NEMSIS V3 Case Definition

Seizure

# Date

June 27, 2023

# Definition

The patient experienced a seizure.

# Criteria Description

Patient care reports where:

* any symptom or impression is seizure  
  or
* seizure protocol is used.

# Pseudocode

Patient care reports where:

eSituation.09 - Primary Symptom  
eSituation.10 - Other Associated Symptoms  
eSituation.11 - Provider's Primary Impression  
eSituation.12 - Provider's Secondary Impressions

* F44.5 Conversion disorder with seizures or convulsions
* G40\* Epilepsy and recurrent seizures
* P90 Convulsions of newborn
* R56\* Convulsions, not elsewhere classified

OR

eProtocols.01 Protocols Used

* Medical-Seizure

# XPath Code

/EMSDataSet/Header/PatientCareReport

  [

    eSituation/(eSituation.09, eSituation.10, eSituation.11, eSituation.12)

      [matches(., '^(F44.5)|(G40)|(P90)|(R56)')]

    or

    eProtocols/eProtocols.ProtocolGroup/eProtocols.01 = '9914141'

  ]

# SAS Code

proc sql;

  create table SeizureKey as

  select distinct pcrKey from

    (

      select pcrKey from nemsis.factPcrPrimarySymptom where

        substr(eSituation\_09,1,3) in ('G40', 'P90', 'R56') or

        eSituation\_09 = 'F44.5'

      union

      select pcrKey from nemsis.factPcrAdditionalSymptom where

        substr(eSituation\_10,1,3) in ('G40', 'P90', 'R56') or

        eSituation\_10 = 'F44.5'

      union

      select pcrKey from nemsis.factPcrPrimaryImpression where

        substr(eSituation\_11,1,3) in ('G40', 'P90', 'R56') or

        eSituation\_11 = 'F44.5'

      union

      select pcrKey from nemsis.factPcrSecondaryImpression where

        substr(eSituation\_12,1,3) in ('G40', 'P90', 'R56') or

        eSituation\_12 = 'F44.5'

      union

      select pcrKey from nemsis.factPcrProtocol where eProtocol\_01 = '9914141'

    )

  ;

quit;

# Discussion

The ICD-10 section R56 includes R56.1 Post traumatic seizures. Depending on the purpose of a particular project, it may be appropriate to exclude R56.1.

The NEMSQA definition for *Seizure-02 Patient with Status Epilepticus Receiving Intervention* only selects seizures with status epilepticus, but this case definition selects all seizures. The NEMSQA definition can be implemented by searching for impressions with the more restrictive regular expression /^G40...[1,3]/. The NEMSQA definition is also limited to impressions, whereas this case definition includes symptoms as well as impressions. The NEMSQA definition does not include the seizure protocol criterion.

The following potential criteria are not used in this case definition:

* eDispatch.01 - Dispatch Reason: Convulsions/Seizure. The reason for dispatch may not match what EMS providers actually found once on scene.
* eExam.20 - Neurological Assessment: Status Seizure, Other Seizures. eExam.20 is not a national element. Its use in the criteria would cause a different set of records to be selected depending on whether or not it was collected and available in the data set, which would lead to local inconsistencies in the case selection.
* eMedications.03 - Medication Administered: benzodiazepines. Benzodiazepines may be administered for conditions other than seizure.

The NEMSIS Defined List for Impressions includes three codes related to seizures: G40.89 Other seizures (which has been given the suggested label “Seizure, NOS”); G40.901 Epilepsy, unspecified, not intractable, with status epilepticus (which has been given the suggested label “Seizure, status epilepticus”); and G40.909 Epilepsy, unspecified, not intractable, without status epilepticus (which has been given the suggested label “Seizure, epileptic,” which is inconsistent with the ICD-10 term).

# References

Gaddam S. (2021). Racial disparities in emergency care for seizures in the United States. *International Paramedic Practice.* [internationaljpp.com/features/article/racial-disparities-in-emergency-care-for-seizures-in-the-united-states](https://www.internationaljpp.com/features/article/racial-disparities-in-emergency-care-for-seizures-in-the-united-states).

Hart L, Sanford J, Sporer S, Kohn M, Guterman E. (2021). Identification of Generalized Convulsive Status Epilepticus from Emergency Medical Service Records: A Validation Study of Diagnostic Coding. *Prehospital Emergency Care.* 25:5,607-614. [doi.org/10.1080/10903127.2020.1817214](https://doi.org/10.1080/10903127.2020.1817214).

Ramgopal S, Martin-Gill C. (2023). Prehospital Seizure Management in Children: An Evaluation of a Nationally Representative Sample. *The Journal of Pediatrics*. [doi.org/10.1016/j.jpeds.2023.02.023](https://doi.org/10.1016/j.jpeds.2023.02.023).

*Seizure-02: Patient with Status Epilepticus Receiving Intervention*. National EMS Quality Alliance (NEMSQA). [nemsqa.org/assets/docs/NEMSQA-Seizure-02\_2021.pdf](https://www.nemsqa.org/assets/docs/NEMSQA-Seizure-02_2021.pdf)

Shtull-Leber E, Silbergleit R, Meurer WJ. (2017). Pre-hospital midazolam for benzodiazepine-treated seizures before and after the Rapid Anticonvulsant Medication Prior to Arrival Trial: A national observational cohort study. *PLoS ONE.* 12(3):e0173539. [doi.org/10.1371/journal.pone.0173539](https://doi.org/10.1371/journal.pone.0173539).