A Sample Manual Osteopathic Protocol for Low Back Pain

Dan Renaud, DO(MP), RMT, BPE.
National Academy of Osteopathy
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Abstract: Chronic low back pain will affect up to 80% of adults in their lifetime. (Low Back Pain Fact Sheet, 2014) This is a common affliction most manual practitioners will see in their practice. The following paper is a summary of the origins of osteopathy, Still's founding principles and offers a sample algorithm to the clinical application of manual osteopathic treatment for low back pain.

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Origins of Osteopathy

Andrew Taylor Still MD, DO (1827-1917) is credited with the development of the modern day philosophical approach to osteopathy. In 1864, Still's 3 children suddenly died from spinal meningitis. Still immersed himself in the study of the nature of health, illness, and disease. His goal was to discover definitive methods for curing and preventing all that ailed his patients. (Chila, 2011)

Following in the footsteps of historical physicians Hippocrates (c. 460–c. 377 b.c.e.), Galen (c. 130–c. 200), and Sydenham (1624–1689), Still questioned what he viewed as inadequate orthodox medical practices of the day. Still began to contemplate the patient's innate ability to heal. While employing current medical practices of his time during 1853 through to 1879, Still experimented with the use of available medications and manipulative techniques to treat ailments. Keeping records and comparing results Still was able to determine the effectiveness of his mechanical corrections and consistently achieved the same or better result without the use of medications. Ultimately, his faith in the body's natural healing capabilities formed the foundation of his new philosophical approach. Later he coined the term "Osteopathy" derived the from the Greek words "osteon" meaning bone and "pathos" meaning to suffer. (Chila, 2011)

Founding Osteopathic Principles

Still believed health is the natural state of all human beings. In his own words:

> Osteopathy is based on the perfection of Nature's work. When all parts of the human body are in **line** we have health. When they are not the effect is disease. When the parts are readjusted dis-ease gives place to health. The work of the osteopath is to adjust the body from the abnormal to the normal, then the abnormal conditions give place to the normal and health is the result of the normal condition. (Chila, 2011)

Still's developed and person centred approaches to health care based upon his founding principles:

1. The body is a unit.
2. Structure governs function.
3. The rule of artery is supreme.
4. The body possesses self-regulatory and self-healing mechanisms.

Is essence, these founding principles are at the core of the practice of osteopathy. Over time osteopathic educators and associations have updated these founding principles to

reflect current practices and understanding. For the purposes of this paper I will reflect on the original ideas.

The Body is a Unit

Still's reasoned the body as whole functioned in harmony as a result of the sum of is 'parts.' From gross anatomy to the microscopic physiological functions, the body systems work as a team. It is this teamwork that allows individuals to remain in homeostasis. Expanding upon this idea and looking beyond the common anatomical view, unity to mind body and spirit as well occurs. Thus any changes within the unit both internally or externally will have a compounding effect.

Structure governs function

Practitioners have long been aware that structure governs function. If there is a change in structure the function of said structure will be affected. An example of this would be a sprained ligament. As a result of an outside force, a sprain would lead to a stretching of the ligamentous tissue. A stretch in the tissue will lead to laxity in the joint. The central nervous system would recruit other tissues, in this case muscle and fascia tissue to make up for the laxity in the joint. This inherent protection mechanism would cause a functional disturbance in the joint and tissues leading to abnormal changes in the articulation and surrounding structures.

The Role of Artery is supreme

Simply put, blood flow is important to overall health. A direct result of proper blood flow is healthy tissue. If blow flow is compromised via structural disturbances tissues cannot operate efficiently thus disturbing homeostasis.

The body possesses self-regulatory and self-healing mechanisms

The self-regulatory mechanism Still recognized is now known as homeostasis. Complex and constant interaction between anatomical systems allows the body to remain in a state of physiological balance. When the body experiences dysfunction additional workload is created to maintain balance known as allostatic load. Allostatic load is the perseverance of a load causing specific effects on the body. Removal of the allostatic load allows the body to return to normal balance and specific effects disappear.

The self-healing mechanism employs the body's innate ability to heal. Leveraging several body systems including immunity, nervous, endocrine and vascular systems, the body will repair itself following the removal of structural dysfunction.

What is low back pain?

Low back pain is pain, muscle tension, or stiffness localized below the costal margin and above the inferior gluteal folds, with or without sciatica, and is defined as chronic when it

persists for 12 weeks or more. Nonspecific low back pain is pain not attributed to a recognizable pathology (e.g., infection, tumor, osteoporosis, rheumatoid arthritis, fracture, inflammation.) (Chou, 2011)

Common Causes and Risk Factors of Low back pain

The causes of low back pain are numerous. Osteoarticular injuries such as internal disc disruption, degenerative disc disease, facet joint pain, and sacroiliac joint pain are all contributors to low back pain. Associated risk factors for low back pain include poor ergonomics, poor biomechanics during heavy lifting and lack of fitness, lifestyle choices and psychosocial factors.

In a 2011 comparative study by DePalma et al., patients attending the Spine Clinic in Richmond Virginia current findings were similar to historical data. The prevalence of internal disc disruption, facet Joint pain, and sacroiliac pain were 42%, 31% and 18% respectively (n=378) (DePalma, Ketchum, & Saullo, 2011) Further more the findings substantiated claims that internal disc disruption was a more common occurrence in young to middle aged adults, while facet joint pain and Sacroiliac joint pain was more commonly seen in adults increasing in age to 70. (DePalma, Ketchum, & Saullo, 2011)

In Andrew Wilson's book, *Effective Management of Musculoskeletal Injury*, heavy physical work, lack of exercise/fitness, lifestyle choice such as smoking and psychosocial factors are listed as possible risk factors to low back pain.

Major heavy physical labour is a major risk factor for low back pain. Biomechanical forces acting on the bony, ligamentous and soft tissues place individuals at greater risk for developing low back pain. Wilson suggests a linear relationship between heavier work load and increase risk of injury.

Lack of exercise is another predisposing factor to low back pain and spinal injury. As activity levels diminish, exposure to increased level of low back pain may result. Wilson (1999) points to the cyclic condition where trunk muscle weakness can lead to chronic low back pain. With reduced muscular support and increased micro-trauma leading to pain and further deconditioning of the low back may result.

Smoking has been listed as lifestyle choice that possibly contributes to low back pain. Reduced circulation delays tissue healing, reduced intervertebral disc oxygenation, biomechanical strains from coughing are listed as contributors to low back pain associated with smoking.

Lastly, there is evidence to support psychosocial factors can influence the incidence of low back pain, albeit minor. Refer to Chapter 6 in Wilson's *Effective Management of Musculoskeletal Injury* for a more in-depth discussion.

Osteopathic evaluation of Low Back Pain

History:

The Osteopathic evaluation of the client begins with a thorough history consultation. The role of the practitioner is to determine the exact nature of the chief complaint, its duration, location, severity, and associated symptoms.
When conducting the consultation, the practitioner will include appropriate and necessary questioning to obtain a complete thorough history.

Chila et al (2011) outlines a list of questions the practitioner needs to ask.
They include the following:

- Location, Duration, severity, radiation
- Mechanism of intermittent to constant
- Improving, worsening or staying the same
- Aggravating or alleviating factors
- What has been done so far
- Mechanism of Injury
    - Blunt trauma or repetitive overuse
    - Previous history
    - Work related
    - Functional limitations

Observation

Visual observation of the clients is another aspect of the osteopathic evaluation. This component of the evaluation begins when encountering the client for the first time while walking. (For a full list of observational cues visit Nicholas et al. Atlas of Osteopathic technique, LWW, 2011)

- Observe overall posture – any obvious abnormality
- Body Symmetry
- Any notable slopes in shoulders, elbows Iliac crests Hips, knee caps etc
- Any obvious rotational issues.
- Any lateral bending
- Any compensatory motions.

While the list above is brief the goal of the observation is to determine what obvious visual abnormal asymmetries exist for any individual.

Osteopathic Examination

This is where the hands on techniques are used. For the purposes of this paper I am focusing regionally on the lower back, namely the lower thoracic region T10-T12, lumbar region L1-L5 and sacral region S1-S2. It is important to note that the areas of transition

thoracolumbar T12-L1 and lumbosacral L5-S1 are the most common areas for osteoarticular injury associated with low back pain.

After the history interview and observation, an osteopathic examination may commence.

- Inter-segmental Static Joint Play – Thoracic and Lumbar
    - Bilateral Soft tissue palpation – noting tissue tone, consistency
    - Bilateral Deep tissue palpation
    - Spinal Process P-A Static Joint play
    - Lateral to Medial Static Joint play on SP Bilateral
    - Facet Joint play P-A and circular
    - P-A TVP static Joint play with Thumbs
    - Seated motion palpation in all planes - Lateral Flexion, rotation, flexion and extension.

- Sacral joint osteopathic evaluation
    - Important to test ilium, sacrum, lumbosacral and sacroiliac joints
    - Ilium – Posterior, Anterior, medial, and lateral glide
    - Sacrum – Lateral, Inferior, static Joint play
    - Lumbosacral – Lateral and Rotation palpation
    - Sacroiliac – Standing bilateral PSIS, Standing Iliolumbar, Standing Lateral flexion.

- While doing the above joint play, the range of motion of the segments and need to be noted then documented
- Palpatory tissue feel – is it boggy, ropey, stringy, and hypertonic then document findings
- Always be in constant communication with the client regarding pain scale; noting tender points, reactionary reflex to palpatory stimulus. Observing referral patterns as well. Use a scale of 0-10 and document.

<u>Orthopaedic Tests</u>

Orthopaedic test are included in the osteopathic examination to further identify preliminary clinical findings. A good orthopaedic assessment allows the practitioner to make good clinical decision when deciding how to proceed with treatment.

There are several orthopaedic tests used in low back pain. The selection of tests listed below are not an exhaustive list but will help elicit clues as to what the primary pathology may be. For explanation and interpretation of the test please refer to any one of the available orthopaedic examination texts or websites available.

- Active range of motion will help determine if the pain is emanating from muscular tissue.
- Passive range of motion will help determine if the pain is emanating from osteoarticular tissue.

- Sacrum
    - Gapping test
    - Gaenslen Test
    - Patrick's Test
    - Ligaments Test

- Lumbar
    - Straight leg raise
    - Thomas Test
    - Active and Passive Hyperextension test

- Be cognizant of dermatome findings as well. These findings can indicate radicular pain emanating from a space occupying lesion or intervertebral disc pathology. In the case of low back pain practitioners should be familiar with dermatome locations and innervations of dorsal roots L1 – S2.

Treatment Plan

Putting all of the subjective and objective data collected above, the practitioner can now begin making clinical decisions and formulate a treatment plan. Depending on the outcomes of the history taking and osteopathic evaluation the practitioner should be able to identify whether the somatic dysfunction is acute or chronic and implement a course of action. See table 1 for identifiers of acute and chronic somatic dysfunction

Table 1 – comparative tissue changes in acute and chronic somatic dysfunction. (Parsons & Marcer, 2006)

	Acute	Chronic
Skin	Inflammatory response, oedema, vasodilation, hot, red, increase sweat gland activity	Pale skin, cold, dry with signs of trophic changes, increase skin pore size
Subcutaneous Tissue	Boggy Feel	Indurated and atrophied
Muscles	Acute reactive muscle spasm, contraction leading to hypertrophy	Atrophy + Fibrotic insertions, leading to fibrosis 'ropey' or 'stringy' feel
Neural Reflexes	Initially may not be present	Somaticosomatic and Somaticovisceral reflexes
Pain	Tenderness or acute pain	Slight or absent tenderness

Contraindications to treatment such as fractures, neoplasms, infection, open wounds, recent surgery or acute pain must be considered. If any contraindications have been found no treatment is warranted until further guidance can be sought and approved by the patients primary medical care provider.

Assuming no contraindication have been found, an initial treatment algorithm may resemble the following:

Osteopathic Mobilizations: 3-5x holding for 2 sec and releasing

- Thoracic
  - Seated extension
  - Prone Alternating P-A, thoracic joint mobilization
  - Prone P-A on TVP with PISI form in cross hand
- Lumbar
  - Prone Alternating P-A, lumbar joint mobilization
  - Prone P-A on TVP with pelvis pull
  - Lateral recumbent P-A contact on TVP with knee bent
- Sacral
  - Prone Bilateral flexion P-A sacrum/ilium
  - Prone Unilateral with Pelvis pull PISI on sacrum lift ilium
  - Lateral recumbent P-A with knee bent sacrum/ilium

Osteopathic muscular energy technique: 3-5x 5-2-5 protocol

- Thoracic
  - Seated lower thoracic rotation
- Lumbar
  - Seated lateral flexion
  - Prone with leg lift
  - Supine for psoas muscle
  - Lateral recumbent rotation
- Sacroiliac
  - Prone unilateral sacral flexion in sphinx position with breath assist
  - Prone Ilium flexion with breath assist
  - Lateral recumbent with shoulder resistance contact on ipsilateral ilium and superior lateral sacrum

Soft Tissue Technique

- Effleurage
- Petrissage
- Trigger Point
- Myofascial release

When soft tissue techniques are used in osteopathic treatment, consider myofascial meridians to work from a local to global perspective.

For more information on myofascial meridians and their structural influences visit Meyers, Anatomy Trains, 2014.

Cranial Sacral Techniques

- Dural Tube Flossing
- Lumbosacral Junction Technique
- Sacroiliac Joint Technique
- Myofascial Diaphragm Release
    - Thoracic Diaphragm
    - Pelvic floor Diaphragm

Visceral techniques

When considering the implementation of visceral technique, osteopathic lesions noted in spinal column segments could give indication to where restrictions may be found in the viscera and vice versa. In low back pain the practitioner could consider segmental restrictions from T10 – S2 as well as myofascial restrictions found within the structures supporting stomach, liver, small intestine, and large intestine as contributing factors.

Frequency of visits

The frequency of visits will depend upon initial findings during the osteopathic evaluation and the stage at which the somatic dysfunction is in. Using table 1 as a guide for somatic dysfunction Pourgol (Pourgol, 2014) suggests the following visit schedule for acute or chronic stages with the goal of maximum medical improvement.

Somatic Dysfunction	Week	Visits
Acute	1 2 3	3x 2x 1x
Chronic		Weekly

After each treatment it is important to look for improvements in palpatory tissue feel, range of motion and pain. If after 2 treatments you see no improvement it is incumbent upon the practitioner to change a method or modality of treatment. If improvement returns, continue with same course of action until diminishing returns of clinical effectiveness. Carry on with this pattern of treatment until correct range of motion for that individual returns with out pain or you have been treating for 5-6 months. If pain continues for 3 months refer to primary care provider for further evaluation. If you have reached the 5-6 month mark after continual treatment change with no improvement in chronic somatic dysfunction, then maximum medical improvement has been reached and treatment should be stopped. It is at this point in the care of the client and the practitioner can refer to another health practitioner for further evaluation and treatment.

Homework/Home care

To encourage healing, the practitioner can assign any number of clinically relevant therapies. Using the data collected and deciding on the stage of the somatic dysfunction therapeutic modalities such as hydrotherapy, thermotherapy, cryotherapy can be implemented. Physical activity, stretching can be included as well to encourage improvements in strength, range of motion, and general overall wellness.

Conclusion

The goal of the Osteopathic Manual Practitioner is to facilitate health in cooperation with the client. By utilizing in-depth knowledge of the human body and clinical experience, the Osteopathic Manual Practitioner is in a position to support healing and educate the client and general public. By remaining true to the founding principles of Andrew Taylor Still, the Osteopathic Manual Practitioner can leverage the body's innate healing mechanism and achieve a healthy, fully functioning state.

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