

POSTMORTEM EXAMINATION PROGRAM

Conducted for the California Horse Racing Board
July 1, 2023–June 30, 2024



UC DAVIS
VETERINARY MEDICINE
*California Animal Health
& Food Safety Laboratory System*

Postmortem

Examination

Program

California Animal Health and Food Safety Laboratory System

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POSTMORTEM EXAMINATION PROGRAM

Introduction

The Postmortem Examination Program has been in operation since February 1990, and has performed examinations on 7,614 horses, as of June 30, 2024. Initiated by the California Horse Racing Board (CHRB), the program is a partnership with the California Animal Health and Food Safety Laboratory System (CAHFS) to meet three primary objectives: 1) determine the nature of injuries occurring in racehorses, 2) determine the reasons for these injuries, and 3) develop injury prevention strategies. To accomplish this, a broad, cooperative approach was developed, involving establishing a contract with the CAHFS to perform a necropsy on every horse that died spontaneously or was euthanized on racetracks or training facilities under the jurisdiction of the CHRB. This visionary partnership has become a national and international model for the racing industry in an effort to improve the safety and welfare of racehorses.

Pathologists at the CAHFS' Davis, Tulare, and San Bernardino laboratories conduct postmortem examinations and compile detailed information on each horse, which is then reported to the CHRB. A broad range of specimens are collected and shared with veterinary scientists in other departments of the School of Veterinary Medicine, University of California, Davis (UC Davis). Specimens from selected cases from CHRB horses necropsied at CAHFS laboratories are frequently shipped to the J.D. Wheat Veterinary Orthopedic Research Laboratory at UC Davis for in-depth analyses. This helps to more precisely determine the causes and risk factors that led up to catastrophic injuries in racehorses resulting in their death or euthanasia. Funding for postmortem

examinations and ancillary testing is provided by the CHRB. Racing associations provide transportation of the horses to the nearest laboratory facility, and additional studies are frequently funded by the Center for Equine Health, UC Davis, and private sources. Information from the tests and data gathered are analyzed in an effort to elucidate the specific cause of catastrophic injuries.

In addition to musculoskeletal injuries, which traditionally comprised between 70 and 80% of the submissions, medical causes of disease and/or death of racehorses (colic, pneumonia, etc.) also are studied. The percentage of musculoskeletal injuries have been reduced significantly over the past few years as a consequence of the dramatic reduction of catastrophic injuries sustained by racehorses in California.



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SUBMISSIONS

General Submission Information

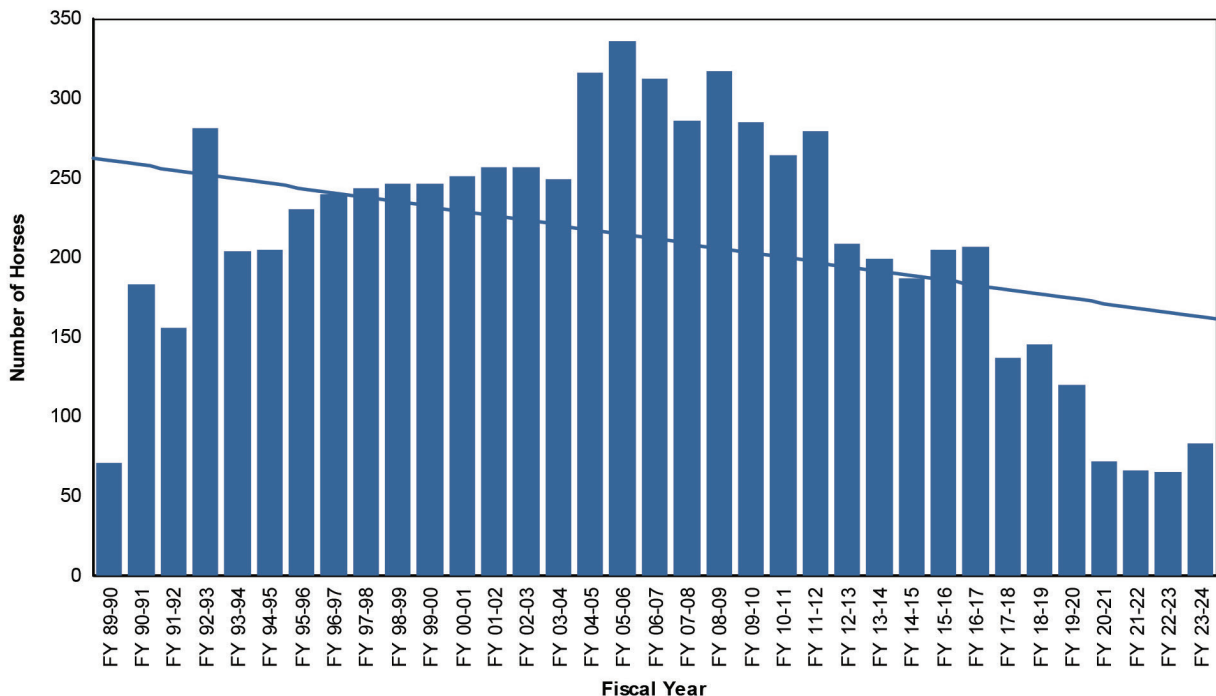
During the 2023–24 fiscal year, 87 horses were submitted to CAHFS as part of the CHRB Postmortem Examination Program. This number, 22 cases above the 65 horses received during fiscal year 2022–23, is a slight increase over the historic lowest number received in the previous fiscal year, but in general terms, continues the trend of significant reduction in fatalities initiated several years ago. The graph below (Figure 1) shows the number of horses that have been submitted to the program since 1990 by fiscal year. The first year of the program (1990) began in February and does not represent a full fiscal year. Figure 1 shows that the number of horses submitted for the CHRB program increased almost every year until 2005–06, after which an overall decline in submissions occurred and continues to date.

The CAHFS San Bernardino and Davis laboratories performed all of the necropsies during this fiscal year. At the time of submission, the CHRB track official categorizes the activity of the horse at the

time of injury/death into one of three types: non-exercise, racing, or training (Table 1). The vast majority of injuries/fatalities (67%) occurred during or immediately following training or racing. This is in agreement with previous years, in which most fatalities were exercise-related. The third category of fatalities, accounting for 33% of submissions, included horses in the non-exercise group. These were horses suffering primarily from medical conditions, such as colic, infectious diseases, or other conditions, although a few musculoskeletal injuries occurred in the non-exercise group of horses.

Activity	Count (Percentage)
Non-Exercise	29 (33%)
Racing	19 (22%)
Training	39 (45%)
Total	87 (100%)

Figure 1. Number of Horses Submitted to the CHRB Postmortem Program by Fiscal Year



SUBMISSIONS • continued

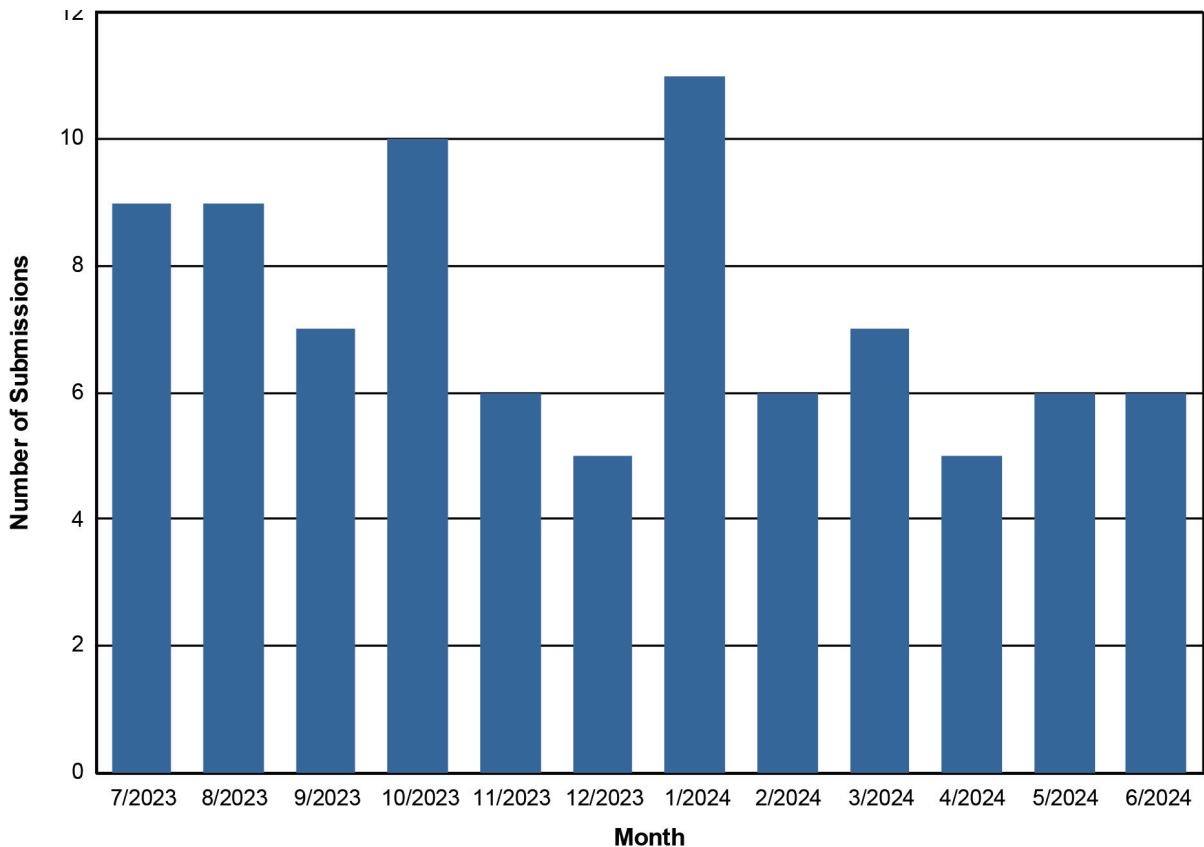
As in the past, for FY 2023–24 the vast majority of submissions (75; ~86%) were Thoroughbreds (Table 2). Nine horses submitted (~10%) were Quarter Horses and three were Standardbred horses.

As usual, the number of horses submitted per month was variable, although there were not obvious clusters of submissions at any given month of the year (Table 2 and Figure 2). This is very similar to submission patterns over the last few years.

Table 2. Submissions by Breed and Month

Breed	Jul 23	Aug 23	Sep 23	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24	Apr 24	May 24	Jun 24	Total
Quarter Horse	0	1	1	0	1	0	3	0	1	1	1	0	9
Standardbred	0	0	0	0	0	0	0	1	0	2	0	0	3
Thoroughbred	9	8	6	10	5	5	8	5	6	2	5	6	75
Grand Total	9	9	7	10	6	5	11	6	7	5	6	6	87

Figure 2. Number of Horses Examined by Month



SUBMISSIONS • continued

The largest proportion of submissions (~86 %) were horses between 2 and 5 years old (Table 3). Approximately 23% of all racehorses submitted were 2 years old or less. The number of horses injuries/fatalities dropped dramatically after the fifth year of age (Table 3 and Figure 3). This distribution is

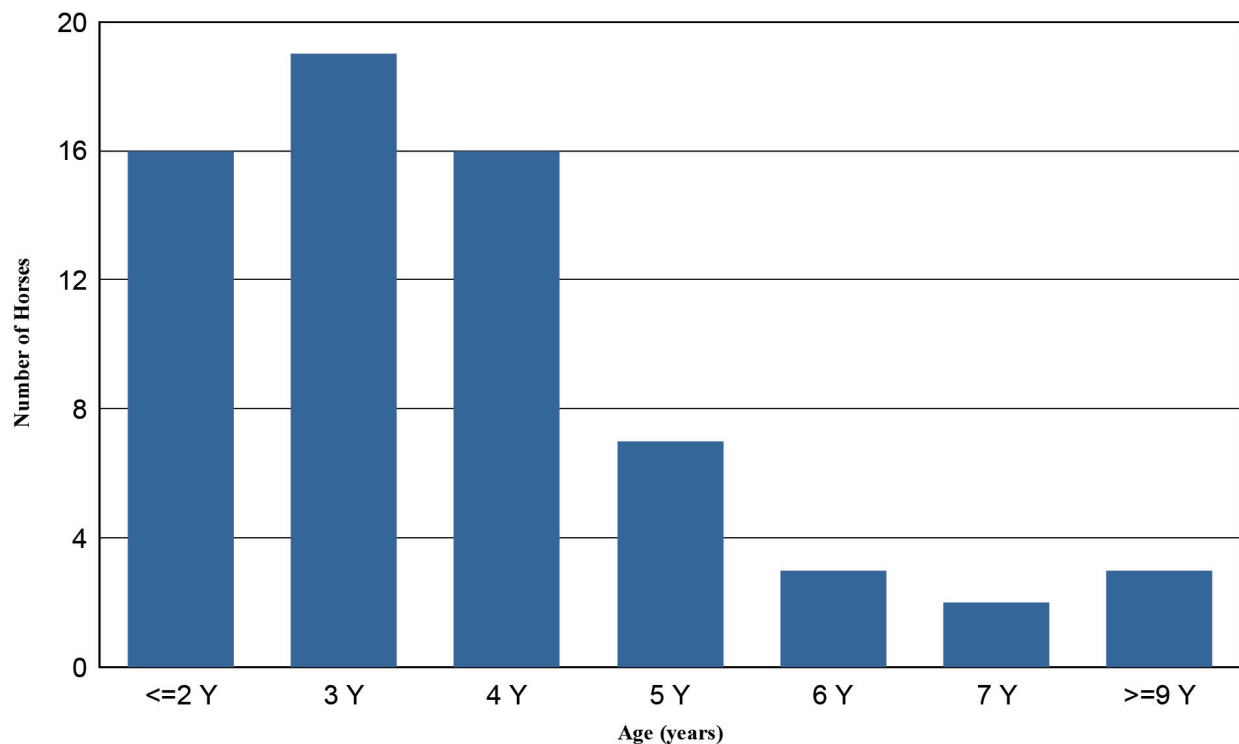
consistent with the age distribution that was seen in prior years. We cannot conclude if horses 6 years of age and greater are less susceptible to the injuries from racing, because the total number of horses in each age group that are racing and training on facilities controlled by CHRB are not known to us.

Submissions By Breed and Age

Table 3. Submissions by Breed and Age

Breed/Age	<=2	3	4	5	6	7	8	>=9	Total
Quarter Horse	7	1	1	0	0	0	0	0	9
Standardbred	0	1	1	0	0	0	0	1	3
Thoroughbred	13	22	16	13	6	3	1	1	75
Total	20	24	18	13	6	3	1	2	87

Figure 3. Number of Horses Examined by Age



SUBMISSIONS • continued

Submissions By Gender

The gender distribution of the horses submitted during 2023–24 is shown in Table 4. Males represented ~60% of the total group with ~40% of males being intact (stallions) and 60% geldings. Females comprised ~40% of the group, all of them being intact.

Table 4. Distribution of Horses by Gender and Category

Gender	Non-Exercise	Racing	Training	Total
Female	12	7	16	35
Intact Male	5	6	10	21
Gelding	12	6	13	31
Total	29	19	39	87

INJURIES

As previously mentioned, the categories of injury represent the activity of the horse or circumstances at the time of the fatal or catastrophic injury. The largest cluster of fatal injuries, ~86%, occurred in 2-, 3-, 4- and 5-year-old racehorses (Figure 3 and Table 5). Non-exercise related deaths occurred in most age groups (Table 5).

Table 5. Category of Injury/Fatality by Age

Category/Age	<=2	3	4	5	6	7	8	>=9	Total
Non-Exercise	6	7	5	7	1	2	0	1	29
Racing	4	4	5	3	1	1	1	0	19
Training	10	13	8	3	4	0	0	1	39
Total	20	24	18	13	6	3	1	2	87

During this fiscal year, Thoroughbred horses suffered more training (36) than racing (13) catastrophic injuries (Table 6). This is different from most previous years when the percentage of racing fatalities was higher than that of training catastrophic injuries.

Only two Quarter Horses suffered a catastrophic injury during training in this period. This continues the downward trend during the previous four years, and is similar to the years before in which catastrophic injuries of Quarter Horses during a training session were infrequent.

Continued

INJURIES • continued

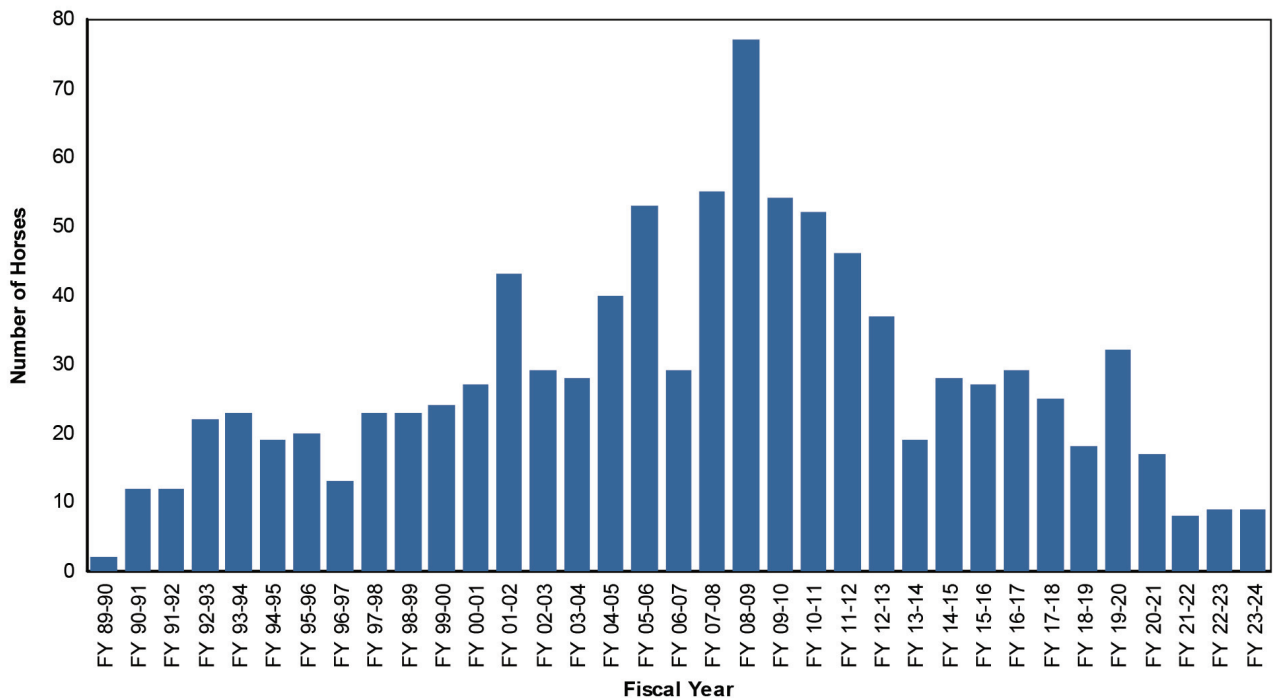
Quarter Horse submissions during 2023–24 (n=9) were lower than the previous years (18 in 2018–2019, 32 in 2019–2020, 17 in 2020–2021 and 8 in 2021–2022), continuing the downward trend which started several years ago, with only a temporary interruption in 2019–2020. Figure 4 shows the historical number of Quarter Horses submitted to the program since its inception.

In 2023–24, ~62% of the total primary injuries or conditions in all breeds were due to musculoskeletal problems (Table 7), which is similar to what has been observed in previous years. Of this group, ~ 86% of injuries affected the front or rear legs (Table 8). The injuries listed in these tables represent the primary *Continued on page 8*

Table 6. Category of Injury/Fatality by Breed

Injury Class by Breed	Non-Exercise	Racing	Training	Total
Quarter Horse	4	4	2	9
Standardbred	0	2	1	3
Thoroughbred	26	13	36	75
Total	29	19	39	87

Figure 4. Number of Quarter Horses Submitted to the CHRB Postmortem Program by Fiscal Year



INJURIES • continued

injury to the horse. In many cases, several primary findings for each horse submitted were recorded. Thus, the total number of reported injury types exceeds the number of horses submitted. This is especially true in severe injuries involving multiple bones in the limbs. In these cases, multiple related injuries, such as tendon and ligament ruptures are identified concomitantly. Musculoskeletal injuries are most likely to occur during racing or training. Because these injuries are by far the

most common, most of the investigative efforts at the University of California, Davis, have focused on causes and prevention of limb injuries.

Table 8 lists catastrophic injuries by limb and axial locations. The number of front limb injuries sustained during racing (16) was lower than those injuries sustained during training (23). There were variable numbers of right and left rear limb injuries, but similar numbers of right (19) and left front (21) limb injuries.

Table 7. Organ Systems Affected

Breed	CV	GI	HL	MS	Nerv	Inte	WB	Total
Quarter Horse	0	1	0	6	0	0	2	9
Standardbred	0	0	0	2	0	0	1	3
Thoroughbred	2	11	1	46	1	1	14	75
Total	2	12	1	54	1	1	17	87

(CV=Cardiovascular; GI=Gastrointestinal; HL= Hemolymphatic; MS=Musculoskeletal; Nerv=Nervous; Inte=Integumentary; WB=Whole body.)

Table 8. Musculoskeletal Structures Affected

Structure Affected	Non-Exercise	Racing	Training	Total
Left Front	1	7	13	21
Left Rear	1	0	1	2
Right Front	0	9	10	19
Right Rear	1	1	2	4
Pelvis	2	0	2	4
Vertebra	1	2	3	6
Ribs	1	0	0	1
skull	0	0	1	1
Total	7	19	32	58

INJURIES • continued

Table 9 lists the specific type of musculoskeletal injuries by breed.

Table 9. Musculoskeletal Injury Type by Breed

Diagnosis	QH*	SB**	TB***	Total
Carpal Fracture – Left	0	0	3	3
Femur Fracture– Left	0	0	1	1
Fetlock Failure – Left Front	1	0	10	11
Fetlock Failure – Right Front	0	0	12	12
Fetlock Failure – Right Rear	0	0	1	1
Humerus Fracture – Left	0	1	3	4
Humerus Fracture – Right	0	0	4	4
Metacarpus III Fracture – Left	1	0	2	3
Metacarpus III Fracture – Right	1	0	1	2
Metatarsus III Fracture – Right	0	0	1	1
Muscle Necrosis	1	0	1	2
P1 Fracture – Left Front	0	0	1	1
P1 Fracture – Right Rear	0	1	0	1
Pelvis Fracture	0	0	4	4
Scapula Fracture – Right	1	0	0	1
Suspensory Ligament Rupture	0	0	1	1
Tenosynovitis	0	0	1	1
Tibia Fracture – Left	0	0	1	1
Tibia Fracture – Right	0	0	1	1
Vertebra Fracture	2	0	3	5
Total	6	2	46	54

*QH: Quarter Horse; **SB: Standardbred; ***TB: Thoroughbred

INJURIES • continued

Track Surface and Musculoskeletal Injuries in Thoroughbreds

The distribution of musculoskeletal injuries in Thoroughbreds was evaluated when comparing the three types of track surfaces in which these horses performed. Table 10 shows the limb distribution of injuries in horses running on different surfaces. As before, this data shows that for the current fiscal year the absolute number of injuries on dirt surfaces was higher than on other surfaces. Because the total number of horses racing on each surface is not known to CAHFS, it cannot be determined from this data whether the injury rates differ by track surface.

Table 10. Musculoskeletal Injury: Affected Limb by Track Type

Structure Affected	Dirt	Synthetic	Turf	N/A*	Total
Left Front	15	5	0	1	21
Left Rear	0	1	0	1	2
Pelvis	2	0	0	2	4
Right Front	14	4	1	0	19
Right Rear	1	2	0	1	4
Vertebra	5	0	0	0	5
Various Structures	2	0	0	2	4
Total	34	7	12	1	54

*Injuries that did not occur on a racing/training surface.

Other Organ Systems Affected by Injuries

Gastrointestinal:

The cause of colitis/typhlitis was determined in only three cases, and it was produced by *Paeniclostridium sordellii* (2), and *Clostridioides difficile* (1), respectively. The cause of intestinal displacements was, as usual, not determined. The cause of intestinal perforation was not determined either, but it was predisposed by an intestinal diverticulum. The cause of hepatopathy was not definitely established, but it was suspected to be caused by pyrrolizidine alkaloids.

Diagnosis	Total
Colitis/typhlitis	7
Intestinal displacement	5
Intestinal perforation	1
Hepatopathy	1
Total	14

INJURIES • continued

Other Organ Systems Affected by Injuries continued

Integumentary:

As usual, diseases of the integumentary system were rare during this reporting period. The only gas gangrene case diagnosed during this year was caused by *Clostridium septicum*. The predisposing factor and port of entry of this infection was several skin lacerations resulted from kicking by other horse.

Diagnosis	Total
Gas gangrene	1
Total	1

Nervous:

The case of meningitis was *Staphylococcus aureus*. The port of entry and predisposing factor was not determined.

Diagnosis	Total
Meningitis	1
Total	1

Cardiovascular:

The cause of the two cardiovascular syndromes mentioned at right was not determined.

Diagnosis	Total
Aortic Rupture	1
Cardiomyopathy	1
Total	2

Hemolymphatic:

The case of this unusual coagulopathy with widespread hemorrhages was not determined.

Diagnosis	Total
Coagulopathy	1
Total	1

Whole Body:

The number of unexplained sudden deaths in horses continues to be significant: 11 cases reported in 2019–2020; 11 cases reported in 2020–2021, 12 cases reported in 2021–2022, and 14 cases reported in this period. Although heart failure is suspected for most of these cases, the cause of these deaths remains undetermined. The three cases of septicemia were produced by bacteria, which in one case was determined to be *Streptococcus equi* subsp. *Zooepidemicus*, and remained undetermined in the other two cases.

Diagnosis	Total
Unexplained sudden death	14
Septicemia	3
Total	17

RESEARCH SUPPORT

- Sponsors:**
- Center for Equine Health, with funds provided by:
 - State of California Satellite Wagering Fund
 - Southern California Equine Foundation
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 - Grayson-Jockey Club Research Foundation, Inc.
 - Pacific Coast Quarter Horse Racing Association

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	Jeff Blea	Susan Stover
	Lucy Gomez	Nicolas Streitenberger
	Omar Gonzalez	Emma Torii
	Eileen Henderson	Francisco Alejandro Uzal
	Asli Mete	

During this period, Dr. Carlos Schild, CAHFS Musculoskeletal Fellow, performed the majority of CHRB horse necropsies submitted to the San Bernardino laboratory with a history of catastrophic musculoskeletal injuries. In addition, he performed a detailed examination of musculoskeletal specimens from CHRB horses necropsied in the CAHFS Davis laboratory, which were shipped to San Bernardino for this purpose. The main goals of this program are to train veterinarians in the examination of the musculoskeletal system of racehorses, and to improve consistency and case documentation for the CHRB necropsy program. The program continues to be a great success, and has brought significant improvement in the consistency of case description, case documentation, and turnaround time of the reports.

OUTREACH AND PRESENTATIONS TO SCIENTIFIC MEETINGS

- Asin J., Nyaoke A., Schild C., Stover S., Uzal F.A. Distal limb dissection wet lab. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.
- Asin J., Nyaoke A., Schild C., Stover S., Uzal F.A. Demonstration of lesions (carpus, fetlock, humerus, scapula, pelvis). Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.
- Asin J., Nyaoke A., Schild C., Stover S., Uzal F.A. Cardiac sample collection wet lab. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.
- Blea J. CHRB perspective on the California Racehorse post-mortem program. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.
- Nyaoke A. Dissection of distal limb structures demonstration. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.
- Stover S. Etiopathogenesis of fatigue fractures – Keynote talk, European College of Veterinary Sports Medicine and Rehabilitation annual meeting. Alfort, France. July 21, 2023.
- Stover S. HISA Requirements and necropsy form. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.
- Stover S. Adaptation of Musculoskeletal Structures to training and competing. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.
- Stover S. Etiopathogenesis of repetitive overuse injuries (Stress fractures and stress remodeling). Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.
- Stover S. Typical skeletal injuries in racehorses – bone by bone. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.
- Stover S. Anatomic nomenclature, definitions. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.

Stover S. Demonstration of lesions. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.

Stover S. Adaptation to training. 9th Uruguayan seminar of the Davis-Thompson Foundation. Universidad de la Republica, Uruguay. August 28, 2023.

Stover S. Anatomic nomenclature and focused necropsy examination. 9th Uruguayan seminar of the Davis-Thompson Foundation. Universidad de la Republica, Uruguay. August 28, 2023.

Stover S. Etiopathogenesis of overuse Injuries. 9th Uruguayan seminar of the Davis-Thompson Foundation. Universidad de la Republica, Uruguay. August 28, 2023.

Stover S. Typical skeletal injuries in racehorses. 9th Uruguayan seminar of the Davis-Thompson Foundation. Universidad de la Republica, Uruguay. August 28, 2023.

Stover S. Exercise history of cluster fatalities, AAEP Racing Safety Forum, American Association of Equine Practitioners Headquarters, Lexington, KY. September 29, 2023.

Stover S. Horseracing Integrity and Safety Authority Update, Table Topic, American Association of Equine Practitioners Annual Symposium, San Diego, CA. December 1, 2023.

Stover S. Racetrack safety update. Global Symposium on Racing – Race Track Industry Program, Tucson, AZ. December 6, 2023.

Stover S. Bone biomechanics, Equine Surgery Resident Rounds, UC Davis. December 13, 2023.

Stover S. Racetrack surface influences fetlock and hoof Motions. University of Kentucky, Lexington, KY. February 23, 2024.

Stover S. HISA racetrack safety – Why data? Association of Racing Commissioners International Annual Meeting, Columbus, OH. March 7, 2024.

Stover S. Role of postmortem exam and racetrack safety and welfare committee in racehorse welfare. Racing Medication and Testing Consortium Regulatory Veterinarian Continuing Education. Santa Anita Racetrack, Arcadia, CA. March 18, 2024.

Stover S. Repetitive stress-induced bone injuries in race and performance horses. Zoom Webinar - American Association of Equine Practitioners. June 12, 2024.

Stover S. Types of fractures (by their cause), their incidence and what proportion we might reasonably hope to prevent. International Federation of Horseracing Authorities Global Summit Equine Safety and Technology. Toronto, Canada. June 12, 2024.

Stover S. Impact of track on fracture risk. International Federation of Horseracing Authorities Global Summit Equine Safety and Technology. Toronto, Canada. June 12, 2024.

Stover S. Localized changes in skeletal morphology (bone formation and/or resorption, fissures and voids) that are commonly found in association with fracture and determining the significance of such changes in relations to risk of fracture. International Federation of Horseracing Authorities Global Summit Equine Safety and Technology. Toronto, Canada. June 12, 2024.

Stover S. Why is it possible to prevent fractures. International Federation of Horseracing Authorities Global Summit Equine Safety and Technology. Toronto, Canada. June 12, 2024.

Stover S. Why do we think we might be able to prevent fractures. International Federation of Horseracing Authorities (IFHA) IFHA Global summit equine safety and technology. Toronto. June 12–14, 2024

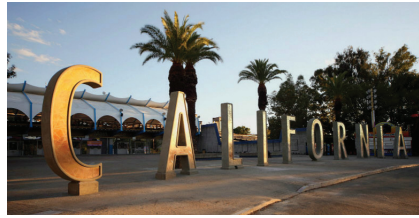
- Schild C.O., Uzal F.A. Tenosynovitis by *Serratia odorifera* in a racehorse. 41st West Coast Veterinary Pathology Conference, Davis, California, USA. 3-4 May. 2024.
- Schild C.O., Nyaoke A., Asin J., Henderson E.E., Blea J., Stover S., Uzal F.A. Radial fracture in racehorses: a retrospective study. 66th AAVLD annual meeting, Maryland, USA. October 12–18, 2023.
- Schild C.O., Uzal F.A. Chronic suspensory desmitis in a Warmblood horse. 66th AAVLD annual meeting, Maryland, USA. October 12–18, 2023.
- Uzal F.A. Sudden death: Current knowledge and diagnostic work up. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.
- Uzal F.A. Horseracing integrity and safety authority necropsy program. Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. National Harbor, Maryland October 12–18, 2023.
- Uzal F.A. Cardiac necropsy and sample collection demonstration. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.
- Uzal F.A. Necropsy program for the California Horse Racing Board Annual report 2022–23. California Horse Racing Board, Board Meeting, Cal Expo, Sacramento, CA. December 14, 2023.
- Uzal F.A. General considerations on necropsy of race horses and The California racehorse Post-mortem program. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.
- Uzal F.A. Conclusions and perspectives from over 3 decades of California post-mortem studies. International Federation of Horseracing Authorities (IFHA) Global summit equine safety and technology. Toronto, Canada. June 12–14, 2024
- Uzal F.A. Pathologists' viewpoint of EASD: current knowledge, gaps and potential solutions International Federation of Horseracing Authorities (IFHA) Global summit equine safety and technology. Toronto, Canada. June 12–14, 2024
- Vale A. CHRB Fatality Review. Davis-Thompson Foundation workshop on Racehorse necropsies to fulfill Horseracing Integrity and Safety Authority (HISA) requirements. California Animal Health and Food Safety, UC Davis, San Bernardino, CA. August 18–19, 2023.

SCIENTIFIC PUBLICATIONS

Schild C.O., Asin J., Blea J., Stover S., Uzal F.A. Scapular fracture in a racehorse with a long career of uninterrupted intense exercise. *Brazilian J Vet Path* 2023, 16:232–235.

Westman S., Cullen T.E., Bergstrom T.C., Edwards L.A., Garcia T.C., Stover S.M. Ex vivo biomechanical evaluation of an adhered fiberglass and polymethyl methacrylate sole-hoof wall cast on stabilization of type III distal phalanx fractures under simulated physiologic midstance loads. *Vet Surg.* 2024 53:224–233.





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