The Development of Defined Lists for Specific NEMSIS Elements

Background:

In the NEMSIS Version 2 (V2) standard, a truncated list of element values for several NEMSIS elements were identified and implemented, based on a review of existing EMS Patient Care Reporting systems collected in several States. Examples of NEMSIS V2 elements utilizing these truncated lists of values include:

E09_13: PRIMARY SYMPTOM

E09_14: OTHER ASSOCIATED SYMPTOMS

E09_15: PROVIDERS PRIMARY IMPRESSION

E09_16: PROVIDER'S SECONDARY IMPRESSION

E10_01: CAUSE OF INJURY

As an example, in the NEMSIS Version 2 standard, there were 31 value choices to document a "cause of injury". The net consequence of these truncated lists was an over- dependence on an "other" category, or EMS agencies requesting of Software products that additional values be added to elements to properly document an EMS event.

In the NEMSIS Version 3 standard, to address this issue, existing American National Standards Institute (ANSI) approved code sets were incorporated to extend and enhance the value choices available for 22 NEMSIS elements. The ANSI Approved codes sets utilized in NEMSIS V3 include:

ICD-10-CM

SNOMED-CT

RxNORM

LOINC

Subsets of codes within each of these coding standards was identified for use, to reduce the potential for miscoding using values not appropriate for use in the out-of-hospital setting.

Issues Associated with use of ANSI Code Sets in NEMSIS Version 3:

The use of ANSI approved code sets did increase the available values associated with 22 NEMSIS V3 elements, perhaps to a much larger extent than is necessary. Software implementations of the ANSI code subsets dramatically increased the specificity and breath of code values for all involved NEMSIS elements. As an example, in 2017, using the NEMSIS V3 standard, 1,357 different ICD-10-CM code values were recorded for the element "Cause of Injury". In 2019, the number of different codes for "Cause of Injury" had increased to 2,154. For EMS provider primary impression of the patient's condition, in 2019, 8,316 different ICD-10-CM codes were submitted.

While inspecting the recorded code values, it became clear that the breath of available codes may be degrading both the accuracy and reliability of the recorded values for each element. For example, when assessing

recorded RxNORM medication codes in the 2018 data, it was noted that 12 different codes were used to document the administration of Albuterol. These 12 codes utilized different brand names or dosages (which is captured in a separate NMSIS element). Also, indications of EMS provider "code fatigue" were also present. In 2019, even with the exponential growth in diverse code use, a general "pain" code was used more often for trauma patients, when compared to NEMSIS V2 data. The underlying supposition is that in the presence of too many code choices to review with every activation, EMS providers are relying on generic or "go-to" codes for broad types of EMS activations.

Identifying a Solution:

In 2016, concerned that vast ANSI code sets may be overwhelming to EMS providers, the NEMSIS TAC developed "suggested lists" of codes for elements utilizing ANSI standards. These suggested lists attempted to target use of specific ANSI approved codes that would prove useful in the pre-hospital environment. Codes sets were organized in a hierarchical fashion, in two-steps (parent and child codes), promoting software developers to utilze code "drill-downs" for ease of use. However, use of these codes sets was not mandatory and uptake was sporadic. In 2019, the NEMSIS TAC evaluated the appropriateness of codes included in the suggested lists, by comparing them to codes actually submitted in 2018 through mid-2019 (36 million records). This review lead to a 2019 revision of the 2016 suggested lists. The table below highlights differences in the 2016 and 2019 suggested lists and the percentage of submitted codes that are adequately captured by the 2019 revision, for selected NEMSIS elements relying on ANSI code sets.

Suggested List	2016 Parent/Child	2019 Parent/Child	Representing
eInjury.01 Cause of Injury	25 Parent / 144 Codes	17 Parent / 82 Codes	91.13%
eMedications.03 Medications Given	127 Codes	70 Codes	166.20%
eProcedure.03 Procedure	13 Parent / 121 Codes	18 Parent / 110 Codes	90.06%
eScene.09 Incident Location	30 Parent / 209 Codes	9 Parent / 35 Codes	97.06%
eSituation.09-10 Primary and Other Symptoms	26 Parent / 159 Codes	17 Parent / 124 Codes	90.53%
eSituation.11-12 Primary and Secondary Impressions	17 Parent / 171 Codes	17 Parent / 120 Codes	93.50%

Movement to Require the Use of the 2019 Suggested Lists:

Beginning with initial recommendations resulting from a work-group convened at the 2018 NEMSIS V3 Implementation Meeting in Park City Utah, State EMS Data Managers and stakeholders participating on the Spring 2020 V3 Implementation video conferences formulated and approved a process to require the use of the 2019 lists. Of the 22 NEMSIS V3 elements utilizing defined ANSI code sets, nine elements have no associated list, and defined patterns identifying usable ANSI codes. For the remaining 13 elements, suggested value lists become "defined" (i.e., standardized). These defined lists focus on EMS activations characterized by a 9-1-1 initiated ground response with BLS or ALS care provided.

These defined lists are expected to be presented to clinicians in the software's graphical interface. This expectation will be evaluated during compliance testing. Specialty care (i.e., air-medical /interfacility/critical care transports) will utilize the same defined lists, excepting for elements identifying medications given and procedures performed. ANSI code values outside of defined lists will be allowed for all users through existing defined code patterns. Finally, standard code "roll-ups" will be provided by the NEMSIS TAC allowing all reported codes at the National and State-levels, to be properly aggregated for research and performance assessment purposes.