

# Motor Vehicle Crash—Pedal Cycle

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## Date

May 5, 2025 (Added ICD-10 codes for “electric (assisted) bicycle”)  
August 26, 2021

## Definition

The patient was a pedal cycle rider injured in a motor vehicle crash.

## Criteria Description

Patient care reports where:

- cause of injury is pedal cycle rider injured in collision with a motor vehicle

## Pseudocode

Patient care reports where:

eInjury.01 Cause of Injury:

*Added by*

*NEMESIS*

*(see*

*Discussion)*

*Y*

*Code*

*Description*

*V12*

*Pedal cycle rider injured in collision with two- or three-wheeled motor vehicle*

*V12.3\**

*Person boarding or alighting a pedal cycle injured in collision with two- or three-wheeled motor vehicle*

*V12.4\**

*Pedal cycle driver injured in collision with two- or three-wheeled motor vehicle in traffic accident*

*V12.5\**

*Pedal cycle passenger injured in collision with two- or three-wheeled motor vehicle in traffic accident*

*V12.9\**

*Unspecified pedal cyclist injured in collision with two- or three-wheeled motor vehicle in traffic accident*

*Y*

*V13*

*Pedal cycle rider injured in collision with car, pick-up truck or van*

*V13.3\**

*Person boarding or alighting a pedal cycle injured in collision with car, pick-up truck or van*

Added by  
NEMSIS

(see

Discussion)

	Code	Description
	V13.4*	Pedal cycle driver injured in collision with car, pick-up truck or van in traffic accident
	V13.5*	Pedal cycle passenger injured in collision with car, pick-up truck or van in traffic accident
	V13.9*	Unspecified pedal cyclist injured in collision with car, pick-up truck or van in traffic accident
Y	V14	Pedal cycle rider injured in collision with heavy transport vehicle or bus
	V14.3*	Person boarding or alighting a pedal cycle injured in collision with heavy transport vehicle or bus
	V14.4*	Pedal cycle driver injured in collision with heavy transport vehicle or bus in traffic accident
	V14.5*	Pedal cycle passenger injured in collision with heavy transport vehicle or bus in traffic accident
	V14.9*	Unspecified pedal cyclist injured in collision with heavy transport vehicle or bus in traffic accident
Y	V19.4	Pedal cycle driver injured in collision with other and unspecified motor vehicles in traffic accident
	V19.40*	Pedal cycle driver injured in collision with unspecified motor vehicles in traffic accident
	V19.49*	Pedal cycle driver injured in collision with other motor vehicles in traffic accident
Y	V19.5	Pedal cycle passenger injured in collision with other and unspecified motor vehicles in traffic accident
	V19.50*	Pedal cycle passenger injured in collision with unspecified motor vehicles in traffic accident
	V19.59*	Pedal cycle passenger injured in collision with other motor vehicles in traffic accident
Y	V19.6	Unspecified pedal cyclist injured in collision with other and unspecified motor vehicles in traffic accident
	V19.60*	Unspecified pedal cyclist injured in collision with unspecified motor vehicles in traffic accident
	V19.69*	Unspecified pedal cyclist injured in collision with other motor vehicles in traffic accident
	V19.9*	Pedal cyclist (driver) (passenger) injured in unspecified traffic accident
	V22.31*	Person boarding or alighting an electric (assisted) bicycle injured in collision with two- or three-wheeled motor vehicle
	V22.41*	Electric (assisted) bicycle driver injured in collision with two- or three-wheeled motor vehicle in traffic accident
	V22.51*	Electric (assisted) bicycle passenger injured in collision with two- or three-wheeled motor vehicle in traffic accident
	V22.91*	Unspecified electric (assisted) bicycle rider injured in collision with two- or three-wheeled motor vehicle in traffic accident

Added by  
NEMSIS  
(see

Discussion)

Code	Description
V23.31*	Person boarding or alighting an electric (assisted) bicycle injured in collision with car, pick-up truck or van
V23.41*	Electric (assisted) bicycle driver injured in collision with car, pick-up truck or van in traffic accident
V23.51*	Electric (assisted) bicycle passenger injured in collision with car, pick-up truck or van in traffic accident
V23.91*	Unspecified electric (assisted) bicycle rider injured in collision with car, pick-up truck or van in traffic accident
V24.31*	Person boarding or alighting an electric (assisted) bicycle injured in collision with heavy transport vehicle or bus
V24.41*	Electric (assisted) bicycle driver injured in collision with heavy transport vehicle or bus in traffic accident
V24.51*	Electric (assisted) bicycle passenger injured in collision with heavy transport vehicle or bus in traffic accident
V24.91*	Unspecified electric (assisted) bicycle rider injured in collision with heavy transport vehicle or bus in traffic accident
V29.401*	Electric (assisted) bicycle driver injured in collision with unspecified motor vehicles in traffic accident
V29.491*	Electric (assisted) bicycle driver injured in collision with other motor vehicles in traffic accident
V29.501*	Electric (assisted) bicycle passenger injured in collision with unspecified motor vehicles in traffic accident
V29.591*	Electric (assisted) bicycle passenger injured in collision with other motor vehicles in traffic accident
V29.601*	Unspecified electric (assisted) bicycle rider injured in collision with unspecified motor vehicles in traffic accident
V29.691*	Unspecified electric (assisted) bicycle rider injured in collision with other motor vehicles in traffic accident
V29.91*	Electric (assisted) bicycle rider (driver) (passenger) injured in unspecified traffic accident

## XPath Code

/EMSDataset/Header/PatientCareReport

```
[
  eInjury/eInjury.01[matches(., '^(V12(\.[345].*)?)|(V13(\.[3459].*)?)|
(V14(\.[3459].*)?)|(V19\.[4]([09].*)?)|(V19\.[5]([09].*)?)|(V19\.[6]([09].*)?)|
(V19\.[9].*)|(V22\.[3459]1.*)|(V23\.[3459]1.*)|(V24\.[3459]1.*)|
(V29\.[456]([09]1.*)|(V29\.[91].*))$')]
]
```

## SAS Code

```
proc sql;
  create table MotorVehicleCrashPedalCycleKey as
  select distinct pcrKey from
  (
    select pcrKey from memsis.factPcrCauseOfInjury where prxmatch(
      '/^((V12(\.[345].*)?)|(V13(\.[3459].*)?)|(V14(\.[3459].*)?)|(V19\.[4]([09].*)?)|
      (V19\.[5]([09].*)?)|(V19\.[6]([09].*)?)|(V19\.[9].*)|(V22\.[3459]1.*)|
      (V23\.[3459]1.*)|(V24\.[3459]1.*)|(V29\.[456][09]1.*)|(V29\.[91].*))$/',
      eInjury_01)
  )
;
quit;
```

## Discussion

For all “crash” case definitions, the following apply:

The *ANSI D.16-2017 Manual on Classification of Motor Vehicle Traffic Crashes* glossary, “Characteristics of Motor Vehicle Traffic Crashes,” was consulted in the development of the motor vehicle crash case definitions, with differences noted below. (Text in *italics* is quoted from ANSI D.16-2017.)

*Motor vehicle traffic crashes have a number of characteristics that are used to distinguish between motor vehicle traffic crashes and other events such as noncrashes, aircraft or railway accidents and other motor vehicles, cataclysms, and nontraffic crashes. The questions below address all the distinguishing characteristics of motor vehicle traffic crashes. If the answer to each of the questions below is “yes,” then the incident is a motor vehicle traffic crash.*

1. *Did the incident include one or more occurrences of injury (2.3.1) or damage (2.3.7)?*
  - It is assumed that injury occurred, since we are looking at eInjury.01 Cause of Injury. Damage-only crashes are out of scope from a NEMSIS perspective.
2. *Was there at least one occurrence of injury or damage which was not a direct result of a cataclysm (2.4.5 Cataclysm and 2.4.9 Transport crash)?*
  - This information is unlikely to be reliably available in NEMSIS data.
3. *Did the incident involve one or more motor vehicles (2.2.7)?*
  - Cases that are specifically reported as not including a motor vehicle are excluded. However, sometimes EMS uses more generic ICD-10-CM codes that do not indicate whether a motor vehicle was involved. The case definitions for pedestrian crash and bicycle crash may include cases that did not specify whether a motor vehicle was involved.
4. *Of the motor vehicles involved, was at least one in-transport (2.2.34)?*
  - This information is unavailable in the NEMSIS data.
5. *Was the incident an unstabilized situation (2.4.4)?*
  - This information is unavailable in the NEMSIS data.

6. *Did the unstabilized situation originate on a trafficway (2.2.1) or did injury or damage occur on a trafficway?*
  - Cases that are specifically reported as “non-traffic” are excluded. However, sometimes EMS uses more generic ICD-10-CM codes that do not indicate whether a crash was “traffic” or “non-traffic.” The case definitions may include cases that did not specify whether a crash was “traffic” or “non-traffic.”
  - The terms “traffic” and “non-traffic” are not further defined in ICD-10-CM. EMS may not interpret the terms in the same way as ANSI D.16-2017.
7. *If the incident involved a railway train (2.2.5) in-transport, did a motor vehicle in-transport become involved prior to any injury or damage involving the train?*
  - The case definitions may include cases where a train was involved in the primary crash event.
8. *Is it true that neither an aircraft (2.1.5) in-transport nor a watercraft (2.1.6) in-transport was involved in the incident?*
  - The case definitions may include cases where an aircraft or watercraft was involved, but not cases where the patient was an aircraft or watercraft occupant.

The intent of the “crash” case definitions is to cast a wide net. Users of the case definitions may choose to narrow the criteria for their specific purposes. For example,

- To identify fatal crashes in a manner similar to the Fatality Analysis Reporting System, the case definition could be narrowed to only include patients who died during the EMS call. However, this would exclude patients who survived to the hospital and died later because of the crash.
- To identify traffic crashes more strictly, the case definition could be narrowed to only include ICD-10 codes labeled as “traffic”. However, this would exclude records where the report did not specify whether the crash was traffic or non-traffic. Also, it is unlikely that EMS providers are highly trained on the differences between “traffic” and “non-traffic”.
- To identify only those crashes involving motor vehicles more strictly, the case definitions for pedestrian and bicycle crashes could be narrowed to only include records where the ICD-10 code indicates that a motor vehicle was involved. However, this would exclude records where the report did not specify whether a motor vehicle was involved.

The ICD-10-CM codes selected for the case definitions for crashes are based on the lists provided in the *CDC NCHS 2020 ICD-10-CM External Cause of Injury Matrix for Causes other than Poisoning*. The NEMSIS case definitions for crashes implement the criteria in the CDC ICD-10 matrix, with the following exceptions and refinements:

- The NEMSIS case definitions do not distinguish between accidental, self-harm, assault, undetermined intent, and legal intervention/war operations. Applicable codes from all intent categories are included in the NEMSIS case definitions.
- NEMSIS data sometimes includes non-billable ICD-10-CM codes. The NEMSIS case definitions account for the non-billable codes and include the ones that would be consistent with the intent of the CDC criteria.

The CDC Injury Matrix label for this case definition is “MVT-Pedal Cyclist”.

Codes for “electric (assisted) bicycle” were added to ICD-10 and the CDC criteria in October 2022 and are included in this NEMSIS case definition.

## References

*ANSI D.16-2017 Manual on Classification of Motor Vehicle Traffic Crashes.*

[transportation.gov/sites/dot.gov/files/docs/resources/government/traffic-records/304331/ansid16-2017.pdf](https://www.transportation.gov/sites/dot.gov/files/docs/resources/government/traffic-records/304331/ansid16-2017.pdf).

*ICD Injury Matrices.* U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC). [cdc.gov/nchs/injury/injury\\_matrices.htm](https://www.cdc.gov/nchs/injury/injury_matrices.htm).