

Electric Bicycle Injury Codes: Clinical Rationale

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Rising Emergence of Electric Bicycles

- E-bicycles became commercially available in the early 1980s, gaining popularity in the early 2000s as an affordable mode of personal transportation
- Debuting in 2009, rental bikeshare programs have increased e-bicycle use in the U.S. with a combined fleet of over 4,000 vehicle in more than 150 cities
- Personal ownership of e-bicycles in the U.S. had grown dramatically with dollar sales increasing by 145% between 2019 and 2020

Device Form and Speed

- Similar in form to conventional bicycles, with two or three wheels
- Fully operable pedals
- Propelled partially or entirely by electric power and equipped with a battery

Device Regulation in the U.S.

- Product regulation
 - Under Consumer Product Safety Act, with a motor limited to <750 watts, fully operable pedals, and a maximum motor-assist speed of 20 MPH under specific conditions (a paved level surface, operator who weighs 170 pounds, etc.)
- Traffic safety regulation
 - Under state motor vehicle codes or traffic laws, which vary by state. Most commonly regulate e-bicycles as bicycles and clearly distinct from motor vehicles or motorcycles

Device Classification in the U.S.

- Proposed national classification
 - PeopleForBikes has worked to develop and legislatively define a three-class system distinguishing e-bicycles by speed and power activation. This system resembles European classifications and has been adopted in the transportation statutes of 33 states and by several federal agencies.
 - The Society of Automotive Engineers developed a comprehensive taxonomy and typology standard for micromobility vehicles that includes a type definition and classification for e-bicycles

Injury Epidemiology of Electric Bicycles

- Reliable U.S. injury epidemiology data are lacking
 - Current ICD-10-CM External Cause of Morbidity codes do not distinguish e-bicycle injuries from those sustained on motorcycles
 - Many trauma center data registries in the U.S. categorize e-bicycle injuries as conventional bicycle injuries
- One Chinese study calculated a rate of 1.52 non-fatal e-bicycle injuries per 100,000 people, as well as 0.30 deaths per 100,000 people

Clinical Picture

- Limited research indicates e-bicycle injuries are more likely to be severe, to injure the head and lower extremities, and require an emergency department visit than conventional bicycle injuries
- Additional research suggests that e-bicycle injuries may also be more severe than injuries related to other micro-mobility devices, being nearly three times as likely to result in hospital admission, as compared to powered scooters
- E-bicycle injury pattern is similar to that of conventional bicycle
- Higher age and increased craniocerebral trauma among e-bicycle riders than conventional bicycle riders

Safety Concerns

- The rising popularity of e-bicycles may be outpacing adequate bicycle infrastructure – this could lead to potential conflicts between e-bicycles and other vehicles
- In general, e-bicycles have greater mass, travel at higher speeds, and have more maneuverability than conventional bicycles, possibly increasing the risk to e-bicycle riders and pedestrians
 - Novice e-bicycle riders may be especially at risk of sustaining/causing an injury
- Most of the existing safety literature is based on studies published in Europe and Asia – it is unclear how generalizable this information is to the US population
- Therefore, new codes are needed to better understand e-bicycle safety risks

Proposal of New ICD-10-CM Codes for e-bicycle

- Classify e-bicycles as “electric assisted bicycle”(V20-V29)
- Add a new code to distinguish e-bicycles from motorcycles and mopeds
- Add the term “electric assisted bicycle” as included mode of transport for section V20-V29

Anticipated Outcomes

- Obtain a better understanding of the problem of e-bicycle morbidity/mortality.
 - Monitor trends.
 - Compare injury incidence across different geographies.
 - Identify specific populations at-risk.
- Develop evidence-based policies, interventions, and programs.
- **Reduce the incidence of e-bicycle related injuries and deaths.**

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Questions?