

Soft Tissue Joint Dysfunction

The type and extent of normal movement occurring in any joint depends on:

- The form of the articular surfaces
- The restraining influences of the ligaments
- The atmospheric pressure within the joint
- The control exerted by muscles as they act upon the joint

Manipulation is indicated if there is a loss of normal joint play, and if this is considered relevant to the patient's symptoms. Palpation of the spine for joint dysfunction entails pressure against the side of the spinous process, springing the spinous process and costovertebral joints, and pressure to the transverse process of the atlas for tenderness and decreased joint play.



If joint dysfunction is severe, if there is a high level of pain and muscle spasm, or if a large section of the spine is affected, then thrusting techniques may not be advisable. Mobilization techniques that affect muscle spasm and overcome movement restriction are usually more effective.

The direction of manipulation should be to the side that does not cause pain. If rotation of the neck is painful to the left but not painful to the right, manipulation needs to be done in rotation to the right. This means the manipulation achieves a gapping or opening up of the joints on the painful side. The gapping opens up the intervertebral foramen, and stretches the joint capsule.

The "cracking" sound of manipulation is caused by the rapid formation and bursting of a gas bubble of carbon dioxide, which forms in the joint from synovial fluid. An audible "crack" is not essential to signify a successful manipulation.

Absolute Contradictions to Manipulation

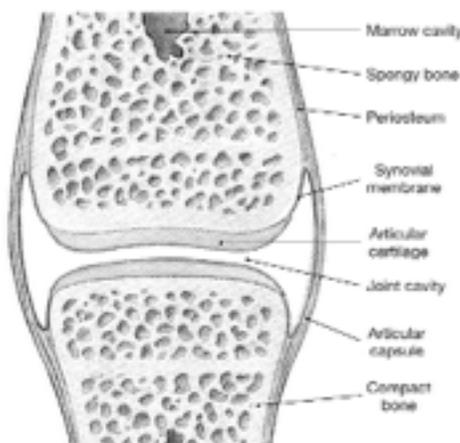
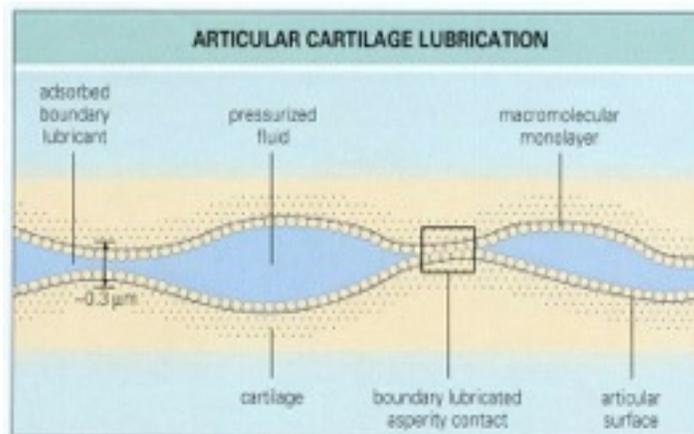
- Neoplasia (benign or malignant)
- Active infection or inflammation
- Rheumatoid arthritis
- Neurological changes such as spinal cord compression or cauda equina compression
- Instability following trauma

In a routine case, which is not very severe nor very acute, soft tissue joint dysfunctions (that are clinically important) are treated. After two weeks, re-examination is appropriate. If the patient shows no improvement at the second examination, we have to determine the reasons for lack of response. It is possible the diagnosis was incorrect, the condition relapsed, or new factors are producing similar symptoms. If response to manipulation is good but short lived, followed by relapse, the cause must be determined, e.g., cardiac ischemia in recurrent lesions of the upper thoracic spine.

Synovial Joint Disruption Type of Joint Dysfunction

When we distract a joint we have to overcome a resistance that is due not only to atmospheric pressure, but to the joint surfaces being “glued” together. It is the synovial fluid that serves as an adhesive. More specifically, it is a specific glycoprotein, **lubricin** that is made within synovial joints that is the principal binding substance.

On the surface of cartilage, lubricin may bind water, which through its cohesion with bound water on the opposing cartilage provides the bond or adhesive that has to be overcome with distraction. There is a flow of fluid between the articular cartilage and synovial cavity. Alterations produced by abnormal joints on normal lubrication mechanisms, or by normal joints on abnormal lubrication mechanisms can lead to joint dysfunction. Fixation of the joint and lack of normal glide properties in this dysfunction occur due to this loss of synovial fluid movement.



If motion in a synovial joint becomes restricted, synovial fluid may not circulate properly. This immobilization causes synovial fluid to undergo fibrofatty consolidation that progresses to more adherent fibrous tissue. Also, when areas of the joint capsule become ad-

herent to the bone do we have the synovial joint disruption.

A tight joint capsule will result in abnormal movement between joint surfaces, usually with premature cartilaginous compression before movement is completed. In most joint positions a joint has some “play” in it because joint surfaces do not fit tightly, and because the capsule and ligaments remain somewhat lax.

The goals of treatment for this joint dysfunction are:

- Restore normal synovial fluid circulation
- Restore normal gliding of the fixated joint surfaces.

Symptoms Related to Synovial Joint Disruption

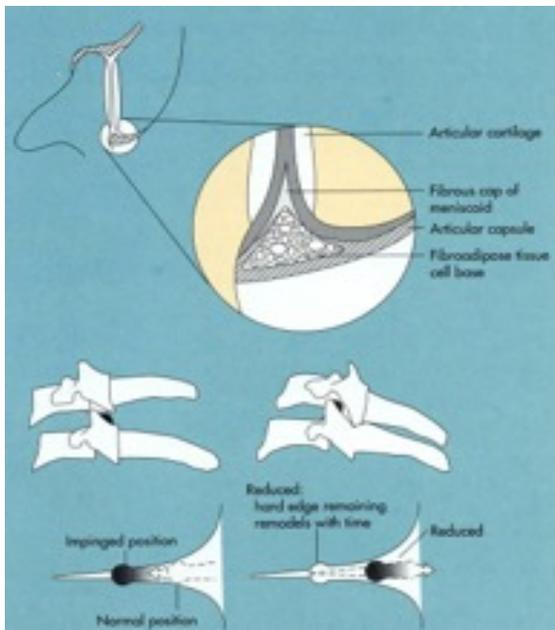
Patients will complain that the joint feels stiff and that it needs to be oiled.

Patients will say the joint feels like it needs to be “popped” or “cracked.”

Body Language Suggesting a Synovial Joint Disruption

- With hip joint fixation the patient will place his hands over the iliac crests.
- With involvement of the upper thoracic segments the patient will tug or pull on the spinous processes of the upper thoracic vertebrae.
- With involvement of the atlanto-occipital joint the patient will point with a finger to the rim of the atlas.
- With involvement of the shoulder the patient will complain of shoulder pain and stiffness and on abduction will rotate the shoulder anteriorly.

Myofascial Layer Disruption Type of Joint Dysfunction



Synovial joint capsules consist of an outer layer of dense fibroelastic connective tissue, and a vascular central layer consisting of a synovial membrane. Synovial folds are synovial-lined extensions of the capsule that protrude into the joint space to cover part of the hyaline cartilage. Synovial folds contain nociceptors and, are therefore, pain sensitive. If a synovial fold becomes compressed by or trapped between the articular surfaces, the joint will lock and pain will result.

Other connective tissue around the joint can also become distorted. Synovial folds and other connective tissue can become distorted from either a traction force or a compression force. Therefore, there are two subtypes of the myofascial layer disruption:

- Traction disruption
- Compression disruption

In traction disruption the connective tissues are tractioned and become distorted. In compression disruption the connective tissues become jammed and distorted. A traction disruption feels better with traction and worse with compression. A compression disruption feels better with compression and worse with traction.

Treatment of a myofascial layer disruption should never be painful. If it is the thrusting force needs to be changed from traction to compression or from compression to traction. Treat a traction disruption with traction or traction and thrust. Treat a compression disruption with compression or compression and thrust.

Symptoms Suggesting a Myofascial Layer Disruption

- The patient will state it hurts deep in the joint.
- There can be deep aching in the joint with swelling.
- Diffuse pain in the hand.
- Tightness of the first rib.
- Ache deep in the spine, worse with stretching.
- Tightness between the ribs.
- Deep ache in the leg.
- Swelling and deep ache in the foot.
- Ache with swelling of toe.

Body Language Suggesting a Myofascial Layer Disruption

- With traction disruption of the ankle the patient will gently grasp the ankle, distal leg or foot.
- With compression disruption of the ankle the patient will gently grasp the ankle and will also make a sideways pushing sweep with the fingers back and forth across the top of the ankle.
- With traction disruption of the knee the patient gently cups the knee or tugs on the thigh.
- With compression disruption of the knee the patient gently cups the knee and rubs fingers back and forth across the inferior knee.
- In traction disruption of the shoulder the patient squeezes the shoulder or tugs on the shoulder.
- In compression disruption of the shoulder the patient squeezes the shoulder and pushes several fingers across the humeral head.

- With a compression disruption of the hip joint the patient will push his fingers across the anterior femoral head.
- If the patient pushes his thumb deep into the anterior forearm or grasps tightly with his fingers and tugs on the radius or ulna this suggests a myofascial layer disruption of the interosseous membrane.
- If the patient reaches over his shoulder and tugs up on the mid-posterior ribs with his fingers this suggests a myofascial layer disruption.
- If the patient places the back of his hand or his fist over the lumbar vertebrae this suggests a myofascial layer disruption type of joint dysfunction.

Joint Dysfunction - An Overview

According to Lewit the most frequent cause of joint dysfunction is a faulty movement pattern due to muscular imbalance, and postural overstrain. The second most common cause of joint dysfunction is trauma. Lewit also states that visceral disease causing nociceptive stimuli is followed by reflex spasm, particularly in the deeper layers of the erector spinae. If the spasm is of sufficient duration, joint dysfunction is likely to occur. A striking characteristic of this type of joint dysfunction is its recurrence with relapses of the internal disease.

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Another important cause of joint dysfunction is disturbed movement patterns. Faulty coordination and patterning of muscle function due to disturbed CNS control. Certain muscles will be weak and inhibited, not contracting in the correct sequence and others will be shortened and tight. There may also be abnormal proprioceptive function.

Joint Dysfunction	Common Symptoms Related to the Dysfunction
TMJ	Headache on the side of the affected joint. Pain radiating into the face.
C0-C1	Headache and/or vertigo. Chronic recurrent tonsillitis.
C1-C2	Headache, vertigo, neck pain.
C2-C3	Acute torticollis. Headache, vertigo. Radiation of pain to head and shoulder.
C3-C6	Pain radiating into the arm. Headache. Elbow pain.
C6-T3	Pain radiating to arm and shoulder. Headache.
T3-T10	Pseudovisceral. Tender spinous processes at T5 or T6 without movement restriction at that segment is usually secondary to a low cervical joint dysfunction

	and occasionally to a T/L dysfunction.
T10-L2	Pain felt more in low back or thoracic region and less so at the site of dysfunction.
L2-L3	Low back pain
L3-L4	Pseudoradicular syndrome felt in the hip and groin radiating towards the knee. Knee pain.
L4-L5	Pain in the lateral aspect of the leg as far down as to the ankle. May be pain at the fibular head.
L5-S1	Pain radiates down the back of the leg as far as the heel. Fibular head and ischial tuberosity may also be tender.
SIJ	Pain point just medial and above PSIS. Pain may be felt in the sacrococcygeal region. Pain radiates down the back of the leg to the heel.
Coccyx	Coccygeal pain in 1/5 of patients in which it is tender; pain may be due to SIJ or painful ischial tuberosity.
Hip	Asymmetrical low back pain radiating in L4 segment. Medial knee pain and groin pain.

ICD 9	Diagnosis Codes for Joint Dysfunction
739.0	atlanto-occipital
739.1	cervical
739.2	thoracic
739.3	lumbar
739.4	sacroiliac
739.5	hip
739.6	lower extremity
739.7	upper extremity

CPT	Treatment Codes for Joint Dysfunction
98940	spine manipulation 1-2 areas
98941	spine manipulation 3-4 areas
98942	spine manipulation 5 or more areas
98943	extremity manipulation
98943-51	extremity manipulation when done with spine manipulation
97140	manual therapy
97012	intersegmental traction

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