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A total solution developed by functional orthoses to facilitate recovery of the hand function in patients with stroke

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Most stroke survivors suffered moderate to severe complications of disability in the affected hands. The loss of hand function resulted from flaccidity in early stage and followed by later hypertonicity or spasticity of the flexors and weakness of the extensor muscles in the affected arm. The limited extension of the fingers and wrists can hinder their hand use in daily living and lead to deterioration of hand function. Functional dynamic orthoses emerged to be considered as promising [therapeutic devices for stroke rehabilitation](#) in recent years as fabrication technology developed. They can provide highly repetitive task-oriented training and improve functional recovery for stroke patients. Stroke patients have different recovery stages in hand movement chronologically. Previous studies mostly explored the design and efficacy of only one type of orthosis for certain stage, and which could not fulfill the demands of patients at [various recovery stages](#). We thus develop a total solution with three types of functional dynamic orthoses for different rehabilitation goals according to recovery stages. In order to open the clasping affected hands of stroke patients, these orthoses are named as (1) iOPEN-[Stretch for reducing contracture](#), (2) iOPEN-Clinic-based for functional training under therapists' guiding, and (3) iOPEN-Home-based for promoting hand use in daily activities frequently. The three types of dynamic orthoses are shown in Figure 1. We are continuing to refine the orthoses and recruit participants for clinical studies. This poster would introduce the latest designs and application of our total solution to improve the hand grip and overall upper extremity function of the stroke patients and facilitate their effective use in daily activities.

Biography

Kai Chang is an occupational therapist from Taiwan. He is a PhD student at the Institute of Allied Health sciences, College of Medicine, National Cheng Kung University in Taiwan. His research interests include stroke rehabilitation, additive manufacturing technology, and medical device development. He is also an entrepreneur and owns a company of medical equipment R&D and manufacturing.

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