



**Supplementary Item 6:** Yearling Sales Price ANOVA, all horses (n = 278).

<b>Predictor Variable</b>	<b>Sum of Squares</b>	<b>Degrees of Freedom</b>	<b>F value</b>	<b>Pr(&gt;F)</b>
OC	0.774	1	1.2415	0.27
gender	7.874	2	6.3169	<b>0.002</b>
sale	39.548	4	15.8629	<b>&lt;0.001</b>
sire	49.128	45	1.7516	<b>0.004</b>



**Supplementary Item 7:** Summary of 2-year-old performance measures for foals in the short-term performance cohort (n = 278) and randomly selected 2010 foals (n = 288). P-value for the outcome “starting at 2” was determined by comparing proportions using a two-sided test. P-value for the remaining outcomes was determined using a Kolmogorov-Smirnov test, which tests the entire distribution of data rather than only the population average.

		Short-Term Performance Cohort	Randomly Selected 2010 Foals	p-value
Starting at 2		171/278 (61.5%)	163/288 (56.6%)	0.27
Sale Price	Mean	\$33,510	\$33,250	0.90
	Median	\$22,000	\$20,000	
	Range	\$1,500-260,000	\$700-450,000	
Starts	Mean	4.3	3.5	0.36
	Median	3	1.5	
	Range	0-21	0-18	
Earnings (starters only)	Mean	\$27,850	\$31,740	0.23
	Median	\$9,102	\$7,355	
	Range	\$1-531,900	\$1-918,300	
Earnings per Start (starters only)	Mean	\$3,043	\$3,814	0.39
	Median	\$1,178	\$1,319	
	Range	\$0.25-48,360	\$0.20-91,830	
Fastest Time (s)	Mean	118.4	117.9	0.24
	Median	118.0	117.0	

	Range	111.2-129.6 (n = 111)	109.4-130.8 (n = 77)	
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## Supplementary Item 8: OC Status ANOVA, all horses (n = 278)

Predictor Variable	Degrees of Freedom	Deviance	Residual Degrees of Freedom	Residual Deviance	F value	Pr(>F)
NULL			277	384.87		
gender	2	3.716	275	381.16	1.6342	0.20
gait	1	5.685	274	375.47	5.0004	<b>0.03</b>
sire	45	61.968	229	313.50	1.2113	0.18



**Supplementary Item 9:** Multiple regression results for pacers (*Short-term performance: Pacers and trotters at 2 years of age*). OC = osteochondrosis; G = gelding; M = mare; S = stallion; OR = odds ratio; IRR = incident rate ratio; time = fastest recorded time over a mile. The reference group for effect estimates is denoted by REF.

Outcome Variable	Predictor Variable	Estimate (OR)	2.5%	97.5%	p-value
Started (yes/no)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.84	0.41	1.71	0.62
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.80	0.36	1.75	0.58
	gender (S)	0.83	0.31	2.32	0.72
Outcome Variable	Predictor Variable	Estimate (IRR)	2.5%	97.5%	p-value
Starts (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.10	0.80	1.52	0.56
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.88	0.62	1.25	0.48
	gender (S)	0.77	0.50	1.21	0.25
Wins (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.73	0.50	1.05	0.11

	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.87	0.57	1.32	0.50
	gender (S)	0.98	0.59	1.63	0.93
	starts	1.15	1.10	1.21	<b>&lt;0.001</b>
	time	0.86	0.81	0.91	<b>&lt;0.001</b>
Top 3 Finishes (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.01	0.92	1.11	0.90
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.05	0.95	1.16	0.38
	gender (S)	1.02	0.89	1.16	0.78
	starts	1.13	1.12	1.15	<b>&lt;0.001</b>
	time	0.97	0.95	0.98	<b>&lt;0.001</b>
Outcome Variable	Predictor Variable	Estimate	2.5%	97.5%	p-value
Earnings (log[\$])	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.45	0.72	2.91	0.30
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	2.21	1.02	4.78	<b>0.04</b>
	gender (S)	1.01	0.39	2.63	0.99
	starts	1.31	1.20	1.42	<b>&lt;0.001</b>
	time	0.68	0.61	0.76	<b>&lt;0.001</b>
Earnings Per Start	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.70	0.84	3.43	0.14

(log[\$])	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.83	0.84	3.99	0.13
	gender (S)	0.81	0.31	2.11	0.66
	time	0.72	0.65	0.81	<b>&lt;0.001</b>
Fastest Time (s)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.15	-0.41	2.70	0.15
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	-0.91	-2.64	0.82	0.30
	gender (S)	-2.16	-4.25	-0.07	<b>0.04</b>
Yearling Sales Price (log[\$])	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.97	0.71	1.33	0.86
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.63	0.45	0.89	<b>0.01</b>
	gender (S)	0.88	0.57	1.37	0.58
	sale	see ANOVA			
	sire				



**Supplementary Item 10:** Yearling Sales Price ANOVA, all pacers (n = 151).

<b>Predictor Variable</b>	<b>Sum of Squares</b>	<b>Degrees of Freedom</b>	<b>F value</b>	<b>Pr(&gt;F)</b>
OC	0.02	1	0.0296	0.86
gender	5.167	2	3.8556	<b>0.02</b>
sale	21.975	4	8.1995	<b>&lt;0.001</b>
sire	21.584	26	1.239	0.22





**Supplementary Item 11:** Multiple regression results for trotters (*short-term performance: pacers and trotters at 2 years of age*). OC = osteochondrosis; G = gelding; M = mare; S = stallion; OR = odds ratio; IRR = incident rate ratio; time = fastest recorded time over a mile. The reference group for effect estimates is denoted by REF.

Outcome Variable	Predictor Variable	Estimate (OR)	2.5%	97.5%	p-value
Started (yes/no)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.62	0.30	1.27	0.20
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.73	0.32	1.64	0.44
	gender (S)	0.51	0.19	1.34	0.18
Outcome Variable	Predictor Variable	Estimate (IRR)	2.5%	97.5%	p-value
Starts	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.82	0.51	1.31	0.41
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.87	0.51	1.49	0.62
	gender (S)	0.93	0.50	1.78	0.83
Wins	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.03	0.85	1.83	0.92
	gender (G)	REF	n/a	n/a	n/a

	gender (M)	0.98	0.52	1.85	0.95
	gender (S)	1.09	0.48	2.41	0.83
	starts	1.15	1.05	1.27	<b>0.01</b>
	time	0.86	0.77	0.96	<b>0.01</b>
Top 3 Finishes	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.19	0.99	1.44	0.08
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.10	0.89	1.37	0.39
	gender (S)	0.91	0.69	1.19	0.50
	starts	1.21	1.17	1.25	<b>&lt;0.001</b>
	time	1.00	0.97	1.07	0.89
<b>Outcome Variable</b>	<b>Predictor Variable</b>	<b>Estimate</b>	<b>2.5%</b>	<b>97.5%</b>	<b>p-value</b>
Earnings	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	2.33	0.57	9.49	0.23
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.51	0.30	7.52	0.61
	gender (S)	1.42	0.18	11.14	0.73
	starts	1.65	1.31	2.08	<b>&lt;0.001</b>
	time	0.82	0.63	1.06	0.12
Earnings Per Start	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	2.07	0.47	9.05	0.32
	gender (G)	REF	n/a	n/a	n/a

	gender (M)	1.28	0.24	6.97	0.77
	gender (S)	4.11	0.54	31.35	0.17
	time	0.71	0.55	0.91	<b>0.01</b>
Fastest Time	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	-1.28	-3.17	0.60	0.18
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	-1.92	-4.03	0.19	0.07
	gender (S)	-1.11	-3.74	1.53	0.40
Yearling Sales Price	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.84	0.62	1.15	0.28
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.74	0.53	1.03	0.08
	gender (S)	1.02	0.67	1.56	0.92
	sale	see ANOVA			
	sire				



**Supplementary Item 12: Yearling Sales Price ANOVA, all trotters (n = 127).**

<b>Predictor Variable</b>	<b>Sum of Squares</b>	<b>Degrees of Freedom</b>	<b>F value</b>	<b>Pr(&gt;F)</b>
OC	0.703	1	1.1994	0.28
gender	2.404	2	2.0511	0.13
sale	18.34	4	7.8243	<b>&lt;0.001</b>
sire	22.756	19	2.0438	<b>0.01</b>



**Supplementary Item 13:** Horses in the OC-affected group had models fit with lesion location and distribution as outcome variables (see Materials and Methods and Supplementary Item 2). DIRT = distal intermediate ridge of the tibia; MM = medial malleolus of the tibia; LTR = lateral trochlear ridge of the talus; bilat = bilateral; G = gelding; M = mare; S = stallion; P = pace; T = trot; OR = odds ratio. The reference group for effect estimates is denoted by REF.

Outcome Variable	Predictor Variable	Estimate (OR)	2.5%	97.5%	p-value
DIRT	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.75	0.31	1.79	0.52
	gender (S)	2.01	0.68	6.55	0.22
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.27	0.11	0.62	<b>0.003</b>
MM	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.15	0.48	2.82	0.75
	gender (S)	0.73	0.25	2.03	0.55
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	5.01	2.27	11.82	<b>&lt;0.001</b>
LTR	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.08	0.46	2.56	0.87
	gender (S)	0.41	0.12	1.23	0.13
	gait (P)	REF	n/a	n/a	n/a

	gait (T)	0.88	0.40	1.95	0.76
Bilat	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.49	0.22	1.11	0.09
	gender (S)	0.78	0.30	2.00	0.60
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.96	0.47	1.96	0.92

Lesion location and distribution were also examined with sire included in the model.



**Supplementary Item 14:** DIRT ANOVA, all OC-affected horses (n = 133).

<b>Predictor Variable</b>	<b>Degrees of Freedom</b>	<b>Deviance</b>	<b>Residual Degrees of Freedom</b>	<b>Residual Deviance</b>	<b>F value</b>	<b>Pr(&gt;F)</b>
NULL			131	160.24		
gender	2	3.133	129	157.10	1.8911	0.16
gait	1	10.053	128	147.05	12.1365	<b>0.001</b>
sire	35	51.112	93	95.94	1.7629	<b>0.016</b>



**Supplementary Item 15:** MM ANOVA, all OC-affected horses (n = 133).

<b>Predictor Variable</b>	<b>Degrees of Freedom</b>	<b>Deviance</b>	<b>Residual Degrees of Freedom</b>	<b>Residual Deviance</b>	<b>F value</b>	<b>Pr(&gt;F)</b>
NULL			131	173.05		
gender	2	0.747	129	172.30	0.3575	0.70
gait	1	17.280	128	155.02	16.5456	<b>&lt;0.001</b>
sire	35	46.314	93	108.71	1.2670	0.18





**Supplementary Item 16:** LTR ANOVA, all OC-affected horses (n = 133).

<b>Predictor Variable</b>	<b>Degrees of Freedom</b>	<b>Deviance</b>	<b>Residual Degrees of Freedom</b>	<b>Residual Deviance</b>	<b>F value</b>	<b>Pr(&gt;F)</b>
NULL			131	156.62		
gender	2	3.528	129	153.09	1.7357	0.18
gait	1	0.098	128	152.99	0.0961	0.76
sire	35	49.914	93	103.08	1.4034	0.10



**Supplementary Item 17:** Bilateral lesion ANOVA, all OC-affected horses (n = 133).

<b>Predictor Variable</b>	<b>Degrees of Freedom</b>	<b>Deviance</b>	<b>Residual Degrees of Freedom</b>	<b>Residual Deviance</b>	<b>F value</b>	<b>Pr(&gt;F)</b>
NULL			132	181.65		
gender	2	3.151	130	178.50	1.3773	0.26
gait	1	0.012	129	178.49	0.0102	0.92
sire	35	42.542	94	135.95	1.0624	0.40



**Supplementary Item 18:** Multiple regression results for *short-term performance: OC-affected horses at 2 years of age*. As all horses in this group were affected with OC, primary predictor variables of interest in this group were specific lesion location (DIRT, MM, LTR) and distribution (bilateral vs. unilateral). Reference states for these binomial predictor variables were unaffected (no) for lesion location and unilateral (bilat [no]) for lesion distribution. The reference group for effect estimates for all other categorical variables is denoted by REF. DIRT = distal intermediate ridge of the tibia; MM = medial malleolus of the tibia; LTR = lateral trochlear ridge of the talus; bilat = bilateral; time = fastest recorded time over a mile; G = gelding; M = mare; S = stallion; P = pace; T = trot; OR = odds ratio; IRR = incident rate ratio.

Outcome Variable	Predictor Variable	Estimate (OR)	2.5%	97.5%	p-value
Started (yes/no)	DIRT (yes)	1.68	0.64	4.53	0.30
	MM (yes)	1.60	0.61	4.45	0.35
	LTR (yes)	0.68	0.27	1.67	0.40
	bilat (yes)	0.50	0.22	1.12	0.10
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.50	0.20	1.19	0.12
	gender (S)	0.55	0.20	1.50	0.25
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.45	0.20	1.02	0.06
Outcome Variable	Predictor Variable	Estimate (IRR)	2.5%	97.5%	p-value
Starts (number)	DIRT (yes)	0.92	0.51	1.67	0.78
	MM (yes)	0.87	0.46	1.67	0.62

	LTR (yes)	0.56	0.32	0.98	<b>0.03</b>
	bilat (yes)	0.60	0.36	1.00	<b>0.03</b>
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.58	0.34	0.97	<b>0.03</b>
	gender (S)	0.47	0.26	0.86	<b>0.01</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.45	0.28	0.73	<b>0.001</b>
Wins (number)	DIRT (yes)	0.81	0.38	1.69	0.58
	MM (yes)	0.96	0.40	2.25	0.93
	LTR (yes)	0.78	0.36	1.66	0.52
	bilat (yes)	1.49	0.82	2.74	0.19
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.11	0.57	2.17	0.76
	gender (S)	0.70	0.30	1.61	0.40
	starts	1.10	1.03	1.19	<b>0.01</b>
	time	0.85	0.78	0.93	<b>0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.72	0.96	3.11	0.08
Top 3 Finishes (number)	DIRT (yes)	1.11	0.94	1.31	0.22
	MM (yes)	1.07	0.89	0.28	0.48
	LTR (yes)	1.06	0.90	1.23	0.51
	bilat (yes)	1.06	0.93	1.20	0.41
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.08	0.94	1.25	0.27

	gender (S)	0.91	0.77	1.08	0.29
	starts	1.12	1.11	1.14	<b>&lt;0.001</b>
	time	0.97	0.95	0.98	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.13	0.99	1.28	0.08
<b>Outcome Variable</b>	<b>Predictor Variable</b>	<b>Estimate</b>	<b>2.5%</b>	<b>97.5%</b>	<b>p-value</b>
Earnings (log[\$])	DIRT (yes)	0.58	-0.68	1.85	0.36
	MM (yes)	0.09	-1.30	1.48	0.89
	LTR (yes)	-0.10	-1.29	1.09	0.86
	bilat (yes)	0.51	-0.46	1.48	0.29
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.62	-0.47	1.70	0.26
	gender (S)	-0.46	-1.77	0.85	0.48
	starts	0.27	0.16	0.39	<b>&lt;0.001</b>
	time	-0.33	-0.46	-0.21	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.53	0.54	2.52	<b>0.003</b>
Earnings Per Start (log[\$])	DIRT (yes)	0.41	-0.91	1.73	0.53
	MM (yes)	-0.28	-1.71	1.15	0.70
	LTR (yes)	-0.64	-1.83	0.55	0.28
	bilat (yes)	0.22	-0.77	1.21	0.65
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.18	-0.90	1.26	0.74

	gender (S)	-0.95	-2.24	0.34	0.14
	time	0.93	-0.03	1.89	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	-0.31	-0.44	-0.18	0.06
Fastest Time (s)	DIRT (yes)	-0.34	-3.57	2.89	0.83
	MM (yes)	-3.00	-6.38	0.37	0.08
	LTR (yes)	-2.57	-5.37	0.23	0.07
	bilat (yes)	0.68	-1.74	3.09	0.58
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	-2.51	-5.04	0.03	0.05
	gender (S)	-3.81	-6.72	-0.90	<b>0.01</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	2.02	-0.24	4.29	0.08
Yearling Sales Price (log[\$])	DIRT (yes)	0.72	0.45	1.14	0.16
	MM (yes)	0.91	0.57	1.45	0.69
	LTR (yes)	1.13	0.70	1.83	0.60
	bilat (yes)	1.21	0.84	1.74	0.31
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.87	0.59	1.30	0.50
	gender (S)	1.12	0.67	1.88	0.65
	sale	see ANOVA			
	sire				





**Supplementary Item 19:** Yearling Sales Price ANOVA, all OC-affected horses (n = 133).

Predictor Variable	Sum of Squares	Degrees of Freedom	F value	Pr(>F)
DIRT (yes)	1.385	1	2.0421	0.16
MM (yes)	0.111	1	0.1644	0.69
LTR (yes)	0.186	1	0.2744	0.60
bilat (yes)	0.709	1	1.045	0.31
gender	0.769	2	0.5665	0.57
sale	13.454	4	4.9586	<b>0.001</b>
sire	30.224	36	1.2377	0.21

*Long-term performance: 2007 horses, 2- through 5-year-old seasons*

Performance outcome variables were examined by race season as well as cumulatively in this group (see Materials and Methods and Supplementary Item 2). The results of the multiple regression model for yearling sales price is reported with the cumulative performance models below. Yearlings in this cohort were sold at one of 4 breed-recognised sales between September and November 2008; one OC-affected horse was not sold and was not included in the analysis of sale price.





**Supplementary Item 20:** Multiple regression results for cumulative performance, 2- through 5-year-old seasons. OC = osteochondrosis; G = gelding; M = mare; S = stallion; P = pace; T = trot; OR = odds ratio; IRR = incident rate ratio; time = fastest recorded time over a mile. The reference group for effect estimates is denoted by REF.

Outcome Variable	Predictor Variable	Estimate (OR)	2.5%	97.5%	p-value
Started (yes/no)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.56	0.16	2.02	0.36
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.09	0.006	0.53	<b>0.03</b>
	gender (S)	0.05	0.003	0.30	<b>0.01</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.34	0.09	1.13	0.09
Outcome Variable	Predictor Variable	Estimate (IRR)	2.5%	97.5%	p-value
Starts (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.96	0.67	1.40	0.82
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.67	0.46	1.00	0.05
	gender (S)	0.66	0.42	1.06	0.08
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.56	0.40	0.80	<b>0.001</b>

Wins (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.76	0.60	0.97	<b>0.03</b>
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.00	0.77	1.29	0.98
	gender (S)	1.18	0.87	1.60	0.28
	starts	1.02	1.01	1.02	<b>&lt;0.001</b>
	time	0.89	0.85	0.93	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.58	1.22	2.04	<b>0.001</b>
Top 3 Finishes (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.93	0.77	1.12	0.45
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.95	0.77	1.17	0.59
	gender (S)	1.11	0.87	1.41	0.41
	starts	1.02	1.02	1.02	<b>&lt;0.001</b>
	time	0.91	0.88	0.94	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.35	1.11	1.65	<b>0.01</b>
Outcome Variable	Predictor Variable	Estimate	2.5%	97.5%	p-value
Earnings (log[\$])	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.82	0.56	1.19	0.29
	gender (G)	REF	n/a	n/a	n/a

	gender (M)	1.61	1.06	2.43	<b>0.03</b>
	gender (S)	1.10	0.67	1.79	0.71
	starts	1.01	1.00	1.02	<b>0.002</b>
	time	0.73	0.69	0.78	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	2.83	1.89	4.22	<b>&lt;0.001</b>
Earnings Per Start (log[\$])	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.87	0.61	1.24	0.43
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.76	1.19	2.59	<b>0.01</b>
	gender (S)	1.18	0.74	1.87	0.48
	time	0.78	0.74	0.82	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	2.69	1.83	3.95	<b>&lt;0.001</b>
Fastest Time (s)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	-0.71	-2.37	0.96	0.40
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	-0.97	-2.76	0.82	0.29
	gender (S)	-1.06	-3.20	1.09	0.33
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	3.55	1.97	5.13	<b>&lt;0.001</b>
Yearling Sales Price	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.91	0.67	1.23	0.55

(log[\$])	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.89	0.64	1.25	0.51
	gender (S)	0.84	0.57	1.23	0.36
	sale	see ANOVA			
	sire				



**Supplementary Item 21:** Yearling Sales Price ANOVA, horses born in 2007 (n = 94).

<b>Predictor Variable</b>	<b>Sum of Squares</b>	<b>Degrees of Freedom</b>	<b>F value</b>	<b>Pr(&gt;F)</b>
OC	0.1375	1	0.3658	0.55
gender	0.3709	2	0.4933	0.61
sale	20.7153	3	18.3694	<b>&lt;0.001</b>
sire	29.5974	24	3.2807	<b>&lt;0.001</b>



**Supplementary Item 22:** Multiple regression results for 2-year-old season. OC = osteochondrosis; G = gelding; M = mare; S = stallion; P = pace; T = trot; OR = odds ratio; IRR = incident rate ratio; time = fastest recorded time over a mile. The reference group for effect estimates is denoted by REF.

Outcome Variable	Predictor Variable	Estimate (OR)	2.5%	97.5%	p-value
Started (yes/no)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.13	0.44	2.99	0.81
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.75	0.27	2.10	0.59
	gender (S)	0.76	0.24	2.50	0.65
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.41	0.16	0.98	0.05
Outcome Variable	Predictor Variable	Estimate (IRR)	2.5%	97.5%	p-value
Starts (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.16	0.69	1.97	0.55
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.82	0.47	1.43	0.47
	gender (S)	0.73	0.40	1.38	0.31
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.55	0.34	0.89	<b>0.01</b>

Wins (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.91	0.45	1.76	0.78
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.96	0.47	1.94	0.90
	gender (S)	1.00	0.46	2.15	1.00
	starts	1.11	1.03	1.20	<b>0.01</b>
	time	0.88	0.81	0.96	<b>0.01</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.32	0.70	2.49	0.39
Top 3 Finishes (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.92	0.63	1.33	0.67
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.07	0.73	1.56	0.73
	gender (S)	1.00	0.65	1.54	0.99
	starts	1.16	1.11	1.20	<b>&lt;0.001</b>
	time	0.96	0.91	1.00	0.08
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.02	0.72	1.45	0.91
<b>Outcome Variable</b>	<b>Predictor Variable</b>	<b>Estimate</b>	<b>2.5%</b>	<b>97.5%</b>	<b>p-value</b>
Earnings (log[\$])	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.40	0.63	3.10	0.39
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.71	0.75	3.88	0.19

	gender (S)	1.15	0.45	2.91	0.76
	starts	1.18	1.09	1.27	<b>&lt;0.001</b>
	time	0.76	0.69	0.84	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	2.24	1.09	4.60	<b>0.03</b>
Earnings Per Start (log[\$])	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.47	0.68	3.17	0.32
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.72	0.78	3.78	0.17
	gender (S)	1.09	0.44	2.71	0.85
	time	0.79	0.72	0.87	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.93	0.95	3.91	0.07
Fastest Time (s)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.49	-1.16	4.15	0.26
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	-0.42	-3.17	2.34	0.76
	gender (S)	-0.66	-3.85	2.53	0.68
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.93	-1.54	3.39	0.45





**Supplementary Item 23:** Multiple regression results for 3-year-old season. OC = osteochondrosis; G = gelding; M = mare; S = stallion; P = pace; T = trot; OR = odds ratio; IRR = incident rate ratio; time = fastest recorded time over a mile. The reference group for effect estimates is denoted by REF.

Outcome Variable	Predictor Variable	Estimate (OR)	2.5%	97.5%	p-value
Started (yes/no)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.44	0.13	1.41	0.17
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.31	0.07	1.21	0.11
	gender (S)	0.17	0.04	0.69	<b>0.02</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.38	0.11	1.14	0.10

Outcome Variable	Predictor Variable	Estimate (IRR)	2.5%	97.5%	p-value
Starts (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.86	0.62	1.22	0.40
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.83	0.58	1.20	0.33
	gender (S)	0.65	0.43	1.00	0.05
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.57	0.41	0.78	<b>0.001</b>

Wins (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.00	0.72	1.37	0.98
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.79	0.55	1.15	0.22
	gender (S)	1.05	0.68	1.30	0.83
	starts	1.05	1.02	1.07	<b>0.001</b>
	time	0.90	0.85	0.95	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.76	1.19	2.61	<b>0.01</b>
Top 3 Finishes (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.32	1.10	1.59	<b>0.004</b>
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.96	0.77	1.19	0.72
	gender (S)	1.24	0.98	1.59	0.09
	starts	1.06	1.04	1.07	<b>&lt;0.001</b>
	time	0.94	0.91	0.97	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.28	1.03	1.59	<b>0.04</b>
<b>Outcome Variable</b>	<b>Predictor Variable</b>	<b>Estimate</b>	<b>2.5%</b>	<b>97.5%</b>	<b>p-value</b>
Earnings (log[\$])	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.31	0.93	1.86	0.12
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.60	1.06	2.40	<b>0.03</b>

	gender (S)	1.04	0.66	1.64	0.86
	starts	1.04	1.01	1.06	<b>0.01</b>
	time	0.76	0.72	0.80	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	2.63	1.74	3.96	<b>&lt;0.001</b>
Earnings Per Start (log[\$])	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.26	0.91	1.74	0.17
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.55	1.06	2.28	<b>0.03</b>
	gender (S)	1.01	0.72	1.67	0.65
	time	0.78	0.74	0.82	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	2.96	2.04	4.29	<b>&lt;0.001</b>
Fastest Time (s)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	-0.43	-2.15	1.30	0.62
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	-2.66	-4.55	-0.77	<b>0.01</b>
	gender (S)	-1.36	-3.54	0.82	0.22
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	3.97	2.33	5.62	<b>&lt;0.001</b>



**Supplementary Item 24:** Multiple regression results for 4-year-old season. OC = osteochondrosis; G = gelding; M = mare; S = stallion; P = pace; T = trot; OR = odds ratio; IRR = incident rate ratio; time = fastest recorded time over a mile. The reference group for effect estimates is denoted by REF.

Outcome Variable	Predictor Variable	Estimate (OR)	2.5%	97.5%	p-value
Started (yes/no)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.81	0.29	2.26	0.69
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.19	0.06	0.58	<b>0.01</b>
	gender (S)	0.34	0.10	1.16	0.09
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.20	0.07	0.50	<b>0.001</b>
Outcome Variable	Predictor Variable	Estimate (IRR)	2.5%	97.5%	p-value
Starts (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	1.05	0.66	1.69	0.85
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.58	0.35	0.97	<b>0.04</b>
	gender (S)	0.73	0.41	1.33	0.29
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.56	0.36	0.88	<b>0.01</b>

Wins (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.77	0.53	1.12	0.18
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.07	0.72	1.61	0.73
	gender (S)	0.95	0.58	1.56	0.84
	starts	1.05	1.03	1.08	<b>&lt;0.001</b>
	time	0.93	0.87	0.93	<b>0.02</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.49	1.00	2.23	0.05
Top 3 Finishes (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.93	0.73	1.18	0.54
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.91	0.69	1.21	0.51
	gender (S)	1.01	0.73	1.40	0.97
	starts	1.07	1.05	1.09	<b>&lt;0.001</b>
	time	0.97	0.93	1.00	0.08
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.13	0.87	1.47	0.38
<b>Outcome Variable</b>	<b>Predictor Variable</b>	<b>Estimate</b>	<b>2.5%</b>	<b>97.5%</b>	<b>p-value</b>
Earnings (log[\$])	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.82	0.37	1.84	0.62
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.18	0.47	2.98	0.72

	gender (S)	0.47	0.16	1.38	0.17
	starts	1.10	1.05	1.15	<b>&lt;0.001</b>
	time	0.78	0.69	0.88	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	3.29	1.40	7.77	<b>0.01</b>
Earnings Per Start (log[\$])	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.76	0.35	1.66	0.49
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.11	0.45	2.73	0.82
	gender (S)	0.42	0.15	1.17	0.10
	time	0.76	0.68	0.85	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	3.02	1.32	6.95	<b>0.01</b>
Fastest Time (s)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	-1.56	-3.57	0.46	0.13
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	-1.40	-3.74	0.94	0.24
	gender (S)	-1.99	-4.63	0.66	0.14
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	3.11	1.12	5.10	<b>0.003</b>



**Supplementary Item 25:** Multiple regression results for 5-year-old season. OC = osteochondrosis; G = gelding; M = mare; S = stallion; P = pace; T = trot; OR = odds ratio; IRR = incident rate ratio; time = fastest recorded time over a mile. The reference group for effect estimates is denoted by REF.

Outcome Variable	Predictor Variable	Estimate (OR)	2.5%	97.5%	p-value
Started (yes/no)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.90	0.33	2.37	0.83
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.21	0.07	0.60	<b>0.01</b>
	gender (S)	0.43	0.13	1.38	0.16
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.36	0.14	0.87	<b>0.03</b>
Outcome Variable	Predictor Variable	Estimate (IRR)	2.5%	97.5%	p-value
Starts (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.94	0.56	1.61	0.83
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.58	0.33	1.02	0.07
	gender (S)	0.57	0.30	1.17	0.10
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	0.55	0.33	0.90	<b>0.02</b>

Wins (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.67	0.45	1.00	0.06
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	1.01	0.63	1.61	0.97
	gender (S)	1.34	0.81	2.24	0.27
	starts	1.05	1.02	1.08	<b>0.001</b>
	time	0.90	0.82	0.98	<b>0.03</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.14	0.90	2.22	0.14
Top 3 Finishes (number)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.92	0.70	1.21	0.54
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.85	0.61	1.18	0.33
	gender (S)	1.07	0.75	1.54	0.71
	starts	1.04	1.02	1.06	<b>&lt;0.001</b>
	time	0.94	0.88	1.00	0.06
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	1.15	0.84	1.58	0.38
Outcome Variable	Predictor Variable	Estimate	2.5%	97.5%	p-value
Earnings (log[\$])	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.77	0.50	1.18	0.23
	gender (G)	REF	n/a	n/a	n/a



	gender (M)	0.77	0.46	1.27	0.29
	gender (S)	0.94	0.54	1.65	0.82
	starts	1.05	1.02	1.08	<b>0.003</b>
	time	0.74	0.67	0.81	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	2.66	1.65	4.29	<b>&lt;0.001</b>
Earnings Per Start (log[\$])	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	0.78	0.52	1.18	0.23
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.81	0.50	1.30	0.36
	gender (S)	0.93	0.57	1.51	0.76
	time	0.74	0.68	0.80	<b>&lt;0.001</b>
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	2.59	1.63	4.10	<b>&lt;0.001</b>
Fastest Time (s)	OC (no)	REF	n/a	n/a	n/a
	OC (yes)	-0.35	-2.15	1.45	0.69
	gender (G)	REF	n/a	n/a	n/a
	gender (M)	0.48	-1.63	2.58	0.65
	gender (S)	-0.17	-2.33	1.99	0.87
	gait (P)	REF	n/a	n/a	n/a
	gait (T)	2.93	1.18	4.69	<b>0.002</b>



**Supplementary Item 26:** Multiple regression results for only radiographed individuals in the 2007 study cohort (n = 32 OC-affected; n= 28 OC-unaffected) for which OC was a significant predictor variable. OC = osteochondrosis; G = gelding; M = mare; S = stallion; P = pace; T = trot; OR = odds ratio; IRR = incident rate ratio; time = fastest recorded time over a mile. The reference group for effect estimates is denoted by REF. The comparable results in the full long-term performance cohort can be found in the tables indicated in the last column.

Outcome Variable	Predictor Variable	Estimate (IRR)	2.5%	97.5%	p-value	Results comparison
Wins at 5 years (number)	OC (no)	REF	n/a	n/a	n/a	Suppl. Item 25
	OC (yes)	0.59	0.37	0.93	<b>0.04</b>	
	gender (G)	REF	n/a	n/a	n/a	
	gender (M)	0.73	0.39	1.38	0.35	
	gender (S)	1.36	0.74	2.50	0.32	
	starts	1.06	1.03	1.10	<b>0.004</b>	
	time	0.88	0.78	1.00	0.07	
	gait (P)	REF	n/a	n/a	n/a	
	gait (T)	1.33	0.69	2.52	0.38	
Top 3 Finishes at 3 years (number)	OC (no)	REF	n/a	n/a	n/a	Suppl. Item 23
	OC (yes)	1.36	1.11	1.68	<b>0.01</b>	
	gender (G)	REF	n/a	n/a	n/a	
	gender (M)	1.15	0.87	1.53	0.33	
	gender (S)	1.34	1.03	1.75	<b>0.04</b>	
	starts	1.06	1.04	1.08	<b>&lt;0.001</b>	
	time	0.96	0.92	0.99	<b>0.03</b>	

	gait (P)	REF	n/a	n/a	n/a	
	gait (T)	1.04	0.79	1.36	0.79	
<b>Outcome Variable</b>	<b>Predictor Variable</b>	<b>Estimate</b>	<b>2.5%</b>	<b>97.5%</b>	<b>p-value</b>	<b>Results comparison</b>
Fastest Time at 4 years (s)	OC (no)	REF	n/a	n/a	n/a	Suppl. Item 24
	OC (yes)	-2.73	-5.06	-0.40	<b>0.02</b>	
	gender (G)	REF	n/a	n/a	n/a	
	gender (M)	-2.88	-5.45	-0.31	<b>0.03</b>	
	gender (S)	-4.60	-7.78	-1.42	<b>0.01</b>	
	gait (P)	REF	n/a	n/a	n/a	
	gait (T)	4.32	2.06	6.58	<b>0.001</b>	