0.2 mg/d x 1 day, then 0.3 mg/d x 1 day, then 0.4 mg/d x 1 day, then 0.5 mg/d. Daily serum E2 measurements informed dose adjustments (e.g., a measured E2 level > 400 pg/ml prompted a dose reduction; a measured E2 level < 250 pg/ml while on the 0.5 mg/d dose prompted a dose increase to 0.6 mg/d). In these six women, daily E2 values (pg/ml) were as follows: baseline 31 (17–36) (median [IQR]) on cycle day 4 (the morning of E2 initiation); 205 (135–240) on day 5; 159 (135–270) on day 6; 263 (202–363) on day 7; 276 (239–351) on day 8; 328 (307–367) on day 9; 333 (269–402) on day 10; and 328 (253–354) on day 11. Median transdermal E2 doses (mg/d) on days 5 through 11 were 0.2, 0.3, 0.4, 0.35, 0.4, 0.4, and 0.4, respectively. Morning serum LH concentrations (median [IQR]) were 5.2 (3.5–6.1) IU/L immediately before E2 initiation (cycle day 4), decreased to a nadir of 1.5 (1.0–2.4) IU/L after 2 days of E2 (cycle day 6), thereafter increasing 8.1-fold to a peak of 12.1 (8.1–18.3) IU/L after 5 days of E2 (cycle day 9). FSH similarly changed from baseline median 3.5 (3.4–4.2) IU/L to nadir median of 1.6 (1.2–1.8) IU/L after 2 days of E2, thereafter increasing again to 3.5 (2.6–4.0) IU/L after 5 days of E2. We conclude that this experimental protocol may be useful to investigate potential defects in E2-induced LH surge generation in PCOS.

Reproductive Endocrinology

FEMALE REPRODUCTIVE HEALTH: HORMONES, METABOLISM AND FERTILITY

Cost-Effectiveness Analysis of an Interdisciplinary Lifestyle Intervention Targeting Women With Obesity and Infertility in Comparison to Usual Care

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Although lifestyle modification is considered as the first-line treatment for women with obesity and infertility, these women generally do not have access to a program supporting them in adopting healthy habits that is integrated to fertility care. Implementing such a program requires to demonstrate its efficiency. The purpose of this study was to conduct a cost-effectiveness analysis (CEA) of an interdisciplinary lifestyle intervention (Fit-for-Fertility (FFF) program) for women with obesity and infertility, in comparison with the usual care protocol, i.e. fertility treatments. **Methods:** A CEA was conducted alongside a randomized controlled trial, recruiting women at the fertility clinic of the Centre hospitalier universitaire de Sherbrooke. Women were randomized to: i) the intervention group (IG): FFF program alone for 6 months (individual follow-ups every 6 weeks and 12 group sessions), and in combination with usual care for infertility after 6 months if not pregnant; or ii) control group (CG): usual care from the outset. Data were collected in both groups, during 18 months or until the end of the pregnancy for those who became pregnant. Costs related to the management of infertility, obesity, pregnancy and childbirth, and the FFF program were considered and collected by self-reported questionnaires, review of medical records and administrative databases. Live birth (LB) rate was used to assess effectiveness. The CEA's parameter of interest was the incremental cost-effectiveness ratio (ICER), calculated by non-parametric bootstrap with 5,000 iterations. All costs are in Canadian dollars, 2019. **Results:** A total of 130 women were randomized (65 CG, 65 IG). We present results for the 108 women (57 CG, 51 IG) who completed at least 6 months in the study. We observed an absolute difference of 14.2% (p=0.328) in LB rate between groups (IG: 51.0%; CG: 36.8%). Total mean costs per patient were significantly higher in the IG vs the CG for healthcare system's ($5,660 ± $3,200 vs $3,631 ± $3,389; p=0.002) and society's ($9,745 ± $5,899 vs $6,898 ± 7,021; p=0.026) perspectives. We observed an ICER of $12,633 per additional LB [$5,319-$19,947] from the healthcare system's perspective, and $5,980 [$3,086-$8 874] from the patients' perspective. Overall, the ICER for the society's perspective, which includes both previous perspectives, was estimated at $24,393 per additional LB [$15,509-$33,276]. **Conclusion:** According to our results, a lifestyle intervention may be clinically more effective than the usual protocol of care for women with obesity and infertility, but generates higher costs as well, resulting in a positive ICER (of $12,600 per additional life birth for the healthcare system). Such an intervention could be considered efficient compared to the usual standard of care, but studies are needed to assess the willingness to pay of stakeholders for this type of intervention.

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FEMALE REPRODUCTIVE HEALTH: HORMONES, METABOLISM AND FERTILITY

Cross-Method Comparison of Serum Androstenedione Measurement Using Three Different Assays: The Siemens Immulite Immunoassay, the Roche Elecsys Immunoassay, and an LC/MS-MS Assay

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Introduction: Androstenedione is a common precursor of male and female sex hormones produced by the adrenal glands and gonads. Serum androstenedione is a helpful biomarker in the diagnostic workup of a subset of patients with polycystic ovary syndrome (PCOS), the investigation of virilizing endocrinopathies, and for monitoring pediatric patients with congenital adrenal hyperplasia. The gold standard for the measurement of androstenedione is LC-MS/MS. A newly developed androstenedione competitive immunoassay is now available in the US, the Roche Elecsys Androstenedione (ASD) immunoassay. Until recently, the Siemens Immulite assay was the only non-radioimmunologic immunoassay available. We characterized the analytical and clinical performance of the ASD across different patient populations and in comparison to the Immulite and an LC-MS/MS assay. **Methods and materials:** The experiments performed were: linearity and analytical measuring range (AMR), precision

(intra- and inter-assay), and accuracy. Androstenedione was measured on de-identified residual serum samples (n=40) using the ASD and Immulite immunoassays and an LC-MS/MS assay. The reference intervals (RIs) provided by Roche for healthy male (0.280-1.52 ng/mL), healthy female (0.490-1.31 ng/mL), postmenopausal women (0.187-1.07 ng/mL), healthy children (<0.519 ng/mL), and patients with PCOS (0.645-3.47 ng/mL) were verified with at least 20 specimens, according to CLSI C28A3. Statistical analysis was performed using EP Evaluator and R program. **Results:** The ASD had a linear response across the AMR of 0.3 to 10.0 ng/mL. The inter- and intra-assay coefficients of variation were 4.5% and 2.0% or lower, at concentrations 0.5-6.7 ng/mL, respectively. The ASD and LC-MS/MS assays had a mean bias of -0.0542 ng/mL (-2%), Deming regression of y = 1.000 [0.961; 1.039] x - 0.0548 [-0.1806; 0.0709], and r = 0.9930. The Immulite assay had a mean bias of 1.15 ng/mL (44%) and 1.22 ng/mL (32%) compared to the LC-MS/MS and ASD assays, respectively. The recommended RIs from Roche for healthy male, female, and postmenopausal female groups were successfully verified in our patient population. However, the androstenedione concentrations for the healthy children and PCOS groups were outside of the suggested RIs, with concentrations up to 1.41 ng/mL and 0.527-2.24 ng/mL, respectively. Unlike published elsewhere, hormone therapies such as contraceptive pills and steroid treatments did not significantly affect serum androstenedione concentrations in healthy females and patients with PCOS. **Conclusion:** The ASD is superior to the Immulite immunoassay, and it has excellent comparability with the LC-MS/MS for serum androstenedione measurement. The RIs published by Roche may not be universally transferable; verification is recommended, and establishing RIs for the pediatric population may be necessary.

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FEMALE REPRODUCTIVE HEALTH: HORMONES, METABOLISM AND FERTILITY

Effect of Diet on Mental Health on Those Suffering With Premenstrual Syndrome

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Objective: This study documents the effects that various dietary factors have on mental health among those suffering with premenstrual syndrome (PMS). DESIGN/ **Methods:** N=3231 participants from around the world took an 85 question questionnaire that assessed depression and anxiety using the DSM-5 [The Diagnostic and Statistical Manual of Mental Disorders Volume 5] criteria, as well as various dietary patterns. Depression was classified as: Less than 7 none, 7 to 10 mild, 11 to 19 moderate and more than 20 severe.
Results: From n=3231 that took the test, n=1330 reported suffering from PMS. The average age from the n=1330 group was 35.1 ST 12.2.
Regarding meat n=1002 reported not eating meat twice a week, they had an average depression of 12 and SD of 7.7, n=328 eating meat twice a week they had a depression of 13.6 and SD of 7.3.
Regarding cheese n=720 reported not eating cheese more than twice a week, they had an average depression of 11 and SD 7.6, n=610 were eating cheese twice a week and had a depression of 14 and SD 7.5.
Regarding folate N=597 were eating folate rich foods at least 3 times a week, they had an average depression of 10.1 SD 7.5, n=356 were eating irregularly folate rich food less than 3 times a week they had a depression of 13.1 SD 7.2, n=377 did not eat folate eat rich food at least 3 times a week they had a depression of 15.2 and SD 7.3.
Regarding fish n=134 were eating fish more than twice a week they had an average depression of 12.6 and SD 7.4, n=1196 were not eating fish twice a week they had a depression of 12.3 SD 7.7
Regarding whole foods n=225 were eating more than 5 portions of fruits, vegetables and whole grain each day had an average depression of 9.6 SD 7.6, those that were eating 3 to 4 portions (n=453) had a depression of 10.8 SD 7.6, those eating 1 or 2 portions (n=512) had a depression of 14.1 SD 7.6, those eating less than 1 portion daily (n=140) had a depression of 15.2 SD 6.9. Regarding alcohol n=132 were drinking alcohol more than twice a week they had an average depression of 16.5 SD 7.2, n=1198 were not drinking alcohol more than twice a week they had a depression of 11.9 SD 7.6.
Conclusions: It seems that among those suffering from PMS eating fruits, vegetables, whole grains, and folate rich foods was related to less depression symptoms while alcohol, meat and cheese consumption was related to worse depression maybe due to a hormonal effect. It seems fish didn't have an effect.

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FEMALE REPRODUCTIVE HEALTH: HORMONES, METABOLISM AND FERTILITY

Effect of One Month Exposure to Components of Reprometabolic Syndrome on Physical Activity & Body Composition in Lean Women

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Background: Subfertility in obese women is associated with chronic pituitary suppression, reduced sensitivity to GnRH and decreased sex steroid production. We have found evidence for a combined effect of hyperinsulinemia and high circulating fatty acids to acutely (4h infusion) suppress pituitary gonadotropin secretion and are currently investigating the effects of one-month exposure to a eucaloric high-fat diet (HFD) on gonadotropin levels in lean women. The aim of this study is to examine the effect of the one-month HFD on physical activity and body composition.
Methods: 12 normal weight (BMI < 25 kg/m^2), normally cycling female participants of reproductive age were given a one-month eucaloric HFD, from the onset of menses in