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Night shift work and other determinants of estradiol, testosterone, and DHEAs in middle-aged nurses and midwives¹

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1 Supplementary material

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Table S1. Adjusted geometric mean serum concentrations of sex hormones (and 95% confidence intervals) by rotating night shift work characteristics among premenopausal nurses and midwives (Model basic + BMI, smoking and total physical activity).

		Adjusted ^a geometric mean (95%CI)								
Characteristics	N	Estradiol (pg/ml)			Testosterone (ng/ml)			DHEAs (µg/dl)		
		mean	95%CI	P-trend	mean	95%CI	P-trend	mean	95%CI	P-trend
Current day workers (reference)	154	115.4	97.8-133.0	0.400	0.23	0.21-0.25	0.258	145.2	132.7-157.6	0.445
Night shift workers	191	105.6	91.3-119.9		0.25	0.23-0.27		151.9	140.4-163.4	

Frequency of NSW										
Day workers (reference)	154	115.5	97.9-133.1	0.166	0.23	0.21-0.25	0.324	145.3	132.8-157.8	0.920
2-7 per month	172	109.2	93.7-124.6		0.25	0.23-0.27		154.8	142.6-167.1	
≥8 per month	19	76.4	43.8-109.0		0.25	0.19-0.31		126.8	96.4-157.1	
Duration of NSW(yr)										
≤ 5 (reference)	40	110.0	77.3-142.6	0.629	0.22	0.19-0.26	0.157	143.1	119.4-168.8	0.296
>5 - ≤ 15	78	110.3	87.2-133.5		0.24	0.21-0.27		145.9	128.6-163.1	
>15 - ≤ 25	153	104.3	88.4-120.3		0.24	0.22-0.26		147.6	135.0-160.3	
>25	74	124.6	93.9-155.3		0.27	0.23-0.30		159.6	137.7-181.5	
^a Adjusted for - Estradiol: age (continuous), menstrual cycle phase (follicular, mid cycle, and luteal), BMI (continuous), smoking (non-smoker, past, current), and total physical activity (continuous) - Testosterone: age (continuous), time of blood collection (continuous), BMI (continuous), sleep quality (continuous), smoking (non-smoker, past, current), and total physical activity (continuous) - DHEAS: age (continuous), BMI (continuous), sleep quality (continuous), smoking (non-smoker, past, current), and total physical activity (continuous)										

Table S2. Adjusted geometric mean serum concentrations of sex hormones (and 95% confidence intervals) by rotating night shift work characteristics among postmenopausal nurses and midwives (Model basic + BMI, smoking and total physical activity).

		Adjusted ^a geometric mean (95%CI)								
Characteristics	N	Estradiol (pg/ml)			Testosterone (ng/ml)			DHEAs (µg/dl)		
		mean	95%CI	P-trend	mean	95%CI	P-trend	mean	95%CI	P-trend
Current day workers (reference)	115	19.8	16.4-23.1	0.915	0.17	0.14-0.20	0.637	94.8	82.9-106.7	0.256
Night shift workers	72	20.0	15.9-24.2		0.16	0.13-0.19		106.8	90.1-123.6	
Frequency of NSW										
Day workers (reference)	115	19.7	16.4-23.1	0.766	0.17	0.14-0.20	0.852	94.7	82.8-106.6	0.224
2-7 per month	60	19.6	15.2-24.0		0.16	0.13-0.19		105.3	87.5-123.1	

≥8 per month	12	22.6	11.0-34.3		0.18	0.10-0.26		115.6	70.8-160.5	
Duration of NSW(yr)										
≤ 5 (reference)	27	14.0	9.4-18.5	0.067	0.16	0.11-0.21	0.750	83.9	62.7-105.0	0.068
>5 - ≤ 15	51	19.1	14.5-23.8		0.17	0.13-0.20		96.9	79.1-114.7	
>15 - ≤ 25	41	24.5	18.0-31.0		0.16	0.12-0.19		93.7	74.8-112.6	
>25	68	20.6	16.3-25.0		0.17	0.14-0.21		112.2	94.1-130.3	
^a Adjusted for - Estradiol: age (continuous), age at menopause (continuous), BMI (continuous), smoking (non-smoker, past, current), and total physical activity (continuous) - Testosterone: age (continuous), time of blood collection (continuous), recreational activity (none vs. any), BMI (continuous), smoking (non-smoker, past, current), and total physical activity (continuous) - DHEAS: age (continuous), season when blood samples were collected (October-March vs. April-September), BMI (continuous), smoking (non-smoker, past, current), and total physical activity (continuous)										

Table S3. Adjusted^a geometric mean serum concentrations of estradiol (and 95% confidence intervals) by rotating night shift work characteristics and chronotype among postmenopausal nurses and midwives.

Night work characteristics	Larks N = 92			Owls N = 95		
	mean (pg/ml)	95%CI	P-trend	mean (pg/ml)	95%CI	P-trend
Current day workers	18.2	14.4-22.1	0.019	20.3	15.4-25.2	0.181
Night shift workers	27.7	20.2-35.1		15.6	11.1-20.2	
P - hetetogeneity	0.0061					
Frequency of night shifts per month						
Day workers	18.3	14.4-22.1	0.012	20.3	15.4-25.2	0.198
2-7 per month	26.0	18.3-33.8		15.8	10.7-20.8	
≥8 per month	36.5	13.2-59.8		14.9	3.8-26.0	

P - hetetogeneity	0.0199					
Duration of night shift work (years)						
≤ 5	12.1	6.7-17.6	<0.001	15.4	8.5-22.4	0.493
>5 - ≤ 15	14.6	10.2-19.1		23.7	15.3-32.1	
>15 - ≤ 25	25.8	18.5-33.1		20.5	10.6-30.4	
>25	29.4	21.4-37.5		15.7	11.1-20.3	
P - hetetogeneity	0.0027					
^a Adjusted for age (continuous), age at menopause (continuous)						