www.cahfs.ucdavis.edu

UCDAVIS VETERINARY MEDICINE

105 W. Central Avenue, San Bernardino,
CA 92408-2113
(909) 383-4287

CAHFS Accession #: [redacted]

FINAL REPORT

Ref.#: [redacted]

Coordinator: Monika Samol, DVM, Resident
E-Signed and Authorized by: Samol, Monika on 1/29/2019 10:21:19AM

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: 12/30/2018 **Date Received:** 12/31/2018

Comments: CHRB
NEED [redacted]

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
Report To	UZAL, FRANCISCO	[redacted]	[redacted]	San Bernardino	CA	92408
Report To	ARTHUR, RICK	[redacted]	[redacted]	Sierra Madre	CA	91024
Attending Vet	BROKKEN, TODD	[redacted]	[redacted]	Sierra Madre	CA	91025
Trainer	Todaro/Hollendorfer, George/Jerry	[redacted]	[redacted]	Richmond	CA	94801

CHRB - Related Information

Horse's Name:	[redacted]	Human Injury?	No
Tattoo:	[redacted]	Death Related to:	Race
Age:	4.00 Years	Track Surface:	Dirt
Gender:	Neutered Male	Location on Track:	1/2 MILE POL
Taxonomy:	Thoroughbred Horse	Insured?	N

Medications: Dormosedan (Detomidine); Pentobarbital;

Laboratory Findings/Diagnosis

A 4 year old [redacted] Thoroughbred [redacted] ([redacted]) with history of left front biaxial proximal sesamoid bone fracture with associated suspensory apparatus failure

LEFT FRONT

Catastrophic fetlock failure with:

ACUTE CHANGES
1. Fracture of the proximal sesamoid bones (PSB)
a. medial PSB fracture: articular, complete, transverse, displaced, simple, mid-body
b. lateral PSB fracture: articular, complete, transverse, displaced, simple, apical with abaxial, comminuted component avulsed with lateral branch of suspensory ligament
2. Full thickness, transverse rupture of the palmar annular ligament

3. Full thickness, transverse rupture of palmar annular ligament
4. Full thickness, transverse and longitudinal rupture of the intersesamoidean ligament
5. Marked, transverse incomplete tearing, fraying of fibers and hemorrhage of the superficial digital flexor tendon
6. Severe fraying of fibers, longitudinal splits and hemorrhage of the deep digital flexor tendon
7. Severe fraying of fibers of the lateral and medial short and cruciate ligaments
8. Severe fraying of fibers and incomplete transverse rupture of the lateral and medial collateral ligaments of the proximal sesamoid bones
9. Mild fraying of fibers of the medial and lateral collateral ligaments of fetlock
10. Severe, longitudinal, full-thickness split and fraying of fibers of the distal straight sesamoidean ligament
11. Mild fraying of the lateral and medial oblique distal sesamoidean ligaments
12. Severe fraying of fibers and complete longitudinal split of the lateral branch of the suspensory ligament
13. Severe fraying of fibers, complete transverse rupture and multiple, short incomplete splits of the medial branch of the suspensory ligament
14. Severe scoring of the distal articular surface of MCIII
15. Moderate, focal, triangle-shaped cartilage ulceration of the distal articular surface of MCIII
16. Moderate scoring of the proximal articular surface of P1

CHRONIC CHANGES:
1. Severe palmar osteochondrosis with focal, biaxial, blue subchondral bone discoloration visible through the flattened cartilage of the distal articular surface of MCIII
2. Moderate lipping of the palmar aspect of the proximal articular surface of P1
3. Severe, biaxial, red cartilage discoloration adjacent to the sagittal groove of the proximal surface of P1
4. Severe, very deep erosion of the dorsal articular margin of the proximal articular surface of P1
5. Moderate, longitudinal, blue subchondral bone discoloration visible through the cartilage of the proximal articular surface of the third carpal bone

RIGHT FORELIMB

CHRONIC CHANGES

FETLOCK
Mild to moderate degenerative/osteoarthritic changes
1. Severe palmar osteochondrosis with focal, biaxial, blue subchondral bone discoloration visible through the flattened cartilage of the distal articular surface of MCIII
2. Moderate fibrillation of the transverse ridge on the distal articular surface of MCIII
3. Mild, biaxial, apical, irregular bony outgrowth of the proximal sesamoid bones
4. Moderate scoring lines of the articular surfaces of the proximal sesamoid bones
5. Mild lipping of the dorsal and palmar aspect of the proximal articular surface of P1
6. Mild, biaxial, cartilage ulceration of the dorsal aspect of the proximal articular surface of P1

Other findings
- Moderate, multifocal gastric hyperkeratosis with moderate to severe, multifocal to coalescing, non-glandular gastric ulceration along the margo plicatus (incidental)
- Pulmonary congestion and edema (euthanasia artifact)
- Splenomegaly (euthanasia artifact)

Case Summary

1/10/19: The most important findings in the left forelimb are biaxial fractures of the proximal sesamoid bones. The injuries of the proximal sesamoid bones resulted in loss of support of the fetlock joint of the left forelimb. The aforementioned fractures may be related to the focal region of discoloration and bone porosity/osteopenic focus associated with the fracture surfaces in the medial proximal sesamoid bone. Changes of similar nature could not be localized in proximal sesamoid bones of the contralateral limb.

12/31/18 No significant findings were identified in visceral organs. At the time of necropsy, both front 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

Left foreleg: Biaxial proximal sesamoid bone fractures (medial PSB - midbody; lateral PSB - apical) with associated suspensory apparatus failure.

Gross Observations

Necropsy of a 4 year old, [redacted] Thoroughbred [redacted] ([redacted] with a [redacted] and tattoo [redacted] is commenced at 9:00 am, December 31, 2018. 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 a marked amount of 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 along the margo plicatus is moderately hyperkeratotic with multifocal (app. 1 cm- diameter) to coalescing (app. 3-4 cm x 6-7cm) , deep ulcers. The intestinal tract is unremarkable, and the small colon contains formed feces. Both front limbs are removed at the level of the chestnut for further examination.

CHRB Musculoskeletal

Both front limbs were examined distally from the chestnut. Following changes were seen:

LEFT FRONT

A- CARPUS
1. Moderate periarticular lipping of the distal articular surface of radius
2. Moderate, focal, rounded (ca. 1 cm in diameter) cartilage ulceration on the proximal articular surface of radial carpal bone. The defect is covered by thin layer of pink connective tissue.
3. Mild to moderate, longitudinal cartilage ulceration (along the dorsal articular margin, ca. 4 cm long) on the distal articular surface of radial carpal bone
4. Moderate, longitudinal (along the dorsal articular margin, ca. 3cm), blue subchondral bone discoloration visible through the cartilage of the proximal articular surface of the third carpal bone
5. Moderate periarticular lipping of the bones constituting the proximal and distal carpal rows

B- PROXIMAL SESAMOID BONES
1. Fracture of the proximal sesamoid bones (PSB)
a. medial PSB fracture: articular, complete, transverse, displaced, simple, mid-body
b. lateral PSB fracture: articular, complete, transverse, displaced, simple, apical with abaxial, comminuted component avulsed with lateral branch of suspensory ligament. The avulsed fragment is divided into three, roughly equal fragments.

A region of increased porosity is present at the abaxial aspect of the articular surface on both opposing fracture surfaces of the medial proximal sesamoid bone. The fracture line propagates through subchondral focus of marked dark red/brown discoloration surrounded by highly compacted trabecular bone (sclerosis) and adjacent to the cartilage of the articular surface of medial proximal sesamoid bone. The subchondral bone of the lateral proximal sesamoid bone and the trabecular bone adjacent to the flexor surface appear to be highly compacted (sclerotic) on both opposing surfaces of the fracture.

For better visualization of described fractures, please see attached pictures and drawings.

2. Severe scoring of the articular surfaces of the proximal sesamoid bones

C- SOFT TISSUES
1. Full thickness, transverse rupture of the palmar annular ligament
2. Full thickness, transverse and longitudinal rupture of the intersesamoidean ligament- Y-shaped, propagates in a crescent direction at the level of the fracture lines and continues distally in a longitudinal direction between the PSBs, to merge with a complete tear of the the distal straight sesamoidean ligament
3. Marked, transverse incomplete tearing (medial aspect, ca. 3 cm long), fraying of fibers and hemorrhage of the superficial digital flexor tendon at the level of the proximal sesamoid bones
4. Severe fraying of fibers, longitudinal splits and hemorrhage of the deep digital flexor tendon at the level of the fetlock
5. Severe fraying of fibers of the lateral and medial short and cruciate ligaments
6. Severe fraying of fibers and incomplete transverse rupture of the lateral and medial collateral ligaments of the proximal sesamoid bones
7. Mild fraying of fibers of the medial and lateral collateral ligaments of fetlock

8. Mild fraying of the lateral and medial oblique distal sesamoidean ligaments
9. Severe fraying of fibers and complete transverse rupture of the lateral branch of the suspensory ligament- the transverse rupture is a continuation of the fracture line propagating through the proximal sesamoid bones. Adjacent to the rupture there are multiple, short, incomplete splits. The part of the branch not affected by severe changes is moderately thickened.
10. Severe fraying of fibers, complete longitudinal split of lateral branch of the suspensory ligament progressing for ca. 3 cm proximally from the insertion on the lateral proximal sesamoid bone, then it turns into multiple incomplete splits coursing towards the bifurcation
11. Severe synovial hypertrophy with red discoloration underneath the bases of the proximal sesamoid bones

D- MCIII
1. Severe scoring of the distal articular surface of MCIII
2. Severe palmar osteochondrosis with focal, biaxial, blue subchondral bone discoloration visible through the flattened cartilage of the distal articular surface of MCIII
3. Moderate, focal, triangle-shaped (app. 0.5 cm x 1 cm) cartilage ulceration between the mid sagittal ridge and transverse ridge of the distal articular surface of MCIII
4. Moderate hemorrhage accompanied by soft tissue hypertrophy at the palmar aspect of the supracondylar region of MCIII
5. Moderate hemorrhage and soft tissue erosion with bone exposure at the dorsal aspect of the supracondylar region of MCIII

E- P1
1. Moderate lipping of the palmar aspect of the proximal articular surface of P1
2. Severe, biaxial, red cartilage discoloration adjacent to the sagittal groove of the proximal surface of P1
3. Severe, biaxial, very deep erosion of the dorsal articular margin of the proximal articular surface of P1- there is no cartilage and subchondral bone left, only rough, darkly discolored (greyish) trabecular bone

RIGHT FRONT

A - CARPUS
1. Mild periarticular lipping of the distal articular surface of radius
2. Mild, focal, rounded (ca. 1 cm in diameter) cartilage ulceration on the proximal articular surface of radial carpal bone. Thin layer of pink connective tissue covers the defect.
3. Mild to moderate, longitudinal cartilage ulceration (along the dorsal articular margin, ca. 3-4 cm long) on the distal articular surface of radial carpal bone
4. Mild, subtle, focal, blue subchondral bone discoloration visible through the cartilage of the proximal articular surface of the third carpal bone- located centrally, app. 3 cm in diameter
5. Mild to moderate periarticular lipping of the bones constituting the proximal and distal carpal rows

B- PROXIMAL SESAMOID BONES
1. Moderate scoring lines on articular surface of proximal sesamoid bones
2. Moderate, biaxial, apical, irregular bony outgrowth of the proximal sesamoid bones

C- MCIII
1. Severe palmar osteochondrosis with focal, biaxial, blue subchondral bone discoloration visible through the flattened cartilage of the distal articular surface of MCIII
2. Moderate fibrillation of the transverse ridge on the distal articular surface of MCIII
3. Mild hemorrhage accompanied by soft tissue hypertrophy at the palmar aspect of the supracondylar region of MCIII
4. Mild hemorrhage and soft tissue erosion with bone exposure at the dorsal aspect of the supracondylar region of MCIII

D- SOFT TISSUE
1. Moderate synovial thickening in the fetlock joint

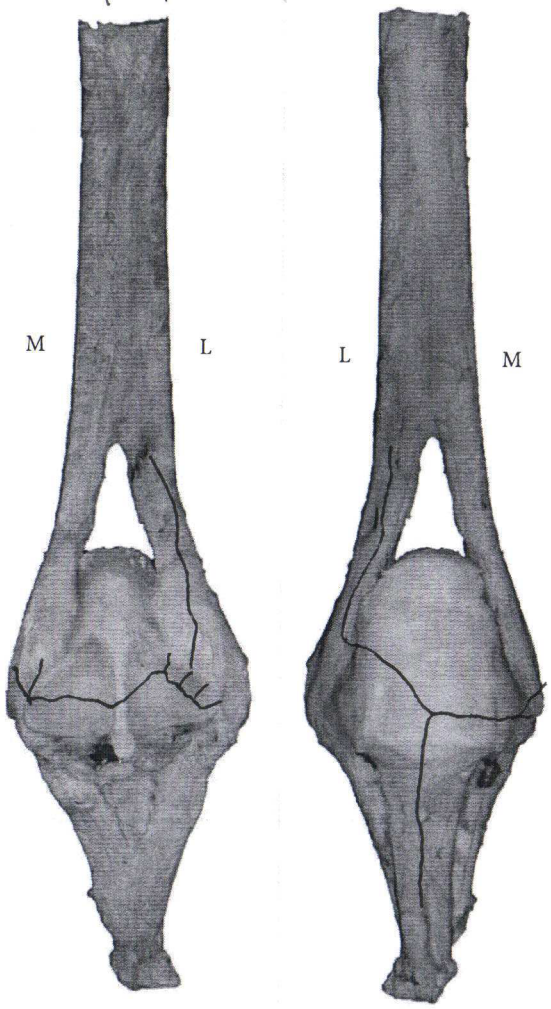
E- P1
1. Mild lipping of the dorsal and palmar aspect of the proximal articular surface of P1
2. Mild, biaxial, cartilage ulceration of the dorsal aspect of the proximal articular surface of P1

No gross lesions/ abnormalities were identified in other bones of both distal front limbs examined from the chestnut to the hoof.

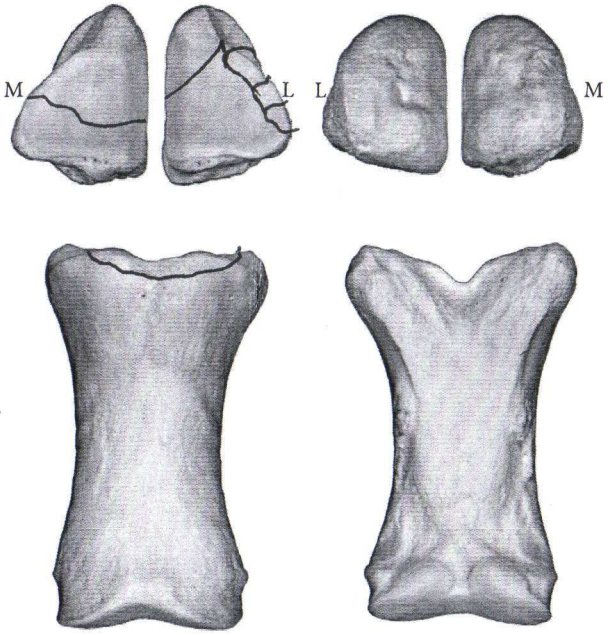
Accession # [redacted]
CC: MAS
Date: 01/09/18

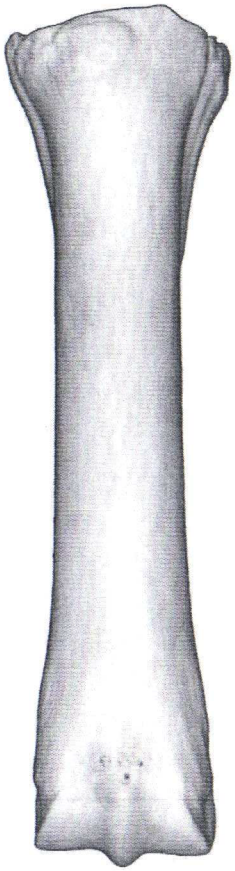
Left Fetlock

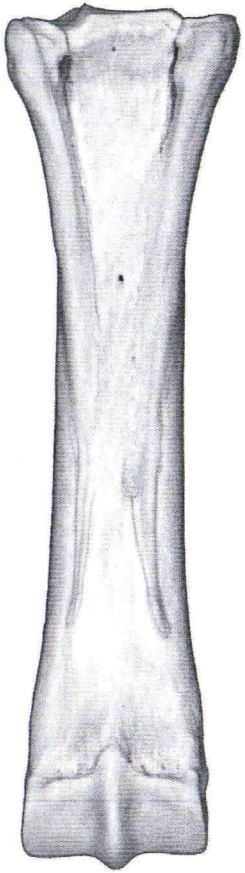
Please circle affected leg
foreleg
hindleg



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: (Yes) No (straight and/or oblique)

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)

Exercise History Report (Full) [redacted]

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

Mar-11-2019

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).

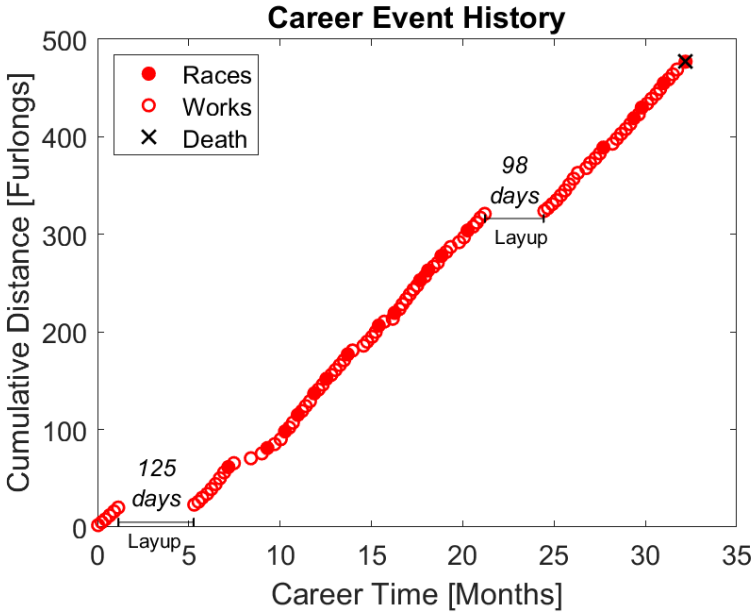
Part 4 is a chart that allows comparison of exercise variables between Case Horse and other racehorses of similar age, sex, and breed that did not die at the same time from an injury. Similar to comparing the results of a blood test to a range of normal values, the values for Case Horse can be assessed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

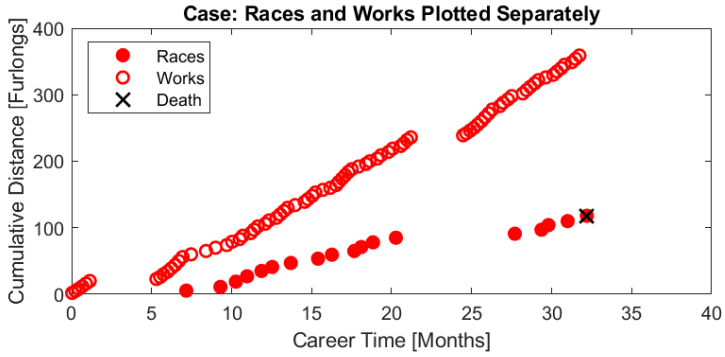
Table of Contents

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

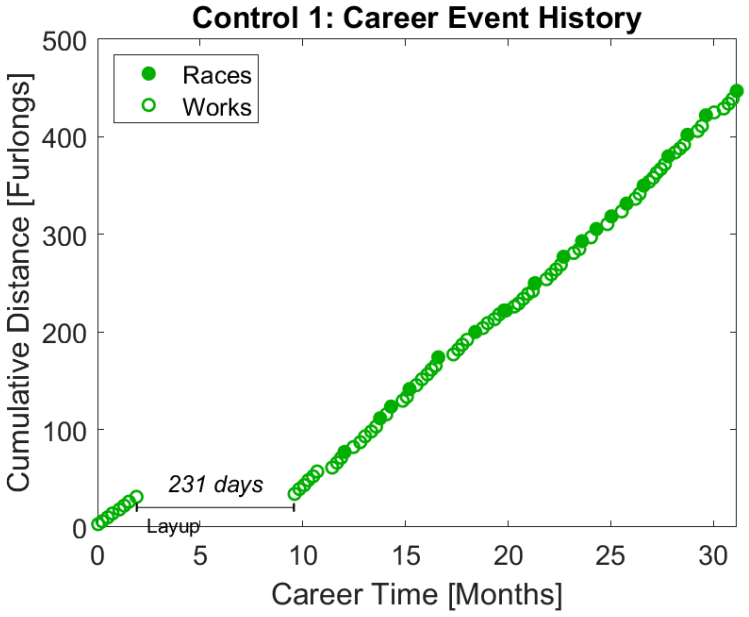
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs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

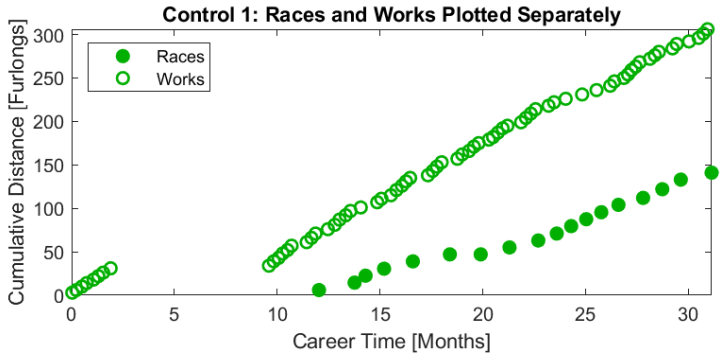
Case Horse High Speed Exercise History



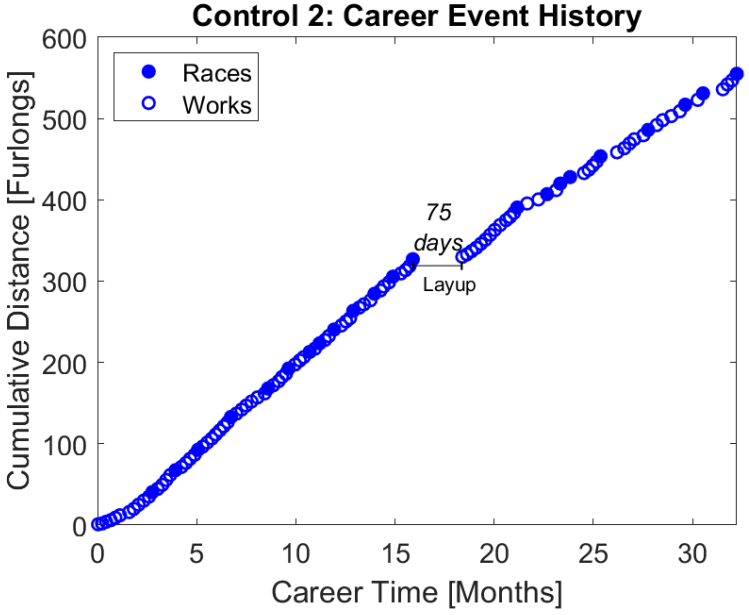


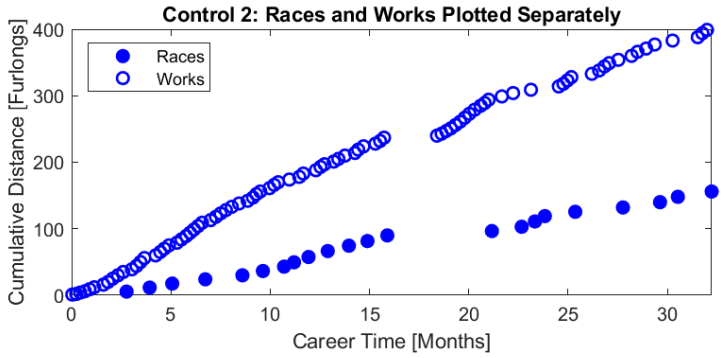
Control 1 High Speed Exercise History



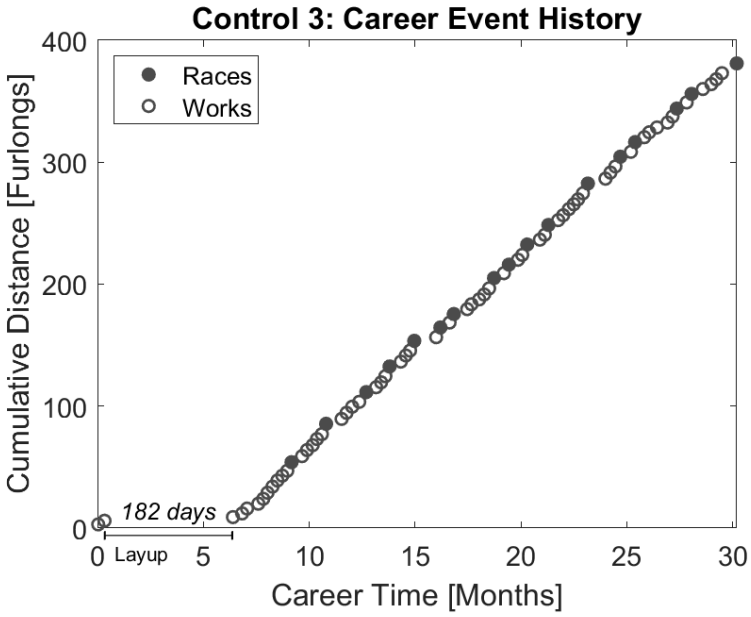


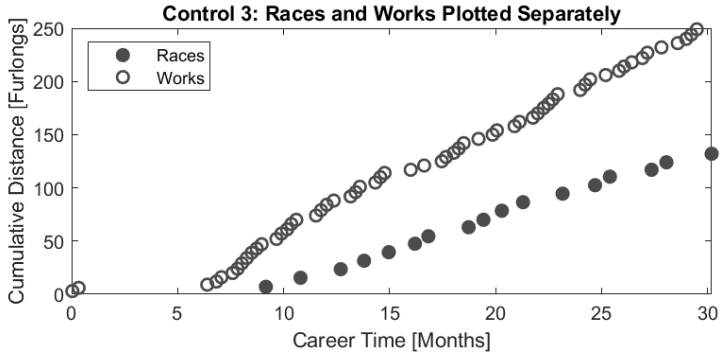
Control 2 High Speed Exercise History



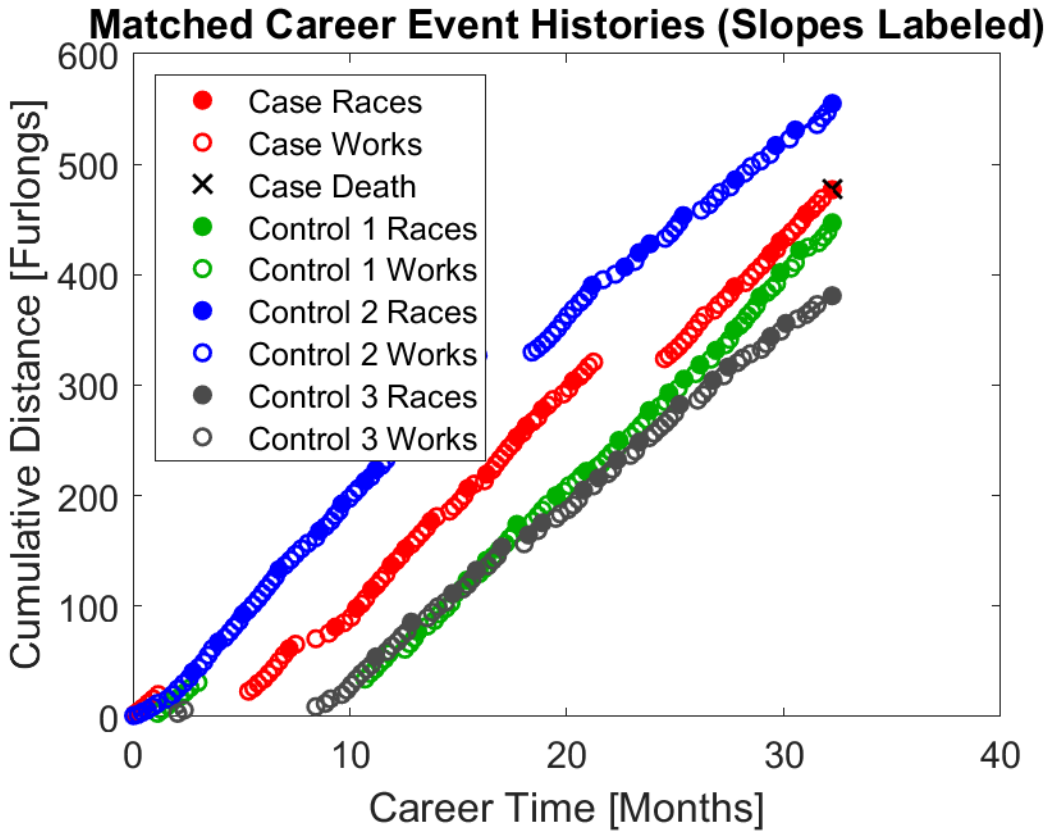


Control 3 High Speed Exercise History

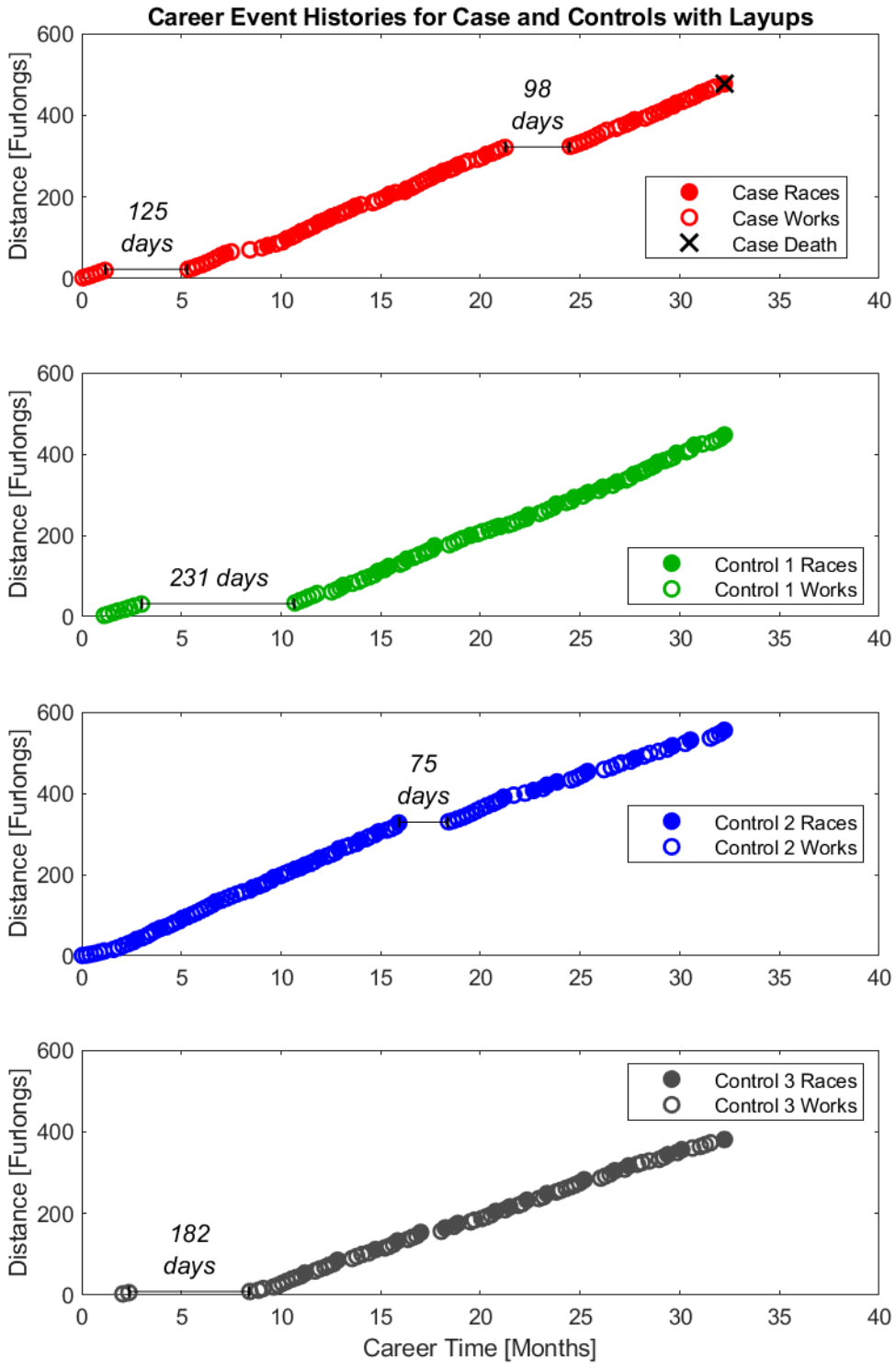


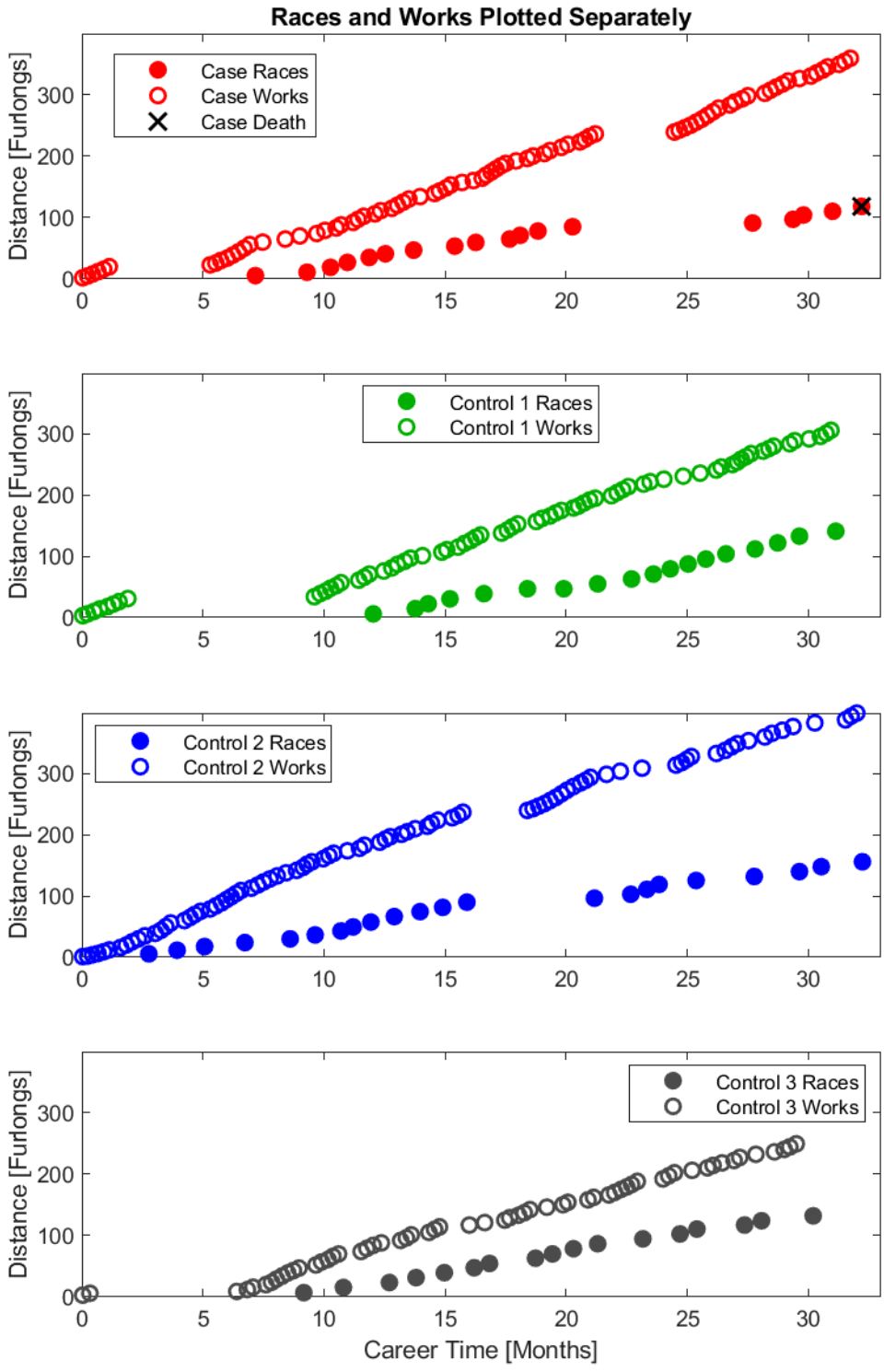


Part 2: Case and Control Horses Plotted Together



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]
600
400
200
0
0
5
10
15
20
25
30
35
40
125
days
98
days
Case Races
Case Works
Case Death
231 days
Control 1 Races
Control 1 Works
75
days
Control 2 Races
Control 2 Works
182
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

Part 3: Case Horse's Event History

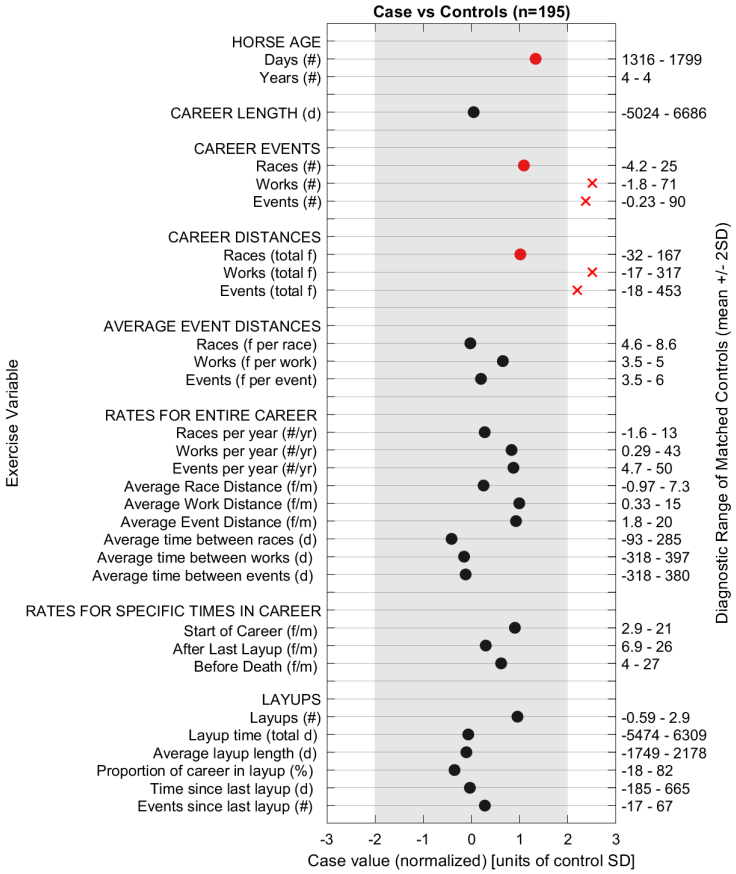
Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
12/30/2018	R	8.0	SA	Dirt	Fast		3U	Clm16000 (16-14)nw3/L	345	8
12/16/2018	W	5.0	SA	Dirt	Fast	01:00.8				
12/9/2018	W	5.0	SA	Dirt	Fast	01:02.2				
12/2/2018	W	4.0	SA	Dirt	Fast	:48.80				
11/24/2018	R	6.0	DMR	Dirt	Fast		3U	Clm16000 (16-14)nw3/L	1200	4
11/18/2018	W	5.0	SA	Dirt	Fast	01:01.0				
11/12/2018	W	5.0	SA	Dirt	Fast	01:02.4				
11/4/2018	W	5.0	SA	Dirt	Fast	01:01.6				
10/28/2018	W	4.0	SA	Dirt	Fast	:50.40				
10/19/2018	R	7.0	SA	Dirt	Fast		3U	Clm12500nw2/ L	10800	1
10/14/2018	W	4.0	SA	Dirt	Fast	:50.40				
10/6/2018	R	6.0	SA	Dirt	Fast		3U	Clm12500nw2/ L	1080	4
9/30/2018	W	5.0	SA	Dirt	Fast	01:01.4				
9/23/2018	W	5.0	SA	Dirt	Fast	01:01.4				
9/15/2018	W	5.0	SA	Dirt	Fast	01:01.0				
9/8/2018	W	5.0	SA	Dirt	Fast	01:00.4				
9/1/2018	W	4.0	DMR	Dirt	Fast	:48.80				
8/17/2018	R	6.0	DMR	Dirt	Fast		3U	Wcl25000 (25-22.5)nw2/ L-N	500	5
8/11/2018	W	5.0	DMR	Dirt	Fast	01:02.8				
8/4/2018	W	5.0	DMR	Dirt	Fast	01:01.0				
7/26/2018	W	5.0	DMR	Dirt	Fast	01:02.0				
7/20/2018	W	5.0	LA	Dirt	Fast	01:00.6				
7/6/2018	W	6.0	LA	Dirt	Fast	01:11.6				
6/29/2018	W	6.0	LA	Dirt	Fast	01:12.8				
6/22/2018	W	6.0	LA	Dirt	Fast	01:13.2				
6/15/2018	W	5.0	LA	Dirt	Fast	:58.40				
6/8/2018	W	5.0	LA	Dirt	Fast	01:00.6				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
6/1/2018	W	4.0	LA	Dirt	Fast	:47.60				
5/25/2018	W	4.0	LA	Dirt	Fast	:49.00				
5/18/2018	W	3.0	LA	Dirt	Fast	:37.20				
5/12/2018	W	3.0	LA	Dirt	Fast	:35.20				
2/3/2018	W	4.0	SA	Dirt	Fast	:52.80				
1/27/2018	W	5.0	SA	Dirt	Fast	01:03.8				
1/21/2018	W	4.0	SA	Dirt	Fast	:48.60				
1/15/2018	W	4.0	SA	Dirt	Fast	:47.60				
1/6/2018	R	7.0	SA	Dirt	Fast		4U	Mcl20000	10800	1
12/31/2017	W	5.0	SA	Dirt	Fast	01:01.8				
12/23/2017	W	5.0	SA	Dirt	Fast	01:00.4				
12/9/2017	W	5.0	SA	Dirt	Fast	01:03.0				
12/2/2017	W	4.0	SA	Dirt	Fast	:48.40				
11/24/2017	R	7.0	DMR	Dirt	Fast		3U	Mcl20000	2040	3
11/18/2017	W	4.0	SA	Dirt	Fast	:48.60				
11/11/2017	W	4.0	SA	Dirt	Fast	:50.40				
11/2/2017	R	6.0	DMR	Dirt	Fast		3U	Mcl20000	2040	3
10/28/2017	W	4.0	SA	Dirt	Fast	:49.40				
10/20/2017	R	5.5	SA	Dirt	Fast		3U	Mcl50000 (50-40)	345	6
10/15/2017	W	4.0	SA	Dirt	Fast	:48.60				
10/9/2017	W	5.0	SA	Dirt	Fast	01:02.4				
10/3/2017	W	5.0	SA	Dirt	Fast	01:02.0				
9/27/2017	W	5.0	SA	Dirt	Fast	01:01.0				
9/21/2017	W	5.0	SA	Dirt	Fast	01:02.0				
9/16/2017	W	4.0	SA	Dirt	Fast	:50.00				
9/8/2017	R	6.0	LRC	Dirt	Fast		3U	Msw	2700	4
9/5/2017	W	3.0	LA	Dirt	Fast	:35.20				
8/22/2017	W	4.0	DMR	Dirt	Fast	:47.60				
8/13/2017	R	6.5	DMR	Dirt	Fast		3U	Msw	1200	5
8/8/2017	W	5.0	DMR	Dirt	Fast	01:00.2				
8/2/2017	W	5.0	DMR	Dirt	Fast	01:01.4				
7/25/2017	W	4.0	DMR	Dirt	Fast	:49.60				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
7/19/2017	W	5.0	DMR	Dirt	Fast	01:02.6				
7/1/2017	W	4.0	SA	Dirt	Fast	:48.80				
6/23/2017	R	6.0	SA	Dirt	Fast		3U	Mcl75000	3960	3
6/17/2017	W	5.0	SA	Dirt	Fast	01:01.4				
6/10/2017	W	5.0	SA	Dirt	Fast	01:02.8				
6/3/2017	W	5.0	SA	Dirt	Fast	01:02.6				
5/27/2017	W	4.0	SA	Dirt	Fast	:47.60				
5/19/2017	R	6.0	SA	Dirt	Fast		3U	Mcl75000	660	5
5/13/2017	W	5.0	SA	Dirt	Fast	01:01.2				
5/6/2017	W	4.0	SA	Dirt	Fast	:49.60				
4/29/2017	R	8.0	SA	Dirt	Fast		3U	Msw	345	9
4/22/2017	W	5.0	SA	Dirt	Fast	01:00.2				
4/15/2017	W	5.0	SA	Dirt	Fast	01:01.4				
4/9/2017	W	4.0	SA	Dirt	Fast	:48.80				
4/2/2017	R	8.0	SA	Dirt	Fast		3	Msw	345	6
3/25/2017	W	5.0	SA	Dirt	Fast	01:01.4				
3/19/2017	W	4.0	SA	Dirt	Fast	:50.40				
3/12/2017	R	8.0	SA	Turf	Firm		3	Msw	3240	4
3/5/2017	W	5.0	SA	Dirt	Fast	01:01.6				
2/23/2017	W	4.0	SA	Dirt	Fast	:48.60				
2/11/2017	R	5.5	SA	Dirt	Wet Fast		3	Msw	6480	3
2/2/2017	W	5.0	SA	Dirt	Fast	01:02.0				
1/15/2017	W	5.0	SA	Dirt	Fast	01:00.8				
12/18/2016	W	4.0	SA	Dirt	Fast	:51.00				
12/9/2016	R	5.5	LRC	Dirt	Fast		2	Msw	5400	3
12/2/2016	W	6.0	LA	Dirt	Fast	01:13.6				
11/25/2016	W	6.0	LA	Dirt	Fast	01:14.4				
11/18/2016	W	5.0	LA	Dirt	Fast	01:00.0				
11/11/2016	W	5.0	LA	Dirt	Fast	01:05.4				
11/4/2016	W	4.0	LA	Dirt	Fast	:48.40				
10/27/2016	W	4.0	LA	Dirt	Fast	:48.20				
10/21/2016	W	3.0	LA	Dirt	Fast	:37.60				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
10/14/2016	W	3.0	LA	Dirt	Fast	:36.60				
6/11/2016	W	4.0	SA	Dirt	Fast	:47.00				
6/4/2016	W	4.0	SA	Dirt	Fast	:48.00				
5/28/2016	W	4.0	SA	Dirt	Fast	:48.80				
5/21/2016	W	3.0	SA	Dirt	Fast	:36.60				
5/15/2016	W	3.0	SA	Dirt	Fast	:35.00				
5/9/2016	W	2.0	SA	Dirt	Fast	:23.80				

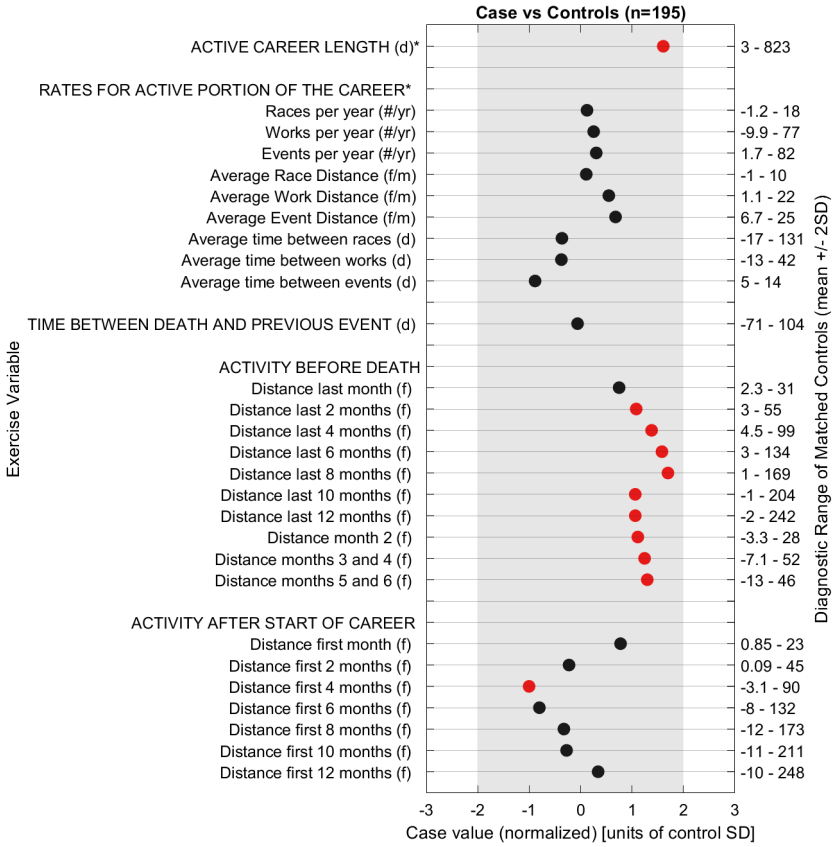
Part 4: Comparison of Exercise Variables between Case Horse and 195 Control Horses (4 year old, male, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 4 year old, male, Thoroughbreds (n=195) (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 4 year old, male, Thoroughbreds (n=195) (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.