

**RESOLUTION OF LOWER LIMB SENSORY POLYNEUROPATHY IN A 63-YEAR-  
OLD MALE RECEIVING ACTIVATOR METHODS CHIROPRACTIC TECHNIQUE  
FOR THE CORRECTION OF VERTEBRAL SUBLUXATION**

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## RESOLUTION OF LOWER LIMB SENSORY POLYNEUROPATHY IN A 63-YEAR-OLD MALE RECEIVING ACTIVATOR METHODS CHIROPRACTIC TECHNIQUE FOR THE CORRECTION OF VERTEBRAL SUBLUXATION

### ABSTRACT

**Objective:** To describe the resolution of low-grade sensory polyneuropathy and the improvements in spinal function in a 63-year-old male receiving Activator Methods Chiropractic Technique (AMCT) to correct vertebral subluxation.

**Clinical features:** A 63-year-old male with a 4-year history of bilateral lower limb sensory polyneuropathy, previously diagnosed by nerve conduction testing. Postural alterations, moderate reduction in cervical and lumbar range of motion (ROM), and positive sensory changes were found in conjunction with vertebral subluxation throughout the spine and moderate lumbar degenerative changes present on x-ray.

**Intervention & Outcomes:** Chiropractic care using AMCT was provided for the correction of vertebral and extremity subluxations. The patient demonstrated subjective improvements in sensation in the lower limb, and objective improvement in posture, in measured spinal ROM, neurological assessment and a reduction in vertebral subluxation.

**Conclusion:** A course of chiropractic care using AMCT was associated with resolution of lower limb sensory polyneuropathy, improvement in objective posture, spinal ROM and neurological assessment with reduction in vertebral subluxation. More research is needed to investigate the role chiropractors may play in helping similar patients so as to inform clinical practice and future higher-level research designs. (*Chiropr J Australia 2017;45:217-228*)

**Key Indexing Terms:** Older Adult; Peripheral Neuropathy; Chiropractic; Range Of Motion

### INTRODUCTION

It has been reported that chronic neurologic symptoms in the adult population result in one of the most common reasons for specialist healthcare visits. (1,2) The prevalence of peripheral neuropathy recorded in the general population is 2.4%; however, as age ranges increase it has been estimated to increase to 8% in those over 55-years-of-age (2,3), and even as high as 50% in people aged over 65-years. (4)

Peripheral neuropathy varies widely in its clinical presentation; however, it most commonly presents with altered sensation, pain, weakness, or autonomic symptoms. (5) Several types of pathology can cause peripheral neuropathy. These range from nerve compression/entrapment and trauma to metabolic and chemically-induced conditions, most being associated with pain. (4,6) While acute peripheral neuropathy is rare, chronic peripheral neuropathy that develops over a period of months and is

identified through history, examination and stage 1 and 2 investigations (see table 1) is most common. (5,7) Diabetic neuropathy is the most common type of chronic peripheral neuropathy, and is estimated to cost up to 5% of the national health service expenditure in the USA and UK. (8,9)

**Table 1:** Stage 1 and 2 investigations of peripheral neuropathy

Stage 1 investigations	Urine analysis	Glucose, protein
	Haematology	Full blood count, erythrocyte sedimentation rate, vitamin B-12, folate
	Biochemistry	Fasting blood glucose concentration, renal function, liver function, thyroid stimulating hormone
Stage 2 investigations	Neurophysiological tests	Assessment of distal and proximal nerve stimulation
	Biochemistry	Serum protein electrophoresis, serum angiotensin converting enzyme
	Immunology	Antinuclear factor, antiextractable nuclear antigen antibodies (anti-Ro, anti-La), antineutrophil cytoplasmic antigen antibodies
	Other	Chest radiography

Conventional treatment for neuropathy is varied; however, pharmacological treatment is recognized as the first-line approach based on current clinical trial recommendations. (10,11) Non-pharmacological management may also be administered to support patients who are experiencing additional effects such as declining social functioning and quality of life (QoL); interventions include improved sleep hygiene, psychological referral and physical therapy for neuromuscular rehabilitation. (10) With patients that have continued symptomatology interventional therapy is recommended, including local anaesthetic and nerve block, however evidence of efficacy is limited. (10)

Complementary and alternative medicine (CAM), including chiropractic, has been used by members of the general population with musculoskeletal complaints such as neuropathy. (12) The general adult population tend to visit chiropractors mostly for musculoskeletal complaints, especially related to the low back. (13-15) However, limited review of the literature found only 4 case reports (16-19) and 1 case series (20) reporting chiropractic care for peripheral neuropathy of the lower limb not related to diabetes.

The purpose of this paper is to inform clinical practice and research the purpose of this case report is to describe the resolution of lower limb polyneuropathy, improvements in posture and spinal ROM, neurological assessment and a reduction in vertebral subluxation in a 63-year-old male receiving Activator Methods Chiropractic Technique (AMCT) for the correction of vertebral subluxation.

**CASE REPORT**

A 63-year-old male complained a 4-year history of bilateral lower limb neuropathy diagnosed 1-year prior as a low-grade polyneuropathy of unknown aetiology. The polyneuropathy was described as a cold and tingling sensation experienced over the shins in addition to the sensation of numbness in the feet. The patient felt the right side was more severe than the left. Sitting, particularly in his car, exacerbated the symptoms; however, laying supine reduced the polyneuropathy symptoms. He had taken statins for some months; however, after specialist consultation he stopped as it was felt these may have contributed to the polyneuropathy. Cessation of the statin drugs made no difference to his presenting polyneuropathy which had remained constant at the time he sought chiropractic care 1-year post cessation. He had no history or family history of diabetes. The patient subjectively rated his physical health as 8/10 and mental health as 9/10 at the time of his initial presentation on a 10-point numeric rating scale where 1 is worst and 10 is best. Additionally, he was assessed using the Health Wellness and Quality of Life (HWQL) instrument, which measures 5 self-reported domains as a percentage. The 5 domains are physical functioning, mental and emotional state, stress evaluation, life enjoyment and overall quality of life (QoL). (21-22) All domains here score at least 80% or higher, except emotional and mental state, which was 75%. (Figure 1)

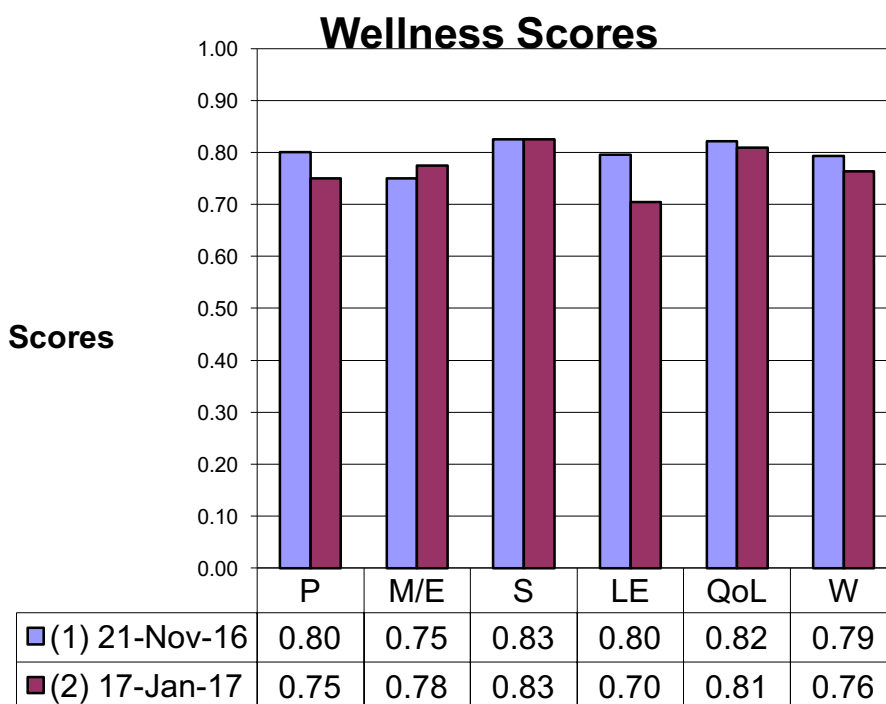


Figure 1. Comparison of HWQL survey at initial and progress exams

## Examination

Posture examination, measured through visual analysis, revealed a significantly higher right hip. All other postural findings were within normal limits. Lumbar orthopaedic testing including Standing Kemp's, Straight Leg Raise, Braggard and Bowstring tests were all negative.

Range of motion (ROM) assessment of the cervical and lumbar regions was performed using a bubble inclinometer. Cervical ROM assessment revealed flexion of 50° and extension of 60°, within normal limits, while left lateral flexion was 20° and right lateral flexion 42°. Lumbar ROM assessment revealed flexion of 50°, extension of 35°, left lateral flexion of 10° and right lateral flexion of 15°.

Neurological testing was performed revealing reduced or no sensation on pin prick to the L4-S1 dermatomes of the feet, while pin prick was noticed across the shins albeit at the same time as constant tingling being experienced. Motor and deep tendon reflex assessment of the lower limb were normal.

Initial chiropractic examination for vertebral subluxation revealed a right shortened leg length inequality, positive right derifield, left sacral restriction, and right fast cervical syndrome. Soft tissue subluxation indicators included hypertonicity of the right Levator Scapula muscle, and hypertonicity of the paraspinal muscles at C5-T1 on the left, T6-12 on the right, and L4-5 on the right. Biomechanical subluxation indicators included reduced joint play (end-feel) at C1-T6, T10-12, L2-5, and the right sacroiliac joint, while restriction in inter-segmental motion was primarily noted at C1 and L5 on the right, and C2 and L2-4 on the left, with extension restriction additionally noted at C5, T6 and T12. These represent commonly used and generally reliable clinical indicators used by chiropractors to assess for vertebral subluxation. (23-25)

Thermography and sEMG studies were recorded using the Insight Millenium™ and are considered reliable measures. (24,26) Thermography revealed overactivity of varying levels of severity in all levels of the spine except C7, while sEMG revealed areas of hyperactivity at C1, C5, T1-2, T6, T12 and L5. (see figure 2)

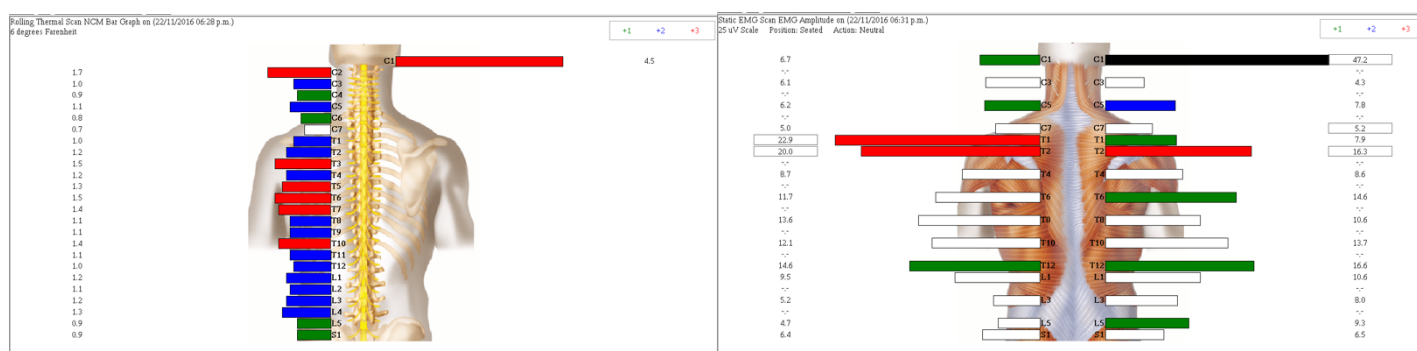


Figure 2. Thermography and surface EMG study at initial visit

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A 2-view lumbar x-ray study found mild thoracolumbar curvature convex left-centred at L1. Mild osteophytes were present at multiple levels without disc height loss; however, at L5-S1 there was moderate disc height loss with associated endplate sclerosis, marginal spurring and vacuum phenomenon. Hypertrophic disease was present at lower 2 levels, more significantly on the left. Small osteophytes were noted inferiorly on both sacroiliac joints, and degenerative changes were also noted in both hip joints with marginal osteophytes seen at both femoral head neck junctions.

### *Intervention*

Chiropractic care was administered over a period of 7-weeks where the patient was seen twice weekly for 13 visits using full-spine AMCT. The most commonly adjusted segments were left AS ilium (n = 10 (76.9%)), right PI ilium (n = 9 (69.2%)) and L5 (n = 8 (61.53%)). An average of 6.3 levels were adjusted at each visit; for a complete summary of levels adjusted per visit see table 2. AMCT is a protocol that uses a functional leg-length analysis in combination with isolation tests (active movements by the patient under the chiropractor's instruction) to determine involved spinal levels, and a hand-held instrument with a blunt stylus to deliver a specific, high-velocity, low-amplitude thrust for the correction of vertebral subluxation. (27)

During the course of chiropractic care the patient subjectively reported by the 6th visit he had noticed reduction in "tingling" over the shins and a sense of "tingling" over the feet that had previously felt numb. By the 8th visit the sensation over the shins had resolved, and by 12th visit the numbness in the feet had resolved apart from rare tingling when driving.

Although positive subjective and objective outcomes were reported, there was an overall reduction in both subjective physical and mental health was reported, physical dropping from 8 to 7/10 and mental dropping from 9 to 8/10. Additionally, all domains measured with the HWQL survey revealed a decline across the tested domains of 1-10%, with only the mental and emotional domain improving. (Figure 1)

Posture examination improved with his right-sided pelvic tilt significantly reducing now presenting as very slight left-sided pelvic tilt. Spinal ROM studies revealed improvements in all ranges of motion. Cervical ROM revealed flexion of 60° (20% improvement), extension of 50° (16.6% reduction), left lateral flexion of 38° (90% improvement) and right lateral flexion of 42° (no change). Lumbar ROM revealed flexion of 75° (50% improvement), extension of 40° (14.2% improvement), left lateral flexion of 30° (200% improvement) and right lateral flexion of 30° (100% improvement).

Neurological sensory testing was repeated, revealing patient awareness of sensation to all points of soft touch and pin prick to the L4-S1 dermatomes of the feet, consistent with the patient reporting reduction in numbness in his feet.

Vertebral subluxation as indicated by the ACMT protocol reduced over the course of care indicating an improvement in spinal function. The number of adjustments made each visit over the first 6 visits ranged from 11-6 (an average of 8.5 adjustments),

while the number of adjustments made each visit over the last 6 visits ranged from 8-1 (an average of 4.3 adjustments). (Table 2)

Table 2. Adjustment summary by visit

Visit	Levels adjusted	Total adjustments
1	R med knee, R lat knee, L AS, R PI, L5 R, L2 L, T1 L, C1 R	8
2	R lat knee, L AS, R PI, L5 R, L5 inf, L5/S1 facet L, T6 R, C7 L, C0 R	9
3	R med knee, L AS, L5 L, L5 inf, L4 L, T8 L, C5L	7
4	R med knee, L med knee, L lat knee, L AS, R PI, L5 L, L5 inf, L4 L, L4 inf, L4/L5 facet L, C5 L, C1 R	11
5	R med knee, L AS, R PI, L5 L, L5 inf, L5 lat L, L4 L, L4 inf, T10 R, C1 R	10
6	L lat knee, L AS, R PI, L5 R, L5 inf, C1 R	6
7	L AS, R PI, L4 L, L4 inf, C5 L	5
8	L AS, R PI, T6 L	3
9	R med knee, L AS, R PI, L4 L, T11 L	5
10	R med knee, L5 L, L5 lat L, L4 R, L4/L5 facet L, T8 L, L post sac	7
11	R lat knee, L AS, R PI, L5 R, L5 inf, L4 inf, T12 L, C5 L	8
12	L PI, L5/S1 facet L	2
13	L4 L	1

Significant changes were recorded in thermography and sEMG after the progress examination. Thermography findings reduced to only 2 levels of hyperactivity from the 24 levels at the initial examination, while sEMG findings reduced to indicators of hyperactivity at C1, T1, L5 and S1 indicating improvement in dysponesis and dysautonomia. (see figure 3)

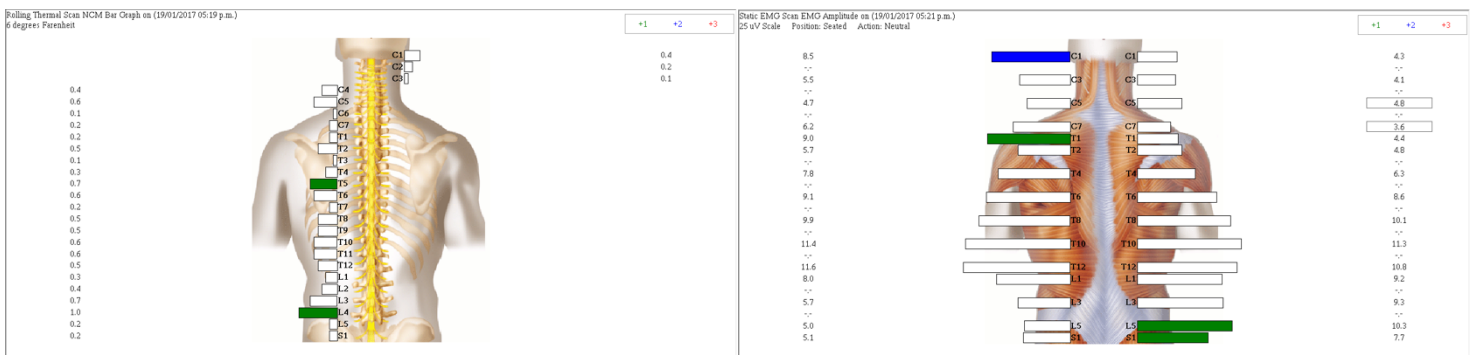


Figure 3. Thermography and surface EMG study at progress examination

## **DISCUSSION**

This case documents that a course of chiropractic care was associated with resolution of lower limb sensory polyneuropathy, improvement in objective posture, spinal ROM and neurological assessment with reduction in vertebral subluxation.

Chiropractic care has been reported as being effective for peripheral neuropathy, a common condition seen by chiropractors (6,15); however, due to the paucity of evidence Perle et al. suggest that this “seems to be part of what may be termed the oral history both the chiropractic and osteopathic professions.” (28)

According to 1 study of 180 CAM users (43% with peripheral neuropathy), the main reason for using CAM services was “inadequate pain control”; 18% of these were concurrently using conventional first-line treatment. The most frequently used methods of care by this group were megavitamins, magnets, acupuncture, herbal remedies and chiropractic care. Chiropractic care was used by 21% of these CAM users, and only 27% perceived that their symptoms improved with any CAM use. (12)

Gudavalli et al reported a case series of 69 postsurgical patients with continued radicular symptoms receiving Cox Technic Flexion Distraction. (20) The majority of these patients (81%) perceived more than 50% improvement in their presentation, rated on a 10-point numerical scale, after an average of 11 visits over 7 weeks. After 24-months post chiropractic care 70% of these patients reported their symptoms resolved.

Bova and Sergent (16) described a 24-year-old female with a 3-month history of intermittent idiopathic right leg paresthesia. Neurologic symptoms were rated 5/10 on a 10-point numerical scale, these resolved to 0/10 after 2 visits. While manipulation was reported as an intervention it was not described; however, laser therapy was.

Francio (17) reported on a 14-year-old female presenting with peroneal nerve neuropathy resulting in right foot drop. Nerve conduction testing confirmed peroneal nerve palsy of unknown etiology. Manipulative procedures to areas of the affected lower limb were performed with report of resolution of neurological symptoms after one visit.

Morningstar (18) reported on a 77-year-old male with paresthesia in the right lower limb. Nerve conduction testing confirmed L4 and L5 radiculopathy. After a series of manipulation procedures performed twice weekly over a 3-month period partial resolution of the presenting neurological symptoms was achieved, with only the L5 radiculopathy remaining. They type of manipulative procedure administered by the chiropractor in this case was not reported.

Reife and Coulis (19) reported on 53-year-old female with a misdiagnosed L5 radiculopathy; however, only advice for the patient to “stop crossing their legs” was given resulting in resolution of the presenting neurological symptoms.

In all the above cases little is known about the common indicators used by chiropractors to identify the site of involved subluxation (24,25) further studies would be strengthened and clinician understanding enhanced by inclusion of this clinically relevant information. Additionally, detailed information regarding chiropractic intervention would also enhance clinician understanding.

Chiropractic care aims to optimize health and wellbeing through the enhancement of the nervous system function by removing nerve interference caused by vertebral subluxations. (29) The correction of vertebral subluxations by chiropractic adjustments are a fundamental component of personal enhancement and wellbeing. The Australian Spinal Research Foundation developed a conceptual definition of vertebral subluxation that states “*A vertebral subluxation is a diminished state of being, comprising of a state of reduced coherence, altered biomechanical function, altered neurological function and altered adaptability.*” (30) Vertebral subluxation has been reported as being a central segmental motor control problem that involves a joint, such as a vertebral motion segment, that is not moving appropriately, resulting in ongoing maladaptive neural plastic changes that interfere with the central nervous system. (31) The correction of vertebral subluxations is achieved through chiropractic adjustments that are typically manually performed. (32-34)

The overall positive result of resolution of the presentation of peripheral polyneuropathy in the current case report are congruent with the limited number of previously reported studies that investigated the effects of chiropractic care in cases of lower limb peripheral neuropathy. (16,17,19,20) While the studies discussed above did not report objective improvements in physical functioning, such as measured ROM, the current study did report this, and is consistent with improvements described in other recent papers describing improvements under ACMT chiropractic care. (35-38)

With regard to self-reported subjective changes, the same 10-point numerical scale was used in the current study was used in others mentioned above (16,20); however, a HWQL instrument was also administered. This is consistent with concerns of patient health status under conventional medical management. (10) Of interest, the current study reports seemingly negative changes in self-reported physical and mental health, and HWQL which are inconsistent with the positive findings reported in the case. A simple explanation for this may be the concept of ‘response shift’ where a patient has somewhat accommodated for their state of health and once improvements occur after intervention which involves recalibrating their internal standards. (39-41)

### *Limitations*

Besides the inherent limitation of a single case study, that of being an isolated case not controlled for external factors and natural progression, there was a limitation in no follow-up nerve conduction test completed confirmed the neurological exam findings described. Additionally, QoL was assessed using an instrument that is not yet validated.

## **CONCLUSION**

A course of chiropractic care using AMCT was associated with resolution of lower limb sensory polyneuropathy, improvement in objective posture, spinal ROM and neurological assessment with reduction in vertebral subluxation. More research is needed to investigate the role chiropractors may play in helping similar patients so as to inform clinical practice and future higher-level research designs.

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## **Resolution of Sensory Polyneuropathy**

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