Osteon Manual Therapy Training

"CPD in Spinal Manipulation"

PRE-COURSE INFORMATION

COURSE OVERVIEW

Lecturers
Mr. Giles Gyer, BSc (Hons) Osteopathy, Dip. MA, Dip. SM
Mr. Jimmy Michael, BSc (Hons) Osteopathy, BSc (Hons) Sports & Exercise Science, Dip. MA

OMT Spinal Manipulation for the management of pain and the treatment of musculoskeletal conditions.	• 4 day Practical Training Course • 16 Hrs of face to face teaching • 16 Hrs pre reading information • Total time 32 hours CPD. • Continued assessment throughout the course. • 30-45min Written competency test for all students.
Pre - Requisites	• Registered healthcare professionals • Student healthcare professionals (dependant on current degree level) • Sports Therapists (Dependant on qualification level) • Ability to participate and receive Manipulation. • Signed health-screening form.
Practical Requirements	• ALL students must be able to fully participate in Skeletal Manipulation during the course, and competency with the techniques must be achieved for completion of CPD
Theoretical Requirements	• Demonstrations • Clinical Reasoning Skills • Examination Techniques
Contact Time	• 16 hours teaching over 2 days • Lectures • Demonstrations on all techniques • Theory • Practical of all techniques

This course requires **ALL** students to receive and administer manipulation.

Students should **NOT** attend this course if there is any reason that prevents **FULL** participation.

This course is **NOT** suitable for participants who are pregnant

A health screening form is attached. This form **MUST** be completed and brought with you on the course, and this form will be kept confidential.

COURSE CONTENT

OMT Training will introduce the participants of OMT Spinal Manipulation into the theoretical and practical principals of using Manipulation techniques within a clinical setting for the treatment of a number of musculoskeletal conditions.

The training will look at the most effective manipulative techniques used within a clinical setting, giving the students a sound background of knowledge and skill to fully use OMT Spinal Manipulation techniques within their own practice.

This course has been FULLY underwritten by Balens Insurance and students who participate will be able to gain insurance to use manipulative techniques within their own practice.

This Course Will Give Students the Following;

- Safe, Sound and effective background in the use of OMT Spinal Manipulation
- OMT Spinal Manipulation will offer participants a fantastic new skill base with which they can use within their clinical practice.
- Discuss scientific evidence for the use of manipulation techniques
- Discuss current research for the use of Manipulation.
- Relate the use of Manipulation to the treatment of acute and chronic pain, and for a number of musculoskeletal conditions.
- Give students a high level of safety, clinical competence and overall the confidence to use manipulation techniques.

Please Note -

1. Course handbooks will be provided, and the content of the handbook will be underpinned by a structured PowerPoint presentation by the lecturers.

2. Students will be expected to take extra notes regarding areas and techniques that will require more specific explanation or detailed clarification.

3. The handbook and PowerPoint's are solely to be used as an aide memoire; the lecturers will adapt the content of the course depending on the student's backgrounds or therapeutic discipline.

4. Students are **ADVISED** to refresh their knowledge of relevant anatomy and physiology prior to attending the course, if students fail tot show the required level of knowledge they can be asked to leave the course.

Learning Outcome/Objectives

At the completion of OMT Spinal Manipulation, students will be able to:

- Discuss current best evidence relating to the use of High Velocity Thrust (HVT) thrust techniques.
- Describe risks and benefits of HVT thrust techniques as applicable to each region of the spine.
- Describe absolute and relative contraindications of HVT thrust techniques.
- Discuss evidence supporting the use and interpretation of clinical tests, Quadrant testing, Slump testing, Straight leg Raise (SLR).
- Discuss the rationale for the use of HVT thrust techniques.
- Describe and demonstrate spinal positioning and locking in different regions of the spine necessary to ensure patient comfort, safety and the effective delivery of HVT thrust techniques.

- Demonstrate proficiency in the delivery of HVT thrust techniques such lift techniques, prone, side lying and supine techniques.
- Ares covered within the training weekend are the cervical-thoracic junction (C7-T1), thoracic spine (T1-T12), Ribs, thoracic- lumbar junction (T12-L1), lumbar spine (L1-S1).
- HVT to OA, AA, C1-C6 and SIJ are not covered within this CPD course.

Program Outline

DAY 1:
Welcome and Introductions.
Introduction to HVT thrust techniques: • Cavitation • Indications for the use of HVT thrust techniques • Complications/contraindications/red flags & safety • Evidence Summary • Clinical Decision Making
Principles of spinal locking using a coupled motion model.
Introduction to HVT thrust techniques
Spinal positioning and locking - Cervical spine, Thoracic Spine, Active and Passive examination, articulation and mobilization techniques. **Note – No CSP HVT's are taught on this module, full articulation and mobilization techniques will be covered for the cervical spine instead.**
Thoracic spine positioning and locking - Active and Passive examination, articulation and mobilization techniques. HVT thrust techniques for the TSP / RIBS, Prone.
Summary and Discussion.

DAY 1:
Cervico-Thoracic Junction and Thoracic Spine and Rib Cage, pain provocation testing, relevant diagnostic testing, Active and passive examination of CTJ and Tsp.
CTJ HVT thrust techniques, Lift and prone techniques.
Thoracic spine and Rib Cage HVT thrust techniques, seated and supine.
Lunch.
When to use HVT thrust techniques.
Review of CTJ / Thoracic Thrust techniques
Summary and Discussion.

Spinal Manipulation - Day 2

Learning Outcomes/Objectives

Upon completion of Module 2, participants should be able to:

- Discuss current best evidence relating to the use of High Velocity Thrust (HVT) thrust techniques.
- Describe risks and benefits of HVT thrust techniques as applicable to each region of the spine.
- Demonstrate enhanced proficiency in pre-thrust spinal positioning of the thoracic-lumbar junction, lumbar, and sacroiliac regions.
- Demonstrate enhanced proficiency in the delivery of HVT thrust techniques for thoracic, lumbar, and sacroiliac regions.
- Describe and demonstrate the spinal positioning and locking used in thoracic, and lumbosacral HVT thrust techniques necessary to ensure patient comfort and safety.
- Demonstrate proficiency in the delivery of HVT thrust techniques for the Thoracic – Lumbar Junction and Lumbar Spine.

Program

DAY 2:
Introduction and Opening Remarks.
Clinical decision making, SLR, Slump testing, Active and passive examination of the TLJ, Lumbar Spine.
Principles of spinal locking within the Lumbar Spine and patient comfort.
Thoracic-Lumbar junction HVT thrust techniques.
Lumbar spine HVT thrust techniques
Lunch.
HVT thrust techniques & disc lesions.
L5-S1 HVT thrust techniques, alternate positioning
Lumbar spine HVT thrust techniques - technique refinement.
Review of CTJ, thoracic, lumbar, SIJ and Pelvis HVT techniques
Summary and Discussion.
Written Examination

Health Screening

Student Name	
Course Dates	
Students Contact Address	
Students Contact E-mail	
Students Contact Telephone Number	
Do you know of any medical reason that you should not receive Manipulative therapy?	
Are you receiving any medication that may interact with manipulation?	
Are you pregnant?	
Have you had any adverse effects to manipulative therapy before?	
I give my consent to receive manipulation from the course tutor / tutors and from my fellow students under tutor supervision.	Signed:

All forms will remain confidential; this short health screen is intended to do the following.

- Safeguard you during your training
- Inform us of and health issues that may prevent training
- Prevent adverse effects from the techniques shown
- Allow for a safe learning environment for tutors and students

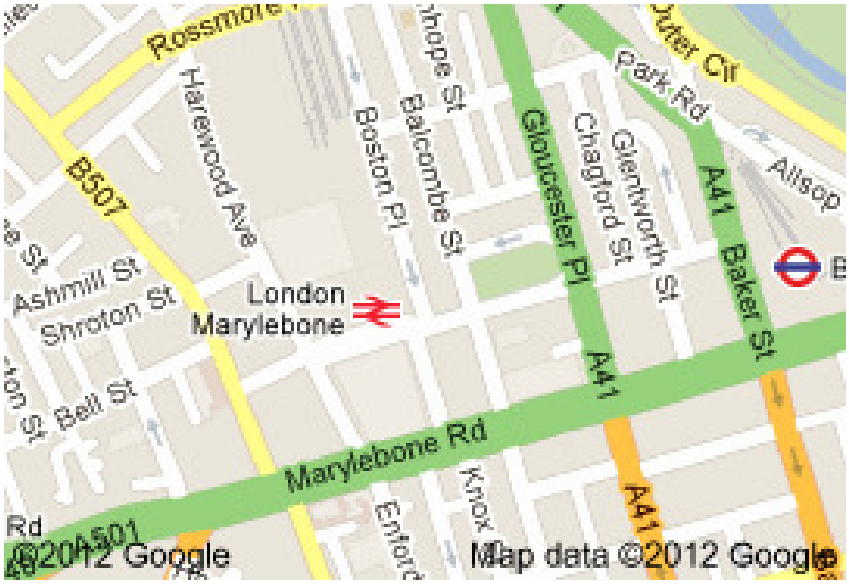
N.B Please bring this completed form with you on the day of your course.

Course Location

The London College of Osteopathic Medicine,

8 - 10 Boston Place.

London, NW1 6QH.



Transport

Nearest Station and Tube: Marylebone Station and Underground – 1 minute walk

Baker Street Station – 5 minute walk

For further information please email
bookings@omttraining.co.uk

Pre – Read Information

Legislation within the UK

In the UK, at present, there are no regulations governing manipulation training and no regulations governing the practice of manipulative technique, this CPD is designed to provide students with the highest possible standards of training in the use of manipulative techniques within clinical practice.

Insurance to Practice

Once you have completed this CPD successfully, manipulation is normally covered by your existing professional insurance provider, that you are now using manipulation.

What Is Manipulation

Manipulation is a manual therapy technique comprised of a continuum of skilled passive movements to joints and/or related soft tissues that are applied at varying speeds and amplitudes, including a small amplitude/high velocity therapeutic movement

Manipulation Education Committee, June 2003- Thrust Joint Manipulation (TJM)- high velocity, low amplitude therapeutic movements within or at end range of motion.

History of Manipulation

Manual medicine or manipulation was not invented by Andrew Taylor Still, the man accredited with the formulation of Osteopathy. Manipulation as a form of therapy was present for many centuries before his birth. Egyptian hieroglyphics show pictographs of a practitioner manipulating the body of a patient.

Nobody holds the rights to manipulation or manipulative technique, Osteopaths, Chiropractors, Physiotherapists, Doctors, and Manual Therapists who use these techniques are not the sole guardians of this style of therapy, and these techniques have been around for hundreds and hundreds of years. Even

Hippocrates the founding father of Medicine around 460-355 B.C, wrote about setting joints by leverage and details the use of manipulation.

Bone Setters

A bonesetter is a practitioner of joint manipulation. Before the advent of chiropractors, osteopaths, and physical therapists, bonesetters were the main providers of this type of treatment. Bonesetters would also reduce joint dislocations and re-set bone fractures. Bone setting flourished in Europe during the period of 1600 to the 1900's. There were no formal training techniques; they were all passed down within families. Clicking sounds were thought to be due to moving bones back into place.

Osteopathy

Andrew Taylor Still, a medical doctor founded Osteopathy in 1874 due to being unhappy with the practice of medicine of the time. A.T. Still believed that structure and function are interrelated in keeping the whole person healthy. This included using Osteopathic manipulation that he learnt from bone setters. In 1895, Daniel Palmer formed Chiropractic and also used manipulative therapy to promote healing.

Overall, manipulation of joint structures in older the current therapeutic practices combined. No therapy can claim to own manipulative techniques.

Website of Interest

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2538670/pdf/canfamphys00424-0081.pdf

What Are Joint Mobilisations/Manipulations

Joint mobilisations or articulations are a type of passive movement of a skeletal joint. It is usually aimed at a 'target' joint with the aim of achieving a therapeutic effect. Mobilizations are commonly used, hands on technique that aim to address joint stiffness and pain. It helps to increase the range of motion and to reduce the muscular tone surrounding the affected joint.

Manipulation is the application of a high velocity thrust to a specific joint. This is where we aim this course.

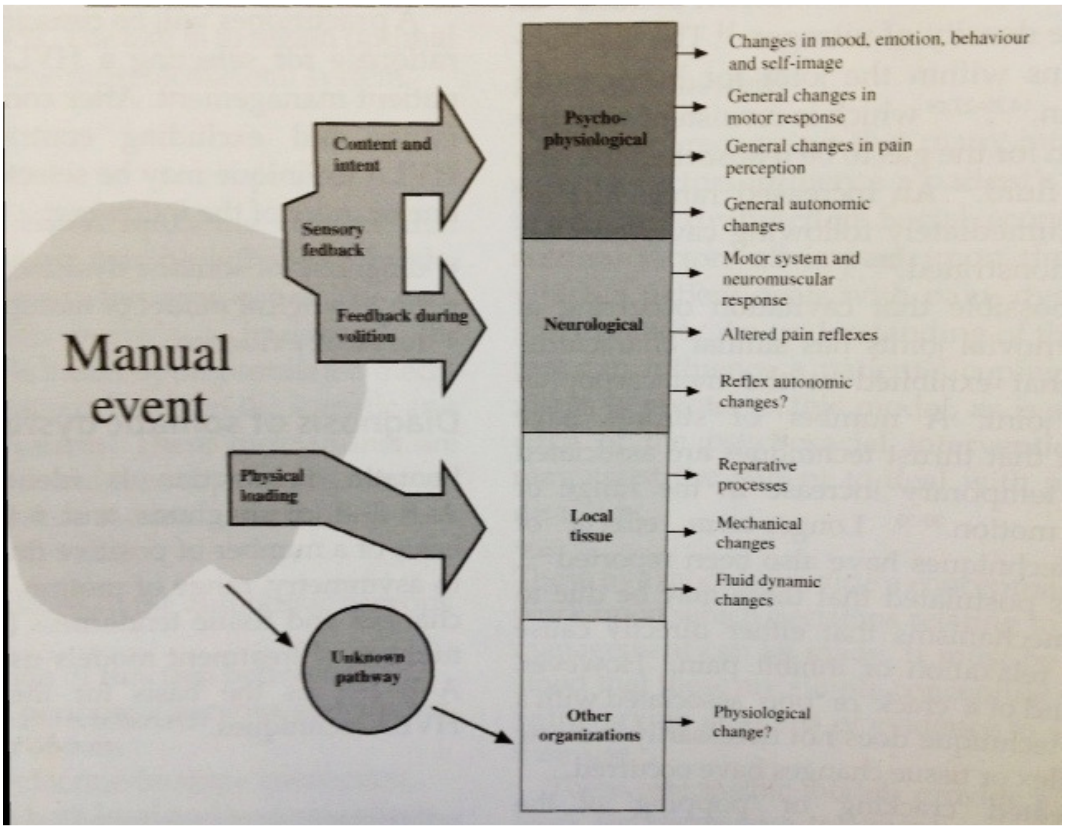
High velocity, low amplitude (HVLA) is a technique employing a rapid, therapeutic force of brief duration that travels a short distance within the anatomic range of motion of a joint, and that engages the restrictive barrier in one or more places of motion to elicit release of restriction.

When a HVT is performed, it is likely a clicking sound will occur. There is much conjecture as to what this sound actually is. At this stage it has been agreed that whatever the sound is it consist of air collapsing in on itself. It's the chemicals in the air that is debated. However, the clicking sound is not the primary factor to determine success of the HVT. In time you may feel the joint move but the main thing to do after the HVT is to re test area. If the joint ROM has improved and pain has decreased…..then success!!

Why use HVT's?

Practioner's use three treatments and reasoning models.

1. Biomechanical
2. Neurological
    a. ANS
    b. Pain
    c. Neuroendocrine
3. Respiratory / Circulatory



Overall, no matter what the reason for using manipulation it should be a carefully thought process with the intention of increasing quality and quantity of movement. Remember, manipulation is just another tool in the tool box of techniques that you have available as a skilled practitioner.

What is the Click?

The aim of the HVT is to achieve joint cavitation, that is accompanied by a "popping" or "clicking" sound. This audible release distinguishes HVT procedures from other manipulative techniques.

The thought process is that the clicking sound is generated by a drop in internal joint pressure. Following cavitation there is an increase in the joint space and gas is found within that space.
The gas is thought to be 80% carbon dioxide or having the density of nitrogen.

The gas bubble remains in the joint for between 15-30minutes due to the time taken to reabsorb into the synovial fluid.

Studies have shown that HVT is associated with temporary ROM increases within the joint, and longer term effects have been reported.

The short term and long term effects are possibly due to reflex mechanisms that either directly cause muscle relaxation or inhibit pain.

The clicking sound should not be associated with a successful manipulation. Your guide should be palpation and retesting for an increase in ROM.

Repetitive manipulation has not been shown to be linked with an increased incidence of degenerative changes within the joints.

Website of Interest
http://www.ncbi.nlm.nih.gov/pubmed/7790795

Contraindications to Spinal Manipulation / Safe Practice

There are risks and benefits to all therapeutic modalities, High Velocity Thrusts (HVT) are considered to be potentially more dangerous than non-thrust mobilizations, but these risk can be minimized with the correct assessment, examinations, and following safe practice guidelines.

HVT Complications – Serious

1. Death
2. Cerebrovascular Accident
3. Spinal Cord Compression
4. Cauda Equine Syndrome

HVT Complications – Substantive

1. Disc Herniation
2. Disc prolapse
3. Nerve Root Compression
4. Fracture

HVT Complications – Minor

1. Local pain and Discomfort
2. Headache
3. Tiredness
4. Radiating pain or discomfort
5. Dizziness
6. Nausea
7. Hot skin
8. Fainting

These side effects generally disappear within 24hrs of treatment.

Causes of Complications

1. Lack of diagnosis
2. Lack of awareness of complications
3. Inadequate palpatory assessment
4. Lack of patient consent

Poor Technique

1. Excessive force
2. Excessive amplitude
3. Excessive leverage
4. Inappropriate combination of leverage
5. Poor patient positioning
6. Lack of patient feedback

Never substitute technique and skill for force

Contraindications

When using HVT techniques, you must always look at the Risk V's Reward ratio, and it must always be that the benefit of the patient must outweigh ANY potential risk associated with the intervention.

ABSOLUTE contraindications to HVT

Bone – any pathology that has resulted in significant bone weakness or weakening:

- Tumour – metastatic deposits
- Infection – Tuberculosis
- Metabolic – Osteomalacia
- Congenital – Dysplasias
- Iatrogenic – Long term Nsaids
- Inflammatory – Sever RA
- Trauma – fracture

Neurological

- Cervical Myelopathy
- Cord Compression
- Cauda equina Compression
- Nerve root compression with increasing neurological deficit.

Vascular

- Diagnosed vertebrobasilar insufficiency
- Excessively High uncontrolled blood pressure
- Aortic aneurysm
- Bleeding diatheses – sever haemophilia

Therapist

- Lack of Diagnosis
- Lack of patient consent
- Patient positioning cannot be achieved because of pain or resistance.

HVT Considerations / Cautions

Special considerations should be given to the following patients and their presentation.

- Adverse reactions to previous manual therapy
- Disc herniation or prolapse
- Inflammatory arthritides
- Pregnancy
- Spondylolysis
- Spondylolisthesis
- Osteoporosis
- Anticoagulant or long term corticosteroid use
- Advanced degenerative joint disease and spondylosis
- High blood pressure
- Ligament laxity

4 Step Guide to Manipulation

1. **Screening**
    a. Red Flags (Pathology)
    b. Yellow Flags (Psycho-Social)

2. **Examination**
    a. Passive
    b. Palpation
    c. Active
    d. Special Tests

3. **Technique**
    a. Prone
    b. Supine
    c. Side lying / Seated

4. **Re-Examine**
    a. Range of movement
    b. Quality and quantity of movement
    c. Pain Levels

Step 1 - Screening

Red Flags

This can help identify signs of serious of pathology, see contraindications for a list of specific red flags to manipulation.

Yellow Flags

Are less serious conditions, that warrant caution when considering the use of manipulation, for example, diabetes or patient non compliant.

Step 2 – Examination

TART

Tissue Texture

This is a palpatory assessment. You are looking for tissue texture changes which usually accompany somatic dysfunction.

Asymmetry

The position of bony landmarks

Restriction

Active and passive examination looking for ROM. You are looking for quality and quantity.

Tenderness

Usually from palpatory pressure in which the patient reports discomfort. It is an objective test that the practitioner applies a measured force to the patient. Patient responds with individual sensitivity or threshold for pain. Tenderness differs from pain. Pain is a subjective cerebral perception from nocicpetors.

Step 3 – Technique

The following are workshops showing specific manipulative techniques applied to the vertebral column from the cervical to the lumbar spine, all techniques are described using different couch heights, hand holds and patient positioning.

The aim of these techniques is to achieve a joint cavitation within the synovial joints of the spine and periphery, and as discussed, the cause of the popping or cracking sound is open to debate and continued research.

It is through clinical screening of the patient that will direct the practioner towards any possible somatic dysfunction and / or pathology. The use of HVT techniques is always dependant on a diagnosis of somatic dysfunction.

Somatic dysfunction is identified by the T.A.R.T mnemonic which has been previously covered.

This manual is designed to be a safe and effective starting point upon which practitioner can build basic and then more refined technical skill.

No text can teach the subtlety required, for example the appropriate pre thrust tension is difficult to describe and acquire. Extensive practice under the supervision of skilled and experienced clinician is advised.

The workshops lay out the primary and secondary joint leverages required to facilitate effective localization of forces to a specific segment of the spine prior to application of the thrust.

If the instructions are followed, the result is likely to achieve joint gliding and cavitation with the use of minimal force. The joint to be thrust should not be

locked by facet apposition, but remain free so that the practitioner can direct a gliding thrust along the joint plane.

Appropriate pre thrust tension is then developed by positioning the joint towards the limit of its physiological and not at its pathological barrier.
The techniques are described using facet apposition locking.

This technique is where you combine flexion, side bending and rotation to allow you to engage the barrier safely.

Patient relaxation is essential for an effective HVT, and you may incorporate the use of breathing techniques or distraction methods.

Prior to manipulation have you…

1. Excluded all contraindications?
2. Explained to the patient what you are going to do?
3. Do you have informed consent?
4. Patient positioned comfortably?
5. Are you in a comfortable position?
6. Do you need to modify the technique?
7. Have you achieved appropriate pre-thrust tissue tension?
8. Is the patient happy for you to proceed?

Step 4 – Re Examination

Revisit steps one and two.

Special Testing

There are several clinical examinations that you can and should perform prior to any spinal manipulation, it will not only aid your diagnosis but also facilitate safe practice. The special tests outlined below will be covered throughout the two day CPD.

Blood Pressure Screening

One of the easiest and least provocative tests you can perform prior to treatment would be a general blood pressure screening of your patient.

This can tell you the underlying general health of the patient, if the patient has undiagnosed high blood pressure, and as we have seen, excessively high blood pressure is a contraindication to cervical manipulation.

Blood pressure (BP), sometimes referred to as arterial blood pressure, is the pressure exerted by circulating blood upon the walls of blood vessels, and is one of the principal vital signs. When used without further specification, "blood pressure" usually refers to the arterial pressure of the systemic circulation. During each heartbeat, blood pressure varies between a maximum (systolic) and a minimum (diastolic) pressure. The blood pressure in the circulation is principally due to the pumping action of the heart. Differences in mean blood pressure are responsible for blood flow from one location to another in the circulation. The rate of mean blood flow depends on the resistance to flow presented by the blood vessels. Mean blood pressure decreases as the circulating blood moves away from the heart through arteries and capillaries due to viscous losses of energy. Mean blood pressure drops over the whole circulation, although most of the fall occurs along the small arteries and arterioles. Gravity affects blood pressure via hydrostatic forces (e.g., during standing) and valves in veins, breathing, and pumping from contraction of skeletal muscles also influence blood pressure in veins.

Blood pressure without further specification usually refers to the systemic arterial pressure measured at a person's upper arm and is a measure of the pressure in the brachial artery, the major artery in the upper arm. A person's blood pressure is usually expressed in terms of the systolic pressure over diastolic pressure and is measured in millimetres of mercury (mmHg), for example 120/80.

Classification of blood pressure for adults

Category	systolic, mmHg	diastolic, mmHg
Hypotension	< 90	< 60
Desired	90–119	60–79
Prehypertension	120–139	80–89
Stage 1 Hypertension	140–159	90–99
Stage 2 Hypertension	160–179	100–109
Hypertensive Emergency	≥ 180	≥ 110

Important Information

Any patient with a blood pressure of 160/90 (that is uncontrolled via medication and you have repeated the test 3 times with three consecutive high readings) manipulation is contraindicated and you should be advising that your patient visit their GP as soon as possible. A reading of 160/100+ should be an immediate referral to the nearest hospital as the risk of heart attack and stroke is greatly increased.

Quadrant Testing

Quadrant testing can be used as a test in the Csp, Tsp and Lsp. It is most useful in the Csp and Lsp and can be completed standing, seated and supine.

In brief, when flexing the patient you are compressing the disc and when extending the patient you are compressing the facet. Reproduction of the symptoms the patient feels is key.

Straight Leg Raise (SLR)

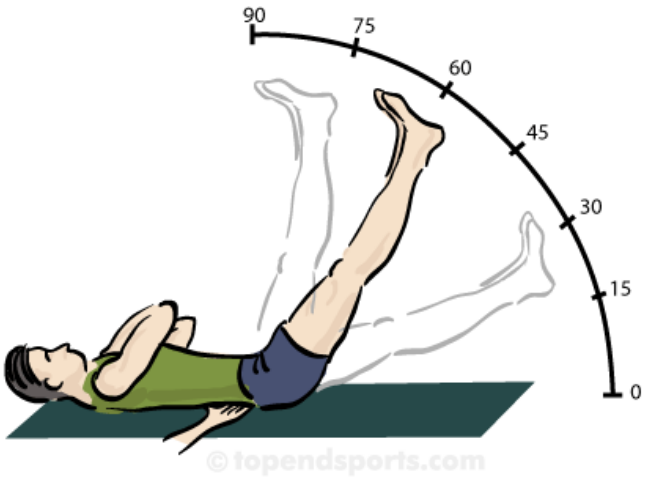
This is a test for lumbosacral nerve root irritation for example, due to disc prolapse.

With the patient laid on their back:

- raise one leg - knee absolutely straight - until pain is experienced in the thigh, buttock and calf
- record angle at which pain occurs - a normal value would be 80-90 degrees - higher in people with ligament laxity
- perform sciatic stretch test - dorsiflex foot at this point of discomfort - test is positive if additional pain results
- flexing the knee will relieve the buttock pain - but this is restored by pressing on the lateral popliteal nerve

Severe root irritation is indicated when straight raising of the leg on the unaffected side produces pain on the affected side. A central disc prolapse is likely with risk to the cauda equina and consequently, of bladder dysfunction.

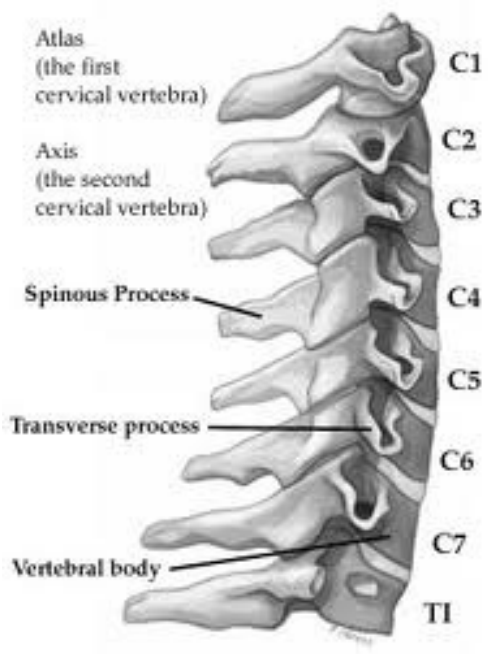
Pain upon straight leg raising before the leg is raised 30 degrees cannot be due to disc prolapse as the nerve root is not stretched within this range. Another explanation of nerve root irritation must then be sought.



Testing Rib Excursion

Place you hands on the patients back (seated). The tips of your thumbs should meet at the spinous process. Ask the patient to take a deep breath in. The ribs should expand 5cm or more. **Normal rib expansion is = 5cm approx.**

Cervical Spine

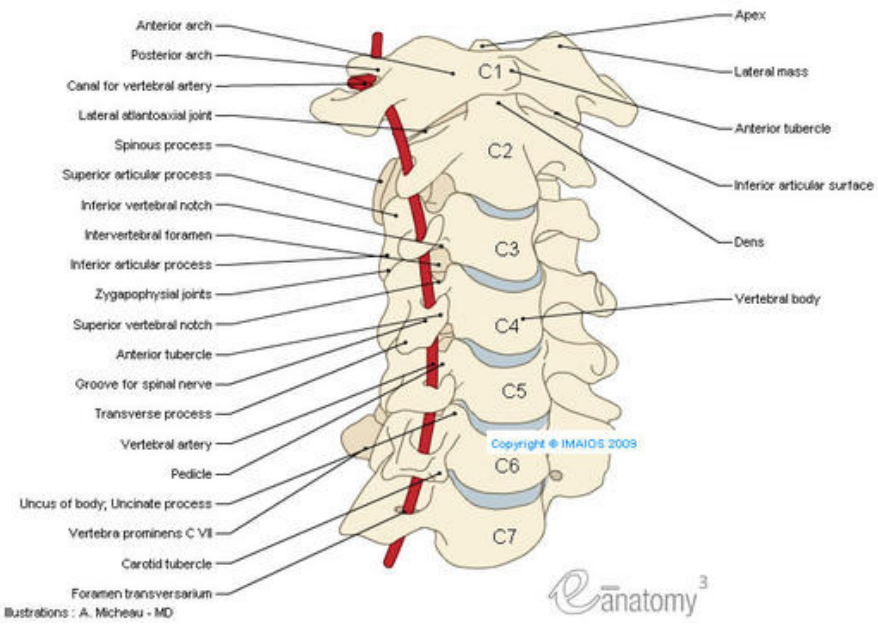


The movement of nodding the head takes place predominantly through flexion and extension at the joint between the atlas and the occipital bone, the atlanto-occipital joint. However, the cervical spine is comparatively mobile, and some component of this movement is due to flexion and extension of the vertebral column itself.

The movement of shaking or rotating the head left and right happens almost entirely at the joint between the atlas and the axis, the atlanto-axial joint. A small amount of rotation of the vertebral column itself contributes to the movement.

Vertebral Arteries

The vertebral arteries arise from the subclavian arteries, on both sides of the body. They enter deep to the transverse process of the level of the 6th cervical vertebrae (C6). Or occasionally (in 7.5% of cases) at the level of C7. They then proceed superiorly, in the transverse foramen of each cervical vertebra until C1. At the C1 level the vertebral arteries enter the posterior aspect of the brain.



Cervical Spine Movement

FORWARD / BACKWARD BENDING

With your fingers on the articular pillars, flex the patient's neck until you feel motion at the articular pillars. Return the patient's head to neutral. Introduce backward bending up to your palpating fingers at the articular pillars. Use your palpating fingers as fulcrum. Feel the fluidity and amount of motion. Note any asymmetry of motion

SIDE BENDING

Palpating fingers on the articular pillars. Introduce side bending until you feel motion at your fingertips. Check each segment. Note the displacement of the patient's head from the midline. Greater motion to one side than the other indicates a side bending restriction on the side of the decreased motion. Feel the fluidity of motion at your fingertips

TRANSLATORY MOTION (SIDE BENDING AND ROTATION)

Palpating fingers on the articular pillars of one segment, cervical spine in neutral. Push the pillar in a left-to-right direction. This translatory motion to the right creates a side bending to the left. Then push right to left, creating a side bending

to the right. Note any symmetry of motion. If the translation to the left is good, it means that the vertebra side bends well on the right

Range of motion available in the Cervical spine (Approx)

50 degrees of flexion – 7 degrees per segment,
60 degrees of extension – 8.5 degrees per segment
45 degrees of side bending – 6 degrees per segment
80 degrees of rotation – 11 degrees per segment

PALPATION

CERVICAL SPINE From C2 to C7

1. Spinous Process
2. Transverse Process
3. Paravertbral Gutter – Facet Joints
4. Occiput
5. Mastoid Process

Cervico-Thoracic Junction (CTJ)

The area is junctional. There will be a change in orientation of anatomical curves. C7-T1 cervical lordosis normally ends and thoracic kyphosis begins As a result, the forces placed on this area are quite complex and of a different nature from forces sustained higher or lower. A mobile area: the neck, meets a less mobile area: the thoracic spine and ribs

The use of the arms puts mechanical strains on the area. It requires this area to be stable, and this very stability means that the range of movement of the joints is somewhat limited. This limitation can lead to a greater susceptibility to mechanical strain in these joints. Therefore, this region can be a source of more frustration in attempting to achieve successful technique results than almost any other area. Somatic dysfunction of the cervico thoracic junction is quite common and difficult to treat

How do you differentiate C6 from C7?

Palpate both ask patient to backward bend, C6 disappears or passively flex and extend the patient's neck. With this movement, the C6 spinous process moves in and out and the C7 spinous process remains stationery

PASSIVE EXAMINATION

The spinous process of C7 is located at the base of the neck. It protrudes further than C6, C5 and C4, a helpful distinction when locating structures in the upper back and neck. With the patient seated place your thumb pad superior to the base of the neck along the midline of the body. Slide inferiorly. At the base of the neck, your thumb will bump into the process of C7. Make sure the process superior to your finger is smaller than the process you are palpating. Also make sure that thereon the equally protruding process of T1 is immediately inferior. When the neck is flexed, the spinous process of C7 shifts superiorly. T1 however, is buckled in by the first ribs and does not move.

The Thoracic Spine (Tsp)

The Tsp is made up of 12 vertebrae. It is not as mobile as the cervical or the lumbar spine. This is due to its connections with the ribs and sternum via the costovertebral joints.

The Tsp normally displays a gentle kyphosis, which is a C-Shape curve posteriorly. This shape is mainly caused by the wedge shaped vertebral bodies. The vertebrae are slightly higher on the posterior then the anterior edges. This can be changed by posture, psychological well being as systemic conditions such as osteoporosis.

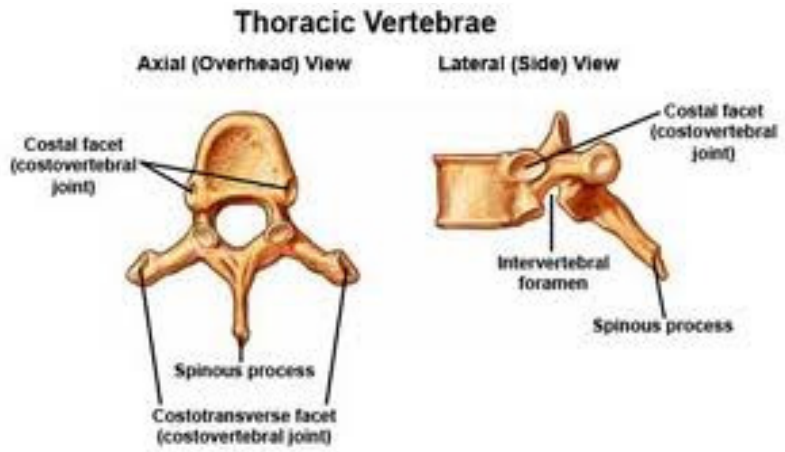
The degrees of movement created by the Tsp per segment are flexion, extension, sidebending, rotation and sidebending

Facet Joints

The articular facets (where we concentrate the manipulation on) can be described as superior and inferior articular facets. The superior articular facets are from the vertebrae above (eg, T1 on T2….the superior facet is T1) and faces backward, upward and lateral. The inferior facet faces forward, downward and medially.

Transverse and Spinous Processes (TPs and SPs)

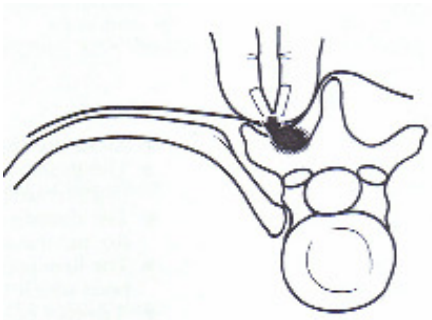
The TPs face laterally and slightly posterior. They have articular facets at the anterior aspects which articulates with the corresponding ribs. These are often incorrectly referred to as rib heads. The SPs face posterior and inferior.



Unilateral Palpation of the facet joints in the paravertebral gutter

It is surprising how sensitive and tender palpation of the paravertebral gutter can be so it is appropriate to commence gently using light pressure initially and then gradually increasing the pressure to provoke underlying symptoms.

Stand at the side of the patient/or head. Direct pressure is applied 2-3cm from the spinous process with opposed straight vertical thumbs (kissing nails) systematically alongside the vertebral column on one side and then the other side. If a symptomatic level is found, palpate above, below and opposite this site.



TO PROVOKE COSTO-TRANSVERSE JOINT PAIN

4-5cm from the midline (kissing nails). If the costotransverse joint is affected it is very painful to pressure since it is relatively superficial and also produces soft tissue irritation in its vicinity

Movement of Thoracic Spine (per segment)

Flexion – 6 degrees
Extension – 2.5 degrees
Sidebending – 3 degrees
Rotation – 4.5 degrees

Ribs 2-12

In this workshop we will be concentrating on rib 2-12. We will not be covering Rib 1.

Anatomy

The heads of ribs 2 – 12 articulate with the bodies of the corresponding vertebrae and the one above as well with the corresponding intervertebral disc. The costo-vertebral articulation is a synovial joint with a joint capsule strengthened by costo-vertebral ligaments.

Costo-Transverse Articulations

Consists of the articulation of the tubercle of the rib and the transverse process of the corresponding vertebrae.

Anterior Articulation

Anterior end of the rib is joined to its costal cartilage by the costochondral joint.

Examination of Ribs

Upper Ribs 1 – 3 = Pump Handle

Middle Ribs 4 – 7 = Bucket Handle

Lower Ribs 8-12 = Pincer Movement

Lumbar Spine

The lumbar vertebral bodies are larger than those of the thoracic. They are wider side to side (transversely) than back to front; they are thicker at the front than at the back, thus creating the characteristic lordotic curve. The spinous processes (SP's) are directed back horizontally. The transverse processes (TP's) are also in the same horizontal plane.

The fifth lumbar has a larger body, thicker and shorter TP's, a smaller SP, and is markedly higher in its anterior aspect. A large number of congenital defects occur at this level, e.g. sacralisation of the 5th lumbar.

The superior articular facets of the lumbars are concave and face primarily medially and backward. They are rotated 45º from the sagittal plane towards the frontal plane. The inferior articular facets are convex and face laterally and forward. The superior and inferior articular facets of the contiguous lumbar vertebrae fit into each other, forming zygopophyseal joints (articular facets).

Movement of Lumbar Spine (per segment)

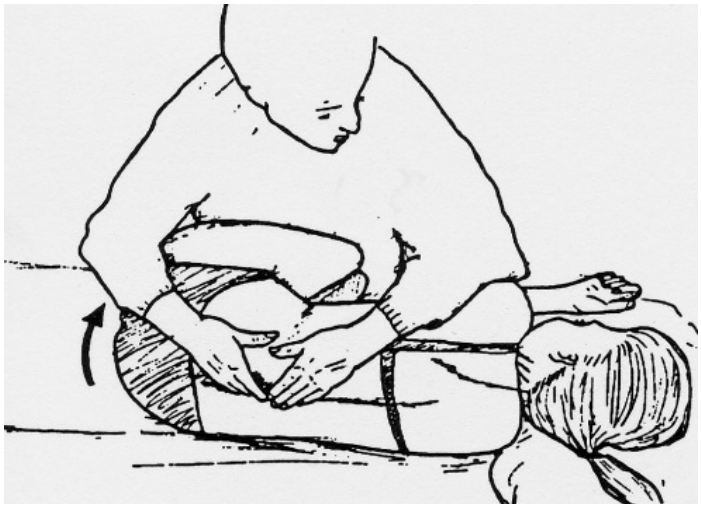
Flexion – 18 degrees
Extension – 6 degrees
Sidebending – 6 degrees
Rotation – 6 degrees

PASSIVE EXAMINATION

Passive - FLEXION

Patient side lying with hips and knees nearly fully flexed. Face the patient, level with their abdomen, with a wide stance, supporting the patient's legs on your thighs.

Move their knees cephalad, caudad, cephalad by rocking from one side to the other as you palpate the lumbar spine with the finger pads of both hands.

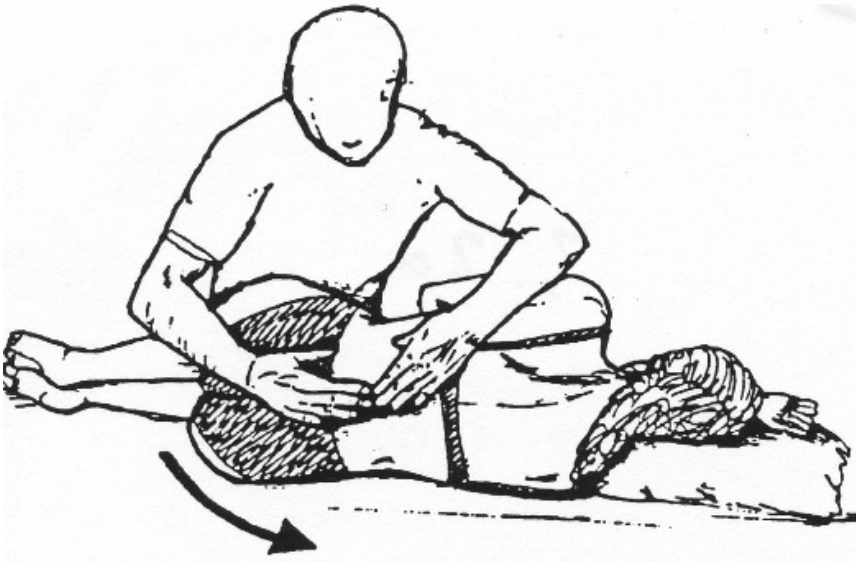


EXTENSION

Again supporting the patient's legs on your thighs, their hips and knees flexed to 50-60º

The patient's knees are moved caudad cephalad caudad.

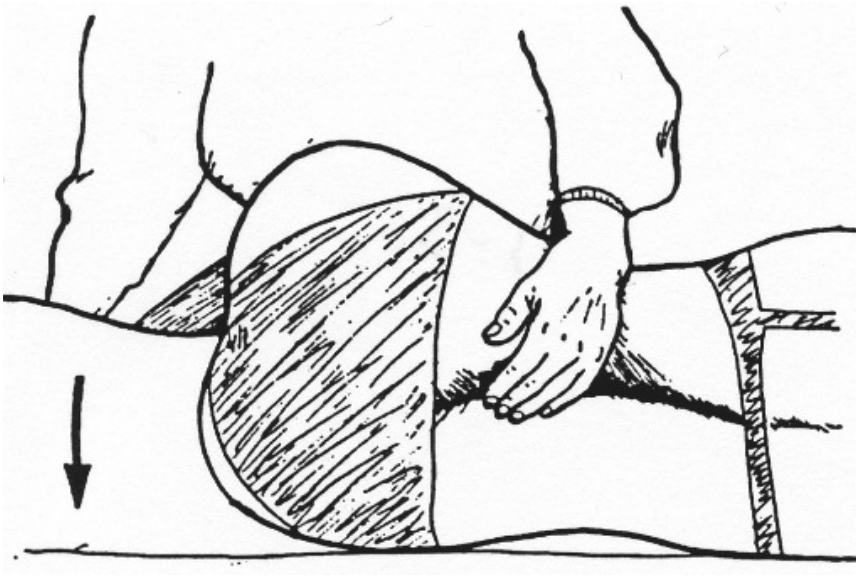
Again, you will need a wide stance to achieve this.



SIDEBENDING

Patient lies on right side, thighs and knees flexed at right angles. Stand facing the patient, level with their abdomen.

Whilst palpating the concavity of the spine (close to the SP's) with your cephalad hand, grip the patient's heels and move them downwards towards the floor. Work through the lumbars as you move the legs up and down.



Suggested Further Reading

Orthopedic Physical Assessment – Magee

Trail Guide to the Body – Biel

Anatomy and Physiology – Tortora