

VETERINARY MEDICAL DIAGNOSTIC PROGRAM

JANUARY 1, 2015 TO DECEMBER 31, 2015



Supported by the
Oklahoma Horse Racing Commission



Oklahoma-Breeding Development Program



Conducted by the
Oklahoma Animal Disease Diagnostic Laboratory
Center for Veterinary Health Sciences
Stillwater, OK
May 4, 2016



CENTER FOR VETERINARY HEALTH SCIENCES
Healthy Animals — Healthy People

Veterinary Medical Diagnostic Program

Supported by: **The Oklahoma Horse Racing Commission (OHRC)**

Conducted by: **The Oklahoma Animal Disease Diagnostic Laboratory (OADDL)**
Center for Veterinary Health Sciences
Oklahoma State University

Reporting Period: **January 1, 2015 through December 31, 2015**

Introduction

This report summarizes the case submissions and diagnostic findings of the Veterinary Medical Diagnostic Program for the period starting January 1, 2015 and ending December 31, 2015.

The Veterinary Medical Diagnostic Program, initiated in 1997, serves to: 1) investigate and document the types of injuries sustained by horses involved in horse racing and in race training related activities on racetracks that fall under OHRC jurisdiction; 2) monitor this population of migrating horses for the presence of any epizootic disease(s) that may pose a threat to Oklahoma's horse industry; and 3) evaluate the overall effects of all other aspects (including diet and stress) of racing and race training on the health and well-being of Oklahoma's racehorses. This program is the result of an alliance formed between the Oklahoma Horse Racing Commission (OHRC) and the Oklahoma Animal Disease Diagnostic Laboratory (OADDL).

OADDL receives the remains of all horses that die or must be humanely euthanized at any of the Oklahoma racetracks under jurisdiction of the OHRC for comprehensive necropsy evaluation. Results of necropsy examination are reported to the OHRC office in Oklahoma City with a copy sent to the Official OHRC Veterinarian at the submitting racetrack. The necropsy examination includes: 1) a complete necropsy and gross examination of the carcass including microscopic examination of tissues (histopathology) if necessary; 2) a thorough examination of all injuries, including an analysis of pre-existing conditions that may relate to the occurrence of the injury; 3) microbiology testing in cases where infectious diseases are suspect; and 4) toxicology testing as dictated by the OHRC.

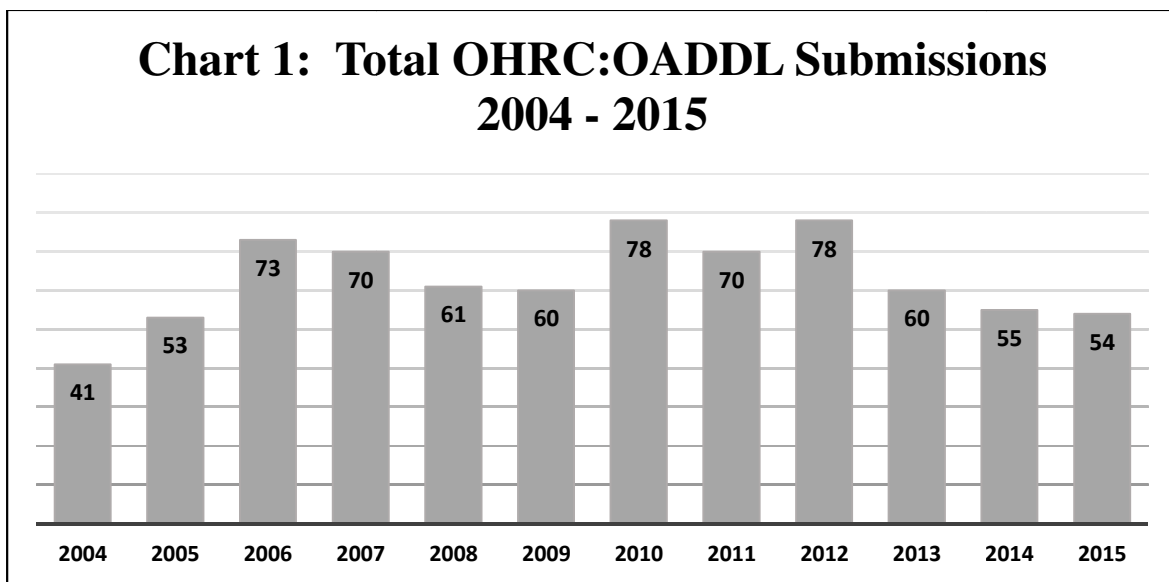
For the calendar year 2015, a total of fifty-four (54) horses were submitted to OADDL under the Veterinary Medical Diagnostic Program. Eight (8) animals died and forty-six (46) animals were humanely euthanized, see Table 1 (next page). A summary of OADDL's necropsy findings follow. For the remainder of this report individual tracks are identified by initials: Remington Park (RP), Fair Meadows Tulsa (FMT) and Will Rogers Downs (WRD). Individual necropsy reports have all been previously submitted to the commission.

Table 1: Total Equine Mortality – 2015

	RP	FMT	WRD	TOTAL
DIED	6	1	1	8
EUTHANIZED	29	9	8	46
TOTAL	35	10	9	54

Submissions:

The total number of horses from Oklahoma racetracks submitted to OADDL from 2004-2015 is presented in Chart 1 below. The total number of submissions went down one horse over-all with reduction in submissions from RP and WRD and increase at FMT in 2015.



Monthly Distribution of Submission:

Table 2 (below) represents the distribution of submissions from each racetrack, sorted by month. The monthly fluctuation of cases most likely coincides with the number of racing days and training activity. During 2015 the peak months for submission were March and October with similar numbers submitted in May.

Table 2: Monthly Distribution of Necropsy Submissions for 2015

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
RP	0	1	7	5	6	0	0	4	3	3	5	1	35
FMT	0	0	0	0	0	6	4	0	0	0	0	0	10
WRD	0	0	1	1	1	0	0	0	1	5	0	0	9
Total	0	1	8	6	7	6	4	4	4	8	5	1	54

Table 3 (below) shows the monthly submissions by horse breed. During this reporting period, Quarter Horse (QH) and Thoroughbred (TB) submissions accounted for 91% (49/54) of the animals submitted. Peak submission months were noted in Sprint Breeds in March, May and October. The fall sprint breed peak was a new finding in 2015. There was a submission peak for Thoroughbred (TB) animals in November, however the peak number was 5 and reduced from 7 (September) in 2014.

Table 3: Monthly Distribution of Necropsy Submissions by Breed for 2015

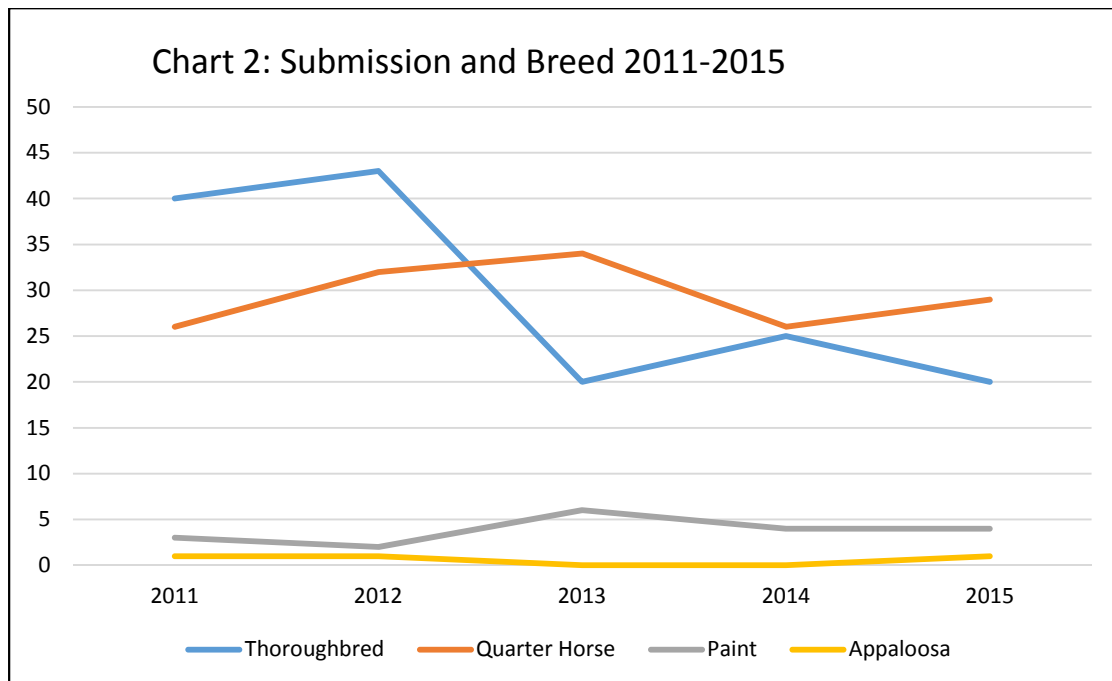
Breed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
TB	0	0	1	1	1	1	1	4	2	3	5	1	20
QH	0	1	7	3	6	4	2	0	1	5	0	0	29
Paint	0	0	0	2	0	1	0	0	1	0	0	0	4
Appaloosa	0	0	0	0	0	0	1	0	0	0	0	0	1
Total	0	1	8	6	7	6	4	4	4	8	5	1	54

Gender and Breed of Horse:

Table 4: Submission by Breed 2015

	Number of Horses
Thoroughbred	20
Quarter Horse	29
Paint	4
Appaloosa	1
Total	54

The Breed distribution of necropsy case submissions to OADDL for 2015 is presented in Table 4 to the left. Quarter Horse submissions were 9 more than for Thoroughbred breed, with four Paints and one Appaloosa submitted. Chart 2 (below) displays submission number and breed for the previous 5-years.

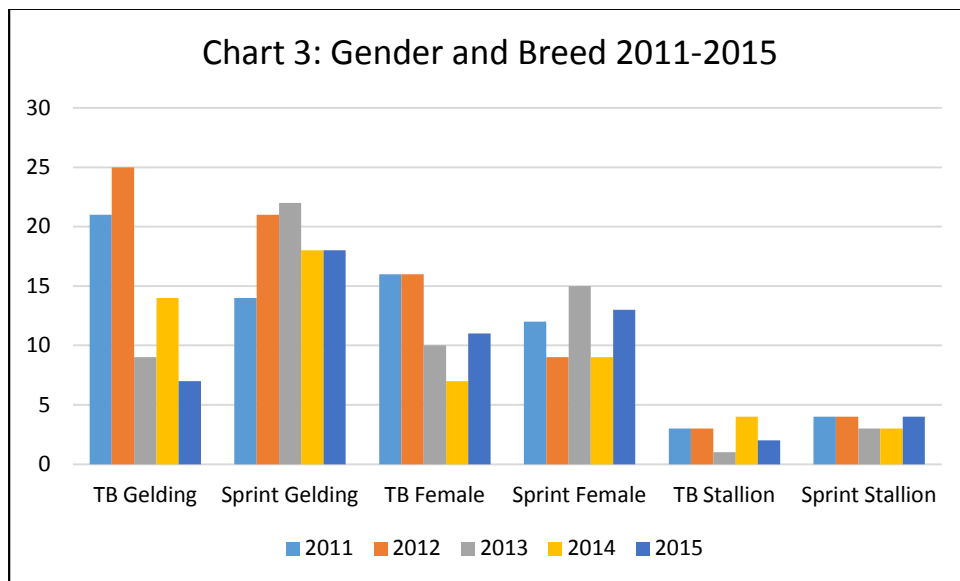


Gender submissions are presented in Table 5 (below) and geldings (neutered males) again predominate at 46% (25/54). Gelding submissions were higher for Quarter Horse, Paint and Appaloosa, however female submissions were higher in Thoroughbred breed. Female submissions increased for all breeds to 23 in 2015, up from just 16 in 2014.

Table 5: Gender and Breed of Submissions 2015

		RP	FMT	WRD	TOTAL
Male	Thoroughbred	2	0	0	2
	Quarter Horse	1	2	1	4
Female	Thoroughbred	9	0	2	11
	Quarter Horse	7	0	3	10
	Paint	1	0	0	1
	Appaloosa	0	1	0	1
Gelding	Thoroughbred	4	2	1	7
	Quarter Horse	9	4	2	15
	Paint	2	1	0	3
Total		35	10	9	54

Chart 3 (below) shows the 5-year trend in submissions by gender and breed. Thoroughbred (TB) is compared to “sprint” breeds (SB) defined as Quarter Horse, Paint and Appaloosa cases combined. This chart reveals an increase in female submission for all breeds and decrease in Thoroughbred gelding submissions in 2015. In addition, along with Chart 2 (previous page) there is a trend toward lower numbers of Thoroughbred breed submissions over time.



The distribution of racehorse submissions arranged by age, breed and track during 2015 is shown in Table 6 (below). Our Oklahoma data continues to report the highest age for submission to be 2-year old animals and “sprint” breeds accounted for 80% (20/25) of the two year old animals. The 10 year old and 20 year animals submitted (*) were both in use as pony horses, and not entered in race competition. In 2015, the number of 2 year old submissions increased, 3 year olds decreased and other age groups remained somewhat constant.

Table 6: Age of Horse and Breed 2015.

		RP	FMT	WRD	Total
Two year old					
	Thoroughbred	5	0	0	5
	Quarter Horse	11	3	5	19
	Paint	1	0	0	1
Three year old					
	Thoroughbred	1	1	0	2
	Quarter Horse	1	2	1	4
	Paint	1	0	0	1
Four year old					
	Thoroughbred	4	0	1	5
	Quarter Horse	2	0	0	2
Five year old					
	Thoroughbred	3	0	2	5
	Quarter Horse	1	1	0	2
Six year old					
	Thoroughbred	2	1	0	3
	Paint	0	1	0	1
	Appaloosa	0	1	0	1
Seven year old					
	Quarter Horse	1	0	0	1
Ten year old					
	Paint Pony Horse	1*	0	0	1
Twenty year old					
	Quarter Horse Pony Horse	1*	0	0	1
Total		35	10	9	54

Fatal Event by Age (in years):

Table 7: Fatal Event by Age (years) 2015

Age	Racing	Training	Non-exercise	Total
2	14	7	4	25
3	5	1	1	7
4	3	1	3	7
5	6	0	1	7
6	4	0	1	5
7	0	1	0	1
10	0	0	1	1
20	0	0	1	1
Total	32	10	12	54

This section describes the fatal event (determined by OHRC history and OADDL necropsy) as compared to age of the horse. The categories included are animals injured during racing, routine training, accidents and those dying of non-exercise or “natural” disease conditions (combined). This data is presented for 2015 in Table 7 to the left. Slightly less than one-half (44%) of the two-year-old fatalities were associated with training or non-

exercise/accidents. Racing fatality rates for 2-year old sprint breed horses were also below 1 per 1000 starters at all three Oklahoma tracks (RP=0.69, FMT=0.46, WRD=0.38) in 2015. State-wide, a majority 59% (32/54), of fatalities were submitted from race day or race-related conditions. Lower numbers of training fatalities in Oklahoma reflect the large number of animals that train off-site of OHRC facilities. In 2015 compared to 2014: race day cases were decreased by 8, training cases increased by 2, and non-exercise cases increased by 5.

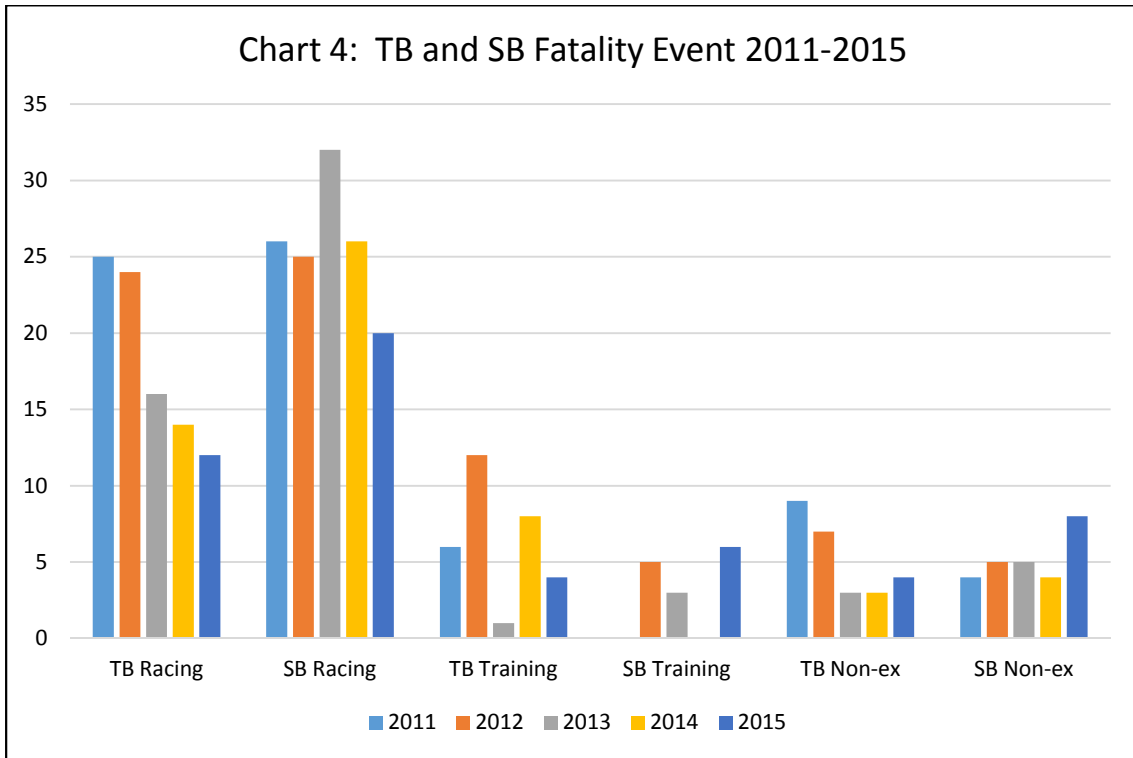
Fatal Event by Breed:

Fatal event categories by breed during 2015 is presented in Table 8 (below). All breeds reported highest fatalities for racing, but this may represent a bias in the current necropsy program. Race day mortality remains the primary submission to the OADDL:OHRC necropsy program, 32/54 (59%) of submissions. More than half of the submissions for Thoroughbred, Quarter Horse and Paint breeds were associated with race day conditions.

Table 8: Fatal Event by Breed 2015:

Breed	Racing	Training	Non-exercise	Total
Thoroughbred	12	4	4	20
Quarter Horse	17	6	6	29
Paint	3	0	1	4
Appaloosa	0	0	1	1
Total	32	10	12	54

A 5-year summary Chart 4 is included below and depicts consistent reduction in race day fatality for “sprint” breeds (SB) over 3 years and Thoroughbreds (TB) over 5 years. Management changes implemented since 2013 include: pre-race Veterinary inspection, banning front toe grabs on Thoroughbreds and renovation of track surfaces at RP and FMT. Increases in SB training and non-exercise (Non-ex) submissions were noted in 2015.



Complete tabulation of category of death and breed by Track is presented in Table 9 on the next page:

Table 9: Fatal event by breed and track 2015.

		RP	FMT	WRD	Total
RACE DAY					
	Thoroughbred	8	2	2	12
	Quarter Horse	7	5	5	17
	Paint	2	1	0	3
	Before Race				
	Thoroughbred	1	0	1	2
(after finish or)	During Race				
	Thoroughbred	5	2	1	8
	Quarter Horse	7	5	3	15
	Paint	2	1	0	3
	Finished Race				
	Thoroughbred	2	0	0	2
	Quarter Horse	0	0	2	2
TRAINING					
	Thoroughbred	3	0	1	4
	Quarter Horse	4	1	1	6
Non-Exercise					
	Thoroughbred	4	0	0	4
	Quarter Horse	6	0	0	6
	Paint	1	0	0	1
	Appaloosa	0	1	0	1
TOTAL		35	10	9	54

All of race day deaths in 2015 were at or around time of race. Two Thoroughbred animals were euthanized prior to the race due to cranial trauma and pelvic fracture; one occurred in the Paddock and one at the Starting Gate. Four animals died or were euthanized following a race; one was a vertebral injury, one a forelimb injury, and two were cases of acute collapse (one EIPH and one internal hemorrhage). Training fatality cases increased to 10 in 2015 from 8 in 2014 and non-exercise fatalities almost doubled from 7 to 12 in 2015. The non-exercise cases will be more completely described later in this report.

GOAL 1: INVESTIGATE AND DOCUMENT TYPES OF INJURIES:

Distribution of Fatal Activity and Track:

Table 10: Fatal Activity by Track - 2015

TRACK	Racing	Training	Non-exercise	Total
RP	17	7	11	35
FMT	8	1	1	10
WRD	7	2	0	9
Total	32	10	12	54

Table 10 (previous page) reports a summary of activity for case fatalities for each of the three submitting tracks. Table 11, below, further separates the total fatalities in a different manner based on final necropsy analysis. Cause of death is divided into categories of natural disease states (non-exercise related and accidents), cases of exercise induced pulmonary hemorrhage (EIPH) and finally conditions involving musculoskeletal injury.

Table 11: Cause of Death by Track - 2015

	RP	FMT	WRD	Total
Natural Disease/Non-Exercise/Accident	11	1	0	12
EIPH (bleeder on RACE DAY)	1	0	0	1
Musculoskeletal Injury	23	9	9	41
Racing:	16	8	7	31
Training:	7	1	2	10
Total	35	10	9	54

In 2015, 76% (41/54) of the submissions were related to musculoskeletal system injury sustained during racing or training. Racing and training musculoskeletal injuries decreased at RP and increased at FMT and WRD in 2015.

Exercise Induced Pulmonary Hemorrhage:

Exercise induced pulmonary hemorrhage (EIPH) has been reported since early history in the horse and research efforts remain directed at the underlying pathophysiology, treatment and management of this condition. The condition is typically not reported as an “injury” in most jurisdictions since the majority of these cases are not fatal. Identification systems for “bleeders” are in place in Oklahoma. During 2015 there was only one submission where EIPH was confirmed as the cause of death on race day. The case was a 6 year old Thoroughbred gelding running in a 6-furlong Claiming Race at RP in October.

Musculoskeletal Injury:

As seen in Table 11, the majority of the total fatalities were related to musculoskeletal disorders, essentially unchanged from 2003. Table 12 (next page) displays the distribution of limb injuries sustained by animals during racing or training, pre-race injuries but excludes EIPH horses and accidents which involved the skeleton. This data is also segregated by breed, track and limb in 2015. Forelimb injuries were nearly equally distributed between right and left in 2015. Bilateral forelimb injury increased by one case to 5 in 2015, and all were in Quarter Horses. Injuries to hind limbs were 3 in 2015, the same as in 2014, however all were in right hind. Injuries to locations other than the limbs increased to 8 in 2015, from 6 in 2014

Table 12: Limb injury by breed and racing/training 2015.

		RP		FMT		WRD		TOTAL		Sum
		Race	Train	Race	Train	Race	Train	Race	Train	
Right Front										12
	TB	4	1	0	0	0	0	4	1	5
	QH	3	0	2	0	0	1	5	1	6
	Paint	1	0	0	0	0	0	1	0	1
Left Front										13
	TB	1	2	2	0	0	1	3	3	6
	QH	1	1	1	1	3	0	5	2	7
Bilateral Front										5
	QH	2	1	1	0	1	0	4	1	5
Right Hind										3
	TB	0	0	0	0	1	0	1	0	1
	Paint	1	0	1	0	0	0	2	0	2
Other										8
	TB	2	0	0	0	2	0	4	0	4
	QH	1	2	1	0	0	0	2	2	4
TOTAL		16	7	8	1	7	2	31	10	41

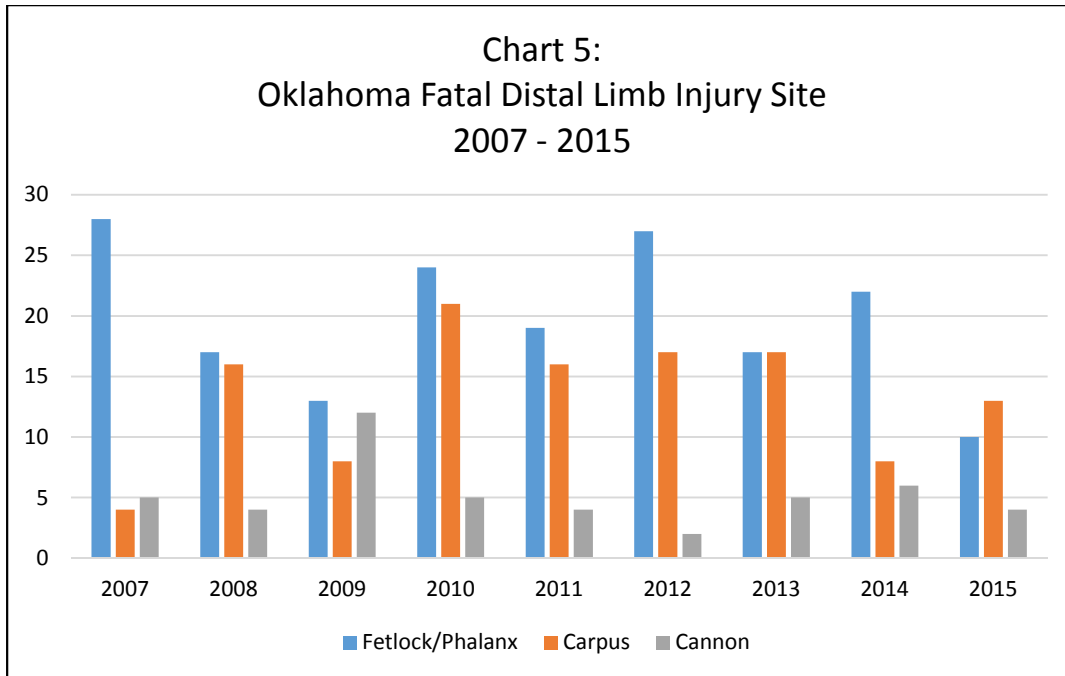
Musculoskeletal Disorder – All Racing or Training Injuries:

The complete reporting of injury site is included in Table 13 (next page). Breed is distributed by Thoroughbred (TB) and Sprint breeds (Quarter Horse, Paint, Appaloosa) designated “SB.” Surveys and research in other racing jurisdictions have reported increased injury to the front limbs and identified injuries to the distal limbs (distal to the carpus) as the most common injury in the racing equine athlete. This table includes race and training injuries, pre-race injury and EIPH but excludes accidents involving the limbs. The EIPH case in 2015 did not sustain musculoskeletal injury. Multiple injury sites were noted at necropsy in some carpal and fetlock cases; where the primary bone fracture was not definitively identified.

Table 13: All Fatal Injuries during Racing or Training & Track 2015

Injury	RP		FMT		WRD		Total		Sum
	TB	SB	TB	SB	TB	SB	TB	SB	
Carpal Fracture:	3	5	0	1	0	4	3	10	13
Fetlock Failure:	2	2	2	2	1	0	5	4	9
Front:	2	2	2	1	1	0			
Hind:	0	0	0	1	0	0			
Cannon (Metacarpus):	0	2	0	1	1	0	1	3	4
Front (MCIII):	0	2	0	1	0	0			
Hind (MTIII):	0	0	0	0	1	0			
Vertebrae (T(1)L S(3)):	0	2	0	1	0	1	0	4	4
Scapula:	0	0	0	2	0	1	0	3	3
Humerus:	2	0	0	0	0	0	2	0	2
Iliac Artery Rupture:	1	1	0	0	0	0	1	1	2
First phalanx (P1 front):	1	0	0	0	0	0	1	0	1
Pelvis (Ilium):	1	0	0	0	0	0	1	0	1
Flexor Tendon Laceration:	0	1	0	0	0	0	0	1	1
Skull:	0	0	0	0	1	0	1	0	1
E.I.P.H.	1	0	0	0	0	0	1	0	1
Total	11	13	2	7	3	6	16	26	42

Distal forelimb injuries accounted for 64% (27/42) of total fatal musculoskeletal injuries in 2014. A change in 2015 was an increase in carpal joint injury cases, which outnumbered fetlock/phalanx joint injuries. Distal limb injury location for the OHRC:OADDL program is presented in Chart 5 (next page) for 2007-2015. Fractures of cannon bones and skull were reduced in 2015 from 2014; while fractures of scapula and humerus increased by 1 animal in 2015. The number of vertebral fractures identified stayed constant at four cases and all were sprint breeds in 2015; however one of these was thoracic location not lumbo-sacral.



Continued monitoring of limb injuries is important for Commission Veterinarians, Track Veterinarians, Track Management and Track Superintendent to improve and ensure a safe racing environment. The increased occurrence of carpal joint injuries in 2015 could be utilized for the remainder of 2016 race meets.

GOAL 2: MONITOR FOR EPIZOOTIC DISEASE:

In Table 11 from page 9, there were 12/54 (22%) of submitted fatal cases reported due to non-exercise related activities, natural diseases and accidents. This type of fatal submission nearly doubled in 2015, up from only 7 submissions in 2014. These animals include cases with potential infectious or communicable disease important to all animals competing, training or residing in the racetrack environment. Table 14 (next page) documents these cases based on final necropsy analysis at OADDL.

Table 14: Non-Exercise, Natural Disease, Accident -2015

	Track	Signalment	Description	
Accidents:				
	RP	5Y;QH;Geld.	Electrocution; stray voltage-horse walker	Died
	RP	2Y;TB;Male	Down under partition of van; vertebral fracture	Euth.
Intestinal:				
	RP	4Y;QH;Geld.	Small intestine torsion	Died
	RP	20Y;QH;Geld.	Right colon displacement; endotoxemia	Euth.
	RP	3Y;QH;Geld.	Gastric rupture and peritonitis	Died
	RP	2Y;QH;Female	Persistent colic & reflux; severe gastric ulceration	Euth.
Respiratory:				
	RP	4Y;TB;Female	Chronic abscess, pharynx/larynx; fistulous tracts	Euth.
	RP	2Y;TB;Female	Chronic pleuropneumonia; <i>Klebsiella pneumonia</i>	Euth.
Musculoskeletal:				
	RP	2Y;QH;Female	Clinical signs & histopathology - wobbler	Euth.
	FMT	6Y;AP;Female	Malignant Edema, neck; <i>Clostridium novyi</i>	Died
	RP	10Y;PT;Geld.	Found in stall; fracture of tibia	Euth.
	RP	4Y;TB;Female	Found in stall; skull fracture	Euth.

In 2015 one non-exercise submission came from FMT, while the other 11 were from RP. Six were Quarter Horses, four were Thoroughbreds and one Paint and Appaloosa were submitted. Five were geldings, six were female and one was an intact male stallion. Four of these cases involved the gastrointestinal system and specific findings are summarized in the table. Intestinal disorders or colic symptoms are a common disorder affecting many equine populations. No cases of diarrhea were submitted in 2015, and no *Salmonella sp* were isolated. Four of the cases were musculoskeletal system injury. Two were animals found in their stall with fractures and the reports were forwarded to OHRC. One animal had clinical signs suggestive of cervical vertebral disease and necropsy confirmed histologic evidence of spinal cord compression. The final musculoskeletal case was one of malignant edema affecting the neck/pectoral muscles. *Clostridium novyi* bacteria were identified. This disease is seen in horses, most commonly secondary to penetrating wounds. Only two cases associated with respiratory system disease were received in 2015. One was a very chronic upper respiratory disease case and the other a chronic pleuritis case. An alpha-*Streptococcus* (not Strangles) bacteria was isolated from the former and classic *Klebsiella pneumonia* bacteria from the latter case. Screening representative cases for Equine Herpes Virus-1 (EHM), West Nile Virus and Eastern Equine Encephalitis were all negative in 2015. Two accident cases submitted were a stray-voltage electrocution of a 5 year old Quarter Horse and Van/Trailer accident of a 2 year old Thoroughbred.

The disease surveillance emphasis for the cooperative OADDL:OHRC program is vital to the Oklahoma racing industry. Monitoring for potential infectious diseases will continue in 2016 submissions.

Drug Testing (TOXICOLOGY):

Since the initiation of the cooperative OADDL:OHRC Diagnostic Program, some toxicology analysis has been performed, at the request of the OHRC. Samples including urine, eye fluid and synovial fluid are harvested and retained according to OADDL policy, and toxicology remains available on all cases at the request of OHRC.

Supplemental toxicology was performed on two animals in 2015. A 2 year old Quarter horse filly had eye fluid that was suspicious for Clenbuterol, Dexamethasone and Phenylbutazone and a 5 year old Thoroughbred filly with synovial fluid analysis revealing: Phenylbutazone <1µg/mL; Clenbuterol<5pg/mL; Methocarbamol≈0.3ng/mL and Dexamethasone≈72pg/mL. Both cases forwarded were from Remington Park. Results were reported to the OHRC for interpretation.

GOAL 3: OVERALL RACEHORSE HEALTH:

The overall health and well-being of the Oklahoma racehorse population remains a stated goal of the joint OADDL:OHRC Program. Of particular interest is the hoof anatomy/morphology/angle and shoeing characteristics of the equine population. This examination is attempted on all submissions, including non-exercise related deaths and pony horse animals. Table 15 (next page) displays the hoof/shoeing data compiled during the 2015 time period. The abnormalities are quantitated for 2015 and also reported by breed (rather than track).

Hoof Anatomy/Shoe Characteristics:

Table 15: Hoof Anatomy and Horse Shoe Characteristics - 2015

		TB	SB	TOTAL
Toe Grabs:				
	Front=None	14	3	17
	Front < 5mm	6	20	26
	Front > 5mm	0	11	11
	Hind < 5mm	1	3	4
	Hind > 5mm	7	20	27
Hind Shoes Not Examined:		11	11	22
Barefooted Hind:		0	1	1
Toe/Heel Length	Normal	7	11	18
Long toe/low heel	Mild	7	11	18
	Moderate	4	9	13
	Marked	1	2	3
	Not reported	1	1	2
Under-run heels	Normal	10	14	24
	Mild	4	9	13
	Moderate	3	9	12
	Marked	2	0	2
	Not reported	1	2	3
Over-grown/need re-set		1	5	6
Abnormal Growth/Symmetry/Imbalance		0	5	5
Squared toe/Dubbed Toe		3	2	5
Rim Pads		2	0	2
Full sole pad/cushion		0	2	2
Corrective shoes		0	1	1

A concerted effort was made to record the hoof morphology and shoeing characteristics on all horses submitted under the OADDL:OHRC Program in 2015. Long toe grabs were present on front feet of 11 animals in 2015, all were in Sprint Breeds and this was the same number reported in 2014. The majority of toe grabs on hind shoes were again long (>5mm). Hind shoes were not examined however on 22 animals in 2015. Over-all there were 68% (37/54) set of front hooves evaluated as “normal” or “mild” with respect to toe length and heel length, improvement from 2014 (53%). Abnormal hooves, corrective shoes, pads and squared or dubbed off toes were reduced from 2014. There were six animals with front hooves that were long, over-grown, with worn shoes or loose nails in need of reset examined in 2015.

Gastric Ulcers:

Table 16: Gastric Ulcers - 2015

	TB	SB	TOTAL
None	3	3	6
Mild	7	14	21
Moderate	3	4	7
Marked	4	2	6
Not Reported	3	11	14
Total	20	34	54

Monitoring of gastric ulcers continues to be a component of the OHRC:OADDL Diagnostic Program. Table 16 (above) presents the data compiled during 2015 regarding gastric ulceration in the Oklahoma racehorse diagnostic program. This data is presented by breed with Thoroughbred (TB) compared to combined “sprint” horses (SB = Quarter Horse, Paint, Appaloosa). There were 14 horses with no specific notations regarding gastric ulcers examined in 2015. Most of these reflect animals without ulcers, where normal organs are not described in the necropsy report. There were 50% (27/54) horses with either a record of no ulcers or only mild ulcers were reported. This is improved from 43% reported in 2014. The number of horses with either moderate or marked gastric ulcers was nearly equally distributed between TB and SB animals and also between age groups.

Fatal Injury and Track Location:

Table 17: Race Day Fatality by Track Location 2015

	RP	FMT	WRD	Total
Finished Race – Clubhouse turn after race	5	2	2	9
At Finish/Past Finish	2	2	2	6
Home Stretch	4	0	0	4
Back Stretch	1	2	0	3
At/Out of Starting Gate	1	1	0	2
In Holding Barn	1	0	1	2
Not on Track	2	0	0	2
Far Turn	0	1	0	1
1/8 Pole	1	0	0	1
In Saddling Paddock	0	0	1	1
Not Reported	0	0	1	1
Total	17	8	7	32

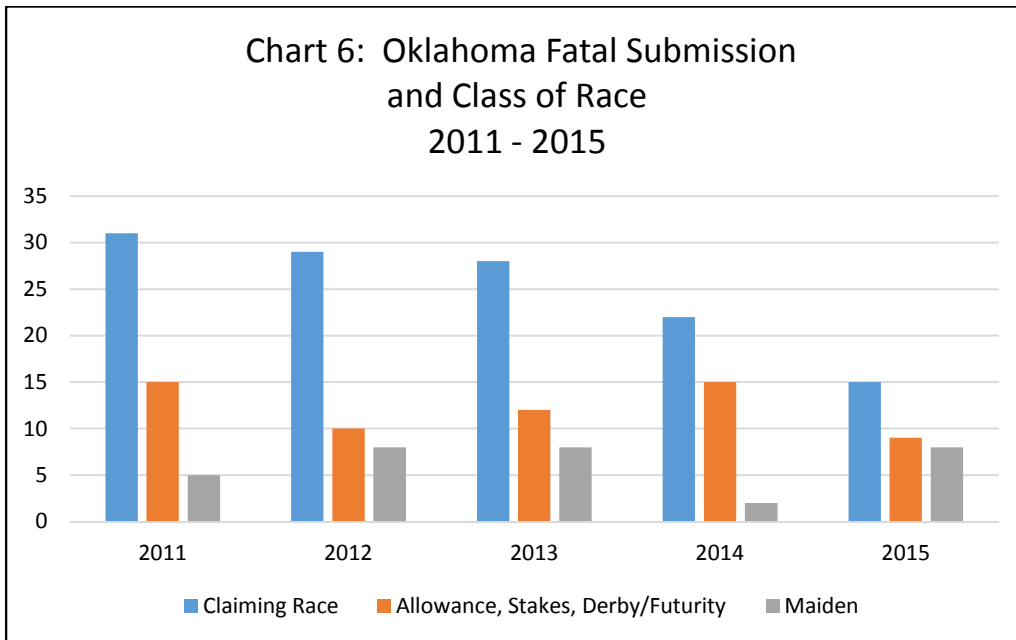
The reporting of location on a racetrack where a catastrophic injury occurs to a racehorse has been utilized by several racing jurisdictions to improve overall safety for equine competitors. This data is compiled as part of the cooperative OADDL:OHRC diagnostic program but is also reliant upon submission of this data from Commission licensed personnel and includes the EIPH case. The 2015 data for track location is included in this report as Table 17 (previous page) and includes only race day deaths. This data was not provided on only one submission form in 2015, as we instituted a new re-designed submission form. The new form allowed diagrammatic representation for submitting Veterinarians. The new form went into use May of 2015, so there is some transition in this information in 2015. The majority of submissions report injuries at or past the finish and also well past the finish in the clubhouse turn following a race, 47% (15/32). Unfortunately, the reporting is not standardized between regulatory officials, and remains difficult to interpret. In addition, this location may indicate the point that an animal is pulled up or identified and not the exact location of the injury in some cases. More in-depth analysis and standard reporting of track location will continue to be an objective of this program.

Race Fatality and Class of Race:

Table 18: Race Day Fatality by Class of Race & Breed – 2015

	RP		FMT		WRD		Total		TOTAL
	TB	SB	TB	SB	TB	SB	TB	SB	
Allowance Claiming	1	0	0	0	0	0	1	0	1
Maiden claiming	0	0	0	2	1	3	1	5	6
Claiming:	4	1	1	2	0	0	5	3	8
\$0-4999	0	0	0	0	0	0	0	0	
\$5000-7499	2	0	1	2	0	0	3	2	
\$7500-9999	0	0	0	0	1	0	1	0	
\$10,000-19,999	3	1	0	2	0	3	3	6	
\$20,000-up	0	0	0	0	0	0	0	0	
Futurity/Derby Trial	0	4	0	1	0	0	0	5	5
Allowance	2	0	0	0	0	1	2	1	3
Stakes	0	0	0	0	1	0	1	0	1
Maiden Race	1	4	1	1	0	1	2	6	8
Total	8	9	2	6	2	5	12	20	32

The 32 race day fatality cases (including EIPH & pre-race cases) are displayed with respect to class of race in Table 18 (previous page). Claiming race information includes claiming price, and also shows subdivision for Maiden Claiming and Allowance Optional Claiming races. In 2015, there were 15 Claiming race fatalities and 9 fatalities from Allowance, Stakes or Futurity/Derby and 8 Maiden races. The distribution of race class for Oklahoma submissions from 2011 to 2015 is included in Chart 6 below. Of note is the over-all reduction in all cases submitted in 2015.



Race Fatality and Distance of Race:

The Oklahoma Quarter Horse Racing Association (OQHRA) and Thoroughbred Racing Association of Oklahoma (TRAO) provided Incompass information for 2015 regarding number of horses starting at different distances. Tables 19a and 19b (following page) contain the total number of race fatalities submitted to OADDL in relation to race distance and surface. These tables include Pre-Race fatalities (1 TB RP, 1 TB WRD) but excludes EIPH (TB RP), total number of 31 animals. Separate tables include Thoroughbred (Table 19a) and Sprint Breeds (Table 19b). This raw data is summarized for the State of Oklahoma in the far right column and all columns include calculation of total fatalities per 1000 starters.

Table 19a: Thoroughbred Race Day Fatality, Number of Starters, Distance 2015:

Race Distance	RP			FMT			WRD			Total		
	#Fatal	#Start	Fatal per 1000 Starters	#Fatal	#Start	Fatal per 1000 Starters	#Fatal	#Start	Fatal per 1000 Starters	#Fatal	#Start	Fatal per 1000 Starters
Races on DIRT												
3 fur	1	13	76.92	0	-	-	0	-	-	1	13	76.92
4 fur	0	-	-	0	287	-	0	-	-	0	287	-
5 fur	0	205	-	0	-	-	0	199	-	0	404	-
5-1/2 fur	1	896	1.12	0	61	-	1	535	1.87	2	1492	1.34
6 fur	0	1225	-	1	338	2.96	1	559	1.79	2	2122	0.942
6-1/2 fur	1	409	2.44	0	123	-	0	-	-	1	532	1.88
7 fur	0	241	-	0	-	-	0	-	-	0	241	-
1 mile	1	783	1.28	1	208	4.81	0	657	-	2	1648	1.21
1mi70yds	0	607	-	0	-	-	0	73	-	0	680	-
1-1/6 mi	0	116	-	0	-	-	0	7	-	0	123	-
1-1/8 mi	0	30	-	0	-	-	0	-	-	0	30	-
1-3/16 mi	0	-	-	0	-	-	0	7	-	0	7	-
Total dirt	4	4525	0.884	2	1017	1.97	2	2037	0.982	8	7579	1.06
Races on TURF												
5 fur	0	199	-							0	199	-
7-1/2 fur	2	223	8.97							2	223	8.97
1 mile	1	387	2.58							1	387	2.58
1-1/16 mi	0	139	-							0	139	-
1-1/8 mi	0	16	-							0	16	-
Total turf	3	964	3.11							3	964	3.11

Table 19b: Sprint Breed Race Day Fatality, Number of Starters, Distance 2015:

Race Distance in yards	RP			FMT			WRD			Total		
	#Fatal	#Start	Fatal per 1000 Starters	#Fatal	#Start	Fatal per 1000 Starters	#Fatal	#Start	Fatal per 1000 Starters	#Fatal	#Start	Fatal per 1000 Starters
110	0	9	-	0	0	-	0	76	-	0	85	-
220	0	0	-	0	10	-	0	96	-	0	106	-
250	1	593	1.69	2	511	3.91	0	349	-	3	1453	2.06
300	1	905	1.10	2	553	3.62	1	693	1.44	4	2151	1.86
330	3	465	6.45	0	215	-	2	313	6.39	5	993	5.04
350	3	1403	2.14	1	567	1.76	1	710	1.41	5	2680	1.86
400	0	513	-	0	0	-	1	226	4.42	1	739	1.35
440	0	217	-	0	0	-	0	101	-	0	318	-
550	0	97	-	0	0	-	0	104	-	0	201	-
870	1	195	5.13	1	155	6.45	0	186	-	2	536	3.73
Total	9	4397	2.05	6	2011	2.98	5	2854	1.75	20	9262	2.16

Chronic Musculoskeletal Lesions:

Complete identification of pre-existing or chronic changes in the musculoskeletal system continues to be documented in the OADDL:OHRC diagnostic program. This analysis was completed on most animals submitted, regardless of history in 2015. There were 15 fatal race day or training cases submitted in which significant pre-existing or chronic joint/bone lesions were present, the same as in 2014. Twelve of these cases were musculoskeletal injury cases and also race day fatalities. Of these race day cases, pre-existing significant arthritis was identified in 11, with multiple joints affected in 7 cases. More severe chronic pre-existing lesions were noted in 6 contralateral and 2 ipsilateral sites. Significant bone chips along joint margins were present in 7 cases, chronic synovitis in 6 cases, chronic suspensory ligament damage in 2 cases and chronic flexor tendon damage in 1 case. The other three submissions included the gastric rupture/peritonitis case, malignant edema case and chondritis/pharyngitis case. All three of these cases had chronic arthritis with bone chips and subchondral sclerosis of distal cannon bone, chronic synovitis and cartilage score lines. One of these animals also had a large cartilage defect. The 15 cases included: 7 Quarter Horses, 6 Thoroughbred, 1 Paint and 1 Appaloosa. There were three 2-year old, two 3-year old, two 4-year old, three 5-year old, and five 6-year old animals in this group. Submissions came from RP (8), FMT (5) and WRD (2). Peak months of submission for cases with significant chronic lesions were June and October with 3 each, followed by May, July, August and November with 2 each and 1 submission was received in September.

Final reports were issued to OHRC on individual cases regarding pre-existing lesions and other conditions preceding death. Review of these cases by OHRC or submitting Track officials is part of the usefulness of the necropsy program.

SUMMARY:

Table 20: Number of Musculoskeletal Fatalities per Number of Race Days

		Catastrophic Musculoskeletal Fatality	Number of RACE DAYS	Catastrophic Musculoskeletal Fatality per Race Day
TOTAL	2007	46	265	0.174
	2008	39	265	0.147
	2009	40	238	0.168
	2010	51	211	0.242
	2011	44	211	0.208
	2012	45	211	0.213
	2013	45	211	0.213
	2014	40	209	0.191
	2015	31	209	0.148
	Remington Park	2007	14	119
2008		16	117	0.137
2009		23	117	0.197
2010		22	117	0.188
2011		21	117	0.179
2012		26	117	0.222
2013		21	117	0.179
2014		26	117	0.222
2015		16	117	0.137
Fair Meadows Tulsa		2007	11	34
	2008	15	34	0.441
	2009	3	34	0.088
	2010	15	34	0.441
	2011	9	34	0.265
	2012	8	34	0.235
	2013	11	34	0.323
	2014	6	34	0.176
	2015	8	34	0.235
	Will Rogers Downs	2007	5	42
2008		3	44	0.068
2009		6	44	0.136
2010		14	60	0.233
2011		14	60	0.233
2012		11	60	0.183
2013		13	60	0.217
2014		8	58	0.138
2015		7	58	0.121

Table 20 (previous page), presents musculoskeletal fatality per racing day for Oklahoma tracks from 2007 to 2015. This value was reduced State-wide again in 2015 calendar year to 0.148, continuing a trend in improvement since 2013. Conclusions from the 2015 year-end report indicate that Oklahoma racetracks remain an active and an improved environment for equine athletes. During 2015, there were 31 race day musculoskeletal fatalities and 1 EIPH race day fatality. Vertebral fractures (4) in Quarter Horses were again noted however lumbo-sacral site was reduced by 1 to three. Carpal joint fractures outnumbered fetlock/phalanx fractures for the first time. The total number of cases submitted was reduced, number of Thoroughbred animals reduced and number of non-exercise cases submitted increased in 2015.

The number of starters by breed was provided by OQHRA and TRAO in 2015, and is presented below in Table 21. For all breeds and tracks, the number of horses starting in races decreased in 2015.

Table 21: Number of Starters by Breed and Track 2015

Breed	RP	FMT	WRD	Total
Thoroughbred	5489	1017	2037	8543
Sprint Breeds Total	4397	2011	2854	9262
Quarter Horse	3765	1546	2375	7686
Paint	544	384	392	1320
Appaloosa	88	81	87	256
Total	9886	3028	4891	17805

This information allows calculation of Catastrophic Musculoskeletal Injury Index (CMI), a more traditional manner of comparing injury statistics. CMI is calculated as the number of Fatal Catastrophic Musculoskeletal Injuries per 1000 horses starting to race. The information is presented in table form below, Table 22, segregated by breed (TB & SB), race track and State-wide total.

Table 22: CMI by Breed and Track 2015:

	RP	FMT	WRD	TOTAL
Number Musculoskeletal Fatality during RACE:				
Thoroughbred	7	2	2	11
Sprint Breeds	9	6	5	20
Total:	16	8	7	31
Total number of STARTERS:				
Thoroughbred	5489	1017	2037	8543
Sprint Breeds	4397	2011	2854	9262
Total:	9886	3028	4891	17805
CMI "index" – number per 1000 starters				
Thoroughbred	1.28	1.97	0.981	1.29
Sprint Breeds	2.05	2.98	1.75	2.16
TOTAL	1.62	2.64	1.43	1.74

The CMI is an attempt to correlate with what is reported in other jurisdictions, a five year Oklahoma summary appears in Table 23 (below). We are fortunate in Oklahoma to have cooperation between breed associations, regulatory associations, practicing veterinarians and diagnosticians in performing analysis. The number of “starters” per race will remain critical in determining any further factors regarding over-all racing safety. Nationwide statistics reported a CMI index of 1.62 for Thoroughbreds (Jockey Club EID March 2016). Table 23 demonstrates Oklahoma remains in line with this figure with a “State-wide” Thoroughbred index of 1.29 and State-wide total index of 1.74. This value is the lowest since 2011 and indicates improvement of fatal injury rate.

There are many factors which may be associated with the State-wide decrease, such as the institution of “pre-race” veterinary examinations, banning of long toe grabs in Thoroughbred horses and significant track surface renovations. Oklahoma is unique in that we have nearly equal numbers of both Thoroughbreds and Sprint Breeds competing.

Table 23: CMI by Breed and Track 2011 – 2015.

	TB	SB	Total
Remington Park			
2011	1.98	1.71	1.86
2012	2.90	1.94	2.45
2013	1.84	2.18	2.00
2014	1.77	2.76	2.24
2015	1.28	2.05	1.62
Fair Meadows Tulsa			
2011	2.98	2.23	2.51
2012	1.58	2.32	2.05
2013	1.58	4.53	3.38
2014	1.64	2.04	1.89
2015	1.97	2.98	2.64
Will Rogers Downs			
2011	2.30	2.19	2.24
2012	1.39	2.21	1.82
2013	1.58	3.10	2.39
2014	0.43	2.12	1.36
2015	0.981	1.75	1.43
State TOTAL			
2011	2.20	1.97	2.08
2012	2.30	2.10	2.20
2013	1.73	2.92	2.34
2014	1.42	2.43	1.94
2015	1.29	2.16	1.74

The Oklahoma Animal Disease Diagnostic Laboratory remains proud to be included as an integral part of the Veterinary Medical Diagnostic Program in cooperation with the Oklahoma Horse Racing Commission. The OADDL remains committed to accomplishing the goals outlined for this project and pleased to support the important racing and equine industries of the state.

Respectfully submitted,

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Scheduled Presentation: Race Horse Pathology: AAVLD Annual Meeting
F. Uzal, L. Kennedy, M. Scollay, G. Rezabek
Sunday October 16, 2016
Greensboro, NC