

**Supplementary table 1.** Baseline Characteristics of the Main Analytical sample, Men who were Lost to Follow-Up and Men who died during follow-up

Parameter	Baseline			P
	Analytical sample	Lost to follow-up	Death	
N	1942	407	168	
Age, years	58.3 ±10.5	60.4 ±12.1 <sup>a</sup>	69.1 ±8.4 <sup>ab</sup>	<.001
Smoking, n (%)	398 (20.7)	110 (27.2) <sup>a</sup>	49 (29.9) <sup>a</sup>	0.001
Frequent Alcohol, n (%)	481 (24.9)	89 (22.2)	30 (18.3)	0.108
Chronic widespread pain, n (%)	152 (8.2)	44 (11.6)	10 (6.8)	0.068
Poor health, n (%)	393 (20.4)	142 (35.8) <sup>a</sup>	90 (54.9) <sup>ab</sup>	<.001
≥1 illness, n (%)	739 (38.1)	190 (46.7) <sup>a</sup>	132 (78.6) <sup>ab</sup>	<.001
≥2 illnesses, n (%)	287 (19.3)	91 (29.6) <sup>a</sup>	78 (68.4) <sup>ab</sup>	<.001
Diabetes, n (%)	107 (5.6)	36 (9.1) <sup>a</sup>	28 (17.3) <sup>ab</sup>	<.001
CVD, n (%)	576 (30.1)	141 (35.6)	98 (60.5) <sup>ab</sup>	<.001
Cancer, n (%)	82 (4.2)	17 (4.2)	23 (13.8) <sup>ab</sup>	<.001
Prostate disease, n (%)	168 (8.8)	41 (10.4)	30 (18.5) <sup>ab</sup>	<.001
Overall Sexual Function	22.1 ±6.6	20.8 ±7.5 <sup>a</sup>	14.6 ±7.5 <sup>ab</sup>	<.001
SF-36 physical	51.1 ±7.5	49.1 ±8.4 <sup>a</sup>	44.9 ±9.2 <sup>ab</sup>	<.001
Beck's Depression Inventory	6.4 ±6.0	7.6 ±6.9 <sup>a</sup>	10.7 ±8.6 <sup>ab</sup>	<.001
SF-36 mental	52.0 ±8.7	50.4 ±10.3 <sup>a</sup>	47.5 ±11.2 <sup>ab</sup>	<.001
DSST	28.9 ±8.4	25.0 ±9.2 <sup>a</sup>	20.5 ±8.4 <sup>ab</sup>	<.001
PASE score	206.9 ±87.7	195.8 ±102.9	142.3 ±92.5 <sup>ab</sup>	<.001
15-ft walk, sec	13.1 ±2.7	13.9 ±2.9 <sup>a</sup>	17.0 ±6.6 <sup>ab</sup>	<.001
PPT rating	24.3 ±2.4	23.5 ±2.8 <sup>a</sup>	21.4 ±3.7 <sup>ab</sup>	<.001
BMI, kg/m <sup>2</sup>	27.1 ±3.8	27.8 ±4.3 <sup>a</sup>	27.5 ±5.0	0.008
FPG, mmol/L	5.5 ±1.1	5.7 ±1.6 <sup>a</sup>	6.1 ±2.7 <sup>ab</sup>	0.003
HOMA-IR	2.8 ±3.6	3.4 ±3.9 <sup>a</sup>	3.6 ±3.7 <sup>a</sup>	<.001
PSA, ng/ml	1.6 ±2.2	2.0 ±2.9	3.2 ±8.3 <sup>ab</sup>	0.002
Hb, g/L	150.3 ±10.6	149.7 ±11.3	143.6 ±13.6 <sup>ab</sup>	<.001
Total T, nmol/L	18.4 ±5.5	16.9 ±6.3 <sup>a</sup>	16.7 ±6.8 <sup>a</sup>	<.001
Free T, pmol/L	321.6 ±79.9	296.9 ±90.0 <sup>a</sup>	259.8 ±92.4 <sup>ab</sup>	<.001
SHBG, nmol/L	44.6 ±18.3	43.2 ±20.2	53.3 ±25.7 <sup>ab</sup>	<.001
FSH, U/L	7.6 ±6.7	9.2 ±9.1 <sup>a</sup>	13.3 ±14.6 <sup>ab</sup>	<.001
LH, U/L	5.8 ±3.2	6.6 ±4.1 <sup>a</sup>	8.6 ±7.9 <sup>ab</sup>	<.001

Data are expressed as mean ±standard deviation for continuous variables or as number (percentage) for binary categorical variables.

Abbreviations: CVD, CardioVascular Disease; SF-36, Short-Form 36 Questionnaire; DSST, Digital Symbol Substitution Test; PASE, Physical Activity Scale for the Elderly; PPT, Physical Performance Test; BMI, Body Mass Index; FPG, Fasting Plasma Glucose concentration; HOMA-IR, HOmeostatic Model of Insulin Resistance; PSA, Prostate Specific Antigen concentration; Hb, Haemoglobin; T, serum Testosterone concentration; SHBG, Sex Hormone Binding Globulin concentration; LH, Luteinising Hormone concentration; FSH, Follicular Stimulating Hormone Concentration

P values were calculated using the Kruskal-Wallis test for continuous parameters and chi-squared analyses for categorical variables. Between group differences were assessed using the Tukey–Kramer post-hoc test for continuous parameters and the Z-test for categorical parameters.

a. p<0.05 when data from this group are compared to those from the analytical sample

b. p<0.05 when data from this group are compared to those from the lost to follow-up group

**Supplementary table 2.** Baseline and Follow-Up Characteristics of Men with Persistent High Luteinising Hormone and those with Reverted High Luteinising Hormone

Parameter	Baseline		P <sup>a</sup>	Follow-Up		P <sup>b</sup>
	pNLH 128	rHLH 46		pHLH 128	rHLH 46	
N						
Age, years	67.8 ±8.8	59.5 ±10.0	<b>&lt;.001</b>	72.1 ±8.8***	63.9 ±10.0***	<b>&lt;.001</b>
Pre-degree Education, n (%) <sup>c</sup>	---	---	---	93 (75.0)	32 (71.1)	0.714
Living with partner, n (%)	---	---	---	96 (83.5)	39 (86.7)	0.617
Smoking, n (%)	29 (22.8)	13 (28.3)	0.627	25 (20.3)	12 (26.1)	0.390
Frequent Alcohol, n (%)	28 (21.9)	16 (34.8)	0.428	34 (30.4)**	18 (43.9)	0.600
Chronic widespread pain, n (%)	14 (11.6)	2(4.6)	0.497	---	---	---
Poor health, n (%)	44 (34.4)	10 (22.2)	<b>0.001</b>	48 (40.3)	10 (22.7)	<b>&lt;.001</b>
≥1 illness, n (%)	79 (61.7)	17 (37.0)	<b>&lt;.001</b>	98 (76.6)***	23 (50.0)	<b>&lt;.001</b>
≥2 illnesses, n (%)	38 (43.7)	11 (27.5)	<b>&lt;.001</b>	62 (67.4)***	18 (43.9)	<b>&lt;.001</b>
Diabetes, n (%)	17 (13.5)	2 (4.6)	<b>0.001</b>	16 (13.1)	4 (8.9)	<b>0.037</b>
CVD, n (%)	60 (47.6)	13 (29.6)	<b>&lt;.001</b>	75 (64.7)**	21 (45.7)**	<b>&lt;.001</b>
Cancer, n (%)	15 (11.7)	4 (8.7)	<b>&lt;.001</b>	20 (16.3)*	7 (15.6)	<b>0.003</b>
Prostate disease, n (%)	25 (19.8)	3 (6.8)	<b>&lt;.001</b>	16 (13.0)	5 (11.1)	0.783
Overall Sexual Function	18.3 ±6.6	21.7 ±6.2	<b>0.005</b>	17.6 ±6.8*	21.3 ±6.6	<b>0.013</b>
SF-36 physical	48.2 ±8.5	50.3 ±7.1	0.145	46.6 ±9.7	49.0 ±7.9	0.294
Beck's Depression Inventory	8.4 ±6.2	6.4 ±5.4	0.058	8.0 ±6.5	6.0 ±4.8	0.128
SF-36 mental	51.9 ±8.9	52.9 ±7.8	0.661	50.7 ±10.1	53.7 ±7.8	0.125
DSST	23.3 ±9.1	27.9 ±8.4	<b>0.003</b>	22.0 ±9.7**	27.2 ±8.9	<b>0.003</b>
PASE	168.2 ±89.9	201.3 ±79.3	<b>0.011</b>	136.9 ±96.4***	182.8 ±94.4	<b>0.003</b>
50-ft walk, sec	13.9 ±2.5	12.5 ±2.0	<b>0.002</b>	15.4 ±3.5***	14.1 ±2.6***	<b>0.026</b>
PPT rating	23.4 ±2.6	24.4 ±2.3	<b>0.022</b>	22.1 ±2.9***	23.4 ±2.4**	<b>0.008</b>
BMI, kg/m <sup>2</sup>	27.0 ±3.3	25.9 ±3.0	<b>0.043</b>	27.1 ±3.6	26.6 ±3.2*	0.557
FPG, mmol/L	5.8 ±1.7	5.7 ±1.8	0.582	5.6 ±1.6	5.7 ±1.7	0.968
HOMA-IR	3.9 ±7.3	2.9 ±3.5	0.271	4.1 ±8.7	2.7 ±1.7	0.358
PSA, ng/ml	1.7 ±1.9	2.1 ±3.5	0.699	4.2 ±19.2	1.8 ±1.5	0.968
Hb, g/L	146.4 ±11.4	148.6 ±11.5	0.276	146.3 ±12.1	149.8 ±11.1	0.297
Total T, nmol/L	19.1 ±5.5	20.4 ±5.9	0.145	17.7 ±5.3***	19.6 ±6.6	0.064
Free T, pmol/L	268.9 ±73.7	332.9 ±90.3	<b>&lt;.001</b>	246.3 ±73.6***	312.3 ±86.7	<b>&lt;.001</b>
SHBG, nmol/L	61.4 ±21.5	50.8 ±18.8	<b>0.003</b>	61.8 ±22.0	52.6 ±22.2	<b>0.005</b>
FSH, U/L	22.4 ±15.2	11.8 ±5.9	<b>&lt;.001</b>	25.0 ±18.7***	10.7 ±5.4*	<b>&lt;.001</b>
LH, U/L	14.4 ±4.8	10.6 ±1.8	<b>&lt;.001</b>	16.4 ±7.3***	7.4 ±1.5***	<b>&lt;.001</b>

Data are expressed as mean ±standard deviation for continuous variables or as number (percentage) for binary categorical variables.

Abbreviations: NLH, Normal Luteinising Hormone; HLH, High Luteinising Hormone; CVD, CardioVascular Disease; SF-36, Short-Form 36 Questionnaire; DSST, Digital Symbol Substitution Test; PASE, Physical Activity Scale for the Elderly; PPT, Physical Performance Test; BMI, Body Mass Index; FPG, Fasting Plasma Glucose concentration; HOMA-IR, HOmeostatic Model of Insulin Resistance; PSA, Prostate Specific Antigen concentration; Hb, Haemoglobin; T, serum Testosterone concentration; SHBG, Sex Hormone Binding Globulin concentration; LH, Luteinising Hormone concentration; FSH, Follicular Stimulating Hormone Concentration

a. P values were calculated using *baseline* parameters and either the independent-samples t-test for continuous variables or chi-squared analyses for categorical variables.

b. P values were calculated using *follow-up* parameters and either the independent-samples t-test for continuous variables or chi-squared analyses for categorical variables.

c. Educated to less than a degree level

\*, \*\*, \*\*\* Data differ significantly (p<0.05, p<0.01 and p<0.001 respectively) from baseline values within the same group when analysed using paired t-test (for continuous variables) or the McNemar test (for categorical variables).