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CAHFS Accession #: [redacted]
FINAL REPORT
Ref.#: [redacted]

Coordinator: Monika Samol, DVM, Resident
E-Signed and Authorized by: Samol, Monika on 4/1/2019 4:46:48PM

Email To:
ARTHUR, RICK
RMARTHUR@UCDAVIS.EDU

Incident Track:
SANTA ANITA RACETRACK
285 West Huntington Road,
Arcadia CA 91007
Los Angeles County

This report supersedes all previous reports for this case

Date Collected: 02/23/2019 **Date Received:** 02/23/2019

Comments: CHRB

Case Contacts

Submitter	GRANDE, TIM	[redacted]	[redacted]	Arcadia	CA	91007
Bill To	CALIFORNIA HORSE RACING BOARD	916-263-6000	1010 Hurley Way Suite 300	Sacramento	CA	95825
Owner	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Report To	UZAL, FRANCISCO	[redacted]	[redacted]	San Bernardino	CA	92408
Report To	ARTHUR, RICK	[redacted]	[redacted]	Sierra Madre	CA	91024
Attending Vet	BLEA, JEFF A	[redacted]	[redacted]	Sierra Madre	CA	91024
Trainer	Todaro/Hollendorfer, George/Jerry	[redacted]	[redacted]	Richmond	CA	94801

CHRB - Related Information

Horse's Name:	[redacted]	Human Injury?	
Tattoo:	[redacted]	Death Related to:	Training
Age:	5.00 Years	Track Surface:	Dirt
Gender:	Male	Location on Track:	1/4th pole
Taxonomy:	Thoroughbred Horse	Insured?	Y

Medications: Dormosedan (Detomidine); Lasix (Furosemide);

Laboratory Findings/Diagnosis

A 5 year old [redacted] Thoroughbred [redacted] [redacted] submitted with history of right hind complete, displaced, lateral condylar fracture, P1 comminuted fracture, comminuted medial proximal sesamoid bone fracture, suspensory apparatus rupture (horse was working in company)

Catastrophic right hind fetlock breakdown with:

RIGHT HINDLIMB

ACUTE CHANGES
1. Closed, comminuted, complete, displaced, articular, parasagittal, lateral condylar fracture of the MTIII with the presence of pre-existing lesion (biaxial plantar osteochondral disease, see chronic changes 1.)
2. Fractures of the proximal sesamoid bones
a) Closed, simple, complete, displaced, articular, transverse, apical/mid-body fracture of the medial proximal sesamoid bone

b) Closed, comminuted, complete, displaced, articular, avulsion fracture of the axial margin of the lateral proximal sesamoid bone
3. Closed, highly comminuted, complete, displaced, longitudinal, bi-articular fracture of P1
4. Moderate to severe scoring of the articular surfaces of the proximal sesamoid bones
5. Severe, full thickness cartilage loss along the fracture line of the lateral proximal sesamoid bone
6. Suspensory ligament failure with severe fraying, complete splits and hemorrhage of the medial branch of the suspensory ligament
7. Severe fraying of fibers, incomplete longitudinal split and hemorrhage of the body of the suspensory ligament
8. Full thickness, longitudinal and transverse rupture of the intersesamoidean ligament
9. Severe fraying of fibers and incomplete transverse rupture of the lateral and medial cruciate ligaments
10. Severe fraying of fibers and incomplete transverse rupture of the lateral and medial short sesamoidean ligaments
11. Severe, longitudinal, full-thickness split and fraying of fibers of the straight distal sesamoidean ligament
12. Full thickness, transverse rupture of the plantar annular ligament

CHRONIC CHANGES:
1. Severe plantar ostechondral disease with subtle, brown, focal discoloration and porosity of the subchondral bone visible on both opposing surfaces of the fractured lateral condyle of the distal MTIII

LEFT HINDLIMB

CHRONIC CHANGES

Moderate osteoarthritis of the fetlock joint
1. Mild to moderate plantar ostechondral disease with focal, blue subchondral bone discoloration (bruising) visible through the flattened cartilage of the lateral condyle of the distal articular surface of MTIII
2. Moderate to severe, focal, blue subchondral bone discoloration visible through the thinned cartilage of the plantar third of the intermediate groove of the proximal articular surface of P1
3. Mild dorsal metatarsal disease with periosteum congestion and thickening
4. Mild transverse ridge arthrosis with cartilage fibrillation and pitting of the distal articular surface of MTIII
5. Moderate lipping of the dorsal and plantar aspect of the proximal articular surface of P1
6. Mild to moderate, biaxial, apical, irregular bony outgrowth of the proximal sesamoid bones (osteophytosis)
7. Mild to moderate, biaxial, blue rim of subchondral bone discoloration (bruising) along the basilar margin of the proximal sesamoid bones
8. Moderate thickening and of the lateral short sesamoidean ligament (ligament feels very firm and rigid- suggestive of calcification)
9. Moderate proliferative synovitis of the fetlock joint

Other findings:
- Severe, extensive gastric hyperkeratosis of non-glandular mucosa with mild gastric ulceration along the margo plicatus (incidental)
- Pulmonary congestion and edema (euthanasia artifact)
- Splenomegaly (euthanasia artifact)

Further histologic examination of the testicles pending

Case Summary

4/1/19: The case will be closed, as the musculoskeletal examination is complete; however, once the reproductive pathologist review of the testicles is complete, the case will be reopened to report the findings.

02/28/19: The most important findings in the right hindlimb are lateral condylar fracture of cannon bone, biaxial fracture of proximal sesamoid bones, comminuted fracture of proximal phalanx and suspensory ligament failure. The latter injuries resulted in loss of support of the fetlock joint of the right hindlimb.
The reason of the aforementioned fractures may be related to the focal region of discoloration and bone porosity/osteopenic focus associated with the fracture surfaces in the lateral condyle of the right cannon bone.
Histology of the testicles will be further examined by a reproductive pathologist to determine if there are any significant changes.

02/23/19: No significant findings were identified in visceral organs. At the time of necropsy, both hind limbs were removed and

saved for detailed examination at a later date. Results of this examination will be included in the next version of this report.

Clinical History

Right Hind: complete, displaced lateral condylar fracture, P1 comminuted fracture, comminuted medial proximal sesamoid bone fracture, suspensory apparatus rupture (horse was working in company); Hx: subfertile stallion.

Gross Observations

Necropsy of a 5 year old, [redacted] Thoroughbred [redacted] 530 kg, with [redacted], [redacted] is commenced at 1:40 pm, February 23, 2019. The carcass is in good nutritional condition, with appropriate musculature development, good deposits of adipose tissue, and in mild post-mortem decomposition. The trachea contains abundant stable foam, the lungs are mottled pink to red, spongy and wet (euthanasia artifact). The spleen is markedly enlarged and congested (euthanasia artifact). The stomach contains green, soft roughage and grain particles. Non-glandular gastric mucosa is extensively hyperkeratotic with mild, shallow ulcers along the margo plicatus. The intestinal tract is unremarkable, and the small colon contains formed feces.
Both hind limbs are removed at the level of the chestnut for further examination.

Examination of testicles and epidydmis

Both testicles appeared to be reduced in size (right: 10,5 cm x 7 cm x 4,5 cm; left: 11,5 cm x 7cm x 5cm), relatively soft and lacking in turgor (cut surface does not bulge). Testicular parenchyma was light brown (darker color color than normal).

CHRB Musculoskeletal

Both hind limbs were examined distally from the mid-shaft of tibia. Following changes were seen:

RIGHT HIND

A- MTIII
1. Closed, simple, complete, displaced, articular, parasagittal, lateral condylar fracture of the MTIII with the presence of pre-existing lesion

The lateral condylar fragment is app. 14,5 cm long and is divided into two components in transverse plane app. in proximal third. The condylar fracture is coursing through blue subchondral bone discoloration visible through the remaining cartilage. The opposing surfaces of the fracture reveal focus of brown discoloration of increased bone porosity (osteopenic focus) surrounded by highly compacted/sclerotic bone. The proximal edges of the of the condylar fragment are slightly irregular due to comminution which resulted in separation of multiple, small, irregularly shaped fragments, mostly from the dorsal aspect.

2. Severe plantar ostechondral disease with subtle, brown, focal discoloration and porosity of the subchondral bone visible on both opposing surfaces of the fractured lateral condyle of the distal MTIII
3. Severe scoring of the distal articular surface of MTIII
4. Severe, focal, full thickness, longitudinal cartilage loss of the dorsal edge of mid-sagittal ridge of the distal articular surface of MTIII
5. Moderate to severe hemorrhage accompanied by soft tissue hypertrophy at the plantar aspect of the supracondylar region of MTIII
6. Moderate to severe hemorrhage and bone erosion due to hypertrophic synovial pad at the dorsal aspect of the supracondylar region of MTIII

B- PROXIMAL SESAMOID BONES
1. Fractures of the proximal sesamoid bones
a) Closed, simple, complete, displaced, articular, transverse, apical/mid-body fracture of the medial proximal sesamoid bone- highly compacted trabecular bone is present on both opposing surfaces, especially on the distal component.
b) Closed, comminuted, complete, displaced, articular, avulsion fracture of the axial margin of the lateral proximal sesamoid bone. The fragment is avulsed with intersesamoidean ligament and it is divided into multiple smaller pieces, which are firmly attached to the latter ligament.
2. Severe, full thickness cartilage loss along the fracture line of the lateral proximal sesamoid bone
3. Moderate to severe scoring of the articular surfaces of the proximal sesamoid bones

C- P1
1. Closed, highly comminuted, complete, displaced, sagittal, articular fracture of P1- probably the main fracture line originates from the plantar aspect of intermediate groove (the cartilage in this location is significantly thinned and subchondral bone appears to be porous- analogous findings can be located in the contralateral P1, see section describing P1 of left hindlimb- D 1.). The fracture line coursing through the intermediate groove is crescent shaped and divides the proximal articular surface into medial and lateral components. The medial fragment is slightly bigger and consists of 4 pieces- axial containing the part of intermediate groove and plantar separating the plantar eminence from the rest of the proximal articular surface. The lateral fracture component is divided into two major fragments, also created by separation of the plantar eminence from the rest of the proximal surface. The main fracture line courses distally to reach the distal articular surface. The latter is divided axially into lateral and medial components. The mid-shaft is shattered, it constitutes of uncountable, variably shaped and sized fragments.
For better visualization of the fractures described above, please see attached pictures and drawings.
2. Severe scoring of the proximal and distal articular surface of P1

D- P2
1. Moderate to severe scoring of the proximal articular surface of P2 (acute, multiple narrow clefts due to high comminution of P1)

E- SOFT TISSUES
1. Full thickness, transverse rupture of the plantar annular ligament
2. Suspensory ligament failure: severe, longitudinal complete splits originating from the level of the fracture line of the medial proximal sesamoid bone. Severe fraying and incomplete longitudinal splits progress all the way proximally, up to proximal third of the mid-body of the suspensory ligament, affecting mainly its plantar surface.
3. Full thickness, longitudinal and transverse rupture of the intersesamoidean ligament- the transverse component follows the fracture line of the medial proximal sesamoid bone, the tear propagates axially between the proximal sesamoid bones, to merge with a complete rupture of the distal straight sesamoidean ligament
4. Moderate fraying of fibers and hemorrhage of the medial edge of the dorsal surface of the deep digital flexor tendon
5. Severe fraying of fibers and incomplete transverse rupture of the lateral and medial cruciate ligaments
6. Severe fraying of fibers and incomplete transverse rupture of the lateral and medial short sesamoidean ligaments
7. Severe synovial thickening in the fetlock joint (proliferative synovitis)

LEFT HIND

A- PROXIMAL SESAMOID BONES
1. Mild to moderate, biaxial, apical, irregular bony outgrowth of the proximal sesamoid bones (osteophytosis)
2. Mild to moderate, biaxial, blue rim of subchondral bone discoloration (bruising) along the basilar margin of the proximal sesamoid bones (more distinct on the lateral proximal sesamoid bone)

B- MTIII
1. Moderate plantar ostechondral disease with focal, rounded (app. 0.7 cm in diameter) blue/grey subchondral bone discoloration (bruising) visible through the flattened cartilage of the lateral condyle of the distal articular surface of MTIII
2. Mild dorsal metatarsal disease with periosteum congestion and thickening, especially at the level of the dorsal mid-shaft the periosteum is strongly adhered to the cortical surface of the MTIII
3. Mild transverse ridge arthrosis with cartilage fibrillation and pitting of the distal articular surface of MTIII
4. Mild, biaxial, shallow fissures (app. 1 cm long) and fibrillation of the cartilage of the condylar grooves
5. Mild hemorrhage accompanied by soft tissue hypertrophy at the plantar aspect of the supracondylar region of MTIII
6. Mild hemorrhage and bone erosion due to hypertrophic synovial pad at the dorsal aspect of the supracondylar region of MTIII

C- SOFT TISSUE
1. Moderate synovial thickening in the fetlock joint (proliferative synovitis)- especially the dorsal aspect of the fetlock joint capsule
2. Moderate, thickening and of the lateral short sesamoidean ligament (ligament feels very firm and rigid- suggestive of calcification)

D- P1
1. Moderate to severe, focal, blue subchondral bone discoloration visible through the thinned cartilage of the plantar third of the intermediate groove of the proximal articular surface of P1- the cross section of the affected area revealed focally extensive, significant cartilage thinning and porosity of the underlying subchondral bone.
2. Moderate, focal cartilage ulceration with fibrillation of the dorsal aspect of the medial proximal articular surface of P1 (app. 0.5 cm from the dorsomedial articular margin, adjacent to the intermediate groove)
3. Moderate lipping of the dorsal and plantar aspect of the proximal articular surface of P1

4. Mild, biaxial, pink discoloration of the cartilage of the axial margin of the plantar eminences of proximal articular surface of P1

No gross lesions/ abnormalities were identified in other sturctures of both distal hind limbs examined from the mid-shaft of tibia.

Histology

Microscopic examination of the testicular tissue is pending

Toxicology

Reporting Limit (Rep. Limit): The lowest routinely quantified concentration of an analyte in a sample. The analyte may be detected, but not quantified, at concentrations below the reporting limit. Sample volumes less than requested might result in reporting limits that are higher than those listed.

The detected liver mineral results are within acceptable or non-diagnostic ranges for this species.

Heavy Metals Screen-CHRB

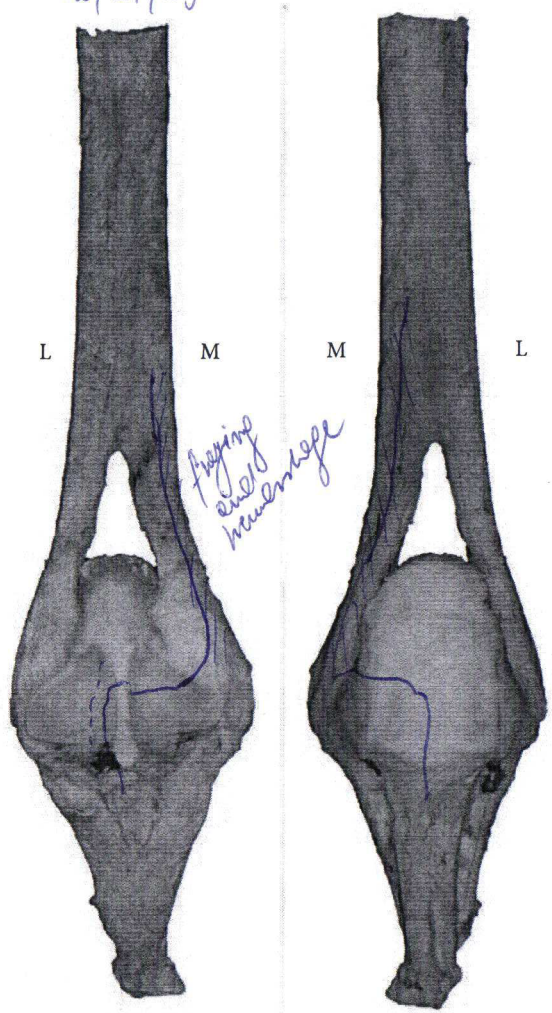
Animal/Source	Specimen	Specimen Type
[redacted]	[redacted]	Liver Tissue

Analyte	Result	Units	Rep. Limit	Units
Lead	Not Detected	ppm	1	ppm
Manganese	1.3	ppm	0.1	ppm
Iron	290	ppm	1	ppm
Mercury	Not Detected	ppm	1	ppm
Arsenic	Not Detected	ppm	0.05	ppm
Molybdenum	0.57	ppm	0.4	ppm
Zinc	31	ppm	0.3	ppm
Copper	3.9	ppm	0.3	ppm
Cadmium	0.79	ppm	0.3	ppm
Cobalt	0.06	ppm	0.01	ppm
Selenium	0.43	ppm	0.02	ppm

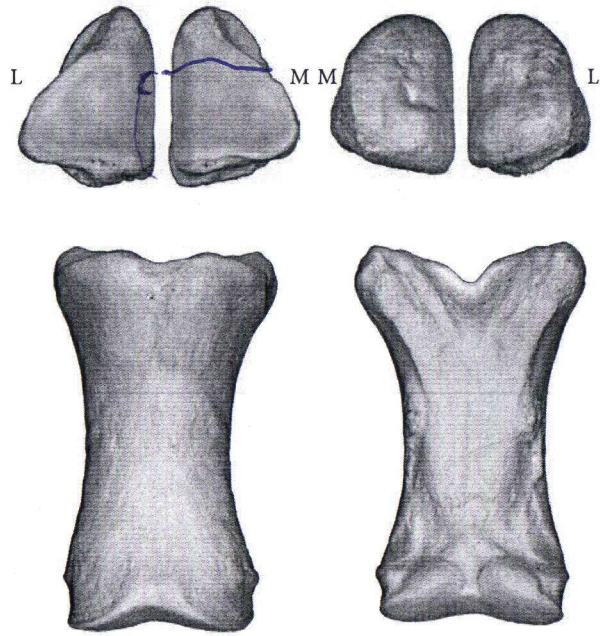
Accession # [redacted]
CC: MAS
Date: 02/27/19

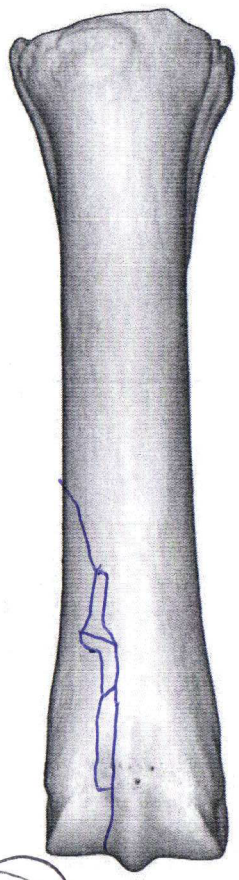
Right Fetlock

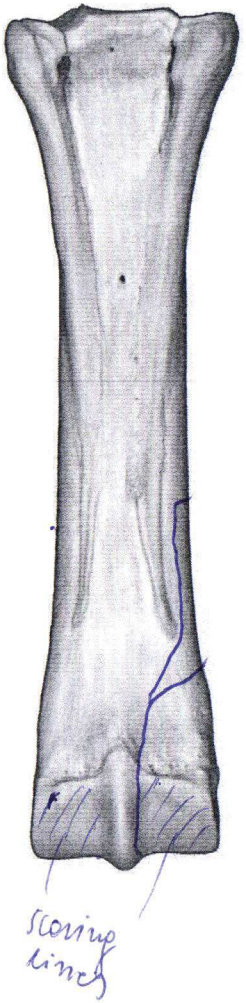
Please circle affected leg
foreleg
hindleg



Susp. App. (dorsal) Susp. App. (palmar/plantar)







Involved Structures

SDF tendon: Yes (No) DDF tendon: Yes (No)

Suspensory ligament: (Yes) No

(SL Medial branch) SL Lateral branch (SL Body)

Intersesamoidean ligament : (Yes) No
(Longitudinal) (Transverse)

Distal Sesamoidean ligaments (straight and/or oblique) (Yes) No

Collateral ligaments: Yes (No)

Collateral Sesamoidean Ligaments: (Yes) No

Cruciate and/or Short Sesamoidean Ligaments (Yes) No

Open wound? Yes (No)

Joint capsule intact? Yes (No)

Joint luxated? Yes (No)

Acc # [redacted]

Date 02/27/13

CC MAS

Proximal Phalanx - Right

Nature:

- [ ] Open
- [x] Simple
- [x] Complete
- [x] Displaced
- [x] Articular
- [x] Closed
- [x] Comminuted
- [ ] Incomplete
- [ ] Non-displaced
- [ ] Non-articular

Location:

- [x] Proximal Epiphyseal
- [x] Proximal Metaphyseal
- [x] Proximal Physeal
- [x] Diaphyseal
- [x] Distal Epiphyseal
- [x] Distal Metaphyseal
- [x] Distal Physeal

Configuration:

- [x] Axial (longitudinal)
- [ ] Transverse
- [ ] Segmental
- [ ] Butterfly
- [x] Oblique

Direction:

- [ ] Proximodorsal-Distopalmar
- [ ] Proximolateral-Distomedial
- [ ] Sagittal
- [ ] Proximopalmar-Distodorsal
- [ ] Proximomedial-Distolateral
- [ ] Dorsal plane (mediolateral)

Pre-existing callus:

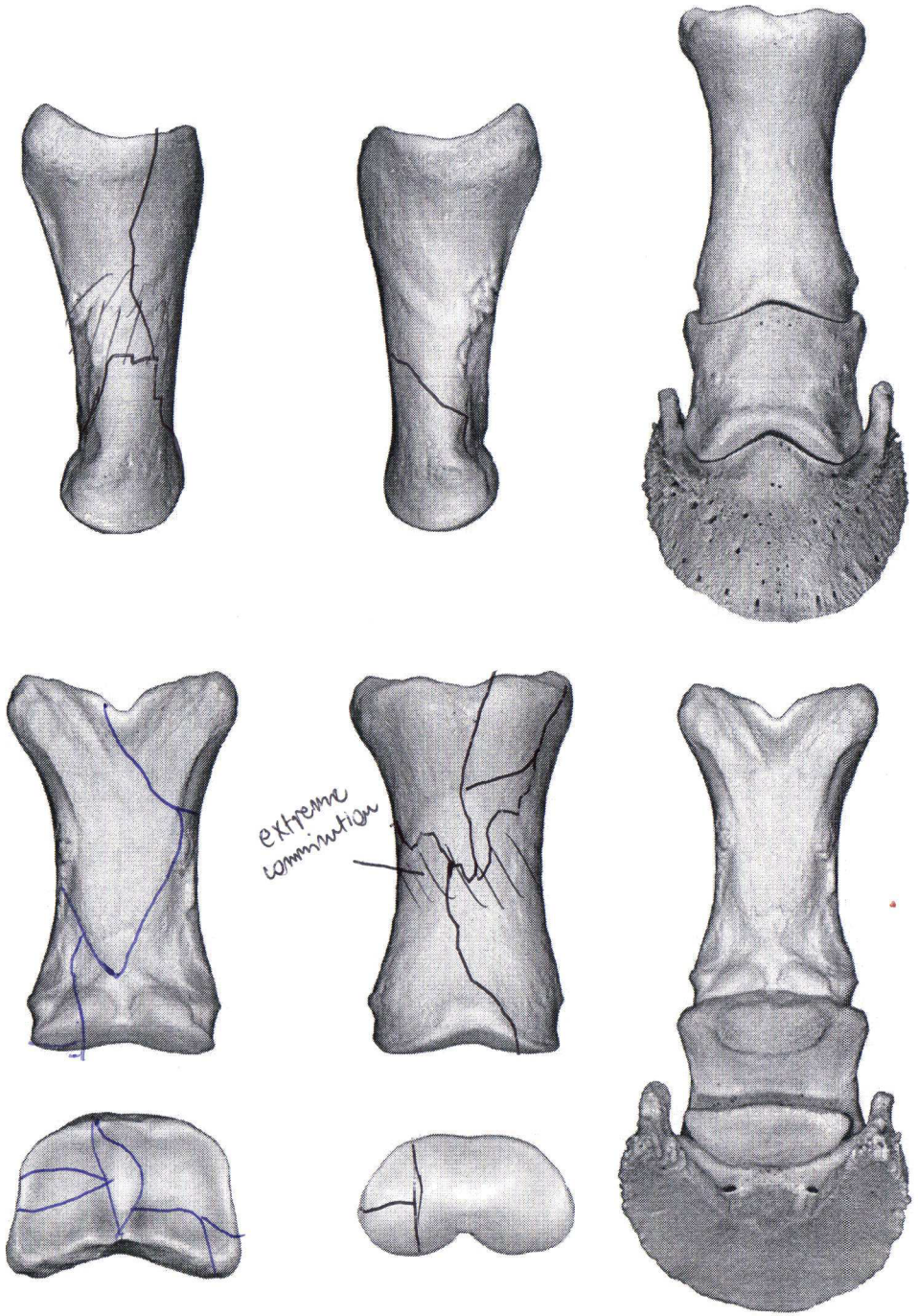
- [ ] Yes
- [ ] Unable to evaluate
- [x] No

Legend:

=== Callus ||||| - high comminution

– – – Incomplete Fx

M Missing fragments



Exercise History Report (Full)

[redacted]

UCDAVIS
VETERINARY MEDICINE
J. D. Wheat Veterinary Orthopedic Research Laboratory

[redacted] 2019

Exercise History Report (Full)

J.D. Wheat Veterinary Orthopedic Research Laboratory

This report summarizes the high speed exercise history for Case Horse. There are four parts to this report:

Part 1 is a graph that depicts the races and officially recorded high speed workouts for Case Horse over the horse's career. The graph is useful for visually assessing features of a horse's career like: career length, periods of layup, and exercise consistency. If Case Horse had zero recorded high-speed exercise events, this graph is not produced. Event histories for three breed, sex, age, and event-matched control horses are also plotted.

Part 2 includes graphs which illustrate Case Horse's exercise history alongside that of Control Horses. These graphs are useful for visually comparing periods of layup and specific rates of exercise in the horses' exercise histories.

Part 3 is a chronological listing of races and officially timed works beginning with the most recent event (race or work).

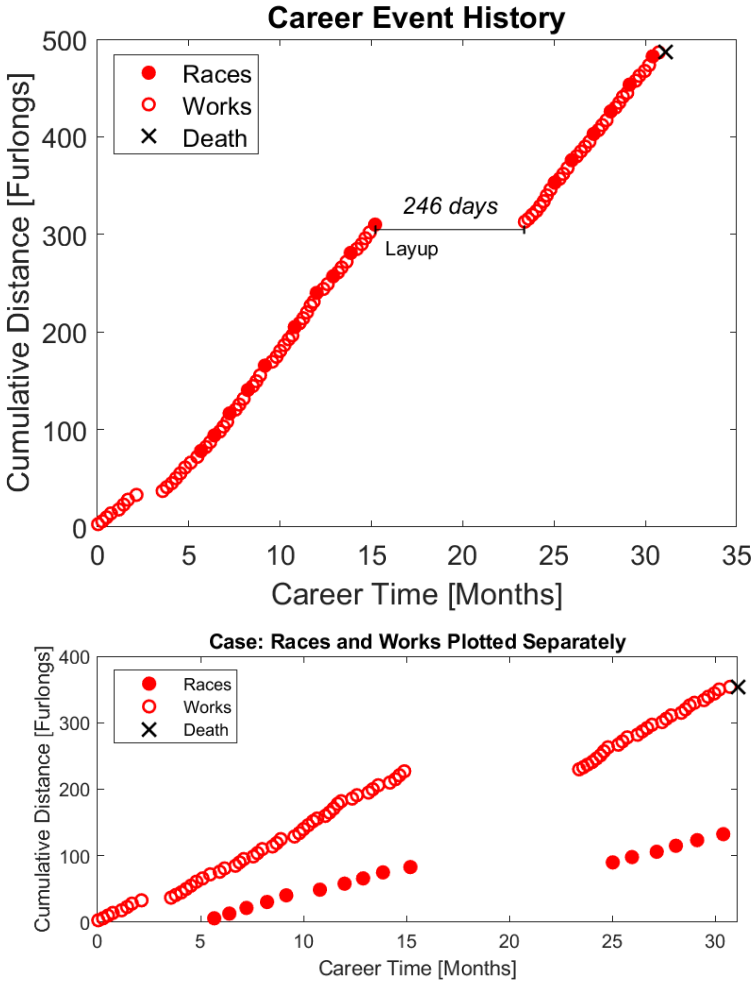
Part 4 is a chart that allows comparison of exercise variables between Case Horse and other racehorses of similar age, sex, and breed that did not die at the same time from an injury. Similar to comparing the results of a blood test to a range of normal values, the values for Case Horse can be assessed in the context of a normal range for 95% of a sample of similar racehorses that did not die during the same time as Case Horse.

Table of Contents

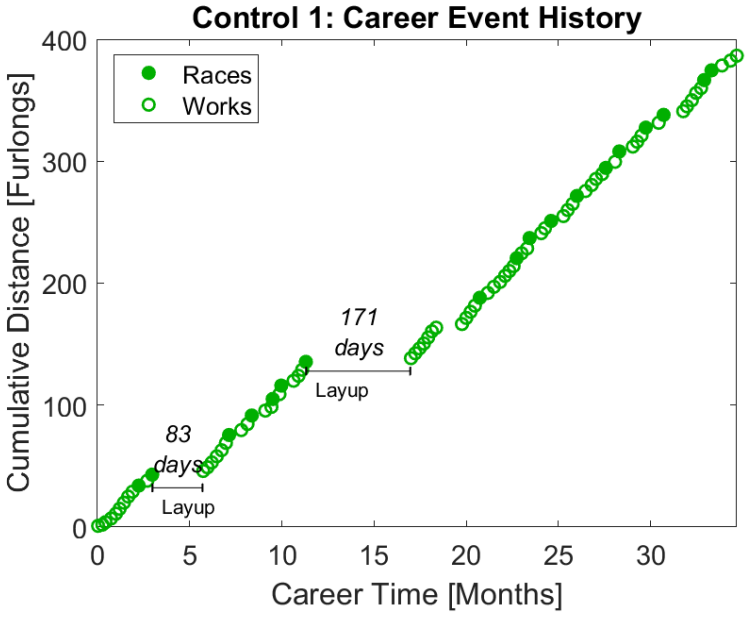
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

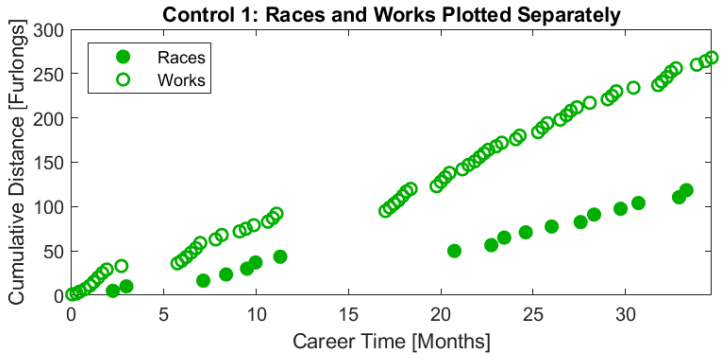
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs the horse exercised in that event is added to the number of furlongs exercised in all previous events.

Case Horse High Speed Exercise History

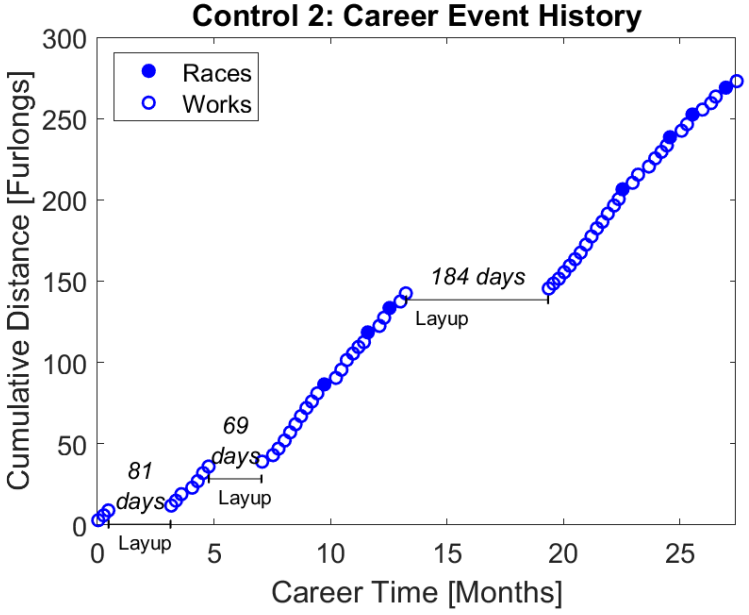


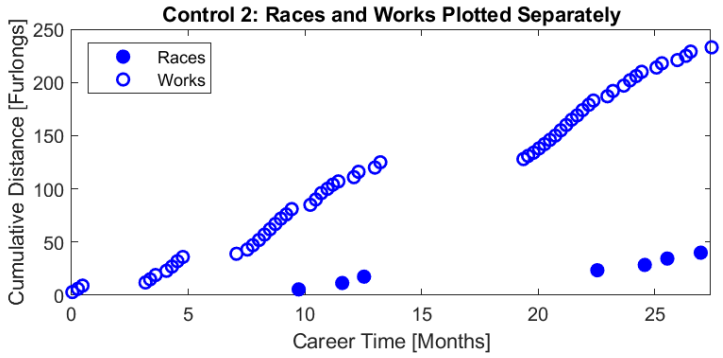
Control 1 High Speed Exercise History



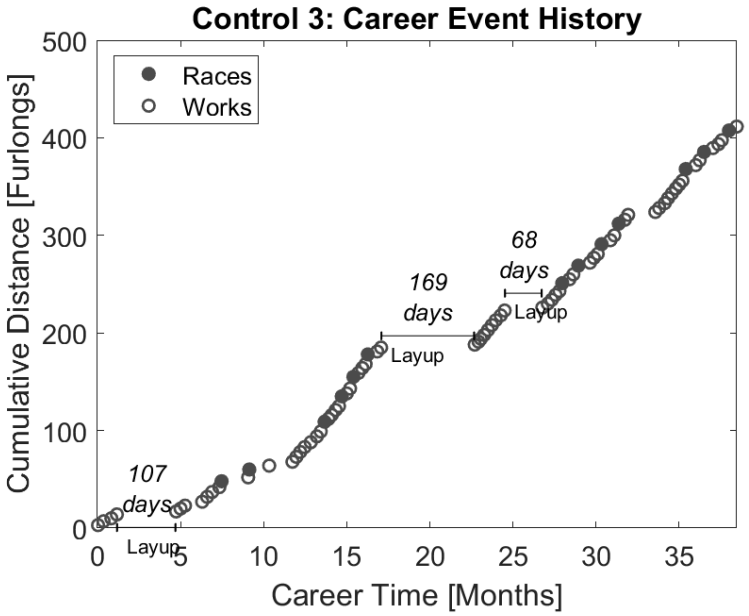


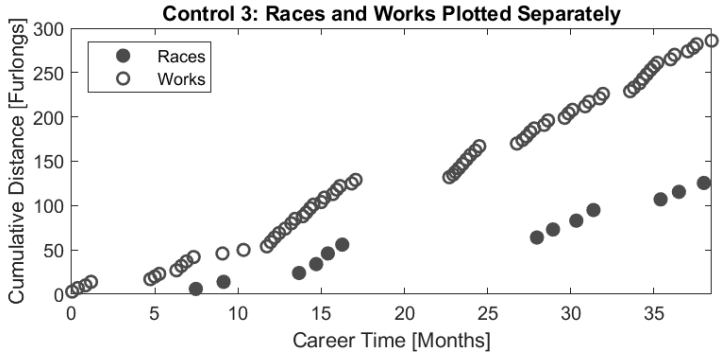
Control 2 High Speed Exercise History



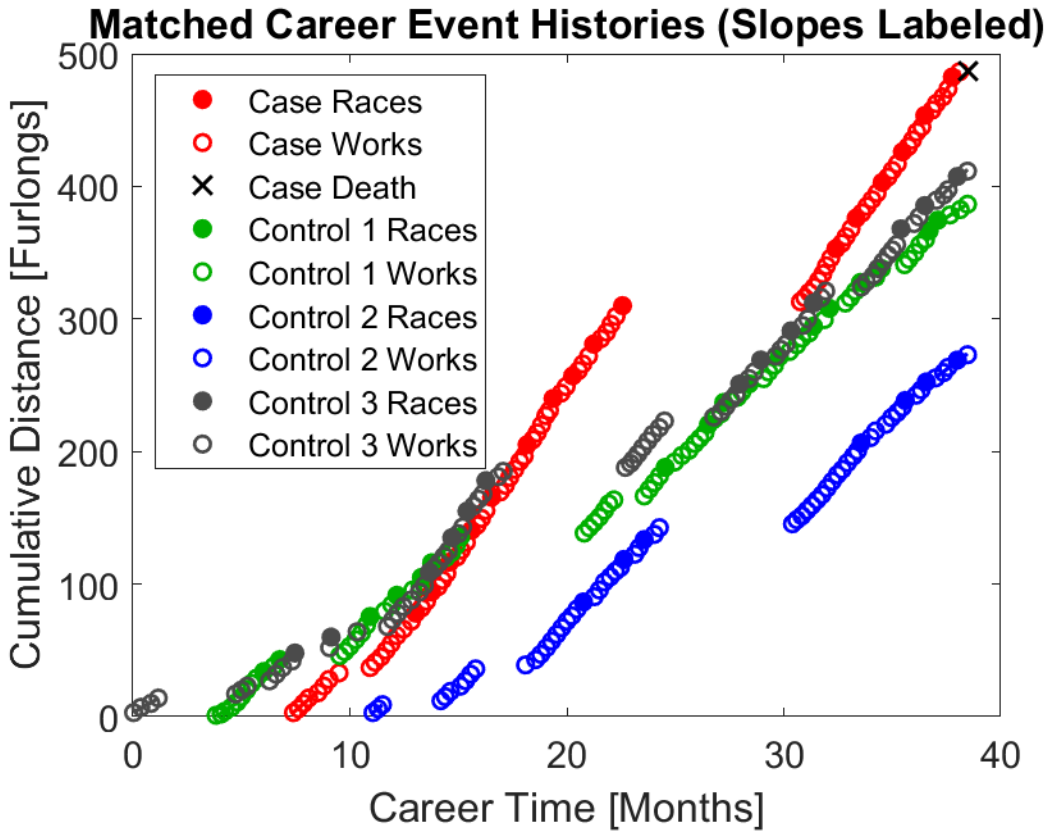


Control 3 High Speed Exercise History

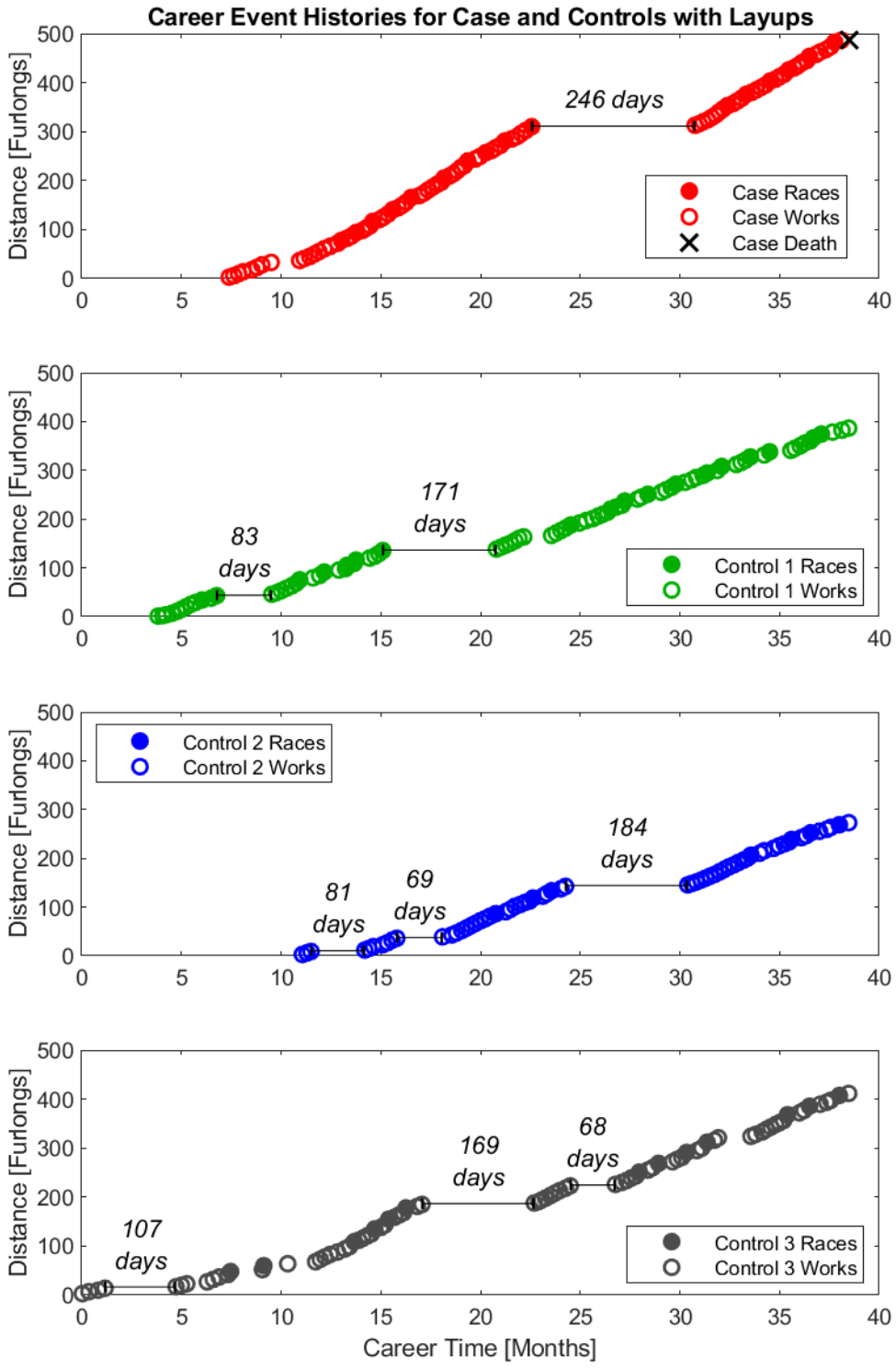


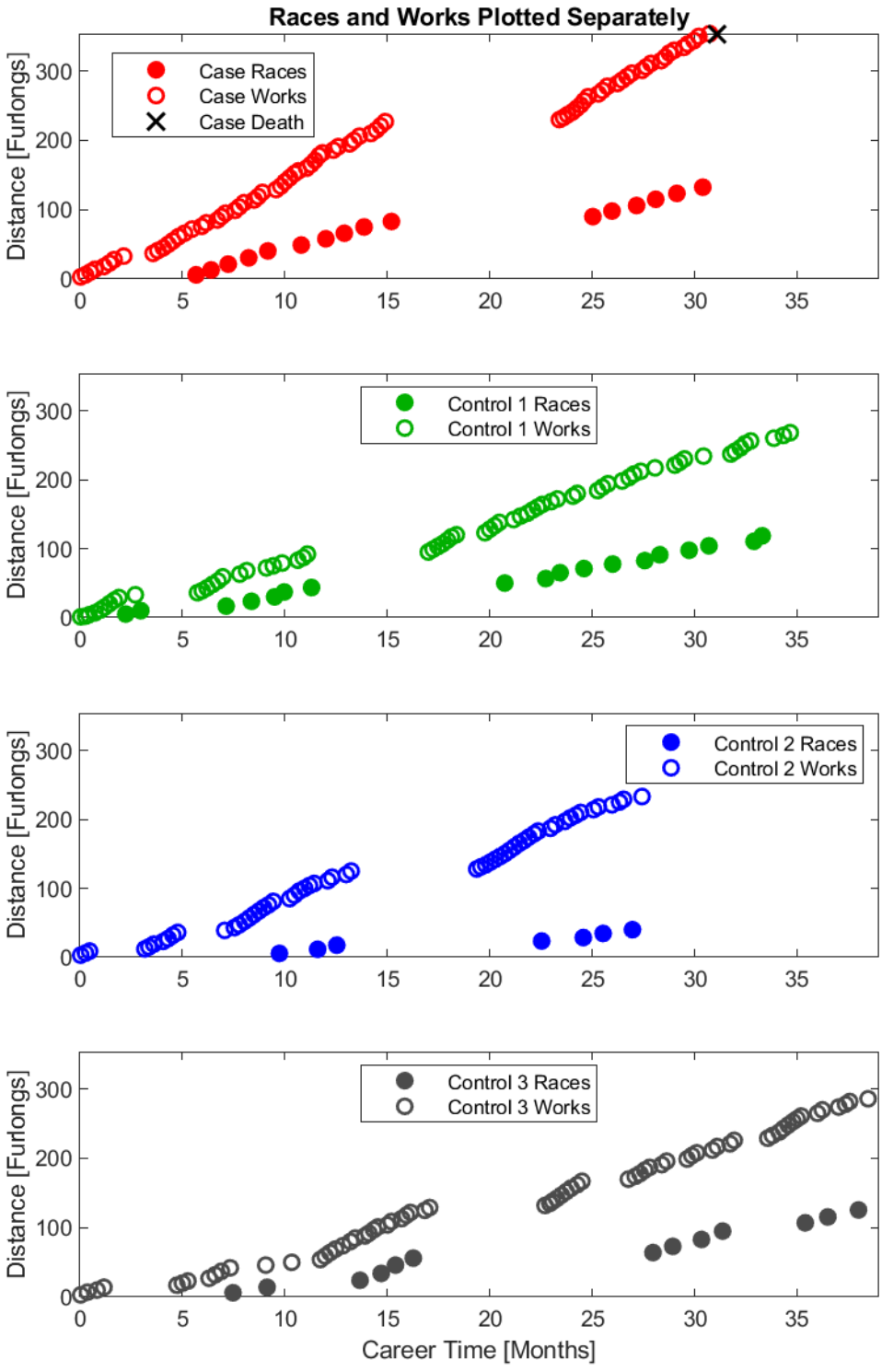


Part 2: Case and Control Horses Plotted Together



Case and Control Horses' exercise event histories are plotted on the same axes. The plots are aligned by the match date (equal to the date of death of Case Horse). Lines segments indicate specific rates of exercise at the start of career, end of career (for Case Horse), and match date (for Control Horses). Event rates are calculated as the slopes of the plots over 2 to 5 events not spanning a layup period, in units of furlongs per month.


Career Event Histories for Case and Controls with Layups
Distance [Furlongs]
246 days
Case Races
Case Works
Case Death
83 days
171 days
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
81 days
69 days
184 days
107 days
169 days
68 days
Control 3 Races
Control 3 Works
Career Time [Months]


Races and Works Plotted Separately
Case Races
Case Works
Case Death
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Distance [Furlongs]
Career Time [Months]
0
100
200
300
0
5
10
15
20
25
30
35

Part 3: Case Horse's Event History

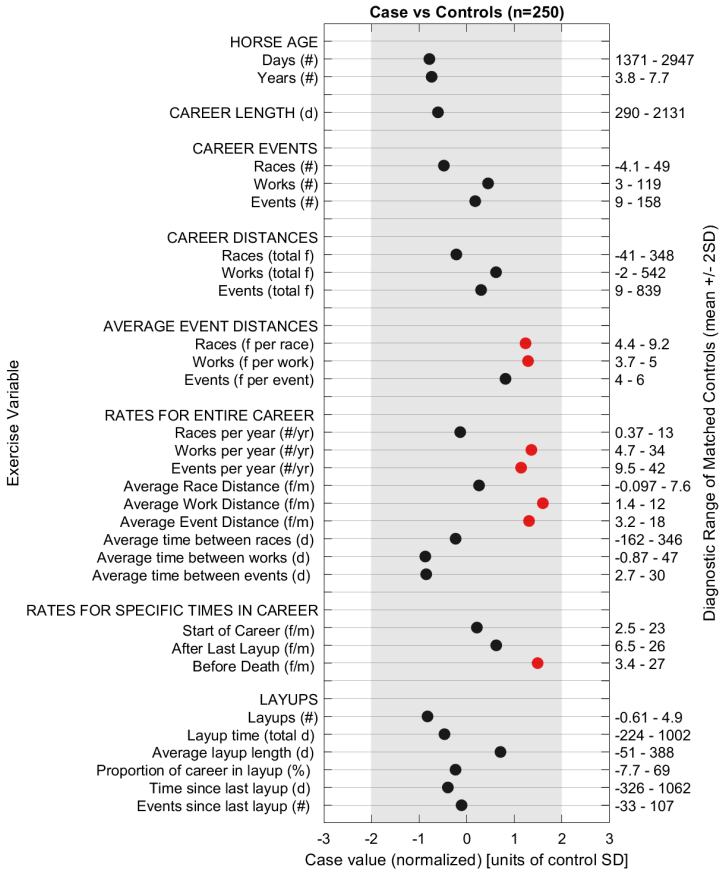
Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
2/12/2019	W	4.0	SA	Dirt	Fast	:48.60				
2/2/2019	R	9.0	SA	Dirt	Sloppy		4U	SnPsqalG2 -200k	120000	1
1/27/2019	W	6.0	SA	Dirt	Fast	01:12.2				
1/20/2019	W	5.0	SA	Dirt	Fast	01:00.0				
1/11/2019	W	5.0	SA	Dirt	Fast	01:00.2				
1/5/2019	W	4.0	SA	Dirt	Fast	:49.40				
12/26/2018	R	8.5	SA	Dirt	Fast		3U	SnAntnoG2 -300k	60000	2
12/22/2018	W	4.0	SA	Dirt	Fast	:50.00				
12/15/2018	W	6.0	SA	Dirt	Fast	01:13.6				
12/9/2018	W	5.0	SA	Dirt	Fast	:59.80				
12/3/2018	W	4.0	SA	Dirt	Fast	:47.60				
11/25/2018	R	9.0	DMR	Dirt	Fast		3U	NatvDivrG3 -100k	60000	1
11/18/2018	W	5.0	SA	Dirt	Fast	01:00.6				
11/11/2018	W	5.0	SA	Dirt	Fast	01:01.0				
11/5/2018	W	4.0	SA	Dirt	Fast	:49.40				
10/28/2018	R	8.0	SA	Dirt	Fast		3U	CmmaToTopB -75k	47100	1
10/21/2018	W	5.0	SA	Dirt	Fast	01:00.4				
10/14/2018	W	5.0	SA	Dirt	Fast	:59.80				
10/7/2018	W	5.0	SA	Dirt	Fast	01:00.2				
9/30/2018	W	4.0	SA	Dirt	Fast	:49.20				
9/22/2018	R	8.0	BEL	Dirt	Fast		3U	KelsoHG2 -300k	12000	5
9/15/2018	W	6.0	SA	Dirt	Fast	01:12.6				
9/8/2018	W	5.0	SA	Dirt	Fast	:58.80				
9/2/2018	W	4.0	DMR	Dirt	Fast	:48.20				
8/25/2018	R	7.0	DMR	Dirt	Fast		3U	POBrienG2 -200k	40000	2
8/18/2018	W	6.0	DMR	Dirt	Fast	01:12.8				
8/12/2018	W	6.0	DMR	Dirt	Fast	01:13.8				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/7/2018	W	5.0	DMR	Dirt	Fast	01:01.0				
8/1/2018	W	5.0	DMR	Dirt	Fast	:59.80				
7/26/2018	W	4.0	DMR	Dirt	Fast	:49.40				
7/19/2018	W	4.0	DMR	Dirt	Fast	:48.40				
7/13/2018	W	3.0	SA	Dirt	Fast	:36.40				
7/7/2018	W	3.0	SA	Dirt	Fast	:39.20				
11/3/2017	R	8.0	DMR	Dirt	Fast		3U	BCDirtMG1 -1000k	550000	1
10/25/2017	W	6.0	SA	Dirt	Fast	01:12.8				
10/18/2017	W	6.0	SA	Dirt	Fast	01:14.6				
10/12/2017	W	5.0	SA	Dirt	Fast	01:00.0				
10/4/2017	W	4.0	SA	Dirt	Fast	:48.00				
9/24/2017	R	9.0	RP	Dirt	Fast		3	OkDrbyG3 -400k	79949	2
9/17/2017	W	6.0	SA	Dirt	Fast	01:13.4				
9/9/2017	W	5.0	SA	Dirt	Fast	01:00.8				
9/3/2017	W	4.0	DMR	Dirt	Fast	:48.60				
8/26/2017	R	8.0	DMR	Dirt	Fast		3	ShrdBelifL -100k	60000	1
8/17/2017	W	5.0	DMR	Dirt	Fast	01:03.4				
8/10/2017	W	4.0	DMR	Turf	Firm	:49.20				
7/30/2017	R	9.0	MTH	Dirt	Fast		3	HsklInvG1 -1000k	10000	6
7/25/2017	W	4.0	DMR	Dirt	Fast	:48.80				
7/20/2017	W	7.0	DMR	Dirt	Fast	01:26.4				
7/14/2017	W	6.0	SA	Dirt	Fast	01:12.4				
7/8/2017	W	5.0	SA	Dirt	Fast	01:00.8				
7/2/2017	W	4.0	SA	Dirt	Fast	:49.60				
6/24/2017	R	8.5	SA	Dirt	Fast		3	AffirmedG3 -100k	60000	1
6/20/2017	W	4.0	SA	Dirt	Fast	:47.60				
6/14/2017	W	6.0	SA	Dirt	Fast	01:11.8				
6/7/2017	W	6.0	SA	Dirt	Fast	01:13.2				
5/31/2017	W	6.0	SA	Dirt	Fast	01:14.8				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
5/25/2017	W	5.0	SA	Dirt	Fast	01:01.8				
5/18/2017	W	4.0	SA	Dirt	Fast	:49.40				
5/6/2017	R	10.0	CD	Dirt	Wet Fast		3	KyDbyG1 -2000k	200000	3
4/28/2017	W	6.0	SA	Dirt	Fast	01:13.4				
4/22/2017	W	5.0	SA	Dirt	Fast	01:00.6				
4/16/2017	W	4.0	SA	Dirt	Fast	:48.40				
4/8/2017	R	9.0	SA	Dirt	Fast		3	SADrbyG1 -1000k	200000	2
4/1/2017	W	6.0	SA	Dirt	Fast	01:11.8				
3/25/2017	W	5.0	SA	Dirt	Fast	:59.80				
3/19/2017	W	4.0	SA	Dirt	Fast	:47.60				
3/9/2017	R	8.5	SA	Dirt	Fast		3	Aoc75000nw1$/3 x-N	33600	1
3/5/2017	W	5.0	SA	Dirt	Fast	01:00.2				
2/27/2017	W	5.0	SA	Dirt	Fast	:59.40				
2/21/2017	W	4.0	SA	Dirt	Fast	:49.80				
2/12/2017	R	7.0	SA	Dirt	Fast		3	SnVcnteG2 -200k	24000	3
2/5/2017	W	5.0	SA	Dirt	Fast	01:04.2				
1/29/2017	W	4.0	SA	Dirt	Fast	:48.60				
1/21/2017	R	6.0	SA	Dirt	Wet Fast		3	Msw	32400	1
1/15/2017	W	6.0	SA	Dirt	Fast	01:13.4				
1/4/2017	W	5.0	SA	Dirt	Fast	01:00.6				
12/26/2016	W	6.0	SA	Dirt	Fast	01:12.4				
12/18/2016	W	5.0	SA	Dirt	Fast	01:00.6				
12/11/2016	W	5.0	SA	Dirt	Fast	:59.60				
12/4/2016	W	4.0	SA	Dirt	Fast	:48.00				
11/26/2016	W	4.0	SA	Dirt	Fast	:48.00				
11/19/2016	W	4.0	SA	Dirt	Fast	:48.60				
10/7/2016	W	5.0	LA	Dirt	Fast	01:01.2				
9/23/2016	W	5.0	LA	Dirt	Fast	:59.60				
9/16/2016	W	5.0	LA	Dirt	Fast	01:00.8				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
9/8/2016	W	4.0	LA	Dirt	Fast	:51.20				
8/26/2016	W	4.0	LA	Dirt	Fast	:49.20				
8/19/2016	W	4.0	LA	Dirt	Fast	:49.20				
8/12/2016	W	3.0	LA	Dirt	Fast	:36.80				
8/5/2016	W	3.0	LA	Dirt	Fast	:38.80				

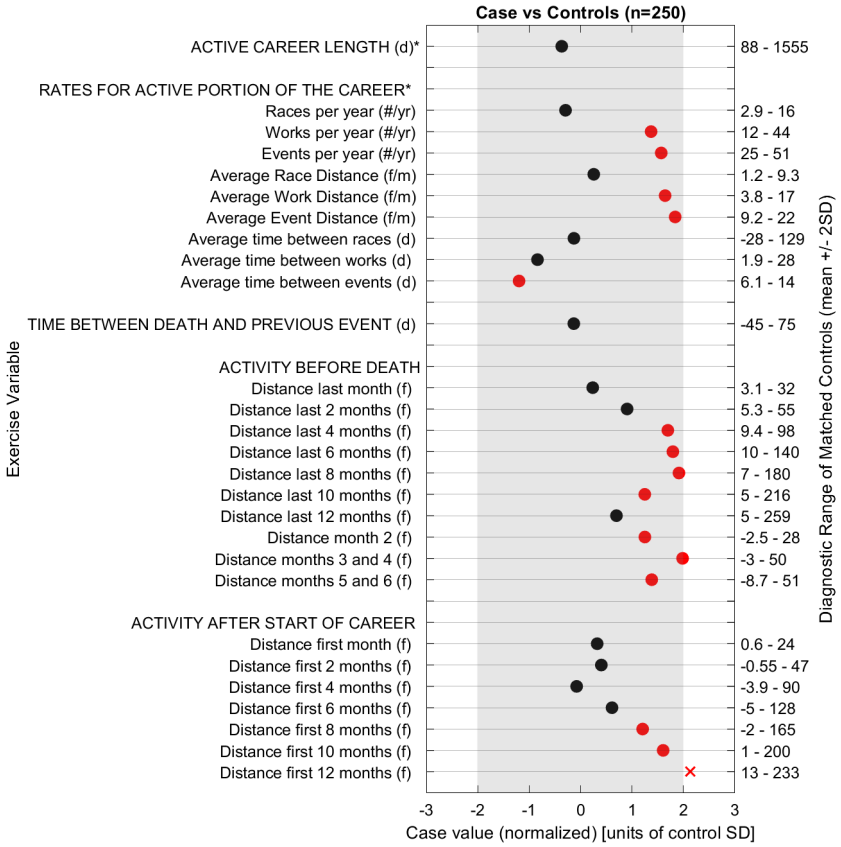
Part 4: Comparison of Exercise Variables between Case Horse and 250 Control Horses (5+ year old, male, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 5+ year old, male, Thoroughbreds (n=250) (gray region) (black and red indicate within 1 and 2 SD, respectively, of mean value of controls), X's indicate values outside of the normal range. Two and 3 year old case horses are also matched to control horses by the quarter in which the case horse died (Jan-Mar, Apr-Jun, Jul-Sep,Oct-Dec). Variables that are not calculable are not plotted (e.g. time between races for a horse with zero events). f=furlongs; yr=year; m=month; d=days.

^Rates are calculated over 2 to 5 events.

*Active Career Length is the career length excluding the time during layups.



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 5+ year old, male, Thoroughbreds (n=250) (gray region) (black and red indicate within 1 and 2 SD, respectively, of mean value of controls), X's indicate values outside of the normal range. Two and 3 year old case horses are also matched to control horses by the quarter in which the case horse died (Jan-Mar, Apr-Jun, Jul-Sep,Oct-Dec). Variables that are not calculable are not plotted (e.g. time between races for a horse with zero events). f=furlongs; yr=year; m=month; d=days.

^Rates are calculated over 2 to 5 events.

*Active Career Length is the career length excluding the time during layups.