



Defense Health Agency

Defense and Veterans Brain Injury Center
“Clinical Updates in Brain Injury Science Today [CUBIST]” Podcast
“Injuries associated with electric-powered bikes and scooters”

TRT: 8:37

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Betsy Myhre: The views, opinions, and findings contained in this podcast are those of the host and subject matter experts. They should not be construed as official Department of Defense positions, policies, or decisions unless designated by other official documentation.

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Myhre: Hi. Welcome to Clinical Updates in Brain Injury Science Today, or “CUBIST,” a podcast for health care providers about current research on traumatic brain injury, also known as TBI. This program is produced by the Defense and Veterans Brain Injury Center, otherwise known as DVBIC. I'm your host today, Betsy Myhre. I'm a nurse practitioner here at DVBIC.

In this episode of CUBIST, I'll be talking with Dr. Donald Marion, neurosurgeon at DVBIC. Don and I will discuss a study entitled: “Injuries associated with electric-powered bikes and scooters: Analysis of US consumer product data,” by Charles DiMaggio and colleagues and published in *Injury Prevention*, November 2019.

Myhre: Hi Don, and thanks for bringing this topic to CUBIST today. During the past one-to-two years, I have been surprised and a little alarmed by the proliferation of E-bikes and powered scooters for rent in our community and especially around our headquarters at DVBIC. I notice that safety helmets are not provided with these rentals and I wonder what the injury risks are. So what were the key findings of this study?

Marion: The types of injuries sustained from riding E-bikes, that's electric bikes, powered scooters, and pedal bicycles, and their relative incidence, were investigated by reviewing a national injury registry of all people admitted to US emergency departments over a period of 18 years. Persons injured using E-bikes were more likely to suffer internal injuries and compared with powered scooter injuries, were nearly three times more likely to require hospital admission. Compared with pedal bicycles, E-bike riders were twice as likely to involve a collision with a motor vehicle. Powered scooter injuries were nearly three times more likely to result in a diagnosis of concussion. E-bike-related injuries were also more than three times more likely to involve a collision with a pedestrian than either pedal bicycles or powered scooters. While pedal bicycle-related injuries, as well as powered scooter injuries, have been decreasing over the past several years, E-bike injuries have been increasing dramatically, particularly among older individuals.

Myhre: How was the study done?

Marion: Injury patterns and trends associated with electric bicycles, that's E-bikes, powered scooters, and pedal bicycles was obtained from 2000 to 2017 using the US Consumer Product Safety Commission National Electronic Injury Surveillance System, or NEISS.

Myhre: Don, what was the actual incidence, typical age, and typical gender for the injured of each of the transportation devices?

Marion: During the 18-year study period, there were 130,797 powered scooter injuries. There were 3,075 E-bike injuries, and 9,477,600 pedal bicycle injuries. Betsy, the mean age of a person injured using a powered scooter was 29.4 compared with 31.9 years of age for persons injured using an E-bike and 25.2 for pedal bicycles. The youngest patients accounted for 49.1 percent of all powered scooter injuries. By contrast, the largest age groups for E-bike injuries was the 18–44 and 45–65-year-old individuals, 10–14 year olds accounted for most powered scooter injuries. For all ages, persons injured using E-bikes were significantly more likely to be male than persons injured using powered scooters. 72.4 percent of pedal bicycle-related injuries were among males.

Myhre: So, I guess I find it interesting that people using the E bikes were more likely to suffer an internal injury and people using scooters are more likely to suffer a concussion.

Marion: That's correct.

Myhre: You know, and just looking around Washington, DC where we are, I noticed that people that rent the E bikes are usually out on the road, whereas most people that are riding a scooter seem to be up on a sidewalk. And I wonder if that's one of the reasons between the differences in the type of injuries that people are getting.

Marion: I suspect it may be that, but it may also be just how unsteady or relatively unsteady as powered scooters would seem to be. I don't know. I've not ridden one myself.

Myhre: And I also thought it interesting that the folks on E-bikes were an older age group and then you wonder if it's tourist and people like that, that are they're renting these E-bikes and using those versus somebody that's wearing a helmet on their own bike or, you know, younger people that are renting the scooters. So it's really interesting. What were the main limitations that they found in this study?

Marion: So, A key limitation actually goes back Betsy to your initial observation. That's there's no information is available about the use of protective helmets for any of the three modes of transportation. I'm sure we've all noticed that helmets don't come with the scooters and don't come with the E-bikes, yet there is abundant evidence in the literature that pedal bicycle and motorcycle helmets significantly reduce the risk of serious head injuries. A second limitation is that only those individuals with injuries severe enough to be evaluated in an emergency department are included in this study. So data regarding collisions with pedestrians are not included if the collision did not result in significant injury to the scooter or bike user. Because of this bias, the actual incidence of pedestrian collisions is really not known, and assumptions regarding the safety of powered scooters, for example, cannot reliably be made.

Myhre: Okay, so for our providers that are listening to this CUBIST what would be the key take-a-ways from this study?

Marion: Injury patterns for E-bike and powered scooters differ from each other and from traditional pedal operated bicycles: persons injured using E-bikes are considerably older and much more likely to be male, consistent with their increasing use for commercial deliveries, especially food, in many urban settings and possibly for their use by older persons needing a powered/electronic mobility device. Older age and commercial use may account in part for the greater likelihood of injuries severe enough to require hospital admission and the nearly threefold increased risk of collision with a motor vehicle. Compared with E-bikes and pedal bicycles, powered scooter collisions are three times more likely to result in a concussion, emphasizing the need for riders to always wear a protective helmet.

Myhre: Yeah, I think that it may be inconvenient, but those who frequently use or rent a powered scooter should obtain and have available either their own bike helmet or access to rent a bike helmet. And likewise for the E-bikes. I think it's also interesting that this study went back 18 years, whereas we know that, at least in urban areas like ours, there's been this rapid increase in the number of E-bikes and power scooters that are available for people to rent, starting about 2013. And it looks like the study showed that that's when there was this really high increase in the amount of injuries.

So, it'll be interesting to see if in the future, we look at the data again and see if those injury rates keep increasing. Really interesting topic, very timely for what's going on right now you know, and the discussions that are occurring on E-bikes and powerscoters.

That's all the time we have for today. You can stay up-to-date on future episodes by subscribing to "CUBIST" on iTunes, Sound Cloud, Stitcher, or wherever you listen to podcasts, where you can also find links to the articles we discuss and other relevant resources.

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"CUBIST" is produced and edited by Vinnie White and was hosted today by me, Betsy Myhre. It is a product of the Defense and Veterans Brain Injury Center, led by Division Chief Captain Scott Pyne, Medical Corps, United States Navy.

Thank you for listening to this episode. Next time, we will discuss TBI research getting attention in the mainstream press.

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