

APPENDIX G-2.
Interaction Tables for the Neurology Assessment

This appendix contains exposure analyses results of interactions between covariates and group or dioxin. Results are presented for separate strata of the covariate and include sample sizes, percent abnormal, relative risks, confidence intervals, and p-values for discrete dependent variables. Sample sizes, adjusted means, differences of adjusted means and confidence intervals or adjusted slopes and standard errors, and p-values are given for continuous dependent variables. Means are transformed back to the original scale, if necessary. Chapter 7, Statistical Methods, provides further details on the analytical approaches used in the interaction analyses. The covariate involved in the interaction and a reference to the analysis table in Chapter 11 are given in the heading of each subtable. A summary of the interactions described in this appendix follows.

Appendix G-2 Table	Chapter 11 Table	Dependent Variable	Model	Covariate
G-2-1	11-4	Hereditary and Degenerative Diseases	2	Occupation
G-2-2	11-5	Peripheral Disorders	4 5 6	Lifetime Alcohol History Lifetime Alcohol History Lifetime Alcohol History
G-2-3	11-7	Smell	3	Insecticide Exposure
G-2-4	11-19	Neck Range of Motion	3	Occupation
G-2-5	11-20	Cranial Nerve Index without Range of Motion	2 3	Age, Diabetic Class Occupation
G-2-6	11-21	Pin Prick	4 5 6	Diabetic Class Diabetic Class Diabetic Class
G-2-7	11-23	Muscle Status	3	Insecticide Exposure
G-2-8	11-24	Patellar Reflex	1 3	Lifetime Alcohol History Lifetime Alcohol History
G-2-9	11-25	Achilles Reflex	2 3	Lifetime Alcohol History Lifetime Alcohol History
G-2-10	11-28	Vibrotactile Threshold Measurement of Right Great Toe	2 3 4 5 6	Composite Exposure to Heavy Metals Lifetime Alcohol History Lifetime Alcohol History, Composite Exposure to Heavy Metals Lifetime Alcohol History, Composite Exposure to Heavy Metals Lifetime Alcohol History, Composite Exposure to Heavy Metals

Appendix G-2 Table	Chapter 11 Table	Dependent Variable	Model	Covariate
G-2-11	11-29	Vibrotactile Threshold Measurement of Left Great Toe	2 4 5 6	Diabetic Class, Composite Exposure to Heavy Metals Lifetime Alcohol History, Diabetic Class, Worked with Vibrating Power Equipment or Tools Lifetime Alcohol History, Worked with Vibrating Power Equipment or Tools Lifetime Alcohol History, Worked with Vibrating Power Equipment or Tools
G-2-12	11-30	Tremor	4	Age
G-2-13	11-33	Gait	2	Age

Table G-2-1.
Interaction Table for Hereditary and Degenerative Diseases

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 11-4)			
Stratum	Initial Dioxin Category Summary Statistics		Analysis Results for Log₂ (Initial Dioxin)
	Initial Dioxin	n	Adjusted Relative Risk (95% C.I.)^a
Officer	Low	76	0.90 (0.18,4.52)
	Medium	34	0.897
	High	1	2.9
Enlisted Flyer	Low	36	0.17 (0.03,0.85)
	Medium	43	0.031
	High	29	0.0
Enlisted Groundcrew	Low	59	1.00 (0.68,1.49)
	Medium	91	0.986
	High	135	5.9

^a Relative risk for a twofold increase in initial dioxin.

Note: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Table G-2-2.
Interaction Table for Peripheral Disorders

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-5)				
Stratum	Current Dioxin Category Summary Statistics		Analysis Results for \log_2 (Current Dioxin + 1)	
	Current Dioxin	n	Percent Yes	
0 Drink-years	Low	17	5.9	1.44 (0.89,2.31) 0.135
	Medium	18	22.2	
	High	24	20.8	
>0-40 Drink-years	Low	204	10.3	1.21 (1.01,1.45) 0.038
	Medium	195	20.0	
	High	190	19.5	
>40 Drink-years	Low	67	22.4	0.82 (0.63,1.07) 0.148
	Medium	78	24.4	
	High	73	15.1	

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-5)				
Stratum	Current Dioxin Category Summary Statistics		Analysis Results for \log_2 (Current Dioxin + 1)	
	Current Dioxin	n	Percent Yes	
0 Drink-years	Low	18	5.6	1.33 (0.87,2.02) 0.188
	Medium	14	21.4	
	High	27	22.2	
>0-40 Drink-years	Low	205	11.7	1.17 (1.00,1.37) 0.048
	Medium	201	17.9	
	High	183	20.2	
>40 Drink-years	Low	68	20.6	0.84 (0.69,1.04) 0.107
	Medium	75	25.3	
	High	75	16.0	

Table G-2-2. (Continued)
Interaction Table for Peripheral Disorders

c) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-5)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for Log₂(Current Dioxin + 1)	
	Current Dioxin	n	Percent		Adjusted Relative Risk (95% C.I.)^a
0 Drink-years	Low	18	5.6	1.36 (0.89,2.08)	0.157
	Medium	14	21.4		
	High	27	22.2		
>0-40 Drink-years	Low	205	11.7	1.20 (1.02,1.41)	0.031
	Medium	201	17.9		
	High	183	20.2		
>40 Drink-years	Low	68	20.6	0.86 (0.70,1.07)	0.168
	Medium	75	25.3		
	High	75	16.0		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = $> 8.1\text{-}20.5$ ppt; High = > 20.5 ppt.
 Models 5 and 6: Low = ≤ 46 ppq; Medium = $> 46\text{-}128$ ppq; High = > 128 ppq.

Table G-2-3.
Interaction Table for Smell

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Insecticide Exposure: Table 11-7)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
No	Comparison	397	0.5		
	Background RH	92	0.0	--	--
	Low RH	51	5.9	11.03 (1.78,68.34)	0.010
	High RH	67	0.0	--	--
	Low plus High RH	118	2.5	5.07 (0.83,30.87)	0.078
Yes	Comparison	665	1.8		
	Background RH	281	2.9	1.57 (0.63,3.93)	0.335
	Low RH	209	0.5	0.25 (0.03,1.93)	0.184
	High RH	190	0.5	0.32 (0.04,2.54)	0.284
	Low plus High RH	399	0.5	0.28 (0.06,1.28)	0.101

^a Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table G-2-4.
Interaction Table for Neck Range of Motion

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Occupation: Table 11-19)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
Officer	Comparison	408	15.0		
	Background RH	236	17.0	1.28 (0.81,2.02)	0.291
	Low RH	103	21.4	1.35 (0.76,2.39)	0.306
	High RH	9	0.0	--	--
	Low plus High RH	112	19.6	1.20 (0.68,2.12)	0.527
Enlisted Flyer	Comparison	173	19.7		
	Background RH	40	2.5	0.13 (0.02,1.00)	0.050
	Low RH	55	12.7	0.54 (0.22,1.34)	0.185
	High RH	55	21.8	0.99 (0.46,2.15)	0.978
	Low plus High RH	110	17.3	0.76 (0.40,1.44)	0.398
Enlisted Groundcrew	Comparison	481	9.4		
	Background RH	97	9.3	0.90 (0.41,2.00)	0.799
	Low RH	102	11.8	1.11 (0.54,2.29)	0.778
	High RH	192	12.0	1.56 (0.88,2.75)	0.128
	Low plus High RH	294	11.9	1.37 (0.83,2.26)	0.212

^a Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table G-2-5.
Interaction Table for Cranial Nerve Index without Range of Motion

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Age: Table 11-20)				
Initial Dioxin Category Summary Statistics			Analysis Results for \log_2 (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a
Born \geq 1942	Low	55	7.3	0.98 (0.60,1.59) 0.922
	Medium	72	1.4	
	High	109	4.6	
Born < 1942	Low	119	5.0	1.26 (0.83,1.90) 0.280
	Medium	100	3.0	
	High	60	10.0	

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Diabetic Class: Table 11-20)				
Initial Dioxin Category Summary Statistics			Analysis Results for \log_2 (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a
Normal	Low	120	3.3	1.80 (1.16,2.78) 0.008
	Medium	117	0.0	
	High	108	7.4	
Impaired	Low	22	4.6	0.74 (0.29,1.92) 0.538
	Medium	24	4.2	
	High	28	3.6	
Diabetic	Low	32	15.6	0.66 (0.36,1.23) 0.194
	Medium	31	9.7	
	High	33	6.1	

Table G-2-5. (Continued)
Interaction Table for Cranial Nerve Index without Range of Motion

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Occupation: Table 11-20)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^b	p-Value
Officer	Comparison	406	3.9		
	Background RH	236	2.5	0.61 (0.23,1.60)	0.316
	Low RH	102	6.9	1.50 (0.59,3.81)	0.392
	High RH	9	0.0	--	--
Enlisted Flyer	Comparison	173	4.1		
	Background RH	40	2.5	0.70 (0.08,5.91)	0.741
	Low RH	55	5.5	1.10 (0.27,4.48)	0.891
	High RH	55	0.0	--	--
Enlisted Groundcrew	Comparison	478	2.5		
	Background RH	95	9.5	3.63 (1.44,9.10)	0.006
	Low RH	102	3.9	1.42 (0.44,4.55)	0.553
	High RH	192	5.7	2.43 (1.04,5.67)	0.040
	Low plus High RH	294	5.1	2.05 (0.93,4.48)	0.074

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-2-6.
Interaction Table for Pin Prick

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Diabetic Class: Table 11-21)				
Stratum	Current Dioxin Category Summary Statistics		Analysis Results for \log_2 (Current Dioxin + 1) Adjusted Relative Risk (95% C.I.) ^a	
	Current Dioxin	n	Percent Abnormal	
Normal	Low	234	3.0	1.01 (0.71,1.43) 0.950
	Medium	208	7.2	
	High	186	1.6	
Impaired	Low	25	4.0	0.64 (0.34,1.19) 0.156
	Medium	29	10.3	
	High	46	8.7	
Diabetic	Low	25	0.0	2.08 (1.23,3.52) 0.006
	Medium	47	12.8	
	High	51	15.7	

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Diabetic Class: Table 11-21)				
Stratum	Current Dioxin Category Summary Statistics		Analysis Results for \log_2 (Current Dioxin + 1) Adjusted Relative Risk (95% C.I.) ^a	
	Current Dioxin	n	Percent Abnormal	
Normal	Low	246	4.1	1.03 (0.76,1.38) 0.867
	Medium	202	5.0	
	High	180	2.8	
Impaired	Low	21	4.8	0.68 (0.39,1.20) 0.186
	Medium	32	9.4	
	High	47	8.5	
Diabetic	Low	24	0.0	1.78 (1.15,2.77) 0.010
	Medium	45	13.3	
	High	54	14.8	

Table G-2-6. (Continued)
Interaction Table for Pin Prick

c) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Diabetic Class: Table 11-21)				
Stratum	Current Dioxin Category Summary Statistics		Analysis Results for Log₂ (Current Dioxin + 1) Adjusted Relative Risk (95% C.I.)^a	
	Current Dioxin	n	Percent Abnormal	
Normal	Low	245	4.1	1.05 (0.77,1.43) 0.778
	Medium	202	5.0	
	High	180	2.8	
Impaired	Low	21	4.8	0.70 (0.40,1.24) 0.220
	Medium	32	9.4	
	High	47	8.5	
Diabetic	Low	24	0.0	1.89 (1.18,3.01) 0.008
	Medium	45	13.3	
	High	54	14.8	

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = $> 8.1\text{-}20.5$ ppt; High = > 20.5 ppt.
 Models 5 and 6: Low = ≤ 46 ppq; Medium = $> 46\text{-}128$ ppq; High = > 128 ppq.

Table G-2-7.
Interaction Table for Muscle Status

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Insecticide Exposure: Table 11-23)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
No	Comparison	397	2.5		
	Background RH	92	0.0	--	--
	Low RH	51	3.9	1.65 (0.35,7.85)	0.526
	High RH	67	6.0	3.09 (0.93,10.32)	0.066
	Low plus High RH	118	5.1	2.40 (0.84,6.82)	0.101
Yes	Comparison	665	2.6		
	Background RH	281	4.3	1.47 (0.69,3.15)	0.319
	Low RH	209	2.9	1.18 (0.46,3.06)	0.729
	High RH	190	2.1	1.02 (0.33,3.09)	0.979
	Low plus High RH	399	2.5	1.11 (0.50,2.46)	0.802

^a Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table G-2-8.
Interaction Table for Patellar Reflex

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Lifetime Alcohol History: Table 11-24)						
Stratum	Occupational Category	Group	n	Percent Abnormal	Adj. Relative Risk (95% C.I.)	p-Value
<i>0 Drink-years</i>	All	Ranch Hand	63	4.8	<i>4.10 (0.40,42.46)</i>	<i>0.236</i>
		Comparison	71	1.4		
<i>>0-40 Drink-years</i>	All	Ranch Hand	625	1.0	<i>0.49 (0.19,1.29)</i>	<i>0.148</i>
		Comparison	854	1.9		
<i>>40 Drink-years</i>	All	Ranch Hand	235	0.9	<i>0.13 (0.03,0.59)</i>	<i>0.008</i>
		Comparison	328	4.6		
<i>0 Drink-years</i>	Officer	Ranch Hand	14	0.0	--	--
		Comparison	24	4.2	--	--
		Enlisted Flyer	Ranch Hand	14	7.1	--
			Comparison	12	0.0	--
	Enlisted Groundcrew	Ranch Hand	35	5.7	--	--
			Comparison	35	0.0	--
		Officer	Ranch Hand	252	0.4	<i>0.21 (0.04,1.09)</i>
			Comparison	340	2.1	
	Enlisted Flyer	Ranch Hand	95	0.0	--	--
			Comparison	122	0.8	--
		Enlisted Groundcrew	Ranch Hand	278	1.8	<i>0.83 (0.28,2.50)</i>
			Comparison	392	2.0	
<i>>40 Drink-years</i>	Officer	Ranch Hand	96	2.1	<i>0.12 (0.02,0.68)</i>	<i>0.017</i>
			Comparison	127	5.5	
		Enlisted Flyer	Ranch Hand	47	0.0	--
			Comparison	65	9.2	--
	Enlisted Groundcrew	Ranch Hand	92	0.0	--	--
			Comparison	136	1.5	--

Table G-2-8. (Continued)
Interaction Table for Patellar Reflex

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 11-24)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
0 Drink-years	Comparison	54	1.9		
	Background RH	20	0.0	--	--
	Low RH	15	6.7	7.04 (0.38,129.89)	0.190
	High RH	24	4.2	4.52 (0.22,92.99)	0.328
	Low plus High RH	39	5.1	5.53 (0.42,76.66)	0.196
>0-40 Drink-years	Comparison	706	2.0		
	Background RH	257	0.4	0.20 (0.03,1.55)	0.123
	Low RH	170	0.6	0.22 (0.03,1.73)	0.149
	High RH	162	2.5	1.29 (0.38,4.38)	0.684
	Low plus High RH	332	1.5	0.65 (0.20,2.09)	0.472
>40 Drink-years	Comparison	280	4.6		
	Background RH	86	0.0	--	0.823
	Low RH	69	2.9	0.41 (0.01,12.37)	0.606
	High RH	64	0.0	--	0.527
	Low plus High RH	133	1.5	0.23 (0.05,1.10)	0.066

^a Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-2-9.
Interaction Table for Achilles Reflex

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Lifetime Alcohol History: Table 11-25)					
Stratum	Initial Dioxin Category Summary Statistics			Analysis Results for Log₂ (Initial Dioxin)	
	Initial Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
0 Drink-years	Low	10	0.0	1.85 (0.96,3.59)	0.068
	Medium	12	16.7		
	High	17	29.4		
>0-40 Drink-years	Low	118	10.2	0.98 (0.73,1.33)	0.901
	Medium	108	13.0		
	High	105	6.7		
>40 Drink-years	Low	42	14.3	0.86 (0.52,1.44)	0.573
	Medium	48	4.2		
	High	43	7.0		

Table G-2-9. (Continued)
Interaction Table for Achilles Reflex

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 11-25)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^b	p-Value
0 Drink-years	Comparison	54	7.4		
	Background RH	20	0.0	--	--
	Low RH	15	6.7	0.95 (0.10,9.35)	0.962
	High RH	24	25.0	4.67 (1.14,19.21)	0.033
	Low plus High RH	39	18.0	2.97 (0.78,11.29)	0.109
>0-40 Drink-years	Comparison	705	8.1		
	Background RH	257	8.6	1.04 (0.61,1.76)	0.894
	Low RH	169	10.7	1.10 (0.61,1.96)	0.754
	High RH	162	9.3	1.27 (0.68,2.36)	0.459
	Low plus High RH	331	10.0	1.17 (0.73,1.87)	0.514
>40 Drink-years	Comparison	281	11.7		
	Background RH	86	12.8	1.18 (0.56,2.51)	0.668
	Low RH	69	11.6	0.80 (0.34,1.89)	0.616
	High RH	64	4.7	0.35 (0.10,1.22)	0.101
	Low plus High RH	133	8.3	0.59 (0.28,1.24)	0.168

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-2-10.
Interaction Table for Vibrotactile Threshold Measurement of Right Great Toe (microns)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Composite Exposure to Heavy Metals: Table 11-28)					
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin)		
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	142	17.23	-0.0256 (0.0455)	0.575
	Medium	140	22.19		
	High	129	16.24		
Yes	Low	29	14.35	0.2556 (0.0828)	0.002
	Medium	27	21.62		
	High	36	28.20		

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 11-28)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d
0 Drink-years	Comparison	54	12.09		
	Background RH	20	15.19	3.09 --	0.414
	Low RH	15	17.04	4.95 --	0.266
	High RH	24	21.94	9.85 --	0.026
	Low plus High RH	39	20.06	7.97 --	0.028
>0-40 Drink-years	Comparison	705	17.83		
	Background RH	259	14.39	-3.44 --	0.007
	Low RH	169	18.43	0.60 --	0.716
	High RH	162	17.09	-0.74 --	0.658
	Low plus High RH	331	17.78	-0.05 --	0.959
>40 Drink-years	Comparison	281	17.58		
	Background RH	86	22.81	5.23 --	0.049
	Low RH	69	14.45	-3.13 --	0.170
	High RH	64	20.75	3.17 --	0.269
	Low plus High RH	133	17.48	-0.10 --	0.845

Table G-2-10. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Right Great Toe (microns)

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-28)					
Current Dioxin Category Summary Statistics				Analysis Results for \log_2 (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	17	14.52	0.1145 (0.0870)	0.189
	Medium	18	16.07		
	High	24	25.93		
>0-40 Drink-years	Low	205	14.04	0.0535 (0.0353)	0.130
	Medium	196	18.53		
	High	189	17.54		
>40 Drink-years	Low	68	21.02	-0.0684 (0.0519)	0.188
	Medium	78	19.11		
	High	73	18.98		

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Composite Exposure to Heavy Metals: Table 11-28)					
Current Dioxin Category Summary Statistics				Analysis Results for \log_2 (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	254	15.62	-0.0054 (0.0318)	0.864
	Medium	246	18.54		
	High	235	16.90		
Yes	Low	36	13.06	0.1939 (0.0644)	0.003
	Medium	46	16.32		
	High	51	24.21		

Table G-2-10. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Right Great Toe (microns)

e) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-28)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)	
	Current Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
0 Drink-years	Low	18	16.23	0.0893 (0.0723)	0.217
	Medium	14	15.24		
	High	27	23.50		
>0-40 Drink-years	Low	207	13.72	0.0521 (0.0304)	0.087
	Medium	200	19.05		
	High	183	17.48		
>40 Drink-years	Low	69	21.43	-0.0630 (0.0428)	0.141
	Medium	75	19.07		
	High	75	18.71		

f) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Composite Exposure to Heavy Metals: Table 11-28)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)	
	Current Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
No	Low	259	15.20	-0.0000 (0.0269)	0.999
	Medium	244	18.75		
	High	232	17.00		
Yes	Low	35	14.18	0.1495 (0.0562)	0.008
	Medium	45	16.72		
	High	53	21.95		

Table G-2-10. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Right Great Toe (microns)

g) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-28)					
Current Dioxin Category Summary Statistics				Analysis Results for \log_2 (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	18	16.29	0.0865 (0.0730)	0.236
	Medium	14	15.27		
	High	27	23.59		
>0-40 Drink-years	Low	206	13.86	0.0442 (0.0323)	0.171
	Medium	200	19.12		
	High	183	17.58		
>40 Drink-years	Low	69	21.51	-0.0660 (0.0438)	0.132
	Medium	75	19.13		
	High	75	18.77		

h) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Composite Exposure to Heavy Metals: Table 11-28)					
Current Dioxin Category Summary Statistics				Analysis Results for \log_2 (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	259	15.22	-0.0013 (0.0283)	0.962
	Medium	244	18.78		
	High	232	17.03		
Yes	Low	34	14.77	0.1356 (0.0604)	0.026
	Medium	45	16.69		
	High	53	21.99		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of vibrotactile threshold measurement of right toe versus \log_2 dioxin.

^c Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = \leq 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = \leq 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table G-2-11.
Interaction Table for Vibrotactile Threshold Measurement of Left Great Toe (microns)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Diabetic Class: Table 11-29)				
Initial Dioxin Category Summary Statistics				Analysis Results for \log_2 (Initial Dioxin)
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b
Normal	Low	120	17.52	-0.0302 (0.0465)
	Medium	117	16.77	
	High	108	15.48	
Impaired	Low	22	11.38	0.2082 (0.0898)
	Medium	24	25.16	
	High	28	26.95	
Diabetic	Low	31	20.21	-0.0260 (0.0743)
	Medium	31	18.04	
	High	34	16.22	

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Composite Exposure to Heavy Metals: Table 11-29)				
Initial Dioxin Category Summary Statistics				Analysis Results for \log_2 (Initial Dioxin)
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b
No	Low	144	17.71	-0.0280 (0.0410)
	Medium	144	17.91	
	High	134	15.84	
Yes	Low	29	15.50	0.1622 (0.0815)
	Medium	28	20.22	
	High	36	24.91	

Table G-2-11. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Left Great Toe (microns)

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-29)					
Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)		
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	17	22.79	-0.0077 (0.0859)	0.929
	Medium	18	15.46		
	High	24	21.44		
>0-40 Drink-years	Low	205	15.44	0.0542 (0.0349)	0.121
	Medium	196	20.06		
	High	189	18.65		
>40 Drink-years	Low	68	21.74	-0.0482 (0.0512)	0.346
	Medium	78	21.23		
	High	73	20.25		

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Diabetic Class: Table 11-29)					
Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)		
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Normal	Low	235	16.69	0.0033 (0.0336)	0.922
	Medium	205	20.16		
	High	187	16.65		
Impaired	Low	27	14.26	0.1940 (0.0742)	0.009
	Medium	31	13.46		
	High	47	30.38		
Diabetic	Low	28	17.55	-0.0097 (0.0602)	0.872
	Medium	56	20.54		
	High	52	18.13		

Table G-2-11. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Left Great Toe (microns)

e) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED
(Current Dioxin-by-Worked with Vibrating Power Equipment or Tools: Table 11-29)

Current Dioxin Category Summary Statistics				Analysis Results for \log_2 (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	232	17.79	-0.0208 (0.0339)	0.540
	Medium	223	20.20		
	High	201	17.21		
Yes	Low	58	14.68	0.1184 (0.0485)	0.015
	Medium	69	18.87		
	High	85	23.27		

f) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED
(Current Dioxin-by-Lifetime Alcohol History: Table 11-29)

Current Dioxin Category Summary Statistics				Analysis Results for \log_2 (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	18	20.10	-0.0042 (0.0711)	0.953
	Medium	14	17.72		
	High	27	19.85		
>0-40 Drink-years	Low	208	15.00	0.0502 (0.0296)	0.090
	Medium	200	19.14		
	High	183	18.69		
>40 Drink-years	Low	69	21.57	-0.0520 (0.0419)	0.215
	Medium	75	20.35		
	High	75	19.61		

g) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED
(Current Dioxin-by-Worked with Vibrating Power Equipment or Tools: Table 11-29)

Current Dioxin Category Summary Statistics				Analysis Results for \log_2 (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	241	17.21	-0.0186 (0.0283)	0.511
	Medium	214	19.51		
	High	201	16.99		
Yes	Low	54	13.92	0.0941 (0.0406)	0.021
	Medium	75	18.34		
	High	84	23.05		

Table G-2-11. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Left Great Toe (microns)

b) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-29)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)	
	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	18	19.89	-0.0021 (0.0719)	0.977
	Medium	14	17.62		
	High	27	19.97		
>0-40 Drink-years	Low	207	14.91	0.0525 (0.0317)	0.098
	Medium	200	19.13		
	High	183	18.82		
>40 Drink-years	Low	69	21.43	-0.0500 (0.0430)	0.245
	Medium	75	20.31		
	High	75	19.76		

i) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Worked With Vibrating Power Equipment or Tools: Table 11-29)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)	
	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	241	17.11	-0.0172 (0.0302)	0.568
	Medium	214	19.49		
	High	201	17.08		
Yes	Low	53	13.87	0.0982 (0.0428)	0.022
	Medium	75	18.31		
	High	84	23.13		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of vibrotactile threshold measurement of left great toe versus \log_2 dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table G-2-12.
Interaction Table for Tremor

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Age: Table 11-30)				
Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a
Born ≥ 1942	Low	97	4.1	0.66 (0.42,1.02) 0.060
	Medium	95	3.2	
	High	164	1.8	
Born < 1942	Low	193	3.1	1.36 (0.89,2.08) 0.160
	Medium	197	0.0	
	High	123	5.7	

^a Relative risk for a twofold increase in current dioxin.

Table G-2-13.
Interaction Table for Gait

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Age: Table 11-33)					
Stratum	Initial Dioxin	Initial Dioxin Category Summary Statistics		Analysis Results for Log ₂ (Initial Dioxin)	
		n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Born ≥ 1942	Low	54	3.7	0.62 (0.33,1.16)	0.136
	Medium	71	5.6		
	High	106	0.9		
Born < 1942	Low	117	2.6	1.65 (1.05,2.61)	0.031
	Medium	97	0.0		
	High	59	11.9		

^a Relative risk for a twofold increase in initial dioxin.