



From the DMRF Journal

Observing the Diversity of Alleviating Maneuvers in Cervical Dystonia

Dystonia, the third most common movement disorder, is characterized by involuntary muscle contractions that produce abnormal postures of varying severity, intensity, and duration. Alleviating maneuvers (AMs), often referred to as “sensory tricks”, have been defined as “voluntary actions that specifically correct the abnormal posture or alleviate the dystonic movements” (Albanese et al., 2013). For this study, the researchers extensively reviewed the existing clinical literature to select 15 commonly described AMs and then included any others described during patient interviews. These AMs were then divided into five groups based on their similarities. (See accompanying chart.) This study used a detailed patient interview to explore any patterns between different clinical features of cervical dystonia (CD) and the benefit of five different categories of AMs.

Study participants were selected if they had adult-onset focal CD and were excluded if they had cognitive impairment, movement disorders other than CD, other neurological conditions, and any prior neurosurgeries, including deep brain stimulation. All participants were undergoing treatment with botulinum neurotoxin injections. To avoid treatment influencing the data, data was collected from each patient 3+ months after their most recent injections.

This resulted in 100 participants, 71 of whom were female, with an average age of 62 years old, and an average time since symptom onset (disease duration) of 14 years. Of these 100 participants, 47 experienced head tremors, and 27 experienced tremors in a non-dystonic body area. In addition to basic patient demographics, the severity of their CD was assessed, and they were asked to describe their experience with AMs, the frequency with which they use them, and to rate their symptom “alleviating power” on a visual 10-point scale.

Frequency and therapeutic effect of the different categories of AMs

First and foremost, 75% of study participants reported using at least one AM, with the most commonly used being the passive category, reported by 58%. 62% of the study

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Albanese et al., 2013

participants reported using more than one category and almost all (34/37) of the patients that reported using two or more categories use the passive AMs. Interestingly, the amount of symptom relief reported for these different categories of AMs was comparable, with the averages falling between 6 and 7 on a 10-point scale, 10 being the most effective. The only exception was the most commonly used category, the passive, which had a significantly greater alleviating impact than the least common group, the pure sensory.

Patterns between patient demographics and the success of different types of AMs

Correlation analyses are used to show whether there are associations between two features in a research study. Here the different features are the frequency of use and amount of symptom relief of the different AM categories and the patient demographics. The researchers found that the frequency of use of pure sensory AMs positively correlated with age, meaning the older participants used this category more frequently. They also found that patients who experience more severe CD symptoms or associated disability use the passive AM category more, and those with greater CD severity reported more symptom relief from this method. Furthermore, patients with greater dystonia-related disability, severity, and frequency of CD-related pain more commonly used a combination of the passive and active non-oppositional AMs than just passive alone. These findings suggest that not only do AMs continue to work for those with greater CD severity, disability, or pain, but many patients benefit from using a diverse set of AMs.

5 TYPES OF ALLEVIATING MANEUVERS FOR CERVICAL DYSTONIA

PURE SENSORY

The sensory effect that results from wearing a variety of head or neckware.

Examples: Wearing a scarf or neck collar, glasses, a hat, or a helmet.



COMPLEX MOTOR

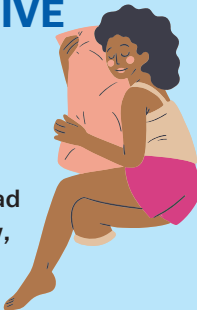
Complex motor movements that are not directly related to the CD, such as walking, talking, yawning, chewing, or closing the eyes.



SENSORIMOTOR: PASSIVE

Intentional positioning that relaxes the muscles supporting the upright position of the cervical spine that are often engaged by CD.

Examples: Resting the back of your head on your hand, the car headrest, a pillow, the couch, or laying on a side.



SENSORIMOTOR: ACTIVE + NON-OPPOSITIONAL

Gently touching parts of your face (chin, nose, or cheek), neck, or the back of your head with your hands



SENSORIMOTOR: ACTIVE + OPPOSITIONAL

Using your hands to push against your chin, forehead, cheek, neck, or upper back, or pushing your head against vertical surfaces (ie: car headrest)



Interestingly, the active oppositional AMs were less effective and used less often by those with longer disease duration. The higher frequency of use and greater effect of active oppositional AMs earlier in the disease progression can be explained by a few possibilities. Early on in disease progression (1) the milder strength or severity of dystonic postures can make them easier to overcome by an applied, counteracting force; (2) patients may be more likely to instinctively counteract their dystonic postures using force; (3) perhaps due to the first two explanations, patients may be unaware that comparable relief can be attained through light touch (active non-oppositional), and that upon learning of these more easily applied AMs they discontinue the with the active oppositional AMs.

Notably, participants who used more than one type of AM used them with similar frequency and therapeutic effect.

Why are passive AMs so effective?

At first glance, passive AMs alleviate symptoms by a simple change in posture and possible added benefit from the sensory input provided by an object being used. However, the success and frequency of use of this method across the study participants also suggest that this method may temporarily correct one of the suggested causes of dystonia: an error in the proprioceptive feedback loop, the feedback loop that describes one of the communication systems between the body and the brain that is negatively impacted by dystonia.

Proprioceptors are specialized cells or neurons that communicate sensory information about movement, action, and your location in space from your body to your brain. The brain uses this information to deliver movement-related instructions back to the muscles. The cells that deliver these instructions from the brain back to the muscles, triggering muscle contractions, are another type of specialized neuron

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called motor neurons. Together these cells make up a communication loop between the body and the brain and are responsible for maintaining stable body posture and coordinated movement as we navigate through varied environments. For example, allowing us to walk without having to actively think about each step.

In patients with CD, the information being sent from the muscles in the neck to the brain is misinterpreted. Botulinum neurotoxin, a primary treatment for CD, works by blocking the motor neurons that initiate a muscle contraction, blocking both the muscle contraction and the resulting information being sent to the brain that is then misinterpreted in CD patients. Reducing the information being sent to the brain decreases the wrong signals getting sent back to the muscles producing dystonia. It is thought that the passive AMs work through a similar mechanism. Repositioning the neck passively removes the need for muscle contraction (to support the head) reducing the signals being misinterpreted at the level of the brain in this feedback loop—functionally turning the volume down on the ongoing signals being sent between the muscles and the brain and back.

Study by Drs. *Laura Avanzino, Francesca Di Biasio, Gaia Bonassi, Elisa Pelosin, Nicholas Cothros, Roberta Marchese, and Davide Martino.*

Study brief originally published in the journal, *Dystonia*, May 17, 2022. Summary by *Kylie McPherson, PhD.*

STUDY OFFERS ADVICE FOR KEY FINDINGS

1. There are five categories of alleviating maneuvers (AMs) that produce the same degree of symptom relief for the cervical dystonia (CD) patients that use them.

Of the five types, one provides pure sensory input (ie: wearing a hat or scarf) and another is complex motor movement (ie: walking or talking). The other three are a combination of sensory and motor (termed “sensorimotor”), the first being sensorimotor passive (ie: natural positions that allow your dystonic muscles to rest like laying on a pillow), then sensorimotor active non-oppositional (ie: gently touching parts of your face, neck, upper back), and sensorimotor active oppositional (ie: pushing on your chin, forehead, etc.).

Advice: There are many AMs that work for CD patients, so explore these different possibilities and find what individual methods or types of AMs help best manage your symptoms.

2. The majority of patients find symptom relief from more than one category of alleviating maneuvers (AMs).

Advice: It is worth trying a variety of different AMs, even if you have found success with one category already, to increase the number of tools at your disposal. For example, if you currently exclusively use passive AMs (ie: laying down with a pillow), try active non-oppositional AMs (ie: light touch to your face, neck, or back) that would be more feasible in other situations like while driving.

3. Active oppositional AMs (ie: using your hands to apply force to your chin or head) are used less often and provide decreased symptom relief in patients with longer disease duration.

Advice: If you use active oppositional AMs, consider trying active non-oppositional AMs to determine if there are less-taxing methods that produce the same relief for you.

4. Patients who experience more severe CD symptoms or associated disability use the passive AM category more and report more symptom relief from this method.

Advice: If you have been reluctant to try sensory tricks because your symptoms are severe or have progressed recently, this could actually be an indication that you will receive greater symptom relief from passive AMs (ie: laying down).