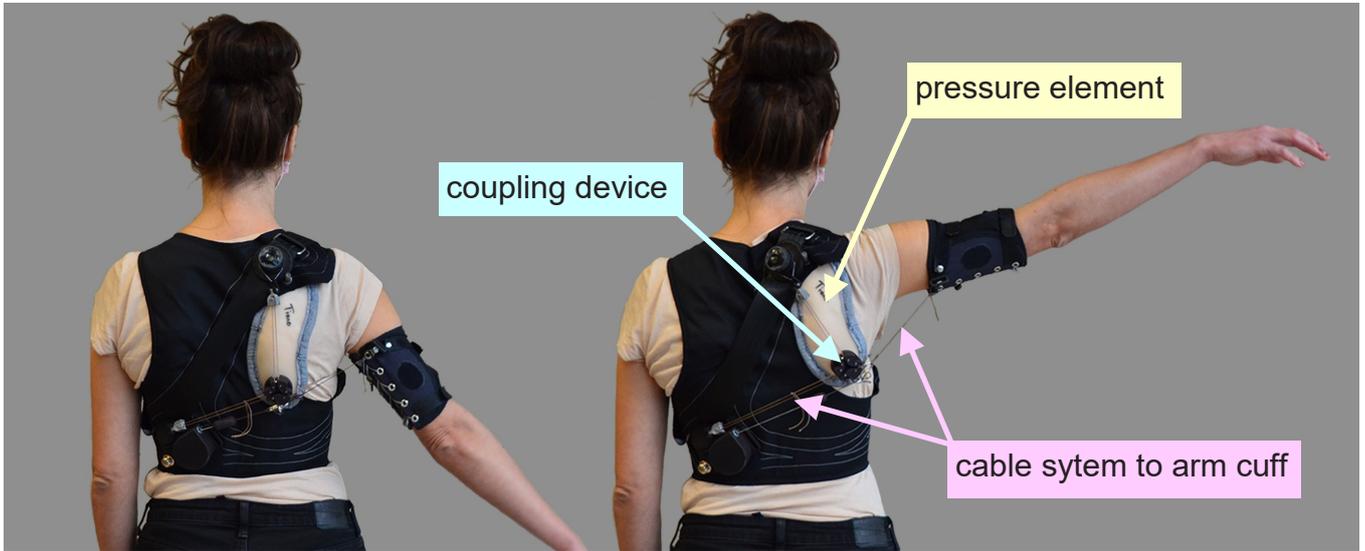


## Licensing Opportunity

Orthosis for supporting the scapula - from daily life assistance to rehabilitation and workplace ergonomics



### Application

The orthosis supports the scapula in the physiological scapulohumeral rhythm during therapy so that patients can regain strength and relearn the coordination of the scapula movement. The orthosis can be applied as a daily life assistance device or during rehabilitation therapy. Moreover, the orthosis supports ergonomic movements when lifting heavy loads and performing overhead tasks.

### Features & Benefits

- Prevents injuries, provides independence
- Low production cost, ease of use, low maintenance
- Light-weight, high comfort-level for the patient

### Publications

- Patent pending

### Background

Shoulder instability is mainly caused by weakness of the muscles that attach to the scapula (shoulder blade). An extreme example is the scapula alata, where the shoulder blades visibly protrude from the chest wall. The condition is usually painful and makes daily activities difficult. Existing orthoses typically stabilize the shoulder blade in one position and either prevent scapula movement completely or do not follow the scapulohumeral rhythm, which reduces therapy quality.

### Invention

The presented orthosis supports the coordinated movement of shoulder blade and upper arm (scapulohumeral rhythm). The orthosis has three key elements: The pressure element (1) is form-fit and attached to the shoulder blade. Its normal force causes the shoulder blade to remain in its natural plane of movement. The coupling device (2) induces a rotation ( $\varphi$ ) around the superior angle of the shoulder blade. The rotation is activated by a cable system (3), which connects the coupling device with a cuff around the upper arm. The device can be pre-tensioned independently from the arm movement according to the patient's needs or an intended special use case of the orthosis. Wide lateral arm movements (beyond 90°) are supported. In therapy the orthosis is a valuable asset, as the therapist uses both arms to move the patient's arm and needs an auxiliary device to support the scapula at the same time for an optimal outcome. The device can be used in combination with most other assistive devices for the upper limb as rehabilitation exoskeletons or exosuits. Furthermore, the orthosis is easy to attach, so that patients can use it on their own (which is an advantage while social distancing rules apply).

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### Technology Readiness Level

