 1990s, the 81-element Uniform Prehospital EMS Data Set was created after a series of meetings and subsequent consensus conference.[2,3] The data set, which consisted of both "essential" and "desirable" elements, included a name, a brief definition, and a discussion of data type. Data elements described the patient, provider, intervention, and system (*time unit responds, vehicle type*). This data set includes several concepts relevant to air transport, but the terms used for those concepts and their specific definitions usually are different from those traditionally related to air transport. For example, *time unit left scene* is defined as the time the response unit began physical motion from the scene. Neither the term *unit* nor *physical motion* were found in any of the 98 records used to identify potential terms for an air transport minimum data set.[4] This finding indicates that the terms do not reflect the language used by air transport personnel.

In 2002, the National EMSC Data Analysis Resource Center (NEDARC) evaluated the extent of use of this data set. Forty-three states collect some of the data elements, six states either have no statewide data collection or their system is under development, and one state did not respond to the request for information.[5] Of the 43 states that collect NHTSA data elements, on average 64 (79%) of the 81 data elements are collected.

The Crash Outcome Data Evaluation System (CODES) is another initiative sponsored by NHTSA. The purpose of this effort is to connect information from accident reports with medical data.[6] Finison[6] notes that more than half of the states have projects, but CODES data reporting has not been standardized. Thus, the ability to compare data between states is limited.

International efforts to create minimum data sets of relevance to EMS include several "Utstein Style" data sets, named for a consensus meeting held at the Utstein Abbey in Norway. These data sets are research-oriented, contain clinical and time-related terms, and have elements that are neither minimum nor necessary to meet the operational needs of transport programs. Utstein Style data sets have been created by task forces for out-of-hospital cardiac arrests,[7] trauma,[8] in-hospital cardiac arrest,[9] pediatric advanced life support,[10] disaster medical response,[11] and laboratory cardiopulmonary resuscitation research.[12]

Data Elements for Emergency Department Systems (DEEDS)[13] describes a minimum data set for voluntary use in emergency department (ED) patient records. The 156 data elements are arranged into eight sections: patient identification data, facility and practitioner identification data, ED payment data, ED arrival and first assessment data, ED history and physical examination data, ED procedure and result data, ED medication data, and ED disposition and diagnosis data. Except for date/time of illness or injury onset date and time, data are limited to events in the ED.

A final potential source of data elements is hospital-based trauma registries, which contain data related to patient injury and subsequent hospital care. However, collection of registry data is not standardized across sites,[14] and data elements are not specific to patients transported by air.

Despite the unavailability of a standardized data set, air transport programs do collect transport data. However, inconsistencies in data collection exist across programs. Thompson and Shaffer[4] found within actual transport records as many as 51 different terms referring to a single concept. In addition, individual terms, such as *response time*, may not always refer to the same concept.[15] Consequently, a need for a set of data elements specific to air transport exists.

Efforts to address the data needs within the air transport community began with the development of the Air Transport Minimum Data Set (ATMDS), a data set focused on times of relevance to air transport by helicopter. Time elements were the first to be included because most if not all critical care air transport programs consider the recording of time variables within the patient record to be essential.[16,17] All terms for the data set were obtained originally from transport records. The set of terms then was consolidated and definitions developed using the Delphi Technique.[4]

Because of the relatively small sample size used in the Delphi study and the purposive nature of the sample, bias may have been introduced into the data set.[4] Thus, validation of the ATMDS is essential. The purpose of this study was to evaluate the terms and definitions included in the ATMDS.

The research questions for the study were:

1. What is the degree of consensus on retaining the 19 terms proposed for the ATMDS?
2. What is the degree of consensus on the proposed definitions for the 19 terms in the ATMDS?
3. Is collection of the 19 proposed data elements feasible?
4. Are programs willing to release aggregate data for these terms to the Association of Air Medical Services (AAMS)?

Methods

The study chose a survey design because of the desire to obtain opinions from a wide international sample of persons representing multiple air transport programs. The University of Utah Institutional Review Board and the AAMS Survey Review Committee approved the study. Return of the question-