

Using NEMSIS data to Address Older Adult Falls at the Local Level

Introduction

Every state, the District of Columbia, and five territories (hereinafter called “states”) have a governmental agency with a legislative mandate to regulate ambulance services that respond to 911 calls. Accountability within these agencies as well as quantifying the nature of their responses has been a high priority of state EMS offices since their formation. This accountability includes a mandate or recommended practice of submitting local ambulance service data about every incident, including clinical information, to the state. The database that collects this data is called the National Emergency Medical Services Information System (NEMSIS). Information captured from an ambulance crew encounter with a falls patient includes clinical assessment results, treatment administered, and whether transportation to an emergency department or trauma center occurred. At a minimum, these data may be available to the local health department (LHD) in aggregated and deidentified form from the state government database where these data are captured. This is especially useful for LHDs with multiple ambulance services and other EMS agencies responding in their jurisdiction.

Leveraging NEMSIS data for Local Health Efforts

Falls data are among the call type categories collected in NEMSIS. These data can help LHDs quantify and analyze fall-related incidents within their jurisdiction and identify trends over time. By analyzing NEMSIS data, LHDs can pinpoint geographic areas or demographics that are most affected by falls, enabling them to target resources such as educational campaigns, home safety assessments, community exercise programs, and/or environmental modifications to reduce fall hazards.



NEMSIS data can inform the development of programs aimed at reducing the incidence of falls and mitigating their impact. LHDs can also utilize these data to evaluate the effectiveness of their fall prevention initiatives over time by monitoring trends in fall-related incidents and comparing them to pre-intervention levels (e.g., outcomes-based evaluation plans, impact evaluation plans). The resulting evaluation analyses can assist in advocating for policies at the local, state, and national levels that promote safer environments and support initiatives to prevent falls among vulnerable populations.

Collaboration between LHDs and other partners such as ambulance services, other EMS agencies, hospitals, long-term care facilities, community organizations, and other local government agencies which use NEMSIS data as a focal point, allows these entities to concentrate collective efforts in addressing multifaceted factors contributing to falls and improve outcomes for affected individuals.

Increasingly, LHDs have the opportunity to collaborate with Community Paramedicine (CP) programs. CP programs use EMS personnel to fill gaps in local community health systems, providing a crucial link between LHDs, NEMSIS data, and the local 911 system. In this type of collaboration, it is completely feasible to retrieve large, customized sets of EMS data across a wide range of factors (e.g. incident locations, types of injuries, and patient demographics). Because most CPs have served in the traditional EMS response role prior to functioning within the CP model, they may be more familiar with the data within the local community and can provide valuable insight into the EMS data reports.

Accessing NEMSIS Data

Public health officials routinely utilize high quality data as the foundation for efficient resource allocation, effective public service, and meaning policy-making. By incorporating data retrieved from a NEMSIS compliant system LHDs gain a unique perspective to help improve the quality of life of the people they support.

There are multiple ways to access data depending on geographic coverage and data elements needed.

National level data can be accessed using the [NEMSIS.org](https://www.nemsis.org) webpage via the [NEMSIS Data Cube](#) or by making a [public research request](#). NEMSIS.org will only provide data that includes elements designated as “national”. State specific and local EMS data may be accessed through the state EMS office. The state NEMSIS compliant software will include a larger selection of state collected elements. Local EMS agencies can include additional elements not provided in the national and state data set yielding a more granular view of the older adult ground level fall picture.

Accessing data directly from local EMS agencies will include national, state, and local data elements. Local EMS agencies can coordinate to align the collection of data elements when multiple EMS agencies respond within the same jurisdiction. For LHDs serving communities with multiple EMS agencies, requests for access to and exports of data may prove challenging. In these cases, it is advisable to work with the state EMS office to access aggregate data from multiple EMS agencies.

Sample Older Adult Falls Data Points from NEMSIS Library

Dispatch

eDispatch.01 - Dispatch Reason

Response

eResponse.02 - EMS Agency Name

eResponse.03 - Incident Number

eResponse.05 - Type of Service Requested

eResponse.23 - Response Mode to the Scene

Time Series (Date/Time)

eTimes.01 - PSAP Call

eTimes.02 - Dispatch Notified

eTimes.03 - Unit Notified to Dispatch

eTimes.04 - Dispatch Acknowledged

eTimes.05 - Unit En Route

eTimes.06 - Unit Arrived on Scene

eTimes.07 - Arrived at Patient

eTimes.08 - Transfer of EMS Patient Care

eTimes.09 - Unit Left Scene

eTimes.10 - Arrival at Destination Landing Area

eTimes.11 - Patient Arrived at Destination

eTimes.16 - EMS Call Completed

Scene

eScene.02 - Other EMS or Public Safety

eScene.09 - Incident Location Type

eScene.15 - Incident Street Address

eScene.16 - Incident Apartment, Suite, or Room

eScene.17 - Incident City

eScene.18 - Incident State

eScene.19 - Incident Zip Code

eScene.21 - Incident County

eScene.23 - Incident Census Tract

eSituation.02 - Possible Injury

eSituation.04 - Complaint

eSituation.09 - Primary Symptom

eSituation.10 - Other Associated Symptoms

eSituation.11 - Providers Primary Impression

eSituation.12 - Providers Secondary Impression

eSituation.13 - Initial Patient Acuity

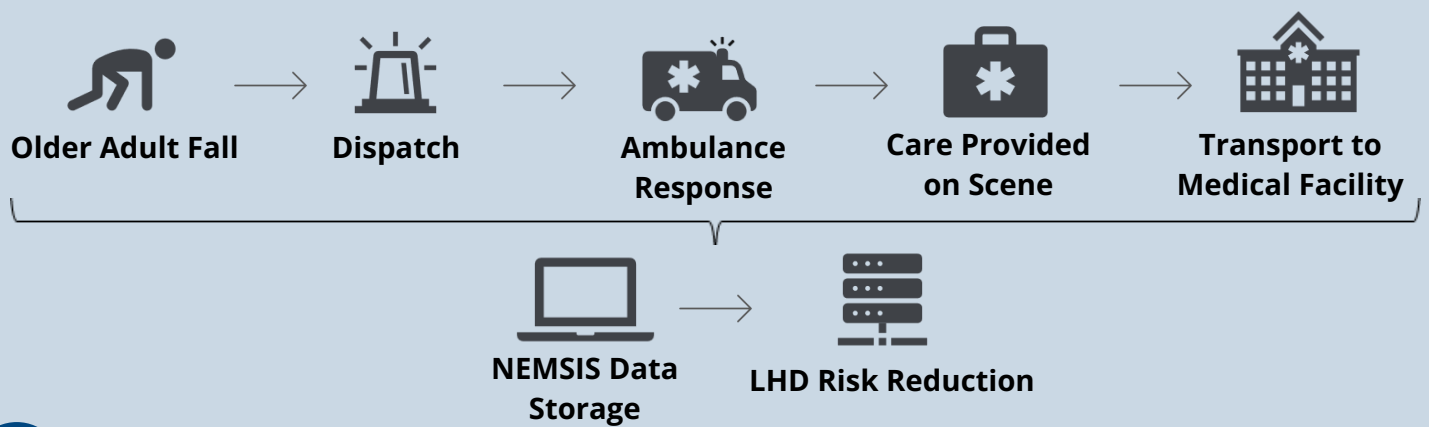
eInjury.01 - Cause Injury

eInjury.09 - Height of the Fall

eProcedure.03 - Procedures Performed

eMedications.03 - Medications Administered

NEMSYS Data Collection Process



1 OLDER ADULT FALL
Ground level fall incidents occur in and around patient residences and public places. There are many factors that increase an older adults' risk of falling including home hazards and certain medical conditions

2 DISPATCH
When someone calls 911 for a medical emergency, the dispatcher gathers information about the situation, including the nature of the emergency, the location, and any other relevant details. Based on this information, they determine the appropriate response, which may include sending an ambulance.

3 AMBULANCE RESPONSE
Once dispatched, the ambulance crew immediately heads to the location of the emergency. They navigate through traffic while adhering to traffic laws and safety protocols to reach the scene as quickly as possible.

4 CARE PROVIDED ON SCENE
The ambulance crew assesses the situation and the condition of the patient. They begin providing emergency medical treatment based on their assessment, monitoring vital signs, administering medications, and performing other lifesaving interventions and stabilize the patient for transportation to an appropriate medical facility.

5 TRANSPORT TO MEDICAL FACILITY
The ambulance crew continues to provide necessary medical care en route to the hospital or another appropriate medical facility. This will include further evaluation and treatment from on scene interventions. Upon arrival at the medical facility, the ambulance crew transfers care of the patient to the hospital staff. They provide a report on the patient's condition, the care provided en route, and any other relevant information to ensure continuity of care.

6 NEMSYS DATA STORAGE
All the data that is collected from the older adult ground level fall encounter into the ePCR is now stored into a local database. A limited subset of this data is sent to the individual state database. The state then transmits an even smaller subset of data elements from each record to the national database.

7 LHD RISK REDUCTION
Analysis of data from your local EMS agency can provide insights to your local risk reduction programs. A local database would only be useful for the individual EMS agency. When you have multiple EMS agencies responding in the same jurisdiction then use of the state level database would be best to compare multiple agencies simultaneously.

NEMSIS Data Collection Process

SUMMARY

A 911 ambulance response involving an older adult fall has several key steps to ensure timely and effective emergency medical care. The infographic above demonstrates the flow of data as it is recorded, processed, and disseminated after an older adult fall is reported to EMS. Through the systems outlined below data is stored securely to allow for retrieval, analysis, and reporting for clinical, administrative, and research purposes. All data elements are stored at the local level and subsets of this data are sent to the state and national EMS repositories.

DISSEMINATION

When used correctly, EMS data can contribute significantly to a community's efforts to reduce the frequency and severity of falls in the aging population. Key considerations for the use of the data include:

- Establish data sharing agreements with local EMS agencies and health departments.
- Build routine communications and updates to review NEMSIS data findings and program progress. Meetings, newsletters, and online platforms can help keep partners informed on emerging trends.
- Focus the data analysis on trends, demographics, risk factors, and outcomes.
- Dissemination of NEMSIS data should involve customized reports and dashboards which are clear and understandable, and tailored in formats appropriate for different community members.
- Utilize the data as you engage with policy makers, community leaders, and others regarding local initiatives aimed at reducing older adult ground-level falls.

NEMSIS Data Collection by the EMS System

911 dispatchers who receive a call about a fall requiring attention send a notification to the ambulance service and, if they exist in the jurisdiction, other EMS agencies to respond to the reported medical emergency or injury. Computer aided dispatch minimizes the data collection effort by automatically transferring information from the dispatch center into the ePCR, but these systems may not be in use in rural areas. NEMSIS compliant software accommodates the utilization of computer aided dispatching. Dispatch Reason (edispatch.01) "Fall" is a field that can be selected to identify ePCRs of interest.

The ambulance service and other EMS agencies that respond to the scene (eResponse.02) document the type of service requested (eResponse.05), if lights and sirens were activated (eResponse.03), and if the ambulance service and other EMS agencies are delayed to the scene for any reason (eResponse.09). Each individual response will receive a unique incident number (eResponse.03).

Documentation includes the location type (eScene.09), incident address (eScene.14-eScene.23), and whether other EMS or public safety agencies also responded (eScene.02). The "other public safety agencies" are typically law enforcement. Patient assessment begins once the patient is located.

The NEMSIS defined list includes 17 different field values that can be used to evaluate patient falls. Each of these different field values help describe conditions related to the fall. The patient's complaint (eSituation.04) is assessed and the primary symptom is established for proper treatment (eSituation.09). Documentation of possible injury (eSituation.02) will specify a physical injury has occurred. Medical interventions by the EMS clinicians can be seen in the Procedures Performed section (eprocedure.03). Pain reducing interventions will be documented as medications given (emedications.03). Patient demographic fields including name (ePatient.02 and ePatient.03), age (ePatient.15), and gender (ePatient.13) can be used to narrow ePCRs based on the population of interest.

Cause of injury (eInjury.01) is the data element for reported or suspected external causes of a fall. Patients fall inside the home from beds, chairs, toilets, or any other piece of furniture (eInjury.03). Typically, outdoor falls from ladders, playground equipment, ice and snow are examples of the detail the cause of injury data element captures. Documentation of the EMS clinicians' primary and secondary impression (esituation.11 and esituation.12) go into further detail of the most serious injury that was sustained. Knowing the patient's initial acuity (esituation.13) prior to the medical interventions measures the effectiveness of the interventions associated with the Injury that has occurred.

Once a patient is assessed and treated, a decision about further medical treatment at a higher level of care is made. Height of the fall (eSituation.09) can be a major determining factor on the destination choice. Certain fall conditions will require that the patient be transported to a designated trauma center. Once patients receive medical care on the scene from EMS clinicians, the patient may refuse transport to a hospital emergency department. A field specific to the destination (eDisposition.01) will identify the health care facility to which the patient was transported.



Most patients will be seen in the local emergency department, however, alternate care facilities (eDisposition.21) have been accepting ambulance patients with lower acuity medical emergencies or physical injuries. Finally, patient acuity (eDisposition.19) describes the patient's condition at the conclusion of the EMS clinicians' interaction with them and provides an opportunity to evaluate the efficacy of treatment provided on the scene and during the transport.

CONCLUSION

As a result of these data being uniform across all ambulance services and other EMS agencies, they can be shared and analyzed on a national, state, or local level. The NEMSIS Technical Assistance Center has created several annual reports and graphics to demonstrate the highest incidence of call types, including falls.

These annual reports may prove useful for LHDs to quantify the prevalence of conditions of interest nationally, whether they are types of medical emergencies or physical injuries due to mechanisms such as falls. State EMS office NEMSIS data repositories have a larger, more detailed data set.

In the NEMSIS database at the national level, data and reports do not identify patients, EMS agencies, receiving hospitals, or individual states. Data of this granularity can only be found in the state or local level ePCR repository. Having a good working relationship with the state EMS office and/or local EMS agency and understanding the state and local process for data requests can provide contemporary data. When a LHD has multiple ambulance services and other EMS agencies responding within its boundaries, working with the state EMS office, and identifying the service area of interest is a first step to accessing meaningful information related to falls.



Acknowledgements

This project is supported by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services (HHS) as part of a financial assistance award (CDC # 6NU38OT000306-05-06). The contents do not necessarily represent the official views of, nor an endorsement, by CDC/HHS, or the U.S. Government.).

