

## Sling for Paretic Limb

### Development status

#### Phase 2

**Feasibility study.** There is a realistic design of the technology and the initial tests in the laboratory are leading to the specification of the technology requirements and its capabilities.

### IP protection status

Czech utility model application (PUV 2022-39935) & know-how

### Partnering strategy

*Collaboration, investment, licensing*



### Institution



**Fakultní nemocnice Hradec Králové**

### Challenge

Paresis of the upper limb is one of the most common consequences of a stroke or brachial plexus injury. Patients have difficulties controlling the paretic limb, especially against gravity so it can create overloading-induced soft tissue damage in the shoulder area, which can lead to the painful shoulder syndrome. Reduced ability of the limb to perform functional movements (reaching, grasping, manipulating an object) leads to difficulties in performing daily activities and dependence of the individual on the help of others. In addition to the irreplaceable role of intensive rehabilitation, temporary positioning of the limb is necessary. For this, rehabilitation aids are used to improve the user's self-service and quality of life. Commonly used solutions for positioning paretic upper limb are non-woven triangular bandage or a „bag“ type arm sling. However, these aids overload the cervical spine and cause pain, while it is difficult for the patient to fix the limb in such aids by himself.

### Description

Our invention is intended to be used for simple fixation of the paretic upper limb in the ideal position without the need to be hung over the neck area. The aid is intended to be used for temporary period, until the patient's condition stabilizes, and he can already be equipped with a suitable orthosis or for a temporary period until the function of the upper limb improves. The positioning sling fixes the elbow joint and the wrist of the handicapped upper limb into a „pocket“, which forms a support and ensures the ideal position of the limb by preventing damage to the muscles and joints of the upper limb. Thanks to the elastic part, there is no overloading in the shoulder area and the sling does not slip and fits well. The sling can put on by the patient himself, thus increasing patient's self-service and quality of life during recovery. The sling is suitable for patients after a stroke, with brachial plexus paresis, peripheral paresis and after injuries of the upper limb, where temporary positioning is necessary. It can also be used, for example, in Sudeck syndrome, which is associated, among other things, with the development of edema. The use of a sling ensures a smaller bend in the elbow joint and a better lymphatic drainage of the upper limb, thus reducing the edema, enabling better rehabilitation process and minimizing the occurrence of secondary problems.

## Commercial opportunity

In the Czech Republic alone, stroke affects approximately 30,000 people per year. Although the mortality from stroke in the Czech Republic has been steadily and significantly decreasing since the second half of the 1990s, mainly thanks to better information of the population, positive changes in lifestyle and advanced treatment methods, the mortality from stroke in the Czech Republic is still significantly higher than in most developed countries. However, despite the favorable trend in the decrease in mortality, the number of patients requiring intensive rehabilitation care is increasing in an attempt to reduce the consequences of stroke, especially significant health limitations or disabilities. It is estimated that 50–60 % of patients with stroke have variously severe mobility disorders of the upper limb. The device is a class I medical device, it can be launch into the market by the manufacturer after meeting the legal requirements either in the self-pay mode or covered by public insurance after obtaining reimbursement (partial/full) based on a prescription by the doctor. The sewing workshop CHariTEX, which supports the employment of people with disabilities, collaborated on the development of the prototype. We are currently looking for a licensee, a manufacturer of medical devices, who will be granted a license to the Czech utility model, know-how related to the technical solution and the right to use the audiovisual work (instructional and promotional vide loop).