# Straight from the Horse's Mouth: A Look at Neurological Injury in Equestrian Sports.

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## Introduction

Injuries to the nervous system are an inevitable part of many sports. Equestrian sports, in particular, can predispose the athlete to increased risk due to many factors. We describe our series of eighty patients with injuries sustained during participation in equestrian sports.

## Methods

From October 2003 to November 2011, all equestrian injuries referred to our regional trauma center were reviewed. Data had been recorded in the hospital's trauma registry and medical records were reviewed retrospectively for additional data pertaining to those injuries with specific emphasis on neurological injuries and associated details.

**Table 1**

| Demographics and categorization of injuries from equestrian sports in 80 patients | |
|---|---|
| Average Age (year) | 37 (2-79) |
| Male gender (%) | 46 |
| Injury Severity Score | 9.9 ± .7 |
| Average Length of Stay (days) | 3.7 ± .35 |
| Patients requiring surgery (%) | 14 |

## Results

Eighty patients were identified. 54% were female. The average age was 37 (2.2 - 79.3) years and 93% had an arrival GCS of 15. The average Injury Severity Score was 9.9 ± .7. Two patients had documented helmet use and two had documented alcohol use.

**Table 2**

| Causes of Equestrian Injury | | |
|---|---|---|
| Reported Reason | # | % |
| Kicked by Horse | 39 | 49 |
| Thrown from/Fell off horse | 22 | 28 |
| Stepped on by horse | 4 | 5 |
| Horse fell on patient | 13 | 16 |
| Not involving horse | 1 | 1 |
| Other | 1 | 1 |
| **Totals** | 80 | 100 |

The mechanisms of injury varied: 55% were kicked/stepped on, 28% were thrown/fell off, and 21% were injured by the horse falling on them. The causes ranged from carelessness and lack of attention to animal factors including inadequate training of horses and animal fear.

The most common neurosurgical injuries were head (28%), including concussions, intracranial hematomas/hemorrhages, and skull/facial fractures and spine fractures (10%), with the majority (63%) being transverse process fractures.

14% required surgery. There were no mortalities and average length of stay was 3.7 ± .35 days. All patients were discharged home with 95% requiring no services.

**Table 3**

| Craniospinal Injuries | | |
|---|---|---|
| System Injured | # | % |
| Spine Injuries | 8 | 10 |
| Cervical Spine | 2 | 3 |
| Thoracic Spine | 3 | 4 |
| Lumbosacral Spine | 3 | 4 |
| Head Injuries | 22 | 28 |
| Concussion | 18 | 23 |
| Trauma | 11 | 14 |

TABLE 4
Non-neurological Injuries Resulting From Equestrian Incidents

| Injury | No (%) of patients (N=80) |
|---|---|
| *Orthopedic* | |
| Upper Extremity | 6 (8) |
| Lower Extremity | 11 (14) |
| Hip/Pelvis | 7 (9) |
| *Abdominal* | |
| Liver | 13 (16) |
| Kidney | 4 (5) |
| Spleen | 5 (6) |
| Other | 7 (9) |
| *Thoracic* | |
| Pulmonary Contusion | 5 (6) |
| Pneumo-/Hemothorax | 9 (11) |
| Rib Fractures | 16 (20) |
| Clavicle Fracture | 4 (5) |
| Other | 1 (1) |

## Conclusions

Equestrian sports conveys its own special risks for its participants. With proper protection and precautions, a decrease in the incidence of central nervous system injuries may be achieved. Neurosurgeons can play key roles in advocating for neurologic safety in equestrian sports.

## Learning Objectives

By the conclusion of this session, participants should be able to:

1) Describe the spectrum of neurological injury sustained by participants of equestrian sports

2) Discuss, in small groups, the means by which these injuries may be avoided or reduced

3) Identify root causes of injuries to develop strategies for prevention