

Even the most talented female athletes cannot beat the top male athletes in their sport. For example,

- **Allyson Felix** is the most decorated U.S. track and field athlete in Olympic history. She has competed in five Olympic Games, winning 11 medals (one more than Carl Lewis). Seven of her medals are Gold.<sup>95</sup> And, yet, Felix's best 400-meter speed (49.26 seconds)<sup>96</sup> is four seconds slower than Usain Bolt's personal best (45.28 seconds)<sup>97</sup> and more than six seconds slower than Wayde van Niekerk's world record (43.03 seconds).<sup>98</sup>

- **Florence Griffith Joyner** ("Flo-Jo")<sup>99</sup> died in 1998, but she still holds the women's world record in both the 100-meter (10.49 seconds) and 200-meter (21.34 seconds).<sup>100</sup> Compare this to Usain Bolt's 100-meter world record of 9.58 seconds.<sup>101</sup> Bolt also holds the men's world record for the 200-meter race, which he ran in 19.19 seconds<sup>102</sup>—2.15 seconds faster than Flo-Jo.



- At the 2020 Tokyo Olympics (held in 2021), American **Sydney McLaughlin** broke the women's world record in the 400-meter hurdles with a time of 51.46 seconds; Karsten Warholm of Norway broke the men's world record in the same event with a time of 45.94 seconds.<sup>103</sup>
- Great Britain's **Bethany Shriever** won a Gold medal in women's BMX racing in Tokyo with a time of 44.538 seconds.<sup>104</sup> The winner of the men's event in Tokyo, Niek Kimmann of the Netherlands, finished with a time of 39.053 seconds.<sup>105</sup>
- American swimmer **Lydia Jacoby** earned a Gold medal in the 100-meter breaststroke in Tokyo with an impressive time of 1:4.95.<sup>106</sup> Meanwhile, American Adam Peaty, the men's 100-meter breaststroke Gold medal winner in Tokyo, finished with a time of 57.37 seconds.<sup>107</sup>



Lydia Jacoby, 100-meter, 1:4.95

PHOTO BY MADDIE MEYER VIA GETTY IMAGES



Adam Peaty, 100-meter, 57.37

PHOTO BY IAN MACNICOL VIA GETTY IMAGES

- Even among athletes that are basically the same size, sex matters significantly. As Duke Law Professor Doriane Lambelet Coleman explains, Olympic swimmers **Missy Franklin** and Ryan Lochte are both about the same height (6'2") and have approximately the same wingspan (6'4"). And yet Franklin's record in the 200-meter backstroke is 2:04.06, while Lochte's world record is 1:53.94—a full nine seconds faster. Writes Coleman,

*If Franklin had been in [Lochte's] race, at her best she would have been about half a lap behind Lochte when he finished . . . Franklin would not have had a world record; she would not have been on the podium; in fact, she would not have made the team. In those circumstances, we might not even know her name.*<sup>108</sup>

But it is not just the top male athletes who can beat the world's best females:

- Tennis player **Serena Williams** is widely regarded as one of the greatest athletes of all time. Yet, in 1998, the 203rd-ranked men's player, Karsten Braasch, beat both Serena and her sister Venus.<sup>109</sup>



Serena Williams

PHOTO BY AELTC/JED LEICESTER - POOL  
VIA GETTY IMAGES



Karsten Braasch

PHOTO BY OLIVER HARDT/AFP  
VIA GETTY IMAGES

- In the USA Swimming Speedo Junior National Championships in 2019, **nine U19 boys** swam the 1500-meter faster than the women's Gold medal winner in the same event at the 2019 FINA World Championships.<sup>110</sup> The boy who came in first swam the race in 15:16.97<sup>111</sup>—over a minute and a half faster than the women's champion.<sup>112</sup>
- In 2019, **high school student Matthew Boling** ran a 100-meter race in just 9.98 seconds—0.51 seconds faster than **FloJo's world record**.<sup>113</sup> In fact, in 2018, the man now ranked 5,606th in the world ran a 100-meter race in the same time as FloJo (10.48 seconds).<sup>114</sup>

## Comparison of 2017 Track & Field Performances

Event	Best Women's Result 2017	Best Men's Result	Instances of Men Out-Performing
100 Meters	10.71	9.69	10,009
200 Meters	21.77	19.77	8,993
400 Meters	49.46	43.62	10,898
800 Meters	1:55.16*	1:43.10	12,285+
1500 Meters	3:56.14	3:28.80	8,251
3000 Meters	8:23.14	7:28.73	1,784
5000 Meters	14:18.37	12:55.23	2,140
High Jump	2.06 meters	2.40 meters	2,981
Pole Vault	4.91 meters	6.00 meters	2,981
Long Jump	7.13 meters	8.65 meters	4,801
Triple Jump	14.96 meters	18.11 meters	3,440

**Source:** Doriane Lambelet Coleman & Wickliffe Shreve, Comparing Athletic Performance of the Best Elite Women to the Boys and Men, Duke Center for Sports Law & Pol'y (Summer 2017), <https://law.duke.edu/sports/sex-sport/comparative-athletic-performance/>.

In many events, *males outperform the best female athletes thousands of times a year*.<sup>115</sup> For example, Duke Law professors Doriane Coleman and Wickliffe Shreve found that in 2017 alone, men and boys around the world beat Allyson Felix's best time in the 400-meter dash more than 15,000 times.<sup>116</sup> Coleman and Shreve put it simply: men and boys beating the world's best female athletes "is far from the exception. It's the rule."<sup>117</sup>

Because of the significant male athletic advantage, it is common for elite women's teams to prepare for top competition by scrimmaging against younger boys' teams. For example, in 2013 and 2014, the **U.S. Women's National Ice Hockey Team** prepared for the 2014 Winter Olympics in Sochi by facing off against top-ranked male high school hockey teams—and losing 6-3 to Dexter Southfield in Massachusetts and 3-1 to the Salisbury School in Connecticut.<sup>118</sup> Even the celebrated **U.S. Women's National Soccer Team**, which won the 2019 FIFA Women's World Cup, has prepared for competition by scrimmaging top boys' teams—and losing 5-2 to FC Dallas' U-15 team.<sup>119</sup>

The male-female athletic gap also exists at ordinary levels of competition between male and females.<sup>120</sup> Indeed, according to World Rugby, "there is no overlap in performance between males compared to females at all matched levels of competition."<sup>121</sup>

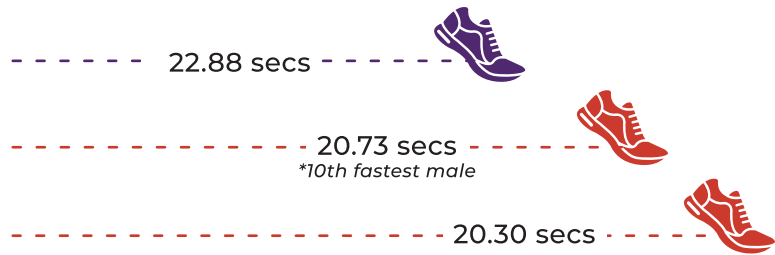


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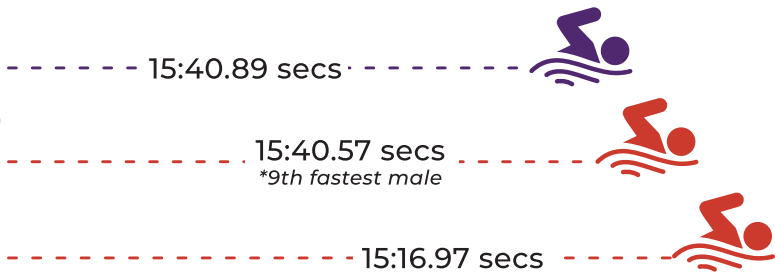


This is true even at the high school level. A review of the best times in the nation across high school track and swimming events during 2019 is illustrative. In the 200-meter dash, the high school male with the tenth-fastest time still beat the top high school female.<sup>122</sup> Likewise, the 9th fastest male high school swimmer beat the top female high school swimmer in the 1500-meter.<sup>123</sup>

### 2019 High School Outdoor 200 Meter Track Speeds



### 2019 High School Swimming 1500 Meter



Sources: athletic.net/TrackAndField/Division/; USASwimming.org



The male-female athletic gap is also evident in individuals who are not athletically-trained at all.<sup>124</sup>

## D. What Role Does Testosterone Suppression Play?

Some activists and state athletic associations take the position that male-bodied athletes should be allowed to participate in women's sports even if they have not undergone a period of hormone therapy.<sup>125</sup> The IOC and the NCAA, by contrast, require a period of testosterone suppression before natal males can participate in women's competitions.<sup>126</sup> In fact, for some athletic regulatory bodies, testosterone levels are dispositive in determining whether someone is eligible to compete as a female.<sup>127</sup>

So does hormone therapy meaningfully eliminate the male athletic advantage? And do current testosterone levels accurately predict performance? The answer, it turns out, is no.

After two years of testosterone suppression, college athlete CeCe (formerly Craig) Telfer ran the indoor 200-meter dash in 24.45 seconds—faster than Telfer's 2017 pre-transition time of 24.64.

Although the significant increase in circulating testosterone that occurs during male puberty is, indeed, the primary biological basis for the male athletic advantage,<sup>128</sup> it is not the only basis. There are, for example, over 3000 genes that contribute to muscle differences between human males and females.<sup>129</sup> **Genetic differences**, of course, cannot be eliminated by reducing testosterone,<sup>130</sup>

and these differences may create different muscle responses to training between even those men and women who have the same concentrations of testosterone.<sup>131</sup>

Moreover, many of the changes brought about by increased levels of testosterone during male puberty (such as changes to skeletal architecture) are **permanent and unalterable** by testosterone reduction later in life.<sup>132</sup> Testosterone suppression will not, for example, make a person shorter or reduce a person's wingspan.

Consider the following:

- **Bone Density and Size** — According to a review of the literature by Hilton and Lundberg, transgender individuals who were born male **maintain bone mineral density over a median of 12.5 years of testosterone suppression.**<sup>133</sup> Testosterone suppression does not alter height, limb length, or other skeletal parameters. Thus, transgender athletes who were born male and begin testosterone suppression after the onset of male puberty are likely to retain an athletic advantage in sports, such as basketball, volleyball, handball, where **height, limb length, and handspan** are relevant. Moreover, male-bodied athletes are likely to continue to be less injury-prone than their female counterparts even after years of testosterone suppression and hormone therapy.<sup>134</sup>
- **Muscle Size** — Hilton and Lundberg also found that, while testosterone suppression reduces muscle size, *it does not reverse muscle size to female levels.*<sup>135</sup> Hilton and Lundberg reviewed twelve longitudinal studies that collectively suggest that 12 months of testosterone suppression to female-typical levels results in **only about a 5% loss of lean body mass or muscle size.**<sup>136</sup> They concluded that, “given the large baseline differences in muscle mass between males and females, the reduction achieved by 12 months of testosterone suppression can be reasonably assessed as small.”<sup>137</sup>

- **Muscle Strength** — Studies on the effect of testosterone suppression on muscle strength (as opposed to size) indicate that **testosterone reduction removes about 5-10% of strength advantages.**<sup>138</sup> Even after years of testosterone suppression, natal males remain stronger than most females.<sup>139</sup> And it is possible that even these decreases in strength can be made up by rigorous athletic training on the part of the athlete whose testosterone is suppressed.<sup>140</sup>
- **Endurance** — The most significant reduction in athletic advantage after hormone therapy seems to be in **hemoglobin counts**, with a 11-14% change.<sup>141</sup> Although further study is needed, it is possible that testosterone suppression brings transgender athletes who were born male closer to the female baseline for endurance sports than for sports that depend on strength or explosive power.<sup>142</sup>
- **Speed** — A study published in the British Journal of Sports Medicine found that transgender women (natal males) in the United States Air Force maintained a **significant advantage in speed** over biological females after a year of hormone therapy.<sup>143</sup> It is perhaps not surprising, then, that two years after undergoing hormone suppression treatment, college athlete **CeCe (formerly Craig) Telfer** ran the indoor 200-meter dash in 24.45 seconds—faster than Telfer's 2017 pre-transition time of 24.64.<sup>144</sup>


Hormone therapy does not come close to leveling the proverbial playing field.

An individual's current testosterone levels are not, therefore, precise predictors of performance. And hormone therapy does not come close to leveling the proverbial playing field.<sup>145</sup>

Some transgender athletes acknowledge as much. International Olympic Committee advisor **Joanna Harper**, a natal male, says that, despite more than 15 years of hormone therapy, she “carr[ies] more muscle mass than a woman [her] size, absolutely.”<sup>146</sup>

And former tennis player and transgender pioneer **Renee Richards** (formerly Richard Raskin) now admits that biology provided her an advantage over her female competitors. Richards, who won her own legal battle for the right to play in the female category of the U.S. Open,<sup>147</sup> now says that transgender athletes who are natal males should not participate in competitive women's sports.





***“I knew that I was the fastest girl here, one of the fastest in the state...Then, the gun went off. And I lost.”***

**CHELSEA MITCHELL**  
Canton, CT



*Lost four state championships, two all-New England awards, and additional other honors to male-bodied competitors.*



“Having lived for the past 30 years,” Richards says, “I know if I’d had surgery at the age of 22, and then at 24 went on the tour, no genetic woman in the world would have been able to come close to me.”<sup>148</sup>

**What about natal males who take puberty blockers from an early age and, therefore, never experience male puberty?**<sup>149</sup> Would this intervention meaningfully reduce or eliminate the male athletic advantage? Unclear, particularly since not all male-female differences are testosterone driven and also because males experience some degree of heightened exposure to testosterone even prior to puberty—both in the womb and shortly after birth.<sup>150</sup> Indeed, Hilton reports that at least one study of males treated with puberty blockers as young as 12, followed by hormone treatment at 16, found that early intervention did *not* reduce height, lean body mass, or grip strength to age-matched female levels.<sup>151</sup>

## IV. WHAT’S THE HARM?

The inclusion of male-bodied athletes in women’s sports harms female athletes by: **(a)** decreasing the chances of female athletic success; **(b)** taking away roster spots, playing time, and potential scholarships from female athletes; and **(c)** (in some sports) increasing the chances of injury.

Supporters of inclusion often argue that, because the number of natal males seeking to compete in women’s sports is relatively small, the harm to natal females as a group is negligible.<sup>152</sup> But to the individual female athletes who lose to male-bodied athletes, the harm feels quite substantial. Moreover, even a small number of natal male athletes have the potential to deny numerous females opportunities to reach the podium.

For example, in just a few short years, two natal males, Terry Miller and Andraya Yearwood, set 17 Connecticut track meet records<sup>153</sup> and captured 15 women’s State Championship titles previously held by girls. **Chelsea Mitchell**, who ran for Canton High School in Connecticut, lost four state championships, two all-New England awards, and various other honors to Miller and/or Yearwood.<sup>154</sup>

