Evidence Summary: Horseback Riding

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**Injury Mechanisms:** Falls are the most common injury mechanism in horseback riding (Abu-Kishk et al., 2013; Ball et al., 2007; Davidson et al., 2015; Ekberg et al., 2011; Kiss et al., 2008; McCrory & Turner, 2005; Smartt & Chalmers, 2009; Thomas et al., 2006).

The majority of injuries occur in the head, trunk, and upper extremities (Abu-Kishk et al., 2013; Davidson et al., 2015; Ekberg et al., 2011; Kiss et al., 2008; McCrory & Turner, 2005; Papachristos et al., 2014; Smartt & Chalmers, 2009; Thomas et al., 2006).

The predominant injury types are fractures, soft tissue injuries, and head injuries (Abu-Kishk et al., 2013; Balendra et al., 2007; Eckert et al., 2011; Ekberg et al., 2011; McCrory & Turner, 2005; Papachristos et al., 2014; Thomas et al., 2006).

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**Children**
Horseback riding-related injuries are reported to occur in 21% of young riders per year. Injury estimates vary between 76,000 to 100,000 injuries per year (Havlik, 2010).

**Fractures**
Fractures of the limbs account for 17.9% of injuries recorded in show jumpers, 40% of injuries recorded in Swedish eventing athletes, and 42.5% of career-ending injuries in horse racing jockeys (Balendra et al., 2007; Ekberg et al., 2011; Gass et al., 2016).

Two studies found that of all equine-related injuries, 25.2% - 28.3% are fractures (reported in emergency departments in the United States) (Loder, 2008; Hitchens et al., 2011).

**Riding Style**
A full-foot riding style increased the risk of falls for jockey and track workers (IRR=2.37, 95% CI: 1.46-3.85) (Hitchens et al., 2011)

**Physiological Attributes of the Rider**
Lower anaerobic strength and aerobic fitness, as well as higher muscular strength and power were associated with greater risk of falls (Hitchens et al., 2011)

**Jockey Age**
Increased jockey fall rates have been associated with age; however, the age most at risk varies by study. An Australian study examining event racing jump jockeys noted those over 35 years of age were at a higher risk of injury (Havlik, 2010).

**Helmets**
While the use of protective riding helmets has been associated with a fivefold reduction in head injuries, one study reports that fewer than 40% of riders are wearing helmets at the time of injury, with some finding numbers as low as 9% (Havlik, 2010).

**Mouth Guards**
The study by Gass et al., (2016) investigated the use of mouth guards in horseback riders. Twenty-three percent of the sample reported finding mouth guards unnecessary in equestrian sports. 26.3% reported they did not wear one due to other riders not wearing mouth guards, 16.5% reported a mouth guard would be annoying, 17.2% have never worried about it, 13.1% cannot say why they do not wear one, and 3.3% claim that a mouth guard is not available for equestrian sports.

Future work needs to be done to assess the effectiveness of mouth guards on dental injuries in this population. (Gass et al., 2016)

Websites
- [http://horse.on.ca/programs/safety/](http://horse.on.ca/programs/safety/)
- [https://www.brainline.org/article/equestrian-safety](https://www.brainline.org/article/equestrian-safety)
In 2008, it was reported that ankle injuries account for 34.5% of fractures. (Ceroni, 2007).

In point to point racing, most of the fractures occur in the clavicle and upper limb (72% - 74%). (Balendra et al., 2007)

**Contusion/Crush**
Contusions account for 30.8%-31.4% of equine-related injuries reported in the United States (Loder, 2008; Thomas et al., 2006) and are the most common injury in point-to-point racing. (Balendra et al., 2007)

**Traumatic Brain Injury (TBI)/Head Injuries**
A 2015 study demonstrated that concussions accounted for 9.5% of show jumping injuries (Gass et al., 2016). Of all equine-related injuries resulting in hospitalization, 48-53.9% are head injuries (Abu-Kishk et al., 2013; Papachristos et al., 2014). Further, 11.6% of equine injuries reported to hospitals in the United States were TBIs (Loder, 2008).

In eventing, the neck/head were the most common recorded injury (22.7% of all injuries). (Ekberg et al., 2011). Similarly, a risk of falls (Hitchens et al., 2011). Another study reported that jockeys ages 13-15 and 10-29 had the highest rates of injury (Havlik, 2010).

In hurdle racing, higher jockey age resulted in 1.41 higher risk of falls resulting in injury (95% CI: 1.23, 1.62) (Hitchens et al., 2011)

**Hurdle Racing**
‘License’ B jockeys, larger field size, higher club level, higher race grade, and older jockey age were associated with injurious falls (IRR=1.68, 95% CI:1.30, 2.16; IRR=4.37, 95% CI:3.62, 5.27; IRR=1.62, 95% CI 1.30, 2.03; IRR=1.72; 95% CI 1.47, 2.02; IRR=1.41; 95% CI 1.23, 1.62, respectively) (Hitchens et al., 2011).

**Steeplechase Racing**
For steeplechase racing, ‘License B’ jockeys, larger field size, longer race distance, and higher club level were associated with increased risk of falls (IRR=1.35, 95% CI:1.01, 1.81; 0.91; IRR 1.41, 95% CI:1.12, 1.77; IRR=1.44, 95% CI:1.10, 1.89; IRR=1.59; 95% CI:1.21, 2.10) (Hitchens et al., 2011). Having had fewer previous rides in the meeting, lower prize money at stake was found to be protective against
New Zealand study found that the most frequent horse-related injury was to the head (23% of cases). (Smartt & Chalmers, 2009). In the US, 23.2% of hospitalized horse-related injuries were reported as head and neck injuries. (Thomas et al., 2006)

the risk of falls (IRR=0.70, 95% CI:0.54; IRR=0.41, 95% CI:0.34, 0.50) (Hitchens et al., 2011).

**Multiple Day Events**

Two- and three-day events were noted to be associated with a higher risk of a horse falling (0.91 falls per 1000 jumping efforts, 95% CI 0.69, 1.18) compared to one-day events (0.27 falls per 1000 jumping efforts, 95% CI 0.23, 0.33) (Murray et al., 2005)

**Sex**

Females are reported to be at a higher risk of falls compared to males (IRR=1.11, 95% CI:1.00-1.23) (Hitchens et al., 2011).

**Works Cited:**


Review of Sport Injury Burden, Risk Factors and Prevention

Horseback Riding

Incidence and Prevalence

A review of equestrian injuries in the pediatric population reports that 21% of young riders in a year, will report a horseback riding-related injury (Havlik, 2010). Injury estimates for all horseback riding related injuries vary between 76,000 to 100,000 injuries per year (Havlik, 2010). Falls are the most common injury mechanism in horseback riding while mounted (Abu-Kishk et al., 2013; Ball et al., 2007; Davidson et al., 2015; Ekberg et al., 2011; Kiss et al., 2008; McCrory & Turner, 2005; Smartt & Chalmers, 2009; Thomas et al., 2006); while not mounted, the most common mechanism of injury is being kicked by the horse. The majority of injuries occur in the head, trunk, and upper extremities, with the predominant injury types being fractures, soft tissue injuries, and head injuries (Abu-Kishk et al., 2013; Davidson et al., 2015; Ekberg et al., 2011; Kiss et al., 2008; McCrory & Turner, 2005; Papachristos et al., 2014; Smartt & Chalmers, 2009; Thomas et al., 2006).

Fractures of the limbs account for 17.9% of injuries recorded in show jumpers, 40% of injuries recorded in Swedish eventing athletes, and 42.5% of career-ending injuries in horse racing jockeys (Balendra et al., 2007; Ekberg et al., 2011; Gass et al., 2016). In the United States, emergency departments report that 25.2%-28.3% of all equine-related injuries are fractures (Loder, 2008; Thomas et al., 2006). Further, it has been reported that ankle injuries account for 34.5% of all fractures (Ceroni, 2007). Contusions account for 30.8%-31.4% of equine-related injuries reported in the United States (Loder, 2008; Thomas et al., 2006), and are the most common injury in point-to-point racing (Balendra et al., 2007).

Approximately half (48-53.9%) of equine-related injuries resulting in hospitalizations are head injuries (Abu-Kishk et al., 2013; Papachristos et al., 2014). Further, 11.6% of hospitalized injuries were diagnosed as traumatic brain injuries (TBIs) (Loder, 2008). Concussions account for 9.5% of show jumping injuries (Gass et al., 2016). In eventing, the neck/head were the most common recorded injury (22.7-23% of all injuries) (Ekberg et al., 2011).

Risk and Protective Factors

Riding Style

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**Opportunities for Prevention: Effective Interventions, Cost-Effectiveness, Implementation and Evaluation**

While the use of protective riding helmets has been associated with a five-fold reduction in head injuries, one study reports that fewer than 40% of riders are wearing helmets at the time of injury, with some finding numbers as low as 9% (Havlik, 2010).

**Implementation and Evaluation**

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