

Transgender women's heart-lung capacity and strength exceed those of cisgender peers even after years of hormone therapy

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The heart and lung capacity and strength of transgender women exceed those of their cisgender peers, even after years of female hormone

therapy, but they are lower than those of cisgender men, indicates the first study of its kind, published online in the *British Journal of Sports Medicine*.

Although only a small study, and despite the fact that it didn't include transgender athletes, the findings could help to inform policy and decisions about [transgender women](#)'s participation in sports, suggest the researchers.

Exposure to male (testosterone) or female (estrogen) sex hormones during puberty and throughout reproductive life influences physical performance in men and women.

Testosterone induces changes in muscle mass, strength, body fat and red blood cell capacity. VO₂, a measure of how efficiently the body transports and uses oxygen, can be up to 50% lower in [cisgender](#) women than in cisgender men of the same age, say the researchers.

It's not clear what impact previous exposure to testosterone might have on the physical effort of transgender women who aren't athletes, and in receipt of long-term therapy to reduce their natural testosterone levels.

In a bid to find out, the researchers assessed heart-lung (cardiopulmonary) capacity and strength in 15 transgender women, 13 cisgender men, and 14 cisgender women. All the volunteers were in their mid-thirties and clocked up similar levels of physical activity.

The transgender women had been on hormone therapy for an average of 14 years, which they had started when they were 17, on average.

Measures of body fat and muscle mass (bioimpedance), the hand grip test to assess strength, and cardiopulmonary exercise testing (VO₂) on a treadmill were carried out in all the volunteers.

Total body fat was lower among the transgender women than it was among the cisgender women, but higher than it was among the cisgender men.

Similarly, skeletal [muscle mass](#) was higher among the transgender women than it was among the cisgender women, but lower than it was among the cisgender men.

"Thus, long-term estrogen exposure and [testosterone](#) suppression were not enough to completely shift [body composition of transgender women] to the female pattern, despite their direct and indirect effects on fat and lean mass," note the researchers.

Grip strength was also greater in the transgender women than it was among the cisgender women, as was average peak VO₂.

This is a small study of non-athletes, for which the medications used, their doses, and frequencies all relied on personal recall, caution the researchers.

Further research that accounts for and measures the start and duration of puberty and muscle cell metabolism are needed to clarify the long-term effects of [hormone therapy](#) on transgender women's performance in sport, they add.

But they note, "These are the first scientific data on the cardiopulmonary capacity of transgender women," and conclude, "These findings add new insights to the sparse information available on a highly controversial topic about the participation of [transgender women] in physical activities," and "...could inform policy and help in decisions about the participation of [transgender](#) women in sporting activities."

More information: Cardiopulmonary capacity and muscle strength in

transgender women on long-term gender-affirming hormone therapy: a cross-sectional study, *British Journal of Sports Medicine* (2022). [DOI: 10.1136/bjsports-2021-105400](https://doi.org/10.1136/bjsports-2021-105400)

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