



# TRAFFIC SAFETY COMMISSION

Electric Scooter Related Injury in Seattle:

A Technical Report for the Washington Traffic Safety Commission

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<b>14. ABSTRACT</b> This study examined injuries over time associated with e-scooter use in Seattle to inform injury prevention efforts. Electronic health records (EHRs) from UW Medicine from 2018-2023 were used. Between 2018 and 2023, there were 282 e-scooter- and 2,487 bicycle-related medical encounters. The number of e-scooter-related medical encounters increased from 9 between 2018-2020 to 273 between 2021-2023. The most common injury among e-scooter riders was to the extremities (57.1%), followed by head/neck (46.8%), and fractures (34.8%). Nearly all e-scooter injuries were falls (87.6%), and 5.7% were injured in a collision with a motor vehicle in a traffic accident. Notably, at least 41.1% of the riders did not wear helmets					
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## Abstract

**Background:** Electric powered scooters (e-scooters) are an increasingly popular mode of transportation, particularly in urban areas, but there is limited research on injuries associated with e-scooter use in the city of Seattle. In 2020, e-scooter share programs were introduced Seattle. We sought to examine injuries over time associated with e-scooter use in Seattle to inform injury prevention efforts. **Methods:** UW Medicine is a large academic health system that includes 3 emergency departments (EDs) and hospitals as well as 5 urgent care centers and 25 primary care clinics in Seattle. Electronic health records (EHRs) from UW Medicine facilities in Seattle between 2018-2023 were reviewed by 2 trained research study assistants. Cases of e-scooter-related injuries were identified by ICD-10-CM codes and confirmed by chart review. Demographic and injury characteristics, facility type, and date of the medical encounters were extracted from the EHR and analyzed descriptively. **Results:** Between 2018 and 2023, we identified 282 e-scooter- and 2,487 bicycle-related medical encounters. The number of e-scooter-related medical encounters increased from 9 between 2018-2020 to 273 between 2021-2023. Relative to cyclists who sought medical care at UW Medicine, the injured e-scooter riders were younger, more likely to be female, and more often seen in EDs. The most common injury among e-scooter riders was to the extremities (57.1%), followed by head/neck (46.8%), and fractures (34.8%). Nearly all e-scooter injuries were falls (87.6%), and 5.7% were injured in a collision with a motor vehicle in a traffic accident. Notably, at least 41.1% of the riders did not wear helmets. **Conclusion:** The UW Medicine health system has treated increasing numbers of people for e-scooter-related injuries over time. Further research is needed to evaluate strategies for preventing e-scooter-related injuries.

## Introduction

Electric scooters (e-scooters) are electric-powered micromobility devices designed to transport a single person. Use of e-scooters have gained popularity, particularly in urban areas.<sup>1</sup> Indeed, many cities have introduced e-scooter share programs,<sup>1</sup> including Seattle in 2020.<sup>2</sup> However, several reports have raised concerns about the safety e-scooter use nationally.<sup>1,3-11</sup> Given the rapid growth in the use of these devices in our region,<sup>2</sup> we examined the incidence, demographics, and patterns of e-scooter-related injuries from medical encounters at UW Medicine facilities in Seattle between 2018-2023.

## Methods

### Data source

UW Medicine is a large academic health system that includes 3 emergency departments (EDs) and hospitals as well as 5 urgent care centers and 25 primary care clinics in Seattle. Electronic health records (EHRs) from UW Medicine facilities in Seattle between January 1, 2018 and December 31, 2023 were queried. Facilities included Harborview Medical Center, University of Washington Medical Center (UWMC) – Montlake, and UWMC – Northwest. This project was approved by the Institutional Review Board of Washington State (IRB number 2023-070).

### Study design and population

We conducted a cross-sectional analysis of data recorded in the UW Medicine electronic data warehouse. The International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) codes for e-scooter-related injury were activated in October 2020. Prior to then, there were no ICD codes for e-scooter-related injuries. Therefore, based on the guidance from trauma registry professionals at Harborview Medical Center who have extensive experience in the use of ICD codes over time, we applied a 2-phase approach to identify cases of e-scooter-related injury between 2018-2023. First, we identified potential cases by searching the EHR using the ICD-10-CM codes for motorized pedestrian conveyance and e-scooter-related injury (see Appendix A for codes). Second, the medical charts of these potential cases were then manually reviewed by 2 research study assistants trained by Harborview's trauma registry team to identify the following: e-scooter-related injury, rental/share program or personally owned device, helmet use, alcohol use, and other substance use.

A commonly used comparator of e-scooter-related injury is bicycle-related injury. Cases of bicycle-related injury were identified in the EHR using the Centers for Disease Control and Prevention (CDC) definition of bicycle-related injury that is also based on ICD-10-CM codes (see Appendix B for codes).<sup>12</sup>

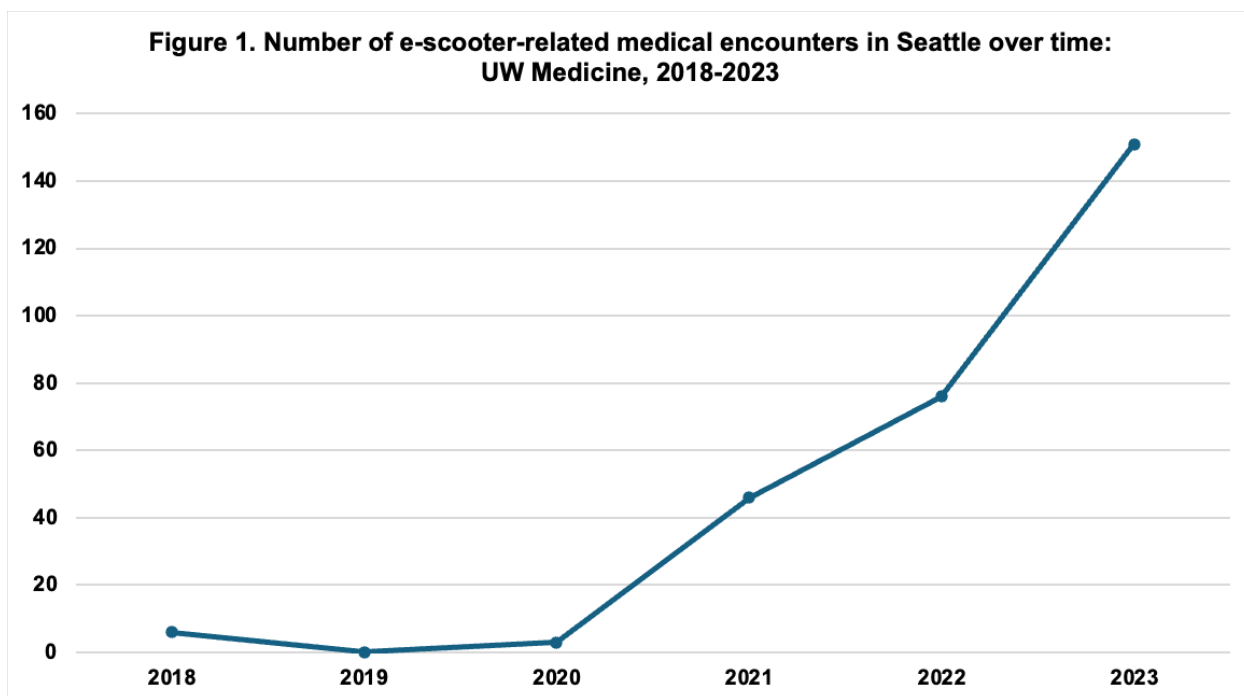
### Statistical analysis

Descriptive statistics were used to examine and characterize the distributions of e-scooter- and bicycle-related medical encounters. SAS version 9.4 (SAS Institute Inc., Cary, NC) and R studio were used in all data analyses. Tableau desktop, 2024.3. was used to create the maps.

## Results

### Distribution and characteristics of medical encounters

There were 282 e-scooter-related medical encounters at UW Medicine facilities in Seattle between 2018-2023 (Figure 1). The number of e-scooter-related medical encounters increased sharply from 3 in 2020 to 151 in 2023.



Compared with cyclists who sought medical care, the e-scooter riders had a higher proportion of females and were younger. Over half of the injured e-scooter riders were 25-44 years old, while just under half of injured bicyclists were in this age group (Table 1).

**Table 1. Demographic and clinical characteristics of patients seen for e-scooter- and bicycle-related injuries: UW Medicine, 2018-2023**

	<b>E-scooter (N=282)</b>	<b>Bicycle (N=2,479)</b>
<b>Gender</b>		
Female	104 (36.9%)	741 (29.9%)
Male	178 (63.1%)	1,738 (70.1%)
<b>Age group</b>		
≤14	8 (2.8%)	114 (4.6%)
15-18	9 (3.2%)	63 (2.5%)
19-24	40 (14.2%)	194 (7.8%)
25-44	161 (57.1%)	1,065 (43.0%)
45-64	59 (20.9%)	770 (31.1%)
≥65	5 (1.8%)	273 (11.0%)
<b>Type of visit</b>		
Outpatient/urgent care	46 (16.3%)	954 (38.5%)
Emergency	207 (73.4%)	1,049 (42.3%)
Inpatient/Observation	29 (10.3%)	476 (19.2%)
<b>Length of stay</b>		
0 day	211 (74.8%)	2,034 (82.0%)

1 day	55 (19.5%)	172 (6.9%)
2 days	4 (1.4%)	73 (2.9%)
≥3 days	12 (4.3%)	200 (8.1%)
<b>UW Medicine Facility</b>		
Harborview Medical Center	142 (50.4%)	736 (29.7%)
UWMC, Montlake Campus	84 (29.8%)	902 (36.4%)
UWMC, Northwest Campus	18 (6.4%)	183 (7.4%)
Primary care/urgent care	38 (13.5%)	658 (26.5%)
<b>Location/Type of Injury</b>		
Head/neck	132 (46.8%)	811 (32.7%)
Extremities	161 (57.1%)	1,330 (53.7%)
Torso	39 (13.8%)	511 (20.6%)
Sprain/strain	33 (11.7%)	292 (11.8%)
Fracture	98 (34.8%)	892 (36.0%)
Internal organ injury	38 (13.5%)	425 (17.1%)
Open wound	80 (28.4%)	436 (17.6%)
Contusion	122 (43.3%)	777 (31.3%)

Nearly three quarters of medical encounters for e-scooter-related injuries were ED visits. Length of stay exceeding 2 days was 8.1% and 4.3% for bicycle- and e-scooter-related medical encounters, respectively. Half of e-scooter-related medical care occurred at Harborview Medical Center. For additional detail on location of medical encounters, see maps in Appendix C and D.

Approximately half of medical encounters for e-scooters and a third of bicycle-related encounters involved head/neck injuries. For both e-scooter and bicycle riders, over half of medical encounters were for injury to the extremities and a third were for fractures. Other common types and sites of injury are shown in Table 1.

**Table 2. Mechanism of e-scooter- and bicycle-related injuries: UW Medicine, 2018-2023**

<b>Mechanism</b>	<b>E-scooter</b>	<b>Bicycle</b>
Fall	247 (87.6%)	
Pedestrian, other	13 (4.6%)	
MVT-Pedestrian	16 (5.7%)	
Struck by/against	6 (2.1%)	
Pedal cyclist, other		480 (19.3%)
MVT-Pedal Cyclist		2007 (80.7%)

Nearly all e-scooter-related injuries were from falling (Table 2), but collisions with a motor vehicle and collisions with another nonmotor vehicle each accounted for 5% of cases. In contrast, nearly all cyclists were injured in a collision with a motor vehicle and the remaining 13% were injured in a collision with other cyclists or pedestrians (Table 2).



**Table 3. E-scooter- and bicycle-related medical encounters according to season and day of the week: UW Medicine, 2018-2023**

	<b>E-scooter</b>	<b>Bicycle</b>
<b>Quarter</b>		
Q1 (winter)	29 (10.3%)	294 (11.8%)
Q2 (spring)	61 (21.6%)	715 (28.7%)
Q3 (summer)	124 (44.0%)	985 (39.6%)
Q4 (fall)	68 (24.1%)	493 (19.8%)
<b>Day of the week</b>		
Monday	41 (14.5%)	390 (15.7%)
Tuesday	39 (13.8%)	375 (15.1%)
Wednesday	33 (11.7%)	403 (16.2%)
Thursday	30 (10.6%)	368 (14.8%)
Friday	27 (9.6%)	350 (14.1%)
Saturday	61 (21.6%)	328 (13.2%)
Sunday	51 (18.1%)	273 (11.0%)

E-scooter- and bicycle-related visits were more likely to occur in the summer months (third quarter of the year; see Table 3). Medical encounters for e-scooter-related injuries were more likely to occur during the weekend (39.7%) than weekdays (60.3%).

**Table 4. Helmet use, alcohol use, substance use, and rental program use documented in the electronic health record: E-scooter-related medical encounters at UW Medicine, 2018-2023**

	<b>Overall (N=282)</b>
<b>Helmet use</b>	
No	116 (41.1%)
Yes	26 (9.2%)
Not documented	140 (49.6%)
<b>Alcohol use</b>	
No	38 (13.5%)
Yes	69 (24.5%)
Not documented	175 (62.1%)
<b>Substances use</b>	
No	56 (19.9%)
Yes	17 (6.0%)
Not documented	209 (74.1%)
<b>Rental E-scooter</b>	
No	1 (0.4%)
Yes	60 (21.3%)
Not documented	221 (78.4%)

## Helmet use

Half of e-scooter-related medical encounters had documentation of whether a helmet was used in the EHR, including the EMS, ED triage, or provider's/clinician's notes. Documentation of alcohol use, substance use, or use of rental e-scooters in the EHR was even lower. Despite these limitations, at least 41.1% of the riders did not wear helmets, 24.5% consumed alcohol, 6.0% used substances, and at least 21.3% rode a rented e-scooter (Table 4).

**Table 5. Use of ICD-10-CM codes for e-scooter-related injuries use over time: UW Medicine, 2018-2023**

Event Code	2018 (N=6)	2020 (N=3)	2021 (N=46)	2022 (N=76)	2023 (N=151)	Overall (N=282)
V00.141A	3 (50.0%)	2 (66.7%)	4 (8.7%)	2 (2.6%)	6 (4.0%)	17 (6.0%)
W05.1XXA	3 (50.0%)	1 (33.3%)	1 (2.2%)	0 (0%)	0 (0%)	5 (1.8%)
V00.142A	0 (0%)	0 (0%)	1 (2.2%)	1 (1.3%)	1 (0.7%)	3 (1.1%)
V00.841A	0 (0%)	0 (0%)	38 (82.6%)	63 (82.9%)	124 (82.1%)	225 (79.8%)
V03.131A	0 (0%)	0 (0%)	1 (2.2%)	6 (7.9%)	9 (6.0%)	16 (5.7%)
V06.131A	0 (0%)	0 (0%)	1 (2.2%)	0 (0%)	0 (0%)	1 (0.4%)
V00.09XA	0 (0%)	0 (0%)	0 (0%)	1 (1.3%)	2 (1.3%)	3 (1.1%)
V03.031A	0 (0%)	0 (0%)	0 (0%)	3 (3.9%)	3 (2.0%)	6 (2.1%)
V00.842A	0 (0%)	0 (0%)	0 (0%)	0 (0%)	3 (2.0%)	3 (1.1%)
V01.031A	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.7%)	1 (0.4%)
V06.031A	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (1.3%)	2 (0.7%)

ICD-10-CM	Description
V00.141A	Fall from scooter (nonmotorized)
W05.1XXA	Fall from non-moving nonmotorized scooter
V00.142A	Scooter (nonmotorized) colliding with stationary object
V00.841A	Fall from standing electric scooter
V03.131A	Pedestrian on standing electric scooter injured in collision with car, pick-up or van in traffic accident
V06.131A	Pedestrian on standing electric scooter injured in collision with other nonmotor vehicle in traffic accident
V00.09XA	Pedestrian on foot injured in collision with other pedestrian conveyance
V03.031A	Pedestrian on standing electric scooter injured in collision with car, pick-up or van in nontraffic accident
V00.842A	Pedestrian on standing electric scooter colliding with stationary object
V01.031A	Pedestrian on standing electric scooter injured in collision with pedal cycle in nontraffic accident
V06.031A	Pedestrian on standing e-scooter injured in collision with other nonmotor vehicle in nontraffic accident

Note: See Appendix A for full list of ICD-10-CM codes of E-scooter-related medical encounters.

## How to identify e-scooter injuries

Since they were activated in 2020, ICD-10-CM codes for e-scooter medical encounters have been used in more than 90% of the visits (Table 5). The rest of the visits were identified by chart review. Table 6 lists the keywords in EMS, ED, and provider notes. The provider notes had the most complete information to identify e-scooter injuries.

**Table 6. E-scooter keywords in the electronic medical record notes**

<b>EMS Keywords</b>		<b>Triage Keywords</b>		<b>Provider Keywords</b>	
e-scooter	2 (0.7%)	automatic scooter	1 (0.4%)	e-scooter	12 (4.3%)
e scooter	1 (0.4%)	bicycle	1 (0.4%)	e scooter	1 (0.4%)
electric scooter	22 (7.8%)	city scooter	1 (0.4%)	electric scooter	55 (19.5%)
e-scooter	17 (6.0%)	e-scooter	14 (5.0%)	electric stand-up scooter	1 (0.4%)
lime bike	1 (0.4%)	e scooter	2 (0.7%)	escooter	1 (0.4%)
lime electric scooter	1 (0.4%)	electric scooter	33 (11.8%)	lime electric scooter	1 (0.4%)
lime green bike/scooter	1 (0.4%)	lime bike	1 (0.4%)	lime scooter	27 (9.6%)
lime scooter	9 (3.2%)	lime bike scooter	1 (0.4%)	line scooter	1 (0.4%)
moped	1 (0.4%)	lime scooter	28 (9.9%)	lyme e scooter	1 (0.4%)
motor scooter	2 (0.7%)	link scooter	2 (0.7%)	lyme scooter	2 (0.7%)
motorized scooter	12 (4.3%)	lyme scooter	1 (0.4%)	motor scooter	2 (0.7%)
motorzied scooter	1 (0.4%)	motorized push scooter	1 (0.4%)	motorized scooter	11 (3.9%)
rented scooter	1 (0.4%)	motorized scooter	13 (4.6%)	rental scooter	1 (0.4%)
scooter	18 (6.4%)	power scooter	1 (0.4%)	scooter	62 (22.1%)
standing electric scooter	1 (0.4%)	recreational scooter	1 (0.4%)	stand-up electric scooter	1 (0.4%)
Missing	192 (68.1%)	rental scooter	1 (0.4%)	standing electric scooter	98 (34.8%)
		scooter	74 (26.3%)	standing scooter	1 (0.4%)
		scootering	1 (0.4%)	Missing	4(1.4%)
		shooter	1 (0.4%)		
		standing scooter	1 (0.4%)		
		Missing	103 (36.6%)		

## Conclusions

Among UW Medicine facilities in Seattle, e-scooter-related medical encounters increased after 2020. The increase in injuries is likely driven by several factors, including greater use of e-scooters in Seattle. Indeed, e-scooters became more accessible after the Seattle Department of Transportation (SDOT) launched the e-scooter share program in late 2020 and ridership seems to have increased since then.<sup>2,13</sup>

More than half of those injured in e-scooter incidents were 25-44 years old, and about two-thirds of e-scooter-related injuries were males. This is consistent with an e-scooter user survey conducted by SDOT in which 64% of respondents reported being 25-44 years old, and 65% identified as male.<sup>2</sup>

Nearly all the e-scooter-related injuries were fall-related. More than half of the e-scooter riders had injuries to the head/neck, and at least 41% of riders were not wearing helmets. Further research on the promotion of helmet use and other strategies are needed to prevent traumatic brain injury and other injuries among e-scooter riders.<sup>14</sup>

We caution that our review of medical records is not a comprehensive population-based study. Importantly, UW Medicine is only one health care delivery system in the region; people injured while using e-scooters and bicycles may have sought care elsewhere. More broadly, though, several aspects of the reviewed data suggest our querying and review process did not capture a consistent sampling fraction of all e-scooter or bicycle-related incidents that occurred from 2018-2023 in Seattle. With respect to e-scooters, the very modest number of e-scooter incidents prior to 2021 likely reflects an undercount that is ameliorated with the introduction and uptake of an e-scooter specific ICD codes that began in late 2020.

As e-scooter use is of public health and injury prevention interest, greater efforts to encourage and train health care providers on documenting e-scooter-related medical encounters could improve health-record base surveillance of these devices; fewer than half of cases had documented the use of helmets, alcohol/other substances, or rental/share program devices (Table 4).

In conclusion, our review of UW Medicine data suggests that as a system, we are treating increasing numbers of people for e-scooter-related injuries over time. The population affected by e-scooter injuries is somewhat younger and less skewed male than the population affected by bicycle injuries. Further study, potentially leveraging data from the Washington State Rapid Health Information Network (RHINO), a real-time, population-based syndromic surveillance monitoring system that includes visits to the ED and urgent care/primary care, may better describe the burden of e-scooter injury in Washington State.

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## Appendix

### Appendix A. ICD-10-CM codes of e-scooter-related injury

ICD-10-CM	DESCRIPTION	Start year
V00.141	Fall from scooter (nonmotorized)	2015
V00.841	Fall from standing electric scooter	2020
V00.848	Other accident with standing micro-mobility pedestrian conveyance	2020
V00.891	Fall from other pedestrian conveyance	2015
W03.XXX	Other fall on same level due to collision with another person	2015
W05.1XX	Fall from non-moving nonmotorized scooter	2015
W05.2XX	Fall from non-moving motorized mobility scooter	2015
V02.131	Pedestrian on standing electric scooter injured in collision with two- or three-wheeled motor vehicle in traffic accident	2020
V02.138	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with two- or three-wheeled motor vehicle in traffic accident	2020
V02.19X	Pedestrian with other conveyance injured in collision with two- or three-wheeled motor vehicle in traffic accident	2015
V02.931	Pedestrian on standing electric scooter injured in collision with two- or three wheeled motor vehicle, unspecified whether traffic or nontraffic accident	2020
V02.938	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with two- or three wheeled motor vehicle, unspecified whether traffic or nontraffic accident	2020
V02.99X	Pedestrian with other conveyance injured in collision with two- or three-wheeled motor vehicle, unspecified whether traffic or nontraffic accident	2015
V03.131	Pedestrian on standing electric scooter injured in collision with car, pick-up or van in traffic accident	2020
V03.138	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with car, pick-up or van in traffic accident	2020
V03.19X	Pedestrian with other conveyance injured in collision with car, pick-up truck or van in traffic accident	2015
V03.931	Pedestrian on standing electric scooter injured in collision with car, pick-up or van, unspecified whether traffic or nontraffic accident	2020
V03.938	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with car, pick-up or van, unspecified whether traffic or nontraffic accident	2020
V03.99X	Pedestrian with other conveyance injured in collision with car, pick-up truck or van, unspecified whether traffic or nontraffic accident	2015

V04.131	Pedestrian on standing electric scooter injured in collision with heavy transport vehicle or bus in traffic accident	2020
V04.138	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with heavy transport vehicle or bus in traffic accident	2020
V04.19X	Pedestrian with other conveyance injured in collision with heavy transport vehicle or bus in traffic accident	2015
V04.931	Pedestrian on standing electric scooter injured in collision with heavy transport vehicle or bus, unspecified whether traffic or nontraffic accident	2020
V04.938	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with heavy transport vehicle or bus, unspecified whether traffic or nontraffic accident	2020
V04.99X	Pedestrian with other conveyance injured in collision with heavy transport vehicle or bus, unspecified whether traffic or nontraffic accident	2015
V01.031	Pedestrian on standing electric scooter injured in collision with pedal cycle in nontraffic accident	2020
V01.038	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with pedal cycle in nontraffic accident	2020
V01.09X	Pedestrian with other conveyance injured in collision with pedal cycle in nontraffic accident	2015
V01.131	Pedestrian on standing electric scooter injured in collision with pedal cycle in traffic accident	2020
V01.138	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with pedal cycle in traffic accident	2020
V01.19X	Pedestrian with other conveyance injured in collision with pedal cycle in traffic accident	2015
V01.931	Pedestrian on standing electric scooter injured in collision with pedal cycle, unspecified whether traffic or nontraffic accident	2020
V01.938	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with pedal cycle, unspecified whether traffic or nontraffic accident	2020
V01.99X	Pedestrian with other conveyance injured in collision with pedal cycle, unspecified whether traffic or nontraffic accident	2015
V02.031	Pedestrian on standing electric scooter injured in collision with two- or three-wheeled motor vehicle in nontraffic accident	2020
V02.038	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with two- or three-wheeled motor vehicle in nontraffic accident	2020
V02.09X	Pedestrian with other conveyance injured in collision with two- or three-wheeled motor vehicle in nontraffic accident	2015

V03.031	Pedestrian on standing electric scooter injured in collision with car, pick-up or van in nontraffic accident	2020
V03.038	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with car, pick-up or van in nontraffic accident	2020
V03.09X	Pedestrian with other conveyance injured in collision with car, pick-up truck or van in nontraffic accident	2015
V04.031	Pedestrian on standing electric scooter injured in collision with heavy transport vehicle or bus in nontraffic accident	2020
V04.038	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with heavy transport vehicle or bus in nontraffic accident	2020
V04.09X	Pedestrian with other conveyance injured in collision with heavy transport vehicle or bus in nontraffic accident	2015
V05.031	Pedestrian on standing electric scooter injured in collision with railway train or railway vehicle in nontraffic accident	2020
V05.038	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with railway train or railway vehicle in nontraffic accident	2020
V05.09X	Pedestrian with other conveyance injured in collision with railway train or railway vehicle in nontraffic accident	2015
V05.131	Pedestrian on standing electric scooter injured in collision with railway train or railway vehicle in traffic accident	2020
V05.138	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with railway train or railway vehicle in traffic accident	2020
V05.19X	Pedestrian with other conveyance injured in collision with railway train or railway vehicle in traffic accident	2015
V05.931	Pedestrian on standing electric scooter injured in collision with railway train or railway vehicle, unspecified whether traffic or nontraffic accident	2020
V05.938	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with railway train or railway vehicle, unspecified whether traffic or nontraffic accident	2020
V05.99X	Pedestrian with other conveyance injured in collision with railway train or railway vehicle, unspecified whether traffic or nontraffic accident	2015
V06.031	Pedestrian on standing electric scooter injured in collision with other nonmotor vehicle in nontraffic accident	2020
V06.038	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with other nonmotor vehicle in nontraffic accident	2020
V06.09X	Pedestrian with other conveyance injured in collision with other nonmotor vehicle in nontraffic accident	2015



V06.131	Pedestrian on standing electric scooter injured in collision with other nonmotor vehicle in traffic accident	2020
V06.138	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with other nonmotor vehicle in traffic accident	2020
V06.19X	Pedestrian with other conveyance injured in collision with other nonmotor vehicle in traffic accident	2015
V06.931	Pedestrian on standing electric scooter injured in collision with other nonmotor vehicle, unspecified whether traffic or nontraffic accident	2020
V06.938	Pedestrian on other standing micro-mobility pedestrian conveyance injured in collision with other nonmotor vehicle, unspecified whether traffic or nontraffic accident	2020
V06.99X	Pedestrian with other conveyance injured in collision with other nonmotor vehicle, unspecified whether traffic or nontraffic accident	2015
V89.1XX	Person injured in unspecified nonmotor-vehicle accident, nontraffic	2015
V89.3XX	Person injured in unspecified nonmotor-vehicle accident, traffic	2015
V00.031	Pedestrian on foot injured in collision with rider of standing electric scooter	2020
V00.038	Pedestrian on foot injured in collision with rider of other standing micro-mobility pedestrian conveyance	2020
V00.09X	Pedestrian on foot injured in collision with other pedestrian conveyance	2015
V00.142	Scooter (nonmotorized) colliding with stationary object	2015
V00.182	Pedestrian on other rolling-type pedestrian conveyance colliding with stationary object	2015
V00.842	Pedestrian on standing electric scooter colliding with stationary object	2020
V00.892	Pedestrian on other pedestrian conveyance colliding with stationary object	2015

Appendix B. ICD-10-CM codes of bicycle-related injury

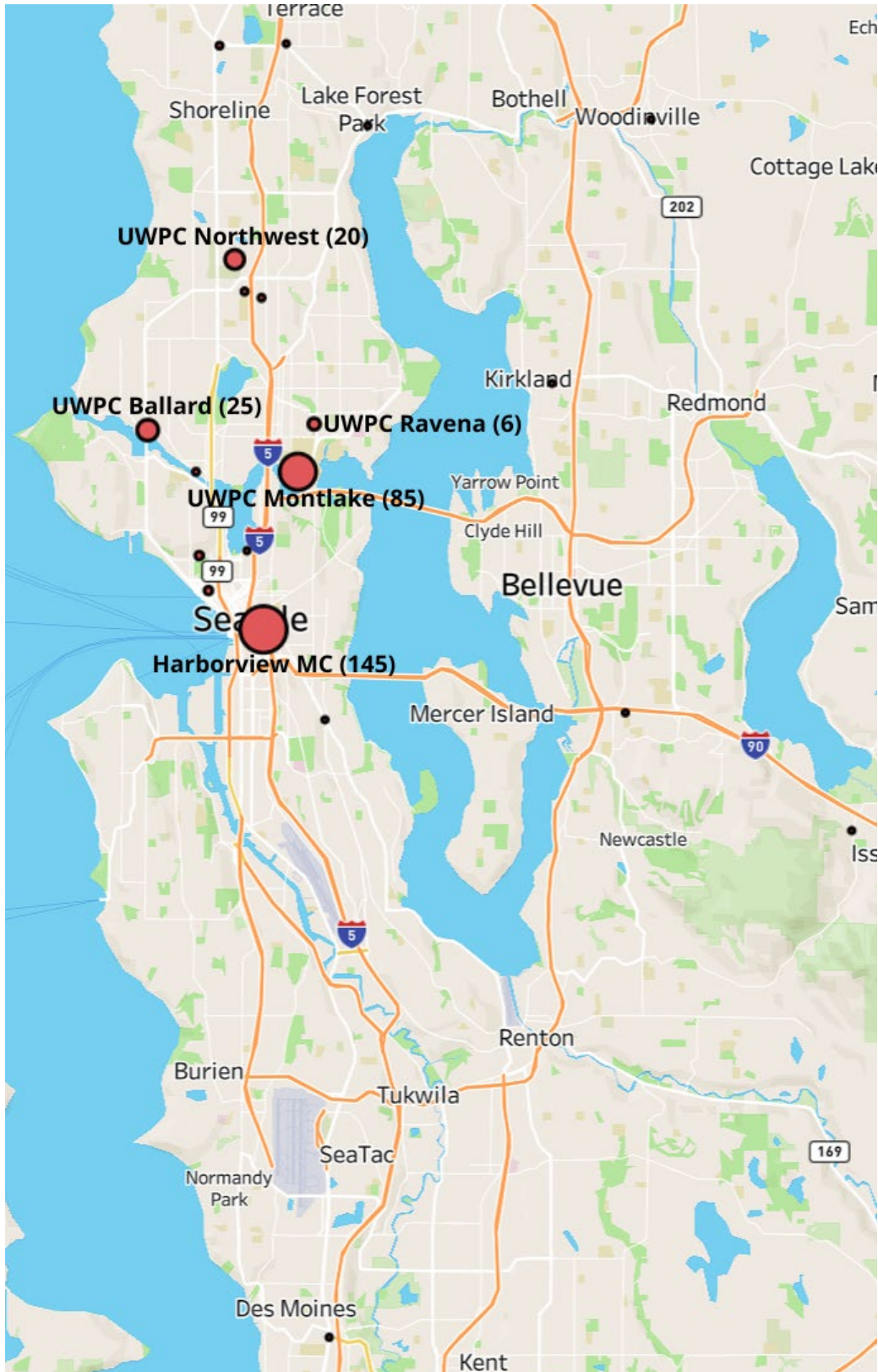
ICD-10-CM	Description	Start year
V12.3XX	Person boarding or alighting a pedal cycle injured in collision with two- or three-wheeled motor vehicle	2015
V12.4XX	Pedal cycle driver injured in collision with two- or three-wheeled motor vehicle in traffic accident	2015
V12.5XX	Pedal cycle passenger injured in collision with two- or three-wheeled motor vehicle in traffic accident	2015
V12.9XX	Unspecified pedal cyclist injured in collision with two- or three-wheeled motor vehicle in traffic accident	2015
V13.3XX	Person boarding or alighting a pedal cycle injured in collision with car, pick-up truck or van	2015
V13.4XX	Pedal cycle driver injured in collision with car, pick-up truck or van in traffic accident	2015
V13.5XX	Pedal cycle passenger injured in collision with car, pick-up truck or van in traffic accident	2015
V13.9XX	Unspecified pedal cyclist injured in collision with car, pick-up truck or van in traffic accident	2015
V14.3XX	Person boarding or alighting a pedal cycle injured in collision with heavy transport vehicle or bus	2015
V14.4XX	Pedal cycle driver injured in collision with heavy transport vehicle or bus in traffic accident	2015
V14.5XX	Pedal cycle passenger injured in collision with heavy transport vehicle or bus in traffic accident	2015
V14.9XX	Unspecified pedal cyclist injured in collision with heavy transport vehicle or bus in traffic accident	2015
V19.40X	Pedal cycle driver injured in collision with unspecified motor vehicles in traffic accident	2015
V19.49X	Pedal cycle driver injured in collision with other motor vehicles in traffic accident	2015
V19.50X	Pedal cycle passenger injured in collision with unspecified motor vehicles in traffic accident	2015
V19.59X	Pedal cycle passenger injured in collision with other motor vehicles in traffic accident	2015
V19.60X	Unspecified pedal cyclist injured in collision with unspecified motor vehicles in traffic accident	2015
V19.69X	Unspecified pedal cyclist injured in collision with other motor vehicles in traffic accident	2015
V19.9XX	Pedal cyclist (driver) (passenger) injured in unspecified traffic accident	2015

V10.0XX	Pedal cycle driver injured in collision with pedestrian or animal in nontraffic accident	2015
V10.1XX	Pedal cycle passenger injured in collision with pedestrian or animal in nontraffic accident	2015
V10.2XX	Unspecified pedal cyclist injured in collision with pedestrian or animal in nontraffic accident	2015
V10.3XX	Person boarding or alighting a pedal cycle injured in collision with pedestrian or animal	2015
V10.4XX	Pedal cycle driver injured in collision with pedestrian or animal in traffic accident	2015
V10.5XX	Pedal cycle passenger injured in collision with pedestrian or animal in traffic accident	2015
V10.9XX	Unspecified pedal cyclist injured in collision with pedestrian or animal in traffic accident	2015
V11.0XX	Pedal cycle driver injured in collision with other pedal cycle in nontraffic accident	2015
V11.1XX	Pedal cycle passenger injured in collision with other pedal cycle in nontraffic accident	2015
V11.2XX	Unspecified pedal cyclist injured in collision with other pedal cycle in nontraffic accident	2015
V11.3XX	Person boarding or alighting a pedal cycle injured in collision with other pedal cycle	2015
V11.4XX	Pedal cycle driver injured in collision with other pedal cycle in traffic accident	2015
V11.5XX	Pedal cycle passenger injured in collision with other pedal cycle in traffic accident	2015
V11.9XX	Unspecified pedal cyclist injured in collision with other pedal cycle in traffic accident	2015
V12.0XX	Pedal cycle driver injured in collision with two- or three-wheeled motor vehicle in nontraffic accident	2015
V12.1XX	Pedal cycle passenger injured in collision with two- or three-wheeled motor vehicle in nontraffic accident	2015
V12.2XX	Unspecified pedal cyclist injured in collision with two- or three-wheeled motor vehicle in nontraffic accident	2015
V13.0XX	Pedal cycle driver injured in collision with car, pick-up truck or van in nontraffic accident	2015
V13.1XX	Pedal cycle passenger injured in collision with car, pick-up truck or van in nontraffic accident	2015
V13.2XX	Unspecified pedal cyclist injured in collision with car, pick-up truck or van in nontraffic accident	2015
V14.0XX	Pedal cycle driver injured in collision with heavy transport vehicle or bus in nontraffic accident	2015

V14.1XX	Pedal cycle passenger injured in collision with heavy transport vehicle or bus in nontraffic accident	2015
V14.2XX	Unspecified pedal cyclist injured in collision with heavy transport vehicle or bus in nontraffic accident	2015
V15.0XX	Pedal cycle driver injured in collision with railway train or railway vehicle in nontraffic accident	2015
V15.1XX	Pedal cycle passenger injured in collision with railway train or railway vehicle in nontraffic accident	2015
V15.2XX	Unspecified pedal cyclist injured in collision with railway train or railway vehicle in nontraffic accident	2015
V15.3XX	Person boarding or alighting a pedal cycle injured in collision with railway train or railway vehicle	2015
V15.4XX	Pedal cycle driver injured in collision with railway train or railway vehicle in traffic accident	2015
V15.5XX	Pedal cycle passenger injured in collision with railway train or railway vehicle in traffic accident	2015
V15.9XX	Unspecified pedal cyclist injured in collision with railway train or railway vehicle in traffic accident	2015
V16.0XX	Pedal cycle driver injured in collision with other nonmotor vehicle in nontraffic accident	2015
V16.1XX	Pedal cycle passenger injured in collision with other nonmotor vehicle in nontraffic accident	2015
V16.2XX	Unspecified pedal cyclist injured in collision with other nonmotor vehicle in nontraffic accident	2015
V16.3XX	Person boarding or alighting a pedal cycle injured in collision with other nonmotor vehicle in nontraffic accident	2015
V16.4XX	Pedal cycle driver injured in collision with other nonmotor vehicle in traffic accident	2015
V16.5XX	Pedal cycle passenger injured in collision with other nonmotor vehicle in traffic accident	2015
V16.9XX	Unspecified pedal cyclist injured in collision with other nonmotor vehicle in traffic accident	2015
V17.0XX	Pedal cycle driver injured in collision with fixed or stationary object in nontraffic accident	2015
V17.1XX	Pedal cycle passenger injured in collision with fixed or stationary object in nontraffic accident	2015
V17.2XX	Unspecified pedal cyclist injured in collision with fixed or stationary object in nontraffic accident	2015
V17.3XX	Person boarding or alighting a pedal cycle injured in collision with fixed or stationary object	2015
V17.4XX	Pedal cycle driver injured in collision with fixed or stationary object in traffic accident	2015

V17.5XX	Pedal cycle passenger injured in collision with fixed or stationary object in traffic accident	2015
V17.9XX	Unspecified pedal cyclist injured in collision with fixed or stationary object in traffic accident	2015
V18.0XX	Pedal cycle driver injured in noncollision transport accident in nontraffic accident	2015
V18.1XX	Pedal cycle passenger injured in noncollision transport accident in nontraffic accident	2015
V18.2XX	Unspecified pedal cyclist injured in noncollision transport accident in nontraffic accident	2015
V18.3XX	Person boarding or alighting a pedal cycle injured in noncollision transport accident	2015
V18.4XX	Pedal cycle driver injured in noncollision transport accident in traffic accident	2015
V18.5XX	Pedal cycle passenger injured in noncollision transport accident in traffic accident	2015
V18.9XX	Unspecified pedal cyclist injured in noncollision transport accident in traffic accident	2015
V19.00X	Pedal cycle driver injured in collision with unspecified motor vehicles in nontraffic accident	2015
V19.09X	Pedal cycle driver injured in collision with other motor vehicles in nontraffic accident	2015
V19.10X	Pedal cycle passenger injured in collision with unspecified motor vehicles in nontraffic accident	2015
V19.19X	Pedal cycle passenger injured in collision with other motor vehicles in nontraffic accident	2015
V19.20X	Unspecified pedal cyclist injured in collision with unspecified motor vehicles in nontraffic accident	2015
V19.29X	Unspecified pedal cyclist injured in collision with other motor vehicles in nontraffic accident	2015
V19.3XX	Pedal cyclist (driver) (passenger) injured in unspecified nontraffic accident	2015
V19.81X	Pedal cyclist (driver) (passenger) injured in transport accident with military vehicle	2015
V19.88X	Pedal cyclist (driver) (passenger) injured in other specified transport accidents	2015

Appendix C. E-scooter-related visits by UW Medicine facility location, 2018-2023



Appendix D. Bicycle-related visits by UW Medicine facility location, 2018-2023

