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# CASE STUDIES & CLINICAL SERIES RESEARCH

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**PRONEX**<sup>®</sup> Cervical Traction



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About the Author...

Dr. Arthur Nitz, an associate professor of Physical Therapy at the University of Kentucky also manages Frankfort Physical Therapy Associates in Frankfort, Kentucky. He lectures on neurogenic inflammation, nerve involvement, and the subsequent delays in a normal course of rehabilitation from an orthopedic injury. Dr. Nitz has been in practice for 18 years and his focus is in orthopedic and spinal injuries. Dr. Nitz has been conducting ongoing clinical studies of the **PRONEX**<sup>®</sup> cervical traction device since March, 1993.

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## INTRODUCTION

The incidence of disorders affecting the cervical spine is substantial in most general orthopedic clinics (estimated to be 15%).<sup>1</sup> These disorders may be identified in categories based on the primary soft tissue involvement such as:

- Myofascial syndrome of cervical musculature, muscle pain, greater occipital neuritis
- Facet joint syndrome, degenerative joint disease, cervical spondylosis
- Cervical nerve root compression (disc herniation)

Cervical spine traction, in one form or another, is a major component of conservative management for patients exhibiting soft tissue disorders and is generally successful.<sup>2</sup> The major goals of spinal traction include: Relief of pain, decreased pressure on cervical nerve roots, improved soft tissue extensibility as indicated in pain-free range of motion (ROM), and reduction in painful, protective muscle activity.

Often, home treatment involves use of a portable cervical traction device designed to augment the effects of improvements obtained by in-clinic manual and/or mechanical traction. However, patients often fail to comply with home traction regimens or they find their self-treatment efforts to be counterproductive for one reason or another.

Two case studies were recently completed using a flexible closed-cell foam, bladder-inflated home traction device (**PRONEX**<sup>®</sup>). The traction unit is designed to be used in the anti-gravity supine position with the normal cervical lordosis supported by the un-inflated device. The pressure level is controlled by the patient using an inflator bulb with a pressure release valve identical to that used for a standard sphygmomanometer.

## CASE STUDIES

The first case study involved a patient with objective evidence of chronic C7 facet syndrome who was unresponsive to a variety of conservative management measures.

Three weeks after instituting use of the **PRONEX**<sup>®</sup> for traction, the patient was pain-free (measured by Visual Analog Scale {VAS}) and had full cervical spine motion (measured by Cervical Range Of Motion instrument {CROM}). The patient has discontinued cervical traction as well as any further treatment, other than standard ROM exercises, and had no additional episodes of recurrence.

Though no unequivocal cause-and-effect relationship was established in this case of chronic cervical facet syndrome, the absence of improvement in the face of several other therapeutic efforts prior to **PRONEX**<sup>®</sup> is strongly suggestive of this explanation.



**PRONEX**<sup>®</sup>

A second case study has been completed which concerns a 60 year old man with a long-standing history of cervical spine pain, occipital headaches, and restricted range of motion supported by radiographic evidence of cervical spondylosis and neural foraminal encroachment (Figure 1).

The patient's physical examination was unremarkable for any objective signs of neurotension, sensory, motor, or upper extremity reflex changes, but he consistently experienced episodes of vertigo with cervical spine extension.

TABLE. 1 CERVICAL SPINE MOTION	CROM MEASUREMENTS (in degrees)	
	APRIL 1994	NOVEMBER 1994
Flexion	30	60
Extension	10	50
Sidebend (L)	15	30
Sidebend (R)	15	35
Rotation (L)	30	60
Rotation (R)	25	60

Initial examination included formal ROM measurements using the CROM device, the values for which were found to be grossly abnormal when corrected for age and gender (Table 1)<sup>3</sup>. The patient was issued a **PRONEX**<sup>®</sup> unit and instructed on proper use of the device following our initial examination.

A follow-up visit, two weeks after initial examination, indicated that the patient's headaches had virtually ceased and his overall pain was diminished.

The patient was instructed to continue use of the **PRONEX**<sup>®</sup>, remain in contact with our office and/or his physician, and return for a re-examination two or three months later. Due to scheduling difficulties the patient did not actually return for review until six months following our initial examination.

At this point the patient complained of no cervical spine pain, no headaches, and had no vertigo with spinal extension.

Repeat CROM measurements also revealed remarkable improvements, with values within the age-corrected normal range (Table 1).

Follow-up radiographs taken at the six month mark indicate apparent improvements in C4-5 intervertebral separation and other possible facet joint changes (Figure 2). We believe that the apparent radiographic improvements are correlated with this patient's objective improvements in cervical range of motion and subjective pain-free state.

Due to the chronic nature of this patient's condition and the fact that no therapeutic intervention, other than the **PRONEX**<sup>®</sup> was attempted, we believe these results provide compelling evidence for **PRONEX**<sup>®</sup> use efficacy and suggest that a large clinical series of cases is warranted. The patient continues to experience relief and maintains a schedule of three **PRONEX**<sup>®</sup> treatments per week.



\*Contrast added to show detail

Figure. 1  
Lateral radiographic view of cervical spine taken in April, 1994, prior to initiating use of **PRONEX**<sup>®</sup> traction treatment. Note generalized evidence of degenerative joint disease, particularly at C4-5 vertebral level.

## CLINICAL SERIES RESEARCH

Since completion of these case studies, we have continued to examine patient responses to **PRONEX**<sup>®</sup> use in an expanded clinical series (sample of convenience). Thirty-seven (37) patients have currently been included in this on-going study and have been delineated according to the categories noted previously in this report. The preliminary results for this clinical series analysis are as follows:

### GROUP 1 (N=11):

Myofascial syndrome, muscle pain, greater occipital neuritis.

9/11 (82%) "Excellent"

2/11 (18%) "Good"

No patients with "Poor" results

### GROUP 2 (N = 15):

Degenerative joint disease, facet joint syndrome, cervical spondylosis (Radiographic confirmation)

6/15 (40%) "Excellent"

7/15 (47%) "Good"

2/15 (13%) "Poor"

### GROUP 3 (N=11):

Cervical nerve root compression, disc herniation (MRI, EMG confirmation).

6/11 (55%) "Excellent"

2/11 (18%) "Good"



\*Contrast added to show detail

Figure. 2

Repeat lateral radiographic view of cervical spine taken in November, 1994, following consistent use of **PRONEX**<sup>®</sup>. Facet joint separation appears to have improved and clear evidence of increased C4-5 intervertebral separation is noted.

3/11 (27%) "Poor"

Further delineation of patient's responses have been categorized according to the following scale, briefly outlined below:

"Poor" - Less than 25% reduction in complaint of pain (measured by Visual Analog Scale {VAS}), little or no noticeable improvement in functional ROM (patient's perception), less than 5 degree objective improvements in ROM (measured by CROM device).

"Good" - Approximately 50% improvement in pain (VAS), substantial improvement in functional range, 10 degree or more improvements in two or more cervical spine motions (CROM).

"Excellent" - Decrease of 75% or more in cervical spine pain, functional range approaching normal, CROM measurements of 20 degree improvements or more in two or more motions.

## CONCLUSION

From these encouraging initial results we have concluded that **PRONEX**<sup>®</sup> use is a very beneficial adjunct to conservative management for patients with a variety of cervical spine conditions. Especially significant is the apparent success we have experienced using this device with patients exhibiting chronic pain of spinal origin. We are currently designing a randomized controlled trial for patients with cervical spine pain using the **PRONEX**<sup>®</sup> device to more fully examine patient responses and **PRONEX**<sup>®</sup> efficacy.

- 1 Kelsey JL, Githens PB, Walter SD et al: An Epidemiological Study of Acute Cervical Prolapsed Intervertebral Disc. J Bone Joint Surg, 66A: 907:914, 1984
- 2 Murphy MJ: Effects of Cervical Traction on Muscle Activity. J Orthop Sports Phys Ther, 13(5): 220-225, 1991
- 3 Kuhlman KA: Cervical Range of Motion in the Elderly. Arch Phys Med Rehabil, 74: 1071-1079, 1993

## **PRONEX**<sup>®</sup> RESEARCH UPDATE, MARCH 20, 1996

Ongoing research and clinical studies by Arthur Nitz, Ph.D., PT, OCS, ECS provides the following conclusions relative to a recently updated study of 55 cervical pain patients.

Patients treated with **PRONEX**<sup>®</sup>, a pneumatic cervical traction device, in this study have been grouped according to the following conditions.

**(Group 1) Muscle and Postural Disorders.** 14 patients treated, all women

Postural neck pain (head forward)  
Myofascial syndrome  
Muscle pain/strain, or flexion/extension injury  
Greater occipital neuritis

**71% responded with excellent results**

**29% responded with good results**

**Conclusion, 100% of Group 1 patients responded with good to excellent results.**

Group 1 patients were all clerical workers who would use the **PRONEX**<sup>®</sup> until the pain would subside, then would discontinue use until the next flare-up.

**(Group 2) Joint Disorders.** 23 patients treated; 11 women, 12 men

Degenerative joint disease  
Cervical spondylosis  
Facet joint syndrome

**43% responded with excellent results**

**39% responded with good results**

17% had poor results.

**Conclusion, 82% of Group 2 patients responded with good to excellent results.**

Group 2 patients showed best improvement in CROM. These patients are generally older, and tend to be impatient. For best results patients must be instructed to inflate the **PRONEX**<sup>®</sup> SLOWLY

**(Group 3) Disc/Nerve Root Disorders.** 18 patients treated; 8 women, 10 men

Cervical nerve root compression, (radiculitis, radiculopathy) Disc herniation (confirmed by MRI/EMG)

**50% responded with excellent results**

**28% responded with good results**

22% had poor results

Conclusion, 78% of Group 3 patients responded with good to excellent results. (By increasing traction strength and duration all new patients responded with good or excellent results.)

If the disc fragment is too large, then surgery may be indicated. If the disc bulge will not permit any extension prior to treatment, patients must be gradually placed into **PRONEX**® then left in the “start position” for more than one visit prior to initiating treatment. Patients in this group generally stop using **PRONEX**® when symptoms abate. Treatment with ice after **PRONEX**® session helps. Group 3 patients require more traction, for a longer period of time with intermittent rest. The recommended treatment time per session is 15-30 minutes.

In order for a clinician to successfully implement the use of **PRONEX**® in his/her practice, the following should be considered:

The clinician should be aware that through **PRONEX**® use, there is subtle and not-so-subtle joint separation.

a. Facet Joint Syndrome

1. Pain is decreased due to changes in mechanoreceptor firing
2. Improved joint capsule extensibility
3. Separation of joints of Von Luska (improvement in side bending with DJD patients).

b. Intervertebral joint (disc)

1. Pain is decreased by relieving mechanical compression of nerve root; this disrupts the biochemical cascade that leads to inflammation.
2. Improved ROM through both mechanical and neurophysiological explanation.

Treatment is recommended for acute or chronic symptoms, either early or late in the treatment schema. It does not matter in which sequence the **PRONEX**® is used as long as the end result is that the patient is helped.

Any of the patients listed in groups 1 through 3 are good candidates for treatment with **PRONEX**®, as are those patients whose symptoms fall “between” two categories of conditions.

What should the clinician consider prior to treating patients with **PRONEX**®, and for subsequent evaluation visits?

1. Patients need to be instructed in the following:

- a. Proper position in the Pronex.

- b. Proper breathing and relaxation techniques.
- c. Pressure delivery must be SLOW.
- d. Post-**PRONEX**® activities such as “chin tucks” or ROM exercises may be ordered.
- e. PRN is the recommended treatment with each session lasting 10-15 minutes, but not to exceed 30 minutes within a two-hour period.

2. The following should be the recommended protocol for follow-up visits:

- a. Measure ROM.
- b. Conduct Oswestry-type Neck Disability Index test.
- c. Neck strengthening exercises should be given only after normal neck lordosis is attained.
- d. If pain is the focus of subsequent visit, it should be measured and compared.
- e. The patient should always bring his/her **PRONEX**® to the clinic for subsequent visits, allowing the clinician to “trouble-shoot” any product or use problem.

3. Patient should be instructed to self-administer maintenance dosage and to contact the health practitioner when any flare-up occurs.

4. When using the **PRONEX**® in the clinic the following hints or tips should be noted.

- a. If the bottom of the Pronex grabs on the table surface, a piece of paper may be placed under the distal portion of the **PRONEX**® to make sliding easier. An alternative would be to ask the patient to do a chin tuck.
- b. If the patient requires some flexion from the normal neck lordosis provided by the **PRONEX**®, a folded thin towel may be placed under the distal portion of the **PRONEX**®.
- c. For patients whose ears are slightly farther back on the head, and which feel slightly uncomfortable in the **PRONEX**®, place a folded washcloth as a “washer” on the bellows under the neck to slightly elevate the neck and head thus greatly increasing the comfort.

**PRONEX**® is manufactured by:

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