

# VETERINARY MEDICAL DIAGNOSTIC PROGRAM

JANUARY 2013 TO DECEMBER 2013



Supported by the  
Oklahoma Horse Racing Commission



Conducted by the  
Oklahoma Animal Disease Diagnostic Laboratory  
Center for Veterinary Health Sciences  
Stillwater, OK  
May 1, 2014



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, 2013 through December 31, 2013 (amended 5/9/14)**

## **Introduction**

This report summarizes the case submissions and diagnostic findings of the Veterinary Medical Diagnostic Program for the period starting January 1, 2013 and ending December 31, 2013.

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).

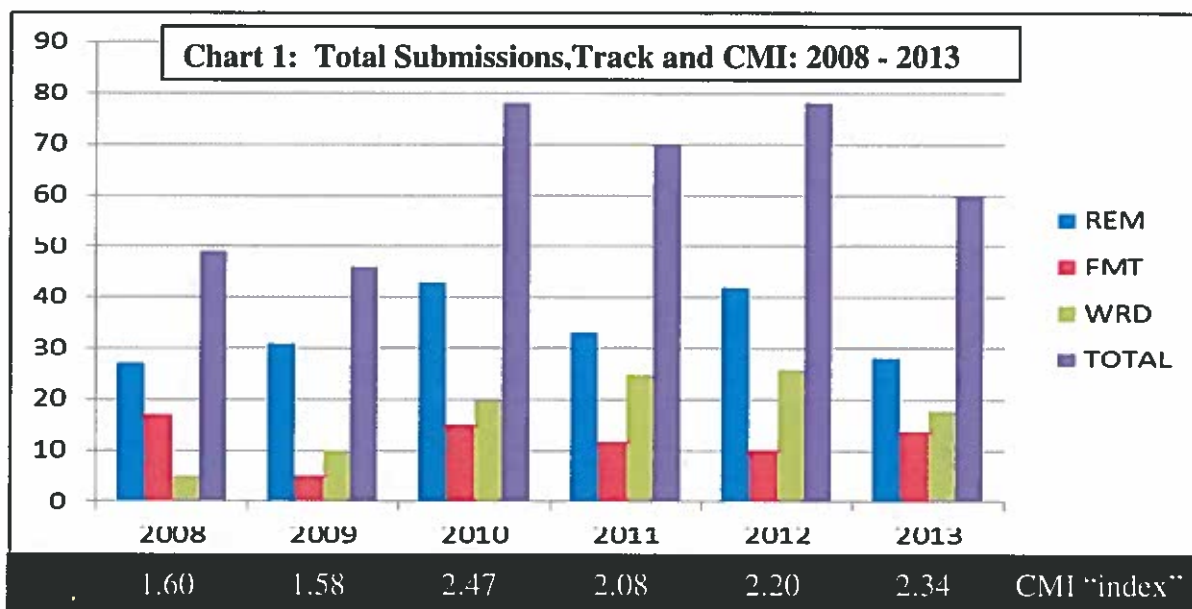
All horses that die or must be humanely euthanized on any of the three Oklahoma racetracks that fall under the OHRC jurisdiction are to be submitted to OADDL for a comprehensive necropsy examination. Results of necropsy examination are reported to the OHRC office in Oklahoma City with a copy sent to 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 have led 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. This last item was changed by direction of the funding agency in May 2011 and toxicology analysis is at the discretion of OHRC.

For the calendar year 2013, a total of sixty (60) horses were submitted to OADDL under the Veterinary Medical Diagnostic Program. This is a reduction in submissions by 18 horses from 2012. Seven (7) animals died and fifty-three (53) animals were humanely destroyed, see Table 1. A summary of OADDL's necropsy findings follow. For the remainder of this report individual tracks are identified by initials: Remington Park (REM), Fair Meadows Tulsa (FMT) and Will Rogers Downs (WRD). Specific OADDL necropsy reports are referenced in parentheses (13XXXXXX). These reports have all been previously submitted to the commission.

**Table 1: Total Equine Mortality – 2013**

	REM	FMT	WRD	TOTAL
<b>DIED</b>	3	3	1	7
<b>EUTHANIZED</b>	25	11	17	53
<b>TOTAL</b>	28	14	18	60

Total equine mortality submissions were decreased in 2013 and were markedly reduced at REM (42 in 2012) and WRD (26 in 2012) however increased from FMT (10 in 2012). This decrease did not achieve lower levels noted in 2008 and 2009 (Chart 1).



**Submissions:**

A total of sixty (60) horses from Oklahoma racetracks were submitted to OADDL for examination during the 2013 calendar year. The total number of animals submitted was reduced in 2013, but not to levels seen or injury rate (CMI-page 18) seen in 2008 and 2009. Table 2 (below) indicates the total submissions for the joint OADDL:OHRC necropsy program for the years 2003-2013.

**Table 2: Total Necropsy Submissions, OADDL:OHRC Necropsy 2003-2013**

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Submissions</b>	35	41	53	73	70	61	60	78	70	78	60

**Monthly Distribution of Submission:**

Table 3 (next page) 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 2013 there were peak submissions in both April and June, unlike previous years reporting.

**Table 3: Monthly Distribution of Necropsy Submissions for 2013**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<b>REM</b>	0	0	3	7	6	1	0	3	4	2	1	1	<b>28</b>
<b>FMT</b>	0	0	0	0	0	8	5	1	0	0	0	0	<b>14</b>
<b>WRD</b>	0	1	2	2	1	0	0	2	1	4	5	0	<b>18</b>
<b>Total</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>9</b>	<b>7</b>	<b>9</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>6</b>	<b>6</b>	<b>1</b>	<b>60</b>

Table 4 shows the monthly submissions by horse breed. During this reporting period, Quarter Horse (QH) submissions exceeded all other breeds, accounting for more than one-half the total mortality. Peak submission months (>4 horses/month) were noted in Sprint Breeds in April, May and June. There was not a submission peak for Thoroughbred (TB) animals during the fall months, which had been noted in previous year reports.

**Table 4: Monthly Distribution of Necropsy Submissions by Breed for 2013**

Breed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<b>TB</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>20</b>
<b>QH</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>34</b>
<b>American Paint</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>6</b>
<b>Total</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>9</b>	<b>7</b>	<b>9</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>6</b>	<b>6</b>	<b>1</b>	<b>60</b>

**Gender and Breed of Horse:****Table 5: Submission by Breed 2013**

	Number of Horses
<b>Thoroughbred</b>	20
<b>Quarter Horse</b>	34
<b>American Paint</b>	6
<b>Appaloosa</b>	0
<b>Total</b>	<b>60</b>

The Breed distribution of necropsy case submissions to OADDL for 2013 is presented in Table 5 to the left. Quarter Horse submissions were most frequent 57% (34/60). No Appaloosa horses were submitted in 2013, and Sprint Breeds (Quarter Horse, American Paint, Appaloosa) combined represented two-thirds of the cases. This is different than previous years,

in which Thoroughbred submissions were greater than Quarter Horse submissions from 2004 until 2013. Gender submissions are presented in Table 6 (next page) and geldings (neutered males) again predominate at 52% (31/60). Quarter Horse stallions, geldings and females exceeded Thoroughbred mortality submissions in 2013, different than previous years.

**Table 6: Gender and Breed of Submissions 2013**

		REM	FMT	WRD	TOTAL
Male	Thoroughbred	1	0	0	1
	Quarter Horse	2	0	1	3
Female	Thoroughbred	4	3	3	10
	Quarter Horse	5	2	5	12
	Paint	1	2	0	3
Gelding	Thoroughbred	7	0	2	9
	Quarter Horse	7	6	6	19
	Paint	1	1	1	3
<b>Total</b>		<b>28</b>	<b>14</b>	<b>18</b>	<b>60</b>

The distribution of racehorse submissions arranged by age, breed and track during 2013 is shown in Table 7. This data is also segregated by breed per request of breed registries. Our Oklahoma data continue to indicate larger numbers of 2-3 year old animals in total mortality in 2013 (53%). Quarter Horses accounted for the largest number of 2 and 3 year old submissions in 2013. There were slightly more Thoroughbred (15) horses than "sprint" type horses (Quarter Horse, Paint, Appaloosa: 13) older than three years submitted in 2013. There may be more animals in the two- and three-year old age group in active training and racing in Oklahoma, and thus are the greater at risk population.

**Table 7: Age of Horse and Breed 2013.**

		REM	FMT	WRD	Total
Two year old	Thoroughbred	2	0	0	2
	Quarter Horse	5	3	4	12
	Am. Paint	1	0	0	1
Three year old	Thoroughbred	3	0	0	3
	Quarter Horse	5	3	4	12
	Am. Paint	0	2	0	2
Four year old	Thoroughbred	5	2	2	9
	Quarter Horse	2	1	1	4
	Am. Paint	1	1	0	2
Five year old	Thoroughbred	0	1	2	3
	Quarter Horse	2	1	3	6
Six year old	Thoroughbred	0	0	1	1
	Quarter Horse	0	0	0	0
	Am. Paint	0	0	1	1
Seven year old	Thoroughbred	2	0	0	2
	<b>Total</b>	<b>28</b>	<b>14</b>	<b>18</b>	<b>60</b>

**Age of Horse (years) by Breed:**

Table 8 below simplifies the 2013 necropsy submissions by age and breed. This information was requested by the Commission during our presentation of the 2006 report.

**Table 8: Age (years) of Horse and Breed 2013.**

Breed	2 yr	3 yr	4 yr	5 yr	6 yr	7 yr	Total
Thoroughbred	2	3	9	3	1	2	20
Quarter Horse	12	12	4	6	0	0	34
American Paint	1	2	2	0	1	0	6
<b>Total</b>	<b>15</b>	<b>17</b>	<b>15</b>	<b>9</b>	<b>2</b>	<b>2</b>	<b>60</b>

This table displays that the majority of two- and three-year-old fatalities occurred in Quarter Horses, 80% (2 yr) and 70% (3 yr). There were markedly fewer two- and three-year-old Thoroughbred submissions compared to 2012, however twice as many 4 year olds. This mirrors a total reduction in Thoroughbred submissions, but must be viewed as a very positive trend for 2013. Over-all reduction in both 2-year old and 3-year old animals must also be seen as positive for 2013.

**Fatal Event by Age (in years):**

**Table 9: Fatal Event by Age (years) 2013**

Age	Racing	Training	Non-exercise	Total
2	10	2	3	15
3	16	1	0	17
4	11	1	3	15
5	8	0	1	9
6	2	0	0	2
7	1	0	1	2
<b>Total</b>	<b>48</b>	<b>4</b>	<b>8</b>	<b>60</b>

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 category is continued for 2013 in Table 9 to the

left. Oklahoma continues to report more race day fatalities than training fatalities compared to some other jurisdictions. This reflects the large number of animals that train off-site of OHRC facilities. In 2013 compared to 2012: racing cases were reduced by 1, training cases reduced by 13, and non-exercise cases reduced by 4.

**Fatal Event by Breed:**

This year we again report the fatal event categories by breed in Table 10 (next page). 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, 48/60 (80%) of submissions. The majority 76% (26/34) of the Quarter Horse and 80% (16/20) of Thoroughbred fatalities occurred on race day. There were markedly fewer training day deaths submitted in 2013 than 2012 as noted above, and no American Paint animals were submitted for training or non-exercise causes.

**Table 10: Fatal Event by Breed 2013:**

Breed	Racing	Training	Non-exercise	Total
Thoroughbred	16	1	3	20
Quarter Horse	26	3	5	34
American Paint	6	0	0	6
<b>Total</b>	<b>48</b>	<b>4</b>	<b>8</b>	<b>60</b>

Complete tabulation of category of death and breed by Track is presented in Table 11 below:

**Table 11: Fatal event by breed and track 2013.**

		REM	FMT	WRD	Total
<b>RACE DAY</b>					
	Thoroughbred	10	2	4	16
	Quarter Horse	10	6	10	26
	Am. Paint	2	3	1	6
	<b>Before Race</b>				
	Thoroughbred	0	0	0	0
	Quarter Horse	0	0	0	0
(at finish or)	<b>During Race</b>				
	Thoroughbred	10	2	4	16
	Quarter Horse	10	6	10	26
	Am. Paint	2	3	1	6
	<b>Finished Race</b>				
	Thoroughbred	0	0	0	0
	Quarter Horse	0	0	0	0
<b>TRAINING</b>					
	Thoroughbred	0	0	1	1
	Quarter Horse	1	2	0	3
<b>Non-Exercise</b>					
	Thoroughbred	2	1	0	3
	Quarter Horse	3	0	2	5
<b>TOTAL</b>		<b>28</b>	<b>14</b>	<b>18</b>	<b>60</b>

The majority of race day deaths, 80% (48/60), occurred during or immediately following a race in 2013. No animals were submitted from pre-race or starting gate associated injury and none from following the race in 2013. Quarter Horse animals accounted for the majority of training fatalities 75% (3/4) unlike 2012. Non-exercise submissions for 2013 were highest from REM 62% (5/8) and for Quarter Horse breed 62% (5/8).



**GOAL 1: INVESTIGATE AND DOCUMENT TYPES OF INJURIES:**

**Distribution of Fatal Activity and Track:**

**Table 12: Fatal Activity by Track - 2013**

<b>TRACK</b>	<b>Racing</b>	<b>Training</b>	<b>Non-exercise</b>	<b>Total</b>
<b>REM</b>	22	1	5	<b>28</b>
<b>FMT</b>	11	2	1	<b>14</b>
<b>WRD</b>	15	1	2	<b>18</b>
<b>Total</b>	<b>48</b>	<b>4</b>	<b>8</b>	<b>60</b>

Table 12 above reports a summary of activity for case fatalities for each of the three submitting tracks. Training submissions decreased by a large number in 2013, with the most occurring at FMT. Table 13, 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 13: Cause of Death by Track - 2013**

	<b>REM</b>	<b>FMT</b>	<b>WRD</b>	<b>Total</b>
<b>Natural Disease/Non-Exercise/Accident</b>	5	1	2	<b>8</b>
<b>EIPH (bleeder on RACE DAY)</b>	1	0	2	<b>3</b>
<b>Musculoskeletal Injury</b>	22	13	14	<b>49</b>
<b>Racing:</b>	21	11	13	45
<b>Training:</b>	1	2	1	4
<b>Total</b>	<b>28</b>	<b>14</b>	<b>18</b>	<b>60</b>

The majority of “injuries” sustained by athletic horses affect the musculoskeletal system. In 2013, 82% (49/60) of the submissions were related to musculoskeletal system injury. This method of separating racetrack injuries has been used in most other jurisdictions world-wide. By this means of segregation, it is possible to assess the Catastrophic Musculoskeletal Injury Index (CMI) utilized to evaluate over-all incidence of exercise associated injury. The number of catastrophic musculoskeletal injuries (49) will be utilized further in this report.

### Exercise Induced Pulmonary Hemorrhage:

Exercise induced pulmonary hemorrhage (EIPH), or “bleeders” in the horse remains an enigma affecting racehorses and other equine athletes. This condition 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 2013 there were three submissions where EIPH was confirmed as the cause of death on race day; all were Quarter Horses, all were three-year-olds and all entered in Claiming Races. One was submitted from REM and two from WRD. Lifetime starts for these animals were 7, 4 and 6 respectively with submissions in April, October and November.

### Musculoskeletal Injury:

As seen in Table 13, the majority (82%) of the total fatalities were related to musculoskeletal disorders, essentially unchanged from 2003. Table 14 (below) displays the distribution of limb injuries sustained by animals during racing or race training, pre-race injuries and EIPH horses but excludes accidents which involved the limbs. This data is also segregated by breed, track and limb in 2013. In 2013 there were nearly twice as many right forelimb injuries than left forelimb. This is similar to 2011 (when two-thirds were the right front limb) and different than 2012 (near equal distribution). The significance of this change is uncertain and should be evaluated based on track conditions/surface, entries and management changes during 2013. There were 2 bilateral forelimb injuries (none in 2012), no hindlimb injuries and 7 musculoskeletal injuries which did not involve the limbs in 2013.

**Table 14: Limb injury by breed and racing/training 2013.**

	REM		FMT		WRD		TOTAL		Sum
	Race	Train	Race	Train	Race	Train	Race	Train	
<b>Right Front</b>									<b>26</b>
TB	7	0	2	0	0	0	9	0	9
QH	5	0	2	1	7	0	14	1	15
A.Paint	2	0	0	0	0	0	2	0	2
<b>Left Front</b>									<b>14</b>
TB	2	0	0	0	4	1	6	1	7
QH	2	0	1	0	1	0	4	0	4
A.Paint	0	0	2	0	1	0	3	0	3
<b>Bilateral Front</b>									<b>2</b>
TB	1	0	0	0	0	0	1	0	1
QH	0	0	1	0	0	0	1	0	1
<b>Other</b>									<b>7</b>
TB	0	0	0	0	0	0	0	0	0
QH	2	1	2	1	0	0	4	2	6
A.Paint	0	0	1	0	0	0	1	0	1
<b>TOTAL</b>	<b>21</b>	<b>1</b>	<b>11</b>	<b>2</b>	<b>13</b>	<b>1</b>	<b>45</b>	<b>4</b>	<b>49</b>

## Musculoskeletal Disorder – All Racing or Race Training Injuries:

The complete reporting of injury site is included below in Table 15. Breed is distributed by Thoroughbred (TB) and Sprint breeds (Quarter Horse, American Paint, Appaloosa) designated “Spnt.” 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. None of the EIPH cases in 2013 sustained musculoskeletal injuries. Multiple injury sites were noted at necropsy in some carpal and fetlock cases; where the primary bone fracture was not identified.

**Table 15: All Fatal Injuries during Racing or Race Training & Track 2013**

Injury	REM		FMT		WRD		Total		Sum
	TB	Spnt	TB	Spnt	TB	Spnt	TB	Spnt	
<b>Fetlock Failure:</b>	5	1	1	3	3	4	9	8	17
<b>Carpal Fracture:</b>	4	6	1	1	1	4	6	11	17
<b>Pelvis/Vertebrae (L-S):</b>	0	3	0	3	0	0	0	6	6
<b>Cannon (MCIII)</b>	0	1	0	2	1	1	1	4	5
<b>Humerus:</b>	1	1	0	0	0	0	1	1	2
<b>Scapula:</b>	0	0	0	1	0	0	0	1	1
<b>Ribs/Thorax</b>	0	0	0	1	0	0	0	1	1
<b>E.I.P.H.</b>	0	1	0	0	0	2	0	3	3
<b>Total</b>	<b>10</b>	<b>13</b>	<b>2</b>	<b>11</b>	<b>5</b>	<b>11</b>	<b>17</b>	<b>35</b>	<b>52</b>

In 2013 there were 65% (34/52) fatal musculoskeletal injuries documented affecting the region from the carpus distal. Fetlock injury and carpal injury were equal in 2013, which is similar to 2010, but fetlock joints were higher in both 2011 and 2012. The greatest majority of injuries however continued to involve the fetlock joint at 33% (17/52), and carpal joint also at 33% (17/52). A disturbing trend identified in 2013 was the identification of 6 (12%) injuries to the lumbo-sacral spine, which was the third highest skeletal site of incidence. Cannon bone fractures were also increased in 2013, up to 5 (10%). The lumbar spine fractures are a concerning condition, all occurred in Quarter Horses during the spring REM and summer FMT race meets. Scapular fractures were down to 1 in 2013 and one Quarter Horse at FMT hit the rail sustaining rib fractures and penetrating injury into the thorax. The three EIPH cases are reported above in Table 13.

Continued monitoring of limb injuries is important for Commission Veterinarians, Track Veterinarians, Track Management and Groundskeepers to improve and ensure a safe racing environment. The increased occurrence of right forelimb to left forelimb injury at all tracks in 2013 could be utilized for the remainder of 2014 race meets.

**GOAL 2: MONITOR FOR EPIZOOTIC DISEASE:**

In Table 13 from page 7, there were 8/60 (13%) of submitted fatal cases reported due to non-exercise related activities, natural diseases and accidents. These animals include cases with potential infectious or communicable disease important to all animals competing, training or residing in the racetrack environment. Table 16 (below) documents these cases based on final necropsy analysis at OADDL.

**Table 16: Non-Exercise, Natural Disease, Accident by Track-2013**

<b>Disease Condition:</b>	
<b>GI, endotoxemia, 3 wk txt for sepsis, 5 yr, QH, colt, REM</b>	<b>Died</b>
<b>GI, endotoxemia, 2 yr, QH, filly, WRD</b>	<b>Euth</b>
<b>GI, endotoxemia, 7 yr, TB, gelding, REM</b>	<b>Euth</b>
<b>Bronchopneumonia, pleuritis, 2 yr, QH, gelding, REM</b>	<b>Died</b>
<b>GI, right colon displacement, 2 yr, QH, gelding, REM</b>	<b>Euth</b>
<b>Pleuropneumonia, bled post race 7/13, died 7/21, 4 yr, TB, filly, FMT</b>	<b>Died</b>
<b>Accident, loose on grounds, fracture Radius, 4 yr, QH, filly, WRD</b>	<b>Euth</b>
<b>GI, enterocolitis, 4 yr, TB, filly, REM</b>	<b>Died</b>
<b>Total</b>	<b>8</b>

In 2013 the majority of non-exercise associated submissions were again associated with gastrointestinal disorders 62% (5/8). Most of these horses were reported in the history to have exhibited colic symptoms and some received veterinary treatment prior to death or euthanasia. One animal with endotoxemia identified at necropsy was reportedly treated for septic arthritis for a 3 week period prior to death at REM. Respiratory diseases were also common and in 2013 as two animals had necropsy findings consistent with primary respiratory condition. One occurred at Remington Park and was a classic case of pleuropneumonia (*Klebsiella* bacteria isolated). The second case of pleuropneumonia was felt to represent reaction to a previous more severe hemorrhagic event. This animal raced on July 13 and died on July 21 at FMT. One accidental death was submitted in 2013 from Will Rogers Downs. This animal was running loose on grounds, fractured her radius and was euthanized.

Bacteriology was performed on several cases in 2013. One pneumonia case was described above and another animal had *Streptococcus equi ssp zooepidemicus* isolated from lung and lymph node. An antibiotic resistant *Staphylococcus* sp and *Streptococcus* species were also isolated from an animal with arthritis/synovitis. No salmonella or *Streptococcus equi* (Strangles) bacteria were isolated in 2013. Screening for Equine Herpes Virus by PCR, and testing for West Nile virus and Eastern Equine Encephalitis was performed on cases, and subsidized by the Oklahoma Department of Agriculture, Food and Forestry (ODAFF). Histopathology (microscopic examination of tissue) was performed on some necropsy cases in order to further characterize lesions noted on gross examination.

The disease surveillance emphasis for the cooperative OADDL:OHRC program is vital to the Oklahoma racing industry. Surveillance for Piroplasmiasis continued in 2013 for animals traveling to other racing jurisdictions. The requirement for testing at Oklahoma tracks however was suspended in January 2012. New cases of Equine Piroplasmiasis were identified in California, Texas and New Mexico in 2013, however no cases were identified in Oklahoma with reduced screening. Recent national outbreaks of Equine Viral Arteritis (EVA) in 2006, Equine Herpes-1 (EHV-1, neurologic form) every year since 2006 and Contagious Equine Metritis (CEM) in the winter of 2013 have emphasized the importance of disease surveillance for general health of the equine population. There is bias in the current program, however, in that only necropsy examinations are being performed. As part of OADDL's continued commitment, we plan to monitor a percentage of routine submissions from each track for respiratory viruses, bacteria and salmonella during the 2014 calendar year.

#### **Drug Testing (TOXICOLOGY):**

Since the initiation of the cooperative OADDL:OHRC Diagnostic Program, some toxicology analysis has been added, at the request of the OHRC. When possible, urine and synovial fluid are harvested from fatally injured equines that died during or immediately following an OHRC race. Following the 2010 report renewal meeting (May 2011) the OHRC requested cancelation of this toxicology portion of the program. The performance of "routine" toxicology on submissions for OHRC was suspended May 1, 2011. Toxicology remains available on all cases at the request of OHRC. No toxicology analysis of specimens was requested at OADDL by the OHRC for calendar year 2013.

#### **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/outrider animals. Table 17 (next page) displays the hoof/shoeing data compiled during the 2013 time period. The abnormalities are quantitated for 2013 and also reported by breed (rather than track) at the request of breed associations.

## Hoof Anatomy/Shoe Characteristics:

**Table 17: Hoof Anatomy and Horse Shoe Characteristics - 2013**

		Thoroughbred	QH/Pnt/App	TOTAL
Toe Grabs:				
	Front < 5mm	18	25	43
	Front > 5mm	0	14	14
	Hind < 5mm	8	5	13
	Hind > 5mm	6	20	26
Shoes Not Examined:		0	0	0
Hind Shoes Not Examined:		4	14	18
Flat shoe/Barefooted:		2	1	3
Toe/Heel Length	Normal	4	8	12
Long toe/low heel	Mild	7	14	21
	Moderate	6	13	19
	Marked	3	3	6
	Not reported	0	2	2
Under-run heels	Normal	1	3	4
	Mild	9	20	29
	Moderate	7	10	17
	Marked	3	5	8
	Not reported	0	2	2
Abnormal Hoof; Epoxy repair		7	8	15
Corrective shoe; Rim/Full Pads		0	5	5

A concerted effort was made to record the hoof morphology and shoeing characteristics on all horses submitted under the OADDL:OHRC Program in 2013. There was an interest in this topic generated during the Commission meeting in 2007 (for year-end report 2006). Long toe grabs were present on front feet of 14 animals in 2013, all were in Sprint Breeds and this was more than reported in 2012 (8). Only 6 Thoroughbred horses had long toe grabs, and all were on hind shoes. Front shoes were examined on all animals, hind shoes not examined on 18 animals. Flat shoes with no toe grabs were present on two horses and one animal submitted did not have shoes. Over-all there were 55% (33/60) set of hooves evaluated as “normal” or “mild” with respect to toe length, heel length and symmetry. This figure is basically unchanged from 2012. There was an increase in the number of hooves with abnormal growth, quarter cracks, imbalance, misshapen or epoxy repairs in 2013. There were 27% (15/60) submitted in contrast to only 8% (6/78) in 2012. All horses submitted in 2013 with corrective shoes or rim/full pads were of Sprint Breeds.

**Gastric Ulcers:**

**Table 18: Gastric Ulcers - 2012**

	<b>Thoroughbred</b>	<b>QH/Pt/Ap</b>	<b>TOTAL</b>
<b>None</b>	7	17	<b>24</b>
<b>Mild</b>	6	9	<b>15</b>
<b>Moderate</b>	4	4	<b>8</b>
<b>Marked</b>	1	0	<b>1</b>
<b>Not Reported</b>	2	10	<b>12</b>
<b>Total</b>	<b>20</b>	<b>40</b>	<b>60</b>

Monitoring of gastric ulcers continues to be a component of the OHRC:OADDL Diagnostic Program. Table 18 presents the data compiled during 2013 regarding gastric ulceration in the Oklahoma racehorse diagnostic program. This data is presented by breed at the request of registry participants, with Thoroughbred compared to combined “sprint” horses (Quarter Horse, American Paint, Appaloosa). Comments regarding gastric ulcers were not reported in twelve cases in 2012. This may reflect either none present or cases unable to be evaluated due to autolysis. Of the 48 animals with gastric lesions reported, 50% (24/48) had no gastric ulcers and 31% (15/48) had only mild gastric ulcers identified. Almost equal numbers of moderate and severe gastric ulceration were noted in Thoroughbreds compared to Sprint Breeds. These numbers were very similar to those reported in 2012. Trainers, owners and veterinarians should continue to recognize the importance of gastric ulcers in overall horse health.

**Fatal Injury and Track Location:**

**Table 19: Race Fatality by Track Location 2013**

	<b>REM</b>	<b>FMT</b>	<b>WRD</b>	<b>Total</b>
<b>Finished Race</b>	7	3	3	<b>13</b>
<b>Home Stretch</b>	5	3	1	<b>9</b>
<b>At Finish/Finish</b>	1	1	5	<b>7</b>
<b>Out of Starting Gate</b>	2	1	1	<b>4</b>
<b>“Turn”</b>	1	1	1	<b>3</b>
<b>1/8 Pole</b>	1	1	1	<b>3</b>
<b>Far Turn</b>	2	0	0	<b>2</b>
<b>1/2 Pole</b>	1	0	1	<b>2</b>
<b>Before Wire</b>	0	2	0	<b>2</b>
<b>Backside</b>	1	0	0	<b>1</b>
<b>1/4 Pole</b>	1	0	0	<b>1</b>
<b>3/8 Pole</b>	0	0	1	<b>1</b>
<b>In Stall</b>	0	1	0	<b>1</b>
<b>Not Reported</b>	1	0	2	<b>3</b>
<b>Total</b>	<b>23</b>	<b>13</b>	<b>16</b>	<b>52</b>

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/Track personnel. The 2013 data for track location is included in this report as Table 19 (previous page) and includes, training deaths and bleeders. This data was not provided on the submission form in 3/62 (5%) of the cases. Unfortunately, the reporting is not standardized between regulatory officials, and is difficult to interpret. Over one-half of the “location” sites reported by Regulatory Officials (56% - 29/52) were associated with the stretch run, or at/near/past the finish. These locations were reported from REM (13), FMT (7) and WRD (9) tracks and involved seven Thoroughbreds and twenty-two Sprint Breeds. In order to utilize this data, the reporting must be standardized (OHRC) and also critical video review incorporated to establish “where” an injury occurs. Four injuries noted “out of the gate” in 2013 include the majority of the spinal/lumbar fractures discussed earlier in this report. One of these cases returned to the stall at FMT after the race injury. More in-depth analysis and standard reporting of track location should continue to be an objective of this program for submitting OHRC personnel.

#### Race Fatality and Class of Race:

**Table 20: Race Fatality by Class of Race & Breed – 2013**

	REM		FMT		WRD		Total		TOTAL
	TB	Q/P/A	TB	Q/P/A	TB	Q/P/A	TB	Q/P/A	
<b>Maiden claiming</b>	3	3	1	4	0	3	4	10	14
<b>Claiming:</b>	4	2	1	1	2	4	7	7	14
<b>\$0-4999</b>	0	0	0	0	0	0	0	0	0
<b>\$5000-7499</b>	2	2	2	0	0	4	4	6	10
<b>\$7500-9999</b>	2	1	0	0	2	0	4	1	5
<b>\$10,000-19,999</b>	2	2	0	5	0	3	2	10	12
<b>\$20,000-up</b>	1	0	0	0	0	0	0	0	1
<b>Futurity/Derby Trial</b>	0	1	0	0	0	1	0	2	2
<b>Allowance</b>	2	3	0	2	0	1	2	6	8
<b>Stakes</b>	1	1	0	0	0	0	1	1	2
<b>Maiden Race</b>	0	2	0	2	2	2	2	6	8
<b>Total</b>	<b>10</b>	<b>12</b>	<b>2</b>	<b>9</b>	<b>4</b>	<b>11</b>	<b>16</b>	<b>32</b>	<b>48</b>

In the 2006 year-end report to OHRC, OADDL included data regarding class of race, this data was continued in 2013. The 48 race fatality cases (including EIPH cases) are displayed with respect to class of race in Table 20. Requests from OHRC in 2009 to stratify the claiming price are included in this table. In addition, this table also indicates class of race by breed, as requested in 2010. Thoroughbreds (TB) are in one column and Quarter Horse, Paint, Appaloosa (Q/P/A) in another. The claiming value tabulation



includes both Claiming and Maiden Claiming races. During 2013 over one-half of fatalities were again in claiming races 58% (28/48), however claiming races also represent the majority (61%) of races run. A majority of claiming race submissions were in the \$10-19,999 range, however the number of \$5-7499 claiming submissions increased from 2012. Claiming fatalities for the sprint breeds (Q/P/A - 17) were more than for Thoroughbred horses (11), a significant change from both 2011 and 2012. More than double the sprint breed (Q/P/A) fatalities were noted in Stakes, Allowance or Maiden races 72% (13/18) than Thoroughbreds. All of the Futurity Trial cases were in Sprint breeds. Over-all there were fewer submissions for Futurity, Futurity Trial, Derby races, more Stakes and Allowance race submissions and Maiden Race submissions remained the same in 2013.

### **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 2013. There were 21 fatal race day or training cases submitted in which significant pre-existing or chronic joint/bone lesions were present. Twenty were race day submittals and one was a training injury, paralleling total submissions in the program. There were 13 geldings, 8 females, 10 Thoroughbred, 10 Quarter Horses, 1 American Paint and 9 REM, 8 WRM and 4 FMT. Ages of these horses were 2 years (1), 3 years (6), 4 years (3), 5 years (7), 6 years (2) and 7 years (2). Many lesions identified could be considered normal remodeling of bone and joint in response to athletic training such as osselets, splints and bucked shins. There were 7 cases with chronic bowed tendons or suspensory tendon lesions and an increase to 9 cases with non-union dorsal margin “chip” fractures (fetlock or carpus). One Thoroughbred mare raced at FMT with severe, chronic arthritis in both front fetlocks (near total ankylosis). These cases were identified in all months April to December with peaks in November (5), April (4) and September (3). In 2013, 86% (18/21) of these cases had significant changes in the contralateral limb (opposite side) to the primary joint of injury. This information will continue to be tabulated and submitted to OHRC but a concerted effort is needed by all in racing to ensure that animals are ready for strenuous work.

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. There are several medical and surgical equine hospital facilities within easy access of all three tracks in Oklahoma however; and it should be the goal of breed registries and horsemen’s groups to ensure appropriate medical care for all animals in the racing industry.

**SUMMARY:**

Table 21 below, present's musculoskeletal fatality per racing day for Oklahoma tracks from 2006 to 2013.

**Table 21: Number of Musculoskeletal Fatalities per Number of Race Days**

		Catastrophic Musculoskeletal Fatality	Number of RACE DAYS	Catastrophic Musculoskeletal Fatality per Race Day
<b>TOTAL</b>	2006	<b>44</b>	<b>264</b>	<b>0.167</b>
	2007	<b>46</b>	<b>265</b>	<b>0.174</b>
	2008	<b>39</b>	<b>265</b>	<b>0.147</b>
	2009	<b>40</b>	<b>238</b>	<b>0.168</b>
	2010	<b>51</b>	<b>211</b>	<b>0.242</b>
	2011	<b>44</b>	<b>211</b>	<b>0.208</b>
	2012	<b>45</b>	<b>211</b>	<b>0.213</b>
	2013	<b>45</b>	<b>211</b>	<b>0.213</b>
<b>Remington Park</b>	2006	23	118	0.195
	2007	14	119	0.118
	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
<b>Blue Ribbon Downs</b>	2006	7	71	0.098
	2007	16	70	0.229
	2008	5	70	0.071
	2009	8	43	0.186
<b>Fair Meadows Tulsa</b>	2006	10	33	0.303
	2007	11	34	0.324
	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
<b>Will Rogers Downs</b>	2006	4	44	0.091
	2007	5	42	0.119
	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	

Conclusions from the 2013 year-end report indicate that Oklahoma racetracks remain an active and relatively safe environment for equine athletes. During 2013, there were 45 race day musculoskeletal fatalities, 3 EIPH fatalities and including 6 unusual lumbosacral fractures in Quarter Horses submitted, described and reported by OADDL.

The number of starters by breed was again graciously provided by Breed Registries in 2013, and is presented below in Table 22. For all breeds and tracks, the number of starters was approximately double the number of horses available indicating most animals had more than one race start in 2013.

**Table 22: Number of Starters by Breed and Track 2013**

Breed	REM	FMT	WRD	Total
Thoroughbred	5441	1262	2531	9234
Quarter Horse	4300	1550	2401	8251
American Paint	626	366	421	1413
Appaloosa	112	72	79	263
Total	10,479	3250	5432	19,161

A more classic analysis of catastrophic musculoskeletal injury used by most racing jurisdictions is the Catastrophic Musculoskeletal Injury Index (CMI). This is a more traditional manner of comparing injury statistics and is calculated as the number of Catastrophic Musculoskeletal Injuries per 1000 horses starting to race. This data has been calculated (Table 22 above) and will be used in this report. The information is presented in table form below, Table 23, segregated by breed, race track and over-all. The Sprint Breeds (Quarter Horse, American Paint, Appaloosa) are combined in this comparison chart for CMI.

**Table 23: CMI by Breed and Track 2013:**

	REM	FMT	WRD	TOTAL
Number Musculoskeletal Fatality during RACE:				
Thoroughbred	10	2	4	16
Qtr/Pnt/App	11	9	9	29
Total:	21	11	13	45
Total number of STARTERS:				
Thoroughbred	5441	1262	2531	9234
Qtr/Pnt/App	5038	1988	2901	9927
Total:	10,479	3250	5432	19,161
CMI "index" – number per 1000 starters				
Thoroughbred	1.84	1.58	1.58	1.73
Qtr/Pnt/App	2.18	4.53	3.10	2.92
TOTAL	2.00	3.38	2.39	2.34

The above CMI is an attempt to correlate with what is reported in other jurisdictions. 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 predict a range of this CMI index around 2.0 and Table 25 demonstrates Oklahoma remains in line with this figure with a “state-wide” index of 2.34. This value increased to 2.34 from 2.20 reported in 2012. There was also a marked increase in Sprint Breed (Quarter Horse/Paint 2013) index at all tracks in 2013. In previous years in Oklahoma, the index was more equal between Thoroughbreds and Sprint Breeds (Table 24). The Thoroughbred index and over-all rate at Remington Park was reduced in 2013, while this index increased for all breeds and remaining tracks. The index is notably elevated at Fair Meadows Tulsa for both Sprint Breeds and over-all. The CMI was lower for Thoroughbreds at both FMT and WRD however the number of Thoroughbred starters and field size at those tracks was smaller than REM. Oklahoma is unique in that we have nearly equal numbers of both Thoroughbreds and Quarter Horses/Paints/Appaloosas competing; and the 2013 elevation in Sprint Breed injury rate is noteworthy.

**Table 24: CMI by Breed and Track 2011 – 2013.**

Breed	REM			FMT			WRD			TOTAL		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
TB	1.98	2.90	1.84	2.98	1.58	1.58	2.30	1.39	1.58	2.20	2.30	1.73
Q/P/A	1.71	1.94	2.18	2.23	2.32	4.53	2.19	2.21	3.10	1.97	2.10	2.92
Total	1.86	2.45	2.00	2.51	2.05	3.38	2.24	1.82	2.39	2.08	2.20	2.34

Limb of injury was predominantly the right front in 2013. Anatomic location of injury identified fetlock injury and carpas to be equal, a difference from previous years. A surprising increase in lumbo-sacral spine injury was noted in Quarter Horses racing at REM and FMT, and a significant increase in Sprint Breed injuries was noted over-all. Thoroughbred injury rates declined at REM and over-all in 2013. This is an excellent trend and very well reflects the funding of an additional Regulatory Veterinarian to assist in “pre-race” examinations at Remington Park. Disease surveillance did not identify reportable diseases in 2013. Monitoring of hoof anatomy, shoe characteristics, gastric ulcers and the presence of chronic limb lesions continued and was forwarded to OHRC upon completion of each case. Reporting of summary cases which may be considered Animal Welfare issues were continued in this 2013 Annual Report. New comparisons of injury data to OHRC racing information and expansion of breed differences was continued in hopes of extending the scope and impact of this program’s usefulness.

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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Oklahoma Animal Disease Diagnostic Laboratory

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**Publication:**

Andrea L. Beisser, BA; Scott McClure, DVM, PhD, DACVS; Grant Rezabek, DVM, MPH; Keith Soring, DVM; Chong Wang, PhD; "Evaluation of frequency and risk factors associated with catastrophic musculoskeletal injuries in Quarter Horses at two Midwestern racetracks"; Accepted JAVMA.

**Poster Presentation:**

"Comparison of Thoroughbred and sprint breed catastrophic musculoskeletal injuries, forelimb injuries, and anatomic location at Oklahoma Racetracks from 2006 to 2012."  
Kendra Chillemi ; Grant Rezabek, MPH, DVM

**Scientific Presentation:**

"OHRC:OADDL Necropsy Program," at OSU/CVHS/OVMA Fall Conference for Veterinarians, by Dr. G.B. Rezabek; Wes Watkins Center, OSU Campus; Thursday November 7, 2013, 5:00-6:00PM.

**SUMMARY TABLE: Veterinary Medical Diagnostic Program**

	<b>Racing</b>	<b>Training</b>	<b>Non-exercise</b>	<b>Accident</b>	<b>TOTAL</b>
<b>Remington Park:</b>					
2003	10	2	1	0	13
2004	10	1	2	0	13
2005	14	5	3	2	24
2006	25	5	2	1	33
2007	14	5	3	2	24
2008	16	7	2	2	27
2009	23	4	3	1	31
2010	23	13	7	0	43
2011	24	2	5	2	33
2012	28	9	5	0	42
2013	22	1	5	0	28
<b>Fair Meadows:</b>					
2003	4	2	0	0	6
2004	6	1	4	0	11
2005	5	0	0	0	5
2006	11	0	0	0	11
2007	11	2	1	0	14
2008	15	0	2	0	17
2009	3	1	1	0	5
2010	15	0	0	0	15
2011	11	0	1	0	12
2012	8	1	1	0	10
2013	11	2	1	0	14
<b>WillRogersDowns:</b>					
2005	0	1	0	0	1
2006	5	2	1	2	10
2007	5	1	1	0	7
2008	3	1	1	0	5
2009	6	2	2	0	10
2010	16	2	2	0	20
2011	16	4	5	0	25
2012	13	7	4	2	26
2013	15	1	1	1	18