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Evaluation of a Hip Stretching Device with Passive Adjustment Mechanism for Rehabilitation Support

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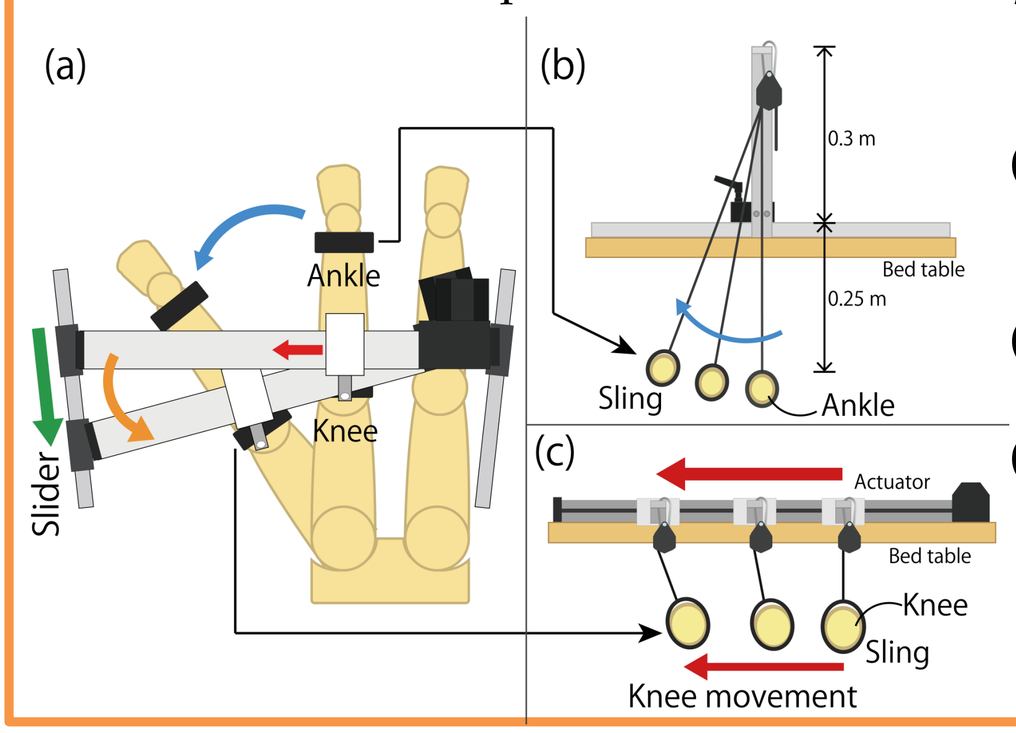
Introduction

This paper proposed a hip joint stretching device which is intended for physical therapist's rehabilitation support by using a passive adjustment mechanism.
Physical therapists treat their patients to prevent contracture of subject hip joint and to improve walking function, but a sufficient rehabilitation therapy can not be done due to demand a labor-task of the hip joint rehabilitation.
To reduce the labor-task, there is a demand of the physical therapist rehabilitation mechanical support long time, especially it can be installed easily in bed in patient home.

Methods

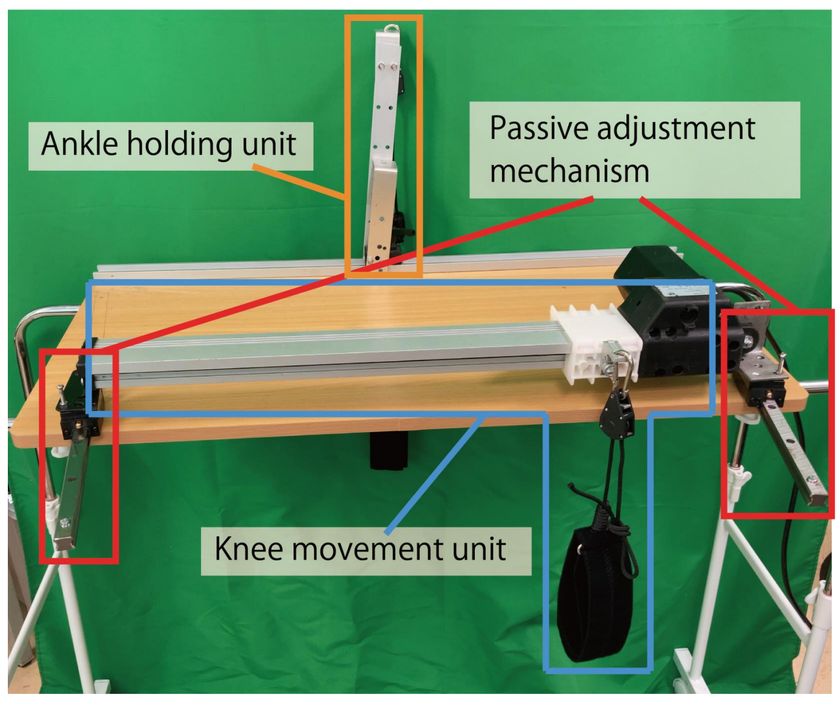
By using a passive adjustment mechanism made of linear guide rails attached to both ends of the actuator, the developed device can work anywhere independently the position the patient's on the bed.



(a)Passive adjustment mechanism

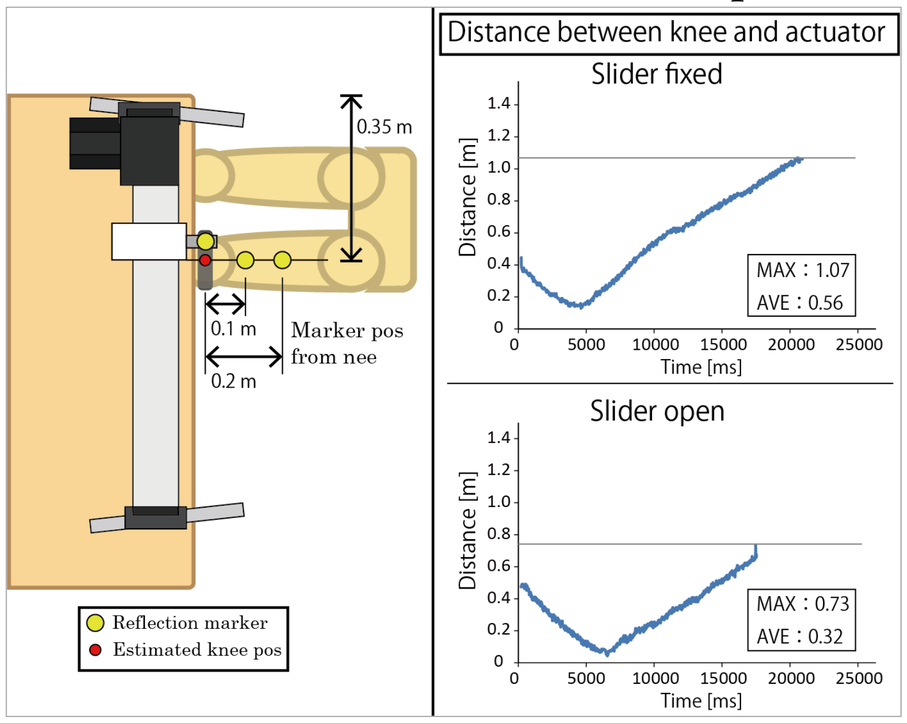
(b) Ankle holding unit

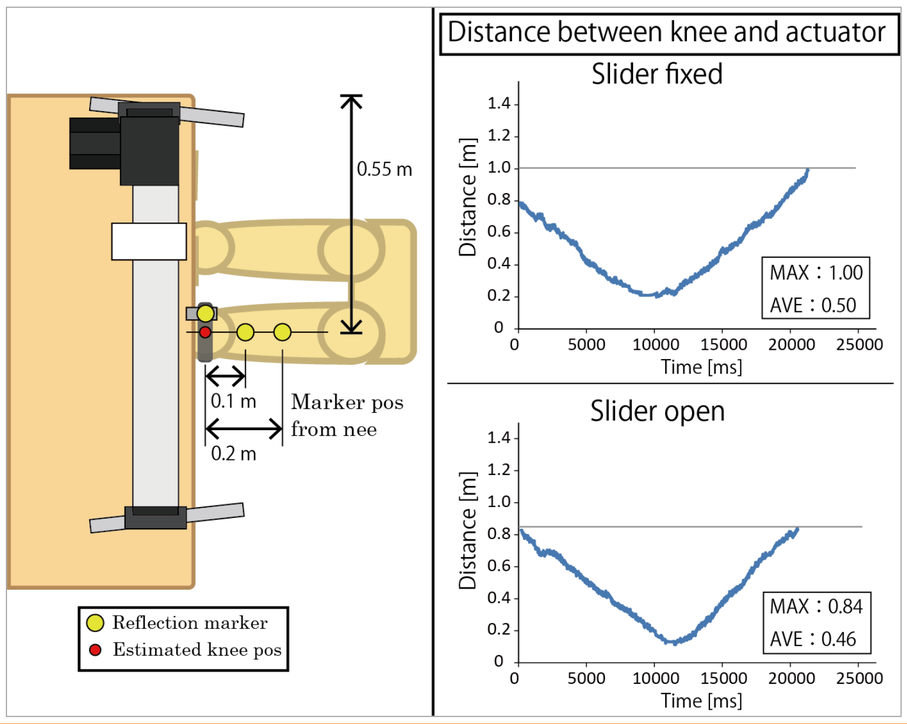
(c) Knee movement unit



Result

As a result of the experiment, it was confirmed that the misalignment between the knee and the actuator was suppressed more when the slider was open than when it was fixed.





Conclusions

The results showed that the proposed passive adjustment mechanism was effective in optimizing the actuator position and reducing patient pain.