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**Virginia Department of Health**

**Office of Emergency Medical Services (OEMS)**

**Quarterly Report on Trauma Incidents**

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**Q3 2022\***

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*This report is based on the deliberations of the System Improvement Committee and analyses performed by Office of EMS Epidemiology staff.*

\*Important Note: The Office of Emergency Medical Services is currently in the process of transitioning to a new data management system for all pre-hospital and trauma registry data. System performance issues identified and corrected during the transition may limit the accuracy of the data contained within this report. As such, this report is considered preliminary and subject to change. Thank you for your understanding and patience during this transition.

## Introduction

Section B 3. of the Code of Virginia (§32.1-111.3) requires the monitoring of the quality of the Commonwealth's emergency medical services (EMS) and trauma services using data from the EMS patient care information system. The EMS Advisory Board reviews and analyzes such data quarterly and reports its findings to the Commissioner. The Advisory Board has delegated this function to the System Improvement Committee (formerly the Trauma Performance Improvement Committee).

This quarterly report focuses on four key areas:

1. Completeness of prehospital vital sign documentation (blood pressure, respiratory rate, and Glasgow Coma Score) as required in Step 1 of the Virginia Field Trauma Triage Decision Scheme.
2. The number of trauma patients treated and transported by EMS agencies.
3. The number of trauma patients who met Step 1 (vitals), Step 2 (anatomy of injury), and Step 3 (mechanism of injury/impact) Virginia Field Trauma Triage Criteria.
4. The number of patients meeting trauma triage criteria transported to hospitals not designated as trauma centers.

The results reported here represent a high-level summary of the findings. This report describes how each EMS Council Region is performing. The report will be provided to the appropriate Regional EMS Council Director for each region. The Directors will be given an opportunity to provide feedback, which may explain special circumstances for which an exception occurred. The findings of this report and any feedback from the Directors will be used to drive education and improve the Trauma Triage Plan.

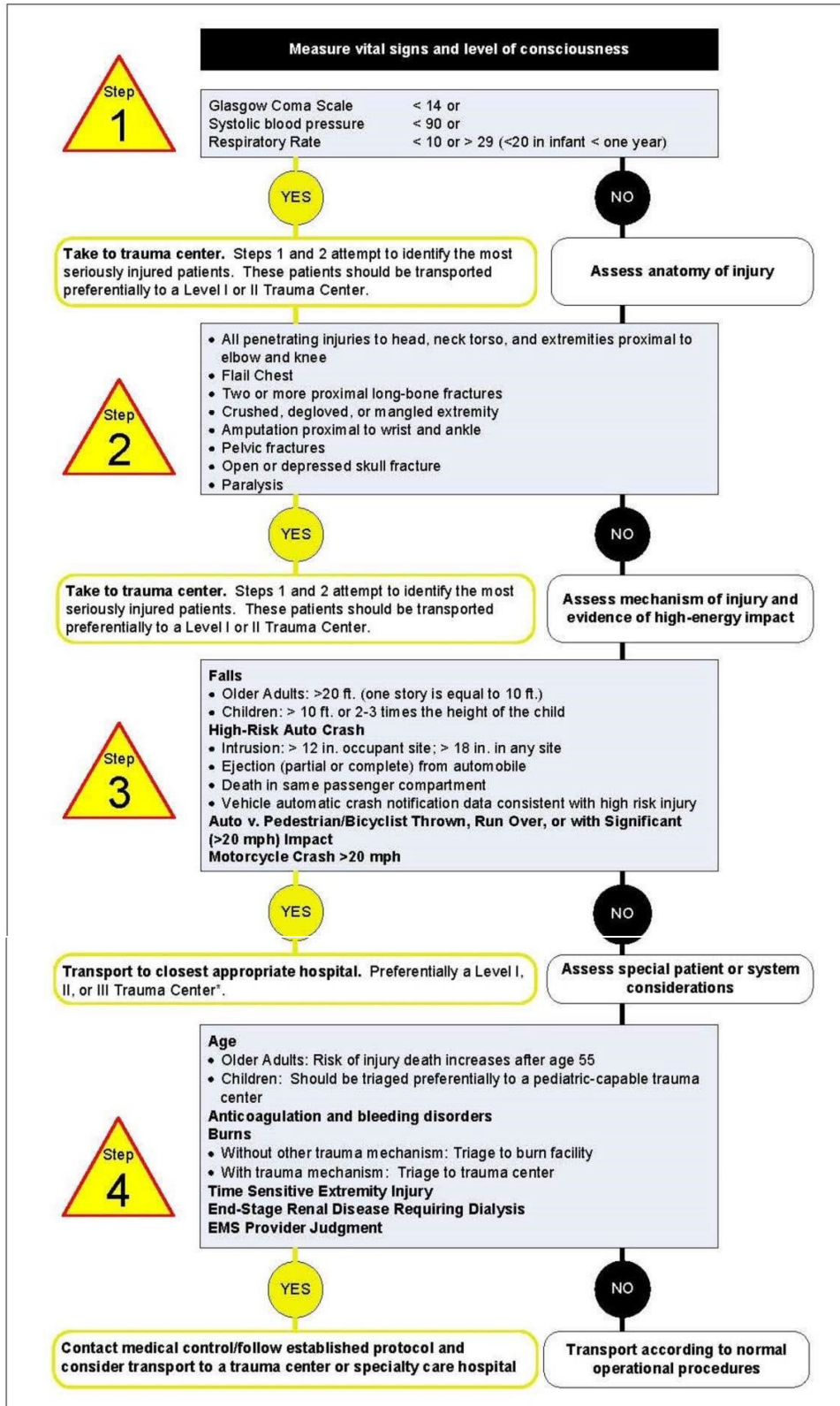
EMS patient data is extracted from patient medical records submitted by EMS agencies to the Virginia Pre-Hospital Information Bridge (VPHIB) program (Elite v3) maintained within the Virginia Department of Health's (VDH) Office of Emergency Medical Services (OEMS). Data summarized in this report represent EMS responses that occurred during the third quarter of 2022 (July through September) and were entered into ESO as of 11/15/2022. VPHIB v3 data are based on the National EMS Information System (NEMSIS) standards.

This report includes all EMS responses categorized as trauma incidents using the following guidelines (Table 1).

Table 1. Definition of Trauma Patients within VPHIB version 3

Type of Service Requested	
911 Response (Scene)	
<b>Incident/Patient Disposition</b>	
Patient Treated, Transported by this EMS unit	
<b>Situation Provider Primary Impression (ICD-10-CM)</b>	
<ul style="list-style-type: none"> <li>• S00-S09 (Injuries to the head)</li> <li>• S10-S19 (Injuries to the neck)</li> <li>• S20-S29 (Injuries to the thorax)</li> <li>• S30-S39 (Injuries to the abdomen, lower back, lumbar spine, pelvis, and external genitals)</li> <li>• S40-S49 (Injuries to the shoulder and upper arm)</li> <li>• S50-S59 (Injuries to the elbow and forearm)</li> <li>• S60-S69 (Injuries to the wrist, hand, and fingers)</li> <li>• S70-S79 (Injuries to the hip and thigh)</li> <li>• S80-S89 (Injuries to the knee and lower leg)</li> <li>• S90-S99 (Injuries to the ankle and foot)</li> <li>• T07 (Injuries involving multiple body regions)</li> <li>• T14 (Injury of unspecified body region)</li> <li>• T20-T25 (Burns and corrosions of external body surfaces, specified by site)</li> <li>• T26-T28 (Burns and corrosions confined to eye and internal organs)</li> <li>• T30-T32 (Burns and corrosions of multiple and unspecified body regions)</li> <li>• T75.0 (Effects of lightning)</li> <li>• T75.4 (Electrocution) (With 7th digit character modifier of A, B, or C; D through S are excluded)</li> </ul>	<p><i>Excluding:</i></p> <ul style="list-style-type: none"> <li>• <i>S00 (Superficial injuries of the head)</i></li> <li>• <i>S10 (Superficial injuries of the neck)</i></li> <li>• <i>S20 (Superficial injuries of the thorax)</i></li> <li>• <i>S30 (Superficial injuries of the abdomen, pelvis, lower back and external genitals)</i></li> <li>• <i>S40 (Superficial injuries of shoulder and upper arm)</i></li> <li>• <i>S50 (Superficial injuries of elbow and forearm)</i></li> <li>• <i>S60 (Superficial injuries of wrist, hand, and fingers)</i></li> <li>• <i>S70 (Superficial injuries of hip and thigh)</i></li> <li>• <i>S80 (Superficial injuries of knee and lower leg)</i></li> <li>• <i>S90 (Superficial injuries of ankle, foot, and toes)</i></li> </ul>

Figure 1. Virginia Field Trauma Triage Decision Scheme



## Virginia Trauma Summary, Third Quarter, 2022

EMS agencies in Virginia responded to a total of 425,354 EMS calls; of that total, 271,949 (63.9%) patients had a disposition of treated and transported by the unit, 54,476 (12.8%) had a disposition of canceled, 30,625 (7.2%) patients had a disposition of EMS assist, 7,193 (1.7%) patients had a disposition of treated and transferred care to another unit, 4,003 (0.9%) patients were documented as dead at the scene, and 57,108 (13.4%) patients had some other incident disposition (e.g., patient treated and released AMA, patient treated and transported by private vehicle, etc.). Out of the total EMS calls, **25,244 (5.9%)** incidents were classified as trauma incidents. The Northern Virginia EMS Council had the highest number of trauma calls (5,880; 23.3%), followed by the Old Dominion EMS Alliance (4,853; 19.2%). Trauma incident numbers for the quarter, broken down by month and Regional EMS Council, are shown in Figure 2. Tables 2-4 summarize the body regions most frequently affected by trauma, the top 10 hospitals receiving trauma transports, and vital signs data quality for trauma incidents.

Figure 2. Monthly Trauma Incidents by Regional EMS Council, Third Quarter, 2022, Virginia

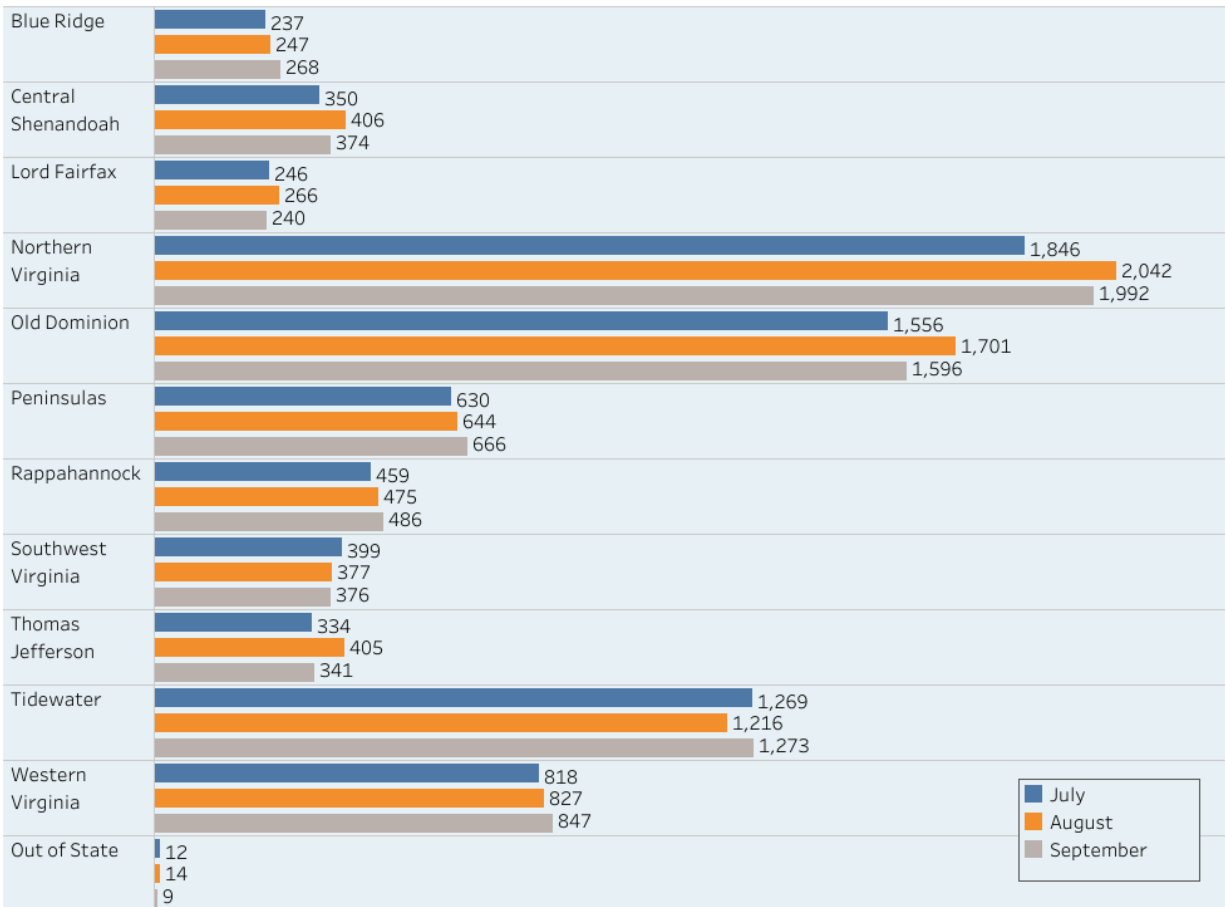


Table 2. Trauma Incidents by Abbreviated Injury Scale (AIS) Body Region, Third Quarter 2022, Virginia

Body Region	Counts of Incidents
Head	4,961 (19.7%)
Face	1,788 (7.1%)
Neck	977 (3.9%)
Thorax	540 (2.1%)
Abdomen	480 (1.9%)
Spine	1,292 (5.1%)
Upper Extremity	3,779 (15.0%)
Lower Extremity	5,815 (23.0%)
Unspecified	5,449 (21.6%)
Multiple Injuries	163 (0.6%)

Table 3. Top Ten Hospital Destinations for Trauma Incidents, Third Quarter 2022, Virginia

Destination Hospital For Trauma Incidents	Counts of Incidents
Inova Fairfax Hospital	1,409 (5.6%)
Sentara Norfolk General Hospital	1,065 (4.2%)
Riverside Regional Medical Center	968 (3.8%)
Carilion Roanoke Memorial Hospital	931 (3.7%)
VCU Health Systems	900 (3.6%)
MWHC Mary Washington Hospital	775 (3.1%)
UVA Health System	768 (3.0%)
Sentara Virginia Beach General Hospital	627 (2.5%)
Virginia Hospital Center	626 (2.5%)
HCA Chippenham Hospital	605 (2.4%)

Table 4. Vital Signs Data Quality for Trauma Incidents, Third Quarter 2022, Virginia

Vital Signs Data Quality	Counts of Incidents
Total Number of Trauma Incidents	25,244
Patients with All 3 Vital Signs Reported	24,563 (97.3%)
Patients with Incomplete* Vital Signs	681 (2.7%)
Patients with Systolic Blood Pressure Reported	25,185 (99.8%)
Patients with Respiratory Rate Reported	24,946 (98.8%)
Patients with Glasgow Coma Score Reported	24,857 (98.5%)

\*Incomplete vital signs are missing one or more of the vital signs required in Step 1 of the Trauma Triage algorithm (e.g., Systolic Blood Pressure, Respiratory Rate, or Glasgow Coma Score).

### Trauma Incidents Meeting Virginia Trauma Triage Criteria

- Of the 25,244 trauma incidents reported by EMS during the third quarter of 2022, 1,920 (7.6%) met Trauma Triage Step 1 criteria, 464 (1.8%) met Step 2 criteria, and 548 (2.2%) met Step 3 criteria. Incidents can meet criteria for more than one step; those incidents were classified into the highest severity level met. For example, if an incident met both Step 1 and Step 2 criteria, it was counted as a Step 1 incident.
- Among the incidents meeting Step 1 criteria, 1,647 (85.8%) were classified as meeting Step 1 based on reported vital signs (see Appendix 1). The remaining 273 (14.2%) incidents were classified as meeting Step 1 based on the provider’s impression, as reported in the “Trauma Center Criteria” field in the patient care report.
- Incidents meeting Step 2 and Step 3 were based solely on the “Trauma Center Criteria” and “Vehicular, Pedestrian, or Other Injury Risk Factor” fields.

### Pediatric Patients (Age < 15)

Trauma patients <15 years old are considered pediatric patients per trauma triage criteria. Of the 25,244 trauma incidents reported by EMS during the third quarter of 2022, 1,354 (5.4%) occurred among pediatric patients. Of the 1,920 Virginia trauma incidents meeting Step 1 trauma criteria, 192 (10.0%) occurred among pediatric patients (further details are shown below).

Table 5. Hospital Destination Type for Pediatric Patients Meeting Step 1 Criteria by Regional EMS Council, Third Quarter 2022, Virginia

Regional EMS Council	Met Step 1	Trauma Hospital				Non-Trauma Hospital
		Level I	Level II	Level III	Pediatric Trauma Center	
Blue Ridge	7	0	5	0	2	0
Central Shenandoah	6	0	0	0	0	6
Lord Fairfax	5	0	4	0	0	1
Northern	49	22	2	10	3	12
Old Dominion	42	3	0	2	27	10
Peninsulas	12	0	6	0	2	4
Rappahannock	14	0	9	0	1	4
Southwest	5	0	0	1	0	4
Thomas Jefferson	9	8	0	0	0	1
Tidewater	26	1	0	2	21	2
Western	16	0	1	2	7	6
Out of State	1	0	0	0	1	0
<b>Grand Total</b>	<b>192</b>	<b>34 (17.7%)</b>	<b>27 (14.1%)</b>	<b>17 (8.9%)</b>	<b>64 (33.3%)</b>	<b>50 (26.0%)</b>

- There were 67 incidents involving pediatric patients that met Step 1 trauma criteria that were taken to a Level III trauma center or lower designation.
- Among the 464 incidents meeting Step 2 criteria during the third quarter of 2022, 23 (5.0%) occurred among pediatric patients. Eight (34.8%) were taken to a pediatric trauma center, 7 (30.4%) were taken to a Level I trauma center, 2 (8.7%) were taken to a Level II trauma center, 2 (8.7%) were taken to a Level III trauma center, and 4 (17.4%) were taken to a non-trauma designated hospital.
- Of the 548 incidents that met Step 3 criteria during the third quarter of 2022, 28 (5.1%) occurred among pediatric patients. Seven (25.0%) were taken to a pediatric trauma center, 5 (17.9%) were taken to a Level I trauma center, 7 (25.0%) were taken to a Level II trauma center, 5 (17.9%) were taken to a Level III trauma center, and 4 (14.3%) were taken to non-trauma designated hospitals.

### Geriatric Patients (Age ≥ 65)

There were 10,708 (42.4% of total trauma incidents) reports of trauma among geriatric patients during the third quarter of 2022. Of the 1,920 Virginia trauma incidents meeting Step 1 trauma criteria, 734 (38.2%) occurred among geriatric patients (further details are shown below).

Table 6. Hospital Destination Type for Geriatric Patients Meeting Step 1 Criteria by Regional EMS Council, Third Quarter 2022, Virginia

Regional EMS Council	Met Step 1	Trauma Hospital			Non-Trauma Hospital
		Level I	Level II	Level III	
Blue Ridge	23	3	18	0	2
Central Shenandoah	25	1	0	0	24
Lord Fairfax	20	0	5	0	15
Northern	174	56	48	31	39
Old Dominion	133	32	21	14	66
Peninsulas	59	0	29	0	30
Rappahannock	48	1	31	0	16
Southwest	47	4	0	7	36
Thomas Jefferson	31	19	1	0	11
Tidewater	96	16	3	35	42
Western	76	30	0	8	38
Out of State	2	1	0	0	1
<b>Grand Total</b>	<b>734</b>	<b>163 (22.2%)</b>	<b>156 (21.3%)</b>	<b>95 (12.9%)</b>	<b>320 (43.6%)</b>

- There were 415 incidents involving geriatric patients who met Step 1 trauma criteria who were taken to a Level III trauma center or lower designation.
- Of the 320 geriatric patients who met Step 1 criteria and were taken to non-trauma designated hospitals, 39 (12.2%) had an EMS provider primary impression of an isolated hip injury.



- Among the 464 incidents meeting Step 2 criteria during the third quarter of 2022, 90 (19.4%) occurred among geriatric patients. Of those, 34 (37.8%) patients were taken to a Level I trauma center, 15 (16.7%) were taken to a Level II trauma center, 16 (17.8%) were taken to a Level III trauma center, and 25 (27.8%) were taken to non-trauma designated hospitals.
- Of the 548 incidents that met Step 3 criteria during the third quarter of 2022, 73 (13.3%) occurred among geriatric patients. Sixteen (21.9%) patients were taken to a Level I trauma center, 8 (11.0%) were taken to a Level II trauma center, 11 (15.1%) were taken to a Level III trauma center, and 38 (52.1%) were taken to non-trauma designated hospitals.
- For 60 incidents, patient age was recorded to be greater than 100 years. Quality assurance of these incidents showed that 11.7% of the entered ages were incorrect.

### Adult Patients (15 ≥ Age < 65)

The majority of the 25,244 trauma cases that occurred during the third quarter of 2022 were among adult patients (n=13,175, 52.2% of all trauma incidents). Of the 1,920 Virginia trauma incidents meeting Step 1 trauma criteria, 990 (51.6%) occurred among adult patients. The hospital destination type for adult trauma incidents meeting Step 1 criteria is shown below by Regional EMS Council (Table 7).

Table 7. Hospital Destination Type for Adult Patients Meeting Step 1 Criteria by Regional EMS Council, Third Quarter 2022, Virginia

Regional EMS Council	Met Step 1	Trauma Hospital			Non-Trauma Hospital
		Level I	Level II	Level III	
Blue Ridge	23	10	11	0	2
Central Shenandoah	29	2	0	0	27
Lord Fairfax	26	1	12	0	13
Northern	242	123	59	24	36
Old Dominion	200	126	15	19	40
Peninsulas	72	5	57	0	10
Rappahannock	54	4	34	0	16
Southwest	36	3	0	11	22
Thomas Jefferson	48	42	0	0	6
Tidewater	165	92	3	46	24
Western	92	42	0	8	42
Out of State	3	3	0	0	0
<b>Grand Total</b>	<b>990</b>	<b>453 (45.8%)</b>	<b>191 (19.3%)</b>	<b>108 (10.9%)</b>	<b>238 (24.0%)</b>

- There were 346 incidents involving adult patients who met Step 1 trauma criteria who were taken to a Level III trauma center or lower designation.
- Among the 464 incidents meeting Step 2 criteria during the third quarter of 2022, 350 (75.4%) occurred among adult patients. Of those, 231 (66.0%) patients were taken to a Level I trauma

center, 48 (13.7%) patients were taken to a Level II trauma center, 32 (9.1%) were taken to a Level III trauma center, and 39 (11.1%) patients were taken to non-trauma designated hospitals.

- Among the 548 incidents meeting Step 3 criteria during the third quarter of 2022, 447 (81.6%) occurred among adult patients. Of those, 208 (46.5%) were taken to a Level I trauma center, 83 (18.6%) patients were taken to a Level II trauma center, 81 (18.1%) were taken to a Level III trauma center, and 75 (16.8%) patients were taken to non-trauma designated hospitals.

### Air-Medical EMS Transport

There were 404 trauma patient transports by an air-medical ambulance during the third quarter of 2022. Of those:

- Thirty-one (7.7%) were pediatric transports, of which:
  - Eight (25.8%) were taken to a Level I trauma center, 22 (71.0%) were taken to a pediatric trauma center and 1 was taken to a Level III trauma center (3.2%).
- Ninety-five (23.5%) were geriatric transports, of which:
  - Eighty-seven (91.6%) were taken to a Level I trauma center, 5 (5.3%) were taken to a Level II trauma center, 2 (2.1%) were taken to a Level III trauma center, and 1 (1.1%) was taken to a non-trauma designated hospital.
- Two-hundred and seventy-seven (68.6%) were adult transports, of which:
  - Two hundred and sixty (93.9%) were taken to a Level I trauma center, 10 (3.6%) were taken to a Level II trauma center, 2 (0.7%) were taken to a Level III trauma center, and 5 (1.8%) were taken to a non-trauma designated hospital.
- One trauma patient (0.2%) transported by air medical were of unknown age and was taken to a Level I trauma center.

### Causes of Injury

Trauma patient records were analyzed to identify the causes of injuries in the Commonwealth of Virginia. Fall injuries occurred most commonly, followed by motor vehicle collision injuries. Causes of injury for the third quarter of 2022 are shown in Table 8.

Table 8. Frequencies and Percentages of Causes of Injury, Third Quarter 2022, Virginia

Causes of Injury	Frequency	Percentage of the Total
Falls, slips/trips	10,758	42.6%
MVC-related	5,169	20.5%
Blunt force trauma	1,149	4.6%
Penetrating trauma	698	2.8%
Firearm	331	1.3%
Non-motorized transport	326	1.3%
Machine-related	234	0.9%
Animal-related	182	0.7%
Burn, smoke inhalation, electrocution, explosion	135	0.5%
Self-harm	67	0.3%
Recreational	57	0.2%

Table 8. Frequencies and Percentages of Causes of Injury, Third Quarter 2022, Virginia (continued)

Causes of Injury	Frequency	Percentage of the Total
Poisoning	21	0.1%
Abuse	21	0.1%
Asphyxiation	14	0.1%
Human bite	14	0.1%
Overexertion/strain	13	0.1%
Environment/weather-related	7	<0.1%
Aircraft	6	<0.1%
Unspecified	6,042	23.9%
<b>Grand Total</b>	<b>25,244</b>	<b>100.0%</b>

### Under-Triage of Trauma Incidents

A trauma incident is considered to be under-triaged if the incident met Step 1 or Step 2 trauma triage criteria and the patient was taken to either a Level III trauma center or a non-trauma designated hospital, or if the incident met Step 3 trauma triage criteria and the patient was taken to a non-trauma designated hospital. Injuries to the head, arms, or legs occurred most often among the under-triaged incidents (Table 9).

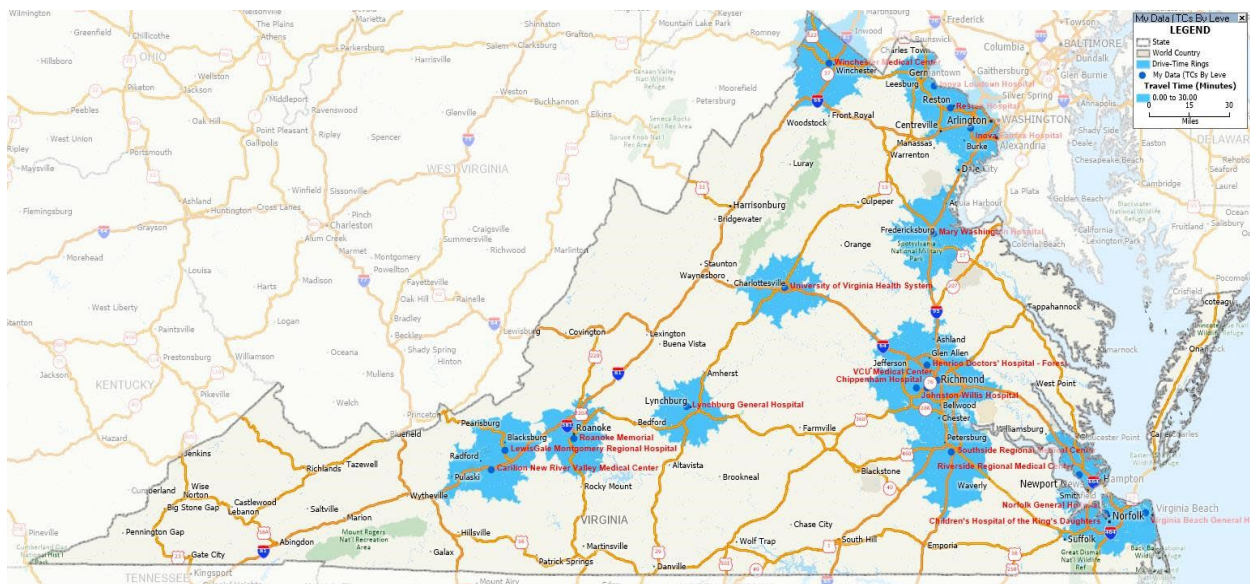
Table 9. Frequencies and Percentages of Under-Triaged Trauma Patients by AIS Body Region of Injury, Third Quarter 2022, Virginia

AIS Region	Frequency	Percentage among Under-Triaged Patients
Unspecified	300	28.2%
Head	275	25.9%
Lower Extremities	192	18.1%
Upper Extremities	102	9.6%
Face	75	7.1%
Thorax	28	2.6%
Spine	27	2.5%
Abdomen	25	2.4%
Neck	20	1.9%
Multiple	19	1.8%
<b>Grand Total</b>	<b>1,063</b>	<b>100%</b>

## Distribution of Trauma Facilities across Virginia

Trauma centers across Virginia are not uniformly distributed. The upper part of the Northern Virginia EMS Council and parts of Central Virginia (e.g., the greater Richmond area) have greater access to trauma centers, as multiple trauma centers are located within close proximity. Most parts of the Old Dominion EMS Alliance, Central Shenandoah EMS Council, and Western Virginia EMS Council have very limited access to trauma centers. The Central Shenandoah EMS Council and Southwest Virginia EMS Council have no trauma centers within their EMS regions, but are reasonably close to Level II trauma centers in other EMS regions or states. The distribution of trauma centers across Virginia, surrounded by rings showing the geographical areas within a 30-minute drive of each trauma center, is shown below (Figure 4). This map displays which parts of Virginia have limited access to a trauma center.

Figure 3. Trauma Centers across Virginia, Surrounded by 30-Minute Drive Time Rings



## Data Quality

Virginia EMS agencies have been working very hard to make sure they provide optimal care to their patients while also making efforts to improve data quality. Over the past years, there has been a significant improvement in trauma triage data quality. Continuation of this improvement is what the System Improvement Committee expects. The OEMS conducted quality assurance checks on trauma triage records from the third quarter of 2022, as described below.

- **Blank Vital Signs** (i.e., no numerical value and no pertinent negative reported): There were a total of 59 trauma incidents without systolic blood pressure documented, 298 trauma incidents without respiratory rate documented, and 387 trauma incidents without GCS documented. In some cases, vitals are unable to be obtained due to patient refusal or because the patient is a child. Such cases should be documented as Pertinent Negatives (e.g., “Refused” or “Unable to Complete”). Leaving the vital sign field blank and reporting such cases only in the patient care narrative will result in the vital sign being identified as missing.

- Ten percent of the incidents missing information from each category were randomly selected for further review; the findings are listed below.
  - In some cases, vitals are unable to be obtained due to patient refusal, because the patient is a child, or because of equipment malfunction. Such cases should be documented as Pertinent Negatives (e.g., “Refused” or “Unable to Complete”). Leaving the vital sign field blank and reporting such cases only in the patient care narrative will result in the vital sign being identified as missing.
  - The majority (90.8%) of the records sampled were found to have blank data points because the vital signs were not recorded anywhere in the patient record (i.e., the vital sign field or the patient care narrative). For 9.2% of the records, the vital signs were recorded in the narrative, but not in the vital sign field.
- **Atypical Vital Signs:** Atypical vital signs are vitals with extreme values. The cutoff values for vitals to be considered atypical are chosen arbitrarily only for quality check and validation purposes. For this report, systolic blood pressures with values of less than 40 or greater than 250 and respiratory rates of less than 3 or greater than 100 were deemed extreme values. There were 23 instances of extreme systolic blood pressures and 35 instances of extreme respiratory rates, totaling 58 instances of extreme values.
  - Thirty percent of the incidents were randomly selected for further review. Among reviewed incidents with extreme values, 61.1% of the narratives suggested the values captured were accurate and are therefore considered to be valid.
- **Blank Trauma Triage Criteria:** There were 22,062 trauma incidents where the “Trauma Center Criteria” field and the “Vehicular, Pedestrian, or Other Injury Risk Factor” fields were both blank. It is understandable that not all trauma incidents meet trauma triage criteria; however, some of these records are incorrectly classified or do not report important information.
  - Of those incidents, 1,032 (4.7%) had recorded vitals meeting Step 1 trauma triage criteria.
  - Step 2 and Step 3 trauma incidents may also be missing trauma triage criteria and therefore may also be incorrectly classified. However, Steps 2 and 3 trauma triage criteria are not based on vital signs, so the exact amount of misclassification cannot be identified.
- **Blank Age**
  - There were eight trauma incident records where age or age units was left blank; quality assurance of the records showed that one was a pediatric patient, two were adult patients, two were geriatric patients, and the remaining three were of unknown age. An additional four patients were identified to have an unknown age during quality assurance of patient records.
    - Of the seven incidents where patient age was unknown, four met Step 1 trauma triage criteria and one met Step 2 criteria. All five of these patients were appropriately triaged.
      - Of the remaining two incidents where patient age was unknown, the reported respiratory rate was between 10 and 20. Patients less than 1 year of age with a respiratory rate between 10 and 20 meet Step 1 criteria. However, these patients could not be classified as Step 1 because their age was unknown.

## Conclusions

Many factors influence the decision regarding where a patient is transported. As noted above, trauma centers are not equally distributed across Virginia. In some areas (Southwest Virginia and Northern Virginia), out of state trauma center resources are available. Despite having a total of 12 Level I and Level II trauma centers (combined) in Virginia, as well as access to several other similar facilities in surrounding states, large areas of Virginia remain underserved. The variability of resources across Virginia is often compounded by geographic and (especially in the case of Helicopter or Medevac EMS) weather factors. Although a solution to this problem is beyond the scope of this report, this variability needs to be considered when comparing the outcomes of pre-hospital trauma patients in Virginia.

Missing vital signs data in EMS records continues to be an area of focus for performance improvement efforts. Currently, about one out of every 37 patients (2.7%) have incomplete vital signs data. During the third quarter of 2022, 31.7% of patients who met Step 1 trauma triage criteria and 14.7% of patients who met Step 2 criteria were taken to non-trauma centers. Acknowledging these data, there may be a need to re-examine how trauma triage criteria are being applied in the field, with an eye towards the existing barriers to trauma center access, including the absence of trauma centers in broad swaths of Virginia. Whether the addition of trauma resources center would allow for improved access and care requires further study.

OEMS staff performed quality assurance on trauma triage data from the third quarter of 2022. Specifically, the data values that were reviewed included the vital signs used in Step 1 trauma triage criteria designation, atypical vital sign values, and trauma triage criteria fields listed as not applicable, not recorded, or blank. OEMS will continue to perform these data quality checks and will summarize findings for inclusion in future trauma triage reports.

Appendix 1: Elite v3 Data Dictionary Elements for Trauma Triage Vital Signs and Trauma Triage Criteria

**eVitals.06 - SBP (Systolic Blood Pressure)**

Definition

The patient's systolic blood pressure.

National Element	Yes	Pertinent Negatives (PN)	Yes
State Element	Yes	NOT Values	Yes
Version 2 Element	E14_04	Is Nillable	Yes
Usage	Required	Recurrence	1 : 1

Associated Performance Measure Initiatives

Airway    Cardiac Arrest    Pediatric    STEMI    Stroke    Trauma

Attributes

**NOT Values (NV)**

7701001 - Not Applicable                      7701003 - Not Recorded

**Pertinent Negatives (PN)**

8801005 - Exam Finding Not Present    8801019 - Refused                      8801023 - Unable to Complete

Constraints

Data Type	minInclusive	maxInclusive
integer	0	500

Data Element Comment

Required for ACS-Field Triage and other patient scoring systems.

**eVitals.14 - Respiratory Rate**

Definition

The patient's respiratory rate expressed as a number per minute.

National Element	Yes	Pertinent Negatives (PN)	Yes
State Element	Yes	NOT Values	Yes
Version 2 Element	E14_11	Is Nillable	Yes
Usage	Required	Recurrence	1 : 1

Associated Performance Measure Initiatives

Airway    Cardiac Arrest    Pediatric    STEMI    Stroke    Trauma

Attributes

**NOT Values (NV)**

7701001 - Not Applicable                      7701003 - Not Recorded

**Pertinent Negatives (PN)**

8801005 - Exam Finding Not Present    8801019 - Refused                      8801023 - Unable to Complete

Constraints

Data Type	minInclusive	maxInclusive
integer	0	300

Data Element Comment

## eVitals.23 - Total Glasgow Coma Score

### Definition

The patient's total Glasgow Coma Score.

National Element	No	Pertinent Negatives (PN)	Yes
State Element	Yes	NOT Values	Yes
Version 2 Element	E14_19	Is Nillable	Yes
Usage	Required	Recurrence	1 : 1

### Associated Performance Measure Initiatives

Airway    Cardiac Arrest    Pediatric    STEMI    Stroke    Trauma

### Attributes

#### NOT Values (NV)

7701001 - Not Applicable

7701003 - Not Recorded

7701005 - Not Reporting

#### Pertinent Negatives (PN)

8801019 - Refused

8801023 - Unable to Complete

### Constraints

Data Type	minInclusive	maxInclusive
integer	3	15

### Data Element Comment

Can be documented or calculated from EVitals.19 (GCS-Eye), EVitals.20 (GCS-Verbal), and EVitals.21 (GCS-Motor).



## eInjury.03 - Trauma Center Criteria

### Definition

Physiologic and Anatomic Field Trauma Triage Criteria (steps 1 and 2) as defined by the Centers for Disease Control.

National Element	Yes	Pertinent Negatives (PN)	No
State Element	Yes	NOT Values	Yes
Version 2 Element		Is Nillable	Yes
Usage	Required	Recurrence	1 : M

### Associated Performance Measure Initiatives

Trauma

### Attributes

#### NOT Values (NV)

7701001 - Not Applicable                      7701003 - Not Recorded

#### CorrelationID

**Data Type:** string                      **minLength:** 0                      **maxLength:** 255

### Code List

Code	Description
2903001	Amputation proximal to wrist or ankle
2903003	Crushed, degloved, mangled, or pulseless extremity
2903005	Chest wall instability or deformity (e.g., flail chest)
2903007	Glasgow Coma Score <= 13
2903009	Open or depressed skull fracture
2903011	Paralysis
2903013	Pelvic fractures
2903015	All penetrating injuries to head, neck, torso, and extremities proximal to elbow or knee
2903017	Respiratory Rate <10 or >29 breaths per minute (<20 in infants aged <1 year) or need for ventilatory support
2903019	Systolic Blood Pressure <90 mmHg
2903021	Two or more proximal long-bone fractures

### Data Element Comment

2011 Guidelines for the Field Triage of Injured Patients - value choices for Steps 1 and 2. For falls, one story is equal to 10 feet.

Code 7701001 - Not Applicable should be used when none of the values listed in the code list for element eInjury.03 apply.

### Version 3 Changes Implemented

Added to better evaluate the CDC-ACS 2011 Guidelines for the Field Triage of Injured Patients.

Website: <http://www.cdc.gov/FieldTriage/>