

Dynamic Neck Support for Extended Surgeries and Other Applications

Surgeons and others experience neck pain stemming from non-ergonomic positions during extended procedures

Surgeons spend most of their time during operations in non-ergonomic positions, with the highest proportion of that time with the neck in a high-risk position. During surgical procedures, a surgeon's cervical spine faces higher risk, which can lead to chronic pain and disability. There is currently no product that supports the head to alleviate neck pain.

Innovative, inexpensive device supports the neck and alleviates pain

This device alleviates neck pain caused by looking down for extended periods of time. It consists of three parts: a head band, an elastic strap, and a posture corrector that both supports the wearer's neck and corrects their posture. When the wearer bends their neck to look down, the elastic strap provides a dynamic force that pulls the head up so that the neck muscles do not have to support the full weight of the head.

Using 2-4 inches of strap with a specific elasticity coefficient in parallel, the device provides varying levels of force to support the head. This pulling force from the strap changes linearly depending on the pull from the head, creating a dynamic support system. When the head is in the upright position, there is no force exerted and the wearer feels nothing.

Summary Bullets

- This device alleviates neck pain caused by looking down for extended periods of time.
- The pulling force changes relative to the extent the head is bent, providing comfortable support both when the head is upright and when bent.
- In mass production, the cost could be less than \$10.

Solution Advantages

- **Improves comfort:** The pulling force of the elastic band changes relative to the extent the head is bent, providing comfortable support both when the head is upright (with no force on the strap) and when it is bent.
- **Prevents pain and injury:** The supportive device may decrease the amount of time the neck is in position that risks injury and, potentially, disability.
- **Covers more angles:** The dynamic nature of the strap results in a wide range of angles at which the head can be bent and supported comfortably.
- **Versatile:** The device strap can be directly connected to a surgeon's loupe headpiece, instead of the device headband, with the same level of support and comfort.
- **Inexpensive:** In mass production, the cost to produce this product could be less than \$10.

Potential Commercial Applications

- For surgeons to alleviate neck pain due to continuously looking down during long surgeries
- Other workers and students who spend long periods of time with their heads bent in a downward position (e.g., looking at a screen, keyboard, keypads, machinery)

Inventors

- Zixiao Yang
Researcher - Georgia Tech George W. Woodruff School of Mechanical Engineering
- Dr. David Hu
Professor – Georgia Tech School of Mechanical Engineering

IP Status

<p>Patent application has been filed</p>: US63/486114

Publications

, -

Images



(left) The dynamic neck support being worn when the head is up and the neck is at rest. (right) The extended device when the head is bowed in a bent position.



The back view of the device, showing the dual elastic straps connecting the posture corrector on the wearer's back to the headband.

Visit the Technology here:

[Dynamic Neck Support for Extended Surgeries and Other Applications](https://s3.sandbox.research.gatech.edu//index.php/print/pdf/node/4003)

<https://s3.sandbox.research.gatech.edu//index.php/print/pdf/node/4003>