

Night work and differential effects on diurnal rhythms of cortisol, melatonin, and testosterone among permanent night-working men¹

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1. Supplementary material
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	Sensitivity Analysis 1 ^a		Sensitivity Analysis 2 ^b		Sensitivity Analysis 3 ^c		Sensitivity Analysis 4 ^d	
	Model 1 ^e	Model 2 ^f	Model 1 ^e	Model 2 ^f	Model 1 ^e	Model 2 ^f	Model 1 ^e	Model 2 ^f
Cortisol	0.196	0.0004	0.200	0.0002	0.202	0.001	0.880	0.0001
Melatonin	0.446	0.529	0.437	0.122	0.292	0.121	0.356	0.182
Testosterone	0.973	0.0001	0.465	0.007	0.817	0.003	0.314	0.029

Supplementary table S1: P-values from sensitivity analyses of main analyses of interaction effects between day and time slot at concentration level

^aSensitivity Analysis 1: Excluding measurements of hormones below limit of detection.

^bSensitivity Analysis 2: With adjustment for time of sampling as a continuous variable.

^cSensitivity Analysis 3: With adjustment for self-reported diurnal type.

^dSensitivity Analysis 4: With exclusion of 4-h time slots with few samples due to sleep, i.e., time slots centered around the scheduled 03:00 for days off and 11:00 for days with night work.

^eModel 1: Difference between the 2nd and 4th night shift.

^fModel 2: Difference between days with night work and days off.

All models are adjusted for age.

		2nd night shift		4th night shift		Day off		P value	
		Mean	SD	Mean	SD	Mean	SD	Model 1 ^a	Model 2 ^b
Acrophase^c	Cortisol (hh:mm)	14:00	04:44	12:53	05:45	12:08	06:37	0.900	0.209
	Melatonin (hh:mm)	10:11	06:20	11:15	05:24	12:57	07:03	0.478	0.321
	Testosterone (hh:mm)	12:17	04:37	13:25	04:01	10:07	05:21	0.303	0.028
Amplitude	Cortisol (nmol/L)	2.1	1.8	3.3	1.8	2.1	1.4	0.037	0.124
	Melatonin (pmol/L)	29	29	46	71	14	15	0.231	0.276
	Testosterone (pmol/L)	86	95	87	66	119	144	0.887	0.072
Mesor	Cortisol (nmol/L)	3.5	1.3	4.8	2.0	3.2	1.0	0.024	0.041
	Melatonin (pmol/L)	27	20	36	49	17	10	0.405	0.322
	Testosterone (pmol/L)	154	106	140	75	160	83	0.285	0.291

Supplementary table S2: Results from sensitivity analyses of cosinor measures, where all participants with a minimum of 3 saliva samples were eligible for cosinor analysis.

^a Model 1: Difference between the 2nd and 4th night shift.

^b Model 2: Difference between days with night work and days off.

^c Acrophase is represented as time relative to midnight, and all models are adjusted for age.

		2nd night shift		4th night shift		Day off		P value	
		Mean	SD	Mean	SD	Mean	SD	Model 1 ^a	Model 2 ^b
Acrophase^c	Cortisol (hh:mm)	14:18	04:42	12:29	06:15	10:03	05:24	0.379	0.095
	Melatonin (hh:mm)	09:47	06:08	11:42	05:52	13:39	07:12	0.309	0.015
	Testosterone (hh:mm)	12:41	04:25	13:16	03:43	10:04	05:00	0.880	0.075
Amplitude	Cortisol (nmol/L)	2.1	1.8	3.2	1.8	2.2	1.4	0.446	0.133
	Melatonin (pmol/L)	23	25	35	55	11	10	0.682	0.127
	Testosterone (pmol/L)	87	97	71	64	112	129	0.984	0.819
Mesor	Cortisol (nmol/L)	3.4	1.3	4.6	2.0	3.2	1.0	0.911	0.040
	Melatonin (pmol/L)	24	19	28	27	17	10	0.457	0.124
	Testosterone (pmol/L)	152	109	121	67	161	90	0.182	0.681

Supplementary table S3: Results from sensitivity analyses of cosinor measures, where participants with a minimum of 5 saliva samples were eligible for cosinor analysis.

^a Model 1: Difference between the 2nd and 4th night shift.

^b Model 2: Difference between days with night work and days off.

^c Acrophase is represented as time relative to midnight, and all models are adjusted for age.

		2nd night shift		4th night shift		Day off		P value	
		Mean	SD	Mean	SD	Mean	SD	Model 1 ^a	Model 2 ^b
Acrophase^c	Cortisol (hh:mm)	14:01	05:09	13:44	04:13	12:46	05:41	0.220	0.997
	Melatonin (hh:mm)	09:14	06:13	11:38	06:07	12:55	08:38	0.603	0.256
	Testosterone (hh:mm)	14:54	01:37	13:43	03:37	09:01	04:10	-	0.014
Amplitude	Cortisol (nmol/L)	2.2	1.1	2.9	1.1	2.0	1.1	-	0.138
	Melatonin (pmol/L)	27	14	30	23	22	14	0.888	0.980
	Testosterone (pmol/L)	105	61	74	58	71	39	0.001	0.673
Mesor	Cortisol (nmol/L)	3.0	0.9	4.2	1.0	2.8	1.0	0.207	0.086
	Melatonin (pmol/L)	26	14	30	22	28	9.9	0.808	0.150
	Testosterone (pmol/L)	145.3	60	123.3	52.7	156.9	49.7	0.001	0.323

Supplementary table S4: Results from sensitivity analyses of cosinor measures, where participants were included if $p < 0.20$ for the comparison between the linear model and the null model using an ANOVA in the cosinor analyses.

^a Model 1: Difference between the 2nd and 4th night shift.

^b Model 2: Difference between days with night work and days off.

^c Acrophase is represented as time relative to midnight, and all models are adjusted for age.

P-values are not reported for model 1 with the acrophase of testosterone and the amplitude of cortisol as outcome, since the estimation of parameters did not converge.