Don't Go Head Over Wheels: A head to toe review of motorized scooter related trauma.

Learning objectives:

• Review common findings of whole body trauma related to the use of motorized scooters
• Provide a broad scope of minor and major injuries to illustrate the wide variety of possible trauma associated with motorized scooters

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All authors have no relevant financial disclosures.
### Head and face

43 yo M hit by a car while riding a scooter: Subdural hematoma and intraparenchymal hemorrhage, patient later expired.

18 yo F who fell off a scooter: Left zygomaticomaxillary complex/tripod fracture with involvement of the left infraorbital canal.

54 yo M with low speed scooter crash: Comminuted fracture of the left frontal bone involving the inner and outer table of the front sinus and a left lamina papyracea fracture.

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**FACT:** Most craniofacial traumas occur in kids aged 6-12 and spare the face.*

**FACT:** From 2008 to 2017, there were an estimated 32,001 craniofacial injuries related to motorized scooters.*

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### Background

- First introduced in 2017
- In over 100 major cities
- Over 20 million rides
- Travel up to at least 15 miles per hour
- $1 to start and $0.15 per additional minute
- Use of these scooters is available to any person with access to smartphone applications
- In 2018, California passed a law only requiring helmets for riders under 18
- First DUI conviction in September 2018 for driving a scooter while intoxicated
- Indianapolis EMS reported ~30% of injuries occurred while the rider was intoxicated
- 32,400 injuries reported in the US from 2013-2017
- Approximately 1,800 required inpatient admission
- In 2017, there was a 77% increase in scooter related traumas in patients aged 21-36
- Patients of all ages are effected
  - Most injuries (34.6%) occur in school aged children
  - Older patients sustain more severe injuries

*Most of the cities where Lime scooters are available [https://www.li.me/locations](https://www.li.me/locations)

*Bresler et. al 2019
52 yo M hit by a car while riding scooter: Right renal artery avulsion with near complete lack of renal enhancement and right adrenal hematoma, grade 2 liver laceration.

FACT: Between 2013-2017, approximately 11% of injuries involved internal organs*.

41 yo M with fall off scooter: Multiple pelvic fractures with extraperitoneal hematoma.

45 yo F who lost balance while riding a scooter: Multiple rib fractures and hemothorax and small pulmonary contusion.

50 yo struck by a car while riding a scooter: Multiple rib fractures with flail chest clinically and scapular body fracture.

12 yo M with fall off scooter: Grade 2 liver laceration.

FACT: The chest (4.8%) and abdomen (5.6%) are similarly affected*.

* Aizpuru et al. 2019
Musculoskeletal

57 yo F with fall off scooter:
Acute, comminuted, extra-articular fracture of the distal left femur with associated lipohemarthrosis.

16 yo with fall from scooter:
Comminuted, displaced intra-articular right distal radius fracture and nondisplaced right ulnar styloid fracture

FACT: Approximately 8% of injuries involved non-rider pedestrians.*

59 yo F in motor vehicle vs scooter accident:
Comminuted femoral fracture, tibial spine fracture (not pictured), pubic symphysis diastasis, and left sacroiliac joint rupture

57 yo M fall from scooter:
Dislocation of the left long finger proximal interphalangeal joint.

FACT: 35.4% of fracture/dislocation injuries in scooter-related trauma involve the wrist or lower arm.**

*Trivedi et. al 2019
**Aizpuru et. al 2019
**Spine**

65 yo F with fall off scooter: Nondisplaced occipital bone fracture.

**FACT: 1.9% of injuries occur in the neck or cervical spine**

37 yo F with fall of scooter: T5 and T6 spinous process fractures

**References**

- Toll, M. (2019, March 08). Electric scooter injuries pile up, half coming from drunk or high riders. Retrieved from https://electrek.co/2019/03/08/electric-scooter-injuries-pile-up-half-coming-from-drunk-or-high-riders/

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*Aizpuru et al. 2019*