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Rehabilitation Robot in Primary Walking Pattern Training for SCI Patient at Home

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Abstract : Recently attention has been focused on incomplete spinal cord injuries (SCI) to the central spine caused by pressure on parts of the white matter conduction pathway, such as the pyramidal tract. In this paper, we focus on a training robot designed to assist with primary walking-pattern training. The target patient for this training robot is relearning the basic functions of the usual walking pattern; it is meant especially for those with incomplete-type SCI to the central spine, who are capable of standing by themselves but not of performing walking motions. From the perspective of human engineering, we monitored the operator's actions to the robot and investigated the movement of joints of the lower extremities, the circumference of the lower extremities, and exercise intensity with the machine. The concept of the device was to provide mild training without any sudden changes in heart rate or blood pressure, which will be particularly useful for the elderly and disabled. The mechanism of the robot is modified to be simple and lightweight with the expectation that it will be used at home.

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