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**Virginia Department of Health**

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

**Quarterly Report on EMS Incidents**

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**Q4 2023**

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*This report is based on analyses requested by the Medical Direction Committee and performed by Office of EMS Epidemiology staff. The accuracy of the data within this report is limited by system performance and the accuracy of data submissions from EMS agencies.*

Quarter 4 2023 data for this report was collected from the ESO Pre-hospital Data System (NEMSIS version 3.4) on February 28, 2024 and March 1, 2024. Importantly, many records submitted by Virginia EMS agencies for incidents occurring during the fourth quarter of 2023 failed to pass established validation rules and are not counted in the dataset used for this report (see Table 1).

Table 1. Counts of Failed Records by Month, Fourth Quarter, 2023, Virginia

Month	Total Failed Records
October	4,636
November	5,214
December	7,331

### Virginia EMS Call Summary, Fourth Quarter, 2023

EMS agencies in Virginia responded to a total of 420,350 EMS calls during the fourth quarter of 2023 (see Tables 2—5 and Figure 1).

Table 2. Number of EMS Incidents by Type of Service Requested and Disposition, Fourth Quarter, 2023, Virginia

Incident/ Patient Disposition	Type of Service Requested							Total
	911 Response (Scene)	Intercept/ Rendezvous	Interfacility Transport	Medical Transport	Mutual Aid	Public Assistance/ Not Listed	Standby	
Assist (Agency, Public, or Unit)	30,858	42	53	139	120	1,595	67	<b>32,874</b>
Canceled (Prior to Arrival at Scene or On Scene)	50,183	30	827	563	213	311	137	<b>52,264</b>
Patient Dead at Scene (with and without resuscitation; with and without transport)	3,920	1	2	6	8	16	1	<b>3,954</b>
Patient Evaluated, No Treatment/Transport Required	3,917	1	7	18	8	62	13	<b>4,026</b>
Patient Refused Evaluation/Care (with or without transport)	24,793	27	20	62	17	92	28	<b>25,039</b>
Patient Treated, Released (AMA or per protocol)	18,285	15	11	14	25	93	36	<b>18,479</b>
Patient Treated, Transferred Care to Another EMS Unit	8,901	11	3	11	30	27	8	<b>8,991</b>
Patient Treated, Transported by Law Enforcement	360	0	0	0	0	4	2	<b>366</b>
Patient Treated, Transported by Private Vehicle	277	0	4	0	0	4	4	<b>289</b>
Patient Treated, Transported by this Unit	188,855	301	32,431	43,851	310	329	42	<b>266,119</b>
Standby (no services/support provided or public safety, fire, or EMS operational support provided)	6,157	5	9	32	25	95	1,253	<b>7,576</b>
Transport Non-Patient, Organs, etc.	1	0	16	199	1	17	1	<b>235</b>
Blank	12	0	17	105	1	3	0	<b>138</b>
<b>Total</b>	<b>336,519</b>	<b>433</b>	<b>33,400</b>	<b>45,000</b>	<b>758</b>	<b>2,648</b>	<b>1,592</b>	<b>420,350</b>

Table 3. Number of EMS Incidents by Type of Service Requested and Age Group, Fourth Quarter, 2023, Virginia

Type of Service Requested	Age Group							Total
	0-4 years	5-12 years	13-17 years	18-24 years	25-64 years	65 and older	Unknown	
911 Response (Scene)	5,655	4,310	5,711	14,741	108,062	116,061	81,979	336,519
Intercept/ Rendezvous	9	7	2	37	176	145	57	433
Interfacility Transport	1,384	657	864	784	10,750	18,639	322	33,400
Medical Transport	416	240	344	345	11,308	31,955	392	45,000
Mutual Aid	11	14	8	18	218	191	298	758
Public Assistance/ Other Not Listed	19	21	18	35	332	848	1,375	2,648
Standby	2	7	33	22	78	46	1,404	1,592
<b>Total</b>	<b>7,496</b>	<b>5,256</b>	<b>6,980</b>	<b>15,982</b>	<b>130,924</b>	<b>167,885</b>	<b>85,827</b>	<b>420,350</b>

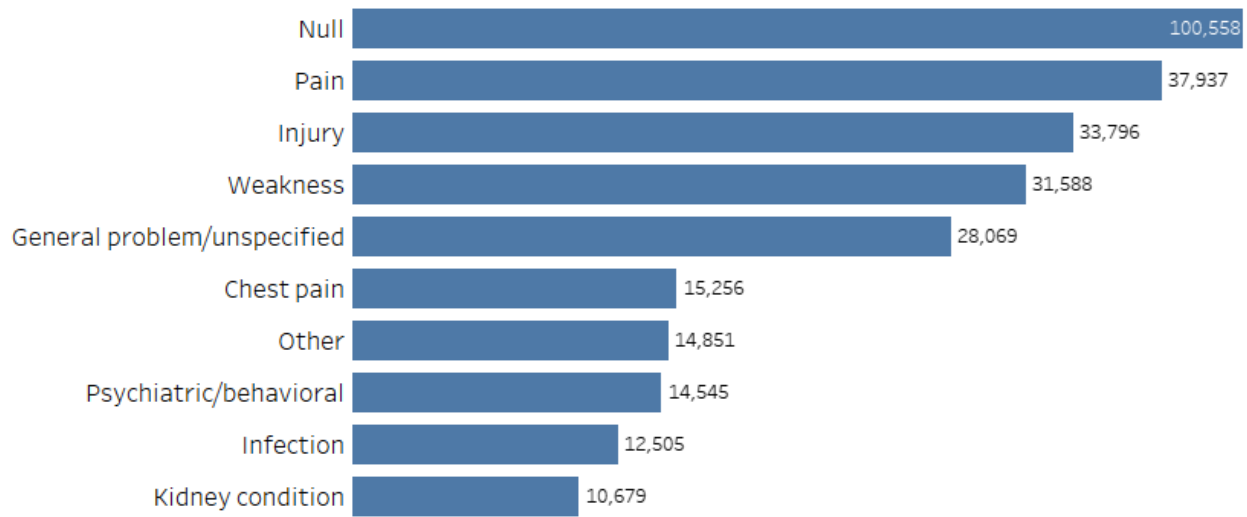
Table 4. Number of EMS Incidents by Patient Disposition and Age Group, Fourth Quarter, 2023, Virginia

Incident/ Patient Disposition	Age Group							Total
	0-4 years	5-12 years	13-17 years	18-24 years	25-64 years	65 and older	Unknown	
Assist (Agency, Public, or Unit)	135	88	148	291	2,585	4,534	25,093	32,874
Canceled (Prior to Arrival at Scene or On Scene)	48	24	35	73	588	903	50,593	52,264
Patient Dead at Scene (with and without resuscitation; with and without transport)	8	3	17	79	1,529	2,260	58	3,954
Patient Evaluated, No Treatment/ Transport Required	223	135	183	367	1,638	1,478	2	4,026

Table 4 (continued). Number of EMS Incidents by Patient Disposition and Age Group, Fourth Quarter, 2023, Virginia

Incident/ Patient Disposition	Age Group							Total
	0-4 years	5-12 years	13-17 years	18-24 years	25-64 years	65 and older	Unknown	
Patient Refused Evaluation/Care (with or without transport)	865	684	823	1,948	9,932	8,232	2,555	25,039
Patient Treated, Released (AMA or per protocol)	619	631	775	1,694	8,580	6,161	19	18,479
Patient Treated, Transferred Care to Another EMS Unit	191	137	189	593	4,126	3,700	55	8,991
Patient Treated, Transported by Law Enforcement	3	5	29	56	238	30	5	366
Patient Treated, Transported by Private Vehicle	20	23	27	18	116	84	1	289
Patient Treated, Transported by this EMS Unit	5,365	3,520	4,737	10,833	101,387	140,183	94	266,119
Standby (no services/support provided or public safety, fire, or EMS operational support provided)	7	5	13	23	185	217	7,126	7,576
Transport Non-Patient, Organs, etc.	11	0	1	3	9	3	208	235
Blank	1	1	3	4	11	100	18	138
<b>Total</b>	<b>7,496</b>	<b>5,256</b>	<b>6,980</b>	<b>15,982</b>	<b>130,924</b>	<b>167,885</b>	<b>85,827</b>	<b>420,350</b>

Figure 1. All EMS Incidents by Top 10 Primary Impression Categories, Fourth Quarter, 2023, Virginia



Of the 420,350 total EMS calls that occurred during the fourth quarter of 2023, a total of 188,855 (44.9%) represented emergency response incidents (i.e., incidents with a Type of Service Requested equal to “911 Response (Scene)” and a Patient Disposition of “Patient Treated, Transported by this EMS Unit”).

Figure 2. Emergency Responses by Top 10 Primary Impression Categories, Fourth Quarter, 2023, Virginia

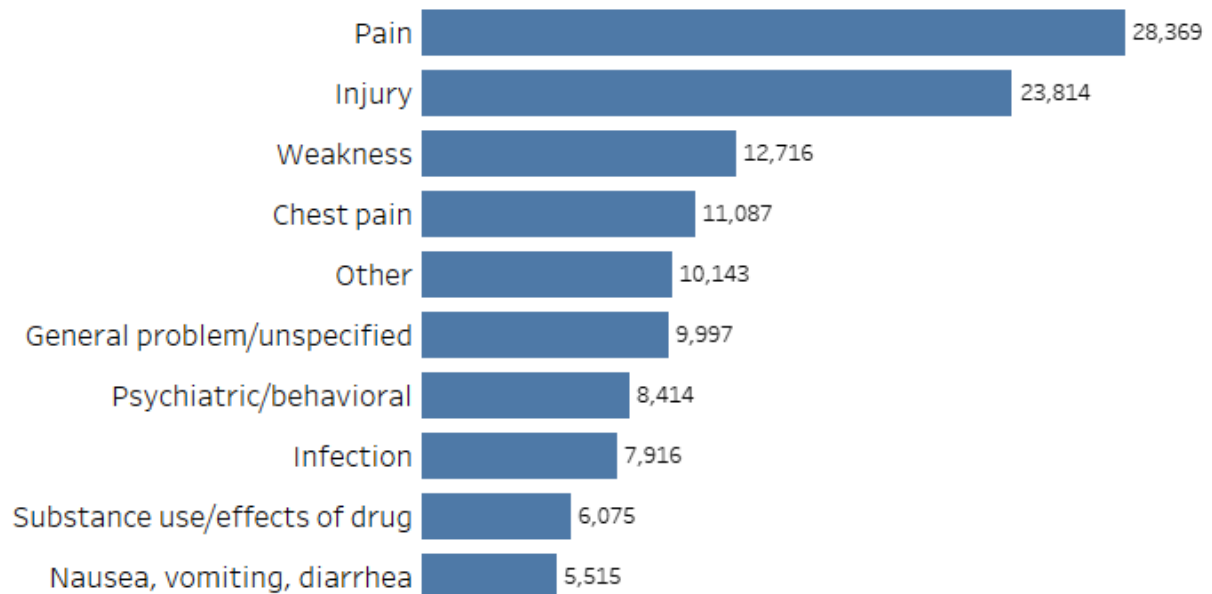


Table 5. Top 10 Primary Impressions for Emergency Responses by Patient Age Group, Fourth Quarter, 2023, Virginia

Provider Primary Impression	Age Group						
	0-4 years	5-12 years	13-17 years	18-24 years	25-64 years	65 and older	Unknown*
1	Seizure/ convulsions	Injury	Injury	Injury	Pain	Pain	Substance use/ effects of drug
2	Infection	Seizure/ convulsions	Psychiatric/ behavioral	Pain	Injury	Injury	Injury
3	Fluid in/around the lungs	Pain	Pain	Psychiatric/ behavioral	Chest pain	Weakness	Fluid in/around the lungs
4	Fever	General problem/ unspecified	Seizure/ convulsions	Substance use/ effects of drug	Psychiatric/ behavioral	Other	Syncope/near syncope
5	General problem/ unspecified	Infection	Substance use/ effects of drug	Seizure/ convulsions	Substance use/ effects of drug	General problem/ unspecified	Pain
6	Injury	Allergic reaction	Syncope/near syncope	General problem/ unspecified	General problem/ unspecified	Chest pain	Brain injury/death
7	Other	Psychiatric/ behavioral	General problem/ unspecified	Chest pain	Weakness	Infection	Other
8	Breathing abnormalities	Fever	Other	Nausea, vomiting, diarrhea	Other	Fluid in/around the lungs	Seizure/ convulsions
9	Nausea, vomiting, diarrhea	Fluid in/around the lungs	Brain injury/ death	Syncope/near syncope	Seizures/ convulsions	Breathing abnormalities	Psychiatric/ behavioral
10	Allergic reaction	Asthma	Allergic reaction	Obstetric condition	Nausea, vomiting, diarrhea	Stroke/TIA	Null

\*Multiple Provider Primary Impressions were tied for the fourth and fifth most frequent impressions for records with an Unknown Age Group.

## Chest Pain Emergency Responses

Importantly, a provider impression of “chest pain” can include multiple causes of chest pain, not specific or limited to chest pain of cardiac causes.

### *Non-Traumatic Chest Pain*

Non-traumatic chest pain incidents are defined as those with a primary impression that includes the words “chest pain,” “myocardial infarction,” or “angina”. Incidents with a response of “yes” in the possible injury (esituation.02) field and/or that have a primary impression that includes the words “injury,” “trauma,” or “burn” are excluded. Twelve-lead acquisition is defined as ECG type (evitals.04) or Procedure (eprocedures.03) = 12 lead-left sided (normal), 12 lead-right sided, 15 lead, or 18 lead. Of the 188,855 emergency response incidents reported by EMS during the fourth quarter of 2023, 9,971 (5.3%) non-traumatic chest pain incidents were identified in patients 35 years of age and older. Of these, a total of 8,347 (83.7%) patients had 12-lead acquisition and 5,336 (53.5%) had aspirin administration documented in the record, either taken daily or administered by EMS.

Table 6. Emergency Responses Among Non-Traumatic Chest Pain Patients ≥ 35 Years of Age with 12-lead Acquisition by EMS Regional Council, Fourth Quarter 2023, Virginia

EMS Regional Council	Number Patients	Number of Patients with 12-Lead Acquisition	Percent With 12-Lead Acquisition Documented	Percent Without 12-Lead Acquisition Documented
Blue Ridge	434	372	85.7	14.3
Central Shenandoah	458	416	90.8	9.2
Lord Fairfax	340	319	93.8	6.2
Northern Virginia	1,601	1,208	75.5	24.5
Old Dominion	2,033	1,459	71.8	28.2
Peninsulas	807	745	92.3	7.7
Rappahannock	652	632	96.9	3.1
Southwest Virginia	638	512	80.3	19.7
Thomas Jefferson	391	366	93.6	6.4
Tidewater	1,446	1,310	90.6	9.4
Western Virginia	1,157	1,004	86.8	13.2
Out of State	14	4	28.6	71.4
<b>Total</b>	<b>9,971</b>	<b>8,347</b>	<b>83.7</b>	<b>16.3</b>

Table 7. Emergency Responses Among Non-Traumatic Chest Pain Patients ≥ 35 Years of Age with Aspirin Administration\* by EMS Regional Council, Fourth Quarter 2023, Virginia

EMS Regional Council	Number Patients	Number of Patients with Aspirin Administration	Percent With Aspirin Administration Documented	Percent Without Aspirin Administration Documented
Blue Ridge	434	210	48.4	51.6
Central Shenandoah	458	250	54.6	45.4
Lord Fairfax	340	151	44.4	55.6
Northern Virginia	1,601	734	45.8	54.2
Old Dominion	2,033	1,151	56.6	43.4
Peninsulas	807	463	57.4	42.6
Rappahannock	652	372	57.1	42.9
Southwest Virginia	638	361	56.6	43.4
Thomas Jefferson	391	253	64.7	35.3
Tidewater	1,446	802	55.5	44.5
Western Virginia	1,157	583	50.4	49.6
Out of State	14	6	42.9	57.1
<b>Total</b>	<b>9,971</b>	<b>5,336</b>	<b>53.5</b>	<b>46.5</b>

\*Includes documentation of medication administration or relevant pertinent negative.

#### *Narrative Review*

Of the 4,635 non-traumatic chest pain incidents occurring in patients ≥ 35 years of age without aspirin administration or a pertinent negative documented, 25 incidents were randomly selected for narrative review. Aspirin administration by EMS was documented in the narrative for 2 (8.0%) incidents. Four (16.0%) narratives documented a reason for EMS not administering aspirin (i.e., blood pressure irregularities and a blood glucose of 137, patient being advised not to take aspirin by their primary care physician, the “type of chest pain” the patient was experiencing, and because the patient had fallen and hit their head). The remaining 19 (76.0%) records did not have aspirin administration or a pertinent negative documented in the narrative.

### *STEMI Patients*

STEMI incidents are defined as those with a documented:

- impression or symptom of myocardial infarction, or
- impression or symptom of unstable angina or angina pectoris and a cardiac rhythm of left bundle branch block, or
- cardiac rhythm of STEMI, or
- STEMI protocol used, or
- STEMI pre-arrival activation.

Time to receive an EKG is defined as the difference between the date/time the EMS clinician arrived at the patient and the date/time an EKG was performed. Of the 188,855 emergency response incidents reported by EMS during the fourth quarter of 2023, 1,006 (0.5%) STEMI incidents were identified. Of these, 743 (73.9%) patients had 12-lead acquisition, with 726 (97.7%) records containing information on the time between arrival at patient and when an EKG was performed. Of these 726 records, time to receive an EKG ranged from 0 minutes to 6 hours and 17 minutes. It took a median of 7 minutes and 56 seconds and an average of 11 minutes and 7 seconds for the 726 STEMI patients to receive an EKG. Notably, narrative review was performed for the patient with the longest interval (i.e., 6 hours and 17 minutes) between EMS arrival and time to receive an EKG. This review showed that the patient received an EKG upon EMS arrival rather than 6 hours post-arrival. When this record was excluded, the average time to receive an EKG declined to 10 minutes, 37 seconds.

## Stroke Emergency Responses

Stroke incidents are defined as those with a documented primary/secondary impression/symptom of stroke, a positive stroke scale score, a destination activation for stroke, or a stroke/TIA protocol used by an EMS clinician. Of the 188,855 emergency response incidents reported by EMS during the fourth quarter of 2023, 4,988 (2.6%) stroke incidents were identified. Of the stroke incidents, 3,966 (79.5%) documented the performance of a stroke scale or a pertinent negative, 4,657 (93.4%) had a blood glucose or pertinent negative recorded, and 4,944 (99.1%) had the date/time the patient was last known well or the date/time of the patient's symptom onset recorded. For 1,145 (23.0%) patients, the interval between symptom onset and EMS clinician arrival at the patient was greater than 4.5 hours and less than 24 hours.

Table 8. Emergency Responses Among Stroke Patients by Destination Hospital Stroke Certification Level and EMS Regional Council, Fourth Quarter 2023, Virginia

EMS Regional Council	Number Stroke Patients	Number (%) Across) of Patients Transported to Out of State Facilities	Number (%) Across) of Patients Not Transported to a Certified Facility	Number (%) Across) of Patients Transported to Acute Stroke Ready Facilities	Number (%) Across) of Patients Transported to Primary Stroke Centers	Number (%) Across) of Patients Transported to Thrombectomy Capable Hospitals	Number (%) Across) of Patients Transported to Comprehensive Stroke Centers
Blue Ridge	207	0 (0.0)	14 (6.8)	0 (0.0)	1 (0.5)	192 (92.8)	0 (0.0)
Central Shenandoah	174	0 (0.0)	27 (15.5)	0 (0.0)	145 (83.3)	0 (0.0)	2 (1.1)
Lord Fairfax	111	0 (0.0)	14 (12.6)	0 (0.0)	97 (87.4)	0 (0.0)	0 (0.0)
Northern Virginia	876	5 (0.6)	39 (4.5)	24 (2.7)	332 (37.9)	175 (20.0)	301 (34.4)
Old Dominion	1,047	0 (0.0)	74 (7.1)	2 (0.2)	404 (38.6)	4 (0.4)	563 (53.8)
Peninsulas	345	0 (0.0)	14 (4.1)	0 (0.0)	111 (32.2)	0 (0.0)	220 (63.8)
Rappahannock	367	0 (0.0)	40 (10.9)	0 (0.0)	304 (82.8)	0 (0.0)	23 (6.3)
Southwest Virginia	254	54 (21.3)	170 (66.9)	0 (0.0)	24 (9.4)	6 (2.4)	0 (0.0)
Thomas Jefferson	224	0 (0.0)	7 (3.1)	0 (0.0)	10 (4.5)	10 (4.5)	197 (87.9)
Tidewater	785	5 (0.6)	38 (4.8)	33 (4.2)	602 (76.7)	0 (0.0)	107 (13.6)
Western Virginia	584	9 (1.5)	133 (22.8)	29 (5.0)	192 (32.9)	219 (37.5)	2 (0.3)
Out of State	14	9 (64.3)	0 (0.0)	0 (0.0)	0 (0.0)	5 (35.7)	0 (0.0)
<b>Total</b>	<b>4,988</b>	<b>82 (1.6)</b>	<b>570 (11.4)</b>	<b>88 (1.8)</b>	<b>2,222 (44.5)</b>	<b>611 (12.2)</b>	<b>1,415 (28.4)</b>

Table 9. Emergency Responses Among Stroke Patients with Symptom Onset Between 4.5 and 24 Hours Prior to EMS Arrival by Destination Hospital Stroke Certification Level and EMS Regional Council, Fourth Quarter 2023, Virginia

EMS Regional Council	Number Stroke Patients	Number (% Across) of Patients Transported to Out of State Facilities	Number (% Across) of Patients Not Transported to a Certified Facility	Number (% Across) of Patients Transported to Acute Stroke Ready Facilities	Number (% Across) of Patients Transported to Primary Stroke Centers	Number (% Across) of Patients Transported to Thrombectomy Capable Hospitals	Number (% Across) of Patients Transported to Comprehensive Stroke Centers
Blue Ridge	48	0 (0.0)	2 (4.2)	0 (0.0)	1 (2.1)	45 (93.8)	0 (0.0)
Central Shenandoah	36	0 (0.0)	3 (8.3)	0 (0.0)	33 (91.7)	0 (0.0)	0 (0.0)
Lord Fairfax	13	0 (0.0)	4 (30.8)	0 (0.0)	9 (69.2)	0 (0.0)	0 (0.0)
Northern Virginia	215	1 (0.5)	14 (6.5)	5 (2.3)	78 (36.3)	46 (21.4)	71 (33.0)
Old Dominion	238	0 (0.0)	18 (7.6)	0 (0.0)	95 (39.9)	2 (0.8)	123 (51.7)
Peninsulas	80	0 (0.0)	2 (2.5)	0 (0.0)	36 (45.0)	0 (0.0)	42 (52.5)
Rappahannock	82	0 (0.0)	5 (6.1)	0 (0.0)	71 (86.6)	0 (0.0)	6 (7.3)
Southwest Virginia	58	14 (24.1)	35 (60.3)	0 (0.0)	6 (10.3)	3 (5.2)	0 (0.0)
Thomas Jefferson	48	0 (0.0)	4 (8.3)	0 (0.0)	2 (4.2)	2 (4.2)	40 (83.3)
Tidewater	207	1 (0.5)	9 (4.3)	10 (4.8)	154 (74.4)	0 (0.0)	33 (15.9)
Western Virginia	118	2 (1.7)	28 (23.7)	6 (5.1)	26 (22.0)	56 (47.5)	0 (0.0)
Out of State	2	2 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
<b>Total</b>	<b>1,145</b>	<b>20 (1.7)</b>	<b>124 (10.8)</b>	<b>21 (1.8)</b>	<b>511 (44.6)</b>	<b>154 (13.4)</b>	<b>315 (27.5)</b>

## Trauma Emergency Responses

Trauma incidents are defined as those meeting the criteria outlined in the VDH Office of EMS quarterly report on trauma incidents. Step 1, 2, and 3 trauma incidents are defined as those meeting the Virginia Field Trauma Triage Decision Scheme. Of the 188,855 emergency response incidents reported by EMS during the fourth quarter of 2023, 25,613 (13.6%) trauma incidents were identified; 21 (0.1%) of the trauma patients were noted to be in cardiac arrest. In addition, a total of 97 (0.4%) of the 25,613 trauma patients were noted to be part of a mass casualty incident (MCI). Of the 25,495 patients not in cardiac arrest or part of an MCI, a total of 1,890 (7.4%) Step 1 patients, 431 (1.7%) Step 2 patients, 519 (2.0%) Step 3 patients, and 22,655 (88.9%) patients not meeting step criteria were noted. Details on the transport of Step 1, 2, and 3 trauma patients who were not in cardiac arrest and not part of an MCI can be found in Tables 10—12.

Table 10. Emergency Responses Among non-MCI Step 1 Trauma Patients Not in Cardiac Arrest Transported to a Level 1/Pediatric or Level 2 Trauma Center by EMS Regional Council, Fourth Quarter 2023, Virginia

EMS Regional Council	Number Trauma Patients	Number (% Across) of Patients Transported to Level 1 Trauma Center	Number (% Across) of Patients Transported to Level 2 Trauma Center
Blue Ridge	58	9 (15.5)	45 (77.6)
Central Shenandoah	47	2 (4.3)	0 (0.0)
Lord Fairfax	44	1 (2.3)	31 (70.5)
Northern Virginia	456	190 (41.7)	102 (22.4)
Old Dominion	394	196 (49.7)	49 (12.4)
Peninsulas	136	2 (1.5)	83 (61.0)
Rappahannock	102	2 (2.0)	64 (62.7)
Southwest Virginia	107	10 (9.3)	0 (0.0)
Thomas Jefferson	73	61 (83.6)	1 (1.4)
Tidewater	286	123 (43.0)	23 (8.0)
Western Virginia	184	75 (40.8)	12 (6.5)
Out of State	3	1 (33.3)	0 (0.0)
<b>Total</b>	<b>1,890</b>	<b>672 (35.6)</b>	<b>410 (21.7)</b>

Table 11. Emergency Responses Among non-MCI Step 2 Trauma Patients Not in Cardiac Arrest Transported to a Level 1/Pediatric or Level 2 Trauma Center by EMS Regional Council, Fourth Quarter 2023, Virginia

EMS Regional Council	Number Trauma Patients	Number (% Across) of Patients Transported to Level 1 Trauma Center	Number (% Across) of Patients Transported to Level 2 Trauma Center
Blue Ridge	1	1 (100.0)	0 (0.0)
Central Shenandoah	12	4 (33.3)	0 (0.0)
Lord Fairfax	3	0 (0.0)	2 (66.7)
Northern Virginia	66	41 (62.1)	10 (15.2)
Old Dominion	124	101 (81.5)	6 (4.8)
Peninsulas	37	1 (2.7)	35 (94.6)
Rappahannock	10	1 (10.0)	9 (90.0)
Southwest Virginia	16	3 (18.8)	1 (6.3)
Thomas Jefferson	5	5 (100.0)	0 (0.0)
Tidewater	108	68 (63.0)	12 (11.1)
Western Virginia	45	20 (44.4)	7 (15.6)
Out of State	4	1 (25.0)	0 (0.0)
<b>Total</b>	<b>431</b>	<b>246 (57.1)</b>	<b>82 (19.0)</b>

Table 12. Emergency Responses Among non-MCI Step 3 Trauma Patients Not in Cardiac Arrest Transported to a Level 1/Pediatric, Level 2, or Level 3 Trauma Center by EMS Regional Council, Fourth Quarter 2023, Virginia

EMS Regional Council	Number Trauma Patients	Number (% Across) of Patients Transported to Level 1 Trauma Center	Number (% Across) of Patients Transported to Level 2 Trauma Center	Number (% Across) of Patients Transported to Level 3 Trauma Center
Blue Ridge	11	4 (36.4)	7 (63.6)	0 (0.0)
Central Shenandoah	10	0 (0.0)	0 (0.0)	0 (0.0)
Lord Fairfax	21	0 (0.0)	2 (9.5)	0 (0.0)
Northern Virginia	91	41 (45.1)	19 (20.9)	27 (29.7)
Old Dominion	88	63 (71.6)	3 (3.4)	11 (12.5)
Peninsulas	31	0 (0.0)	26 (83.9)	0 (0.0)
Rappahannock	32	8 (25.0)	21 (65.6)	0 (0.0)
Southwest Virginia	28	5 (17.9)	0 (0.0)	6 (21.4)
Thomas Jefferson	16	15 (93.8)	1 (6.3)	0 (0.0)
Tidewater	153	87 (56.9)	13 (8.5)	49 (32.0)
Western Virginia	37	9 (24.3)	2 (5.4)	12 (32.4)
Out of State	1	0 (0.0)	0 (0.0)	0 (0.0)
<b>Total</b>	<b>519</b>	<b>232 (44.7)</b>	<b>94 (18.1)</b>	<b>105 (20.2)</b>

## Pain Emergency Responses

Pain incidents are defined as those with documented pain scale scores between 4 and 10. Patients with a primary impression of chest pain are excluded.

### *Pain Scale Score 4—6*

Of the 188,855 emergency response incidents reported by EMS during the fourth quarter of 2023, 22,285 (11.8%) incidents occurred among patients with a pain score of 4—6, with 1,962 (8.8%) patients receiving an analgesic (additional details provided in Tables 13—15). By age group, 109 (0.5%) incidents occurred among patients younger than 5 years of age, 328 (1.5%) incidents occurred among patients 5—12 years of age, 526 (2.4%) incidents occurred among patients 13—17 years of age, 1,554 (7.0%) incidents occurred among patients 18—24 years of age, 10,184 (45.7%) incidents occurred among patients 25—64 years of age, 9,581 (43.0%) incidents occurred among patients 65 years of age and older, and 3 (<0.1%) incidents occurred in patients whose age was not documented.

### *Narrative Review (Pain Scale Score 4—6)*

Of the 20,323 incidents occurring among patients with a pain score of 4—6 without analgesic administration or a pertinent negative documented, 25 incidents were randomly selected for narrative review. One incident (4.0%) documented analgesic administration prior to EMS arrival in the narrative. The remaining 24 (96.0%) records did not have analgesic administration or a pertinent negative documented in the narrative.

Table 13. Emergency Responses Among Patients with Pain Score of 4—6 and Analgesic Administration\* by Age Group, Fourth Quarter 2023, Virginia

Age Group	Number Pain Patients	Number of Patients Receiving an Analgesic	Percent With Analgesic Administration Documented	Percent Without Analgesic Administration Documented
0-4 years	109	7	6.4	93.6
5-12 years	328	39	11.9	88.1
13-17 years	526	74	14.1	85.9
18-24 years	1,554	162	10.4	89.6
25-64 years	10,184	911	8.9	91.1
65 years and older	9,581	768	8.0	92.0
Unknown	3	1	33.3	66.7
<b>Total</b>	<b>22,285</b>	<b>1,962</b>	<b>8.8</b>	<b>91.2</b>

\*Includes documentation of medication administration or relevant pertinent negative.

Table 14. Emergency Responses Among Patients with Pain Score of 4—6 and Analgesic Administration\* by EMS Regional Council, Fourth Quarter 2023, Virginia

EMS Regional Council,	Number Pain Patients	Number of Patients Receiving an Analgesic	Percent With Analgesic Administration Documented	Percent Without Analgesic Administration Documented
Blue Ridge	1,177	126	10.7	89.3
Central Shenandoah	818	82	10.0	90.0
Lord Fairfax	483	36	7.5	92.5
Northern Virginia	4,565	330	7.2	92.8
Old Dominion	4,106	266	6.5	93.5
Peninsulas	1,970	141	7.2	92.8
Rappahannock	1,461	251	17.2	82.8
Southwest Virginia	1,443	132	9.1	90.9
Thomas Jefferson	631	97	15.4	84.6
Tidewater	3,131	260	8.3	91.7
Western Virginia	2,478	233	9.4	90.6
Out of State	22	8	36.4	63.6
<b>Total</b>	<b>22,285</b>	<b>1,962</b>	<b>8.8</b>	<b>91.2</b>

\*Includes documentation of medication administration or relevant pertinent negative.

Table 15. Analgesics Administered to Patients with Pain Score of 4—6, Fourth Quarter 2023, Virginia

Analgesic Administered	Number Analgesic Administrations†	Percent of Analgesics Administered
Acetaminophen/Tylenol	53	2.6
Dilaudid/Hydromorphone	1	<0.1
Fentanyl	1,527	76.0
Ibuprofen/Motrin	10	0.5
Ketamine	77	3.8
Ketorolac/Toradol	167	8.3
Morphine	174	8.7
<b>Total</b>	<b>2,009</b>	<b>100.0</b>

†The number of analgesic administrations is higher than the number of patients receiving an analgesic, as patients may receive more than one medication during an incident.

### *Pain scale score 7—10*

During the fourth quarter of 2023, 31,064 incidents occurred among patients with a pain score between 7 and 10, with 4,337 (14.0%) patients receiving an analgesic (additional details provided in Tables 16—18). By age group, 65 (0.2%) incidents occurred among patients younger than 5 years of age, 322 (1.0%) incidents occurred among patients 5—12 years of age, 610 (2.0%) incidents occurred among patients 13—17 years of age, 1,946 (6.3%) incidents occurred among patients 18—24 years of age, 16,911 (54.4%) incidents occurred among patients 25—64 years of age, 11,206 (36.1%) incidents occurred among patients 65 years of age and older, and 4 (<0.1%) incidents occurred in patients whose age was not documented.

### *Narrative Review (Pain Scale Score 7—10)*

Of the 26,727 incidents occurring among patients with a pain score of 7—10 without analgesic administration or a pertinent negative documented, 25 incidents were randomly selected for narrative review. Two incidents (8.0%) documented analgesic administration prior to EMS arrival in the narrative. The remaining 23 (92.0%) records did not have analgesic administration or a pertinent negative documented in the narrative.

Table 16. Emergency Responses Among Patients with Pain Score of 7—10 and Analgesic Administration\* by Age Group, Fourth Quarter 2023, Virginia

Age Group	Number Pain Patients	Number of Patients Receiving an Analgesic	Percent With Analgesic Administration Documented	Percent Without Analgesic Administration Documented
0—4 years	65	12	18.5	81.5
5—12 years	322	74	23.0	77.0
13—17 years	610	141	23.1	76.9
18—24 years	1,946	326	16.8	83.2
25—64 years	16,911	2,264	13.4	86.6
65 years and older	11,206	1,519	13.6	86.4
Unknown	4	1	25.0	75.0
<b>Total</b>	<b>31,064</b>	<b>4,337</b>	<b>14.0</b>	<b>86.0</b>

\*Includes documentation of medication administration or relevant pertinent negative.

Table 17. Emergency Responses Among Patients with Pain Score of 7—10 and Analgesic Administration\* by EMS Regional Council, Fourth Quarter re2023, Virginia

EMS Regional Council	Number Pain Patients	Number of Patients Receiving an Analgesic	Percent With Analgesic Administration Documented	Percent Without Analgesic Administration Documented
Blue Ridge	1,236	232	18.8	81.2
Central Shenandoah	1,248	226	18.1	81.9
Lord Fairfax	959	89	9.3	90.7
Northern Virginia	5,169	880	17.0	83.0
Old Dominion	7,607	610	8.0	92.0
Peninsulas	2,948	324	11.0	89.0
Rappahannock	1,715	531	31.0	69.0
Southwest Virginia	1,576	207	13.1	86.9
Thomas Jefferson	970	209	21.5	78.5
Tidewater	4,194	562	13.4	86.6
Western Virginia	3,417	457	13.4	86.6
Out of State	25	10	40.0	60.0
<b>Total</b>	<b>31,064</b>	<b>4,337</b>	<b>14.0</b>	<b>86.0</b>

\*Includes documentation of medication administration or relevant pertinent negative.

Table 18. Analgesics Administered to Patients with Pain Score of 7—10, Fourth Quarter 2023, Virginia

Analgesic Administered	Number Analgesic Administrations <sup>†</sup>	Percent of Analgesics Administered
Acetaminophen/Tylenol	79	1.8
Dilaudid/Hydromorphone	1	<0.1
Fentanyl	3,484	78.5
Ibuprofen/Motrin	9	0.2
Ketamine	183	4.1
Ketorolac/Toradol	340	7.7
Morphine	342	7.7
<b>Total</b>	<b>4,438</b>	<b>100.0</b>

<sup>†</sup>The number of analgesic administrations is higher than the number of patients receiving an analgesic, as patients may receive more than one medication during an incident.

## Pediatric (<15 Years) Pain Emergency Responses

During the fourth quarter of 2023, 1,165 incidents with a recorded pain score between 4 and 10 were identified among patients younger than 15 years of age, with 193 (16.6%) patients receiving an analgesic (additional details provided in Tables 19—20).

Table 19. Emergency Responses Among Pediatric Patients with Pain Score of 4—10 and Analgesic Administration\* by EMS Regional Council, Fourth Quarter 2023, Virginia

EMS Regional Council	Number Pediatric Pain Patients	Number of Patients Receiving an Analgesic	Percent With Analgesic Administration Documented	Percent Without Analgesic Administration Documented
Blue Ridge	57	10	17.5	82.5
Central Shenandoah	36	11	30.6	69.4
Lord Fairfax	23	4	17.4	82.6
Northern Virginia	318	61	19.2	80.8
Old Dominion	243	23	9.5	90.5
Peninsulas	102	17	16.7	83.3
Rappahannock	92	20	21.7	78.3
Southwest Virginia	39	6	15.4	84.6
Thomas Jefferson	24	5	20.8	79.2
Tidewater	124	25	20.2	79.8
Western Virginia	107	11	10.3	89.7
Out of State	0	0	0.0	0.0
<b>Total</b>	<b>1,165</b>	<b>193</b>	<b>16.6</b>	<b>83.4</b>

\*Includes documentation of medication administration or relevant pertinent negative.

Table 20. Analgesics Administered to Pediatric Patients with Pain Score of 4—10, Fourth Quarter 2023, Virginia

Analgesic Administered	Number Analgesic Administrations†	Percent of Analgesics Administered
Acetaminophen/Tylenol	11	5.6
Dilaudid/Hydromorphone	0	0.0
Fentanyl	152	77.2
Ibuprofen/Motrin	1	0.5
Ketamine	6	3.0
Ketorolac/Toradol	7	3.6
Morphine	20	10.2
<b>Total</b>	<b>197</b>	<b>100.0</b>

†The number of analgesic administrations is higher than the number of patients receiving an analgesic, as patients may receive more than one medication during an incident.

## Asthma Emergency Responses

Asthma incidents are defined as those with a primary impression that includes the words “asthma” or “reactive airway” or with a protocol that includes the word “asthma”. Patients with a primary impression of chronic obstructive pulmonary disease are excluded. Of the 188,855 emergency response incidents reported by EMS during the fourth quarter of 2023, 2,389 (1.3%) asthma incidents were identified. By age group, 45 (1.9%) incidents occurred among patients younger than two years of age, 198 (8.3%) incidents occurred among patients 2 – 17 years of age, 2,145 (89.8%) incidents occurred among patients older than 18 years of age, and 1 (<0.1%) occurred among a patient of unknown age. A total of 1,016 (42.5%) incidents had no steroid, magnesium, or Albuterol/ipratropium administration documented, while 1,373 (57.4%) incidents reported administration of at least one of the three medications or had a pertinent negative documented.

### *Narrative Review*

Of the 1,016 asthma incidents occurring among patients without steroid, magnesium, or Albuterol/ipratropium administration or a pertinent negative documented, 25 incidents were randomly selected for narrative review. Medication administration was documented in the narrative for 5 (20.0%) incidents. Of these five:

- In two instances, use of an inhaler or nebulizer prior to EMS arrival was noted in the narrative, with no detail provided on what medication was administered.
- In three instances, Albuterol was administered prior to arrival of EMS.

The remaining 20 (80.0%) records did not have medication administration or a pertinent negative documented in the narrative.

Table 21. Emergency Responses Among Asthma Patients with Albuterol/Ipratropium Administration\* by Age Group, Fourth Quarter 2023, Virginia

Age Group	Number Asthma Patients	Number of Patients Receiving Albuterol/Ipratropium	Percent With Albuterol/Ipratropium Administration Documented	Percent Without Albuterol/Ipratropium Administration Documented
< 2 years	45	17	37.8	62.2
2 – 17 years	198	135	68.2	31.8
18 and older	2,145	1,179	55.0	45.0
Unknown	1	1	100.0	0.0
<b>Total</b>	<b>2,389</b>	<b>1,332</b>	<b>55.8</b>	<b>44.2</b>

\*Includes documentation of medication administration or relevant pertinent negative.

Table 22. Emergency Responses Among Asthma Patients with Albuterol/Ipratropium Administration\* by EMS Regional Council, Fourth Quarter 2023, Virginia

EMS Regional Council	Number Asthma Patients	Number of Patients Receiving Albuterol/Ipratropium	Percent With Albuterol/Ipratropium Administration Documented	Percent Without Albuterol/Ipratropium Administration Documented
Blue Ridge	66	41	62.1	37.9
Central Shenandoah	41	25	61.0	39.0
Lord Fairfax	34	27	79.4	20.6
Northern Virginia	198	140	70.7	29.3
Old Dominion	334	235	70.4	29.6
Peninsulas	181	121	66.9	33.1
Rappahannock	224	101	45.1	54.9
Southwest Virginia	327	104	31.8	68.2
Thomas Jefferson	62	45	72.6	27.4
Tidewater	503	303	60.2	39.8
Western Virginia	417	189	45.3	54.7
Out of State	2	1	50.0	50.0
<b>Total</b>	<b>2,389</b>	<b>1,332</b>	<b>55.8</b>	<b>44.2</b>

\*Includes documentation of medication administration or relevant pertinent negative.

Table 23. Emergency Responses Among Asthma Patients with Steroid Administration\* by Age Group, Fourth Quarter 2023, Virginia

Age Group	Number Asthma Patients	Number Patients Receiving a Steroid	Percent With Steroid Administration Documented	Percent Without Steroid Administration Documented
< 2 years	45	1	2.2	97.8
2 – 17 years	198	26	13.1	86.9
18 and older	2,145	439	20.5	79.5
Unknown	1	0	0.0	100.0
<b>Total</b>	<b>2,389</b>	<b>466</b>	<b>19.5</b>	<b>80.5</b>

\*Includes documentation of medication administration or relevant pertinent negative.

Table 24. Emergency Responses Among Asthma Patients with Steroid Administration\* by EMS Regional Council, Fourth Quarter 2023, Virginia

EMS Regional Council	Number Asthma Patients	Number Patients Receiving a Steroid	Percent With Steroid Administration Documented	Percent Without Steroid Administration Documented
Blue Ridge	66	28	42.4	57.6
Central Shenandoah	41	11	26.8	73.2
Lord Fairfax	34	11	32.4	67.6
Northern Virginia	198	49	24.7	75.3
Old Dominion	334	55	16.5	83.5
Peninsulas	181	55	30.4	69.6
Rappahannock	224	34	15.2	84.8
Southwest Virginia	327	48	14.7	85.3
Thomas Jefferson	62	15	24.2	75.8
Tidewater	503	72	14.3	85.7
Western Virginia	417	87	20.9	79.1
Out of State	2	1	50.0	50.0
<b>Total</b>	<b>2,389</b>	<b>466</b>	<b>19.5</b>	<b>80.5</b>

\*Includes documentation of medication administration or relevant pertinent negative.

Table 25. Emergency Responses Among Asthma Patients with Magnesium Administration\* by Age Group, Fourth Quarter 2023, Virginia

Age Group	Number Asthma Patients	Number of Patients Receiving Magnesium	Percent With Magnesium Administration Documented	Percent Without Magnesium Administration Documented
< 2 years	45	0	0.0	100.0
2 – 17 years	198	4	2.0	98.0
18 and older	2,145	94	4.4	95.6
Unknown	1	0	0.0	100.0
<b>Total</b>	<b>2,389</b>	<b>98</b>	<b>4.1</b>	<b>95.9</b>

\*Includes documentation of medication administration or relevant pertinent negative.

Table 26. Emergency Responses Among Asthma Patients with Magnesium Administration\* by EMS Regional Council, Fourth Quarter 2023, Virginia

EMS Regional Council	Number Asthma Patients	Number of Patients Receiving Magnesium	Percent With Magnesium Administration Documented	Percent Without Magnesium Administration Documented
Blue Ridge	66	9	13.6	86.4
Central Shenandoah	41	1	2.4	97.6
Lord Fairfax	34	1	2.9	97.1
Northern Virginia	198	9	4.5	95.5
Old Dominion	334	11	3.3	96.7
Peninsulas	181	0	0.0	100.0
Rappahannock	224	5	2.2	97.8
Southwest Virginia	327	4	1.2	98.8
Thomas Jefferson	62	1	1.6	98.4
Tidewater	503	46	9.1	90.9
Western Virginia	417	11	2.6	97.4
Out of State	2	0	0.0	100.0
<b>Total</b>	<b>2,389</b>	<b>98</b>	<b>4.1</b>	<b>95.9</b>

\*Includes documentation of medication administration or relevant pertinent negative.