***This document is provided as a sample/template that can be used to meet a portion of the Accreditation Requirements. Covered Persons may use their own documentation, use the sample template, or modify the sample template.***

|  |  |
| --- | --- |
|  |  |
| Document Type | Equine Catastrophic Injury Review Template |
| REg. Reference # | *2121* |
| Racetrack | *Insert Track Name* |
| Version Number | *1.0* |

Equine Catastrophic Injury Review:

**Information to have before the interview:**

1. Racing/Training History - lifetime performance including official timed works

2. Veterinary History – Veterinarians’ List, Stewards’ List, Medication, Treatments

3. Pre-race Examination Findings

4. Medication Overages (if known/available)

5. Necropsy Findings

6. Reference Materials Relative to Cause of Death (reference list at end of this document)

7. Other

**Trainer Questions:**

Preamble: Thank-you for participating in this review of the catastrophic injury that occurred to <horse name>. The purposes of this review are to provide you with information on the injury your horse had and what we know about those injuries, and to gain a better understanding of circumstances around the injury that may be useful for preventing the same injury in other horses in the future. We know that catastrophic injuries are the sudden manifestation of a problem that was developing over several months or longer of time before the injury occurred, and the problem can be very difficult to detect before injury. Consequently, we will be asking questions related to the time leading up to injury that may provide clues to recognizing problems earlier and preventing horse deaths. Please feel free to ask questions and also to provide information that we did not touch on that may be useful.

1. First, lets go over the necropsy report…

2. Provide information relative to the cause of death

Provide continuing education opportunities (e.g., HorsemenU)

Supply reference(s) if applicable (see list at end of document)

The following questions help us with information that will be useful in recognizing signs of impending problems and early recognition of horses at risk for injury.

3. How long has the horse been in your care?

How did you acquire the horse?

What health history did you receive when the horse arrived in your barn?

4. Has your horse been examined by a veterinarian?

When was the most recent visit?

What was the reason for the examination?

What was determined?

Anything else that you noted?

5. How would you characterize the horse?

Size?

Conformation?

Temperament/behavior?

Any special management techniques based on above?

Equipment?

6. Describe the feed and dietary supplements.

7. How was the horse handling training and racing?

8. Has the horse had a layup?

What was the reason for the layup?

How long was the layup?

How long has the horse been in training since the last layup?

What was the nature of the layup? (e.g., pasture turnout, rehabilitation facility?)

What was the nature of the rehabilitation? (e.g, water treadmill, physiotherapy?)

9. Was the horse ever lame or have abnormal way of moving or gait?

When? (after work?, next day?)

How long did the lameness or abnormal gait last?

Cause of lameness?

10. Past problems?

Bones?

Joints?

Tendons?

Muscles?

Heart?

Lungs?

Throat?

11. Did the horse have diagnostic tests? And test results?

Nerve Blocks?

Joint Blocks?

Radiographs?

Ultrasound?

Bone Scan?

MRI?

Pet Scan?

12. Has the horse had surgery?

What surgeries?

How long ago?

13. Has the horse had shockwave treatment?

What was the reason?

How long ago?

14. Medication?

Medications administered in the last month?

Pain medications (e.g., bute)?

Bleeder treatments (e.g., Lasix)?

Ulcer treatments (e.g., Gastro-gard)?

Joint injections?

Tendon injections?

Antibiotics?

Other?

Reason for treatment?

Problem(s)?

Swelling?

Lameness?

Pain?

Other?

15. Shoeing?

Changes in shoeing?

Foot problems?

14. Did the horse race as a 2-year-old? Why? Why not?

15. How do you determine your horse was ready to work and how do you decide how far to work the horse?

16. What were your veterinarian’s findings on pre-race and pre-work examinations?

17. Were you present when the horse was injured? Please describe what occurred. Who attended to the horse after the injury?

18. Did you have any concerns about the track surface, in general or that day?

19. Reflecting back, knowing what you know now, what would you have done differently in caring for and training this horse?

20. Have you participated in trainer Continuing Education Courses? If so, comment?

21. Is there anything that you would like to tell us?

**Veterinarian Questions**:

1. First, lets go over the necropsy report…

2. Provide information relative to the cause of death

Provide continuing education opportunities (e.g., HorsemenU, publications)

3. How long has the horse been in your care?

What health history did you receive when the horse arrived in the trainer’s barn?

4. Was the horse ever lame or have abnormal way of moving or gait?

When? (after work?, next day?)

How long did the lameness or abnormal gait last?

Cause of lameness?

5. Past problems?

Bones?

Joints?

Tendons?

Muscles?

Heart?

Lungs?

Throat?

6. Did the horse have diagnostic tests? And test results?

Nerve Blocks?

Joint Blocks?

Radiographs?

Ultrasound?

Bone Scan?

MRI?

Pet Scan?

7. Has the horse had surgery?

What surgeries?

How long ago?

8. Has the horse had shockwave treatment?

What was the reason?

How long ago?

9. Medication?

Medications administered in the last month?

Pain medications (e.g., bute)?

Bleeder treatments (e.g., Lasix)?

Ulcer treatments (e.g., Gastro-gard)?

Joint injections?

Tendon injections?

Antibiotics?

Other?

Reason for treatment?

Problem(s)?

Swelling?

Lameness?

Pain?

Other?

10. Did you attend to the horse after injury? What were your findings, or those shared with you?

11. Did you have any concerns about the racing surface, in general or that day?

12. Reflecting, knowing what you know now, what would you have done differently in caring for and treating this horse, or client education?

**Questions unique to specific causes of death**:

Sudden Death:

Supplements, thyroxin, EIPH, poor performance, exercise intolerance/fatigue?

Deworming program, bloodwork abnormalities, recent attitude/behavior change?

Did the horse whinny or vocalize upon collapse?

Lumbar fracture:

Sire?

Ever locked up? Stifle/back issue? Hind end weakness/lameness.

How do they break from the gate? How do you train a horse to break from the gate (how soon do you start gate work and how often, what distance/speed do they go after breaking)?

**Report Summary:**

Horse Information: [name], \_-year-old Thoroughbred [gelding/colt/filly/mare], Tattoo \_\_\_, Microchip\_\_\_

Necropsy Summary:

[Example] A necropsy examination revealed biaxial proximal sesamoid bone fractures in the left front limb. Presence of pre-existing injury that likely predisposed to catastrophic proximal sesamoid bone fracture was evidenced by focal discoloration indicative of an osteopenic focus associated with the fracture of the medial proximal sesamoid bone.

Racing/Training History:

Veterinary History Summary:

Pre-race Examinations:

[Example] Pre-race examinations had noted exostosis and a decreased range of motion in both front fetlock joints…

Conclusion:

Respectfully Submitted,

-, DVM

-, Steward

-, Safety Steward

 \_, 2022

**Continuing Education Modules:**

<https://horsemenu.mclms.net/en/>

<https://vorl.vetmed.ucdavis.edu/continuing-education>

**References** (not all possible references are listed**):**

Fetlock Proximal Sesamoid Bone Fractures

|  |  |
| --- | --- |
| 2022 | Exercise history predicts focal differences in bone volume fraction, mineral density and microdamage in racehorse proximal sesamoid bones. Shaffer SK, Garcia TC, Stover SM, Fyhrie DP. Journal of Orthopaedic Research doi: 10.1002/jor.25312. Online ahead of print. |
| 2021 | In vitro motions of the medial and lateral proximal sesamoid bones under mid-stance load conditions are consistent with racehorse fracture configurations. Shaffer SK, Shelly K, Garcia TC, Samol MA, Hill AE, Fyhrie DP, Stover SM. J Biomech 2021 Online ahead of print |
| 2021 | Subchondral focal osteopenia associated with proximal sesamoid bone fracture in Thoroughbred racehorses. Shaffer SK, To CM, Garcia-Nolen TC, Fyhrie D, Uzal FA, Stover SM. Equine Vet J. 53(2):294-305. doi: 10.1111/evj.13291. Epub 2020 Jul 23. |
| 2021 | Sudden death caused by spinal cord injury associated with vertebral fractures and fetlock failure in a Thoroughbred racehorse. Samol MA, Uzal FA, Blanchard PC, Arthur RM, Stover SM. Journal of Veterinary Diagnostic Investigation, 33(4):788-791 |
| 2013 | Diagnostic workup of upper-limb stress fractures and proximal sesamoid bone stress remodeling. Stover SM. Proceedings of the 59th Annual Convention of the American Association of Equine Practitioners, 59: 427-435. |
| 2007 | Risk factors for proximal sesamoid bone fractures associated with exercise history and horseshoe characteristics in Thoroughbred racehorses. Anthenill LA, Stover SM, Gardner IA, Hill AE. American Journal of Veterinary Research, 68(7): 760-771. |
| 2006 | Association between findings on palmarodorsal radiographic images and detection of a fracture in the proximal sesamoid bones of forelimbs obtained from cadavers of racing Thoroughbreds. Anthenill LA, Stover SM, Gardner IA, Hill AE, Lee CM, Anderson ML, Barr BC, Read DH, Johnson BJ, Woods LW, Daft BM, Kinde H, Moore JD, Farman CA, Odani JS, Pesavento PA, Uzal FA, Case JT, Ardans AA. American Journal of Veterinary Research, 67(5): 858-868. |

Fetlock Suspensory Apparatus Injuries

|  |  |
| --- | --- |
| 2020 | Science-in-brief: Risk assessment for reducing injuries of the fetlock bones in Thoroughbred racehorses. Colgate VA; FRAT Group, Marr CM. Equine Vet J. 2020 Jul;52(4):482-488. doi: 10.1111/evj.13273. PMID: 32525619 |
| 2016 | Prevalence, location and symmetry of noncatastrophic ligamentous suspensory apparatus lesions in California Thoroughbred racehorses, and association of these lesions with catastrophic injuries. Hill AE, Gardner IA, Carpenter TE, Lee CM, Hitchens PL, Stover SM. Equine veterinary journal, 48(1): 27-32. |
| 2010 | Comparison of macrostructural and microstructural bone features in Thoroughbred racehorses with and without midbody fracture of the proximal sesamoid bone.Anthenill LA, Gardner IA, Pool RR, Garcia TC, Stover SM. Am J Vet Res, 71(7): 755-65. |
| 2004 | Effects of injury to the suspensory apparatus, exercise, and horseshoe characteristics on the risk of lateral condylar fracture and suspensory apparatus failure in forelimbs of thoroughbred racehorses. Hill AE, Gardner IA, Carpenter TE, Stover SM. Am J Vet Res, 65(11): 1508-17. |
| 2003 | Evaluation of a stochastic Markov-chain model for the development of forelimb injuries in Thoroughbred racehorses. Hill AE, Carpenter TE, Gardner IA, Stover SM. American Journal of Veterinary Research, 64(3): 328-37. |
| 2001 | Risk factors for and outcomes of noncatastrophic suspensory apparatus injury in Thoroughbred racehorses. Hill AE, Stover SM, Gardner IA, Kane AJ, Whitcomb MB, Emerson AG. Journal of the American Veterinary Medical Association, 218(7): 1136-44. |
| 1998 | Hoof size, shape, and balance as possible risk factors for catastrophic musculoskeletal injury of Thoroughbred racehorses. Kane AJ, Stover SM, Gardner IA, Bock KB, Case JT, Johnson BJ, Anderson ML, Barr BC, Daft BM, Kinde H, Larochelle D, Moore J, Mysore J, Stoltz J, Woods L, Read DH, Ardans AA. American Journal of Veterinary Research, 59(12): 1545-52. |
| 1996 | Horseshoe characteristics as possible risk factors for fatal musculoskeletal injury of thoroughbred racehorses. Kane AJ, Stover SM, Gardner IA, Case JT, Johnson BJ, Read DH, Ardans AA. American Journal of Veterinary Research, 57(8): 1147-52. |
| 1996 | Postmortem evaluation of homotypic variation in shoe characteristics of 201 thoroughbred racehorses. Kane AJ, Stover SM, Gardner IA, Case JT, Johnson BJ, O'Brien MJ, Read DH, Ardans AA. American Journal of Veterinary Research, 57(8): 1141-6. |

Cannon Bone Fractures

|  |  |
| --- | --- |
| 2017 | Preexisting lesions associated with complete diaphyseal fractures of the third metacarpal bone in 12 Thoroughbred racehorses. Gray S, Spriet M, Garcia TC, Uzal FA, Stover SM. Journal of Veterinary Diagnostic Investigation, 29(4): 437-441. |
| 2006 | Subchondral bone failure in overload arthrosis: A scanning electron microscopic study in horses. Norrdin RW, Stover SM. J Musculoskelet Neuronal Interact, 6(3): 251-257. |
| 2003 | Biomechanical investigation of the association between suspensory ligament injury and lateral condylar fracture in thoroughbred racehorses. Le Jeune SS, Macdonald MH, Stover SM, Taylor KT, Gerdes M. Vet Surg, 32(6): 585-97. |

Humeral Fractures

|  |  |
| --- | --- |
| 2013 | Diagnostic workup of upper-limb stress fractures and proximal sesamoid bone stress remodeling. Stover SM. Proceedings of the 59th Annual Convention of the American Association of Equine Practitioners, 59: 427-435. |
| 2013 | Humeral stress remodelling locations differ in Thoroughbred racehorses training and racing on dirt compared to synthetic racetrack surfaces. Dimock AN, Hoffman KD, Puchalski SM, Stover SM. Equine Veterinary Journal, 45(2): 176-181. |
| 2009 | Material properties are related to stress fracture callus and porosity of cortical bone tissue at affected and unaffected sites. Entwistle RC, Sammons SC, Bigley RF, Hazelwood SJ, Fyhrie DP, Gibeling JC, Stover SM. J Orthop Res, 27(10): 1272-9. |
| 1998 | Association between long periods without high-speed workouts and risk of complete humeral or pelvic fracture in thoroughbred racehorses: 54 cases (1991-1994).Carrier TK, Estberg L, Stover SM, Gardner IA, Johnson BJ, Read DH, Ardans AA. Journal of the American Veterinary Medical Association, 212(10): 1582-7. |
| 1992 | An association between complete and incomplete stress fractures of the humerus in racehorses. Stover SM, Johnson BJ, Daft BM, Read DH, Anderson M, Barr BC, Kinde H, Moore J, Stoltz J, Ardans AA. Equine Veterinary Journal, 24(4): 260-3. |

Scapular Fractures

|  |  |
| --- | --- |
| 2012 | Case-control study of high-speed exercise history of Thoroughbred and Quarter Horse racehorses that died related to a complete scapular fracture. Vallance SA, Entwistle RC, Gardner IA, Hitchens PL, Stover SM. Equine Veterinary Journal, 45(3): 284-292. |
| 2012 | Characteristics of Thoroughbred and Quarter Horse racehorses that sustained a complete scapular fracture. Vallance SA, Case JT, Entwistle RC, Barr BC, Moore J, Anderson ML, Arthur RM, Stover SM. Equine Vet J, 44(4): 425-431. |
| 2011 | Catastrophic scapular fractures in Californian racehorses: Pathology, morphometry and bone density.Vallance SA, Spriet M, Stover SM. Equine Vet J, 43(6): 676-685. |

Tibial Fractures

|  |  |
| --- | --- |
| 2020 | Characteristics of complete tibial fractures in California racehorses. Samol MA, Uzal FA, Hill AE, Arthur RM, Stover SM. Equine Vet J. 2020 Oct 29. doi: 10.1111/evj.13375. Online ahead of print. PMID: 33119186 |

Pelvic Fractures

|  |  |
| --- | --- |
| 1999 | Pathologic changes in the lumbosacral vertebrae and pelvis in Thoroughbred racehorses.Haussler KK, Stover SM, Willits NH. American Journal of Veterinary Research, 60(2): 143-53. |
| 1998 | Stress fractures of the vertebral lamina and pelvis in Thoroughbred racehorses. Haussler KK, Stover SM. Equine Veterinary Journal, 30(5): 374-81. |
| 1998 | Association between long periods without high-speed workouts and risk of complete humeral or pelvic fracture in thoroughbred racehorses: 54 cases (1991-1994). Carrier TK, Estberg L, Stover SM, Gardner IA, Johnson BJ, Read DH, Ardans AA. Journal of the American Veterinary Medical Association, 212(10): 1582-7. |
| 1996 | Oblique views of the ilium and the scintigraphic appearance of stress fractures of the ilium.Hornof WJ, Stover SM, Koblik PD, Arthur RM. Equine Veterinary Journal, 28(5): 355-8. |

Lumbar (Back) Fractures

|  |  |
| --- | --- |
| 2015 | Caudal lumbar vertebral fractures in California Quarter Horse and Thoroughbred racehorses. Collar EM, Zavodovskaya R, Spriet M, Hitchens PL, Wisner T, Uzal FA, Stover SM. Equine veterinary journal, 47(5): 573-9. |
| 1999 | Pathologic changes in the lumbosacral vertebrae and pelvis in Thoroughbred racehorses.Haussler KK, Stover SM, Willits NH. American Journal of Veterinary Research, 60(2): 143-53. |
| 1998 | Stress fractures of the vertebral lamina and pelvis in Thoroughbred racehorses.Haussler KK, Stover SM. Equine Veterinary Journal, 30(5): 374-81. |

Sudden Death

|  |  |
| --- | --- |
| 2017 | Sudden death in racehorses: postmortem examination protocol.Diab SS, Poppenga R, Uzal FA. J Vet Diagn Invest. 2017 Jul;29(4):442-449. doi: 10.1177/1040638716687004.x |
| 2011 | Sudden death in racing Thoroughbred horses: an international multicentre study of post mortem findings. Lyle CH, Uzal FA, McGorum BC, Aida H, Blissitt KJ, Case JT, Charles JT, Gardner I, Horadagoda N, Kusano K, Lam K, Pack JD, Parkin TD, Slocombe RF, Stewart BD, Boden LA. Equine Vet J. 2011 May;43(3):324-31. doi: 10.1111/j.2042-3306.2010.00164.x |

General Catastrophic Musculoskeletal Injury and Factors Related to Injury

|  |  |
| --- | --- |
| 2018 | Relationship between historical lameness, medication usage, surgery, and exercise with catastrophic musculoskeletal injury in racehorses. Hitchens PL, Hill AE, Stover SM. Frontiers in Veterinary Science, 2018(7): 1-10. |
| 2012 | Fatal Musculoskeletal Injuries of Quarter Horse Racehorses: 314 cases (1990-2007). Sarrafian TL, Case JT, Kinde H, Daft BM, Read DH, Moore JD, Uzal FA, Stover SM. Journal of the American Veterinary Medical Association, 241(7): 935-942. |
| 1998 | A case-crossover study of intensive racing and training schedules and risk of catastrophic musculoskeletal injury and lay-up in California thoroughbred racehorses. Estberg L, Gardner IA, Stover SM, Johnson BJ. Preventative Veterinary Medicine, 33(1-4): 159-70. |
| 1998 | Relationship between race start characteristics and risk of catastrophic injury in thoroughbreds: 78 cases (1992). Estberg L, Stover SM, Gardner IA, Johnson BJ, Jack RA, Case JT, Ardans A, Read DH, Anderson ML, Barr BC, Daft BM, Kinde H, Moore J, Stoltz J, Woods L. Journal of the American Veterinary Medical Association, 212(4): 544-9. |
| 1996 | High-speed exercise history and catastrophic racing fracture in thoroughbreds. Estberg L, Stover SM, Gardner IA, Drake CM, Johnson B, Ardans A. American Journal of Veterinary Research, 57(11): 1549-55. |
| 1996 | Fatal musculoskeletal injuries incurred during racing and training in thoroughbreds. Estberg L, Stover SM, Gardner IA, Johnson BJ, Case JT, Ardans A, Read DH, Anderson ML, Barr BC, Daft BM, Kinde H, Moore J, Stoltz J, Woods LW. Journal of the American Veterinary Medical Association, 208(1): 92-6. |
| 1995 | Cumulative racing-speed exercise distance cluster as a risk factor for fatal musculoskeletal injury in Thoroughbred racehorses in California.Estberg L, Gardner IA, Stover SM, Johnson BJ, Case JT, Ardans A. Preventive Veterinary Medicine, 24: 253-63. |
| 1994 | Causes of death in racehorses over a 2 year period. Johnson BJ, Stover SM, Daft BM, Kinde H, Read DH, Barr BC, Anderson M, Moore J, Woods L, Stoltz J, Blanchard P. Equine Veterinary Journal, 26(4): 327-30. |

Post Mortem Examination

|  |  |
| --- | --- |
| 2017 | Diagnostic approach to catastrophic musculoskeletal injuries in racehorses. Diab SS, Stover S, Carvallo F, Nyaoke AC, Moore J, Hill A, Arthur R, Uzal FA. Journal of Veterinary Diagnostic Investigation, 29(4): 405-413. |
| 2017 | Nomenclature, classification, and documentation of catastrophic fractures and associated pre-existing injuries in racehorses. Stover, SM. Journal of Veterinary Diagnostic Investigation, 29(4): 396-404. |

Jockey Injuries

|  |  |
| --- | --- |
| 2014 | The role of catastrophic injury or sudden death of the horse in race-day jockey falls and injuries in California, 2007-2012. Hitchens PL, Hill AE, Stover SM. Equine veterinary journal, 48: 50-56. |
| 2013 | Jockey falls, injuries and fatalities associated with Thoroughbred and Quarter Horse racing in California, 2007-2011. Hitchens PL, Hill AE, Stover SM. Orthopaedic Journal of Sports Medicine, 1(1): 2325967113492625. |