



Standard Practice for View of Emergency Medical Care in the Electronic Health Record¹

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1. Scope

1.1 This practice covers the identification of the information that is necessary to document emergency medical care in an electronic, paperless patient record system that is designed to improve efficiency and cost-effectiveness.

1.2 This practice is a view of the data elements to document the types of emergency medical information that should be included in the electronic health record.

1.2.1 The patient's summary record and derived data sets will be described separately from this practice.

1.2.2 As a view of the electronic health record, the information presented will conform to the structure defined in other ASTM standards for the electronic health record.

1.3 This practice is intended to amplify Guides E1239 and F1629 and the formalisms described in Practices E1384 and E1715.

1.3.1 This practice details the use of data elements already established in these standards and other national guidelines for use during documentation of emergency care in the field or in a treatment facility and places them in the context of the object models for health care in Practice E1384 that will be the vehicle for communication standards for health care data.

1.3.1.1 The data elements and the attributes referred to in this practice are based on national guidelines whenever available.

1.3.1.2 The EMS definitions are based on those generated from the previous EMS consensus conference sponsored by NHTSA and from ASTM task group F 30.03.03 on EMS Management Information Systems.

1.3.1.3 The Emergency Department (ED) definitions are based on the Data Elements for Emergency Department Systems (DEEDS) distributed by the Centers for Disease Control in June 1997.

¹ This practice is under the jurisdiction of ASTM Committee E31 on Healthcare Informatics and is the direct responsibility of Subcommittee E31.25 on Healthcare Data Management, Security, Confidentiality, and Privacy.

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1.3.1.4 The hospital discharge definitions are based on recommendations from the Centers for Medicare and Medicaid Services (CMS) for Medicare and Medicaid payment and from the Department of Health and Human Services for the Uniform Hospital Discharge Data Set.

1.3.1.5 Because the current trend is to store data as text, the codes for the attribute values have been determined as unnecessary and thus are eliminated from this document.

1.3.1.6 The ASTM process allows for the data elements to be updated as the national consensus changes. When national or professional guides do not exist, or whenever there is a conflict in the existing EMS, ED, hospital or other guides, the committee will recommend a process for resolving the conflict or an explanation of the conflict within each guide.

1.3.2 This practice reinforces the concepts set forth in Guide E1239 and Practice E1384 that documentation of care in all settings shall be seamless and be conducted under a common set of precepts using a common logical record structure and common terminology.

1.4 The electronic health record focuses on the patient.

1.4.1 In particular, the computer-based patient record sets out to ensure that the data document includes:

1.4.1.1 The occurrence of the emergency,

1.4.1.2 The symptoms requiring emergency medical treatment, and potential complications resulting from preexisting conditions,

1.4.1.3 The medical/mental assessment/diagnoses established,

1.4.1.4 The treatment rendered, and

1.4.1.5 The outcome and disposition of the patient after emergency treatment.

1.4.2 The electronic health record consists of subsets of data for the emergency patient that have been captured by different care providers at the time of treatment at the scene and en route, in the emergency department, and in the hospital or other emergency health care settings.

1.4.3 The electronic record focuses on the documentation of information that is necessary to support patient care but does not define appropriate care.

2. Referenced Documents

2.1 ASTM Standards:²

- E1239** Practice for Description of Reservation/Registration-Admission, Discharge, Transfer (R-ADT) Systems for Electronic Health Record (EHR) Systems
- E1384** Practice for Content and Structure of the Electronic Health Record (EHR)
- E1633** Specification for Coded Values Used in the Electronic Health Record
- E1715** Practice for An Object-Oriented Model for Registration, Admitting, Discharge, and Transfer (RADT) Functions in Computer-Based Patient Record Systems
- E1869** Guide for Confidentiality, Privacy, Access, and Data Security Principles for Health Information Including Electronic Health Records
- E1985** Guide for User Authentication and Authorization
- E2084** Specification for Authentication of Healthcare Information Using Digital Signatures³
- F1177** Terminology Relating to Emergency Medical Services
- F1288** Guide for Planning for and Response to a Multiple Casualty Incident
- F1629** Guide for Establishing Operating Emergency Medical Services and Management Information Systems, or Both

2.2 ANSI Standard:

- X3.172** American National Dictionary for Information Systems 1990⁴

2.3 Institute of Electrical Electronic Engineers Standards:

- 610.12** Standard Glossary of Software Engineering Terminology⁵

3. Terminology

3.1 For definitions of terms used in this specification, refer to ANSI **X3.172** and IEEE **610.12**

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *emergency condition*—change(s) in the patient's health status perceived to require immediate medical attention to prevent unnecessary death or disability (See also Guide **F1177**).

3.2.2 *emergency department (ED) data set*—that set of data elements collected in the emergency outpatient treatment facility prior to admission as an inpatient.

3.2.3 *emergency encounter*—a single event of health care for an emergency, such as care at the scene, or at the emergency outpatient setting. It concludes when the patient proceeds to the next phase of care for the emergency.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Withdrawn. The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁵ Available from Institute of Electrical and Electronics Engineers, Inc. (IEEE), 445 Hoes Ln., P.O. Box 1331, Piscataway, NJ 08854-1331, <http://www.ieee.org>.

3.2.4 *emergency episode*—a series of encounters relating to an emergency condition that may lead either to death, full recovery, or a clinical steady state.

3.2.5 *emergency episode documentation*—those recorded observations that describe the care rendered during the period of an emergency episode, whether brief or extended.

3.2.6 *other emergency outpatient facility*—emergency facility that is not a licensed emergency department connected to an acute care hospital but which provides emergency stabilization and treatment upon demand. Such facilities may include clinic/health centers, freestanding ambulatory surgery center, physician's office, etc.

3.2.7 *pre-hospital EMS data set*—that set of data elements collected at onset and en route prior to arrival at the first treatment facility.

4. Significance and Use

4.1 The Emergency Medical Service System (EMSS) in the United States has largely arisen since 1945 and has drawn to a great degree from the experience gained in military conflicts during and since World War II. The documentation of care, however, has remained largely paper record-based until recently.

4.1.1 Beginning in the 1970s both civilian and military agencies have closely examined electronic means of storing and managing patient data about emergency medical care.

4.1.2 The report of the Institute of Medicine on the Computer-Based Patient Record has emphasized the use of information technology in patient care in general and emergency care data in particular.

4.1.3 During this period ASTM has documented the logical structure of the electronic health record in Guide **E1239** and Practice **E1384**, while Guides **F1288** and **F1629** has defined the patient care data, to be gathered in the pre-hospital record, and the outcome data, relative to the pre-hospital phase of the emergency, which are collected in the emergency department and after inpatient admission.

4.1.3.1 Specifications for the logical model are also presented in Practice **E1715**.

4.2 This practice shows how the data gathered for EMS operations and management merge smoothly into the computer-based patient record, consistent with the recognition that these data are part of the primary record of care. Several states⁶ have formalized that recognition in state law.

4.2.1 This practice does not instruct physicians how to collect data for patient care.

4.2.2 This practice does not indicate what information needs to be collected at the time of patient care.

4.3 The task now is to document, using standard conventions, the means by which this integration occurs in order to set the stage for the capture and transfer of such emergency care data using information technology and telecommunications in a standardized way consistent with all other settings of care while protecting the privacy and confidentiality of that data.

⁶ State of Washington: Revised Code of Washington 76.168 and Washington Administrative Code 246-976-380.

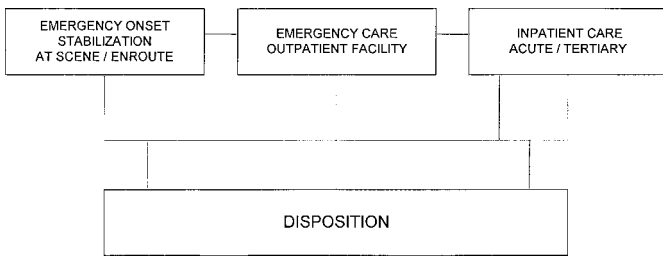


FIG. 1 Data Flow in Emergency Medical Care

5. Phases of Emergency Medical Care

5.1 Patient data are collected during the different phases of the emergency by different care providers, the number and type depend on the severity of the emergency.

5.1.1 Fig. 1 presents the different phases of emergency from onset until final disposition, at which point the patient is no longer the responsibility of emergency care.

5.1.2 In some instances, emergency patients are transported from the location of onset to an emergency department and then later transferred to specialty tertiary care centers to receive treatment for life-threatening medical problems.

5.1.3 Records completed for the emergency patient at different points in time are unique to the type of emergency response and the phase of the emergency.

5.1.4 This practice does not include rehabilitation and outpatient follow-up as part of emergency medical care since this information is recorded elsewhere in the RHR and is not within the scope of this practice.

5.2 Documentation of emergency care is more efficient if the data are captured at the time of collection so that this information can be incorporated simultaneously into the electronic health record at the time of data entry.

5.3 A core of patient identification information (age/date of birth, sex/gender, facility identification, times, etc.) is common to all of the medical records.

5.3.1 Other data elements exist that are unique to the emergency event, and still others exist that are unique to a specific care site.

5.3.2 Although many different records may be completed for a single emergency patient, not all of the data collected are incorporated into the electronic health record.

5.3.2.1 Except for times (see 6.14.4 and 6.14.14), administrative data which are useful for ambulance service management information, such as the use of lights and sirens and mileage, the EMS agency's response number, the type of EMS vehicle, and environmental factors affecting EMS care, have been excluded from the electronic health record, which focuses on the patient.

5.4 The electronic health record has the potential to improve data quality as follows.

5.4.1 Time and date entries will not be subject to the idiosyncrasies of the clock at hand, or the memory of the person entering the data but may be automatically recorded by the computer; however, when data are entered retrospectively, the system should allow a manual override to record actual time.

5.4.2 Direct data entry, by voice, dictation, touch, etc., by the care provider will eliminate the need to interpret the care provider's handwriting.

5.5 Each segment of emergency care is cumulative, though not necessarily sequential, to the prior documentation in the computer-based patient record. Data entered also may update previous documentation.

5.6 The EMS data set is and will continue to be a subset of Practice E1384 and Specification E1633; it will continue to be included in Guide F1629, EMS-MIS global lists of elements.

5.6.1 Each encounter contains contributions to the various record segments noted in Practice E1384.

4.3.1 The electronic health record has the potential to reduce health care costs by optimizing case management and supporting effective post ED follow-up.

4.3.2 Systematizing the data also enhances its ability to be used consistently, with proper protection, for research into and for management of EMSS operations within the various jurisdictional boundaries.

4.4 The electronic form of the emergency episode documentation utilizes the same logical data model as the electronic health record, but it focuses on data collected during the different phases of the emergency.

4.4.1 These data sets do not limit what may be recorded, or by whom, but they do identify those data considered essential, when they exist. These data sets include all those data recorded to document instances of emergency medical care.

4.4.2 Data organized to enhance flexible and efficient management of information.

4.4.2.1 Identifications of practitioners and facilities will be coded, when necessary, to protect confidentiality and to make provider data comparable. Names will be included when they are necessary to support patient care. Privacy and confidentiality of patient data should be handled according to Guide E1869.

4.4.2.2 Provider identification numbers will be maintained on master data files which also include additional information such as specialty, license level, and the like.

4.4.2.3 Provider identification numbers recorded in the electronic health record will automatically link to the master data files to eliminate the need for duplicate data entry of reference material in the patient record.

4.4.2.4 Coding systems for emergency reporting (ICD-9-CM, CPT,⁷ HCPCS,⁸ SNOMED⁹) will be referenced in the master data files for Practice E1384 as appropriate.

4.4.2.5 The efficient arrangement of the logical model of Practice E1384 permits output to be generated and identified to mirror the paper record, such as nurse-specific or physician-specific notes.

4.4.2.6 The arrangement of the logical model permits multiple entries of assessment data, using a small group of variables, that can then be used to generate output. For example, sequence of diagnoses by date-time.

⁷ Current Procedure Terminology for Physician Services.

⁸ HCFA (Health Care Financing Administration) Common Procedure Coding System.

⁹ Systematized Nomenclature of Medicine.