NEMSIS v3 EMSDataSet Guide

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Overview

The NEMSIS v3 data standard includes three data sets: DEMDataSet (snapshot information about EMS agencies), EMSDataSet (EMS patient care reports), and StateDataSet (state reporting requirements and resources). This guide discusses the EMSDataSet. Each EMS activation will have an ePCR created by EMS Clinicians in the field. The EMSDataSet includes patient conditions, impressions, treatments, and response information for that EMS unit.

Purpose of the EMSDataSet

The NEMSIS Technical Assistance Center (TAC) created the EMSDataSet XML Schema (XSD) to provide a consistent format in which to share NEMSIS v3 data about an EMS response. The elements within the EMSDataSet adhere to the national standard but can include custom elements developed by the state and/or additional schematron validation rules that can refine national schematron validation rules or add new schematron validation rules. Refer to state specific resources that may expand upon the national standards.

EMSDataSet Sections

The EMSDataSet contains the following ePCR sections for each activation. Click each section for more information in the v3.5.0 Data Dictionary.

dAgency.01	eScene	eProtocols
dAgency.02	eSituation	eMedications

dAgency.03	eInjury	eAirway
eRecord	eArrest	eDevice
eResponse	eHistory	eDisposition
eDispatch	eProcedures	eOutcome
eCrew	eNarrative	eOther
eTimes	eVitals	eCustomResults
ePatient	eLabs	
ePayment	eExam	

The EMSDataSet data dictionary, API, and XSD files are available on the Version 3 Data Dictionaries page of the NEMSIS Web site. Elements in the EMSDataSet are either Mandatory, Required, Recommended, or Optional.

EMSDataSet Elements

Elements within the EMSDataSet can be national, state, recommended or optional elements. A national element is required to be included in the XML file sent to the national repository. A state element is the most likely to be required to be included in the XML file sent to the state repository. Recommended or optional elements can be chosen by state or local EMS agencies to be collected. There are 144 National elements, 217 state elements, and 224 elements that are recommended or optional elements.

Each element within the EMSDataSet has a usage level that indicates when the data element is expected to be collected.

- **Mandatory** = Must be present within the EMSDataSet and does not allow for NOT values.
- **Required** = Must be present within the EMSDataSet and allows NOT values.
- **Recommended** = Does not need to be present within the EMSDataSet and allows NOT values.
- **Optional** = Does not need to be present within the EMSDataSet and does not allow for NOT values.

Required and Recommended elements within the EMSDataSet allow "Not Values". States can write validation rules regarding the use of "Not Values" within the national data standard. For more information on the use of "Not Values," please refer to NEMSIS v3 Guidance for the use of NOT Values.

- "Not Values" are used (where permitted) to document that a data element was not applicable, not completed, or not collected.
- "Not Values" are documented as an attribute of an element.

Each element within the EMSDataSet has a recurrence level which indicates how often the element may appear within the XML structure. This can be found at the top of the element page within the NEMSIS Data Dictionaries.
- **0:1** = element is not required and can occur only once.
- **0:M** = element is not required and can repeat multiple times.
- **1:1** = element is required and can occur only once.
- **1:M** = element is required and can repeat multiple times.

Each element within the EMSDataSet may or may not have associated attributes. An attribute provides extra information within the element. For more technical information about attributes, please refer to NEMSIS v3 Pertinent Negatives (PN) and NOT Values (NV) Usage. See below for a list of attributes that can be found throughout the NEMSIS standard.

List of Attributes

PN (Pertinent Negative)	NV (Not Value)	CorrelationID
8801001 - Contraindication Noted	7701001 - Not Applicable	Data Type = String
8801003 - Denied By Order	7701003 - Not Recorded	minLength = 0
8801005 - Exam Finding Not Present	7701005 - Not Reporting	maxLength = 255
8801007 - Medication Allergy		
8801009 - Medication Already Taken	**Code Type**	**EmailAddressType**
8801013 - No Known Drug Allergy	9924001 = ICD-10	9904001 - Personal
8801015 - None Reported	9924003 = RxNorm	9904003 - Work
8801017 - Not Performed by EMS	9924005 = SNOMED-CT	
8801019 - Refused		**PhoneNumberType**
8801021 - Unresponsive	**DistanceUnit**	9913001 - Fax
8801023 - Unable to Complete	9921001 - Kilometers	9913003 - Home
8801025 - Not Immunized	9921003 - Miles	9913005 - Mobile
8801027 - Order Criteria Not Met		9913007 - Pager
8801029 - Approximate	**StreetAddress2**	9913009 - Work
8801031 - Symptom Not Present	Data Type = String	
	minLength = 1	**VelocityUnit**
UUID		9921001 - Kilometers

UUIDs must be generated using the IETF RFC 4122 standard.	maxLength = 255	9921003 - Miles
RFC 4122 defines four algorithms for UUID generation, any of these four can be used.		
UUIDs must be represented in canonical form, matching the following regular	**TimeStamp**	
	Data Type = DateTime	
expression: [a-fA-F0-9]{8}-[a-fA-F0-9]{4}-[1-5][a-fA-F0-9]{3}-[89abAB][a-fA-F0-9]{3}-[a-fA-F0-9]{12}	minValue = 1950-01-01T00:00:00-00:00	
	maxValue = 2050-01-01T00:00:00-00:00	

EMSDataSet at the EMS Agency Level

EMS software vendors that create field-level products are tested on their ability to collect and send the full and complete EMSDataSet.

Each state or local EMS Agency may develop validation rules in addition to the national data standard. These rules may disallow certain values or Not Values within elements, require only a valid value as defined by the state or local EMS Agency within specific elements, or apply constraints to certain elements based on the values recorded in other elements. It is important to carefully consider any additional schematron validation rules before implementation. Consideration should be taken regarding whether the field crew would always have the information within additional validation rules or that there is a way for an EMS clinician to enter a value for "Unknown".

Examples of additional schematron validation rules:
- Removing Not Values within an element: If Cause of Injury (eInjury.01) indicates a trauma, mechanism of injury cannot be "Not Applicable", "Not Recorded", or "Not Reporting".
- Requiring specified values within specific elements: Crew Member Certification Level (eCrew.02) must be one of the state/agency allowed crew member certification levels.
- Requiring additional elements based on ePCR data entry: If Cause of Injury (eInjury.01) indicates an MVC, Use of Occupant Safety Equipment (eInjury.07) must have a valid value.

Retrieving EMS Schematron Schemas

EMSDataSet schematron schemas containing rules that need to be applied to the EMSDataSet data reported to a state are published by the NEMSIS TAC within each state's repository. For more information about the NEMSIS v3 repositories, see the [NEMSIS v3 Resource Repository Guide](). If a state has published a state-specific EMSDataSet schematron schema, it is contained in the state schematron folder and is named XX_EMSDataSet.sch (where XX is the postal abbreviation of the state). EMS software vendors are encouraged to clone the state repositories and set up automated systems to monitor and process updates.

EMSDataSet Section Descriptions

Recommendations are provided for state systems to generate and for local systems to process information in an EMSDataSet file. Each section of the EMSDataSet is made up of elements intended to collect different aspects of the ePCR.

eRecord Elements Section

This section collects the ePCR number and information about the software used to create the ePCR for this EMS Activation. Information will likely be auto-generated by the software and not by EMS clinician direct entry.

eResponse Elements Section

This section collects agency and unit response information. Some of the information includes response numbers, any delays during the EMS Activation, odometer information and response mode information. The information may come from dispatch software interface (such as CAD) or EMS clinician direct entry.

eDispatch Elements Section

This section collects dispatch information. This section contains dispatch reason, emergency medical dispatch card information, and dispatch priority information. The information may come from dispatch software interface (such as CAD), or EMS clinician direct entry.

eCrew Elements Section

This section is designed to collect the crew information on the unit. This information may come from a dispatch software interface or EMS Clinician direct entry.

eTimes Elements Section

This section is designed to collect the time information for this EMS Activation. The date/times recorded can include dispatch date/time, scene date/time, and arrival at scene or destination date/time. This information may come from a dispatch software interface or EMS Clinician direct entry.

ePatient Elements Section

This section is designed to collect patient information for this EMS Activation. Patient information can include patient name, home address, age and gender information. This information may come from a health information exchange for patient lookup or by EMS Clinician direct entry.

ePayment Elements Section

This section is designed to collect information necessary to collect payment for the care provided. This section collects information such as the physician's certification statement, patient insurance information, closest relative to patient, patient employer information, and supplies used by this unit for the EMS Activation. This information may come from a health information exchange, a billing software interface or EMS Clinician direct entry.

eScene Elements Section

This section is designed to collect information describing the scene the unit responded to, including incident location information and other responders on the scene. This information may come from a dispatch software interface or from EMS Clinician direct entry.

eSituation Elements Section

This section is designed to collect information describing the patient's condition for this EMS Activation. Data elements include complaints, symptoms, impressions and justification for transfer. This information may come from a health information exchange or from EMS Clinician direct entry.

eInjury Elements Section

This section is designed to collect information describing the patient's injury(ies) related to this EMS Activation. Data elements include cause of injury, use of safety equipment, triage criteria, and ACN information. This information may come from an auto crash notification interface or from EMS Clinician direct entry.

eArrest Elements Section

This section is designed to collect information describing the specifics related a patient who experiences a Cardiac Arrest event related to this EMS Activation. Data elements include information about the arrest and resuscitation efforts taken. This information comes from EMS Clinician direct entry.

eHistory Elements Section

This section is designed to collect information describing the patient's medical history related to this EMS Activation. Data elements include information about the patient's medical history prior to this EMS Activation. This information may come from a health information exchange or from EMS Clinician direct entry.

eNarrative Element Section

This section contains a single data element that allows the crews to expand with free text on the selections made within the ePCR elements completed from codes/descriptions available within the ePCR software. This information is from EMS Clinician direct entry.

eVitals Elements Section

This section is designed to collect the patient's vital signs taken during this EMS Activation. Data elements include electrocardiography, blood pressure, pulse, Glasgow Coma Core, pain scales, stroke scales and other vital sign information. This information could be from medical devices or EMS Clinician direct entry.

eLabs Elements Section

This section is designed to collect lab information for the patient associated with this EMS Activation. Data elements include the type of lab or image and results. This information could be from health information exchange or from EMS Clinician direct entry.

eExam Elements Section

This section is designed to collect physical exam information for the patient associated with this EMS Activation. Data elements include patient weight, mental and neurological assessments, and physical exam of body parts. This information should come from EMS Clinician direct entry.

eProtocols Elements Section

This section is designed to collect the information regarding the local protocols the EMS Clinicians utilized to direct patient care related to the ePCR. Data elements include the protocol and the age category of the protocol to be indicated. This information should come from EMS Clinician direct entry.

eMedications Elements Section

This section is designed to collect the information regarding medications taken by the patient, given by the crew on the unit associated with the ePCR, or medications given by others prior to the unit arrival on scene or during the EMS Activation. Data elements include date/time the medication was administered, name of medication, route and dose of medication, who administered and the patient's response to the medication. This section also supports the ability to report a medication that was *not* administered, and why. This information should come from health information exchange or EMS Clinician direct entry.

eProcedures Elements Section

This section is designed to collect the information regarding procedures performed by the crew on the unit associated with the ePCR, or procedures performed by others prior to the unit arrival on scene or during the EMS Activation. Data elements include date/time the procedure was performed, name of procedure who performed the procedure and the patient's response to the procedure. This section also supports the ability to report a procedure that was *not* performed, and why. This information should come from health information exchange or EMS Clinician direct entry.

eAirway Elements Section

This section is designed to collect the information specific to the placement of invasive airways by the crew on the unit associated with the ePCR. Data elements include why the airway was placed, date/time the airway was placed and the confirmation steps taken to confirm proper placement. Each airway confirmation can optionally reference a specific procedure in the eProcedures section to indicate which airway procedure the confirmation is related to. This information should come from EMS Clinician direct entry.

eDevice Elements Section

This section is designed to collect the information specific to the medical devices used during the EMS Activation. Data elements include device information, date/time of event from the medical device, and information provided from the device. This information should come from the medical device.

eDisposition Elements Section

This section is designed to collect the information about the disposition of the unit and crew associated with this EMS Activation. Data elements include transport destination information and the incident disposition for crew, unit, and patient. This information could come from a dispatch software interface, agency demographic data, and EMS Clinician direct entry.

eOutcome Elements Section

This section is designed to collect the information about the patient outcome after the transport to the destination. Data elements include emergency department procedures, diagnosis, hospital admission, and patient outcome. This information should come from a hospital data exchange interface.

eOther Elements Section

This section is designed to collect the information not collected elsewhere within the NEMSIS data standard associated with the unit and ePCR for this EMS Activation. Data elements include protective gear utilized by the crew members on the unit, who completed the ePCR for this EMS Activation, and signatures related to this EMS Activation. This information should come from the ePCR software or EMS Clinician direct entry.

Custom Data Elements Section

eCustomConfiguration and eCustomResults contain the information for any custom data element included in the EMSDataSet. A NEMSIS compliant software product may be customized with data elements or values that are not defined in the NEMSIS v3 standard. See Approaches to using NEMSIS v3 Custom Elements or Custom Element Best Practice Guide for information on using custom elements within the EMSDataSet.

Lifecycle of the EMSDataSet

The ePCR generated by a collect and send software contains data from the EMSDataSet. The newly created ePCR is submitted to the state data repository (NEMSIS Compliant Receive and Process Software) from the collect and send software. The ePCR is then submitted from the state data repository to the national data repository. The transfer of data from one NEMSIS compliant system to another is done via NEMSIS web services.   More information can be found regarding [web services](#) on the NEMSIS.org website.

The NEMSIS web services does not provide a way for a system to indicate whether the data the NEMSIS compliant software is submitting is new or is an update to previously sent data. The receive and process systems rely on a combination of data elements to recognize whether a record the system is receiving is new or is an update to an existing record.

Prior to NEMSIS v3.5.0, an ePCR will be uniquely identified by some combination of the following elements/attributes from the EMSDataSet. The presence of the eResponse.14 - EMS Unit Call Sign and eTimes.03 – Unit Notified by Dispatch Date/Time elements can cause some records to be interpreted as new rather than updates if a change was made in these two elements.

- dAgency.01 EMS Agency Unique State ID
- dAgency.02 EMS Agency Number
- dAgency.04 EMS Agency State
- eRecord.01 Patient Care Report Number
- eResponse.14 EMS Unit Call Sign
- eTimes.03 Unit Notified by Dispatch Date/Time

In NEMSIS v3.5.0, a UUID within the EMSDataSet was added to the NEMSIS standard. An ePCR can be uniquely identified by the following combination of elements/attributes:

- dAgency.01 - EMS Agency Unique State ID
- dAgency.02 - EMS Agency Number
- dAgency.04 - EMS Agency State
- eRecord.01 - PatientCareReport/@UUID - The universally unique identifier for the patient care report

The technical specifications of the UUID attribute added in NEMSIS v3.5.0 provides a unique identifier to ensure that an ePCR can be overwritten and not duplicated when an ePCR is resubmitted by a local EMS agency to the state data repository, or when a state data repository resubmits data to the national data repository.

Conclusion

The EMSDataSet provides a format in which EMS ePCR data can be collected in a consistent and standardized format which facilitates improved.   local, state, and national data analysis.