# Evolution of body composition and bone mass in transgender adolescents treated with pro- or anti-androgenic progestins

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## Introduction

Gender dysphoria (GD) is defined as a discrepancy between the expressed or experienced gender and the sex assigned at birth, which causes distress or impairment in important areas of functioning.

To reduce this distress, two types of treatment can be offered to adolescents depending on the pubertal development at diagnosis:

- **Early pubertal diagnosis:** gonadotropin releasing hormone analogues (*GnRHa*) for suppression of gonadotropins and development of secondary sexual characteristics from puberty onwards.
- **Mid- or late pubertal diagnosis:** pro- or anti-androgenic *progestins* to weaken the effects of endogenous hormones, e.g. suppress menstruation, virilisation, libido,...

## Hypothesis

GnRHa for ≥1 year impair bone mass accrual in late pubertal transgender adolescents.[1] Pro- and anti-androgenic progestins do not fully suppress endogenous sex hormones. ***We hypothesize that progestins have less negative effects on bone health and that they are capable of inducing changes of sex hormone levels that can alter body composition.***

1) *Klink D, Caris M, Heijboer A, van Trotsenburg M, Rotteveel J.* Bone Mass in Young Adulthood Following Gonadotropin-Releasing Hormone Analog Treatment and Cross-Sex Hormone Treatment in Adolescents With Gender Dysphoria. J Clin Endocrinol Metab 2015; 100: E270–E275

## Aim

To prospectively examine the effects of Lynestrenol (L) and Cyproterone Acetate (CA) in monotherapy on **Antropometry, Grip strength, Bone health and Body composition** in Female to Male (FtM) and Male to Female (MtF) late pubertal trans adolescents, respectively.

## Methods

Grip strength, Antropometric, DXA (spine, hip, whole body) and pQCT (radius, tibia) measurements were performed at start of treatment and before association with cross-sex hormones in **50 adolescents** (35 FtM, 15 MtF; median age: 16,3y (11,9-18,4y); mean treatment: duration 11,5m). Vitamin D supplementation and calcium-enriched diet was advised in all participants.

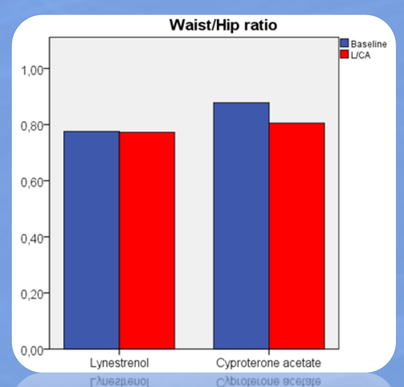
## Results

### Antropometrics, Grip Strength, Body Composition

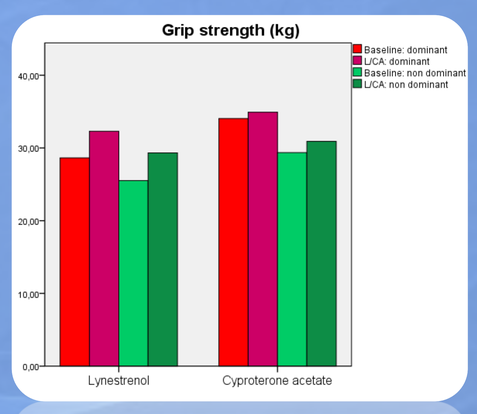
#### Antropometrics

**FtM**
Growth: 0,9 cm
Δ Weight: +2,21 kg*
Δ Waist: +2,4 cm*
Δ Hip: +2,54 cm*
Δ W/H ratio: -0,003

**MtF**
Growth: 0,8 cm
Δ Weight: +1,56 kg
Δ Waist: -6,17 cm*
Δ Hip: +0,31 cm
Δ W/H ratio: -0,073*




#### Grip Strength



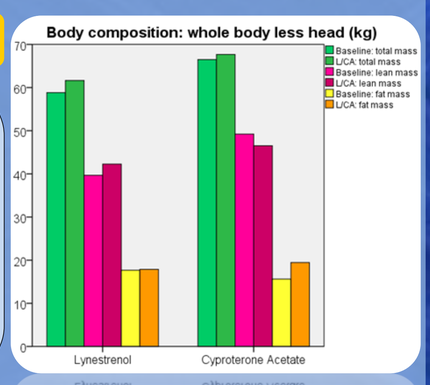

**FtM:**
- Dominant hand: +3,2 kg*
- Non-dominant hand: +3,8 kg*

**MtF:**
- Dominant hand: +0,9 kg
- Non-dominant hand: +1,5 kg

#### Body Composition

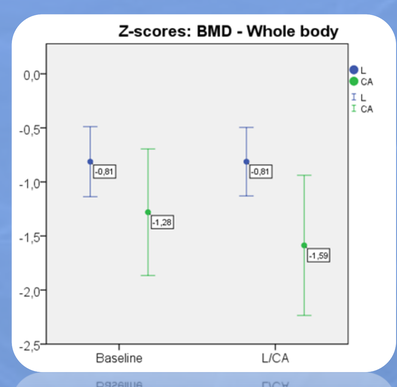
**FtM (DXA)**
Δ Weight: +2.566g*
Δ Lean mass: +2.592g*
Δ Fat mass: +20g
Δ %fat: -1,28%
Δ Z-scores %fat: -0,265*

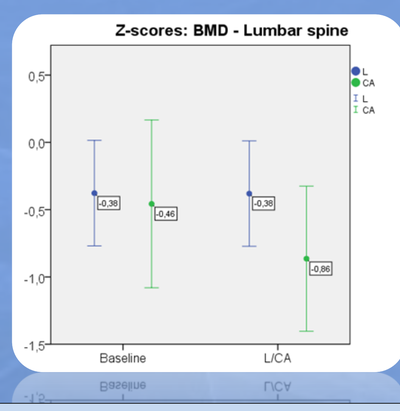
**MtF (DXA)**
Δ Weight: +1.192g
Δ Lean mass: -2.690g*
Δ Fat mass: +3.823g*
Δ %fat: +4,82%*
Δ Z-scores %fat: +0,556*

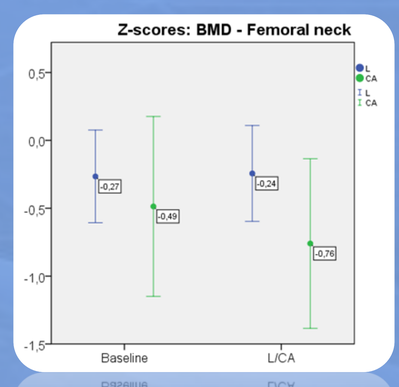



### Bone Health

#### DXA



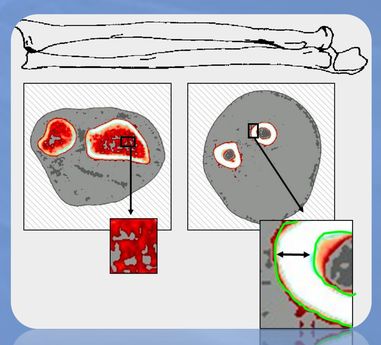

**FtM:**
Z-scores of BMD at all sites, showed no significant changes, indicating bone mass accrual conform age-matched, female peers.

**MtF**:
Only moderate increases of absolute BMD values were seen, with decreased Z-scores, indicating impaired bone mass accrual.

#### pQCT

**FtM**:
Total, trabecular and cortical vBMD increased at all sites. All results were similar to female peers.

**MtF**:
Negative effects on metaphyseal vBMD (trabecular bone) were seen. Cortical bone showed a similar evolution as their male peers.



## Conclusions

Treatment with pro- and anti-androgenic progestins results in **body composition changes towards the desired sex**. **Lynestrenol did not impair bone mass accrual**. However, **Cyproterone acetate affects bone mass accrual** similar to GnRHa. A**dequate vitamin D and calcium intake** as well as **weight bearing exercise** are indicated**,** especially in MtF transgender adolescents treated with progestins.

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