Neck Pain

Version 2 Final

Document control

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Changes since last version

1. Introduction

Pain in the neck can be due to injury, a mechanical or muscular problem, a trapped nerve caused by a bulge in one of the discs between the vertebrae, or from arthritis of the neck.

Description

The stability of the neck depends mainly on the musculature and ligamentous structures attached to the cervical spine which consists of seven vertebrae which articulate with each other through a system of joints of unusual complexity. Each pair of cervical vertebrae is separated by an intervertebral disc and a pair of apophyseal joints but they also articulate through an additional pair of apophyseal joints at their posterolateral aspects.


Normal X-Ray

The cervical spine provides a protective passageway for the vertebral arteries and the spinal cord.

Most cervical problems are mechanical and mainly affect the joints and associated ligaments and muscles[1]. However, systemic disorders do give rise to similar symptoms and need to be excluded by careful history and examination techniques. There are also a number of important malignant conditions which need to be excluded, including cervical spine malignancy/metastasis and vertebral osteomyelitis, as well as head and neck soft tissue tumours.

Neck pain is discussed in general followed by specific sections on degenerative change, whiplash injury and torticollis.

Prevalence

The prevalence of neck related discomfort has been estimated as 9% for adult males and 12% for adult females. It has been estimated that two thirds of the population will suffer an episode of neck pain during their lifetime[2, 3] and that up to one third of patients attending general practitioners will complain of symptoms lasting more than six months or occurring in bouts. Prevalence is highest in middle age, with women being affected more than men. About 15% of hospital-based physiotherapy in the UK is for neck pain[4].

Cervical dystonia (torticollis or “wry neck”) is the most common adult form of focal dystonia, with prevalence in Europe of 5.7/100,000.[5]

2. Aetiology

Neck pain can arise from a variety of conditions including whiplash injury, cervical dystonia and cervical spondylosis; although in the latter case there is only poor correlation between symptoms and radiological evidence of degenerative disease in the cervical spine[6].

Although mechanical neck pain is common in the adult population, has significant morbidity and is a common cause of referral to hospital specialists, there is a scarcity of studies on the natural history and outcome. This may reflect the difficulty in assessing severity of neck pain, for while symptoms are most prominent, signs, which are difficult to quantify, are generally limited to tenderness and a reduced range of neck movement[7].

It is pain felt in the neck may be referred from many sources outwith the musculoskeletal structures of the cervical spine. These may include the mouth, jaw and teeth, the meninges, the middle and inner ear, the larynx, pharynx and sinuses, the cervical lymph nodes and the shoulder girdle.

3. Diagnosis

Symptoms arising in the neck are often poorly localised, making a precise anatomical diagnosis difficult. However, particular features of the patient's history and examination can distinguish between common mechanical disorders and more sinister disease.

As spondylosis is most common in the lower cervical spine, any pain is usually felt low in the neck and often radiates to the occiput, trapezius and inter-scapular areas. This distribution may be due to dural irritation. Painful shoulder movement can lead to an erroneous diagnosis of a shoulder problem. However, referred pain is rarely affected by shoulder movement and pain varying on neck movement is normally related to the cervical spine.

Symptoms and signs of neck pain may be conveniently divided into those arising from either articular, dural or nerve root problems.

	Symptoms	Signs
Articular	Intermittent neck pain movement	Asymmetrical restriction of neck
Dural Pain	In occiput, vertex, trapezius, deltoid and inter-scapular regions	Rarely pain on shoulder adduction/external rotation
Nerve root Usually C7	Severe pain in upper arm, dorsum of forearm, dorsum extensors	Weakness of triceps, fingers and wrist Absent triceps reflex and sensory impairment

The presence of bilateral symptoms or signs or involvement of more than one nerve root usually signifies more severe or possibly sinister pathology, e.g. cold compression due to tumours.

Plain x-rays of the cervical spine are rarely helpful in diagnosing the cause of neck pain except to look for major injury after trauma, an observation confirmed by a study in elderly patients which concluded that there was no place for routine radiological examination of the cervical spine in patients with vertebrobasilar insufficiency.

Radiologically degenerative changes occur commonly in people over the age of forty, are often symptomless and do not correlate well with clinical findings.

Magnetic Resonance Imaging (MRI) can be used to diagnose and assess anatomical problems such as atlantoaxial subluxation in rheumatoid disease, tumours, infections (abscesses) and injury.

It can identify prolapsed cervical discs but is not yet able to demonstrate the anatomical abnormalities attributable to neck pain in most cases.

Differential Diagnosis

Infective

Infection in the cervical spine or retropharyngeal space causes persistent pain with symmetrically restricted movement. Although the patient is usually unwell, this is not a constant feature. The ESR, plasma viscosity and CRP is raised early but bone and joint changes on x-ray are a late feature. Expansion of the retropharyngeal space as a soft tissue shadow may be seen on a lateral x-ray of the neck.

Non-infective inflammation

This occurs in a wide range of connective tissue disorders particularly:

Rheumatoid arthritis
The upper cervical synovial tissue is affected causing ligamentous weakness and joint instability. Atlantoaxial subluxation is common in about 25% of inpatients with rheumatoid arthritis, while destruction of the lateral processes of the atlas can lead to vertical subluxation.

Ankylosing spondylitis
This classically presents with sacroiliac problems but neck stiffness can be a presenting feature.

Polymyalgia rheumatica
Polymyalgia rheumatica and giant cell arthritis can also present with neck pain. Classically they occur in the elderly, with pain and stiffness which is symmetrical. The classical presentation involving shoulders etc is usually a straightforward diagnosis, but occipital artery involvement causing neck pain and stiffness is more difficult.

Neoplastic disease
This is suggested by unremitting pain which radiates to both arms and is worse at rest. Sleep disturbance is common and neck movements are usually painfully limited in all directions.

The following diseases should be considered in the differential diagnosis of cervical spondylosis with myelopathy: motor neurone disease, multiple sclerosis, spinal cord tumour and syringomyelia.

While with cervical spondylosis with radiculopathy: nerve entrapment syndromes (carpal tunnel etc.) and brachial neuritis should be excluded.

4. Degenerative Change

Mild to moderate degenerative changes are often asymptomatic[8], but when degenerative changes are severe they may be associated with neck pain which, because it is mechanical in nature, is usually intermittent and related to use. With normal ageing the intervertebral discs fragment, lose water content and collapse. This causes increased mechanical stress at the cartilaginous end plates and osteophyte formation which can extend ventrally and in some cases encroach on nervous tissue.

Osteophyte formation, most common in patients over the age of 55 years, should be differentiated from the soft disc herniations which occur in the young and middle aged. The most severe form of cervical spondylosis can involve the nerve roots (radiculopathy), the vertebrobasilar circulation and the spinal cord itself (myelopathy). Cervical spondylosis is a condition in which degenerative changes in both the intervertebral disc and the annulus, as well as the formation of bony osteophytes, narrows the cervical canal or neural foramina which can, in severe cases, lead to cord compression.

Spondylosis is most common in the low cervical spine, between C5-C6 and C6-C7, the joints associated with flexion and extension, and much less commonly in the upper spine, C1-C2 and C3-C4, which are associated with rotatory movements. About 60-85% of middle-aged adults are affected by spondylotic changes between the third and seventh vertebrae.

Intervertebral discs from C2-3 and below are subject to significant deformation during flexion and extension. Disc herniation can lead to compression of the nerve root (radiculopathy) or of the spinal cord (myelopathy). Eight pairs of spinal nerves exit bilaterally through the intervertebral foramina and each is named from the vertebra below. Therefore a herniated disc at the C5-6 level will most commonly involve the C6 nerve and its area of distribution.

Cervical spondylotic myopathy has a variable natural course. It usually develops insidiously although episodes of abrupt deterioration do occur. It was assumed at one time that the spondylitic changes in the cervical spine, which occur with increasing age, may impinge on the spinal canal causing chronic cord compression. However, at operation, the degree of cord compression was often not consistent with the neurological disturbance and decompression seldom led to significant neurological improvement. It seems therefore that production of the myopathy in these cases is more than just simple compression and may involve compression of the radicular and/or anterior spinal arteries[9].

Fortunately, most adults with cervical spondylosis — nearly 90 percent — will not lose nerve function, even temporarily.[10]

High compressive myelopathy (C3-C5) causes numb clumsy hands and is associated with loss of manual dexterity, diffuse non-specific weakness of the arms and abnormal sensations. Lesions affecting levels C5-C8 cause a syndrome of spasticity and proprioceptive loss in the legs. Improvement has been quoted to occur in 30-50% of patients with non-operative treatment.

The various myelopathic syndromes, e.g. Brown-Séquard, have different localising symptoms depending on the position of the compression.

Acute cord compression by disc protrusion and spinal cord damage caused by a combination of cervical spondylosis and hyperextension injury (whiplash) may lead to severe cord compression, but is not related to spondylotic myelopathy.

Treatment

Episodes of acute neck pain are generally self limiting and require only symptomatic treatment.

Active treatment involving mobilisation (moving the joints within their restrictive range) and manipulation (moving the joints briefly beyond their restrictive range) is now the treatment of choice.
Collars, if prescribed, are generally only worn for activities likely to exacerbate the pain and then for only two to three weeks.

Advice on the correction of postural abnormalities and neck stretching exercises is beneficial.

Radicular pain is treated with rest and wearing a collar for up to two weeks.

Approximately 75% of patients have complete or partial but significant relief of symptoms with non-operative management.[11] Features suggesting a poor response to nonoperative treatment include advanced age, duration of symptoms, severity of myelopathy, and severity of stenosis[12]

Limited studies have shown some improvement with muscle relaxants (cyclobenzaprine)[13] but 60% of patients demonstrate side effects, mainly dry mouth and sedation.[14]

A controlled trial comparing acupuncture with placebo failed to show a significant difference in pain relief but there were concerns about the quality of the placebo.[15]

Intractable nerve root symptoms and the rare occurrence of spinal cord compression are investigated further and can require surgical intervention if conservative measures fail.

Despite early recognition and improved surgical techniques, not all authors agree that surgery improves the variable clinical spectrum of cervical spondylotic myelopathy. A variety of surgical techniques have been proposed including cervical laminectomy and anterior spinal fusion but the results are often disappointing and no single procedure has been found to be superior over another[16]. In a recent series[17] anterior cervical discectomy and fusion was associated with an acceleration of degenerative changes at the fused and adjacent levels.

Prognosis

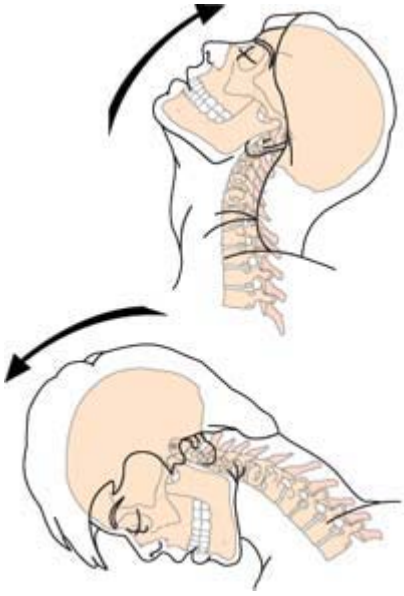
Neck pain from degenerative cervical disease usually responds to simple measures such are mobilisation and analgesia.

Spondylotic radiculopathy also resolves with conservative therapy in most cases and surgical intervention is not considered unless there is persistent pain or progressive neurological problems.

Myelopathy is the most severe form of the disease but a third to a half of these patients improve with simple measures such as wearing a collar[18].

5. Whiplash injury

Between 2002 and 2009 the incidence of whiplash injury increased by 25% in the UK, and constitute 76% of motor insurance claims. It is estimated that they cost the UK economy £3.63billion a year. Whiplash injury, an acute soft tissue injury (extension sprain[19]) in the neck after a road traffic accident or sporting accident may occur after front, side or rear collision. In road traffic accidents proper adjustment of head restraints should prevent whiplash injury in rear collisions but there is a general lack of knowledge on proper positioning of the head restraint.



(Image from www.bodymovesphysio.com.au)

Although the mechanism of injury appears well understood as a hyperextension strain beyond the normal anatomical limit, the immediate pathology and resultant long-term effects are not known and therefore treatment is empirical.

It has been suggested that whether or not a victim pursues litigation is related to the severity of injury[20]. However a study of 100 patients, mean age 47 years, who had sustained neck 'sprains' as a result of rear impact does not confirm this impression. In nearly 60% of these cases, the patients were free of significant pain before settlement of their claims.

Factors in the prognosis in whiplash injury were reported upon as follows:

- The patient's sex was not statistically related to the duration or grade of pain.
- Age over 45 years was associated with longer duration of pain.
- Onset of pain occurring at least twelve hours after the accident was associated with a quicker recovery and a better end result.
- Previous symptoms in the cervical spine before injury resulted in a longer period of pain.

- Cervical spondylosis diagnosed by X-ray at or prior to the injury was associated with longer duration of symptoms.
- The presence of root pain at any time after injury bore no relation to either the duration of symptoms or the final outcome.

Grading whiplash injury

The Quebec Task Force developed a classification for grading whiplash injury[21].

Parameters:
(1) Neck complaint (pain, stiffness, tenderness)

(2) Musculoskeletal signs (decreased range of motion and/or point tenderness)

(3) Neurological signs (decreased or absent deep tendon reflexes [DTR], weakness, sensory deficit)

(4) Vertebral fracture or dislocation

Neck Complaint	Musculo-skeletal	Neurological Signs	Fracture or Dislocation	Grade
absent	absent	absent	absent	0
present	absent	absent	absent	1
present	present	absent	absent	2
present	NA	present	absent	3
NA	NA	NA	present	4

The following findings may be seen with any grade and are not used for classification: headache, dizziness, deafness, memory loss, dysphagia and temporomandibular joint pain.

Treatment

Caution is needed when attempting to draw conclusions regarding the efficacy of conservative treatments in whiplash-patients, because of the paucity of high-quality studies.

'It appears that "Rest makes rusty." In other words, rest and immobilization using collars are not recommended for the treatment of whiplash, while active interventions, such as advice to 'maintain usual activities' might be effective in whiplash-patients'[22]. Physiotherapy may be of benefit, as well as Maitland's manipulations. Non-steroidal anti-inflammatory analgesia can be used. In the chronic cases, facet blocks have been shown to show some short-term benefit, but have a 50% recurrence rate within a week. Botulinum toxin has been used and shown to produce only a 7% reduction in pain. In brachalgia, cervical fusion has produced a 32% success rate[19].

Prognosis

In the UK up to 40% of people continue to report symptoms 15 years after the accident.[23] Just under 50% make a permanent recovery and 4.3% are permanently disabled.[24]

There is compelling data from Germany and Greece indicating that the outcome of whiplash injury is culturally dependent.[25]

In a prospective study of 210 consecutive persons experiencing rear-end collisions in Kaunas, Lithuania 47% reported initial symptoms but one year after the accident they had no more symptoms than a group of 210 matched controls who had not been in accidents[26]. They concluded that, where there was no preconceived notion of chronic pain following rear-end collisions; no fear of long-term disability and usually no involvement by therapists, insurance companies or lawyers, symptoms from `whiplash injury' were brief and self- limiting.

The wide variations in whiplash injury incidence and/or chronicity reported from country to country are more plausibly explained by cultural and psychosocial factors than by purely mechanical ones. The signs and symptoms of whiplash syndrome include psychological as well as physical components. This may involve impaired concentration, poor memory, somatoform disorder, post-traumatic stress disorder and depression. These symptoms may be as severe as after trauma involving multiple fractures. A pre-accident psychological history may predispose to these manifestations.[19]

6. Torticollis (Cervical Dystonia) [27, 28]

Spasmodic torticollis, also known as cervical dystonia, and commonly called "wry neck", is the condition of spasm affecting the muscles of the neck, causing the head to assume unnatural postures.

The head may be pulled backwards (retrocollis), forwards (anterocollis) or to the side (torticollis), depending on which muscle groups are affected. This muscle spasm may occur intermittently or continuously. The cause of cervical dystonia is not known.
In children, it is sometimes associated with congenital abnormalities of the shape of the head or of the spine, but it may occur at any age. Cervical dystonia may persist for several years, or sometimes for life. Some patients recover spontaneously.

The movements may be sustained or jerky (myoclonic torticollis). Muscle spasms or pinching nerves in the neck can be very painful. The neck may eventually be held permanently in one position.

Torticollis usually develops gradually. At first, the patient may notice that the head turns during everyday activities. In about a quarter of patients the hand may also develop some tremor, especially if trying to correct the involuntary movement. The tremor is common but not usually disabling and is referred to as an enhanced physiologic tremor.

The severity of torticollis can vary and may be worse if the patient is under stress. Occasionally drinking alcohol can improve the torticollis.

Some sufferers have a history of head or neck injury, but as yet there is no evidence to support the theory that torticollis is directly related to trauma.

Patients with torticollis often find that their daily lives are affected. Head turning can prevent a proper view of the road when driving.
It may become difficult to eat, brush teeth or apply makeup.
Many sufferers find embarrassment and anxiety the major handicap.If chronic, torticollis can lead to cervical spondylosis, radiculopathy and myelopathy[29].

Prevalence

5.7 per 100,000 in Europe.
There are thought to be 10,000 people in the UK suffering from this condition. The average age of onset is in the early 40s and more women are affected than men.

Aetiology

Spasmodic (or adult-onset) torticollis is usually idiopathic. About 5% of patients with spasmodic torticollis have a family history. One third of these patients have other dystonias (e.g. eyelids, face, jaw, hand). Torticollis can also be congenital or secondary to other conditions such as lesions of the brain stem and basal ganglia[30].

Diagnosis

The diagnosis is based on characteristic symptoms and signs and exclusion of alternative diagnoses, such as the following:

Tardive dyskinesia can cause torticollis but can usually be distinguished by a history of chronic antipsychotic use and involuntary movements in muscles outside of the neck.

Basal ganglia disease and occasionally CNS infections can cause movement disorders but usually also involve other muscles.
Also, CNS infections are usually acute and cause other symptoms.

Neck infections or tumours are usually differentiated by features of the primary process.

Antipsychotics and other drugs can cause acute torticollis, but the symptoms usually develop in hours and resolve within days.

Torticollis may be graded by the Toronto Western Spasmodic Torticollis Rating Scale [31]

Treatment[30]

Spasms can sometimes be temporarily inhibited by physical therapy and massage, including sensory biofeedback techniques (slight tactile pressure to the jaw on the same side as head rotation - *sensory trick*) and any light touch.
Touching an affected or adjacent body part can sometimes significantly reduce contractions. For example, placing a hand on the chin, side of the face or back of the head may reduce neck muscle contractions.
People with dystonia typically discover and use this trick to reduce their own dystonic contractions. Some physical therapists have developed head or neck braces, hand splints or other devices that mimic the sensory trick.

Injections of botulinum toxin type A & B into the dystonic muscles can reduce painful spasms for 1 to 3 months in about 70% of patients, restoring a more neutral position of the head. However, this treatment can lose effectiveness with repeated injections because antibodies develop against the toxin.

Drugs can usually relieve pain. However they suppress dystonic movements in only about 25 to 33% of patients. Anticholinergics such as trihexyphenidyl may help. All drugs should be started in low doses. Doses should be increased until symptoms are controlled or intolerable adverse effects (particularly likely in the elderly) develop.

Surgery is controversial in adult torticollis. The most successful surgical approach, selective peripheral denervation, selectively severs nerves to affected neck muscles, permanently weakening or paralysing them. Results are favourable when the procedure is done at centres with extensive experience. Patient selection for this procedure is important. Patients should be offered the procedure only when their disease has become refractory to best non-surgical treatment.[27] In congenital torticollis sternomastoid release is a more successful and accepted procedure.

Rarely, an emotional problem contributes to spasmodic torticollis when psychiatric treatment is indicated.
Prognosis is best if symptom onset coincided with exogenous stress.

Prognosis

Most patients find the condition deteriorates over the first five years, but their symptoms then stabilise. One third of patients progress to a segmental dystonia, usually involving the arm. The symptoms of about 10 per cent may resolve spontaneously, but then later recur.

7. Main Disabling Effects of Neck Pain

These can be considered under musculoskeletal, neurological and ischaemic factors. Ultimately, significant disability arising from pathology in the neck may lead to chronic periodic pain, bent jerky gait and clumsy hands.

Musculoskeletal disorders give rise to stiffness and acute or developing chronic pain. In many cases of acute pain they settle without medical advice. Treatment for acute pain includes, rest, support, education about movement and analgesia. About 10% of those presenting for medical opinion progress to chronic pain. This is both local and referred to head, shoulder or arm.

A 'functional disability scale' has been developed [Appendix A – The Copenhagen Neck Functional Disability Scale] and used to demonstrate that patients with 'chronic pain' have reduced neck muscle strength and endurance, particularly of the extensor muscles. [32]

Lesions at C1-2 refer pain to the occiput and at C5-6 refer pain to the forearm and hand.

Neurological disabilities due to disc herniation or isolated osteophytes may be localised, of a lower motor neurone type1 and related to one or more nerve roots.

In spondylosis, multiple level disease develops in 60-85% of cases.

The C6 and C7 nerve roots are most commonly affected causing weakness of the triceps muscle which may affect reaching but not lifting, and sensory impairment of the index and middle fingers which may affect pinch grip function.

75% of patients with radiculopathy as a result of cervical spondylosis will resolve spontaneously[18].

Involvement of a nerve root will involve loss of power with flaccid paralysis and referred pain and paraesthesia.

Myelopathy produces more general effects and is the result of cord compression. This may be more likely in people with narrow vertebral foramina which is usually a familial complaint and is also associated with achondroplasia. Mechanical relief of cord compression does not always lead to improvement because ischaemia of the cord is also though to be a factor.

Myelopathy with cord compression at C3-5 causes clumsiness of the hands with weakness and loss of dexterity.

Compression lower down at C5-8 causes spasticity with loss of proprioception in the legs.

Myelopathy is a serious condition and although the progress of the disease varies greatly, 30-50% can improve with non-surgical treatment[1].

Extreme cases will exhibit urinary frequency and urgency.

Major anatomical deformity in the cervical spine produces cerebellar ischaemia resulting in giddiness especially on rotation or extension of the neck.

The Division of Industrial Accidents at the University of California has attempted to develop guidelines for the evaluation of medical factors of disability in neck (and back) injuries over the past ten years[33].

The guidelines are very comprehensive and consist of a list of 37 factors of disability.

The first ten factors are ‘subjective’ and in this system only count towards a final assessment if supported by ‘objective’ factors such as muscle strength. Trigger points and ranges of flexion, extension etc.

Currently many of the objective factors require measurement using instruments which have significant inter-observer error.

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APPENDIX A

The Copenhagen Neck Functional Disability Scale

Overview: The Copenhagen Neck Functional Disability Scale can be used to evaluate the disability experienced by patients with neck pain. The scores can be monitored over time to evaluate the disease course and response to any interventions.

Questions:

(1) Can you sleep at night without neck pain interfering?

(2) Can you manage daily activities without neck pain reducing activity levels?

(3) Can you manage daily activities without help from others?

(4) Can you manage putting on your clothes in the morning without taking more time than usual?

(5) Can you bend over the washing basin in order to brush your teeth without getting neck pain?

(6) Do you spend more time than usual at home because of neck pain?

(7) Are you prevented from lifting objects weighing from 2-4 kilograms due to neck pain?

(8) Have you reduced your reading activity due to neck pain?

(9) Have you been bothered by headaches during the time that you have had neck pain?

(10) Do you feel your ability to concentrate is reduced due to neck pain?

(11) Are you prevented from participating in your usual leisure time activities due to neck pain?

(12) Do you remain in bed longer than usual due to neck pain?

(13) Do you feel that neck pain has influenced your emotional relationship with your nearest family?

(14) Have you had to give up social contact with other people during the past two weeks due to neck pain?

(15) Do you feel that neck pain will influence your future?

Direction of questions:

- "positive" (a yes indicates good function): 1-5
- "negative" (a yes indicates poor function): 6 - 15

Response	Points for "Positive" Directed	Points for "Negative" Directed
yes	0	2
occasionally	1	1
no	2	0

disability index = SUM(points for all 15 questions)

Interpretation:

- minimum score: 0
- maximum score: 30
- The higher the score the greater the disability.

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APPENDIX B

Toronto Western Spasmodic Torticollis Rating Scale

I. Torticollis Severity Scale (maximum=35; sum of A through F)

A. Maximal Excursion: Rate the maximum amplitude of excursion by asking the patient not to oppose the abnormal movement; the examiner may use distracting or aggravating maneuvers. When the degree of deviation is between scores, choose the higher of the two.

1. Rotation (turn: right or left)
   0=None (0°)
   1=Slight (<1/4 range, 1°-22°)
   2=Mild (1/4-1/2 range, 23°-45°)
   3=Moderate (1/2-3/4 range, 46°-67°)
   4=Severe (>3/4 range, 68°-90°)

2. Laterocollis (tilt: right or left, exclude shoulder elevation)
   0=None (0°)
   1=Mild (1°-15°)
   2=Moderate (16°-35°)
   3=Severe (>35°)

3. Anterocollis/Retrocollis (a or b)
   a. Anterocollis
      0=None
      1=Mild downward deviation of chin
      2=Moderate downward deviation (approximates 1/2 possible range)
      3=Severe (chin approximates chest)
   b. Retrocollis
      0=None
      1=Mild backward deviation of vertex with upward deviation of chin
      2=Moderate backward deviation (approximates 1/2 possible range)
      3=Severe (approximates full range)

4. Lateral Shift (right or left)
   0=Absent
   1=Present

5. Sagittal Shift (forward or backward)
   0=Absent
   1=Present

B. Duration Factor: Provide an overall score estimated through the course of the standardized examination after estimating the maximal excursion (exclusive of asking the patient to allow the head to deviate maximally) (weighted × 2).
   0=None
   1=Occasional deviation (<25% of the time, most often submaximal)
   2=Occasional deviation (<25% of the time, often maximal) or intermittent deviation (25%-50% of the time, most often submaximal)
   3=Intermittent deviation (25%-50% of the time, often maximal) or frequent deviation (50%-75% of the time, most often submaximal)
   4=Frequent deviation (50%-75% of the time, often maximal) or constant deviation (~75% of the time, most often submaximal)
   5=Constant deviation (>75% of the time, often maximal)

C. Effect of Sensory Tricks
   0=Complete or partial relief by one or more tricks
   1=Partial or only limited relief by tricks
   2=Little or no benefit from tricks

D. Shoulder Elevation/Anterior Displacement
0=Absent
1=Mild (<1/3 possible range) and intermittent or constant
2=Moderate (1/3-2/3 possible range) and constant (>75% of the time) or severe (>2/3 possible range) and intermittent
3=Severe and constant

E. Range of Motion (without the aid of sensory tricks). If limitation occurs in more than one plane of motion, use the individual score that is highest.
0=Able to move to extreme opposite position
1=Able to move head well past midline but not to extreme opposite position
2=Able to move head barely past midline
3=Able to move head toward but not past midline
4=Barely able to move head beyond abnormal posture

F. Time (up to 60 seconds) for which patient is able to maintain head within 10° of neutral position without using sensory tricks (the mean of two attempts).
0=>60 seconds
1=46-60 seconds
2=31-45 seconds
3=16-30 seconds
4=<15 seconds

II. Disability Scale (maximum=30; sum of A through F)

A. Work (occupation or housework/home management)
0=No difficulty
1=Normal work expectations with satisfactory performance at usual level of occupation but some interference by torticollis
2=Most activities unlimited, selected activities very difficult and hampered but still possible with satisfactory performance
3=Working at lower than usual occupation level; most activities hampered, all possible but with less than satisfactory performance in some activities
4=Unable to engage in voluntary or gainful employment; still able to perform some domestic responsibilities satisfactorily
5=Marginal or no ability to perform domestic responsibilities

B. Activities of Daily Living (eg, feeding, dressing, or hygiene, including washing, shaving, makeup, etc)
0=No difficulty with any activity
1=Activities unlimited but some interference by torticollis
2=Most activities unlimited, selected activities very difficult and hampered but still possible using simple tricks
3=Most activities hampered or laborious but still possible; may use extreme "tricks"
4=All activities impaired, some impossible or require assistance
5=Dependent on others in most self-care tasks

C. Driving
0=No difficulty (or has never driven a car)
1=Unlimited ability to drive but bothered by torticollis
2=Unlimited ability to drive but requires "tricks" (including touching or holding face, holding head against headrest) to control torticollis
3=Can drive only short distances
4=Usually cannot drive because of torticollis
5=Unable to drive and cannot ride in a car for long stretches as a passenger because of torticollis

D. Reading
0=No difficulty
1=Unlimited ability to read in normal seated position but bothered by torticollis
2=Unlimited ability to read in normal seated position but requires use of "tricks" to control torticollis
3=Unlimited ability to read but requires extensive measures to control torticollis or is able to read only in nonseated position (eg, lying down)
4=Limited ability to read because of torticollis despite tricks

5=Unable to read more than a few sentences because of torticollis

E. Television
0=No difficulty
1=Unlimited ability to watch television in normal seated position but bothered by torticollis
2=Unlimited ability to watch television in normal seated position but requires use of tricks to control torticollis
3=Unlimited ability to watch television but requires extensive measures to control torticollis or is able to view only in nonseated position (eg, lying down)
4=Limited ability to watch television because of torticollis
5=Unable to watch television more than a few minutes because of torticollis

F. Activities Outside the Home (eg, shopping, walking about, movies, dining, and other recreational activities)
0=No difficulty
1=Unlimited activities but bothered by torticollis
2=Unlimited activities but requires simple "tricks" to accomplish
3=Accomplishes activities only when accompanied by others because of torticollis
4=Limited activities outside the home, certain activities impossible or given up because of torticollis
5=Rarely if ever engages in activities outside the home

III. Pain Scale (maximum=20; sum of A through C)

A. Severity of Pain: Rate the severity of neck pain due to torticollis during the last week on a scale of 0-10, where a score of 0 represents no pain and 10 represents the most excruciating pain imaginable. Score calculated as [worst+best+(2×usual)]/4.
Best_____
Worst_____
Usual_____

B. Duration of Pain
0=None
1=Present <10% of the time
2=Present 10%-25% of the time
3=Present 26%-50% of the time
4=Present 51%-75% of the time
5=Present >75% of the time

C. Disability Due to Pain
0=No limitation or interference from pain
1=Pain is quite bothersome but not a source of disability
2=Pain definitely interferes with some tasks but is not a major contributor to disability
3=Pain accounts for some (less than half) but not all of the disability
4=Pain is a major source of difficulty with activities; separate from this, head pulling is also a source of some (less than half) disability
5=Pain is the major source of disability; without it, most impaired activities could be performed quite satisfactorily despite head pulling

Reference: Consky ES. Clinical assessments of patients with cervical dystonia. In: Jankovic J, Hallett M, eds. Therapy With Botulinum Toxin. New York, NY: Marcel Dekker; 1994:211-237