therapeutic goal on maximum oral estradiol. Furthermore, high dose oral estrogen has been associated with increased thrombotic risk, especially in older individuals. The efficacy or optimal dose of adding or switching to the transdermal route is not known. We investigated the efficacy of estradiol transdermal patches and the optimal dose to reach therapeutic goal. **Methods:** A chart review was conducted of all MTF patients who were treated with estradiol transdermal patches in our transgender clinic from 2006 through 2020. We looked at the success of achieving physiologic serum 17β-estradiol levels (with and without antiandrogens spironolactone and finasteride) on various doses of estradiol transdermal patches. Target serum level for estradiol >100 pg/mL is recommended (but may be lower in certain clinical circumstances). **Results:** 371 MTF patients were identified, 41 received an estradiol transdermal patch. Of these 41 patients, 16 of them were placed on a transdermal patch due to failure to achieve target 17β-estradiol levels on maximal oral therapy. We found that 9 of these 16 patients achieved goal estrogen levels, as well as one patient very near goal. Of the 7 who did not reach goal, only 2 were on patch doses >60 mcg/day. The majority who reached goal serum estradiol levels were taking a dose of 100 mcg/daily. When considering all MTF patients on the highest dose (100 mcg) of transdermal estrogen, 11 of 18 attained goal level, as well as one just under goal. Of the 41 MTF patients taking a transdermal patch, only 6 of them had serum estrogen levels lowered from being at goal on oral therapy. Thirteen patients had their estrogen levels improve to reach goal when placed on patch (4 as add-on therapy). **Conclusions:** Our study supports the findings that using an estradiol transdermal patch can help MTF patients achieve goal 17β-estradiol levels. This delivery method can be useful for patients unable to reach goal on oral agents and for patients at higher thrombotic risk. The highest dose patch available is often needed to achieve therapeutic goal.

**Reproductive Endocrinology**

**TRANSGENDER CARE**

**Body Composition of Transgender Women After Long-Term Hormone Therapy - a Cross-Sectional Study**

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**Introduction:** Few studies of transgender women (TW) body composition (BC) in long-term gender-affirming hormone therapy (GAHT) have been reported. **Objective:** To evaluate BC parameters of TW in long-term GAHT. **Methods:** A cross-sectional study was carried out with 8 TW (average age of 34.0 ±4.8 y), 8 cisgender men (CM) and 8 cisgender women (CW) matched to age and body mass index (BMI). All TW were non-gonadectomized subjects and were in estrogen [(E); transdermal estradiol (n=2), oral estradiol (n=3) and conjugated estrogen (n=3)], plus cyproterone acetate (CA) (n=8) therapy in an average time of 15.6 ±8.7 years of treatment. Total testosterone (ng/dL) levels of TW, CW and CM were 83,5 (range 12.0-637.0), 20.5 (range 12.0-41.0) and 480.5 (range 264.0-843.0) at the time of the study, respectively. BC was assessed by InBody 720. Percentage of fat mass (%FM), skeletal muscle mass (SMM) were evaluated. Baumgartner Index was calculated. **Results:** Regards %FM, that of TW was lower than CW (29.59 ±7.56 vs 32.9 ±3.99; p=0.5394) and higher than CM (23.58 ± 6.44; p=0.1512). SMM of TW was 33.6% higher than that of CW (p<0.001) and 14.7% lower than that of CM (p=0.014). Baumgartner Index of CM group was 17.7% higher than TW group (p=0.001), which presented rates 20.3% higher than the CW (0.002). **Discussion:** BC changes in the first two years of GAHT in TW were consistent with loss of lean mass and gained fat mass associated with an increase of body weight. This profile was identified in adults and youth transgender after short-term hormone therapy. **Conclusion:** Our data shown a similar profile of short-term treatment, with a body composition intermediate between BMI-matched cisgender males and females. However, unlike young TW undergoing short-term GAHT, the parameters of BC in the TW using estrogens plus cyproterone acetate in the long term did not present %FM statistically different from CW and CM, in contrast to the lean mass that maintained significant differences in the long term.

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**Cardiovascular Risk Factors in Transgender Women Undergoing Long-Term Gender-Affirming Hormone Therapy: A Cross-Sectional Study**

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**Introduction:** Few data of long-term outcomes of cardiovascular (CVRF) risk factors of transgender women (TW) undergoing gender-affirming hormone therapy (GAHT) are available. **Objectives:** Evaluate CV risk factors after long-term GAHT in TW. **Methods:** A cross-sectional study was carried out with 8 TW (average age of 34.0 ±4.8 y), 8 matched CM and 8 CW on age, body mass index (BMI) and activity level. All TW were non-gonadectomized subjects and were in estrogen [(E); transdermal estradiol (n=2), oral estradiol (n=3) and conjugated estrogen (n=3)] plus cyproterone acetate (CA) (n=8) therapy in an average time of 15.6 ±8.7 years. **Results:** Total Testosterone (ng/dL) level of TW, CW and CM were 83.5 (range 12.0-637.0), 20.5 (range 12.0-41.0) and 480.5 (range 264.0-843.0), respectively. It
was similar between TW and CW (p=0.7284) and different in the comparison TWxCM (p=0.0325). In TW group, the median of blood glucose was 84 mg / dL, HBA1c 5.1%, total cholesterol 146 mg / dL, HDLc 43 mg / dL, LDLc 89 mg / dL and triglycerides 81.5 mg / dL. In the comparison with other groups, there was no difference from the statistical point of view. It is necessary to emphasize the HDLc of TW (43 mg / dL) which was exactly the same of CM (p>0.999) and lower than CW (60 mg/dL)(p=0.0720). Systolic Blood Pressure (SBP)(mmHg) of TW (126±13) was higher than that of CW (95±11;p<=0.001) and equal to that of CM (115±9;p=0.1489). Regards Diastolic Blood Pressure (DBP) (mmHg), the medians of TW, CW and CM were 80, 60 and 80, respectively, and in the comparison TWxCW p = 0.0070 and TWxCM p> 0.9999. Discussion: Youth TW (16.3 ± 1.4 yo) taking an average estradiol dose of 1.5 ± 1.0 mg/day, with an average AGHT duration of 12.3 ± 9.9 months matched to controls on age and BMI did have higher HDL than CW and TW participants were more insulin resistant than CM. About SBP of that youth TW (107 ± 12), it was lower than CW 113 ± 7 (p>0.05) and CM 116 ± 8 (p<0.001). Other previous study showed that after 6 months of estradiol use, in doses ranging from 2 to 8 mg daily glucose enhanced 6 mg / dL (from 86 to 92) as well as TC from 170 to 178 mg/dL, HDLc from 50 to 54 mg/dL, TGL from 102 to 115 mg/dL, and LDL did not change (93), while a systematic review and meta-analysis showed increased only in TG levels. SBP and DBP increased on average of 7.2 mmHg and 5.7 mmHg, respectively. Conclusion: Metabolic findings observed after the first few months of TW GAHT appear to remain at long term, except for HDLc. SBP and DBP appear to increase in the long term, after a drop initially observed.

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Case Report: Invasive Endometrial Cancer in a Trans Man and Risk of Testosterone Therapy
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Background: Only one case of uterine cancer in a trans man on testosterone is noted in literature prior to this case. No clinical evidence nor guidelines exist regarding testosterone therapy for this subset of patients.

Clinical Case: A 41-year-old trans man was seen by Gynecology for vaginal bleeding, with work-up revealing thickened endometrium and biopsy with endometrial adenocarcinoma. Testosterone therapy was held, and patient underwent total hysterectomy with BSO and bilateral pelvic/ aortic lymph node dissection. Pathology demonstrated stage IIIA invasive adenocarcinoma, endometrium type with focal squamous differentiation, low grade. The tumor extended into the endocervical stroma with small metastasis to one ovary. He received adjunct pelvic radiation and sandwich chemotherapy with carboplatin and taxol. Concurrently, he was referred to Endocrinology for management of hormone replacement therapy (HRT). He originally started weekly testosterone injections and anastrozole at an outside facility in 2016 and underwent bilateral mastectomy in 2017. Testosterone was held perioperatively and during chemoradiation, for a total duration of 9 months. The patient experienced worsening gender dysphoria during this time. Discussion was held on goal to restart HRT in the setting of a theoretical risk of testosterone conversion to estradiol with increased risk of cancer recurrence; thus, patient initially chose to delay re-initiation of HRT. Following the completion of chemotherapy, he started on low-dose (30mg) weekly IM testosterone with plans for continued monitoring of testosterone and estradiol levels.

Conclusion: Research is needed in monitoring the effects of testosterone therapy on reproductive organs in patients assigned female at birth, and whether anastrozole therapy has protective effects for estrogen-driven cancers. Further, guidance is needed on monitoring of uterine lining in trans men and whether this should be standard of practice.

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Development of Hip Bone Geometry in Transgender Adolescents Resembles the Experienced Gender if GnRHa Treatment Is Started in Early, but Not Late, Puberty
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Bone geometry can be described in terms of periosteal and endocortical growth and is partly determined by sex steroids. Periosteal and endocortical apposition are thought to be regulated by testosterone and estrogen, respectively. Gender-affirming hormone (GAH) treatment with sex steroids in transgender people might affect bone geometry. However, in adult transgender people no change in bone geometry during GAH was observed. In this study, we investigated changes in bone geometry among transgender adolescents using a gonadotropin-releasing hormone agonist (GnRHa) and GAH prior to achieving peak bone mass. Transgender adolescents treated with GnRHas and subsequent GAH at our center before the age of 18 years were eligible for inclusion. Participants were grouped based on their Tanner stage at the start of GnRHa treatment and divided into early, mid, and late puberty groups. Hip Strength Analysis software calculating subperiosteal width (SPW) and endocortical diameter (ED) was applied to dual-energy X-ray absorptiometry scans performed at start of GnRHa and GAH treatments, and after ≥ 2 years of GAH treatment. Mixed model analyses were performed to study differences over time. Data were visually compared with reference values of the general population retrieved from the literature. A total of 322 participants were included, of whom 106 trans women and 216 trans men. In both trans women and trans men participants resembled the reference curve for SPW and ED of the experienced gender, but only when GnRHa was started during early puberty. Those who started during mid- and late puberty remained