Stance stability with unilateral and bilateral light touch of an external stationary object

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Abstract:
Unilateral light fingertip touch of a stationary object has a significant stabilizing effect on postural sway during stance. The purpose of this study was to find out if this effect is enhanced by bilateral light touch of parallel stationary objects. The postural sway of 54 healthy subjects was tested in four stance conditions: no touch; unilateral left light touch of the left handle of a walker; unilateral right light touch of the right handle of the same walker; and bilateral light touch of the two handles. During testing, subjects stood blindfolded on two foam pads placed on the left and right force plates of the Tetrax balance system (Sunlight Medical). Testing in each condition lasted 45?s and was executed twice in a random order. As expected, postural sway was significantly reduced by unilateral left or right light fingertip touch. It was significantly further decreased by bilateral light touch. In addition, light touch conditions were associated with a reduction in pressure fluctuations between the heel and forefoot of the same foot as well as those of the contralateral foot, with a concomitant increase in weight shift fluctuations between the two feet. The decrease in postural sway with bilateral light touch suggests cortical modulation of the bilateral touch inputs, with enhancement of the stabilizing response.