An open letter to those in purely osteopathic manipulative medicine practices on reimbursement strategies

Douglas J. Jorgensen, DO, FAAO

Recently, at a coding and reimbursement workshop I was giving, I was asked how one can improve revenue if only doing Osteopathy in the Cranial Field (OCF) and seeing eight patients a day four days per week. I must admit that I was taken aback, as I just finished outlining revenue opportunities from various sources in a musculoskeletal medicine practice (MSK). Honestly, this is not just about those doing exclusively cranial work, but all doctors doing osteopathic manipulation as their primary practice. My reply was short and, honestly, not as thoughtful or helpful as I or he would have liked. A good friend gave me some constructive feedback on how my remarks were interpreted by those attending—in a nutshell, "there is nothing I can do to help you." At first glance, and in light of what I was reviewing at this point in the talk, that could be true. Unfortunately, in this case, the conversation ended, he thanked me and left the venue. However, there are a great deal of potential opportunities to improve revenue, and I will outline them below.

Your fee schedule: Some doctors never change it. I was guilty of this too, but many states now have public data sites showing your schedules. Please remember, you *cannot* ask colleagues what they charge, as that is potentially collusion (price fixing by some standards), but see what you are charging per relative value unit (RVU) and do an annual adjustment. Consultants can help, or use federal and state sites on the Web, but be aware of your fees. If it is feasible, charge cash so you are getting the equivalent of four 99213s per hour. For example, if a 99213 reimburses $100 in your area, are you making at least $400 per hour of your time? If you are not charging *at least* the equivalent of four 99213s, your fees are way too low.

For a real-time comparison, use the *best* payor (not Medicare), to set this standard by seeing what they pay for 98929 or 99213s. A better goal for reimbursement would be to see if your cash payment equals four 98928s and four 99213s—even two of each per hour is likely a better gauge than just four 99213s. Regardless, these tactics will help "normalize" your pay, and allow your patients to be reimbursed for your services if they went to submit the bill to their insurance. However, if they want to submit your notes for reimbursement, your notes need to meet the documentation requirements. With the growing use of health savings accounts (HSAs) and limits being placed on "spinal manipulation," you can keep your cash flow up, maintain access for your patients and allow your income to grow annually with updated fee schedules.

Streamline your office: Consider this, if you are seeing one person per hour, you may not even need an employee. Phone service companies can answer calls with recorded or live people answering with your practice name. Thirty-two patients per week is a low enough volume to stay on top of calls yourself. A free electronic medical record (EMR) system like Practice Fusion® may be your best choice. There is no cost, you can use your own templates, and it gives you e-prescribing and links to various clearinghouse and billing options. Plus, it brings you into EMR/eRx compliance, potentially opening you up to federal and state bonus money. No matter how efficient your practice may seem, there is always room for improvement. Have an outside consultant look at things with a fresh set of eyes—you may be surprised by what he/she sees and suggests to optimize your practice's efficiency and make you more money in less time.

Analyze your space: If you're a solo doc at only one patient per hour, you may only need 800 to 1000 square feet of office space. This could be done in a high-end setting for less than big space would cost—but perception is reality, people are willing to pay more for nice things and ambience counts! Subleasing is often very inexpensive, and you could even share staff in certain business arrangements. If you could get in with a group of high-end physicians, the perceived value is always greater and your fees would more than justify the space. Plus, by cost sharing employees, your monthly expenses would be negligible compared to maintaining full-time staff for such a small practice.

Charge for all somatic dysfunctions (not just the head): What do I mean by that? Many with whom I have spoken who do cranial and/or biodynamic work only charge for the head and neck (98925 and 98926 maybe),

but if you diagnose SI, LE, TL, UE and/or rib dysfunction, and you document and treat it, then bill for all the regions. If I fix the L5-S1 dysfunction and subsequently T12, rib 12, the right ilium and RLE normalize, did I not treat all those areas? Of course I did. Do great medicine, document it and get paid for it.

Lastly look at what you might provide rather than refer out: Lots of us doing MSK work recommend supplements, braces, etc. Why not provide them yourself? There are several reputable companies that will wholesale or bulk sale items you regularly recommend, or you could consider one of several multi-level marketing companies that have very good products as well. Some docs get skittish about "selling" something to patients, but what is confusing to me is that we are already selling our services— they are an intangible product that is often undervalued in the current medical market. If you truly believe someone would benefit from lifts, a brace, supplements, etc., simply determine how often you recommend it, what the cost is, what you can sell it for (your return on investment (ROI) monetarily) and if it's something you have sent them somewhere to buy (yes, the Web counts). If you do this analytic, then you may have another revenue source that was previously being sent elsewhere. Patients often like supporting their own doc rather than the health food store or some online merchandiser, so it is certainly worth considering.

Follow-up to: OMT and exercises for a patient with limited knee range of motion prior to knee replacement: A case report [*AAOJ*. 2011;21(4):32-33.]

Robert C. Clark, DO, MS

Two months after the reported encounter, the patient had a knee replacement of the right knee. After the surgery, he completed the physical therapy program prescribed by the orthopedic surgeon. Two months after the surgery, he returned to the gym and gradually resumed his regular fitness and exercise program. Three months later he reports he does his regular program and has resumed all activities including playing goal tender on a senior league hockey team. Further, he reports it is essential that he work out at least five times a week or he experiences noticeable tightening of the thigh and leg muscles with a loss of range of motion. He notes that without exercise, he cannot straighten the knee fully, but with exercise, he achieves a slight degree of knee extension. He has a maximum of knee flexion of roughly 130 degrees.

He fully recognizes the need for regular exercise and flexibility training in perpetuity to maintain full, normal function of his knee. The physical therapy program left him short of his personal goals for strength and flexibility. He could not resume the normal range of activities that he had prior to the surgery. This deficit is not due to any fault of the physical therapy, but due to the limit of the duration of the program by the insurance companies. By creating his own training program, he was able to achieve his personal goals for range of motion, strength and activities.

Synergopathic medicine and the cranial concept in the successful treatment of a patient with acute paralytic ileus: A case report

Krishnahari S. Pribadi, MD, ABPN Dipl.

Dear Editor,

I am submitting a case report describing the use of Synergopathic Medicine (and the cranial concept) in the successful treatment of a patient with acute intestinal paralysis (paralytic ileus) caused by acute pyelonephritis with urolithiasis, bacterial gastroenteritis (gram negative?) and probably sepsis without operation, intravenous fluid, antibiotic or hospitalization. Indeed, a very unusual, daring and revolutionary approach. This was possible and necessary because the patient refused hospitalization. What is Synergopathic Medicine? The term was coined by Dr. Krishnahari S. Pribadi, MD, to describe a system of medicine capable of integrating the philosophical bases of various forms of medicine within a giant single framework developed on synergetic philosophical ideas and concepts promulgated by R. Buckminster Fuller.

Synergy is a state of optimal functioning of an integrated system consisting of parts and components. "Synergy means behavior of integral, aggregate, whole systems unpredicted by behaviors of any of their components or subassemblies of their components taken separately from the whole."[1] Synergopathic Medicine synthesizes and integrates all forms of medicine currently in existence and being practiced in the world, including but not limited to, allopathic medicine, osteopathic medicine, cranial osteopathy, homeopathic medicine, natural medicine, chiropractic, acupuncture, herbal medicine, traditional medicine, bio-energetic medicine, spiritual medicine, etc., within a giant single framework capable of dissolving all differences and contradictions, and thereby synthesizing and integrating all the components and subassemblies of their components to form a synergic state.

Cranial osteopathy is the core of Synergopathic Medicine and is used to integrate all elements, since all forms of medicine affect the craniosacral system, which functions as the highest regulatory system in the body. By evaluating, monitoring and therapeutically manipulating the craniosacral system, we synergetically apply any medical procedures capable of optimizing this system. With this kind of medicine, we no longer divide a patient into parts and components to be treated with various forms of medicine. Thus, no longer do we treat organs with various pharmacological moieties or surgeries only, the mind with manipulation of thinking and emotional patterns with various psychotherapeutic modalities and interventions only, and the spirit with practices of various beliefs and myths only. Instead, we see a patient as a living human being consisting of systems organized and integrated biologically, socially, mentally, cosmologically and spiritually to form a being that has feelings, thoughts, actions, willingness, meaning and hope, as well as physical components and spiritual existence. Instead of subjecting a patient into one form of medicine or another, we bring all forms of medicine to the patient to be applied systematically and holistically.

Case Report

The patient is a 39-year-old male who was brought to the doctor's clinic in a small town with a three-day history of no bowel movement, bloating sensation, no gas passing, inability to eat and drink, hematuria and flank pain. He was dehydrated, weak, pale and unable to sit or walk. Blood pressure was 110/70, radial pulse was weak and rapid. The abdomen was bloated and there was no intestinal peristaltic sound. Heart and lungs were normal. Urinalysis revealed micro-hematuria, slight leucocytes but no bacteria, with amorphous crystals and ketonuria due to starvation. No other blood tests were done as the laboratories were closed. The general practice doctor, who was trained by me in cranial techniques, then consulted with me (about 160 kilometers away) via long distance short messages services (SMS) with mobile phones. We decided to treat the patient together: she delivered all the medical procedures instructed by me, based on findings detected by craniosacral telediagnosis and her direct examination and urinalysis. The patient was diagnosed with pyelonephritis, bacterial gastroenteritis, probably sepsis, intestinal candidiasis, electrolyte disturbance, dehydration, paralityc ileus, starvation and blood intoxication based on history, physical findings, urinalysis data and craniosacral telediagnosis**.** Using cranioscral telediagnosis, the electrolytes were approximately as follow: sodium 115 meQ/L, potassium 3.6 meQ/L, blood glucose 90 mg/dl, creatinine 1.2 mg/dl. Furthermore, the craniosacral system was locked up by cranial compression, bilateral

osteomastoid restrictions and the presence of strong negative energy and an abdominal energy cyst.

In my opinion, strong negative energy is emanated by specific electromagnetic fields in the environment that cause a negative craniotropic effect (immobilizing the primary respiratory mechanism). These negative electromagnetic fields can be induced by certain soil minerals, radioisotopes, cosmic radiation, underground water flow, geopathic stress, negative and destructive emotional states and thinking patterns, and evil beings of other dimensions. It can be detected by very light cranial palpation of the skin and any acupuncture points that usually demonstrates the absence of primary respiratory mechanism pulsation and zero cranial rhythmic impulse, even after successful mechanical cranial manipulation.

The first order was to get rid of the negative energy field by praying (the patient as a Moslem was instructed to read Al Fatihah from Al Quran, the Islamic Holy Book, to ask for His protection) and having the patient drink a glass of Zam-zam water (holy water from Meccah). This resulted in the immediate pulsation of the acupuncture points, Chi flow in the meridians and mobilization of the primary respiratory mechanism by mobilizing the Breath of Life. However, the sutures were still locked up.

TIME	SYMPTOMS & SIGNS	EXAM AND LAB	PROCEDURES	RESULTS
Day 1: 16:00	A three-day history of no bowel movement, bloating sensation, no gas passing, unable to eat and drink, slight hematuria, and flank pain. He was dehydrated , weak, pale and unable to sit or walk. Still able to urinate.	Weak, eyes pushed inside indicating dehydration The abdomen was bloated, no intestinal peristaltic sound. Heart and lungs were normal. Urinalysis revealed micro-hematuria, slight leucocytes but no bacteria, with amorphous crystals and ketonuria due to starvation. Pulse: rapid, weak BP: 110/70 Cranial compression, CRI zero. Negative energy field, energy cysts.	Examination, urinalysis, long distance consultation	Using craniosacral telediagnosis, I established the electrolytes were approximately as follows: sodium 115 meq/L, potassium 3.6 meq/L, blood glucose 90 mg/dl, creatinine 1.2 mg/dl.
17:00		Negative energy field, PRM paralyzed, CRI zero.	Praying, drinking zam-zam water, drinking Young Green Coconut Water, every half hour 50 cc 4 x. Drinking Soya Milk as tolerated, date juice to provide energy and potassium 1 tbsp 4 x a day **Herbal tinctures*: IMMUNOVITA** (q 1 hr 40 drops for 6x, then 4 x 40 drops daily): a homeopathic herbal formula* to stimulate the immune system.	Onset of Chi flow and pulsation of acupuncture points Mobilization of PRM CRI remained zero

continued on next four pages

			ProSMART+ (3x 40drops): an herbal tincture to provide nerve tonic, antibiotic, detoxification and improve nutrition assimilation. **UROBIOS (3x40 drops)**: an herbal tincture to treat infection of the urinary system and kidneys.	
17:30		BP: 110/80. Pulse: 92/m stronger.	Neurobion 5000 (B1,B6,B12) IM injection one ampoule	Improvement of circulation
18:00			IMMUNOVITA 40 drops with water	
18:14		Sutures remained locked up	The doctor was instructed to perform cranial manipulation: Compression and decompression of sphenobasilar symphisis, frontal decompression, temporal decompression, occipito-mastoid sutures decompression And Still point using V technique.	Performed at 20:30
18:45			Aromatherapy, warm compress (cajuput oil and fennel oil applied to the abdomen and kidney regions) covered with warm wet towels for 15 minutes , half glass Green Young	Patient felt more comfortable

			Coconut Water, half glass Soya Milk, with 1 tbsp date juice.	
19:30			Immunovita 40 drops with distilled water.	
20:00	Nausea, no gas passing, urination once, eyes fuller	BP: 110/70 Skin turgor improved, no peristaltic sound	ProSmart+: 40 drops Urobios: 40 drops Began detox formula every 1 hour 40 drops 4 x then q 6 hr.	
20:30 - 21:00		CRI remained zero, cranial compression, OM sutures locked up	Cranial manipulation performed by the doctor: compression and decompression of sphenobasilar symphisis, frontal decompression, temporal decompression, occipito-mastoid sutures decompression, Still point using V compression	Patient felt more relaxed.
20:45		Cranial rhythmic impulse remained zero, PRM locked up, strong energy cyst in the abdomen	Zam-zam water rubbed on the abdomen after praying: Al Fatihah	CRI remained zero
21:03		PRM remained immobilized, CRI zero, strong negative energy in the body	Divine bio-energy (Breath of Life) channeled using craniosacral, breathing technique and prayers into one glass drinking distillated water via long distance	

			transmission by Dr. Krishnahari Pribadi	
21:04	Still nauseated. Urinated a lot.			
21:08			Drank bio-energy water mixed with Immunovita 40 drops	Immediate mobilization of the PRM and strong normal cranial rhythmic impulse detected
21:15		Remained no peristaltic sound	Patient instructed to chant ("Zikir"): "Astagfirullah al azhim" 99 x to ask for God's forgiveness.	Stronger cranial rhythm detected
23:00	Abdominal pain, no gas passing	Peristaltic sound absent		
24:00	Patient went home.		Patient recommended to admit himself to the hospital.	Patient refused and signed a statement indicating his refusal. Instead, patient went home.
17:00-24:00			All herbal formulas were given as per instruction.	
Day 2: 07:00	No gas passing, no bowel movement	Strong negative energy field in his house, cranial rhythm dropped	Drank a glass of water sprinkled with 1 tsp bio-energized salt (Breath of Life sent via long distance transmission into the salt). All corners of rooms sprinkled with this bio-energized salt.	Immediate mobilization of the PRM, immediate mobilization of the intestinal peristaltic movement, immediate passing of gas. Bowel movement occurred, urinated a lot—a tiny

			Soil sprinkled with water containing bio-energized salt.	kidney stone detected in urine.
07:01-	Patient felt relieved, able to sit and walk.		Instructed to begin feeding with rice porridge, Soya Milk, strained vegetable soup, date juice, drink distilled water as tolerated and to continue herbal formulas as directed. Twice a day drink a glass of water sprinkled with bio-energized salt (at 7 am and 7 pm). Daily Neurobion 5000 injection for three days (patient refused) and daily home visit by the doctor. Lab testing instructed.	Patient able to eat, sit and walk around. Patient refused further lab testing. Patient refused further Neurobion injections and treatment.
Day 1: 16:00- Day 2:				Dr. Yuke Gufron provided the direct medical treatment. Dr. Krishnahari Pribadi provided long distance consultation via telephone through SMS and verbal communication.

*All herbal formulas were formulated by Dr. Krishnahari S. Pribadi, MD, and internally named and used mainly for medical practice and doctors who have a consultation arrangement, and are not available for public sale.

**Dr. Yuke Pudiastuti Gufron-Soerojo, MHA, General Medicine Practice, West Java, Indonesia.

Conclusion

The successful treatment management of paralytic ileus caused by severe infection and bacteria toxins using the cranial concept (and its application in Synergopathic Medicine) suggests the following points:

1. Spiritual and bioenergy factors are part of the disease process, not only bacteria, viruses and other microbes, toxins, trauma, metabolic derangements, emotional factors, genetic factors, etc.
2. Strong negative energy fields can immobilize the primary respiratory mechanism, herbal and homeopathic formulas (and even chemical drugs) perhaps by destroying biological energies at the molecular, sub-molecular and particle levels, and thus paralyze the homeostatic regulation mechanisms.
3. Herbal and homeopathic remedies can work fast and treat urgent conditions, as long as they do not involve life-endangering conditions. Infection can be treated with herbal remedies possessing strong antibiotic effects without the use of chemical drugs or antibiotics.
4. Detoxification is an important part of treatment.
5. Spiritual treatment and positive bio-energy can positively affect the craniosacral system.
6. Praying is an essential part of providing treatment, particularly for serious conditions, and can positively affect the craniosacral system by mobilizing the primary respiratory mechanism via transmission of the Breath of Life it induces.
7. Cranial osteopathic medicine can be used as the organizing factor and the core of medical treatment procedures.
8. Craniosacral telediagnosis has value in detecting medical conditions. Treatment processes via long distances supported by objective physical examination and laboratory testing can be used to guide treatment performed by another physician or team of health professionals.

Respectfully yours,
Dr. Krishnahari S. Pribadi, MD, ABPN Dipl.

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Somatic dissatisfaction - Somatic dysfunction and the role of intention in treatment

Zachary J. Comeaux, DO, FAAO

Current scope of osteopathic practice

Experience through such global organizations as the Osteopathic International Alliance, which now has 62 members,[1] and the interest of the World Health Organization,[2] which recently published Benchmarks for Training in Osteopathy, highlight the diversity in expressions of osteopathic practice globally. Osteopathic principles and methods have diversified principally along three streams. In the United States, the scope of practice was largely self-defined by A.T. Still and his students as they progressively attained full medical practice rights in each state.[3] Probably due to language affinity, Osteopathy spread from America to the British Isles as early as 1898, stimulated by J.M. Littlejohn's speeches before the Society of Science Letters and Arts.

Due to differences in the politics of healthcare systems, British Osteopathy has developed with distinctive differences to the U.S. osteopathic physician model.[4] In the United Kingdom, the Osteopaths Act of 1993 finally regulated, but did not define, Osteopathy or scope of practice.[3,5] A third stream developed at a later date, as students of William Sutherland introduced Osteopathy in the Cranial Field as the fundamental method of osteopathic practice.[6] Besides this geographic proliferation, diversity has been amplified by particular individuals formulating models and establishing schools in an unregulated environment, as well as variation in scope of practice and definition of what it is that osteopaths or osteopathic physicians do.

What role is the role of somatic dysfunction? What level of function is primary?

In the founding days of osteopathic medicine, American practitioners conceptualized the osteopathic lesion.[7] Since the mid-1960s, Osteopathy and osteopathic medicine have identified correction of somatic dysfunction as the primary intent of treatment. The official U.S. definition is cited in the footnote below.[8] The history and use of this term, a construct developed to describe a broad range of anatomical considerations, were reviewed in a previous article.[9] That article suggested revisiting this aspect of osteopathic terminology to reconcile the definition with the progressive diversity of how osteopathic practitioners currently describe the focus of their intention in treatment. As more DOs begin to circulate globally in the osteopathic community, these divisions become more apparent, and some legitimate work appears beyond the scope of the glossary definition of somatic dysfunction.

A partial list of models of osteopathic approaches, each emphasizing different parameters defining dysfunction but vying for prominence, would include the following: muscle energy, high velocity, functional methods, visceral, counterstrain, myofascial, cranial Osteopathy, biodynamic approach, bioenergetic approach and the fluidic approach. To this could be added the notable differences in trends between groups of practitioners within different countries and regions. Sometimes the divisions are reduced to the distinction between biomechanical versus functional approaches. Also, I see an emerging common trend in newer models along the dimension of *subtlety*. How does the definition of somatic dysfunction relate to these variations, especially as we move into the subtle domain?

An additional dimension of this complexity involves the often anxious relationship between osteopathic and conventional medicine. The very use of the *somatic dysfunction* reflects the inadvertent influence of medicine and its bond to conventional bioscience. It presents a representational bias toward comprehension and manipulation through categorization—in this case, grouping findings as a diagnosis. Following a scientific revolution in Germany, resulting in the Flexner Report in the U.S., social and intellectual pressures have influenced all branches of health care to incorporate the scientific method without reflecting on its basic premises.

Science, in this sense, has a bias toward only recognizing materially tangible, reproducible and measureable discrete entities (things or categories of things) and processes. The implication is that for scientific and medical purposes, if something cannot be measured by a detached, external observer it does not exist. Osteopathy, through the generational efforts of Denslow, Korr, Patterson and others had attempted to define mechanisms responsible for the experience of dysfunction. In so doing, osteopathic

Osteopathic manipulative treatment of somatic dysfunction as an integral component in the care of patients with chronic medical disease: A thirty-month study in rural Appalachia

Randy G. Litman, DO, FAAO, FACOFP

Abstract

Sixty-one people with both chronic, co-morbid systemic disease(s) and musculoskeletal complaint(s), were followed for a minimum of two years to assess the clinical value and limitations of Osteopathic Manipulative Treatment (OMT) with regard to their overall sense of well-being. Four conditions predominated: cardiovascular disease, connective tissue disease, osteoarthritis and chronic pain syndromes. Predominant neuromusculoskeletal regions treated included somatic dysfunction within the cervical, sacral and ribcage areas, and areas of soft tissue restriction (Counterstrain Points, Chapman's Points, Diaphragmatic restriction, and "non-compensatory" (Gordon Zink)[1] fascial restriction within the torso).

Data collected suggested an association between the diagnosis of osteoarthritis and the occurrence of cervical somatic dysfunction. Those with cardiovascular disease(s) were most associated with several areas of somatic dysfunction (cervical, sacrum, ribs and soft tissue restriction). The predominant symptomatic age group was women 50 to 59 years of age, with a range of 28 to 97 years. OMT performed by Neuromusculoskeletal Medicine/ Osteopathic Manipulative Medicine (NMM/OMM)-certified osteopathic physicians and/or undergraduate fellows (under the supervision of the attending physician), had no recorded effect on systemic disease outcomes.

However, patients reported the treatments to be of functional value. Functional value was evaluated by four criteria: the subjective analogue pain scale, activities of daily living (ADL) evaluation, energy-level evaluation and psycho-social evaluation. The predominantly used OMT was direct and indirect myofascial release. Stability and improvement of ADLs and marginal pain improvement were observed as gauges of patient success. Depression had no correlation with medical diagnosis or symptom severity, however patient-perceived improvement correlated reciprocally. Allostasis, the body's neuroendocrine response to any extrinsic or intrinsic stressors, and its prolonged presence, allostatic load, were probable but not measurable outcome influences. Cultural disparity was suggested to be an outcome factor.

Key Terms

ADL, chronic disease, OMT, health, structure, function, somatic dysfunction, allostatic load, cultural disparity

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Introduction

"Appalachia" classically refers to contiguous regions within five states in the southern region of the United States: Tennessee, Virginia, West Virginia, North Carolina and Kentucky.[2] Kentucky College of Osteopathic Medicine (KYCOM) is located within the coal mining region of Eastern Kentucky, and is situated in the center of Appalachia.[3] KYCOM is in a large rural area with sparse population and limited-access roadways. Preventive health screens and health education are limited by the remoteness of the region, poverty, limited formal education, access to regional facilities, numbers of healthcare personnel and the inability to establish trust between the modern physician (the outsider) and the native Appalachian.[4] The morbidity and mortality of heart disease, cancer, hypertension, stroke, lung disease, diabetes and premature births have changed little in thirty years.[5,6,7] In the October 2008 edition of *Morbidity and Mortality Weekly*, Kentucky was named

as one of nine southern states with the highest prevalence of modifiable risk factors for diabetes, i.e., obesity and physical inactivity.[8] For two days per week during the academic calendar, KYCOM provides an outpatient clinic where patients from Eastern Kentucky communities can be evaluated and treated for both acute and chronic musculoskeletal conditions. Patients who frequent the clinic are not subject to fees for the care provided. The clinic, supervised by a licensed osteopathic physician, is staffed by undergraduate fellows and fourth-year medical students.

The fellows program at KYCOM is three years in duration. It is intended to encourage an in-depth study of the multiple philosophies and practices of osteopathic medicine. The program is designed to encourage the future educators and practitioners of our profession to be open to new ideas, and promote development of the capacity to produce new concepts. Osteopathic fellows are post-baccalaureate, graduate teaching assistants who have completed a minimum of two years of predoctoral didactic osteopathic medical education, which includes two years of didactic/practical Osteopathic Principles and Practice training. Additionally, the clinic provides an opportunity for first- and second-year osteopathic medical students to observe the osteopathic evaluative and treatment process in action on patients with actual pathology. The clinic serves as a real-time training center for the predoctoral students at KYCOM. Representative patients that frequent the KYCOM OMT Clinic have been previously diagnosed with one or more of the most prevalent diseases acknowledged as an Appalachian health problem.

This study evaluates the efficacy of OMT for patients from rural Appalachia with regard to their overall sense

Maxim 1 Classical Osteopathic Philosophy

A.T. Still's fundamental concepts of Osteopathy can be organized in terms of health, disease and patient care.

Health

1. Health is a natural state of harmony.
2. The human body is a perfect machine created for health and activity.
3. A healthy state exists as long as there is normal flow of body fluids and nerve activity.

Disease

4. Disease is an effect of underlying, often multifactorial, causes.
5. Illness is often caused by mechanical impediments to normal flow of body fluids and nerve activity.
6. Environmental, social, mental and behavioral factors contribute to the etiology of disease and illness.

Patient Care

7. The human body provides all the chemicals necessary for the needs of its tissues and organs.
8. Removal of mechanical impediments allows optimal body fluid flow, nerve function and restoration of health.
9. Environmental, cultural, social, mental and behavioral factors need to be addressed as part of any management plan.
10. Any management plan should realistically meet the needs of the individual patient.

Table 1 Five Evaluative Physiologic Models for Patient Assessment and Treatment

Biomechanical	Evaluation of postural muscles, spine and extremities	Posture and Motion
Respiratory-Circulatory	Evaluation of thoracic inlet, thoracic and pelvic diaphragms, Tentorium cerebellum, and ribcage	Arterial, Venous, and Lymphatic Circulation and Respiratory Function
Neurological	Evaluation of central and peripheral nervous system, and autonomic nervous system	Cranial Nerves, Autonomic Nervous System, Reflex and Protective Feedback Loops
Metabolic Energy	Evaluation of internal organs and endocrine glands	Nutrition, Visceral function, Energy balance and efficiency
Behavioral	Evaluate for depression, anxiety, attitudes, stressors	Psycho-social stressors, Environmental stressors

of well-being. Thirty-one men and 69 women from the patient population of the KYCOM OMT Clinic volunteered to enter the study, which included completion of health questionnaires before and after each treatment session. The 30-month, patient-centered study assessed the clinical value and limitations of OMT with regard to co-morbid state(s), age group and gender. The study focused on patients who suffer from chronic illnesses, traumatic events or both. Correlations were sought between changes in "working function" and OMT treatment utilized.

For evaluation purposes, the term "function" defined two elements:

1. Working definition: The factors that gauge instrumental activities of daily living, i.e., ability to independently shop, keep house, ambulate, drive, etc.
2. Inherent definition: If the structure of the body is in balance, then the interdependent function of the body systems are facilitated (the osteopathic tenet that the body's systems serve to collectively maintain homeostasis, i.e., "maintain health").[9]

Hypothesis

Patients from rural Appalachia, represent a culturally and behaviorally distinct group of people. The musculoskeletal system represents 60 percent of the human body, and is the core that links the interrelated body systems. Removal of somatic dysfunction (mechanical impediments) by use of OMT allows optimal body fluid flow, nerve function and restoration of health (system harmony). A patient-centered treatment program designed to promote efficient communication between anatomical, physiological (inherent function) and behavioral parameters (Maxim 1)[10] will produce a positive effect on the individual's ability to perform instrumental activities of daily living (working function) and improve overall sense of wellbeing.

Methods

During each patient encounter, 39 men and 61 women received structural examinations and evaluation and treatment for diagnosed somatic dysfunction only. Evaluation and treatment regimen(s) for previously diagnosed medical condition(s) were left to the expertise and discretion of the patient's primary treating physician(s). Evaluation included static and dynamic structural examination of the axial and appendicular skeleton and search for the presence of somatic dysfunction. Guides utilized included: T.A.R.T. [a mnemonic device for *tenderness* at the site of palpation, *asymmetry* by palpation of body landmarks, *restriction* of active ranges of motion and palpable *tissue texture changes* (by light touch, tissue drag and graduated pressure)][11,12] and the five evaluative physiologic models shown in Table 1,[13] which are a basis for evaluation and monitoring of the "interdependent body systems."

The aims for OMT included:[14] relief of musculoskeletal pain, reduction of comorbid symptoms, improvement of the working definition of function, optimization of the inherent definition of function, improvement of blood supply and nutrition to the affected regions, improvement of venous and lymphatic return flow from the affected regions and removal of impediments to normal nerve transmission. Evaluation and treatment were patient-centered—"…analogous to viewing a patient through a lens; by altering the focal length of the lens one could view different aspects of the patient and gain various perspectives on the patient's struggle to maintain health."[15] OMT modalities utilized included: Strain-Counterstrain (SCS); Indirect Myofascial Release (IMFR); Direct Myofascial Release (DMFR); Muscle Energy Technique (MET); Facilitated Positional Release (FPR); Balanced Membranous Tension (BMT), Osteopathy in the Cranial Field (OCF); High Velocity, Low Amplitude (HVLA); Lymphatic Drainage (Lymph); and Progressive Inhibition of Neuromusculoskeletal Structures (PINS).

Treatment length (time in minutes) was variable for each patient encounter, and the number of patient visits over the study period was patient specific. The sequence and number of modalities used was at the preference of the examiner. Treatment concluded when the examiner found static landmarks more symmetrical, active and passive ranges of motion improved, and soft tissue structures palpably more elastic. A patient encounter concluded with discussion of a care plan and completion of a patient questionnaire. The findings and treatment outcomes of all patients treated by undergraduate fellows were reviewed prior to discharge from the clinic by the NMM/OMM-certified osteopathic physician(s) in charge. When necessary, the supervising physician would additionally treat the patient to achieve the stated goals.

At the end of 30 months, the records for the 100 patients were retrospectively reviewed by the principal investigator. Thirty-nine patients were eliminated from the study. Criteria for elimination included: patient relocation and loss to follow-up, total treatment length less than 24 months, clinical treatment(s) for acute rather than chronic issues and patient compliance. Twenty men and 41 women were chosen for retrospective evaluation. Assessment and monitoring tools used in the questionnaires were adapted from currently utilized clinical questionnaires,

Table 2 Subjective Analogue Pain Scale (Range 0 - 10)

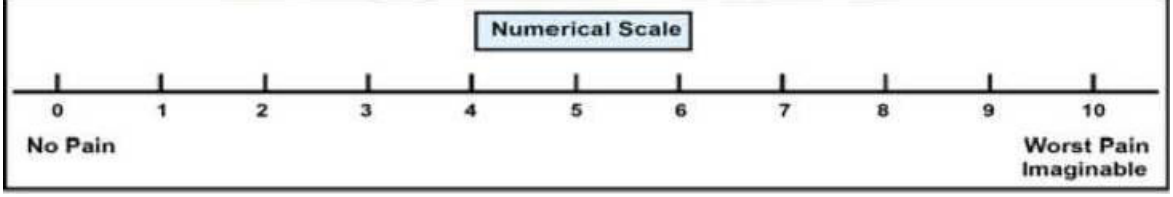


Table 3 ADL Evaluation (Range 0 - 6)

*** Exertional Questions	N/A	No = 0	Yes =1
Can you walk around a food market?			
Can you walk around a "Wal-Mart"?			
Can you walk the length of Main St. (1/2 mi)?			
Can you do activities like play golf?			
Can you do activities like dancing?			
Do you fatigue when you participate in sexual activity?			

Table 4 Energy Level Evaluation (Range 0 - 10)

**Base Level Questions	No = 0	Barely = 1	Yes = 2
Can you strip and make a bed?			
Can you dress yourself?			
Can you shower independently?			
Can you mop floors?			
Can you hang laundry?			

Table 5 Psycho-Social Evaluation (Range 0 - 27)

Symptom	None (0)	Less than 7 of 14 days (1)	More than 7 of 14 days (2)	Daily (3)
Little interest in activities				
Feeling of hopelessness (down)				
Sleep (too much or too little)				
Low energy				
Poor appetite/overeat				
Feel like a failure				
Trouble with concentration				
Feel like life is in slow motion/high gear				
Feel like "better off dead"/Suicidal Thoughts?				
TOTAL=				
Scales	Mild ≤ 9	Moderate ≤ 18	Severe ≥ 24	

Table 6 Improvement Score (Range 0 - 27)

CONCLUSION QUESTIONNAIRE					N/A	0	-1	1	2	3
0 = no change	-1 = worse	1 = bit better	2 = somewhat better	3 = much improved						
1. Since you started OMT, has the reason you came gotten better or worse?										
2. Since you started OMT, has your overall health gotten better or worse?										
3. Since you started OMT, do you think you can do more things?										
4. Comment on the following:										
Date_____				Pain						
				Walk						
				Work						
				Sleep						
				Appetite						
				Interest						

i.e., the National Initiative on Pain Control in Table 2, Comparative Reproducibility and Validation of Systems for Assessing Cardiovascular Functional Class in Tables 3 and 4, and the Patient Health Questionnaire in Table 5. The assessment tool shown below in Table 6, was generated by the principal investigator as an end-of-study (Conclusion Questionnaire) opinion poll, aimed to evaluate attainment of treatment goals from a patient point of view. Nine general questions (each scaled from [-1] to [+3]) were asked, which considered the patient's sense of well-being, perception of physical ability, pain improvement (versus pain level) and basic functional daily activities (Gauged Improvement versus Milestone Achievement).

Results

The 61 patients (20 men and 41 women) were correlated by age, gender and condition (Charts 1 and 2). Four diagnoses were most prevalent: cardiovascular disorders (n = 25), connective tissue disease (n = 18), osteoarthritis (n = 16) and chronic pain syndrome (n = 15). Predominance in women, (age range 28 to 97 years) was age 50 to 59 years (n = 15), followed by men (age range 36 to 80 years) age 60 years and above (n = 9). Thirty-two patients were grouped by predominant age range, gender, recorded presence of regional somatic dysfunction, and one or more of the four prevalent disorders (Tables 7a and 8a). Comparatively, groups (Tables 7b and 8b) reported high energy levels (eight to nine out of 10), pain scores mid-scale (five out of 10), ADL score mid to high scale (four to five out of six), and depression scores predominantly low (five to seven out of 27 [greater than nine considered mild depression]). Improvement scores for 18 of 32 patients were reported within the "bit better" range.

Tables 7c and 8c show frequently used techniques, and outcomes for the somatic dysfunctions noted in Tables 7a and 8a. Of note, five were seen at frequencies less than once per month, and seven were seen on monthly schedules. The remainder (20 patients), were seen infrequently.

In Chart 3 and Table 9b, a predominance of cervical somatic dysfunction is found within a relatively small male osteoarthritis group (one-quarter of the 13.5 percent of prevalent patients). Also in Chart 3 and prominently in Tables 9a and 9b, the occurrence of somatic dysfunction and region frequency are seen in more than half of patients

Chart 1 Patient Distribution: Women by Age and Condition (n = 41)

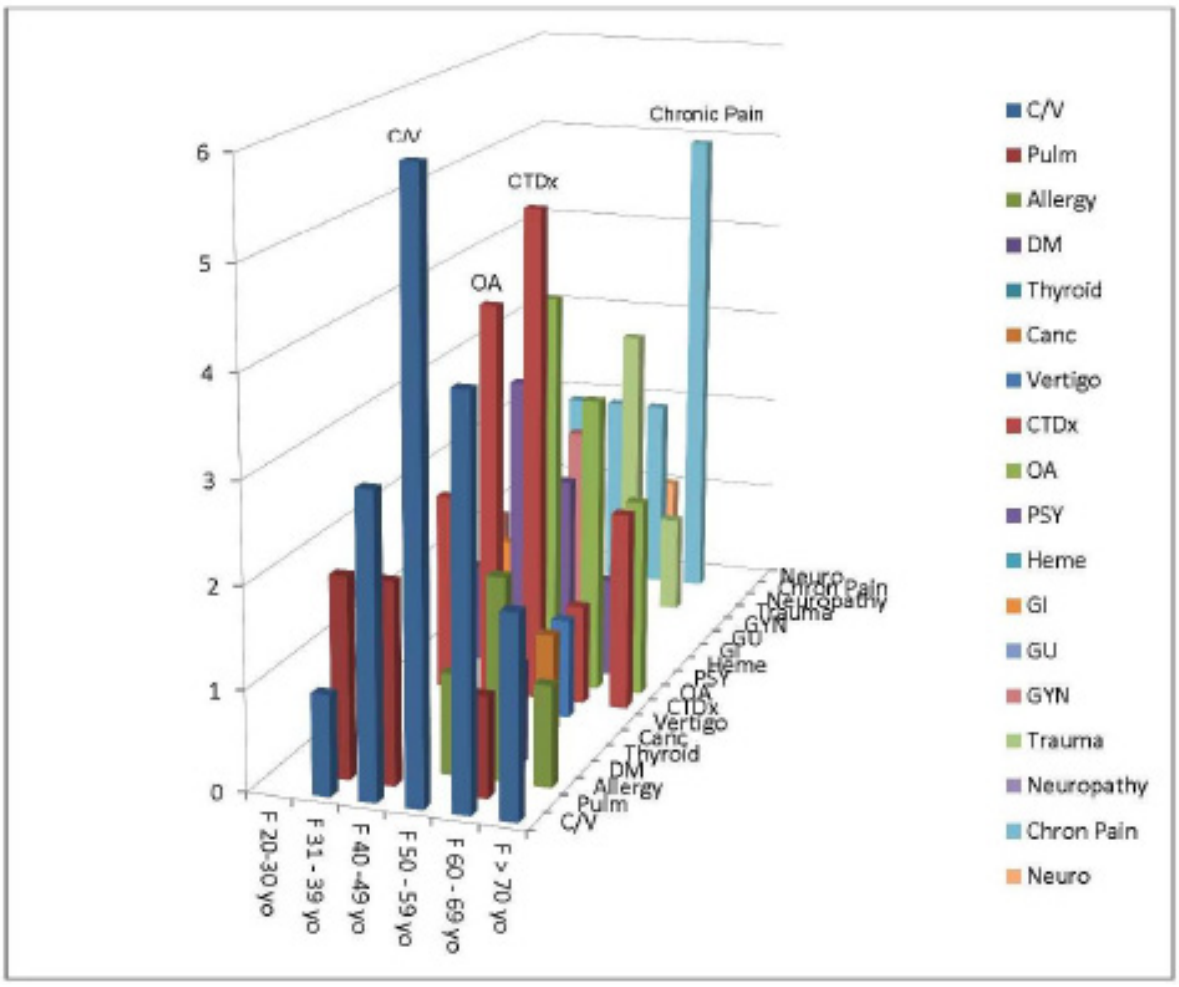


Chart 2 Patient Distribution: Men by Age and Condition (n = 20)

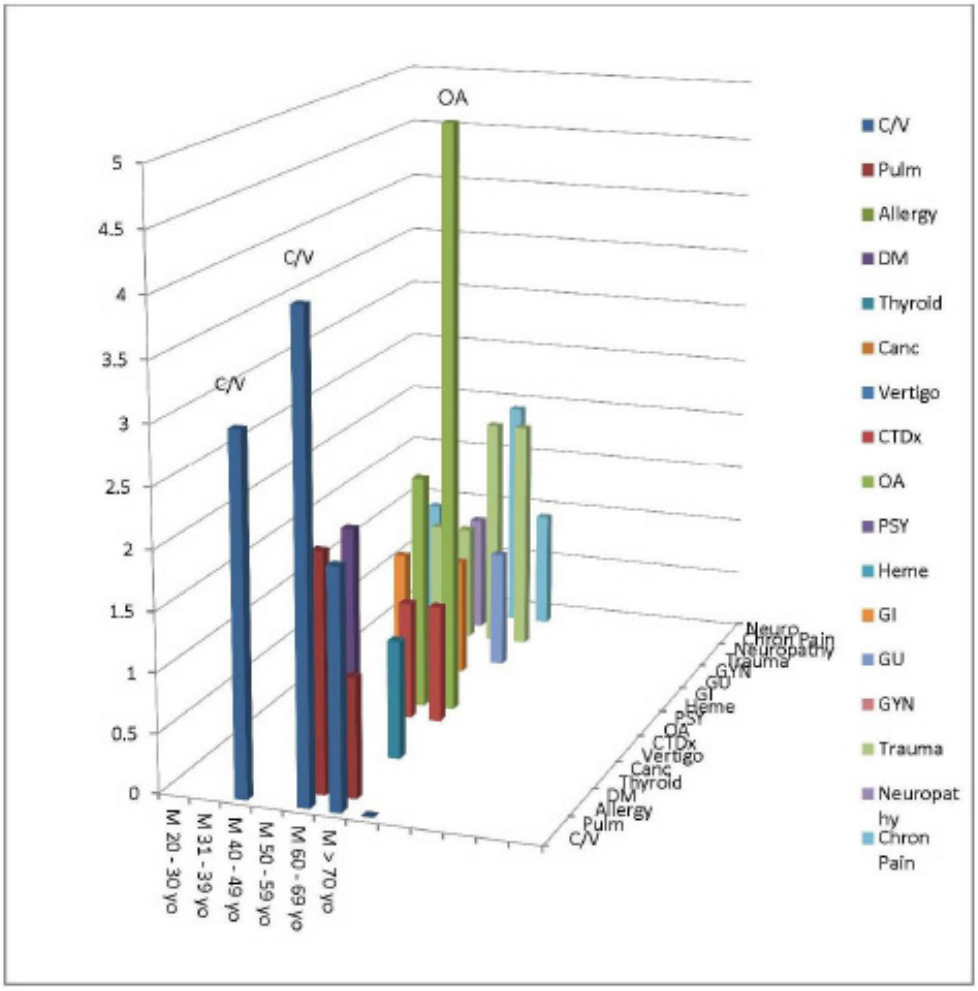


Table 7a Comparison Diagnoses of 50-59 Year-Old Age Group (n = 14)

ID	AGE	Gender	DX #1	DX #2	DX #3	DX #4	Som. Dysfunction Region
MM	51	M	Surg. TRAUMA	NEUROPATHY			C, R, ST
RF	59	M	OA	HTN	RADICULOPATHY		C, T
SF	56	F	CERV. NEURITIS	HTN	OA SPINE		C, T
KE	58	F	ALL. RHINITIS				H, C, ST
TL	56	F	Chr. SINUSITIS				H, C, R, ST
LC	53	F	MCTD				S, P, LE
RB	59	F	Br. CA	Fibromyalgia			H, C, R, S, UE, ST
JB	52	F	MCTD	Henoch-Schonlein Purpura			R, ST
JVB	51	F	MS	HTN	MCTD	GERD	LE, ST
HB	58	F	HTN	OA HIP			S, P, LE, ST
DA	51	F	GRIEF RXN	DEPRESSION	HYPERLIPIDEMIA		H, C, R, S
CM	52	F	GERD	HYPERLIPIDEMIA	DEPRESSION		H, R, UE, ST
VR	52	F	MVA TRAUMA	PTSD			H, C, S, R
JF	52	F	WK. INJURY (Leg)	LBP	HTN		C, T, L, S, LE, ST

H = CRANIAL; C = CERVICAL; T = THORACIC; L = LUMBAR; S = SACRUM; P = PELVIS; UE = UPPER EXTREMITY
LE = LOWER EXTREMITY; R = RIBS; ST = SOFT TISSUE

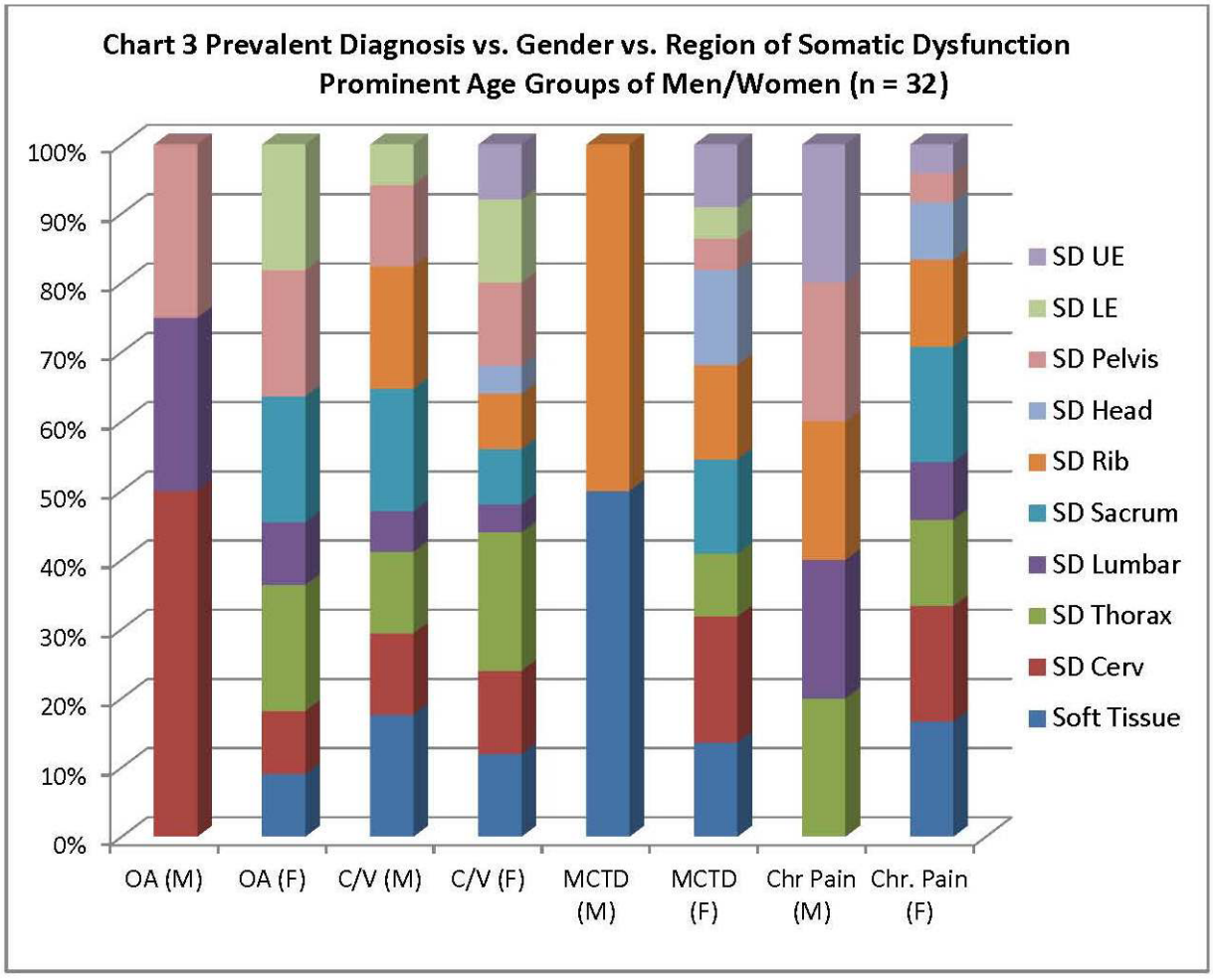
Table 8a Comparison Diagnoses of 60-69 Year-Old Age Group (n = 18)							
ID	AGE	Gender	DX #1	DX #2	DX #3	DX #4	Som. Dysfunction Region
JBB	69	M	HTN	DM	Sciatica	OA	L, S, P, LE
BC	62	M	HTN	Acid Peptic Disease	PTSD		C, R, ST
SD	64	M	DM	Peripheral Vascular Dx			T, S, P
JYF	64	M	CAD	Restrictive Lung Dx	Chronic Bronchitis	MCTD	R, ST
JMC	61	M	S/P Fall	Chronic LBP			T, L, P, R, UE
TM	63	M	CAD	Asthma	Chest Wall Pain		T, R, S, ST
JL	66	M	OA				C, L, P
SM	63	F	DM	Restrictive Lung Dx	Hypothyroid		H, C, T, S, R, ST
KS	65	F	MCTD	Chest Wall Pain	All. Rhinitis	OA	H, C, T, R, S, SC
CP	64	F	Breast CA	Adhesive Cap. Shoulder			C, T, UE, R, ST
PK	60	F	PTSD	Fibromyalgia			C, T, UE, ST
AL	64	F	HTN	Depression	Polycythemia		H, C, T, P
SN	62	F	Chron. Vertigo				H, C, P
JO	68	F	HTN	OA (Hips/Spine)			T, L, S, P, LE
BH	63	F	S/P Gastric Bypass	Rt. Scapular Pain			T, R, ST
SRD	60	F	OA Hips				S, P, LE, ST
BGC	64	F	HTN	B/L Shoulder Pain	All. Rhinitis		C, T, R, UE
TA	64	F	HTN	Frozen Shoulder			T, UE
H = CRANIAL; C = CERVICAL; T = THORACIC; L = LUMBAR; S = SACRUM; P = PELVIS; UE = UPPER EXTREMITY LE = LOWER EXTREMITY; R = RIBS; ST = SOFT TISSUE; SC = STRUCTURAL SCOLIOSIS							

Table 7b Reported Self-Assessment Scores in 50-59 Year Old Age Group (n = 14)					
ID	Energy Level 0-10	Pain Score 0-10	ADL Score 0-6	Depression Score 0-27	Improvement Score [-1] -27
MM	10	5	3	5	6
RF	10	5	5	0	6
SF	10	8	5	0	3
KE	10	4	5	5	7
TL	10	8	5	0	7
LC	10	4	6	0	13
RB	10	5	5	10	4
JB	8	4	5	4	6
JVB	8	4	5	5	4
HB	7	6	2	9	7
DA	10	4	5	17	3
CM	10	2	5	15	4
VR	10	6	5	9	8
JF	5	8	2	12	7
All values are expressed in terms of the mode of responses. The recorded range of scores varied little over 30 months.					

Table 8b Reported Self-Assessment Scores 60-69 Year-Old Age Group (n = 18)					
ID	Energy Level 0-10	Pain Score 0-10	ADL Score 0-6	Depression Score 0-27	Improvement Score [-1] -27
JBB	10	5	5	0	20
BC	10	4	6	0	8
SD	4	4	0	9	11
JYF	10	4	4	0	11
JMC	10	6	6	0	11
TM	10	4	5	2	16
JL	10	2	5	3	6
SM	3	6	3	13	7
KS	10	6	4	13	5
CP	6	6	2	1	8
PK	8	4	2	13	6
AL	10	4	5	18	5
SN	8	2	5	3	9
JO	10	6	5	3	11
BH	8	4	4	3	8
SRD	8	8	2	0	2
BGC	8	2	5	2	4
TA	7	6	5	2	9
All values are expressed in terms of the mode of responses. The recorded range of scores varied little over 30 months.					

Table 7c Treatment Modalities and Outcomes in 50 - 59 Year-Old Age Group (n = 14)		
ID	Frequent OMT Modalities	Outcomes
MM	Dir & Indir. MFR, FCT Release	Decreased symp.; unempl.; seen 2x/mo.
RF	MET, HVLA	Recurrent symp.; seen monthly
SF	FCT Release, MET	Incr. symptoms; s/p surg.; seen monthly
KE	BMT, MFR, SCS, Effleurage	Medication; seen prn; home prgm.
TL	BMT, MFR	Decreased symptoms; seen prn
LC	MET, MFR, HVLA	Decreased symptoms; seen prn
RB	HVLA, MET, MFR, BMT	Seen annually until 5/11; SXs stable; moved
JB	SCS, MFR, Lymph Drainage	Seen during exacerbation only
JVB	SCS, Chapman's Pts., Indir. MFR	Stable symptoms; seen prn
HB	MFR, MET, FCT Release	Marginal improvement; seen prn
DA	MFR, BMT, MET	Stable; seen prn
CM	SCS, Chapman's Pts., MET, HVLA	GI medication; seen monthly
VR	BMT, MET, MFR, HVLA	Stable; seen prn
JF	FCT Release, MET, MFR	Marginal improvement; seen (irreg.) monthly

Table 7c Treatment Modalities and Outcomes in 50 - 59 Year-Old Age Group (n = 14)		
ID	**Frequent OMT Modalities**	**Outcomes**
MM	Dir & Indir. MFR, FCT Release	**Decreased symp.; unempl.; seen 2x/mo.**
RF	MET, HVLA	**Recurrent symp.; seen monthly**
SF	FCT Release, MET	**Incr. symptoms; s/p surg.; seen monthly**
KE	BMT, MFR, SCS, Effleurage	**Medication; seen prn; home prgm.**
TL	BMT, MFR	**Decreased symptoms; seen prn**
LC	MET, MFR, HVLA	**Decreased symptoms; seen prn**
RB	HVLA, MET, MFR, BMT	**Seen annually until 5/11; SXs stable; moved**
JB	SCS, MFR, Lymph Drainage	**Seen during exacerbation only**
JVB	SCS, Chapman's Pts., Indir. MFR	**Stable symptoms; seen prn**
HB	MFR, MET, FCT Release	**Marginal improvement; seen prn**
DA	MFR, BMT, MET	**Stable; seen prn**
CM	SCS, Chapman's Pts., MET, HVLA	**GI medication; seen monthly**
VR	BMT, MET, MFR, HVLA	**Stable; seen prn**
JF	FCT Release, MET, MFR	**Marginal improvement; seen (irreg.) monthly**



with either cardiovascular, mixed connective tissue disease or chronic pain syndromes.

Chart 4 demonstrates a negligible relationship between the severity of musculoskeletal pain, the prevalent diagnoses and the presence of comorbid depression. Predictably, patients with osteoarthritis in the greater than 70-year-old age group predominantly experience mid-severity pain (four to 5.9 out of 10), and are followed by patients with cardiovascular disease in the 60 to 69-year-old age group (four to 5.9 out of 10 pain severity). Notably, neither group reports comorbid symptoms of depression.

Symptoms of depression versus primary diagnosis (Chart 5) showed no correlation to the presence of chronic disease. Predictably, the highest depression score was seen in one trauma patient, a 49-year-old victim of pediatric sexual abuse (Chart 5). Patients with osteoarthritis had a stated pain scale equal to four to 5.9 out of 10 (Chart 4), and reported a clinically insignificant depression severity of zero to three out of 27 (Chart 5).

Chart 6 suggests an inverse relationship between the self-assessed improvement score (Tables 6, 7b and 8b) and the depression score collected with the Patient Health Questionnaire tool (Table 5).

Reported pain intensity versus gender found a distinct group. Women in the 50 to 59-year-old age group (prevalent chronic disease group) reported a pain intensity between five to eight out of 10 (Chart 7). In men, one 36-year-old man with chronic headache reported pain intensity as eight out of 10. The remaining male groups were indiscriminate (Chart 8).

In Chart 9, direct and indirect myofascial release was shown to be the most frequently utilized modality, especially for women.

Table 10 arranged patients modally by the number of years they were enrolled at the KYCOM OMT Clinic. One-third of patients (median age 64 years with range of 52 to 69 years) had a one-way distance of greater than 30 miles commute to the clinic through very rural areas. The median number of years as a clinic patient was five (highlighted in blue) and 15 of the highlighted 20 had one of the common diagnoses identified previously in Charts 1 and 2. Eighteen of the 32 are employed, three are retired, six never worked and five are disabled. Three of the 32 patients detailed have since left the clinic practice (two moved and one was lost to follow-up). The frequency of visits for 31 of the 32 decreased over the 30-month study period. Chart 10 looks at the 20 patients highlighted in Table 10, for frequency of clinic visits per month over the study period of 30 months (range zero to six visits per month.). The predominant frequency of visits for the 20 patients was once monthly. Of note, some of the patients recorded as having zero visits per month during months one to six had yet to enter the study.

Chart 11a trends patients seen at one-month intervals over the 30-month study period, and shows a negative frequency with peaks at months two, 10, 15 and 25. Each peak, however, also shows a negative frequency of number of visits scheduled at one-month intervals.

Discussion

From a conceptual point of view, all patients were successfully treated for musculoskeletal findings and outcomes met goals, i.e., static landmarks were found to be more symmetrical, active and passive ranges of motion were fuller, and soft tissues were palpably more elastic. The predominantly utilized myofascial and soft tissue techniques, if performed properly, would encourage improvement of blood supply and nutrition to the affected regions, improvement of venous and lymphatic return flow from the affected regions, and removal of impediments to normal nerve transmission,[16] and would satisfy fundamental osteopathic concepts (Maxim 1) and the Respiratory-Circulatory Model (Table 1). Additionally, the generally downward trend for frequency of patient visits would suggest a decreased need for restorative OMT and achievement of the inherent definition of function. Paradoxically, when evaluated with the tools illustrated in Tables 2 to 6, patients reported little variation in musculoskeletal pain severity between visits and little change in their ability to perform the questioned functions, i.e., making a bed. Yet, when asked, "Do treatments help?," invariably patients would say "yes," but collected data and outcomes indicate otherwise. Table 11a compares patient self-assessment for improvement (Table 6 and summarized in Tables 7b and 8b) with reported activity and perceived pain (Tables 2 to 5, and summarized in Tables 7b and 8b). Improvement scores were arranged modally (Range two to 20 out of a possible [-]1 to 27). Patient JBB is a retired high school teacher who continues to work full time with children and is very active. He chronically takes six medications (Table 11b) that alter glucose metabolism, cardiac output, peripheral circulation, hepatic and muscle metabolism, and gastric function.

Patient JMC is married, owns and operates a construction business and remains active. His estimation of pain is rarely below five, yet he reports a relatively higher improvement score. He chronically takes two medications: one that alters cardiac output and peripheral circulation, and one that affects circulating inflammatory mediators. Patient SRD is a housewife, had bilateral hip replacements (during study) and remains inactive. She regularly takes two medications, one that acted directly on the brainstem and

Table 9a Distribution of Somatic Dysfunction by Prevalent Disease						
ICD 9 Code	Region of Somatic Dysfunction	% of total Somat. Dysf. In Prevalent Groups	C/V %	OA %	MCTD %	Pain %
739.1	Cervical	15	31	19	25	25
739.2	Thoracic	13.5	46.5	13.3	13.3	27
739.3	Lumbar	6	28.5	28.5	0	43
739.4	Sacrum	12	36	14	21.5	28.5
739.5	Pelvis	10	45.5	27	9.5	18
739.6	Lower Extremity	6.5	57	28.5	14.5	0
739.7	Upper Extremity	5.5	33.3	0	33.3	33.3
739.8	Ribs	12	38	0	31	31
739.0	Cranial	5.5	16.7	0	50	33.3
728.81, 728.89	Soft Tissue	14	40	5	27.5	27.5

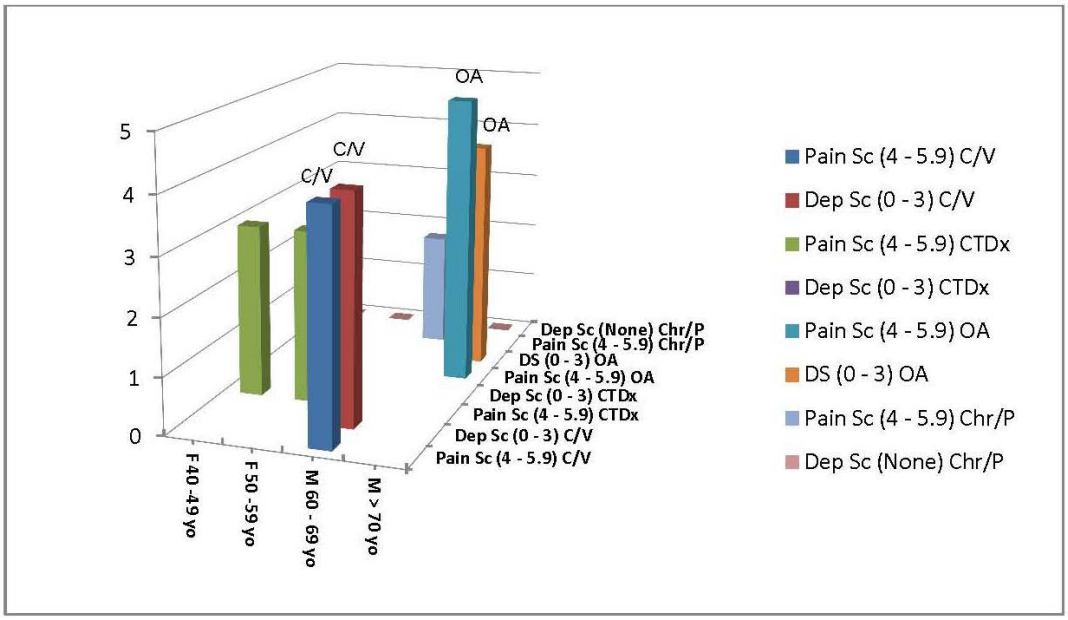
Table 9b Distribution of Prevalent Disease Group vs. Distribution of Somatic Dysfunction										
Prev. Dis. (% of Grp)	% C	% T	% L	% S	% P	% LE	% UE	% R	% H	% ST
C/V (39%)	12	16	5	12	12	9	5	12	2	14
OA (13.5%)	20	13.3	13.3	13.3	20	13.3	0	0	0	6.7
MCTD (21.5%)	16.7	8.3	0	12.5	4.2	4.2	8.3	16.7	12.5	16.7
Chr. Pain (26%)	13.8	13.8	10	13.8	7	0	7	13.8	7	13.8
C – Cervical; T – Thorax; L – Lumbar; S – Sacrum; P – Pelvis; LE – Lower Extremity; UE – Upper Extremity; R – Ribs; H – Cranial; ST – Soft Tissue										

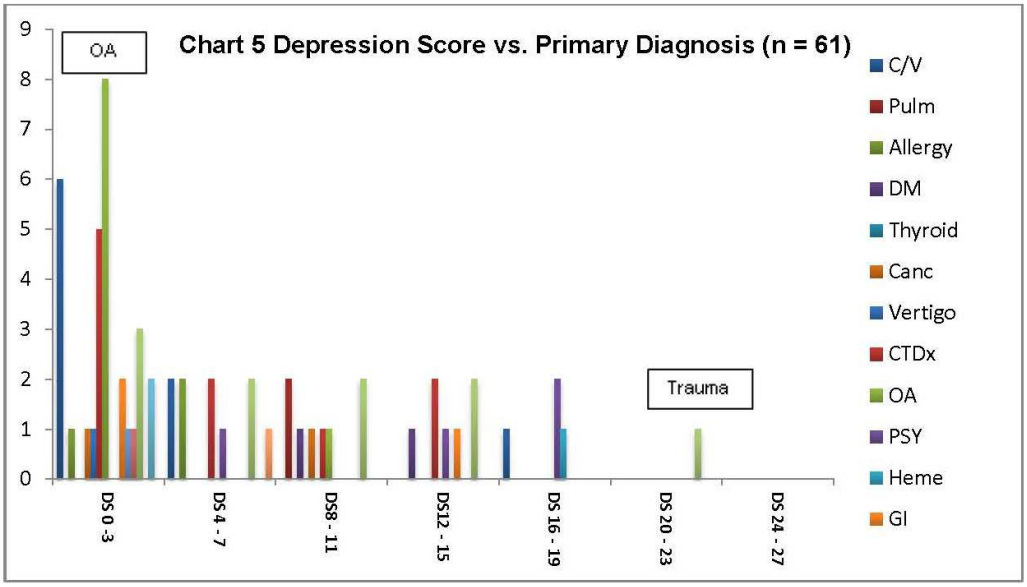
the other that centrally decreased muscle tone. Patient JYF reported a self-improvement score within the higher modal group; however, the standardized measure of his ADLs was paradoxically comparatively low. He is a retired educator, maintains a one-third acre garden, does woodworking and is active with his grandchildren. He chronically takes four medications and two supplements. Of his medicines, one affects cardiac output and peripheral circulation, one alters hepatic metabolism, two affect renal function and one affects gastric function.

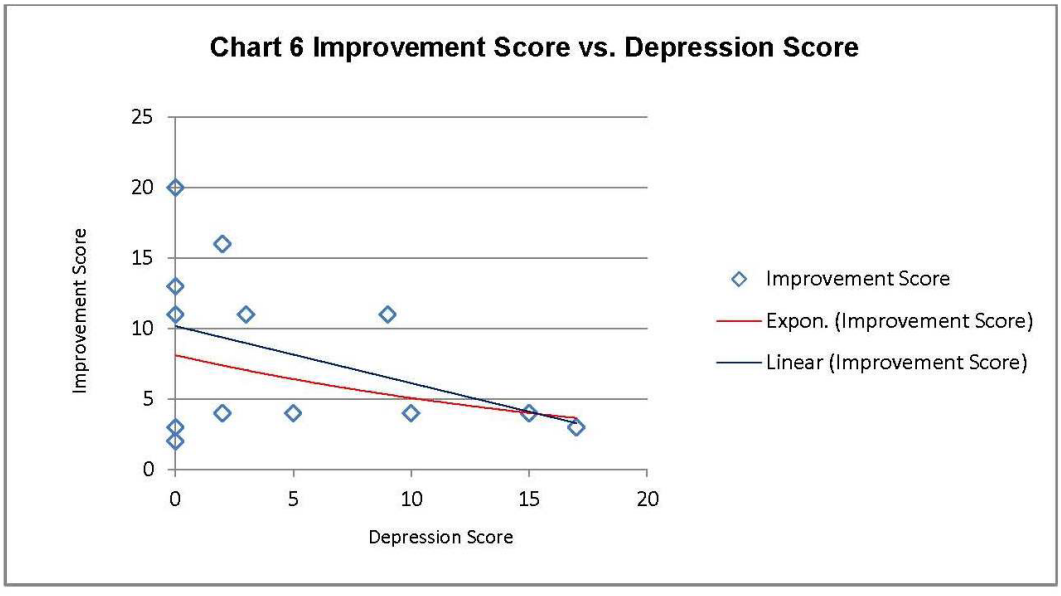
Patient BC is a war veteran, an educator, does woodworking, and hikes. His self-improvement assessment is comparatively low. Patient BC chronically takes three medications, one alters hepatic metabolism: one alters gastric function and one affects renal blood flow. Patient KE is a librarian whose issues are primarily allergies. She has tried multiple medical regimens and maintains her musculoskeletal dysfunctions with a home program. She reports a comparatively low self-improvement score. She chronically takes four medications: one that alters circulating vasoactive amines, one that affects blood coagulation, as well as circulating hormones, and two that alter upper airway mucosal defenses. Patient JL could retire, but chooses to continue teaching, is physically active, maintains a home program and makes an appointment when his pain level rises above his usual two. His self-improvement score is comparatively low—a six (range [-]1 to 27). He recently was prescribed two medications, and chronically takes two supplements; the medications alter peripheral circulation and cardiac output, and blood coagulation.

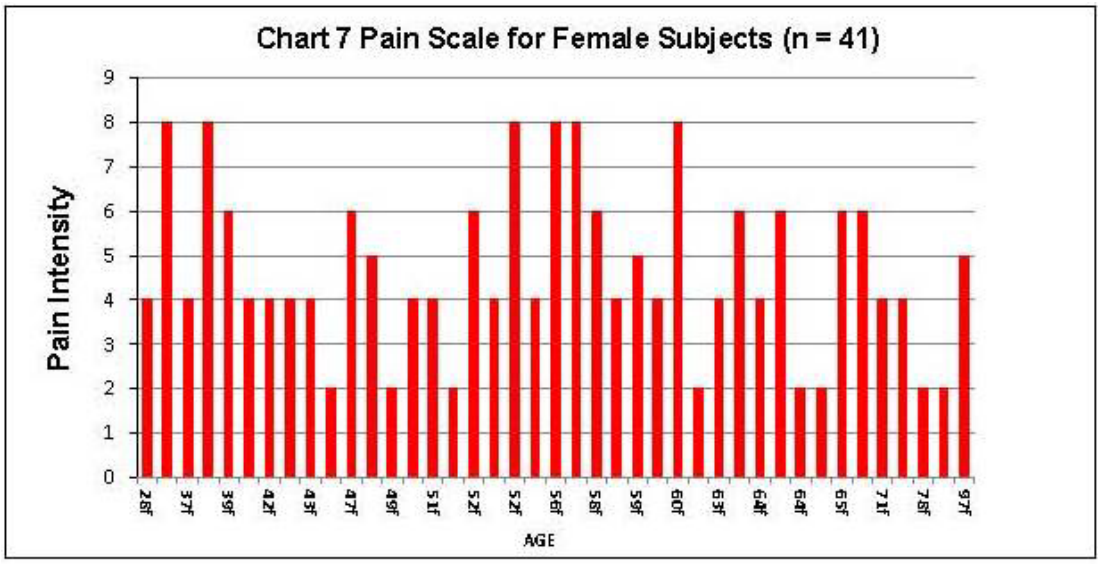
Patient CM is a secretary, is married, has no children and suffers from gastroesophageal reflux disease. She is followed by a specialist in practice 150 miles from Pikeville, KY, and sees him twice a year. She is treated with a proton pump inhibitor, and has yet to find an agreeable diet plan. She frequently presents with soft-tissue, upper-extremity and cranial dysfunction, and is adjudged by the OMT staff to respond well to her treatment. She grades her ADL five out of six (high), energy 10 out of 10 (high), pain two out of 10 (low) and improvement four out of 27 (low). Of note, she is physically inactive and has recently earned her bachelor's degree in business. She takes five additional medications: one alters peripheral circulation and

Chart 4 Predominant Diagnoses vs. Age Group vs. Pain/Depression Scales (n = 28)









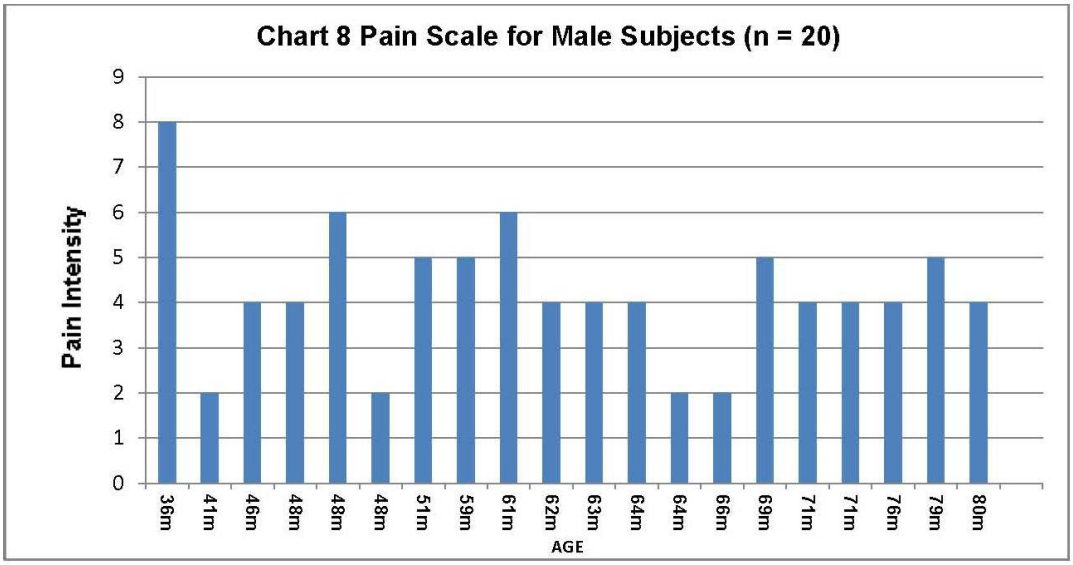
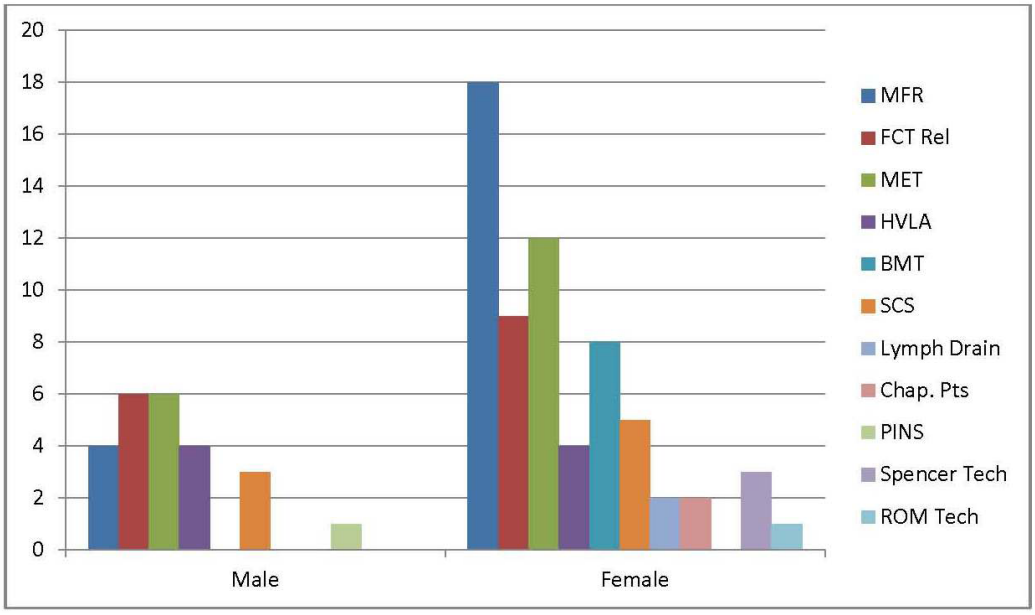


Chart 9 Treatment Modalities Utilized in Predominate Age Groups by Gender (n = 32)



cardiac output, one affects hepatic metabolism, one affects circulating vasoactive amines, one affects gastric function, and one affects upper airway mucosal defenses.

Of the seven patients detailed, five reported active lives, four perform a routine home program, six are employed, five have a zero depression score (range zero to 27), and five have been in the practice longer than five years. To summarize, five of the seven patients described, and the remainder of the 32 patients listed, have self-rated low pain scores of less than 5 out of 10 (20 of 32 patients [Tables 7b, 8b and 11a]), and variable self-perceived improvement.

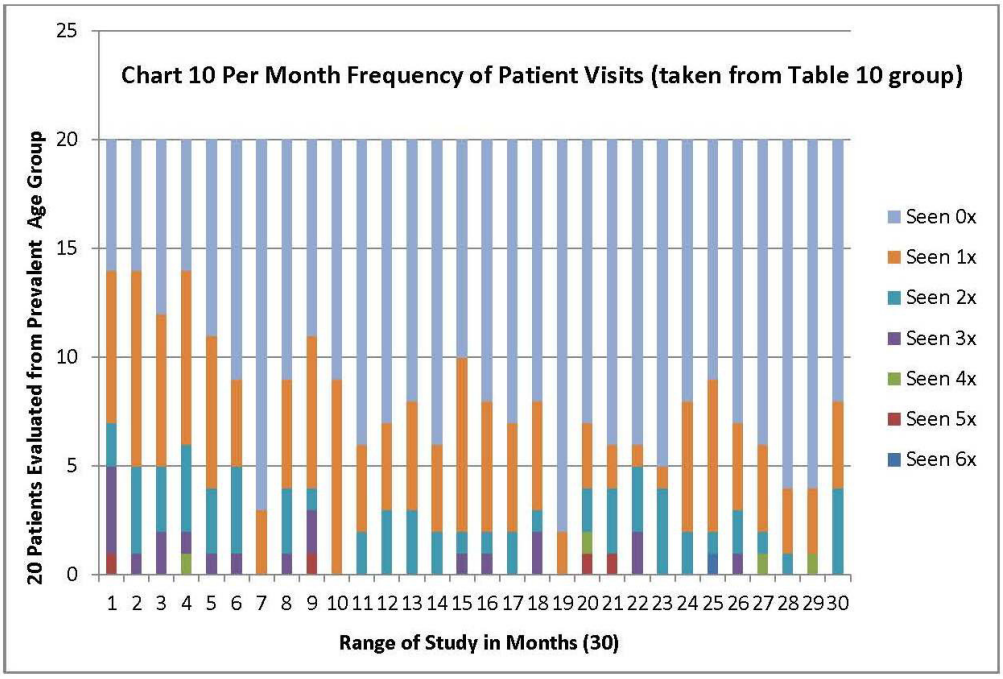
Table 11b lists the medications for ten patients from those observed. The numbers of prescribed medications that either alter and/or facilitate visceral function, peripheral circulation or central brain chemistry range from two to nine per patient, and suggest the potential for variable systemic stressors/changes/influences on the system, i.e., the potential for neuroendocrine reactivity (allostasis). Frank Willard. PhD,[17] describes allostasis as a neuroendocrine network response to homeostatic threat manifested by the release of norepinephrine, adrenal cortical steroids and cytokines. He suggests long-term exposure to these threats is cumulative and leads to gradual destruction of organ systems, as well as the efficacy of

Table 10 YEARS IN PRACTICE vs NO. of VISITS vs OUTCOMES

ID	AGE YRS.	GENDER	Pract. Yrs.	Primary Diagnosis	Tot. study. visits	No. of Visits Mos. 25-30	Currently Seen	COMMUTED DIST. Miles	OUTCOME(S)
CM	52	F	8	mctd	28	4	Y	10	GI Medication, seen monthly
AL	64	F	8	psych	14	5	Y	5	Works every day; seen Q 3 wks
LC	53	F	7.5	mctd	13	1	Y	5	Decreased symptoms; seen prn
JL	66	M	7	oa	19	3	Y	10	Very active seen prn; home prgm.
DA	51	F	6.5	psych	24	2	Y	5	Stable; seen prn
JYF	64	M	6.5	c/v	33	2	Y	30	seen prn; home prgm.
TM	63	M	6.5	c/v	14	2	Y	10	seen 4x/yr; s/p CABG
BC	62	M	6	psych	20	3	Y	30	decreased symptoms;active;f/u 6x/yr
SM	63	F	5.5	chr. Pain	64	20	Y	35	seen wkly; increased exercise tolerance
JO	68	F	5.5	oa	38	8	Y	20	very active; seen 2x/mo
RB	59	F	5	CA	13	0	N	100	seen annually until 5/11;sx's stable;moved
HB	58	F	5	oa	15	2	Y	2	Marginal improvement; seen prn
VR	52	F	5	psych	20	2	Y	30	Stable; seen prn
SN	62	F	5	mctd	9	0	Y	5	RESOLUTION OF SX'S; SEEN ONCE/YR
SRD	60	F	5	oa	5	1	Y	5	B/L Hip Replacement; seen prn
BGC	64	F	5	c/v	8	3	Y	30	increased ROM; seen prn
TA	64	F	5	c/v	25	3	Y	30	increased ROM; dec'd pain; seen mthly; h.prgm
KE	58	F	4.5	allergy	6	2	Y	5	Medication; seen prn; home prgm.
JVB	51	F	4.5	mctd	5	1	Y	5	stable symptoms; seen prn
SD	64	M	4.5	c/v	18	2	Y	20	s/p BKA; seen 1-2x/month
KS	65	F	4.5	mctd	32	2	N	5	Recent divorce;marg. Improvement; moved
JB	52	F	4	mctd	9	2	Y	5	seen during exacerbation only
JF	52	F	4	chr. Pain	17	3	Y	12	Marg. Improvement; seen monthly
PK	60	F	4	chr. Pain	12	0	Y	25	Good ROM; Increased exercise tolerance
MM	51	M	3	chr. Pain	11	9	Y	15	Decreased symp.; unempl.;seen 2x/mo.
JMC	61	M	3	chr. Pain	11	4	Y	10	very active; seen monthly
CP	64	F	3	CA	8	5	Y	35	increased ROM;Home prgm.;seen monthly
RF	59	M	2.5	oa	10	5	Y	30	Recurrent Symptoms;seen monthly
SF	56	F	2.5	chr. Pain	7	2	Y	30	Incr. symptoms;s/p surg.;seen monthly
TL	56	F	2	mctd	7	1	Y	5	Decreased symptoms; seen prn
JBB	69	M	2	oa	15	2	Y	60	Decreased symp.; Home prgm.;seen prn
BH	63	F	2	chr. Pain	13	1	N	5	Decreased GERD; seen prn

the allostatic response. He defines allostatic load as the summation of stress exposure, and defines these stressors as both physical and visceral. He notes that the negative effects of allostatic load include injury to the cardiovascular system, obesity, increased activity of the fibrinogenic system, injury to the central nervous system and decreased immune system function. He implies diagnosis of clinically apparent systemic disease and that initiation of medical and/or cannot balance irreparable damage already done to affected systems before intervention. The limitations placed upon both the patients' primary physicians and the OMT Clinic staff are such that normalization of inherent function and optimization of working function are dependent on how much of the organ system is intact. If numbers of medications and reported prevalent diagnoses are any indicator of severity of disease states, then organ system compromise can be inferred from the collected data, and the presence of allostatic load is a questionable factor that can potentially influence outcome.

Patient Records 1, 2, and 3 are representative illustrations of the 32 patients selected for detailed review in Tables 7a-c, 8a-c, 10 and 11a-b. Patient Record 1 is for JF, born and raised in Eastern Kentucky (Tables 7a,10 11b)



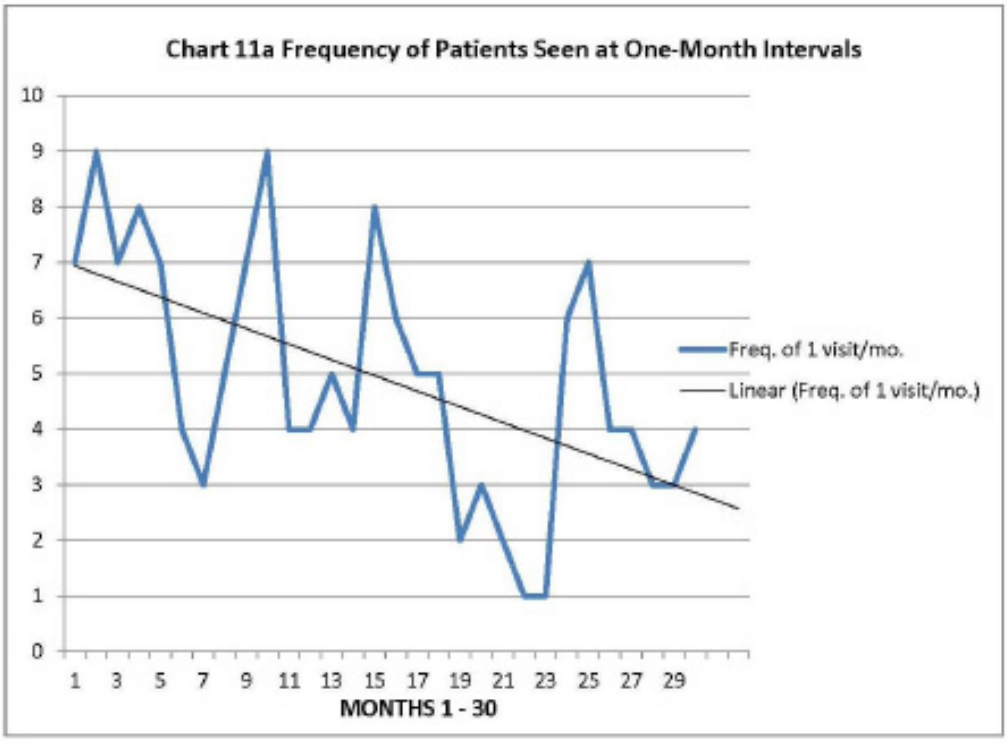


Table 11a Self-Assessment Improvement Scores vs. Standard Tool Data					
ID	IMPROVEMENT	ADL	ENERGY	PAIN	EMPLOYED
					YES/NO/RETIRED/DISABLED
JBB	20	5	10	5	YES/ACTIVE
TM	16	5	10	4	YES/ACTIVE
LC	13	6	10	4	YES/ACTIVE
JMC	11	6	10	6	YES/ACTIVE
JO	11	5	10	6	RETIRED/ACTIVE
SD	11	0	4	4	DISABLED/INACTIVE
JYF	11	4	10	4	RETIRED/ACTIVE
SN	9	5	8	2	YES/INACTIVE
TA	9	5	7	6	YES/ACTIVE
BC	8	6	10	4	YES/ACTIVE
VR	8	5	10	6	YES/INACTIVE
BH	8	4	8	4	NO/INACTIVE
CP	8	2	6	6	NO/INACTIVE
KE	7	5	10	4	YES/ACTIVE
TL	7	5	10	8	YES/INACTIVE
SM	7	3	3	6	NO/INACTIVE
HB	7	2	7	6	YES/INACTIVE
JF	7	2	5	8	DISABLED/ACTIVE
RF	6	5	10	5	YES/ACTIVE
JB	6	5	8	4	NO/ACTIVE
JL	6	5	10	2	YES/ACTIVE
MM	6	3	10	5	DISABLED/INACTIVE
PK	6	2	8	4	NO/INACTIVE
KS	5	4	10	6	RETIRED/INACTIVE
AL	5	5	10	4	YES/ACTIVE
RB	4	5	10	5	NO/ACTIVE
JVB	4	5	8	4	YES/INACTIVE
CM	4	5	10	2	YES/INACTIVE
BGC	4	5	8	2	YES/INACTIVE
SF	3	5	10	8	NO/ACTIVE
DA	3	5	10	4	YES/ACTIVE
SRD	2	2	8	8	NO/INACTIVE

and seen 17 times in 30 months. She takes five chronic medications: one for blood pressure (note BP from Table 11b), three for pain and two psychotropics. The data shown in her patient record are representative of her typical responses. JF suffered a leg injury at work nearly ten years ago, has not worked since, and continues to verbalize anger at her prior employer. A clinic patient for four years, she first entered care on crutches. At present, JF remains unemployed, is disabled and yet receives no compensation. However, she drives, shops, does chores in her rural home (without crutches) and is active with her family. She reports little objective change on the evaluative tools, demonstrates little blood pressure improvement and functions well in the "working" sense.

Typical responses noted in Patient Record 2 are for SM, an Appalachian who has lived in Eastern Kentucky for more than forty years (Tables 8a, 10 and 11a-b) and was seen 64 times over 30 months. SM initially sought treatment for fibromyalgia symptoms; however, review of her symptom complex did not meet diagnostic guidelines (OHSU Fibromyalgia Clinic Questionnaire). SM has been a Type 1 diabetic since age 21 years, complains of mid-thoracic and ribcage pain, and has pulmonary function

Table 11b Chronic Medication List for 10 of 20 Patients Detailed from Table 11a										
ID	JBB	JMC	SRD	BC	KE	JYF	JL	CM	SM	JF
AVG. BP	120/65	127/85	128/86	112/75	121/79	119/60	125/85	115/70	128/72	160/100
MEDICATION										
O. H.	X									
B-BL.	X									
ACE	X	X				X	X	X		X
ARB									X	
ST	X			X		X		X		
BAS						X				
NSAID	X			X		X				X
AC							X			
NARC										
A-CON										
OA			X						X	
L.I.		X								
A. H.										
THY									X	
PPI	X			X				X	X	
H2								X		
MP									X	
MR			X							
SSRI					X			X	X	X
AL										X
IN									X	
HR					X					
NAH					X					
NS					X			X		
VIT	X					X	X		X	
N.SUPP						X	X		X	

AC = ANTICOAGULANT
ACE = ANGIOTENSIN CONV. ENZYME INHIBITOR
A-CON = ANTICONVULSANT
ARB = ANGIOTENSIN RECEPTOR BLOCKER
A.H. = ANTI-HISTAMINE
AL = ANXIOLYTIC
BAS = BILE ACID SEQUESTRANT
B-BL. = BETA BLOCKER
H2 = HISTAMINE 2 BLOCKER
HR = HORMONE REPLACEMENT
IN = INSULIN
LI = LIPOXYGENASE INHIBITOR
MP = MUCOSAL PROTECTANT
MR = MUSCLE RELAXANT
N.SUPP = NUTRITIONAL SUPPLEMENTS
NAH = NASAL ANTIHISTAMINE
NARC = NARCOTIC ANALGESIC
NS = NASAL STEROID
NSAID = NON-STEROIDAL ANTI-INFLAMMATORY
OA = OPIOID AGONIST
O.H. ORAL HYPOGLYCEMIC
PPI = PROTON PUMP INHIBITOR
SSRI = SELECTIVE SEROTONIN REUPTAKE INHIBITOR
ST = STATIN
THY = THYROID SUPPLEMENT
VIT = VITAMIN SUPPLEMENT

tests that suggest restrictive lung disease. Her medical status is essentially poor. Her blood pressure control, an effect of diabetic renal disease, often creates hypotensive periods, dizziness and periods of near syncope. During the 30-month study period, her primary physician hospitalized her three times for diabetes complications. She takes nine medications chronically—two endocrine supplements (insulin and thyroid hormone), a blood pressure medication, an opioid analgesic, two stomach preparations, a psychotropic and some nutritional supplements. Of note, her pain symptom complex began ten years ago while she cared for her now deceased mother. At present, her blood glucose is regulated with an insulin pump (recent change) and her pain is lessened with a fentanyl patch (last six months of study). Since OMT (aimed at the respiratory mechanism) began, oxygen saturation (room air) at rest has risen from 94 to 95 percent to 98 to 100 percent, and with ambulation has risen from 89 to 90 percent to 97 to 99 percent. SM drives, struggles with housework (but now notes many more "better days"), and has even presented with acute musculoskeletal symptoms consistent with "over-exertional" housework activities. SM reports little objective change on the evaluative tools, but does show transient improvement in the working sense, notes marginal

pain control and shows stable improvement in respiratory function (inherent function).

Patient Record 3 is for JYF, seen 33 times over 30 months. JYF continues to live where he was born and raised, within central Appalachia, 30 miles south of the KYCOM OMT Clinic (Tables 8a, 10 and 11a-b). Like SM, he has restrictive lung disease, is within the same age group, commutes the same distance to the clinic and has chronic co-morbid disease (SM has Type 1 diabetes mellitus and JYF has coronary artery disease). JYF had one admission to the hospital within the study period, a work-up for stable angina. As noted above, he chronically takes four medications. JYF frequently presents with rib somatic dysfunction, upper-extremity restriction and soft tissue-restriction. He rates his self-improvement score within the "bit better" to "somewhat better" range (11) records a relatively low self-rated ADL score (4) for the number of activities he reports (gardening, woodworking and family), and for the extent of somatic dysfunction treated, he self-rates a relatively low pain score (4). JYF reports that during his years as an educator, he habitually worked through frequent occurrences of lower respiratory infection and attributes that behavior to his present condition. As is the case with JBB, who is also within the same age group and a retired educator, (Table 8a,10, 11a-b) JYF took a job working with students after retirement. However, unlike JBB, JYF was retired by his second employer for budgetary reasons, but continues to be active with both hobbies and family. Psycho-socially on the Patient Health Questionnaire Tool, JF scored an average of 12, SM scored an average of 13, and JYF, like JBB (Table 8b), continually scored a zero.

A comparison of the three patients (Table 12) shows little objective difference by standardized methodology for JF or SM, but a generally more favorable result for JYF. Interval histories, for JF and SM, given at sequential visits and accompanied by interviewer observations, do reveal increased home activities (since the start of the program) and greater involvement with family and friends, but, not to the extent of JYF's report. Chart 11b compares patients JF, SM and JYF with the 20 highlighted in Table 10 and shown in Chart 11a. SM, comparatively the most ill of the 32 patients detailed in Table 10, has been seen the most of the three (twice as often as JYF and four times JF's number of visits). However, as noted above, SM has increased exercise tolerance and resting oxygen saturation. JYF and JF show downward trends in visit frequency. SM shows an increase in visit frequency, which is attributed to the severity of her medical condition.

Thirty-two subjects with one or more of the four prevalent disorders were grouped by predominant age range and gender. Tables 7a and 8a recorded the presence of regional somatic dysfunction for these 32 patients (regions identified during at least 50 percent of the total number of patient encounters). Their clinical outcomes are recorded in Tables 7c, 8c and 10. All pain, depression, ADL and energy scores were expressed as an average range over 24 months (Table 7b and 8b). The range of individual patient responses for these 32 differed little over the study period and is representative of all 61 people studied. This lack of variability, as measured by standard evaluative tools, suggested little value of OMT to the treatment of the working definition of function.

Paradoxically, the examiners' finding of more symmetrical static landmarks, fuller active and passive ranges of motion, and more elastic soft tissues to palpation, suggested effective treatment of the inherent definition of function. Tables 7c, 8c and Chart 9 list the OMT modalities utilized for treatment. Since the majority of modalities utilized primarily affect fascia, perhaps the palpated results supported regional communication and the osteopathic definition of health.[18]

The collected data and the observations from the involved osteopathic physicians and students raise the following questions:

(1) If the observed improvement is not real as suggested by the collected data, then why have the majority of the patients remained in the study?

(2) If the observed improvement is real, then why have the responses been without considerable variation?

(3) Cardiovascular disease, connective tissue disease, chronic pain syndromes and osteoarthritis were among the prevalent disease processes. The medication regimens, with their own potential to alter afferent and efferent signals between viscera and the central nervous system, were an uncontrolled variable and perhaps reflective of the extent of disease within this population. These concerns raise questions about unmeasured neuroendocrine (allostatic) reactions to maintain function.

(4) Forty percent of the reviewed patients were prescribed a psychotropic medication by their primary physician, and remained on it for the entire length of the study. Depression scores varied little throughout the study and appeared to have little relation with outcomes. If the patient empowerment approach, created by patient involvement with all questionnaires and post-treatment plans, reduced psycho-social stressors, then why did these medications remain prescribed for 30 months and more?

Patient Record #1: JF 52 y.o.

Subjective Analogue Pain Scale (Range 0 - 10)

Numerical Scale

0 1 2 3 4 5 6 7 8 9 10

No Pain — Worst Pain Imaginable

ADL Evaluation (Range 0 - 6)			
*** Exertional Questions	N/A	No = 0	Yes =1
Can you walk around a food market?			x
Can you walk around a "Wal-Mart"?			x
Can you walk the length of Main St. (1/2 mi)?		x	
Can you do activities like play golf?	x		
Can you do activities like dancing?	x		
Do you fatigue when you participate in sexual activity?	x		

Energy Level Evaluation (Range 0 - 10)			
**Base Level Questions	No = 0	Barely = 1	Yes = 2
Can you strip and make a bed?		x	
Can you dress yourself?			x
Can you shower independently?			x
Can you mop floors?	x		
Can you hang laundry?	x		

Psycho-Social Evaluation (Range 0 - 27)				
Symptom	None (0)	Less than 7 of 14 days (1)	More than 7 of 14 days (2)	Daily (3)
Little interest in activities				x
Feeling of hopelessness (down)				x
Sleep (too much or too little)		x		
Low energy		x		
Poor appetite/overeat	x			
Feel like a failure				x
Trouble with concentration		x		
Feel like life is in slow motion/high gear	x			
Feel like "better off dead"/Suicidal Thoughts?	x			
TOTAL= 12	0	3	0	9
Scales	Mild ≤ 9	Moderate ≤ 18	Severe ≥ 24	

Table 6 Improvement Score (Range 0 - 27)						
CONCLUSION QUESTIONNAIRE	N/A	0	-1	1	2	3
0 = no change; -1 = worse; 1 = bit better; 2 = somewhat better; 3 = much improved						
1. Since you started OMT, has the reason you came gotten better or worse?		x				
2. Since you started OMT, has your overall health gotten better or worse?				x		
3. Since you started OMT, do you think you can do more things?						x
4. Comment on the following:						
Pain				x		
Walk					x	
Work	x					
Sleep		x				
Appetite		x				
Interest	x					

Date_____

7

Patient Record # 1

Patient Record #2: SM 63 y.o.

Subjective Analogue Pain Scale (Range 0 - 10)

Numerical Scale

0 1 2 3 4 5 6 7 8 9 10

No Pain — Worst Pain Imaginable

ADL Evaluation (Range 0 - 6)			
*** Exertional Questions	N/A	No = 0	Yes =1
Can you walk around a food market?			x
Can you walk around a "Wal-Mart"?			x
Can you walk the length of Main St. (1/2 mi)?		x	
Can you do activities like play golf?	x		
Can you do activities like dancing?	x		
Do you fatigue when you participate in sexual activity?			x

Energy Level Evaluation (Range 0 - 10)			
**Base Level Questions	No = 0	Barely = 1	Yes = 2
Can you strip and make a bed?		x	
Can you dress yourself?		x	
Can you shower independently?		x	
Can you mop floors?	x		
Can you hang laundry?	x		

Psycho-Social Evaluation (Range 0 - 27)				
Symptom	None (0)	Less than 7 of 14 days (1)	More than 7 of 14 days (2)	Daily (3)
Little interest in activities				x
Feeling of hopelessness (down)				x
Sleep (too much or too little)		x		
Low energy				x
Poor appetite/overeat	x			
Feel like a failure				x
Trouble with concentration	x			
Feel like life is in slow motion/high gear	x			
Feel like "better off dead"/Suicidal Thoughts?	x			
TOTAL= 13		1		12
Scales	Mild ≤ 9		Moderate ≤ 18	Severe ≥ 24

Improvement Score (Range 0 - 27)						
CONCLUSION QUESTIONNAIRE	N/A	0	-1	1	2	3
0 = no change; -1 = worse; 1 = bit better; 2 = somewhat better; 3 = much improved						
1. Since you started OMT, has the reason you came gotten better or worse?				x		
2. Since you started OMT, has your overall health gotten better or worse?				x		
3. Since you started OMT, do you think you can do more things?					x	
4. Comment on the following:						
Pain					x	
Walk		x				
Work	x					
Sleep		x				
Appetite	x					
Interest				x		

Date_____

7

Patient Record # 2

Patient Record No. 3: JYF 64 y.o.

Subjective Analogue Pain Scale (Range 0 - 10)

Numerical Scale

0	1	2	3	4	5	6	7	8	9	10
No Pain										Worst Pain Imaginable

ADL Evaluation (Range 0 - 6)

*** Exertional Questions	N/A	No = 0	Yes =1
Can you walk around a food market?			x
Can you walk around a "Wal-Mart"?			x
Can you walk the length of Main St. (1/2 mi)?			x
Can you do activities like play golf?	x		
Can you do activities like dancing?			x
Do you fatigue when you participate in sexual activity?	x		

Energy Level Evaluation (Range 0 - 10)

**Base Level Questions	No = 0	Barely = 1	Yes = 2
Can you strip and make a bed?			x
Can you dress yourself?			x
Can you shower independently?			x
Can you mop floors?			x
Can you hang laundry?			x

Psycho-Social Evaluation (Range 0 - 27)

Symptom	None (0)	Less than 7 of 14 days (1)	More than 7 of 14 days (2)	Daily (3)
Little interest in activities	x			
Feeling of hopelessness (down)	x			
Sleep (too much or too little)	x			
Low energy	x			
Poor appetite/overeat	x			
Feel like a failure	x			
Trouble with concentration	x			
Feel like life is in slow motion/high gear	x			
Feel like "better off dead"/Suicidal Thoughts?	x			
TOTAL= 0				
Scales	Mild ≤ 9	Moderate ≤ 18	Severe ≥ 24	

Improvement Score (Range 0 - 27)

CONCLUSION QUESTIONNAIRE	N/A	0	-1	1	2	3
0 = no change; -1 = worse; 1 = bit better; 2 = somewhat better; 3 = much improved						
1. Since you started OMT, has the reason you came gotten better or worse?						x
2. Since you started OMT, has your overall health gotten better or worse?					x	
3. Since you started OMT, do you think you can do more things?				x		
4. Comment on the following:						
Pain					x	
Walk				x		
Work				x		
Sleep				x		
Appetite	x					
Interest	x					

Date_____

11

Patient Record #3

Table 12 Comparison Data Patients 1, 2 and 3					
ID	Pain Score	ADL Score	Energy Score	Psycho-Social Score	Improvement Score
1 (JF)	8	2	5	12	7
2 (SM)	6	3	3	13	7
3 (JYF)	4	4	10	0	11

Chart 11b Per Month Frequency of Patient Visits (taken from Table 10 group)

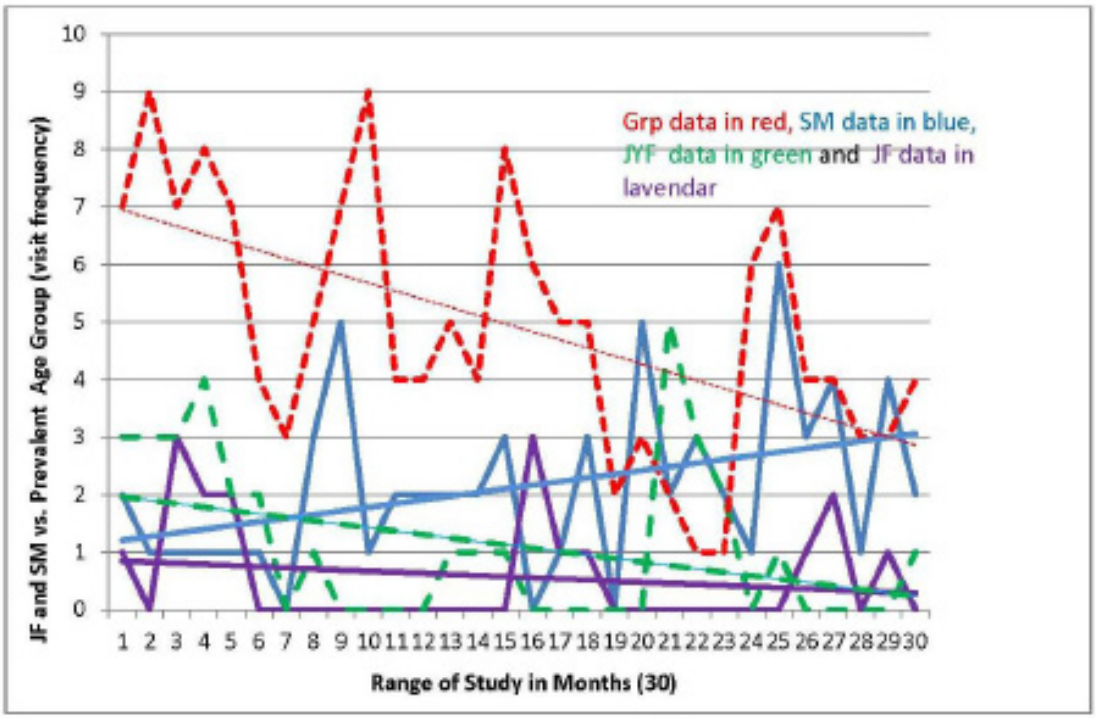
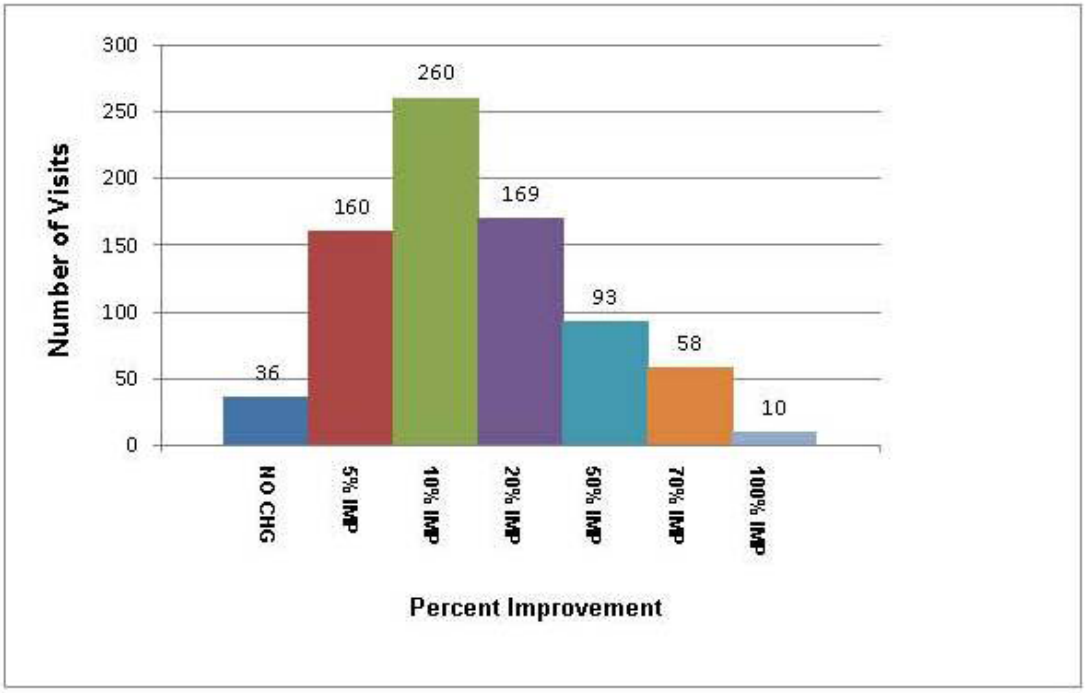


Chart 12 Nearly 800 Patient Visits Over 30 Months Subjectively Reported Improvement



(5) Somatic dysfunction was treated to normalize acilitated segments, mobilize body fluids and lessen sympathetic activity. The most ill patient showed improved tissue oxygen concentration, and many were observed to increase activity. However, if allostatic load,[19] a maladaptive neuroendocrine response to failing physiology, was well established before the above stated efforts, and long-term exposure to the allostatic response is cumulative and perhaps viscerally and structurally (inflammation) destructive, then can late efforts by the KYCM OMT Clinic produce a demonstrative marker for success?

(6) Are qualitative markers, i.e., instruments measuring ADLs, a measure of successfully performed OMT? Is the subtle improvement seen as a result of patient-centered osteopathic care (outlined in Maxim 1), a real driver for success of these 61 patients?

Chart 12 is a product of retrospective chart review of the 61 patients over 30 months. In nearly 800 visits, almost 600 patient encounters (75 percent) recorded marginal improvement (five to 20 percent) when asked about their musculoskeletal symptoms. Additionally, 20 percent of the patient encounters reflect a greater than 50 percent improvement when asked about their musculoskeletal symptoms. Did these 61 patients get better? Similar questions have arisen with cancer treatment and outcomes within the Central Appalachian Region. Regional disparities in cancer outcomes have been studied by the Centers for Disease Control (CDC). Research has suggested the unique culture of the Appalachian people as a possible explanation for this disparity.

The Appalachians have been studied for decades. Behringer and Friedell[20] have observed the following typical characteristics of the people in Appalachia: (1) Pride is a major deterrent to effective healthcare delivery and is more important than most life choices, i.e., receipt of healthcare. (2) Privacy is very important to Appalachians; they prefer to handle family problems themselves and are reluctant to share concerns with a stranger (physician) unless they trust him/her. (3) "Personal trust is hard to gain, but once gained is hard to lose." (4) Past history with "outsiders" has created an air of skepticism, which dates back to the religious missionaries of the nineteenth century, the mining company doctors and violence during the early twentieth century.[21] (5) Healthcare information is more readily accepted from a family member or community leader than from a physician, and is related to the trust issue and the clannish social structure, i.e., settling problems among themselves. (6) People believe in "God's will" and "fatalism." Some illnesses follow generations, and people accept that it will happen to them, i.e., mineworkers and lung cancer. Dr. Kelly Dorgan explored "culturally tailored cancer treatment" in Appalachia, and notes cultural values, resources and beliefs must be considered when engaging in cancer control in Appalachia.[22] Retrospectively, many patients seen within the study made unique regional comments, used unique regional language or were reluctant to answer questions relative to sexuality or suicide. Perhaps regional bias should have been considered more in the construction of the evaluative tools.

Attempts were made to empower patients to actively engage in visits by encouraging them to share their perspective as a partner in the patient-physician relationship. This was established by creating a patient-centric dialogue in which the visit began and concluded with patient participation in the encounter. The physician and undergraduate fellows facilitated this through two communication modalities—visits began with a conversation (oral/aural) that encouraged the patient to speak and concluded with the completion of a patient questionnaire (written). Of note, neither of the attending physicians were natives of Central Appalachia, and four of the ten undergraduate fellows involved with the study were "not from around here," which is a term used by the local population to describe an outsider. As much as possible the patient was seen by the same examiner(s) for each visit (scheduling was often a limitation). Was a trusting relationship achieved by the team if both attending physicians lacked native language and communication skills (one was from Philadelphia and one was from New York City), and the undergraduate fellows were neophytes to the effective use of the patient-physician interview? Attorney Mark Hall, Professor of Public Health at Wake Forest University addressed this dimension of care in his study on trust. He states, "(1) Trust is a core-defining characteristic of the doctor-patient relationship. (2) Trust is necessary if patients are to seek care, reveal sensitive personal information, submit to treatment and follow treatment recommendations. (3) There are four components of trust – competence, agency, honesty and confidentiality. (4) Interpersonal skill, a competence, encompasses both effective communication and appropriate bedside manner."[23] In essence, language and communication skills perhaps inhibited the necessary trust to obtain definitive patient responses.

The evaluative tools were adaptations from the medical and surgical literature, and taken from tested inventories to assess either patient readiness for surgery (potential stresses on the system) or cardiopulmonary reserve. The ADL and energy criteria were taken from tested behaviors, with their associated metabolic energy equivalents (METS) within the range of four to six METS. Many of the behaviors queried possessed gender bias (i.e.,

making and stripping a bed), threats to pride (i.e., sexual questions) and regional unfamiliarity (i.e., "Can you walk the length of Main St?"). The concept of ADLs refer to the rehabilitation literature, and major tools incorporated within this context address "self-care" items such as feeding, hygiene, toileting, bathing and dressing.[24,25,26] All patients within the study cohort possessed skill sets above those basic concepts.

Additionally, summary scores were often recorded without attention to coincident tabulation of individual measures. The rehabilitation literature does cite limitations with "summary" and/or "total" scores versus consideration of "individual" indices.[27] These evaluative tools were culturally disparate, lacked individual quantification, and perhaps, created barriers to trust. Ideally, a group of physicians to oversee total patient care would have provided a common ground to evaluate clinical progress. All patients were treated by two teams. Diagnosis and treatment regimen(s) for medical condition(s) were under the purview of the patient's primary treating physician(s), and the evaluation and treatment for somatic dysfunction was at the discretion of the KYCOM OMT Clinic staff. A de facto disconnect of care existed from the outset of the study, that violates quality total osteopathic care, as defined by the definition of osteopathic medicine: "A complete system of medical care with a philosophy that combines the needs of the patient with current practice of medicine, surgery and obstetrics; that emphasizes the interrelationship between structure and function; and that has an appreciation of the body's ability to heal itself."[28]

Thus, inherent questions could not be verified, (i.e., the effects of changes in medical regimen on the presence of somatic dysfunction) and changes from the baseline to interval measures of allostatic load could not be followed as recommended in the insert taken from the 2nd edition of *Foundations for Osteopathic Medicine*, or the frequency and location of somatic dysfunction versus prevalent medical condition. Additionally, the disconnect between care providers deprived the study of a control group, i.e., a group of age-matched patients under the care of the same provider(s) with similar medical histories, and perhaps musculoskeletal complaints, treated without the use of OMT. While the data perhaps does not reveal quantitative parameters with which to assess improvement in subjective areas, such as perception of pain or quality of life, they do underline the need for accurate assessment and documentation of clinical findings (provided by a single-provider group) in order to establish patient status and progress from a more objective and measurable perspective.

The tool for depression screening possessed elements of regional unfamiliarity ("life in slow motion/high gear"), threats to pride ("feeling of failure," "feeling of hopelessness" and "feel as if better off dead") and perhaps threats to religion (suicide). The generally low scores reported perhaps reflect Dr. Behringer's observations[29] noted previously. Of note, at the conclusion of all patient encounters, patients received encouragement to modify daily habits, and comparatively, those with home programs and generally active lifestyles reported greater improvement scores and lower depression scores.

Markers Assayed to Determine Allostatic Load

Total Cholesterol-HDL Ratio

$HgBA_{1c}$

Urinary Cortisol Level

Urinary Norepinephrine Level

Urinary Epinephrine Level

The Conclusion Questionnaire (Table 6), an attempt to gauge patient improvement, looked from general, i.e., "Are you better or worse since you started OMT?" to specific criteria, i.e., pain, gait, ability to work or sleep, size of appetite and interest (mental health). This tool overlooked the patient concept of improvement versus the examiner concept of improvement, as exampled by Feinstein et. al, in 1986.[30] Dr. Feinstein distinguished the patient with rheumatoid arthritis that regained the ability to sew or hold playing cards (an observed improvement). However, when questioned, she said she was "no better" because she remained unable to walk without aid. Perhaps the patients, recognized by many to have a unique system of beliefs and characteristics,[31] assumed a literal interpretation of the term improvement. The Institutes of Medicine (with limited English proficiency its intent) has defined health literacy as "the degree to which individuals have the capacity to obtain, process and understand the basic health information and services needed to make appropriate health decisions."[32] Thus, if pain (even if lower in scale) is still present, then (in the patient's interpretation) no improvement has been made, or if no job has been obtained since entry into the study, then no improvement has been made. Also, in retrospect, many of the patients studied were unemployed, and questions about "work" attacked pride and trust. Again, this tool contradicted physician observation, and gave us little objective data.

Conclusion

The KYCOM OMT Clinic provides access (2200 patient visits per year) to a quality of osteopathic manipulative medicine that meets or exceeds the standard of care, at no cost to the patient. All patients selected suffered from comorbid disease, trauma, or both, however,

were treated for somatic dysfunction only. All patients selected, came to the clinic for relief of musculoskeletal symptoms. From a clinical standpoint, the inherent definition of function was optimized. The working definition of function was observed to improve, however, regional uniqueness was a major influence to the marginal tabulated result. Sixty-one patients continued in the study, two recently moved away and three have recently died. The remainder continues in the practice. The relationship between structure and function within this geographical region, lies not to be proven by patient report, but by patient demonstration. The effectiveness of care was beyond the soma, but perhaps was a measured effect of the personal and intimate relationships created by the patient-centered approach incorporated here.[33]

Empowerment and goal-directed treatment modalities were the strengths of this study. Distribution of patients was limited to those with previously diagnosed medical conditions who presented for musculoskeletal complaints and chose to enter and continue in the study. No patient during the study was diagnosed with a new condition. All conditions were present for a minimum of two years before entry into the study, and medical care was independent and uncoordinated with osteopathic care. Further research is required to clarify the fundamental question posed, i.e., does the use of OMT improve the working definition of function because of optimization of inherent function? Requirements for further research minimally would include an osteopathic hospital medical residency program in Appalachia with access to:

(1) A similar patient population;

(2) Laboratory and radiology facilities;

(3) Post-graduate osteopathic fellows versus undergraduate fellows (with broader clinical experience);

(4) NMM/OMM specialists;

(5) Primary Care Medicine specialty physicians;

(6) Medical specialty physicians and Physiatrists.

All would involve ADL, medical, structural and psychosocial evaluations conducted at defined milestones and in a coordinated manner.

Summary

One hundred people entered a 30-month long study, to evaluate the effect of Osteopathic Manipulative Treatment on the well-being of patients with chronic comorbid illness. Sixty-one were chosen for retrospective review. Women predominated and the 50 to 59-year-old age group was most representative of the studied patients (range 28 to 97 years). Predominant group(s) were mostly affected by cardiovascular disease, osteoarthritis, chronic pain syndromes and connective tissue diseases. Review of the records for 32 patients within the prevalent medical disease and age group(s), has opened an avenue for further research beyond the scope of this study (i.e., the frequency and location for somatic dysfunction in patients with cardiovascular disorders, mixed connective tissue disease or chronic pain syndromes). Patients were grouped modally by length of stay within the KYCOM Clinic practice and their self-assessed improvement scores. Clinical improvement was seen with patients who reported both active lifestyles and low depression scores. Approximately 800 patient encounters were reviewed, and 95 percent reported musculoskeletal improvement. Approximately 400 patient encounters were reviewed for 20 select patients. With the exception of one, all patients averaged greater than one visit per month, which gradually trended downward over the 30-month study. No definitive data could be obtained to substantiate OMT as a reason for improvement in patient well-being. However, no patient reported a negative self-improvement score, downward trend in ADL score, or upward trend in pain or depression score. Eighty-four of the original 100 patient volunteers continue to frequent the KYCOM OMT Clinic for treatment of somatic dysfunction.

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Neuropathy of the inferior alveolar nerve: A case report

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Abstract

Neuropathy of the inferior alveolar nerve is not an uncommon complication after dental procedures. In this case, a 36-year-old male had a six-week history of burning pain of the left jaw following a crown lengthening procedure and crown placement. Osteopathic philosophy dictates that the function of the nerve is greatly influenced by the surrounding structures. By diagnosing and treating somatic dysfunctions related to the patient's complaint, the symptoms of the neuropathic pain resolved. This case greatly illustrates the efficacy of osteopathic manipulation and the depth of the anatomy that can be influenced.

Introduction

Nerve injuries are a known consequence of dental anesthesia and procedures. The inferior alveolar nerve is particularly vulnerable to injury and likely to result in neuropathic pain. Considering the quantity of dental procedures performed in this country, this complication likely affects a significant number of people. Medications may help with the symptoms, but they do not improve the underlying function of the nerve. Osteopathic manipulation addresses the structures that may be inhibiting nerve function, and therefore may improve nerve function and reduce pain. The following case illustrates the successful application of this approach.

Case History

Chief Complaint: Left Jaw Pain

History of Present Illness: A 36-year-old male presented to the Neuromusculoskeletal Medicine (NMM) clinic with complaints of six-week duration of left jaw pain. The pain was burning in nature and of moderate to severe intensity. It was located in the left jaw area and radiated down the jaw line. The pain began after a crown-lengthening dental procedure performed on the left lower second molar. It was constant in nature, and worse at night and with opening the jaw or chewing food. The patient had difficulty eating and was only able to tolerate soft food. Nothing seemed to help the pain. He had returned to the dentist for re-evaluation, but no abnormalities were found to explain his pain.

PMH: Negative

PSH: Negative

Social: No smoking or illicit drug use. Social alcohol use—two to three drinks per week. He is married and does not have any children. He works at the airport in a supervisor position on the grounds crew.

Family: Father—DM, HTN, Gout

ROS: Negative except per HPI

Physical Exam:
Vitals: Afebrile, BP: 118/78, Pulse: 60, Ht: 5'10" Wt: 219 lbs
Gen: Alert, oriented, mild difficulty talking due to pain
HEENT: PERRLA, Ears- wnl, TMJ- No clicking, Mouth- Unable to open fully, no evidence of erythema or infection of teeth or gums.
Neck: No lymphadenopathy
CV: RRR, no murmurs
Lungs: CTA-B, no wheezes/rales/rhonchi
Neuro: Normal sensation of face, EOM-I, symmetrical facial expressions, tongue midline, palate elevated equally

Osteopathic Exam:
Head: Left lateral strain, left temporal bone interally rotated, restriction of left sphenopetrous suture, left Zygoma internally rotated, left masseter tender point
Cervical: OA ES_LR_R C2-3 ESR_L
Thoracic: T1-4 bilateral paraspinal hypertonicity
Ribs: Rib 1 inhalation dysfunction on left

Assessment:
1. Left jaw pain (differential listed below)
    a. Neuropathic pain—inferior alveolar nerve
    b. Secondary to muscle spasm of muscles of mastication
    c. Persistent dental etiology
    d. TMJ
2. Somatic dysfunction of head, cervical, thoracic and ribs

Treatment:
1. Treatment of OA, C2, C3 using ligamentous articular strain/balanced ligamentous tension
2. Treatment of left temporal bone at sphenopetrous suture via Magoun

3. Treatment of the root of the tongue with gentle inhibition
4. Treatment of medial pterygoid and masseter
5. Offered anti-inflammatory and muscle relaxant medications. Considered antiepileptic medication for neuropathic pain.

Results

Immediately after treatment, the patient could open his jaw more and said he felt better, but was unable to judge how much he was improved. That evening, it was reported that he was 90 to 95 percent improved. The patient returned for a follow-up in one week and felt only very mild discomfort that no longer interfered with his daily life. The pain resolved after the second treatment.

Medical and Anatomical Discussion

Injuries to the branches of the trigeminal nerve are major consequences of dental procedures.[1] Depending on the procedure, different branches are at risk for injury. This patient had a crown-lengthening procedure performed prior to having a crown placed on his left lower second molar. A crown-lengthening procedure is performed to expose more of the tooth prior to placing a crown or repairing the tooth. It involves incising the gingiva around the tooth, and sometimes removing part of the alveolar bone to expose more of the tooth.[2]

The location and nature of this procedure puts the nerves from the mandibular branch of the trigeminal nerve at risk for injury. The trigeminal nerve supplies sensory innervation to the face and motor innervation to the muscles of mastication. The mandibular division is composed of the inferior alveolar, lingual, buccal and auriculotemporal nerves. They supply sensation to the lower jaw and teeth, tongue, cheek and the side of the head and scalp, respectively. The motor component of the trigeminal runs with the mandibular nerve and supplies the medial pterygoid, lateral pterygoid, masseter, anterior belly of the digastric, mylohyoid, tensor tympani and tensor veli palatani.[3] Therefore, the mandibular branch of the trigeminal is intimately involved in both sensation and motor function of the lower jaw.

The patient had pain in the area corresponding to the inferior alveolar nerve. It was located along the jaw line and was burning in nature. Neuropathic pain is often described as burning, aching or throbbing.[4] The inferior alveolar nerve enters into the mandible via the mandibular foramen located on the internal surface of the mandibular ramus. From here, it provides sensory innervation to the lower molars and forms the inferior dental plexus that gives off branches to the teeth and gums.[5]

The inferior alveolar nerve and the lingual nerve are both commonly affected during dental procedures. The incidence of inferior alveolar nerve injuries has increased in recent times due to increases in endodontic therapy and implant surgery. Additionally, the inferior alveolar nerve seems to be more at risk for permanent injury than the lingual nerve.[1] The patient could have sustained an injury to this nerve during the crown lengthening procedure, or during anesthesia using an inferior alveolar nerve block. The inferior alveolar nerve typically has an intimate relationship with the third molar and less commonly with the second molar.[5] If the patient is one of the individuals with this close relationship with the second molar, then the nerve could have been injured directly during the crown lengthening process.

Injury to the nerve during the inferior alveolar nerve block is also a very likely mechanism. An inferior alveolar nerve block is performed by injecting a local anesthetic agent near the entrance of the inferior alveolar nerve into the mandible. The needle is aimed toward the medial surface of the mandibular ramus near the mandibular foramen. The object is to advance the needle until it hits bone to verify the location, withdraw the needle slightly, and then inject the anesthetic agent.[6] Damage to the nerve can occur during this process by chemical and physical means. Physical injury can occur from trauma to the nerve induced by the needle, or from epineural or perineural hemorrhage. The trauma and hemorrhage can cause inflammation and scarring that can then lead to demyelination.

Additionally, the anesthetic agent can cause chemical injury to the nerve; different toxicities are based on the medication, its concentration, and the preservative agents used. When the inferior alveolar nerve is injured, there is a 34 to 70 percent chance of it resulting in neuropathic pain. Furthermore, 81 percent of nerve injuries caused by this nerve block resolve by two weeks, and 85 to 94 percent of cases are expected to recover by eight weeks. The risk of permanent injury to this nerve during dental anesthesia is 1:26,762 to 1:800,000.[1] Therefore, the majority of patients with this type of pain will spontaneously improve in the first two weeks. The patient has had constant pain for a six-week duration; it was worrisome that he had not improved at all at this point.

On initial osteopathic examination, it was found that he had tenderness to palpation in the belly of the left masseter muscle. This was locally tender to touch, but it did not produce radiation of pain or mimic his original pain complaint. This was diagnosed as a tender point in the masseter muscle. Tender points are defined as "small, hypersensitive points in the myofascial tissues of the body that do not have a pattern of pain radiation."[7] This is in contrast to trigger points that have a consistent and

reproducible pain radiation pattern.[8] Based on the concepts of facilitation and excitability, we know that an irritation to the nerve can affect the muscles, and an irritation to the muscle can also create irritation in the nerve.[9] Even though this is primarily a nerve injury, it would make sense that muscles from the same nerve roots would also be affected.

Treatment Approach

Treatment began by addressing the somatic dysfunctions of the upper cervical spine: OA, C2, and C3. The reason treatment began here was twofold. First, the patient was acutely tender to touch over the jaw area. Second, "local listening" led to this area. Local listening is a technique described by Jean-Pierre Barral that allows the body tissues to direct the practitioner to areas of greatest restriction.[10] Anatomically, this area correlates to the superior cervical ganglion. Excessive input from the head and neck structures may cause facilitation and increase sympathetic outflow.[11] The superior cervical ganglion is the largest of the cervical sympathetic ganglia and carries sympathetic fibers from the upper thoracics to the head and neck. This ganglion adjoins the second and third cervical vertebra, and it is located anterior to the longus capitus muscle and posterior to the carotid sheath.[5] The area was treated with ligamentous articular strain.[12] The goal was to address the somatic dysfunction, and also try to calm the sympathetic hyperactivity related to the patient's complaint.

Next, the left temporal bone was examined and treated. The major restriction seemed to be at the sphenopetrous suture, where the petrous portion articulates with the sphenoid bone. The temporal bone has several intimate connections to the mandibular nerve. The trigeminal ganglion sits in Meckel's cave, which is located near the apex of the petrous portion of the temporal bone. The mandibular nerve then travels through the foramen ovale, which is situated just anterior to the sphenopetrous suture.[5] The suture was treated using a technique described in Magoun.[13]

After the treatment performed so far, the patient was feeling more relaxed and his pain was less intense. At this point, it seemed appropriate to use intraoral techniques. Upon evaluation of the root of the tongue, there was restriction noted on the left side. Several doctors have described to me the value of treating the root of the tongue for multiple head and neck dysfunctions (Ed Miller, DO, small group lecture, March 2011; Wm. Thomas Crow, DO, FAAO, personal communications, 2009-2011). The root of the tongue was treated with inhibitory pressure bilaterally.

Anatomically, this can affect multiple structures. The mylohyoid muscle makes up the floor of the mouth and is innervated by a branch of the inferior alveolar nerve.[5] It is apparent that treating the mylohyoid muscle can influence the inferior alveolar nerve. Next, there are anastomoses between the hypoglossal nerve (that innervates the tongue) and branches of the mandibular nerve.[14] Additionally, the submandibular ganglion is located in the floor of the mouth on the hypoglossal muscle. The submadibular ganglion hangs from the lingual nerve, which is a branch of the mandibular nerve. In addition to being a parasympathetic nucleus, it also contains sympathetic fibers from the carotid plexus.[5,14] Treating the root of the tongue can be effective at addressing muscular, nervous and autonomic elements of this dysfunction.

While I was treating the patient via intraoral techniques, I examined the jaw musculature more completely. I found the medial pterygoid and masseter muscles both hypertonic and tender to touch. The patient noted tenderness, but again denied specific pain radiation patterns. The masseter muscle arises from the zygoma and zygomatic arch and attaches to the mandibular ramus; its function is to elevate the jaw. The medial pterygoid muscle arises from the lateral pterygoid plate and the pyramidal process of the palatine bone. A small, superficial slip also arises from the maxillary tuberosity. The muscle inserts on the ramus and angle of the mandible. Branches from the mandibular nerve innervate both of these muscles.[5] Based on the anatomy, it is likely that these muscular dysfunctions contributed to the dysfunctions found in the left zygoma and sphenoid regions. He was able to tolerate direct inhibitory pressure to these muscles, and they responded quickly to treatment. After treatment, these muscles were significantly less tense and were no longer acutely tender to touch.

On a return visit one week later, the patient reported that he had 90 to 95 percent relief the evening after the treatment, and currently has hardly any noticeable discomfort. He did not require the muscle relaxant or non-steroidal anti-inflammatory medication that was prescribed either. The pain no longer interfered with opening his mouth or chewing, and he felt he was continuing to improve. An abbreviated treatment was directed at the remaining OA, cranial and jaw muscle dysfunctions; the patient had no further problems with the pain after the second treatment.

This case is a great illustration of osteopathic principles. Our goal is to address structural components that improve overall body function and physiology. By treating various dysfunctions of the muscles, joints and cranial sutures, we were able to influence neuropathic pain. We often don't remember all of the interrelationships between the treatments we perform and the numerous aspects of anatomy and physiology we affect. This case was

a great reminder of just how intricate and interconnected the human body is. Finally, this case highlights the value of an osteopathic approach to treating a condition for which traditional medicine does not have a great treatment.

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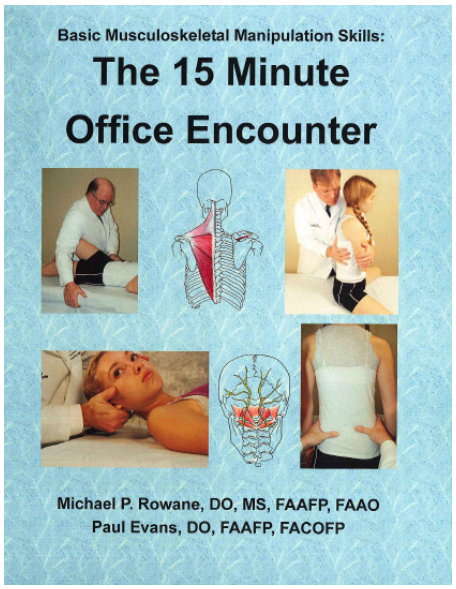
Basic Musculoskeletal Manipulation Skills: The 15 Minute Office Ecounter

by Michael P. Rowane, DO, MS, FAAFP, FAAO & Paul Evans, DO, FAAFP, FACOFP



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Assessing the effectiveness of OMT provided by predoctoral teaching fellows as measured by a visual analog pain scale

Jana A. Sarkaria, DO; Rebecca M. Render, DO; Christine M. Lerma, DO; Nicholle Henley, DO; Michael A. Seffinger, DO; Raymond J. Hruby, DO, MS, FAAO

Abstract

A retrospective patient satisfaction survey review evaluated the perceived effectiveness of Osteopathic Manipulative Treatment (OMT) delivered in an on-campus, free, educational clinic run by Predoctoral Teaching Fellows (PTFs) at the College of Osteopathic Medicine of the Pacific on the campus of Western University of Health Sciences in Pomona, CA. Of the 356 patients evaluated and treated between the fall 2005 semester and spring 2006 semester, 17 percent (61) returned an anonymous post-treatment survey that included a visual analog pain scale. A significant difference was found between patients' recollections of their pre-treatment pain (mean 4.5) and immediate post-treatment pain (mean 2.2; $p = 0.00$) and 72-hour post-treatment pain (mean 2.3; $p = 0.00$), demonstrating an average of 50 percent reduction of pain. There was no significant statistical difference between the immediate post-treatment pain scale and the 72-hour post-treatment pain scale ($p = 0.73$). Based on the results from the patient satisfaction survey, osteopathic medical students are effective in using OMT to relieve pain.

Introduction

There is substantial research demonstrating the efficacy of osteopathic manipulative treatment (OMT).[1] However, little research has been aimed toward evaluating the effectiveness of OMT performed by osteopathic medical students.

In an attempt to assess a student's ability to perform OMT correctly, the National Board of Osteopathic Medical Examiners has established a performance-based clinical skills examination using standardized patients.[2] The COMLEX-USA-PE assesses objective findings, such as correct patient position and hand placement, appropriate time, force and direction, and reassessment amongst other objective components to a treatment.[2] This examination does not factor in the subjective experience of the patient or whether the treatment was considered successful in the eyes of the patient or physician. The utility and efficacy of evaluating physician-patient interactions and therapeutic techniques using a standardized patient set-up has been established. However, it is important that new physicians not only have the ability to perform the techniques, but also be able to provide effective treatments to their patients. Though not evaluated in the COMLEX-USA-PE, a valid method of assessing efficacy is just as important to the practitioner of OMT.

The terminology "effective treatment" is generally used by the medical profession to articulate whether a specific treatment is therapeutic and worthy of further application.[3] A practitioner could assess pain using an analog pain scale, improvements in activities of daily living or increased range of motion.[4] Another valid form of evaluating effective treatment is for the practitioner to assess the somatic dysfunction(s) as U (unchanged), I (improved), R (resolved), or W (worse) from pre-treatment to post-treatment, as well as whether resolution or improvement of pain is sustained over a set period of time.[5]

It is our hope that demonstrating to students that their treatment can be effective in a clinical setting will lead to more confidence. Physician insecurity in OMT skills has been identified as a barrier to the practice of OMT.[5-9] With increased confidence, students will presumably be more likely to maintain their OMT skills.[10] Unfortunately, training in OMT in third- and fourth-year clerkships is difficult to pursue, and even more difficult to obtain in the residency years, with more than 50 percent of graduating osteopathic physicians entering Accreditation Council for Graduate Medical Education-approved residencies.[11,12] Of family practice residents in an American Osteopathic Association (AOA) program, 70 percent reported frequent use of OMT, versus 40 percent of DOs in an ACGME program reporting frequent use.[12]

Usually, the osteopathic physician attempts to treat the whole patient, using OMT where indicated. This is in keeping with the eminent professor Irwin Korr, PhD, who stated: "It is essential…that assessments of effectiveness