Interest in manual therapy appears to continue to grow among physical therapy clinicians and educators throughout the world even though the underlying concepts and techniques have not been justified by a knowledge base. The purposes of this article are to critically assess the role of manual therapy within the physical therapy profession and to provide an introduction to the other articles in this special issue. Eisner’s model of explicit, implicit, and null curricula is used as a framework for our analysis and our discussion of manual therapy. The explicit area of manual therapy includes discussions of the definition and the role of manual therapy, the scientific rationale for manual therapy, and manual therapy in education and a comparison of manual therapy evaluative frameworks. The implicit area deals with the role of clinical decision making and critical thinking in manual therapy in education and rehabilitation. In the null (unaddressed) area of manual therapy, we suggest directions for future development and research. (Farrell JP, Jensen GM. Manual therapy: a critical assessment of role in the profession of physical therapy. Phys Ther. 1992;72:843–852.)

Key Words: Joint mobilization, Manual therapy, Orthopedics.

Mennell stated, Beyond all doubt the use of the human hand, as a method of reducing human suffering, is the oldest remedy known to man; historically no date can be given for its adoption.1(9)

The human hand continues to be an essential tool for physical therapists. Since the inception of physical therapy, manual treatment has been part of the identified knowledge base.2 How manual treatment (eg, massage, corrective exercise, muscle training), or the laying on of hands, has been used continues to evolve. Today, manual therapy is seen by many as an area of specialization within the profession. Manual therapists provide nonsurgical management of spinal and extremity dysfunction related to the neuromusculoskeletal system.3–5 We believe the role of the manual therapist in the rehabilitation process is to assess pain and function, detect movement abnormalities, test anatomical tissue structures, and design a treatment program that is related to realistic goals. The treatment should be continually reassessed and altered to optimize recovery to full function.6

Interest in manual therapy appears to continue to grow among physical therapists and educators throughout the world.7,8 Clinical interest and application in the manual therapy arena often exceed the current understanding of the scientific rationale and basis for this form of treatment. The purposes of this article are to present a critical assessment of the role of manual therapy in the profession and to provide an introduction to the other articles in this special issue.

We will use a framework from the literature, Eisner’s model9 of explicit, implicit, and null curricula, as a general framework for our analysis and discussion. In Eisner’s framework, the explicit dimension refers to knowledge and ideas that are public, easily identified, and part of common practice. Analysis of the explicit dimension of manual therapy will include discussions of the definition and the role of manual therapy, the scientific rationale for manual therapy, the role of manual therapy in education, and a comparison of evaluative approaches.

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[footnotes]

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in manual therapy. The implicit dimension, often labeled as the most powerful dimension of the framework, includes the values and behaviors that underlie that which we do explicitly (eg, the explicit focus is frequently on doing the evaluation, yet the clinician's analysis and interpretation of the clinical data are imperative for a successful outcome). In the implicit dimension, our discussion will focus on the role of critical analysis in manual therapy (eg, systematic evaluation, critical thinking, clinical decision making). Our consideration of the null dimension, that which is unattended or forgotten, will include discussion of areas in need of further exploration and development.

**Explicit Dimension**

**Definition and Role**

The practice of manual therapy has evolved from numerous clinicians.4-6,10-13 The contributions of these clinicians has led to an eclectic set of evaluation and treatment procedures for musculoskeletal dysfunction. We believe that some experienced, skillful clinicians consider musculoskeletal conditions as complex as spinal dysfunction, as being multifactorial and multistructural in effect.5 Consideration of these multiple factors and structures is seen in the indications and procedures for manual therapy. Indications for manual treatment frequently evolve from clinical criteria rather than from descriptions of pathology (eg, asymmetry of position, altered joint range of motion, functional limitation, soft tissue texture abnormalities).6,14 Assessment of soft tissue texture abnormalities refers to the clinician's palpation of the soft tissues (eg, skin, muscle, connective tissue structures), feeling for thickness, swelling, or tightness.6 A variety of physical therapy procedures frequently are required to assist the patient in restoring function. These procedures may include soft tissue massage; various forms of traction; proprioceptive neuromuscular facilitation; electrotherapeutic modalities; ergonomic analysis; exercise to improve strength, coordination, endurance, flexibility, stabilization and education; and specific manual therapy procedures.6,10-13

In our view, manual therapy is not a specialty utilizing only passive movement techniques. Many manual therapists appear to agree that manual techniques include massage and muscle stretching of soft tissues, distraction and traction techniques, specific (ie, specific to one vertebral motion segment such as L4-5) or general (ie, specific to a region of the spine such as L1-S1) high-velocity manipulation and joint mobilization, and what is called "adverse neural tissue mobilization."3,5,6,15 Butler defines adverse neural tissue mobilization as

... abnormal physiological and mechanical responses produced from nervous system structures when their normal range of movement and stretch capabilities are tested.15

Manual techniques are one component part of nonsurgical management of the patient and are used to assist in elimination of pain and improve function. A thorough examination performed by a skilled manual therapist should, however, govern the use of passive movement procedures as part of the treatment for the presenting clinical signs and symptoms.

The Practice Affairs Committee of the Orthopaedics Section of the American Physical Therapy Association (APTA), offered the following position:

Manipulative techniques by licensed physical therapists in evaluation and treatment of individuals with musculoskeletal dysfunction has [sic] always been an integral component within the scope of practice. . . . 1. Manipulation in all forms is within the scope of practice of the licensed physical therapist. 2. The force, amplitude, direction, duration, and frequency of manipulative treatment movements is a discretionary decision made by the physical therapist on the basis of education and clinical experience and on the patient's clinical profile. 3. Manipulation implies a variety of manual techniques which is not exclusive to any specific profession.16(p22)

There are multiple definitions of the terms "manipulation" and "mobilization." For example, Cyriax10 defines manipulation as the use of hands to passively move a joint for a therapeutic purpose. Paris4 describes manipulation as the skillful application of a passive movement to a joint. Grieve defines manipulation as

... an accurately localized, single, quick and decisive movement of small amplitude, following careful positioning of the patient. It is not necessarily energetic and is completed before the patient can stop it. The manipulation may have a regional or more localized effect, depending upon the technique or position of the patient.5(p534)

The Orthopaedics Section of the APTA17 defines mobilization as the act of imparting movement, actively or passively, to a joint or soft tissue. Maitland6 defines mobilization as the passive movement performed with a rhythm and grade so that the patient is able to prevent the technique from being performed. Paris18 suggests that the terms "mobilization" and "manipulation" are identical in meaning and thus can be used interchangeably.

Among some physical therapists in the United States, "mobilization" has probably evolved as a common term for two reasons: (1) Therapists may want to avoid the term "manipulation" because of its strong association with the chiropractic profession, and (2) "mobilization" is an accepted term in some physical therapy state practice acts. Researchers have argued that there is recognition and acceptance for use of the term "manipulation" by physical therapists with training in this specialty.19-21 Manipulation, in a general sense, means any manual procedure in which the hands or fingers are used to move a vertebral motion segment (ie, two adjacent vertebra and their interconnecting tissues),22 soft tissue structure, or a peripheral joint. We believe that the suitability of manipulation is dependent on precise clinical assessment and the patient's response to treatment.6,15 Various medical, chiropractic, osteopathic, and physical therapy clinicians use manipulative procedures and have many
different terms to describe the techniques.

In summary, we believe manual therapy is more than the passive movement of joints. Manual therapy is not exclusive to any profession, and different professionals use a variety of manual techniques. The practitioner should decide on the force, amplitude, direction, duration, and frequency of manual therapy techniques based on his or her educational background and clinical experience together with the patient’s clinical profile.16

Scientific Rationale

Professional interest in the application of manual therapy evaluation and treatment techniques appear to continue to flourish,7,8,23 despite continued slow development of a substantial, scientific rationale for manual therapy.23,24 In addition, there appear to be no active investigative agendas among researchers and clinical experts. In 1985, in the foreword of the second edition of Aspects of Manipulative Therapy, Maitland observed

None of us can afford to neglect the anatomical and physiological components of manipulative therapy, and it is essential that the clinician should try to bridge the gap between the practice and theory of how, when and why treatment should be administered and why it is successful.8

Biomechanics, anatomy, and neurophysiology are frequently the disciplines used to provide rationales or theories for the use of manual therapy,6,24–26 although there are few studies that have specifically examined whether and how these theoretical arguments provide a basis for practice. In this issue, articles by Riddle, Di Fabio, Twomey, Threlkeld, and Walker critically assess what we know as well as what we need to know to provide a scientific basis for practice.

Research in manual therapy is complicated by the following factors: (1) Various clinicians and researchers disagree over the etiology of musculoskeletal pain; (2) indications for manual therapy often revolve around criteria based on clinical findings rather than knowledge of the musculoskeletal pathology (eg, similar diagnoses can present different clinical findings); (3) musculoskeletal conditions often improve with time; and (4) the clinical application of manual therapy demands interaction of human beings, and there is the effect of human behavior.6,14,16,27 The medical and physical therapy professions have examined the efficacy of manipulation in the treatment of patients who have low back pain.28–30 Some positive short-term effects have been found with application of manipulation or mobilization.28,31 The majority of research in manual therapy pertains to spinal conditions, particularly the lumbar spine.23,28,31 In this issue, Di Fabio’s article addresses the issue of efficacy in manual therapy.

Role of Manual Therapy in Education

There is evidence that manual therapy has had an expanding role in physical therapy curricula. For example, in 1970, Stephens32 surveyed all physical therapy programs in the United States (N = 51) regarding the inclusion of manipulative therapy in entry-level curricula. In this survey, she used the term “manipulative therapy,” not “manual therapy,” and defined it as a system of manual therapeutic techniques for the restoration of the integrity of joints, including spinal articulations, by use of normal involuntary ranges of passive movement. Among the 40 programs (78%) that responded to her survey, no programs offered separate courses in manipulative therapy, but 17% offered some instruction in manipulative therapy, with class time ranging from 3 to 20 hours. Thirty schools (59%) were not teaching manipulative techniques, and the most frequently cited reason was insufficient time because of curriculum priorities. Her initial definition of manipulative therapy may have been somewhat restrictive, and she proposed an expanded definition of manipulative therapy at the completion of her study. This expanded definition included reference to restoration of the normal anatomical and physiological relationships of the synovial joints and skilled, passive movements delivered to the relaxed joint within the normal joint ranges of voluntary and involuntary movement.

In 1988, a similar survey was done by Ben-Sorek and Davis,7 who investigated the presence of joint mobilization in physical therapy curricula and compared their results with those of the 1970 survey by Stephens.32 No operational definition of joint mobilization was used in the survey. Only 50 physical therapy education programs were surveyed, and 38 (76%) of those programs responded. Thirty-eight percent of the programs reported that mobilization was taught as a separate course, and 60% had mobilization as a subunit in another course. These data demonstrated significant increases in course offerings and content from the data gathered by Stephens in 1970. The most prevalent manual techniques used by programs were those of Paris,4 Maitland,6 Cyriax,10 and Kaltenborn.11

In January 1992, the Evaluative Criteria for Accreditation of Education Programs for the Preparation of Physical Therapists went into effect.33 These criteria now include mobilization as one of the specific skills of the graduate.33 The previous Standards and Criteria for Accreditation of Physical Therapy Educational Programs54 had referred to the ability of the physical therapist to be able to perform definitive physical therapy testing of the musculoskeletal system with no specific mention of mobilization skills. Physical therapy education has evolved considerably since 1970, when just a few programs included content and skills in “manipulative therapy.” Currently, all entry-level education programs must have some content on mobilization. Tracking this process of curricular change for physical therapy programs raises questions such as these for the profession: What elements are essential in our “operational definitions” of certain clinical procedures (eg, mobilization, manual therapy)? and What forces drive deci-
The philosophical approach to evaluation and treatment has been and continues to be the strongest point of identification and argument regarding differences among the various approaches to manual therapy (Tabs. 1, 2). Our use of a "philosophical approach or basis" rather than a theoretical rationale for the manual therapy approach is purposeful. We believe that the basis for these manual therapy approaches is better described by using the term "philosophy" (ie, the general beliefs, concepts, and attitudes shared by those who practice) than by the term "theory." Our definition of theory is consistent with that of Kerlinger:

[A theory is] a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting the phenomena.

In 1979, Cookson and Kent and Cookson published review articles emphasizing the similarities and differences among the various approaches commonly used in orthopedic manual therapy. These articles provided an overview of the four major approaches in manual therapy as espoused by Maitland, Cyriax, Kaltenborn, and Mennell. A comparison of the four evaluation approaches used in manual therapy, as reviewed by Cookson and Kent and Cookson, as well as two other approaches frequently used by physical therapists (ie, McKenzie's approach to the spine and the osteopathic approach to musculoskeletal dysfunction) is presented in Tables 1 and 2. The selection of these six approaches is not meant to be exhaustive or comprehensive, but it is representative of major approaches integrated into physical therapy practices today.

The philosophical basis presented for these evaluative approaches also appears to be a critical factor in understanding how the evaluation will be structured and how the clinical findings will be interpreted. Table 1 provides an overview of evaluation approaches used in manual therapy that have been physician-generated (ie, Cyriax, Mennell, and osteopathic) and McKenzie approaches. Cyriax's contribution in devising a logical method for clinical examination of "soft tissue structures" or musculoskeletal problems has been a component of many of the other evaluative frameworks in manual therapy. Common elements in these three approaches include gathering of patient data through taking of a history, active movement testing, palpation, and mobilization, manipulation, and patient education as treatment interventions. Again, the major differences appear in the philosophical basis for the approach, which in turn leads to a difference in interpreting musculoskeletal signs and symptoms. For example, Cyriax subscribes to an assessment system closely linked with his interpretation of applied anatomy (eg, differentiating contractile and noncontractile structures). Mennell's primary focus is examination of synovial joints and treatment of joint dysfunction with joint-play techniques. Central to the osteopathic approach is the belief that the body is an integrated unit or total system; that is, the neuromusculoskeletal system is connected with other systems of the body, and disease processes are frequently visible in the musculoskeletal system. A second belief is that structure governs function and an abnormality in structure can lead to abnormal function. Somatic dysfunction is the impaired or altered function of the somatic system (skeletal, articular, and myofascial structures and related vascular, lymphatic, and neural elements).

The physical therapist-generated evaluative frameworks, like the physician-generated evaluative frameworks, subscribe to a philosophical basis. This philosophical basis often includes integration of other approaches, but with application of evaluation and treatment techniques done by the physical therapist (Tab. 2). The evaluation frameworks for all three approaches (ie, Maitland, Kaltenborn, and McKenzie approaches) have many elements similar to Cyriax's screening criteria. Each approach also includes examination procedures specific to the approach. For example, Maitland emphasizes the importance of continual assessment in developing working hypotheses based on evaluation. Kaltenborn includes elements that represent his background as an osteopath (eg, reference to somatic dysfunction) as well as biomechanical assessments of joint motion. McKenzie uses evaluation of repeated active movements and patient self-treatments as key elements in his assessment.

Similarities among these three approaches include the use of palpation; testing of joint movements; and mobilization/manipulation, exercise, and patient education as treatment strategies.

As practitioners become more eclectic in their evaluation and management of patients, the lines between evaluative approaches are likely to continue to blur over time. A challenge for manual therapists will be to search for and identify the underlying theoretical arguments for manual therapy evaluation and treatment procedures that cross the various "philosophical approaches" so that propositions can be derived from the theories and tested.

**Implicit Dimension**

**Musculoskeletal Evaluation: The Role of Critical Analysis**

Even though we see that, explicitly, manual therapy approaches are based on somewhat different philosophies, they do share a common dimension—there is always some form of systematic evaluation and treatment of patients with musculoskeletal dysfunction. The implicit dimension, that is, the values and behaviors that are central to the work of the manual therapist, includes perhaps the most important contribution to the profession made by manual therapy. This
| Table 1. Comparisons of Physician-Generated Evaluative Approaches Used in Manual Therapy |
|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|
| **Manual Therapy Approach**                                  | **Cyriax<sup>10</sup> (Orthopedic Medicine) Contentions**     | **Mennell<sup>12</sup> Contentions**                         | **Osteopathic<sup>13</sup>-<sup>40</sup> Contentions**       |
| Philosophical basis                                         | 1. All pain has an anatomical source                           | 1. Dysfunction is a sign of a serious pathological process or joint disease | 1. The body is a total unit, and the neuromusculoskeletal system is connected with other systems; therefore, disease processes can be visible in the musculoskeletal system |
|                                                             | 2. All treatment must reach that anatomical source             | 2. Loss of normal joint movement or joint play can lead to dysfunction | 2. The structure of the body governs function; an abnormality in structure can lead to abnormal function |
|                                                             | 3. If the diagnosis is correct, all treatment will benefit the source | 3. Joint manipulation can restore normal joint-play movements | 3. Somatic dysfunction is the impaired function of related components of the somatic system (eg, skeletal, arthroidal, and myofascial structures and related vascular, lymphatic, and neural elements) |
|                                                             |                                                               |                                                               | 4. Manipulative therapy can restore and maintain normal structure and function relationships |
| Key concepts                                                | • Diagnosis of soft tissue lesions                             | • Assessment of joint play                                    | • Diagnosis of somatic dysfunction |
|                                                             | • Categorization of referred pain                              |                                                               | • Clinical examination focuses on the presence of asymmetry, restriction of movement, and palpation of soft tissue texture changes (ie, palpation of skin, muscle, and other connective tissue for feeling of thickness, swelling, tightness, or temperature change) |
|                                                             | • Differentiation of contractile and noncontractile lesions    |                                                               | |
| Evaluation framework                                        | Observation, history                                          | Present complaint                                             | History |
| History                                                     | • Age and occupation                                          | • Onset                                                      | • Knowledge of physical trauma, past visceral and soft tissue problems |
|                                                             | • Symptoms (site and spread, onset and duration, behavior)    | • Nature of pain                                              | Present complaint |
|                                                             | • Medical considerations                                      | • Localization of pain                                        | • Establish relationship between adaptation, decompensation, trauma, and time from patient's history |
|                                                             | • Inspection                                                  | • Loss of movement                                            | |
| Physical                                                    | Physical examination                                          | Past history                                                  | Physical examination |
|                                                             | • Active movements                                            | Family history                                                | • Postural analysis |
|                                                             | • Passive movements                                           | Medical systems review                                        | Regional screening functional units |
|                                                             | • Resisted movements                                          |                                                              | • Pelvic girdle |
|                                                             | • Neurological examination                                    |                                                              | • Foot |
|                                                             | • Palpation                                                   |                                                              | • Vertebral column |
|                                                             |                                                               |                                                              | • Shoulder girdle |
|                                                             |                                                               |                                                              | • Hand |
|                                                             |                                                               |                                                              | Detailed evaluation of regions in dysfunction |
| Interpretation of evaluation                                | Identification of anatomical structure associated with lesion  | Joint dysfunction                                             | Positional fault |
|                                                             |                                                               |                                                              | Restriction fault |
|                                                             |                                                               |                                                              | Segmental or multisegmental |
| Treatment strategies                                        | Friction massage                                              | Manipulation                                                  | Manipulation |
|                                                             | Injection                                                     | Mobilization                                                  | Mobilization |
|                                                             | Manipulation                                                  | Physical therapy (eg, exercise, modalities)                   | Muscle energy |
|                                                             | Mobilization                                                  |                                                              | Myofascial techniques |
|                                                             | Physical therapy (eg, exercise, modalities)                    |                                                              | Counterstrain |
|                                                             | Patient education                                             |                                                              | Exercise therapy |
|                                                             |                                                               |                                                              | Patient education |
Table 2. Comparisons of Physical Therapist-Generated Evaluative Approaches Used in Manual Therapy

|-------------------------|-----------------------------------|-------------------------------------|-----------------------|
| Philosophical basis     | 1. Personal commitment to understand the patient  
2. Think about and apply theoretical thinking (eg, pathology, anatomy) and clinical thinking (eg, signs and symptoms)  
3. Continual assessment and reassessment of data | 1. Biomechanical assessment of joint movements  
2. Pain, joint dysfunction, and soft tissue changes are found in combination | 1. Predisposing factors of sitting posture, loss of extension range, and frequency of flexion contribute to spinal pain  
2. Patients should be involved in self-treatment |
| Key concepts            | • Examination, technique, and assessment are interrelated and interdependent  
• Grades of movement (I-V)  
• Testing accessory and physiological joint movements  
• Differential assessment to prove or disprove clinical working hypotheses | • Somatic dysfunction  
• Application of principles from arthrokinematics (eg, concave-convex rule, close- and loose-packed positions)  
• Grades of movement (I-III) | • During movements of the spine, a positional change to the nucleus pulposus takes place  
• Flexed lifestyle leads to a more posterior position of nucleus  
• Intervertebral disk is a common source of back pain |
| Evaluation framework     | Subjective examination (as defined by Maitland⁴)  
• Establish kind of disorder  
• Area of symptoms  
• Behavior of symptoms  
• Irritability  
• Nature  
• Special questions  
• History  
Planning the objective examination (as defined by Maitland⁴)  
Physical examination  
• Observation  
• Functional tests  
• Active movements  
• Isometric tests  
• Other structures in plan  
• Passive movements (eg, special tests, physiological and accessory joint movements, relevant adverse neural tissue tension tests)  
• Palpation  
• Neurological examination  
• Highlight main findings | History ("five-five scheme")  
1. Immediate case history (eg, assess symptoms for localization, time, character, and so on)  
2. Previous history (eg, assess for kind of treatment, relief of symptoms, presence of similar symptoms or related symptoms)  
3. Social background  
4. Medical history  
5. Family history  
Patient's assessment of cause of complaint  
Physical examination  
• Inspection  
• Function (active and passive movements; testing with traction, compression, and gliding; resisted tests)  
• Palpation  
• Neurological tests  
• Additional tests | History  
• Interrogation (eg, Where did pain begin, how, constant or intermittent, what makes it better or worse, previous episodes, further questions?)  
Physical examination  
• Posture (sitting, standing)  
• Examination of movement (flexion, extension, side gliding)  
• Movements in relation to pain  
• Repeated movements  
• Test movements  
• Other tests (eg, neurological, other joints) |
| Interpretation of evaluation | Initial assessment—relate examination findings to  
• Behavior of patient's symptoms  
• The diagnosis  
• Stage of disorder  
• Stability of disorder  
• Irritability of disorder | Biomechanical assessment (ie, restriction of joint mobility) and assessment of soft tissue changes | Postural syndrome  
Dysfunctional syndrome  
Derangement syndrome |
| Treatment strategies     | Based on continual assessment  
Mobilization  
Manipulation  
Adverse neural tissue mobilization*  
Traction  
Exercise  
Patient education | Mobilization  
Exercise (emphasis on proprioceptive neuromuscular facilitation)  
Traction/distraction  
Soft tissue mobilization  
Manipulation  
Patient education | Patient self-treatment using repeated movements  
Exercise  
Mobilization or manipulation (if needed)  
Patient education |

*Abnormal physiological and mechanical responses produced from nervous system structures when their normal range of movement and stretch capabilities are tested.¹⁵
contribution is an emphasis on systematic evaluation as well as analysis and interpretation of the clinical data.

We have seen increased integration of manual therapy in practice and education. Along with this growth has been an increased emphasis on the evaluative process as well as the thinking and reasoning behind clinical decision making. For example, Cookson and Kent argue that although therapeutic techniques applied for a certain musculoskeletal condition may vary across the different philosophical approaches, evaluation of the patient to determine whether to treat or not to treat is essential. Over the last few years, several musculoskeletal texts have been written, not by physicians, but by physical therapists. These texts focus on orthopedic assessment, including evaluation and treatment. The value of clinical reasoning and decision making in practice and education also is a theme in recent professional writings.

In our view, this process of not only using a systematic evaluation scheme, but investigating the clinical reasoning and decision making that underlie the evaluation and the understanding and interpretation of findings is an extremely important goal for the profession. Professional expertise is described by many educators in the professions as not only the possession of technical skills, but also the use of analytical skills for critical analysis and deliberate action. This critical analysis requires that the professional education process assist students in becoming critical analysts. This process must occur in the "context of action" or practice. For example, the practitioner must first make sense of a situation by imposing a structure or framework for analysis. This framework is used to help define a problem and judge the potential consequences of action. Students and practitioners must think about what they will do and why and then take action. The initial emphasis for students should be on the thoughtful analysis of an experience rather than finding the correct procedure.

The importance of developing therapists' thinking and analytical skills, as well as their technical skills, raises important questions. Do entry-level degree programs promote critical analysis of technique and allow time for thoughtful analysis and reflection? Are these programs focused on covering a given amount of material, consistent with trends in clinical practice? Do we see in continuing education programs an equal emphasis on critical analysis of scientific rationales or underlying theories as well as application and mastery of clinical techniques?

The Maitland, or Australian, approach includes an evaluative framework that is based on a conceptual model or framework. We believe that the Australian evaluation framework is an example of how a clinician can facilitate his or her clinical-reasoning process. What follows in this next section is an example of how the manual therapist uses the evaluation framework for organizing and interpreting clinical data.

The Australian Approach: An Example of a Framework for Critical Analysis

In the Australian approach, the evaluation process should begin when a patient walks into the treatment room. An interview process occurs in which the manual therapist guides the patient's description of his or her symptoms by defining the location and behavior of those symptoms, obtaining the patient history, and determining any precautions that may preclude treatment. The interview (defined by Maitland as the subjective examination) is vital as the first step in determining the source of the patient's complaint. Maitland uses the term "subjective" here to represent the interactive portion of the examination, that is, the therapist's interview with the patient in which the therapist begins to interpret the patient's perceptions of his or her symptoms. The term "subjective" is not used in a scientific manner to represent a subjective measure or test. The clinician makes an assessment or appraisal of the interview data collected, which, in essence, is a clinical judgment or decision based on the experience, training, and skills of the clinician. A "working hypothesis" is formulated with the intent of identifying the potential musculoskeletal structures involved in the presenting pathology. The clinician uses his or her assessment skills and knowledge to rank the importance of each component of the working hypothesis according to the SINS algorithm. (S=severity, I=irritability, N=nature of the complaint, and S=stage of pathology)

Severity is the term used to describe the clinician's assessment of the intensity of the patient's symptoms as they relate to a functional activity. For example, if the patient has ceased using his or her arm to dress and is unable to find a position to ease pain, then the symptoms are considered severe. Nonsevere symptoms are represented by the patient who is able to dress with arm or shoulder pain, yet the pain is not intense enough to stop the functional activity even though pain is experienced. Irritability is the term used to describe the clinician's assessment of the intensity of the patient's symptoms as they relate to a functional activity. For example, a shoulder pain that begins when the patient lifts an arm and that lasts for 4 hours means that the patient's condition is extremely irritable (little activity causes considerable pain that lasts for a long period of time). Conversely, a shoulder pain that is aggravated when the patient lifts his or her arm, but eases when the patient returns the arm to his or her side, would be considered a nonirritable condition.

The nature of the complaint is the term that represents the clinician's assessment of the patient's pain tolerance, including consideration of cultural differences, stability of the condition, type of pathology, and the physical therapist's hypothesis of the structures responsible for producing the pain complaint. The stage of the pathology is a term used to describe...
Throughout the course of treatment, treatment goals are established. The clinician has a central role to play in developing intervention also revolve around assessing and at the conclusion of the initial treatment, a treatment strategy is formulated. The therapist continues to assess the patient's active or passive movement signs and symptoms that relate to the clinical working hypothesis. Through continual assessment of each technique, exercise, or modality, the clinician progresses treatment and hypothesizes which structures or body regions most likely contribute to the patient's problem. For example, if a patient's active or passive movement signs, symptoms, and functional status are not changing at what the clinician believes is an appropriate rate, the clinician needs to reassess (ie, rerank, reject, or reformulate) the working hypothesis and alter the treatment accordingly.

Clinical decisions that relate to intervention also revolve around assessing data during and at the conclusion of the physical examination, during the application of treatment techniques, and at the conclusion of the initial treatment. From this form of analysis, treatment goals are established and a treatment strategy is formulated.

Throughout the course of treatment, the therapist continues to assess the effect of treatment on the patient's functional limitations that relate to his or her lifestyle and work environment and the active, passive, or functional movement signs and symptoms that relate to the clinical working hypothesis. Through continual assessment of each technique, exercise, or modality, the clinician progresses treatment and hypothesizes which structures or body regions most likely contribute to the patient's problem. For example, if a patient's active or passive movement signs, symptoms, and functional status are not changing at what the clinician believes is an appropriate rate, the clinician needs to reassess (ie, rerank, reject, or reformulate) the working hypothesis and alter the treatment accordingly.

The clinician has a central role to play in collecting and interpreting clinical data for individual patients. We propose that the clinician also has a central role to play in the generation of classification systems that identify commonalities and differences across patient cases. In 1989, Rose argued that therapists need to identify and characterize the relationships between clinical entities and specific treatments and management strategies. He argued that clinicians need to use a process of rational practice and critical thinking to achieve this goal. Others have suggested that the use of established clinical classification systems may assist physical therapists in this classification process. As the physical therapy profession moves toward more systematic observation and classification of clinical phenomena, the manual therapist could serve a critical role assisting with the development of this process. In this special issue, the article by Jones provides further dialogue about the role of clinical reasoning in manual therapy.

**Null Dimension**

We believe that there are other aspects of manual therapy that are part of the null dimension, that is, aspects that are often ignored. Grieve describes the present state of manual therapy well:

> We continue to sound as though we know so much, when we know comparatively little. It might be a good thing to admit this. We make much of clinical science, enthusiastically referring to this or that part of the massive mountain of literature which best serves our particular interest. Much of what we do is simply what has been proven on the clinical shop floor to be effective in getting our patients better—we do not always know why.

One aspect of manual therapy that is frequently ignored is consistent discussion and analysis of the identified theory or body of general principles underlying the knowledge base. We have noted that biomechanics, anatomy, and neurophysiology are often discussed as providing an underlying rationale for manual therapy and are enthusiastically referred to as the elements that fit our applications. We need to ask ourselves, What are the sources of knowledge cited for manual therapy in either entry-level or continuing professional education? Is the knowledge base in manual therapy built on a model of tradition or authority or the scientific method? A model of tradition refers to knowledge obtained from "truths" or beliefs that were accepted in the past and that continue to influence practice. A model of authority is when knowledge is gained from experts (authority figures) and that knowledge, like knowledge from tradition, has not been validated or verified through research. For example, the philosophical bases of the different approaches to manual therapy are generally well-known and central aspects of the written materials, yet there has been little focus on developing and discussing application of theory to practice or generating testable questions from identified key theories.

We cannot ignore that clinical practice combines the elements of art and science. Clinical observation and manual technique are central components of the artistry of practice in manual therapy. Feinstein suggests that clinical practice is neither art nor science, but the most scientific art and the most humanistic science. Several articles in the July 1989 issue of Physical Therapy on clinical decision making focused on discussion and improvement of clinical measures. Grieve and Delitto suggest consideration of Feinstein's principles of clinimetrics (eg, development of clinimetric indexes that address face validity and content validation and that have a formal expression of the index) as a way of expanding the scientific basis of clinical practice. Many of these principles have application for investigations in manual therapy.

For example, palpation plays a central role in application of several manual therapy techniques. Palpation is a practical skill that apparently requires many hours of training and practice to master. Many manual therapists believe that palpation of the spine and associated areas that contribute to the presenting symptoms may be the most informative aspect of the physical examination. Sophisticated imaging techniques continue to serve as major tools in the diagnosis of musculoskeletal problems, with less reliance on palpation. The challenge for physical therapists will be to integrate technology and manual skills so that both components can enhance therapists' understanding of musculoskeletal problems. For example, Jull et al...
studied 20 patients, all of whom had complained of chronic neck or headache for at least 1 year, who underwent manual examination of the cervical zygapophyseal joints and radiographic assessment. In one group of patients (n = 11), the presence or absence of symptoms associated with a joint was established by radiographically controlled diagnostic nerve blocks. The manual therapist was unaware of the diagnosis and examined the patients 1 to 4 weeks after the nerve block. The order of events was reversed in the second group of patients (n = 9); that is, the manual examination was first, followed by the diagnostic nerve blocks. Of the 20 patients studied, the manual therapist identified all 15 patients who had symptomatic zygapophyseal joints and also identified the 5 patients who did not have joint involvement. This study is an example of systematic investigation of the "art" of palpation and represents an initial step toward investigation of the validity of palpation techniques.

Another area of manual therapy that is often ignored are investigations regarding the effectiveness and efficacy of manual therapy. Several investigations have examined the use of manual therapy for treating spinal conditions, particularly low back pain. Di Fabio's article in this issue provides an analysis of this literature. A related issue is exploration of the potential role of the placebo effect in manual therapy. Improvement of a patient's condition after physical therapy cannot be seen as evidence of the efficacy of manual techniques.

Gie1en identifies two major elements that contribute to the placebo effect: (1) the therapist-patient relationship, which is influenced by the patient's perceptions of the therapist's expertise, trustworthiness, optimism, and enthusiasm, and (2) the use of other modalities. Patient education is also seen as a component of a manual therapy intervention (Tabs. 1, 2). In our theory development for manual therapy, we may need to consider a model that not only represents the dimensions we routinely think of as underlying musculoskeletal evaluation and treatment (eg, anatomic, biomechanical, neurophysiologic), but gives more purposeful consideration to aspects of human behavior. For example, theories regarding patient-provider interactions, health behavior, and cultural aspects of illness may also help clinicians develop a fuller understanding of the context of clinical practice.

**Conclusion**

This assessment of manual therapy has provided an introduction to the current role of manual therapy in the profession of physical therapy. Manual therapy represents more than just the application of passive movements, and the field continues to evolve as a subspecialty in physical therapy. The knowledge base and practice of manual therapy have strong ties to the philosophical approaches advocated by several clinicians. The scientific base of manual therapy is frequently tied to knowledge from other disciplines (eg, anatomy, biomechanics, neurophysiology), with few or no investigations to substantiate the connections made between knowledge and practice, or the efficacy of practice. Systematic and continual assessment is a central component of the clinical-reasoning process manual therapists use in confirming or disconfirming a diagnosis. Investigations that focus on the clinical-reasoning and decision-making processes should be helpful initial steps in addressing questions such as, Why are patients getting better? and What kinds of patients get better with what treatments? Such investigations, ultimately, should be helpful in developing theories of practice for the profession of physical therapy.

**References**

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