



### Technology owner

University Hospital Hradec Králové

### Inventor (s)

Petra Šolínová, MSc.

### IPR status

EUIPO 8597157  
CZ industrial design application  
PVZ 2021-41967

### Stage of Development

Prototype tested

### Contact

Lucie Bartošová, Ph.D.  
lucie.bartosova@fnhk.cz  
+420 727 802 314

## Head and Neck Brace

### Background

Head and Neck Brace is a solution to the difficulties involved with fallen head syndrome: it solves head fixation in the required position for safe food intake (mild flexion, head support) and at the same time it uprights body position (spine support).

Some neurological disorders are manifested by weakness of the extensor muscles of the neck, which causes inadequate kyphosis in the area of the cervical and thoracic spine (dropped head syndrome DHS). This creates problems with food intake and the risk of aspiration and swallowing disorders and an overall reduction in quality of life. One of the common causes of these disorders are neurodegenerative disorders – amyotrophic lateral sclerosis (ALS). Patients experience gradual progressive muscle weakness, including respiratory muscles. All this happens while maintaining mental abilities.

### Description of the Invention

Head and neck brace – a device made of a combination of plastic and aluminum and textile cover, which on the principle of a splint attached and fixed to the head and torso maintains an upright position of the head and neck and stability of the spine. The system of attaching the brace to the body and head is secured with adjustable straps and velcro fastener. The upright position of the head reduces the risk of inhaling food and at the same time allows the user to perform normal daily activities (reading, writing, working on a PC, watching TV). Our device is easy to handle, easy to maintenance and it offers the possibility of individual production, directly according to the user's instructions. Prototype testing took place both in hospital environment and at home.

### Advantages and Potential Applications

The chin support collars used in practice stabilize the position of the head, but at the same time, they make it difficult to open the mouth and chew. The use of various positioning aids is also limited. Any other device that would ensure an upright position while maintain the ability to swallow and quality of life is not currently available on the market in the Czech Republic. Our device is intended for acute and follow-up care facilities, rehabilitation institutions, social care institutions and home environment. The device can be easily used both by professional medical staff and by caregiver in the home environment.

*The development was supported by the Technology Agency of the Czech Republic within the programme for applied research, experimental development and innovation GAMA 2 – Project TP01010034 – Centre for Transfer of Biomedical Technologies – PoC 2.*