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Principles of the Osteopathic Examination

Osteopathic Principles (Philosophy)
The primary goal of the Educational Council on Osteopathic Principles (ECOP) of the American Association of Colleges of Osteopathic Medicine is to evaluate the most current knowledge base in the fields of biomechanics, neuroscience, and osteopathic principles and practice. By constantly studying the most current trends in osteopathic principles and practice, as well as the basic science database, this committee produces a glossary of osteopathic terminology that is the language standard for teaching this subject. It was originally created to develop a single, unified osteopathic terminology to be used in all American osteopathic medical schools. One of the reasons Nicholas S. Nicholas, DO, FAAO, published his original *Atlas of Osteopathic Techniques* was to help in this endeavor. He and his associate, David Heilig, DO, FAAO, were two of the original members of this committee as representatives of one of the original sponsors, the Philadelphia College of Osteopathic Medicine (PCOM). Over time, with its glossary review committee, the ECOP has produced frequent updates of the *Glossary of Osteopathic Terminology*, issued each year in the American Osteopathic Association Yearbook and Directory of Osteopathic Physicians (1). It is now printed in each edition of *Foundations for Osteopathic Medicine* (2).

The ECOP glossary defines osteopathic philosophy as “a concept of health care supported by expanding scientific knowledge that embraces the concept of the unity of the living organism's structure (anatomy) and function (physiology). Osteopathic philosophy emphasizes the following principles: (a) The human being is a dynamic unit of function. (b) The body possesses self-regulatory mechanisms that are self-healing in nature. (c) Structure and function are interrelated at all levels. (d) Rational treatment is based on these principles.” (1) The uses of the diagnostic and therapeutic maneuvers illustrated in this atlas are all based upon these principles.

Structural Components

Structure and Function
Structure and function concepts of the myofascial and articular portions of the musculoskeletal system are inherent to understanding osteopathic diagnostic and therapeutic techniques. For example, knowledge of the origin and insertion of muscles (functional anatomy) is imperative in the performance of muscle energy technique. Understanding the structure of the spinal joints helps in the evaluation of spinal mechanics and in the direction of applied forces in techniques such as high-velocity, low-amplitude (HVLA) manipulations, such as when it is necessary to consider oblique cervical facets and coupled joint motion.
Barrier Concepts

Barriers are also an important concept in the understanding and application of osteopathic techniques. In osteopathic medicine, various barriers to motion have been classically described within the framework of normal physiologic motion.

The greatest range of motion in a specified region is the anatomic range, and its passive limit is described as the anatomic barrier (1). This barrier may be the most important to understand, as movement beyond this point can disrupt the tissues and may result in subluxation or dislocation. Osteopathic techniques should never involve movement past this barrier!

The physiologic range of motion is the limit of active motion given normal anatomic structures and the articular, myofascial, and osseous components (1). The point at which the physiologic motion ends is the physiologic barrier. The term elastic barrier is used to describe the motion between the physiologic and anatomic barriers, which is available secondary to passive myofascial and ligamentous stretching (1).

When a dysfunctional state exists, reduced motion or function occurs, and a restrictive barrier between the physiologic barriers may be demonstrated (1). The restrictive barrier, the major aspect of the overall dysfunctional pattern, can be eliminated or minimized with osteopathic treatment. Manipulative techniques incorporate activating forces in the attempt to remove the restrictive barrier, but these forces should be kept within the bounds of the physiologic barriers whenever possible. A pathologic barrier is more permanent; it may be related to contractures within the soft tissues, osteophytic development, and other degenerative changes (e.g., osteoarthritis).

To avoid further injuring the patient with diagnostic or therapeutic techniques, the practitioner must understand the normal compliance of tissues and the limits they maintain. These different barriers must be understood completely, as they may cause the physician to alter the technique chosen (i.e., indirect versus direct), or may limit the motion directed into the tissues and or joints during treatment.

In osteopathic principles the present system of describing the cardinal motion dynamics in spinal mechanics is based on the positional and/or motion asymmetry related to the freedom of motion (1). Previously, there have been other ways to describe these asymmetries. The direction in which the motion was restricted was the most common early method. Other past descriptions included whether the joint was open or closed. These were also based on the mechanical findings revealed on palpation. Today, the governing system in use names the biomechanical findings based on motion restriction and/or asymmetry and the directions in which motion is most free. This motion freedom is also called ease, free, and loose. In myofascial diagnostic findings, it is common to see both the freedom and the limitation used (i.e., loose, tight; ease, bind; and free, restricted). Yet the use of these descriptions does not allow for problems in which motion is symmetrically and/or universally restricted, as seen in some patients.
One of the most important principles in diagnosis and treatment is to control the tissue, joint, or other structure within its normally adaptive motion limits. Thus, the motion in a treatment technique should be within normal physiologic limits. Certainly, the motion used should always be within anatomic limits. It is our philosophy that controlling motion within the physiologic limits ensures greater safety margins while still keeping efficacy high, whereas moving closer to the anatomic limits increases risk with little increase in efficacy.

For example, in an HVLA technique, the restrictive barrier should be engaged if engagement is tolerated. The movement necessary to affect this barrier, however, should be only 1 to 2 degrees of motion (still within the physiologic limits), whereas the actual physiologic barrier of normal motion may be 5 to 6 degrees further.

**Somatic Dysfunction**

Somatic dysfunction is the diagnostic criterion for which osteopathic manipulation is indicated. The ECOP definition of somatic dysfunction is as follows:

Impaired or altered function of related components of the somatic (body framework) system: skeletal, arthrodial, and myofascial structures, and related vascular, lymphatic, and neural elements. Somatic dysfunction is treatable using osteopathic manipulative treatment. The positional and motion aspects of somatic dysfunction are best described using at least one of three parameters: (a) the position of a body part as determined by palpation and referenced to its adjacent defined structure; (b) the directions in which motion is freer; and (c) the directions in which motion is restricted (1).

Associated criteria for somatic dysfunction are related to *tissue texture abnormality, asymmetry, restriction of motion, and tenderness* (mnemonic: TART). The glossary of osteopathic terminology states that any one of these must be present for the diagnosis. The primary findings we use for the diagnosis of somatic dysfunction are motion restriction (and related motion asymmetry, if present) and tissue texture changes. Tenderness (some prefer sensitivity) can be one of the great pretenders in the clinical presentation of a problem. Tenderness may be elicited on palpation due to pressure or because the patient wants the physician to believe there is pain. Pain may be present in one area but the primary dysfunction or problem distant. Therefore, we believe tenderness (sensitivity or pain) to be the weakest of the aforementioned criteria, and in our practice it is used in a limited fashion, mostly when implementing counterstrain techniques.

Certain qualities of these criteria are particularly common in specific types of dysfunctions arising from acute and chronic states. Increased heat, moisture, hypertonicity, and so on are common with acute processes. Decreased heat, dryness, atrophy, and stringiness of tissues are more common with chronic problems.

**Myofascial-Articular Components**
As the presence of somatic dysfunction by definition may include myofascial and articular components, the palpatory examination is an important part of the evaluation. Palpation will determine whether there is a primary myofascial or articular component or both and lead to the development of the most appropriate treatment plan. Specific types of dysfunctions are best treated by certain techniques. For example, a primary tissue texture abnormality in the fascia is best treated by a technique that most affects change at that level (e.g., myofascial release), whereas another technique may have no real effect on the specific tissue involved (e.g., HVLA). Articular dysfunctions, on the other hand, are best treated with an articular technique, such as HVLA, and myofascial release would be less appropriate.

**Visceral-Autonomic Components**

Some dysfunctions may directly affect an area (e.g., small intestines with adhesions), while other dysfunctions may be more reflexively important (i.e., cardiac arrhythmia–somatovisceral reflex). Somatic dysfunction may cause reactions within the autonomic nervous system and result in many clinical presentations or visceral disorders present with a number of somatic components (3).

**Order of Examination**

The order of the osteopathic physical examination is best based on the patient's history and clinical presentation. In general, it is best to begin the examination by performing the steps that have the least impact on the patient physically and that lead to the least tissue reactivity and least secondary reflex stimulation.

**General Observation**

It is recommended the physician begin with general observation of the static posture and then dynamic posture (gait and regional range of motion). For safety, it is best to begin by observing function and range of motion with active regional motion testing. After examining the patient in this manner, the physician may decide to observe the patient's limits by passive range of motion (ROM) testing. The passive ranges should typically be slightly greater than those elicited during active motion assessment. After identifying any asymmetries or abnormalities at this point, it is reasonable to proceed to the palpatory examination.

**Layer-by-Layer Palpation**

The palpatory examination is also best started by observing the area of interest for any vasomotor, dermatologic, or developmental abnormalities. The examination may then proceed to temperature evaluation. The physician may now make contact with the patient following a layer-by-layer approach to the examination to evaluate the tissue texture. This approach permits the examiner to distinctly monitor each anatomic layer from a superficial to deep perspective to best determine the magnitude of and specific tissues involved in the dysfunctional state. The tissues are progressively evaluated...
through each ensuing layer and depth by adding a slightly greater pressure with the palpating fingers or hand. The physician should also attempt to monitor the tissue texture quality and any dynamic fluid movement or change in tissue compliance. During palpation over a visera, the mobility of that organ may be evaluated along with any inherent motility present within that organ.

Another method that we commonly use is a screening evaluation using percussion over the paraspinal musculature, with patient seated or prone, to determine differences in muscle tone at various spinal levels. In the thoracic and lumbar areas, a hypertympanic reaction to percussion appears to be associated with the side of the rotational component.

These steps in the examination evaluate the postural and regional movement ramifications involved in the patient's problem, in addition to eliciting any gross and fine tissue texture changes. The final step in the examination is to determine whether there is a related articular component to the patient's problem. This involves controlling a joint and putting it through very fine small motion arcs in all phases of its normal capabilities (intersegmental motion testing). The physician attempts with a three-plane motion examination to determine whether the motion is normal and symmetric or whether pathology is restricting motion, with or without asymmetry in the cardinal axes. For example, the C1 segment may be restricted within its normal physiologic range of rotation and exhibit either a bilaterally symmetric restriction in rotation (e.g., 30 degrees right and left) or an asymmetry of motion with greater freedom in one direction than the other (e.g., 30 degrees right, 40 degrees left). As stated previously, most descriptions of somatic dysfunction relate to the asymmetric restrictions, but symmetric restrictions are seen clinically.

In performing the stepwise layer-by-layer palpatory examination and finishing with the intersegmental motion evaluation, the physician can determine the specific tissues involved in the dysfunction (e.g., muscle, ligament, capsular), the extent to which it is present (e.g., single segment, regional), and whether the process is acute, subacute, or chronic. These determinations prepare the physician to develop the most appropriate treatment plan for the somatic dysfunction or dysfunctions.

References


