

Seizure

Date

May 27, 2025 (updated to ignore eSituation.10 - Other Associated Symptoms if it has a Pertinent Negative, "Symptom Not Present")
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 (without Pertinent Negative)

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[not(@PN)], eSituation.11, eSituation.12)
  [matches(., '^(F44.5)|(G40)|(P90)|(R56)')]
or
  eProtocols/eProtocols.ProtocolGroup/eProtocols.01 = '9914141'
]
```

SAS Code

The NEMESIS public release research dataset does not include the Pertinent Negative attribute on eSituation.10 - Other Associated Symptoms, which was added in NEMESIS version 3.5, so the SAS code will select some records where a symptom was actually documented as “Symptom Not Present.” This is estimated to affect less than 3% of v3.5 records.

```
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. *Journal of Paramedic Practice*. paramedicpractice.com/content/features/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.

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.

Seizure-02: Patient with Status Epilepticus Receiving Intervention. National EMS Quality Alliance (NEMSQA). 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.