

TEXT NECK SYNDROME: PREVENTION AND MANAGEMENT

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ABSTRACT

Text neck syndrome refers to the overuse injury which leads to the cervical spinal degeneration due to repeated stress over it while texting in the smartphones. It affects cervical as well as thoracic postures in individuals using smartphones. Cervical posture changes lead to forward head posture and thoracic posture changes lead towards forward position of the scapula and shoulder. Muscle activity changes are seen in sternocleidomastoid and middle trapezius muscles while texting. The clinical examination is directed towards to assess postural changes by photogrammetric examination for various postural angles such as craniovertebral angle (CVA), Sagittal head tilt, Coronal head tilt etc. Ergonomic modifications will help to prevent the further injury to spine. The pain due to this can be managed by medication and improvement in posture managed by strengthening and stretching exercises as well as ergonomic modification.

INTRODUCTION

"Text neck syndrome" may be considered an emerging condition of the 21st century. This clinical issue refers to the onset of cervical spinal degeneration resulting from the repeated stress of frequent forward head flexion while individuals look down at mobile device screens and engage in prolonged texting. Text neck syndrome is particularly prevalent among adolescents, who spend several hours a day and numerous days each year hunched over smartphones and personal computers. It is estimated that 75% of the world's population spends hours each day with their heads flexed forward while using handheld devices.[1] The term "text neck" was coined to explain persistent stress-related pathology associated with modern technology usage. Nowadays, text neck

syndrome is recognized as a serious condition due to the continuous and extensive use of smartphones among students. In today's work culture, where much communication, such as emails, financial transactions, and social media interactions, occurs via smartphones, prolonged smartphone use puts significant stress on the muscles of the cervical spine.[2]

The term "TEXT NECK" was first coined by US chiropractor Dr. Dean L. Fishman. It describes neck discomfort and upper back muscle injuries caused by frequent neck flexion at various angles while staring down at a mobile phone, which alters the normal curve of the cervical spine. Text neck syndrome is often referred to as the "Pain of the

Modern Era" because it is caused by modern gadgets such as cell phones and computers, leading to acute to chronic pain in the neck and upper back area[3]

DEFINITION

Text neck syndrome is an overuse syndrome typically attributed to repetitive stress injury of the cervical spine resulting from a flexed and forward head position sustained during prolonged engagement with mobile screens. If left unaddressed, the pain and other symptoms associated with cervical spine discomfort can deteriorate progressively, contributing to various physical health problems including spinal disc degeneration, musculoskeletal pain, and reversed cervical lordosis.[4]

EPIDEMIOLOGY

Neck pain is a widespread cause of disability globally, presenting a significant public health concern that has seen a notable increase in recent times. Its prevalence, irrespective of age, is substantial, akin to low back pain. Epidemiological data reveals that 73% of university students and 64.7% of individuals working from home experience neck or back pain, with 39.2% of them acknowledging reduced productivity due to such discomfort. The surge in the prevalence of neck pain can be attributed in part to the ubiquitous use of personal computers and cell phones for texting.[5] In epidemiological studies examining the general population, the 1-year incidence of neck pain can soar as high as 40%. Neck pain and other musculoskeletal diseases have been classified by the World Health Organization (WHO) as the 4th and the 10th most significant pathological conditions in terms of years lived with disability, respectively.[1] Numerous studies have been undertaken to gauge the prevalence of text neck syndrome, predominantly focusing on the young adult population, which exhibits the strongest attachment to smartphones. A study conducted among 283 college students in India in 2021 revealed that 76.6% of respondents reported experiencing text neck syndrome. Similarly, Ayhualem S. et al. investigated the prevalence of neck pain among smartphone users in Ethiopia over a year, finding that 47.4% of users complained of this particular symptom. Notably, this figure is lower than those reported in studies conducted in China (72.9%), Saudi Arabia (71.2%), Brazil (66.7%), Singapore (74%), and Taiwan (52%).[6] A study by Susilowati IH. et al. among the University Indonesia community during the work-from-home program implemented due to the

COVID-19 pandemic revealed that 70.5% of respondents reported musculoskeletal discomfort, notably in the neck (86.4%), lower back (75.9%), and shoulders (76.2%).[7] These findings underscore the high prevalence of text neck syndrome, which may continue to escalate with the significant increase in smartphone usage.[8]

ETIOLOGY

The pediatric population is particularly susceptible to developing text neck due to the escalating use of mobile devices and screens at a young age. In today's technologically advanced world, an increasing number of individuals are spending prolonged periods on handheld devices such as smartphones, computers, tablets, and e-readers. This prolonged usage often entails flexing the neck for extended durations, leading to the development of "text neck".[9,10]

The primary factor exacerbating this clinical condition is prolonged periods of looking down with the cervical spine in flexion, as observed when using a smartphone or tablet, reading on a laptop, or leaning the head forward while viewing a computer screen.[5]

CLINICAL FEATURES [11]

Specific symptoms associated with text neck syndrome may include:

Stiff neck: Difficulty in moving the neck, particularly when attempting to turn the head from side to side after prolonged smartphone use.

Sharp pain: Localized pain, often described as stabbing or stinging, typically felt in the lower levels of the neck.

General soreness: Discomfort concentrated in one area of the neck and trapezius muscle region.

Radiating pain: Pain that extends along a nerve pathway from the neck into the shoulder and arms.

Weakness and numbness: Weakening of shoulder muscles, particularly the trapezius, scalenus, rhomboids, and sternocleidomastoid muscles.

Eye symptoms: Texting with the neck in forward flexion can cause nearsightedness, eye strain, or dry eyes, as the focus on the object is nearby. Common eye symptoms include eye strain, dry eyes, and nearsightedness.

Electromagnetic radiation symptoms: Exposure to electromagnetic radiation from devices may result in various symptoms such as difficulty sleeping,

dizziness, headaches, tingling in the hands, ringing in the ears, and eye pain.

PATHOPHYSIOLOGY [1]

The weight of the head on the spine significantly increases when it is flexed forward, and this effect intensifies with greater degrees of flexion. A full-grown head weighs approximately 5 kg in a neutral position. As the head is increasingly flexed, the forces on the neck surge, more than doubling at 15° (roughly 12 kg). Furthermore, the burden of head weight escalates to 18.14 kg at 30° and 22.23 kg at 45°, reaching over fivefold at 60°, total 27.22 kg. Not only is the degree of neck flexion relevant, but the frequency of head bending also induces additive effects on neck physiology. Frequent forward flexion can alter the curvature of the cervical spine, as well as affect supporting ligaments, tendons, musculature, and bony segments. These changes commonly lead to postural alterations and pain in the neck and associated areas

ergonomics, positioning chairs, monitors, mobile phones, and keyboards to maintain natural alignment of the body, head, and neck. Additionally, learning to sleep on the back with an ergonomically-friendly pillow and mattress can help.

- Lifestyle modifications: Identify activities that contribute to recurring neck pain and limit or avoid them. For instance, reduce time spent craning the neck over a smartphone while texting by holding the device closer to eye level.



Figure 2 Faulty and correct posture while texting[12]

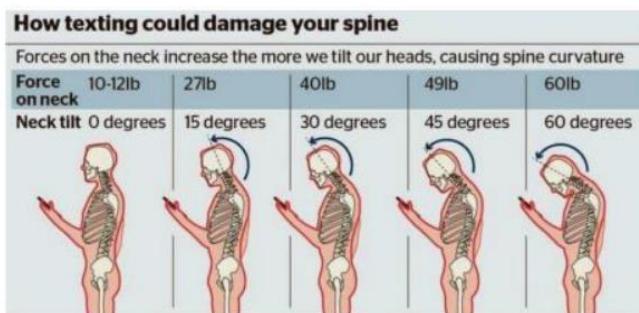


Figure 1 How texting could damage your spine [11]

PREVENTION[1,5,11]

Prevention is paramount when addressing text-neck. The following suggestions should be kept in mind while using smartphones or other handheld devices:

- Limit excessive usage and take frequent breaks.
- Avoid prolonged static postures.
- Position the device to reduce stress on the head/neck and upper extremities.
- Minimize high repetitions of movements such as prolonged typing or swiping.
- Refrain from holding large or heavy devices in one hand for extended periods.

Modifying the ergonomics of the working environment, controlling lighting and glare on device screens, taking frequent breaks, and educating oneself on proper posture and eye care are all crucial.

- Improving posture: Simple changes can alleviate neck pain caused by poor posture. This may involve adjusting the workstation for better

Ergonomic tips for smartphone use[13]

Avoid cradling the phone between your ear and shoulder.

- Use a Bluetooth headset instead of holding the phone to your ear to prevent fatigue.
- Vary the way you hold the smartphone and alternate between using thumbs and fingers when typing.
- Take breaks and change positions frequently while using the smartphone.
- Keep wrists relaxed while holding or typing.
- Utilize features like predictive text or auto-complete tools to reduce typing frequency.
- Choose a smartphone that fits your hands properly.
- If using the smartphone one-handed, ensure you can hold the phone securely and tap with the thumb on all targets without strain.

Children should be taught in schools from an early age about the symptoms of text neck syndrome, its risk factors, the negative health effects of excessive and inappropriate mobile device use, and available preventive and treatment options [14]. Using teaching programs in schools or smartphone apps that alert users when they use screens for longer than is advised or when they position their heads and necks incorrectly while using them could be good solutions.[14, 15]

Education is essential to the healing process as well as to prevention. If the patient already has a condition, they should be taught how to improve their posture, complete exercises correctly, practice self-therapy, change their movement patterns, and use the right posture when using electronic devices.[39] electrical gadgets.[39] Additionally, it is critical to break bad habits, modify the study and work environment to suit the needs of the individual, take regular breaks, and cultivate the understanding that the patient bears responsibility for the results of their therapy and that they must adhere to instructions in order to see benefits. Perseverance, drive, and dedication to the therapy are necessary for success.

Reducing the amount of time spent on mobile phones is another crucial consideration. According to the 2012 guidelines published by the Australian Department of Health, children younger than two years old should not be exposed to cell phones [14]. Youngsters between the ages of two and five shouldn't use their phones for more than an hour every day, and teenagers between the ages of 5–17 years should restrict their use to two hours each day when they are relaxing [14]. It is also crucial to note that stretching and taking breaks throughout that time are important ways to avoid uncomfortable discomfort.[17, 18]

Using a mobile phone for more than three hours a day is a substantial risk factor for the development of text neck syndrome, according to Elvan A. et al. [19]. According to Shahzad Y. et al. [20] and Khan S. et al. [21], people who use their phones for more than four hours a day are more likely to experience neck pain. In a study including 1143 students, De Vitta A. et al. [22] also found a link between the amount of time spent on smartphones and use and the frequency of neck pain.

To lower the risk of musculoskeletal problems, general recommendations advise adults to limit non-essential screen time to 2-3 hours per day and children and adolescents to less than 2 hours. The study of Aziz et al. [23] supports these recommendations. In order to determine the prevalence of text neck syndrome and its contributing factors in children and adolescents in 2022, Aziz et al. [23] carried out a cross-sectional investigation. Children in Erbil between the ages of 5 and 15 were included in the study. 352 persons in all were enlisted. Teenagers who used their phones for more than three hours a day had a higher risk of

developing text neck syndrome. Furthermore, kids who slept less, participated in less sports, used computers more, watched more television, and spent more time playing video games than 3 h were also at higher risk for text neck. The findings suggest the need for interventions to reduce screen time and promote better physical health practices in this population.[23]

MANAGEMENT

Medical Management.[11]

Over-the-counter medications: Numerous over-the-counter pain relievers are available to either reduce inflammation or block pain signals from reaching the brain. However, it's crucial to use these drugs with caution. For instance, acetaminophen is the active ingredient in Tylenol, also present in many other common drugs like cold and allergy medications.

Prescription pain medications: If over-the-counter pain relievers prove ineffective, prescription-strength medications may be considered. While opioids were once commonly prescribed for pain relief, the centers for disease control and prevention revised its guidelines in 2016, recommending fewer opioid prescriptions for chronic pain management due to the risk of addiction and other complications.

Cervical epidural steroid injections: This procedure involves injecting a cortisone steroid solution into the cervical epidural space, the outer layer of the spinal canal. X-ray guidance (fluoroscopy) is used to ensure the injection targets the epidural space near the inflamed nerve. The aim is to reduce inflammation of the nerves or nearby tissues caused by a disc herniation. While these injections can help alleviate pain and facilitate a return to normal activities or progress in physical therapy.

Cervical facet injections: When neck pain stems from irritation of the facet joints, injections of steroids into the specific joints can alleviate pain. If these injections provide temporary pain relief, radiofrequency ablation (RFA) of the small sensory nerves leading to the affected facet joints may be recommended for longer-lasting effects.

Trigger point injections: Pain originating from specific muscle bundles can be treated with trigger point injections, aimed at resetting the normal orientation of these irritated muscle bundles. The injection materials may include saline, lidocaine, dextrose, or cortisone. While this treatment can be effective for well-defined trigger point irritations in

the neck muscles, it may not offer long-term efficacy or the desired level of pain reduction.

Physiotherapy Management

Farooq M. et al. emphasize the role of education in the healing process [39]. According to Fouda K.Z. and Abdelsalam M.S. [24], the combination of exercising to strengthen the neck's deep flexor muscles with appropriate education and learning how to keep proper posture when using mobile devices has a significant impact on the attainment of favorable treatment results. The Shah J. and Soni K. investigation found a similar correlation between therapy and behavior change.[25]

Text neck syndrome can be avoided by engaging in regular physical exercise [26, 23]. Regularly performing exercises for maintaining good posture and spinal stabilization is an effective preventative measure [17,26,].

The physiotherapy methods identified as useful and effective in reducing pain and correcting posture in individuals with text neck syndrome include PNF (Proprioceptive Neuromuscular Facilitation)[27,28], corrective exercises, strengthening the deep neck flexor muscles[29], dynamic correction exercises[30], Pilates[31,32], Gong's mobilization[33], Elongation Longitudinaux Avec Decoaption Osteo Articulaire (ELDOA)[39], and kinesiology taping (KT)[34,35].Regarding the improvement of cervical range of motion (CROM), the most effective methods were PNF[27,28], Gong's mobilization [33], and Pilates[31,32].

Electrotherapy

Ice and/or heat

Using ice can act as an anti-inflammatory, reducing swelling and pain. Initially, it's advisable to apply ice or cold packs for neck pain as they can temporarily constrict small blood vessels and prevent worsening of swelling. After a few days, alternating between ice and heat can be beneficial. However, continuous heat application may lead to increased swelling.[11]

LASER Therapy

Low-level laser therapy (at 830 or 904 nm) is utilized for pain reduction and functional improvement in the intermediate term for acute/subacute and chronic musculoskeletal and degenerative conditions.[13]

Intermittent traction

For pain relief, moderate evidence supports the benefits of intermittent traction compared to control or placebo for chronic musculoskeletal neck disorders, non-radicular neck pain, and degenerative changes.[13]

Exercises

Warm up your neck muscles periodically[11]

Take breaks every 30-40 minutes while using smartphones or e-readers to perform neck muscle warm-up exercises such as rotating your head, moving it back and forth, changing directions, or adjusting your posture. Repeat these exercises at least 10 times.

Stretches [11]

Engage in various muscle stretches, holding each stretch for 10-30 seconds. Examples include side neck stretches, levator scapula stretches, and front neck stretches.

Chin and scapula retraction[11]

Retract your chin and scapula, holding the position for 20-30 seconds. This helps strengthen neck muscles and stabilizes the head, alleviating neck pain and postural instability.

Massage[11]

Following ice or heat application, massage can relieve muscle tension and spasms, reducing pain.

Manual Therapy

Increased range of motion, normalized paraspinal tissue tension, improved joint mechanics, and decreased movement discomfort are all achieved by manual therapy [16, 36]. In addition to the cervical spine, manual therapy also targets the thoracic spine and the cervicothoracic junction [30]. It may include manipulations, mobilizations, or Muscle Energy Techniques (MET).[39]

The muscle energy technique is a form of manual therapy aimed at improving joint mobility by lengthening tense muscles and strengthening weakened muscles through the use of isotonic or isometric contractions.[37] The Bowen therapy, on the other hand, employs gentle rolling movements applied to soft tissues in a specific manner and at designated points.[37]

Manual manipulation. [11]

Consider consulting a chiropractor or other health professional for manual adjustments to the spine to

improve range of motion and reduce pain. While rare, negative outcomes such as stroke or paralysis have been associated with high-velocity cervical spine adjustments.

Post-facilitation stretching technique [38]

This technique involves contracting the muscles near their maximum voluntary capacity for 5 to 10 seconds, followed by quick relaxation while the researcher stretches the muscle aggressively at the barrier. It is used to treat tight trapezius and levator scapulae muscles.

Stabilization exercises[32]

These exercises aim to maximize function and prevent injury progression or re-injury by coordinating and training the shoulder girdle, anterior, and posterior cervical muscles. By reconditioning and increasing general muscle control, stabilization exercises protect spinal segments and reduce discomfort and incapacity.[32]

Pilates training.[34]

Pilates focuses on improving physical and mental health by strengthening trunk-supporting muscles, enhancing spinal mobility, and making postural adjustments. Patients with non-specific chronic neck pain have benefited from Pilates exercises, experiencing reduced pain and impairment.

For text neck syndrome, Shah J. and Soni K[32] advise adding Pilates to the treatment regimen. The Pilates approach promotes mobility, balance, flexibility, and endurance, strengthens muscles, and stabilizes the core, all of which have a good impact on psychophysical functioning [31, 32]. Bhanu Sri P.L. et al. assessed the efficacy of Pilates as a treatment for text neck syndrome [31]. The researchers assessed how Pilates and the Gong mobilization technique affected function, range of motion, and pain intensity. It has been demonstrated that the Pilates group showed a larger improvement in the parameters under study after six weeks of therapy[31]. In order to relieve tension in the deep neck flexor muscles, Pilates helps to strengthen and increase their endurance and reducing the activity and fatigue of the superficial muscles, which in turn leads to pain reduction and improvement of overall functioning [31,32,34].

Taping[34]

Kinesio tape applied to the skin exerts pressure and stretching effects, stimulating cutaneous mechanoreceptors to convey information about joint

position and movement, enhancing proprioception. Studies have shown that taping on the trapezius reduces muscle activity during computer work, decreases workload on the upper trapezius muscle, maintains neutral shoulder and neck positions, enhances blood and lymph circulation, reduces muscle tension, and improves functional ability. Application of Kinesio Taping on cervical myofascial pain syndrome has been found to reduce pain and improve disability.

Self Myofacial Release

Self-Myofascial Release (SMR) is a technique involving the self-application of mechanical pressure to fascia and muscle tissue, aiming to enhance flexibility, reduce muscle soreness, and decrease neuromuscular overactivity. Utilizing a Comprehensive Exercise Program incorporating SMR to specific muscle groups, improvements in forward head posture (FHP), forward shoulder posture, and hyperkyphosis have been observed when combined with stretching, strengthening, and ergonomic interventions.

Myofascial Rolling for the Thoracic Spine.[39]:

- Begin by holding pressure on the middle portion (shoulder blade region) of your thoracic spine for 30 seconds.
 - Perform slow repetitions of active rolling over your entire thoracic spine.
 - Initially, keep your hips low during myofascial rolling.
 - To progress, raise your hips off the floor during myofascial rolling.
- Self-Applied Manual Pressure for Sternocleidomastoid and Upper Neck Extensors[39]:
- Apply pressure to the middle of the sternocleidomastoid muscle on both the right and left sides of your body for 30 seconds.
 - Gradually increase the amount of pressure applied each week.
 - Ensure that the pressure applied is never painful or causing bruising. Adjust the intensity as needed to maintain comfort.

Self-Applied Pressure with Soft-Tissue Mobilization Tool for Upper Trapezius and Pectoralis Minor.[39]:

- Apply pressure in the middle of the upper trapezius and pectoralis minor muscles on both the right and left sides of your body for 30 seconds.
- Gradually increase the amount of pressure applied each week.

- Ensure that the pressure applied is never painful or causing bruising. Adjust the intensity as needed to maintain comfort.

Stretching

Stretching exercises targeting tight muscles involved in forward head and shoulder posture can help to improve flexibility and reduce tension. Here are some examples:

Static Stretching for Sternocleidomastoid and Upper Trapezius [39]:

- Sit or stand comfortably with good posture
- For the sternocleidomastoid stretching begin by tilting head slightly to one side, bringing ear towards the shoulder and use hand on the same side as tilt to gently apply pressure to the top of head, increasing the stretch on the opposite side of your neck.
- For the upper trapezius stretching reach behind back with one hand and grasp wrist or forearm of the opposite arm. Gently pull arm downward while tilting head to the opposite side, bringing ear towards shoulder until stretch is felt.
- Hold each stretch for 20 seconds initially. Perform 2 repetitions on both the right and left sides.
- After 2-3 weeks, increase the duration of each stretch to 30 seconds. Perform 3 repetitions on both the right and left sides.

Static Stretching for Pectoralis and Upper Neck Extensors [39]:

- For pectoralis stretch, stand in a doorway or corner of a room. Place forearm against the door frame or wall at a 90 degree angle, with elbow level with shoulder. Step forward with same side leg, allowing chest to open up and lean forward slightly until stretch is felt.
- For upper neck extensors stretch sit or stand comfortably with good posture. Tuck chin towards chest, gently lengthening the back of the neck. Place one hand on top of head and apply gentle stretch on the back of your neck.
- Stretch the muscles to the end of its range, ensuring no pain or discomfort is felt.
- Hold each stretch for 20 seconds initially. Perform 2 repetitions on both the right and left sides.
- After 2-3 weeks, increase the duration of each stretch to 30 seconds. Perform 3 repetitions on both the right and left sides.

Subscapularis Stretch [13]:

- Stand or sit with your arms by your sides.
- Reach your affected arm across your body towards the opposite shoulder.

- Use your other hand to gently press the arm closer to your body until you feel a stretch in the back of your shoulder.
- Hold the stretch for 20-30 seconds and repeat 2-3 times on each side.

Latissimus Dorsi Stretch [13]:

- Stand with your feet shoulder-width apart. Reach your arms overhead and clasp your hands together
- Lean to one side, feeling a stretch along the side of your body.
- Hold the stretch for 20-30 seconds and repeat on the other side.

Anterior Deltoid Stretch [13]:

- Stand tall with your shoulders relaxed.
- Place one hand behind your back and gently press down on your elbow with the opposite hand.
- You should feel a stretch in the front of your shoulder.
- Hold the stretch for 20-30 seconds and repeat on the other side.

Posterior Capsule Stretch [13]:

- Sit or stand tall with good posture.
- Reach one arm across your body towards the opposite shoulder blade.
- Use your other hand to gently press the arm towards your body until you feel a stretch in the back of your shoulder.
- Hold the stretch for 20-30 seconds and repeat on the other side.

Performing these stretches regularly can help alleviate tightness and improve flexibility in the muscles commonly affected by forward shoulder posture. Remember to stretch gently and avoid bouncing, as this can cause injury.



Figure 3 : Myofascial rolling : Thoracic spine[39]



Figure 4 : Self-Applied Manual Pressure : Sternocleidomastoid, Upper neck extensors [39]



Figure 9: Supine chin tuck(Progression 1) [39]



Figure 10: Supine chin tuck (Progression 2) [39]



Figure 5 : Self-Applied Pressure with Soft Tissue Mobilization Tool : Upper trapezius, Pectoralis minor[39]



Figure 6: Static stretching : Sternocleidomastoid, Upper trapezius[39]



Figure 11: Muscle strengthening: Upper thoracic-lower cervical extensors[39]



Figure 12: Muscle strengthening: Single-Arm row with trunk rotation[39]

Muscle strengthening

Muscle Strengthening: Supine Chin Tuck.[39]

• Perform this strengthening exercise after self-myofascial release and static stretching. Ensure that the exercises are performed gently and without discomfort.

- Lie on your back.
- Slowly tuck your chin back, holding for 2 seconds.
- Slowly return to the starting position over 4 seconds.
- Repeat this movement 5 times

Muscle Strengthening: Supine Chin Tuck (Progression) .[39]



Figure 7 :Static stretching : Pectoralis, Upper neck extensors[39]



Figure 8 :Supine chin tuck(Progression 1) [39]

- To progress the exercise, follow these steps:
- Lie on your back with a towel roll placed under your head for support.
- Tuck your chin back and pull your neck backward into the towel roll. Hold this position for 2 seconds.
- Slowly return to the starting position over 4 seconds.
- Repeat this movement 5 times.

This progression adds resistance and further challenges the muscles involved in the chin tuck exercise

Muscle Strengthening: Supine Chin Tuck (Progression) .[39]

- To further progress the exercise, follow these steps:
- Lie on your back.
- Begin by performing a chin tuck, pulling your chin back gently.
- Once in the chin tuck position, lift your head up 1 inch from the ground.
- Hold this position for 2 seconds.
- Slowly return to the starting position over 4 seconds.
- Repeat this sequence 5 times.

This progression adds an additional challenge by incorporating head elevation while maintaining the chin tuck position, further strengthening the muscles involved

Muscle Strengthening: Upper Thoracic-Lower Cervical Extensors, Strengthening Exercise [39]

- Place a resistance band behind your head.
- Stand facing a wall and place your hands on the wall for support.
- Keep your neck slightly flexed forward.
- Begin by extending your head backward against the resistance of the band.
- Hold this extended position for 2 seconds.
- Slowly return to the starting position over 4 seconds.

This exercise helps strengthen the muscles in the neck by providing resistance during the backward extension movement.

Follow these steps to perform the exercise [39]:

- Begin by getting into a split stance position, with one foot forward and one foot back.
- Hold the resistance tubing or band with one hand.

- Perform a rowing motion by pulling the tubing or band towards your body, keeping your elbow close to your side.
- As you complete the row, simultaneously rotate your trunk 90 degrees to the same side as your row.
- Control the movement throughout the exercise.
- Repeat the exercise on both the right and left sides, ensuring equal effort and control.
- Wand Exercises [13]:** Use a wand or stick to perform various shoulder mobility exercises, such as shoulder circles, shoulder flexion, abduction, and external rotation.
- Wall Climbing[13]:** Stand facing a wall and "climb" your hands up the wall, reaching as high as possible while keeping your shoulders down and back. Then, slowly lower your arms back down.
- Overhead Pulleys[13]:** Use an overhead pulley system or resistance band to perform exercises that involve raising your arms overhead, such as shoulder flexion and abduction.
- Tabletop Dusting[13]:** Place your hands on a table or countertop and perform small circles or movements with your shoulders, focusing on keeping your shoulder blades pulled back and down.
- Wall Washing[13]:** Stand facing a wall with your arms extended straight out in front of you at shoulder height. Slowly walk your fingers up the wall as high as you can while maintaining proper posture, then walk them back down.

These exercises help improve shoulder mobility, flexibility, and posture by targeting the muscles and joints involved in forward shoulder posture [11]. To strengthen weak and lengthened muscles such as the middle and lower trapezius, rhomboids, posterior deltoid, and rotator cuff, the following exercises can be beneficial:

Scapular Retraction with Theraband[13]:

- Sit or stand with good posture and hold a theraband or resistance band in front of you at shoulder height, with your arms extended.
- Retract your shoulder blades by pulling your shoulder blades back and down, squeezing your shoulder blades together.
- Keep your arms straight and elbows locked as you perform the movement.
- Hold the retracted position for a few seconds, then return to the starting position.
- Perform 2-3 sets of 10-15 repetitions.

Scapular Retraction Combined with Shoulder Horizontal Abduction/Extension [13]:

- Begin in the same starting position as the previous exercise, holding a theraband or resistance band in front of you at shoulder height.
- Retract your shoulder blades as before.
- Then, while keeping your shoulder blades retracted, slowly move your arms outward (horizontal abduction) or backward (horizontal extension) against the resistance of the band.
- Focus on engaging the muscles between your shoulder blades throughout the movement.
- Perform 2-3 sets of 10-15 repetitions.

Scapular Retraction and Abduction Combined with External Rotation [13]:

- Start in a similar position, holding a theraband or resistance band with your arms in front of you at shoulder height.
- Retract your shoulder blades and then perform shoulder abduction (lifting your arms out to the side) while keeping your shoulder blades retracted.
- Additionally, perform external rotation by rotating your arms outward against the resistance of the band.
- Maintain good posture and engage your core throughout the exercise.
- Perform 2-3 sets of 10-15 repetitions.

Upright Press-Up [13]:

- Begin by lying face down on a mat or exercise bench, with your arms bent at 90 degrees and hands positioned near your shoulders.
- Engage your core muscles and slowly lift your upper body off the mat or bench by pressing through your hands, while keeping your hips and legs in contact with the surface.
- Squeeze your shoulder blades together as you lift your chest upward into a slight backbend.
- Hold the lifted position for 60 seconds, then lower back down slowly.
- Perform 3 sets of 10 repetitions with a 60-second hold between each set.

These exercises target the weak and lengthened muscles of the scapular region and rotator cuff, helping to improve muscle strength, stability, and posture. Gradually increase resistance as you become stronger, and consult with a healthcare professional before starting any new exercise program, especially if you have any existing medical conditions or concerns.[13]

CONFLICT OF INTEREST:

None

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