Tension-Type Headache: Prevalence and Etiology

•Tension-type headache is among the most common primary headache disorders.

•Lifetime prevalence ranges from **30% to 78%** in the general population.

•Chronic TTH is defined as headache occurring **15 or more days per month for more than 3 months**.

•Common contributing factors include:

- excessive muscle activity related to stress,
- cervical structural abnormalities causing nerve root compression,
- muscle imbalance associated with poor posture.

•Symptoms may be aggravated by increased activity of the **neck, head, and periocular muscles**.

•Patients often report a sensation of **pressure**, persistent pain, and **neck discomfort**.

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Definition and Diagnostic Features (ICHD-3)

Tension-type headache is a primary headache disorder characterized by:

- Bilateral location
- Pressing or tightening (non-pulsating) pain
- Mild to moderate intensity
- No aggravation by routine physical activity

Associated symptoms:

- No nausea or vomiting
- No more than one of photophobia or phonophobia

Duration: 30 minutes to 7 days (episodic TTH).

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Type	Frequency	Duration
Infrequent episodic TTH	Less than 1 day/month	At least 10 episodes
Frequent episodic TTH	1–14 days/month for more than 3 months	Recurrent
Chronic TTH	≥15 days/month for more than 3 months	Hours to days or continuous

- With pericranial tenderness
- Without pericranial tenderness

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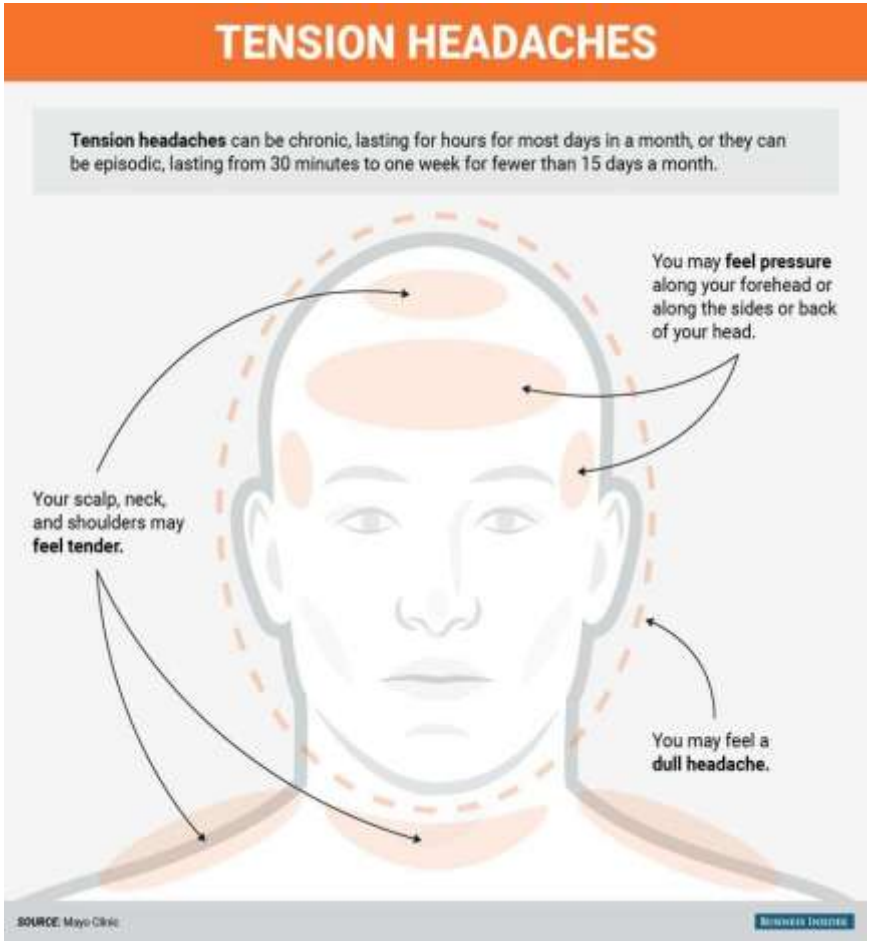
COMPARISON OF COMMON HEADACHE TYPES

Clinical features: tension-type headache, migraine without aura, and cervicogenic headache

Feature	Tension-type headache (TTH)	Migraine without aura	Cervicogenic headache
Location	Bilateral (frontal / occipital)	Unilateral (one-sided)	Unilateral (occiput → forehead)
Pain quality	Pressing / tightening; non-pulsating	Pulsating / throbbing	Non-pulsating; deep
Duration	30 minutes – 7 days	4–72 hours	Hours to weeks
Nausea / vomiting	No	Yes	No (unless migraine coexists)
Aggravation by activity	No	Yes	Yes (especially neck movement)
Restricted cervical ROM	No	No	Yes

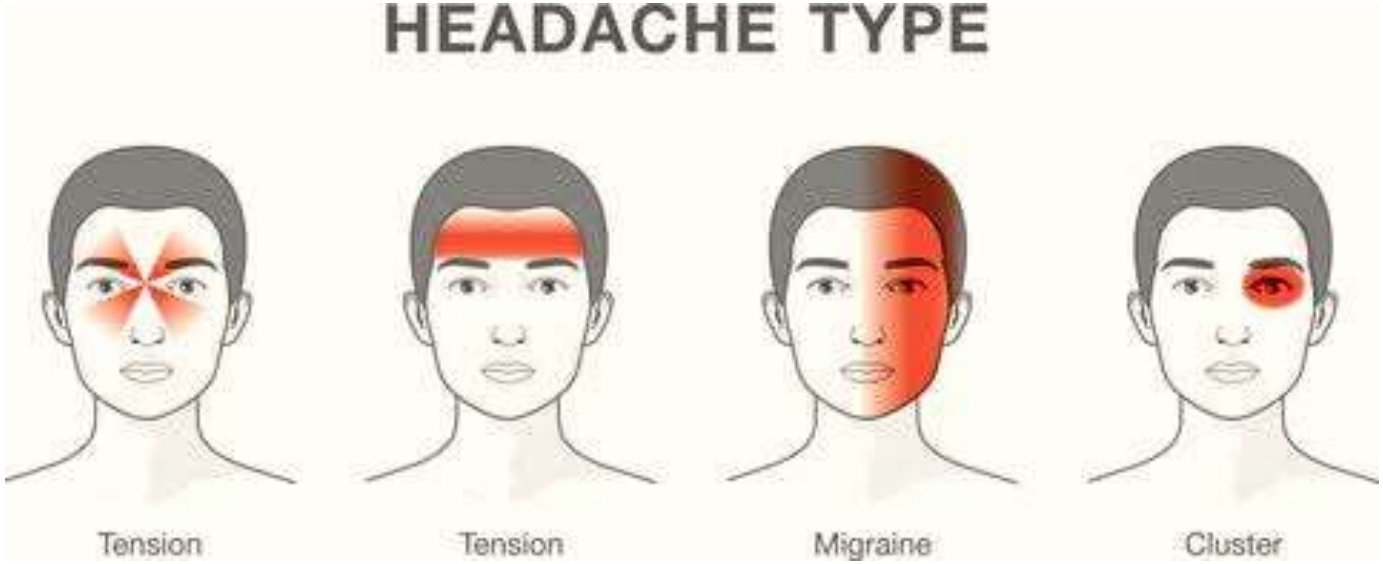
ROM = range of motion

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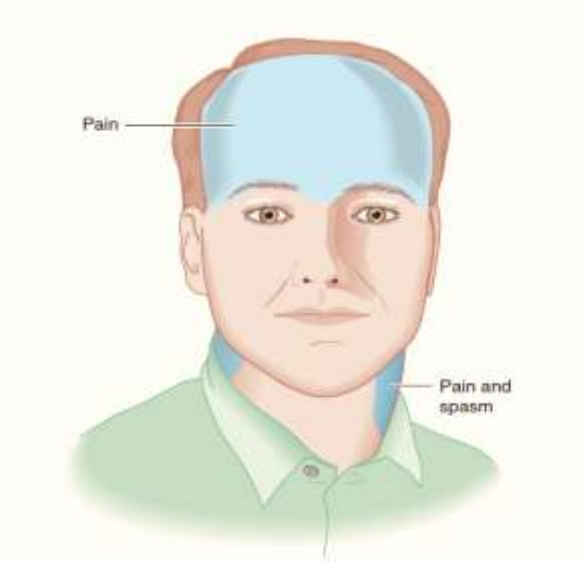


FIGURE 5-1 Distribution of signs and symptoms in a tension headache.

Tension-Type Headache (TTH)
based on headache frequency Classified as:

1. Infrequent episodic TTH <12 days/year
2. Frequent episodic TTH 12–180 days/year
3. Chronic type TTH ≥180 days/year.

•More common in **women** (3/2)

Significantly reduces:

•Work productivity
•Daily functioning
•Family and social activities

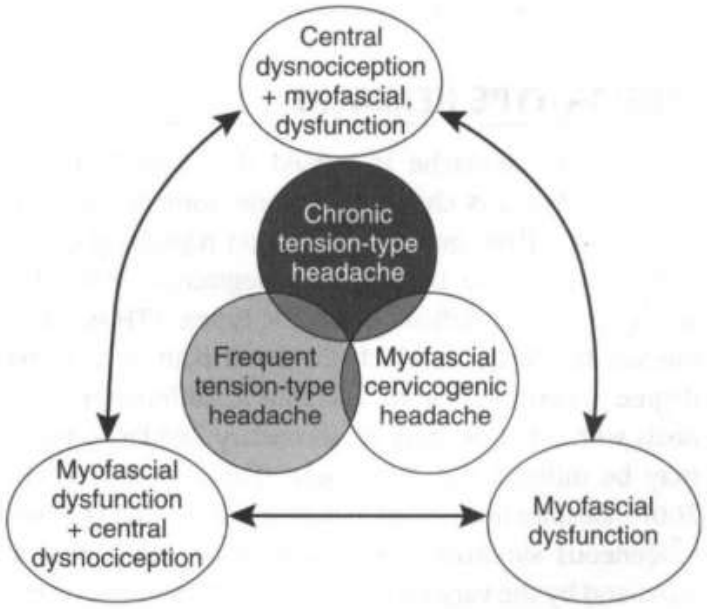
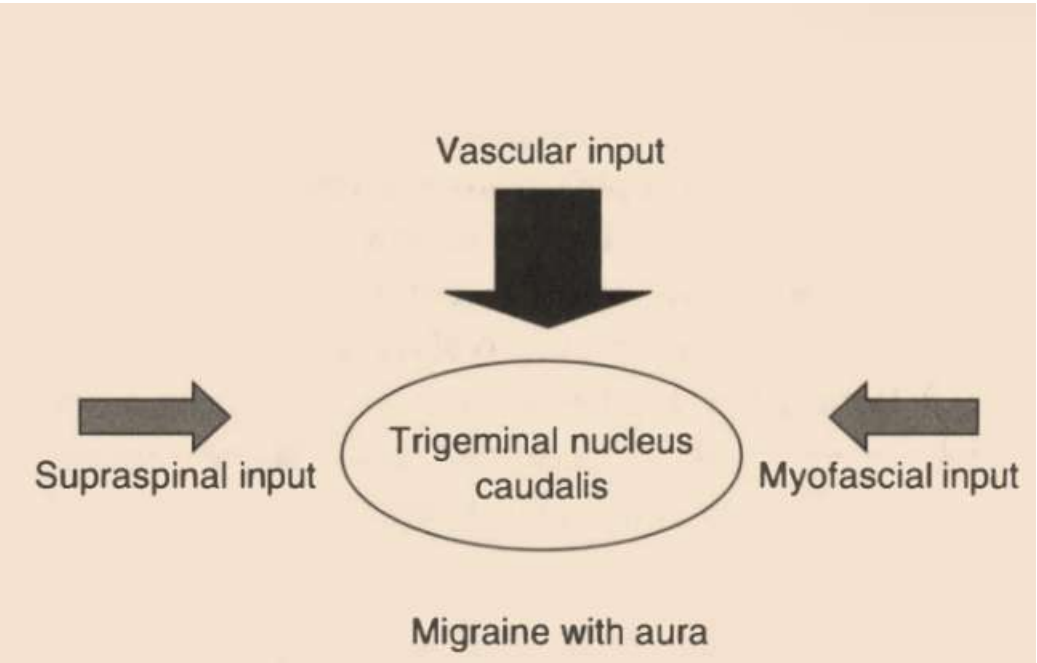
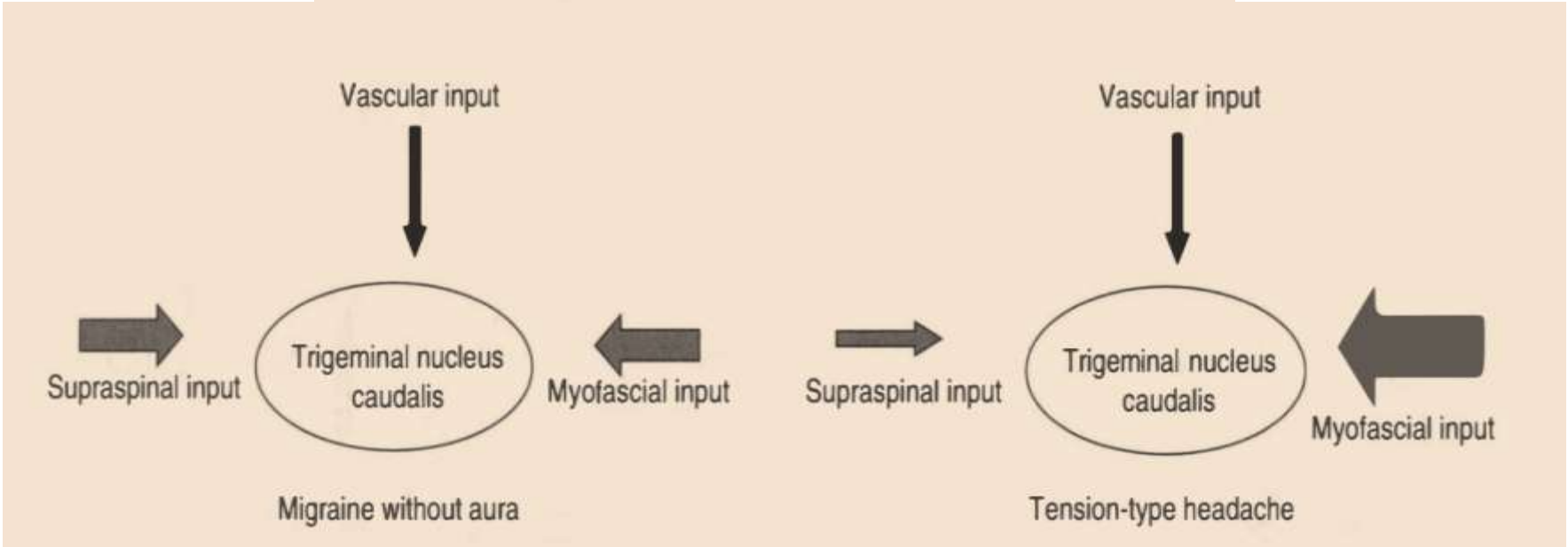


Figure 1.1 Hypothesis for Tension-Type and Cervicogenic Headache


Vascular input
Supraspinal input
Trigeminal nucleus caudalis
Myofascial input
Migraine with aura


Vascular input
Supraspinal input
Trigeminal nucleus caudalis
Myofascial input
Migraine without aura
Vascular input
Supraspinal input
Trigeminal nucleus caudalis
Myofascial input
Tension-type headache

Current Treatment Challenges

Pharmacological Management

- **Episodic TTH:**
  - Simple analgesics
  - Nonsteroidal anti-inflammatory drugs (NSAIDs)
- **Chronic TTH:**
  - Amitriptyline
  - Mirtazapine (preventive therapy)

Limitations of Medication

- High economic burden
- Common adverse effects:
  - Dry mouth
  - Drowsiness
  - Dizziness
- Overuse of acute medications may result in **medication-overuse headache (MOH)**

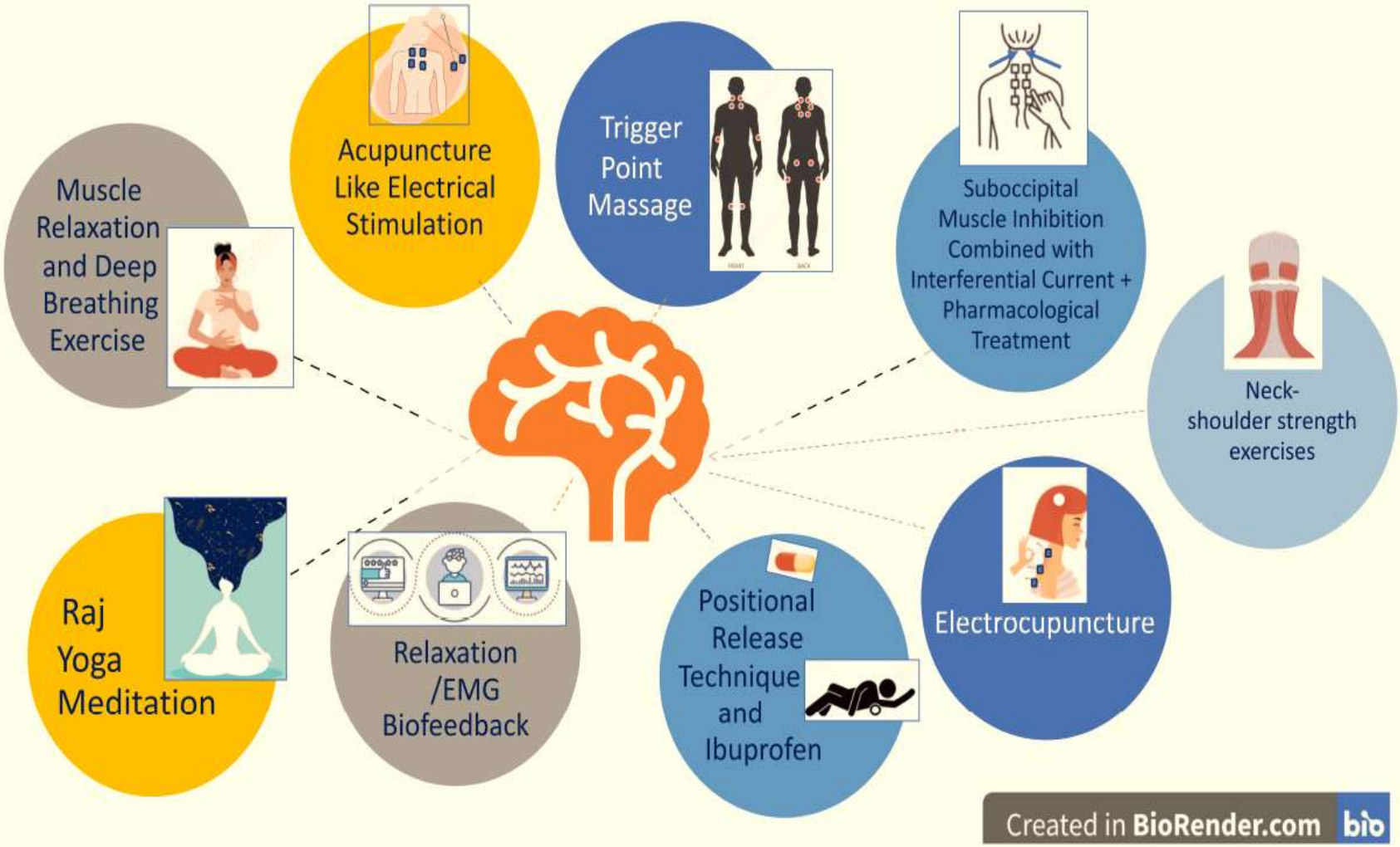


FIGURE 3. Summarized physiotherapy intervention approaches in CTTH. EMG: electromyography. The images were specifically created using BioRender (https://www.biorender.com/).

Mechanisms, Posture, and Quality of Life

- Tension-type headache (TTH) is strongly associated with **forward head posture (FHP)**, neck muscle imbalance, and sustained muscle tension.

- Overactivity of the **suboccipital** and **upper trapezius** muscles may contribute to pain and postural dysfunction.

- Reduced activity of the **longus colli** and other deep cervical stabilizers may worsen cervical instability.

- Postural correction, stabilization exercise, and relaxation of overactive muscles may reduce headache intensity, neck pain, and functional imbalance.

- Chronic muscle fatigue and abnormal posture can create a **vicious cycle** of neck pain and headache.

- Psychological factors such as **anxiety** and **depression** may also worsen symptoms.

- Quality of life should be assessed using both pain-related and psychosocial measures.

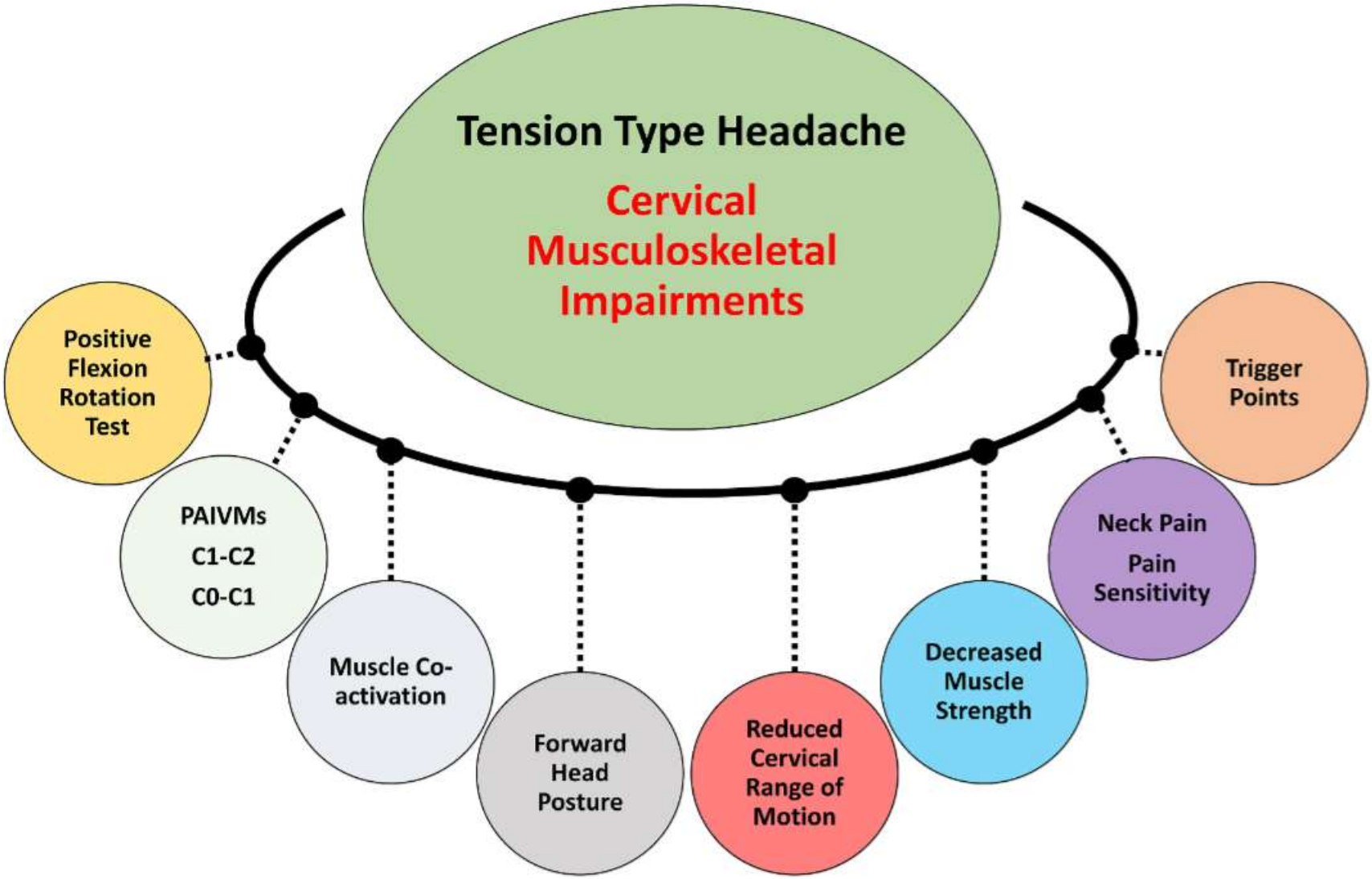
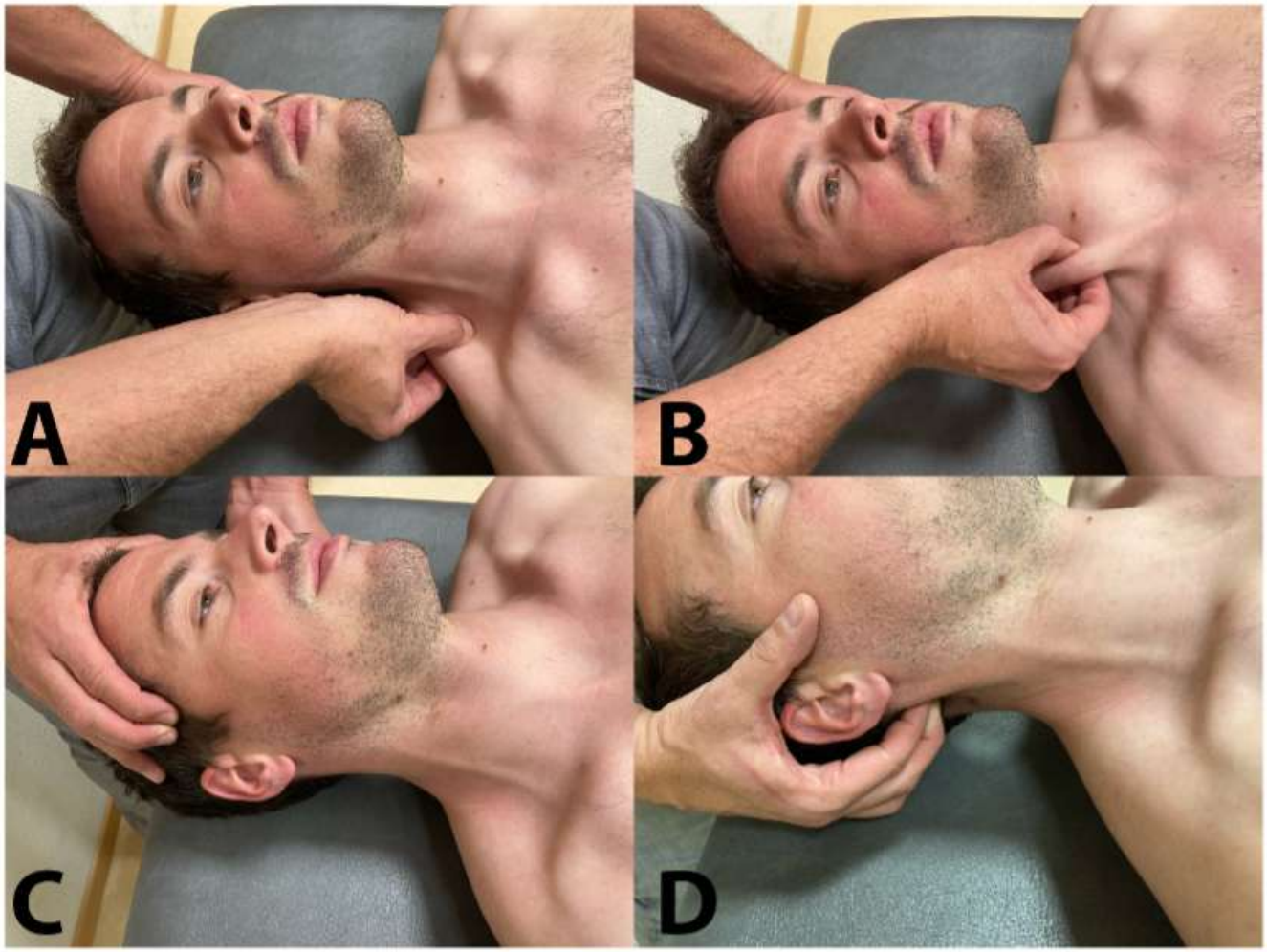


Fig. 5. Musculoskeletal impairments of the cervical spine observed in people with tension type headache.



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Table 1. Muscles Treated with Dry Needling for Tension Headaches — Referral Patterns and Key Features

Muscle	Headache Referral Zone	Common Triggers	DN Accessibility
Suboccipitals	Back of head, top of skull, behind the eye	Screen use, forward head posture, stress	Moderate depth; requires precise angulation
Upper Trapezius	Lateral neck to temple and mastoid	Sustained shoulder elevation, stress, poor posture	Superficial and accessible; high-yield target
Sternocleidomastoid	Vertex, behind eye, forehead, behind ear	Head-forward posture, whiplash, upper chest breathing	Superficial; requires care near carotid
Temporalis	Temporal region, upper teeth	Jaw clenching, bruxism, stress	Superficial; easily accessible
Splenius Capitis	Top of skull ("skullcap" pattern)	Sustained neck rotation, forward head posture	Moderate depth; accessible through cervical paraspinals
Semispinalis Capitis	Back of head and occiput	Prolonged neck extension or flexion	Moderate depth; treated alongside suboccipitals
Masseter	Cheek, ear, eyebrow, lower teeth	Jaw clenching, TMJ dysfunction, stress	Superficial; often treated with temporalis

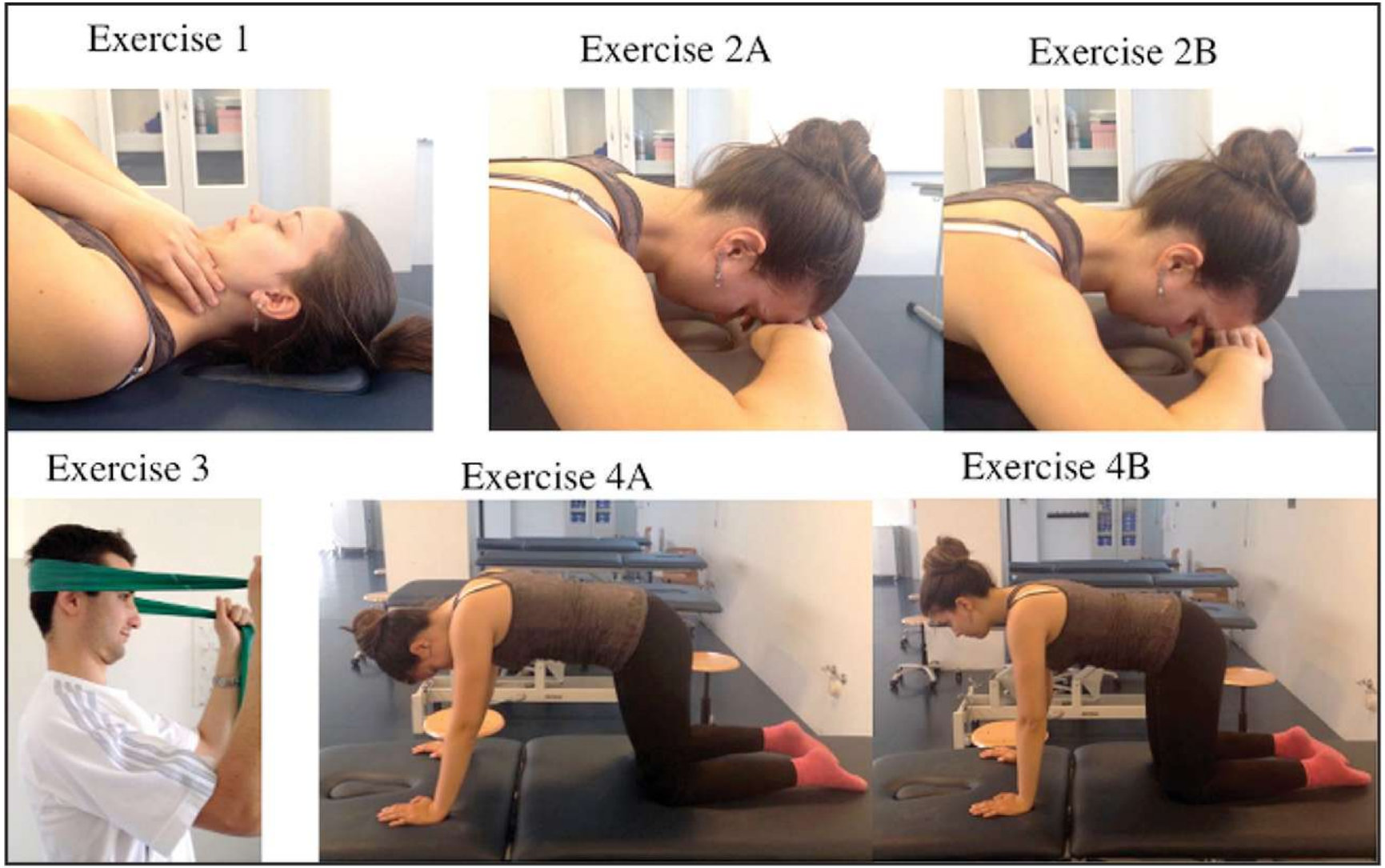
Cervical Stabilization and Exercise

- Relax overactive muscles: suboccipital, upper trapezius, SCM.
- Strengthen deep neck flexors, especially longus colli.
- Add postural correction, stabilization, and manual therapy.
- Eyeball exercises may improve muscle tone and reduce headache impact.

Eyeball Exercises in TTH

- Eyeball exercises may reduce **headache impact**, **neck disability**, and **suboccipital muscle tension**.
- They are often used with **cervical stabilization** and manual therapy.
- Possible mechanism: relaxation of eye and neck muscles, reduced nerve compression, and improved postural control.

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re 1 *Exercises that were used in the motor control therapeutic exercise program: 1) Craniocervical flexor exercise, 2) C1*

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Effects of physical therapy and relaxation techniques on the parameters of pain in university students with tension-type headache: A randomised controlled clinical trial

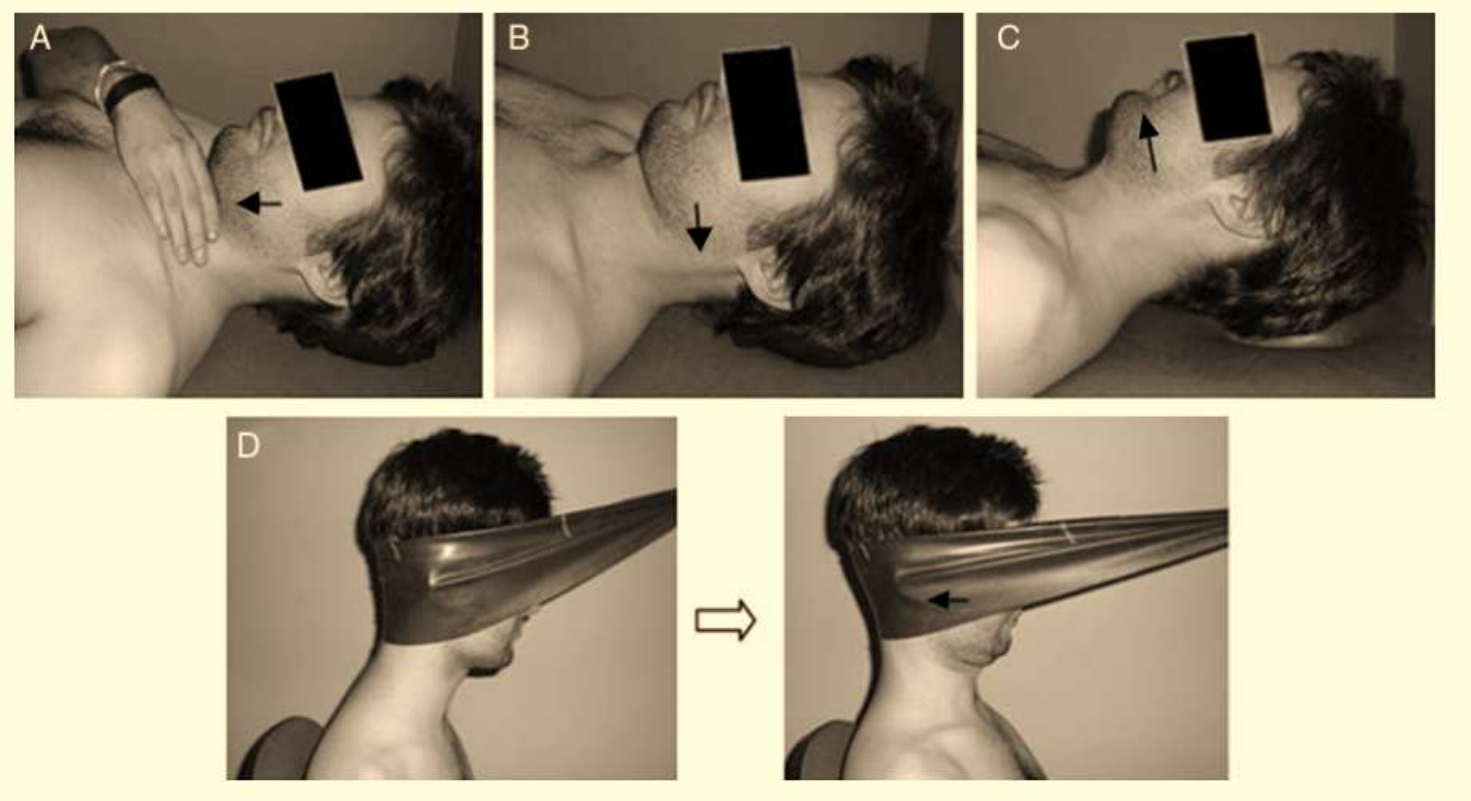




Figure 2. Cervical stabilization exercise using pressure biofeedback.

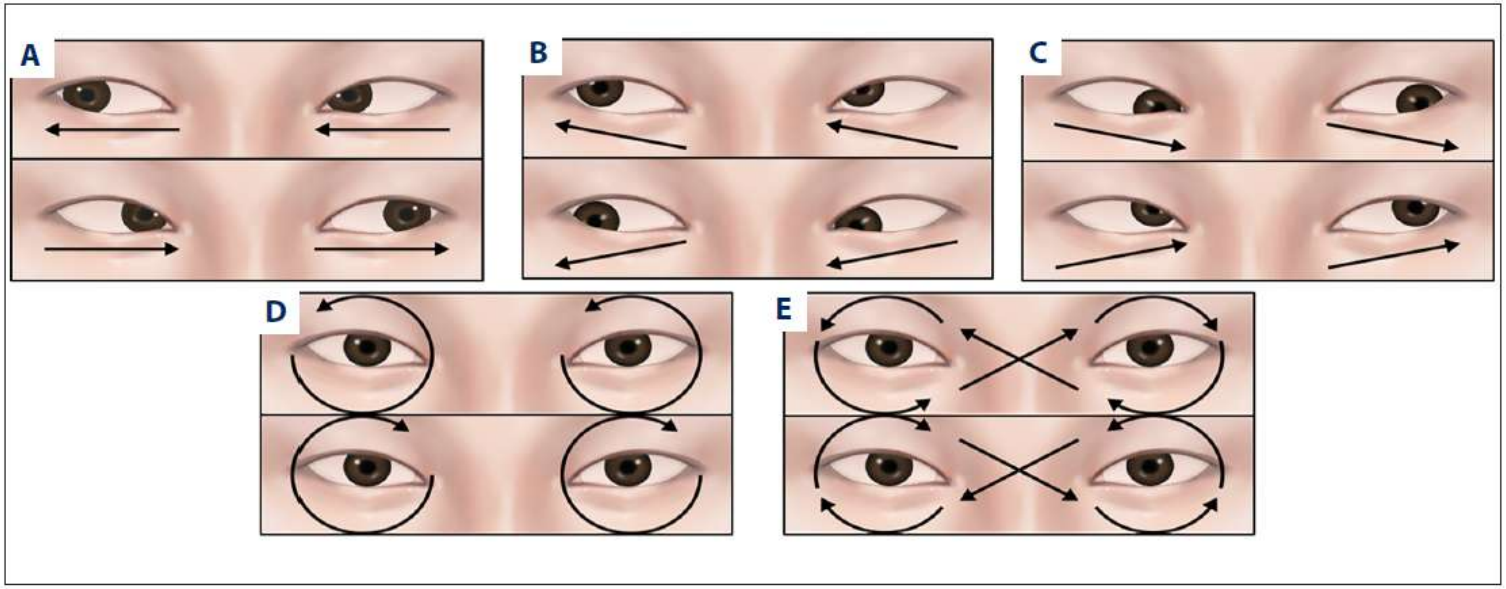


Figure 3. (A-E) Eyeball exercise program.

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Exercise protocol

Shoulder Abduction



Isometric Cervical Flexion



Horizontal Row



Isometric Cervical Extension



Vertical Row



Isometric Cervical Lateral Flexion



Horizontal Abduction



Relaxation Training

- Heaviness and warmth exercises
- Cardiac and respiratory regulation
- Forehead cooling

Specific exercises for neuromuscular re-education

1- Cervical Motor Control Exercises

Deep craniocervical flexor training, Flexor–extensor synergy retraining, Dynamic neck retraction with Thera-Band resistance

2- Stretching

Trapezius, Sternocleidomastoid, Scalene, suboccipital, and pectoral muscles

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Effects of Exercise on Tension-Type Headache

- **Resistance exercise** may:
- Reduce **headache frequency**
- Reduce **headache intensity**
- **Aerobic exercise** may:
- Reduce **headache intensity**
- **Strength exercise** may:
- Reduce headache intensity
- *Possibly* increase headache frequency

- Exercise appears to have **little or no significant effect** on:
- Headache duration
- Medication use

Resistance exercise may reduce headache intensity by:

- Decreasing activation of **myofascial nociceptors**
- Reducing **peripheral sensitization**
- Improving neuromuscular function of the cervical region

- **Combination physiotherapy** appears more effective than single interventions for **tension-type headache (TTH)**.
- Effective multimodal programs may include:
- Manual therapy (MT)
- Soft tissue techniques
- Exercise
- Postural correction
- TENS
- Dry needling
- Neural mobilization

Table 5. Treatment ranking (headache intensity): 17 treatments.

Treatment nodes	*P*-score*
TENS + Combination PT techniques	0.9711
Dry needling	0.7680
Soft tissue techniques	0.6894
Soft tissue techniques + Neural mobilisation	0.6860
MT (joint mobilisation) + Exercise	0.6831
MT (joint mobilisation)	0.6326
TENS + soft tissue technique	0.5928
Combined PT techniques	0.5631
Soft tissue techniques + Manipulation	0.5276
Trigger point therapy	0.5272
Manipulation	0.4601
Neural mobilisation	0.3973
Exercise	0.3583
Relaxation	0.2221
Usual medical care	0.2116
Control	0.1479
TENS	0.0619

PT: physiotherapeutic; TENS: transcutaneous electrical nerve stimulation; MT: manual therapy.
*A larger P-score indicates a better treatment or "the probability of being superior to a competing treatment" (20).

ANDRES JUNG,2022

Intervention	Main outcome
Acupuncture-like electrical stimulation	↓ headache frequency, intensity, duration
Electroacupuncture	↓ headache intensity
Trigger point massage	↓ morning headache intensity
Suboccipital inhibition + interferential current	↓ disability, ↓ headache impact
Relaxation / EMG biofeedback	Pain control support
yoga	Non-pharmacological support
Muscle relaxation + deep breathing	↓ tension, better symptom control
Neck-shoulder strength exercises	↓ headache intensity, frequency, duration

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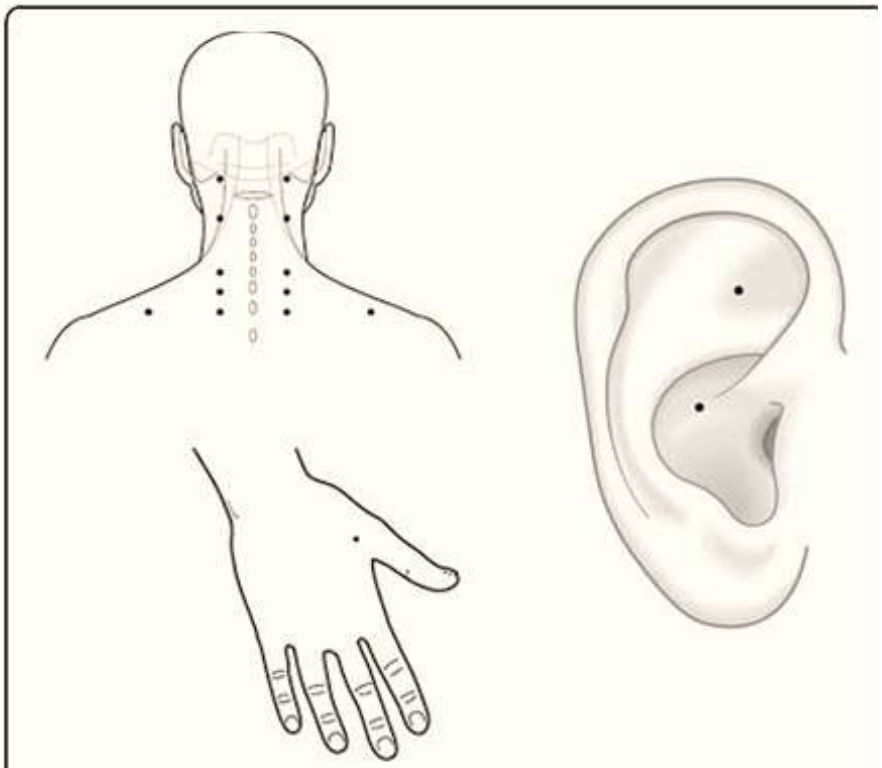


Figure 2 Anatomic needling points. Sixteen needles were inserted, from cephalad to caudal, bilaterally: superior and central area of the tip of the triangular fossa in junction of the superior and inferior crus of the antihelix (ear); helix root (ear); medial aspect of splenius capitis and semispinalis capitis muscles (C1-C2 level); lateral aspect of trapezius; semispinalis capitis muscle (C6-T1 level); levator scapulae muscles (C6-T1 level); abductor pollicis brevis and dorsal interossei muscles (hands).

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