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Editorial

The Heads-Up on Neck Strengthening Devices: An Industry Hanging its Head

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Background

Neck Pain is defined by the Global Burden of Health 2015 Study as "pain in the neck with or without pain referred into one or both upper limbs that lasts for at least one day" [1]. With regards to the neck, this region is from the occiput to the first thoracic vertebra [2].

Worldwide, in 2020, neck pain affected 203 million (95% uncertainty interval [UI] 163-253) people [2]. Indeed, neck pain is a very common reason for seeking physical therapy in the United States. There are many causes of neck pain and thus treatments vary widely as a result. One constant through all the various treatments, regardless of etiology, is exercise, the chin tuck. With its many forms, exercise is highly customizable to the specific diagnosis, patient tolerance, pain level, etc. For decades, rehabilitation practitioners have used pillows, towels, resistance bands, or manual resistance to help patients improve their strength. When it comes to home exercise program prescription, the choices in home exercise devices are not as plentiful. The commercial market offers very few sensible options with regards to neck strengthening devices that simulate the chin tuck. This is very frustrating for the practitioner, who, like the consumer, is looking for a practical device to help make rehabilitation easier and quicker.

Market search

This clinician-author decided to do a market search (Types of Neck Strengthening Devices) first through Google Gemini (https://gemini.google.com), the Google personal AI assistant. It quickly separated the available neck strengthening devices into the following categories.

Neck harnesses (Weight-loaded)

This classification is perhaps the most common and classic of the neck strengthening tools. This category includes a padded harness with a chain or strap that fits around your head. The harness is designed so that one can attach weight plates or resistance bands. Various neck movements are then performed against the resistance of the weights or bands. Here are the companies listed by Gemini in this category:

- Pros: Often less expensive, they can provide varied resistance patterns, some even offer rotational resistance.
- Cons: Generally, less comfortable than resistance band based devices.
- DMoose Fitness Neck Harness https://www.dmoose.com: A popular and affordable option found on Amazon and other fitness retailers.

- Flexi Muscles Neck Harness https://fleximuscles.com: Another popular choice for weight-loaded neck training.
- RDX Neck Harness https://rdxsports.com: Often found in boxing and MMA training contexts.
- The Strong Neck https://thestrongneck.com/: A unique attachment that turns standard disc weights into a neck strengthening system.

Specialized neck training systems (Resistance-based)

These devices often use internal resistance mechanisms (like friction dials or resistance bands) to provide a more controlled and often 360-degree training experience.

How do they work? They offer resistance as you move your head in various directions, focusing on isometric (holding still against resistance) and dynamic movements.

- Pros: Often more comfortable and adjustable, they can provide varied resistance patterns, some even offer rotational resistance.
- Cons: Generally, more expensive than basic harnesses.
- Iron Neck https://www.iron-neck.com: Considered a premium neck training device offering rotational resistance and can be found in various models (Pro, Varsity, Starter) with different features like variable friction dials. It's designed for recovery, prevention, posture, and mobility. You can find it on retailers like Rogue Fitness and Target.
- NecksLevel Glide https://neckslevel.com: A Physical Therapist developed system designed for neck rehab and strengthening, using resistance bands for various movements.
- NECK X® https://www.neckxsystems.com: Originally developed for the U.S. military, this portable device uses TPE Latex Free Exercise Bands and an adjustable cap to target different muscle groups. It aims to increase neck strength, flexibility, range of motion, and endurance.

Plate-loaded neck machines

Description: These are larger, stationary gym equipment pieces designed specifically for neck training. They typically have a seat and a padded lever arm that you push against with your head, loading with Olympic weight plates.

How they work: They isolate neck muscles, often allowing for 4-way movement (flexion, extension, and lateral flexion).

- Pros: Provides a stable and isolated way to train the neck, allows for heavy progressive overload.
- Cons: Expensive, takes up a lot of space, usually found in commercial gyms or dedicated home gyms.
- Titan Fitness Plate Loaded Neck Machine https://titan.fitness/products/plate-loaded-neck-machine: This four way neck machine isolates neck muscles to improve neck strength and muscle control, leading to better posture and neck stability.

Simple devices/tools using bodyweight or free weights

Description: These are often simpler attachments or concepts that allow you to use your own bodyweight or existing free weights in new ways.

How they work: They facilitate movements that engage neck muscles with weighted resistance without complex machinery.

- Pros: Very affordable, minimal space needed, good for beginners.
- Cons: May offer less resistance than dedicated machines, some can be a bit awkward as there is not the support of a machine as the base.
- The Strong Neck https://thestrongneck.com/products/the-strong-neck: A rigid silicone pad with a handle that turns standard disc weights into a neck strengthening system for neck curls, lateral bends, and extensions.
- Kensui EZ Neck https://kensuifitness.com/products/ez-neck-pro: A device designed to make weighted neck exercises more comfortable and effective.
- CBP® Pro-Lordotic Neck Exerciser (https://www.idealspine.biz/collections/pro-lordotic-neck-exerciser): An exercise band designed to load the cervical spine's lordosis while performing active exercises, strengthening deep neck flexors.

This clinician-author then performed a second search on Amazon under "neck strengthening device" and in addition to those companies above, there were the following.

Description: These are often simpler attachments or concepts that allow you to use spring loaded devices or resistance band devices in new ways.

How they work: They facilitate movements that engage neck muscles with spring loaded or resistance band without complex machinery.

- Pros: Very affordable, minimal space needed, good for beginners.
- Cons: May offer less resistance than dedicated machines, some can be a bit awkward as there is not the support of a machine as the base.
- Neck Stretcher https://www.amazon.com/s?srs=69588267011&rh=p_89%3ABLRZHFC: A spring-loaded device that attaches to a head band and a door frame to provide resistance for head movements.
- Neck Trainer with Adjustable Resistance https://a.co/d/4aftmVb: A device that allows for adjustable resistance to neck bending and extending while holding onto handles that attach to a shoulder piece.
- X-nek- https://xtreemnek.com/: A device to help you perform the chin tuck exercise with proper form with an integrated resistance band mechanism.

Literature search

Next in order is a literature search of 200 articles with keywords "neck strengthening device" on Google Scholar (since this clinician researcher feels more comfortable in this space versus Google Shopping). Below is what is offered to us research shoppers with our specific list (this author "scholared" until he dropped):

1. TopSpin360 helmet https://topspin360.com/. The small weighted arm swings freely about the centrally mounted axis such that the athlete wearing the helmet and using coordinated head movements can get the weighted arm spinning. The faster the individual can get the weighted arm spinning, the greater the centripetal force generated and the stronger and faster the neck muscles need to respond and contract to maintain the weight spinning [3].
2. Shingo Imara™ Athletic Neck™ https://www.facebook.com/shingoimara/ brand is a 2-tool kit and protocol for developing neck strength as a means to stabilizing the head. It is a neck band resistance apparatus [4].
3. Chattanooga stabilizer pressure biofeedback (Manufacturer discontinued) is a simple pneumatic device to provide feedback to ensure quality, and precision in exercise performance and testing of particular neck muscles [5].

Top of the shopping list

Rested up after the neck strengthening device searching, the brain can now focus on what is the most effective exercise for neck pain and postural improvement. When it comes to posture, a longtime favorite ("longtime" refers to over forty years of this author's physical therapy career), the chin tuck, is still at the top of the shopping list [6-8].

So, what makes the chin tuck such a Physical Therapist (Speech Therapist as well) favorite through the years? Like any other bargain, you get more for your money. So, what you get with the chin tuck is multiple cervical muscle activation. Namely, rectus capitis anterior, rectus capitis lateralis, longus capitis, and longus colli/longus cervicis (3 portions: superior oblique, inferior oblique, vertical) [9]. This exercise can help to maintain the cranium in the center of each of the three anatomical planes in between the shoulder girdles. Additionally, this exercise reduces excessive strain on the cervical region muscles with lower risk of increased forces on the intervertebral discs, due to minimal displacement of the vertebral bodies during the chin tuck moment. To demonstrate this point, one study demonstrated that in the Forward Head Posture group, average muscle forces were approximately 33% of those of the Neutral Head Posture group. Average joint forces and torques of the Forward Head Posture group were approximately 38.0% and 20.2% higher during protraction and 36.1% and 25.3% lower during retraction, respectively [10].

Armed with this information, a quick return to our shopping list reveals one device that meets the chin tuck criteria, which leads back to the previous statement about very few options with regards to neck strengthening devices on the commercial market. In the interest of giving a heads up, the device that simulates the chin tuck, according to its website, is X-nek- https://xtreemnek.com/. A quick scan through the website menu reveals the How to Use section, where you can find a demonstration video. Here one can see that the device truly does mimic the chin tuck.

The bottom line

As one can readily see, the chin tuck is the most effective exercise for strengthening the neck and helping to maintain proper head position to assist with improving posture. So, when it comes to "taking it on the chin", therapists don't have to when it comes selecting a biomechanically accurate exercise device. Patients and therapists will certainly get the "heads up" with a chin tuck mimicking device for use in the clinic or at home.

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