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Introduction

- Wearable robots were developed in the 1960s to be worn on the body to assist muscle strength or endurance and lift heavy objects more easily.
- Research on gait-assisted robots began in earnest in the early 2000s, and they are currently being used to help patients with gait disturbance with gait training and to improve gait ability.
- Wearable gait-assisted robots are actively utilized in rehabilitation medicine, but there is no established protocol for their application.
- In this study, we would suggest in more detail the application method of a wearable gait-assisted robot according to the patient's walking disability.

Materials and Methods

- The wearable gait-assisted robot used was the Angel Legs.
- The patient's gait function was classified using Functional Ambulation Categories (FAC) and Berg Balance Scale (BBS).
- The application method was organized according to the functional level of 167 patients with brain lesions, spinal cord injury, cerebral palsy, developmental delay, and peripheral nerve disease who received robotic-assisted gait training (RAGT).



Fig. 1. Angel Legs:
Wearable gait training robot

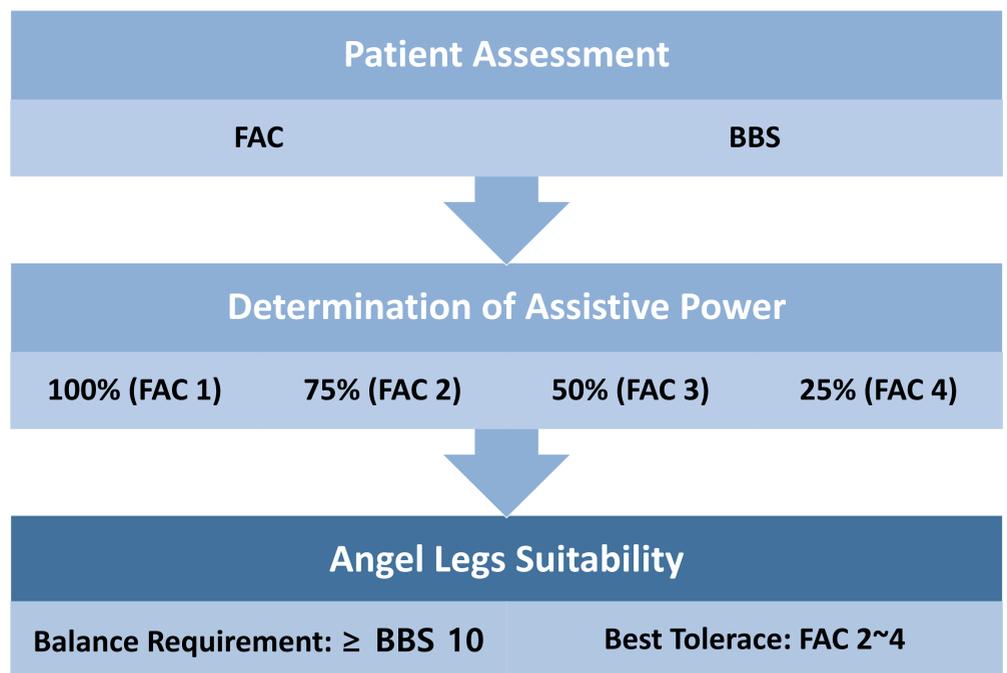


Fig. 2. From Patient Evaluation to Angel Legs:
A Step-by-Step Guide

Results

- Sensitivity, assistive power, and assistive power maintenance time were set according to FAC and muscle strength.
- The assistive power was started by setting FAC 1 to 100%, FAC 2 to 75%, FAC 3 to 50%, and FAC 4 to 25%.
- Walking assistance devices such as a cane, walker, and partial weight-bearing suspension were applied to patients with FAC less than 2, BBS less than 15, poor hip extensor, and decreased proprioception.
- Angel Legs is a mobile gait training robot that requires higher balance ability compared to fixed gait-assisted robots. Therefore, when performing gait training using a wearable gait-assisted robot, it is considered that a balance ability of BBS 10 points or higher is required.
- It was applied to patients corresponding to FAC 0~4, and among them, it was more tolerable to patients corresponding to FAC 2~4.

Conclusion

- Gait-assisted robots are one of the methods that can help with gait training for patients with gait disorders, and it is necessary to establish a protocol for this and apply it based on this.
- There will be a need to develop more precise RAGT protocols for each disease and functional level.