M. Naganuma, E. Okhubo, R. Kimura, M. Watanabe, N. Kato. ***Gait rehabilitation with a robotic dog.*** *Gerontechnology 2012;11(2):342;* doi:10.4017/gt.2012.11.02.366.00 **Purpose** Gait rehabilitation is a fundamental requirement to avoid disuse syndrome for the long-term hospitalized person such as cerebral infarction patient or patient with dementia. In general gait rehabilitation is monotonous and dull, so some entertainment or a sense of achievement is helpful to maintain motivation during the daily exercise. This paper proposes an effective gait-rehabilitation system using a robotic dog supporting individual initiatives of the patient. **Method** Walking with a living dog is one way to achieve this; however as an intervention it is limited to mildly symptomatic patients because a real dog risks sudden lunging. We used a robotic dog instead of a living dog for relatively critical patients. We have studied robot-assisted activity and therapy using robotic animals in the elderly nursing home in order to improve residents' quality of life (QOL)[1-3]. In the case of a man-made robot, aforementioned risks can be ignored. Moreover, it is an advantage that an in-house walking exercise with the dog is possible. The basic concept of this proposal is co-creation of steps between the elderly and dog. That is, the real-time stabilometric signal of the elderly was measured and analyzed to extract a single step and forwarded to the robotic dog to make a step. Since commercially available amusement products pass through the safety review of public administration, the proposed system was composed of those products as a hardware tool. More specifically, entertainment robot AIBO of Sony ERC was adopted as the robotic dog and Nintendo's Wii-balance-board is used as the stabilometric human interface devices. All signals are transmitted by conventional Bluetooth and LAN systems. **Results & Discussion** Figure 1 shows the block diagram and enforcement scenes of gaiting exercise at standing and sitting positions, respectively. The patients both suffered from dementia and made their own steps in a positive manner shown by arrows in the figure. Such positive attitude was uncommon in the conventional daily exercise. Functions for walking back and forth walk, and turning right and left are installed. It is noteworthy that the standing patient tempts the dog to move toward another patient and the patient calls the robot to her. This means there a co-creation field is created through the robotic dog. This was followed by a chat between the patients. In the case of the sitting patient, although for her it is very hard exercise to raise her foot from the floor, she made several steps on her own initiative successively after the physical therapist guided her how to walk by patting and lifting her right and left knees alternately. The position of the center of gravity and command signal were logged every 0.1 sec in the control PC and available to be analyzed afterward. For example, the change of exhaustion during exercise was estimated from the magnitude and regularity of steps. Since all hardware tools can be packed in a suitcase the proposed gait exercise can be easily done everywhere.

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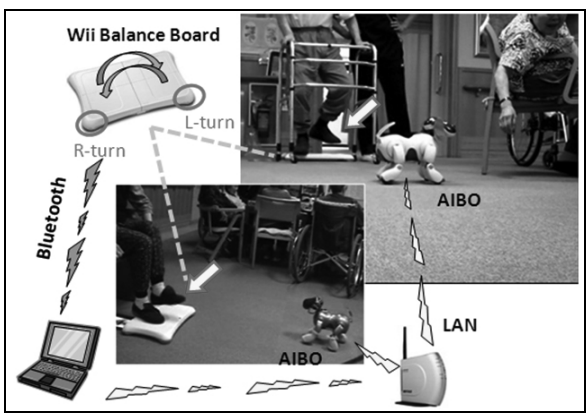

Figure 1. The diagram of proposed system and the scenes of exercise for standing and sitting positions