

## Abstract

► **McDonald, C. and J. Dapena. Linear kinematics of the men's 110-meter and women's 100-meter hurdles races. *Med. Sci. Sports Exerc.* 23:1382-1391, 1991.**

Twenty-three male and nine female hurdlers were filmed using three-dimensional methods during competition at the 1988 United States Olympic Trials. An entire four-step cycle was analyzed, including the clearances of the men's fifth hurdle and the women's fourth hurdle. The results showed an increase in vertical velocity and a decrease in forward horizontal velocity during the takeoff of the hurdle step. The forward velocity was recovered mainly in the second support phase after the hurdle. The downward motion of the center of mass (c.m.) was not stopped until the second support phase after the hurdle clearance. The peak of the c.m. parabola was almost directly over the hurdle in the men, and 0.30 m before the hurdle in the women. It was shown that the women used a parabola with a larger margin over the top of the hurdle than the men: A lower parabola would shorten the hurdle step, and would require the lengthening of the three interhurdle steps. It would also make the duration of the airborne phase too short, which would not give the legs enough time to prepare for landing after the execution of their motions over the hurdle. Therefore, women should not be coached to imitate the men's hurdle clearance technique.