Moving Precisely? or Taking the Path of Least Resistance?

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The path of physical therapy over the past 48 years

- Change from a clinically driven profession to an academically driven profession
Health and Exercise

• Perfect time as prevention continues to be the emphasis
• Role of exercise
  – In disease prevention
  – Is increasingly recognized
• Clinicians and academics must work together
Moving Precisely? or Taking the Path of Least Resistance?

• Insights from observing impaired movement patterns in myriads of patients
Compensatory Motion During Finger Extension
Path of Least Resistance

- Occurs at hyperflexible joint
- Joint moves when should be stable
- Easy to move along path of least resistance
- Not always the precise path
- Leads to undesirable outcome
- Easy to overlook
- Correct path early to restore precise path easily
Move to Academically Driven Profession

• Ease determined by
  • Past experiences, Current influences, Visions of the future
    • How they affect our
  • Identity, Clinical Science, Academia, Practice
Professional Considerations

- Whether relatively small changes in path can either compromise or secure our place in health care for the next century.
Professional Identity of Physical Therapy
Professional Identity

• **Move Precisely**
  – Continue to develop the concept of movement as a **physiological system**

• Take the Path of Least Resistance
  – Limit our idea of movement to a phenomenon
  – Becomes impaired by lesion in specific system
  – Musculoskeletal pain – single episode of tissue inflammation and/or restriction
Pathokinesiology

• The defining science of Physical Therapy
  – Helen Hislop, PhD, PT, FAPTA
  – 1975 Mary McMillan Lecture
• Physical Therapy is a health profession whose primary purpose is the promotion of optimum human health through the application of scientific principles to prevent, identify, assess, correct, or alleviate acute or prolonged movement dysfunction.

• House of Delegates 1983
Movement System

• A physiological system that functions to produce motion of the body as a whole or of its component parts.

• The functional interaction of structures that contribute to the act of moving
  – Stedman’s Medical Dictionary
Importance of Movement as Physiological System

• Concern about future expansion of education and practice unless role is defined

• Medical specialties are based on body systems
  – Florence P. Kendall, 1980 McMillan Lecture

• Almost all well established and accepted health professions have defined their role

• Experts on anatomical or physiological system
Implications for Practice and Education

• Concern with impairments that adversely affect movement
• Concern with how movements cause impairments that can result in disease & pain disability
• Clinicians and researchers must work together
• To elaborate all the functions and dysfunctions of the movement system
To be Respected for Knowledge of Movement System

- Elucidation of mechanisms of impairments
- Use of movement as a tool
- Increased knowledge of physiology and biomechanics of the system
- Increase our diagnostic tools - radiological
- Increase our treatment methods - pharmacological
Practice Based on Movement System

• Requires consideration of the effect of all components involved in system function
• Similar to consideration of
• Gastrointestinal, genitourinary, cardiopulmonary in affecting pH, regulated by metabolic system
Failure to Consider All Components of Movement System

- Patients with hemiplegia
  - “Tone” entirely attributed to spasticity a dysfunction of central nervous system
  - Secondary muscle changes (Dietz) overlooked
- Patients with musculoskeletal pain syndromes
  - Movement problem attributed to soft tissue dysfunction
  - Motor control contribution (Babyar)
**Cause versus Source Operational Definitions**

### Cause
- the mechanical factor (movement) that results in tissue irritation
- e.g. lumbar extension, femoral anterior glide, tibiofemoral rotation syndromes

### Source
- the tissue or pathoanatomical structure that is symptomatic
- e.g. facet syndrome, iliopsoas tendinopathy, chondromalacia
Components of Movement System

- Muscular, Neurological, Cardiopulmonary, Metabolic Systems
- Must consider their role and their interactions
- To move precisely toward the level of professional identity needed for next century
Physical Therapy Clinical Science
Clinical Science

- The study of the signs, symptoms, and course of the patient’s disease or dysfunction
- the integration of foundation sciences with our clinical knowledge and procedures
  - Task Force on Content of Post baccalaureate Degree Entry-Level Curricula
Clinical Science—Move Precisely

• Continuing to develop our clinical science
  – Incorporating and integrating current knowledge from the basic, medical, and social sciences into therapists understanding and communication
  – Conducting clinical and basic research related to the movement system
Clinical Science-Move Precisely

• Emphasizing treatments with a rationale scientific basis as opposed to those for which explanations require large leaps of logic or are based on pseudo-science

• Providing students with multiple opportunities to defend treatment choices based on clinical science
Clinical Science - We must not Take the Path of Least Resistance

• Teaching basic science without noting ways that science can explain clinical conditions and methods

• Failing to provide current pathophysiological information about impairments of the movement system
Clinical Science - We must not Take the Path of Least Resistance

- Teach clinical techniques without critical analysis of their effect on the impairments for which the patient is being treated
- Expecting the student to apply information obtained in the basic sciences to clinical practice independently
PT Education in the 1950’s

- Anatomy – lots
- Physiology – primitive
- Therapeutic exercise
  - Passive, active-assistive, active, resistive
- Skill in manual muscle testing for strength and length
Change in Patient Population

- Patients with polio - decreased
- Patients with hemiplegia - increased
  - lost confidence in clinical skills
  - my basic knowledge and skills no longer applicable
  - did not understand underlying mechanisms
Clinical Dilemma

• Clinical technique courses not available
• Pursue graduate education
  – To investigate mechanisms
• Understand underlying mechanisms
  – Design appropriate intervention
State of Clinical Science

• 1975  State of disarray
  – lack of identity
  – clinically driven
  – limited PhDs

• 2006  State of disuse
  – have not applied existing information
  – have not communicated using our basic science
Established Basic Science - Cellular & Clinical Manifestation

- use
- disuse
- stretch
- strain
- stiffness
- anatomical length adaptations
Application of Basic Science Information

• Muscle hypertrophy increases the amount of connective tissue
  – Improves passive stability
• Basic kinesiological information
  – maximal lumbar flexion
  – number of degrees of spinal movement between each vertebral segment in each plane.
Clinical Science in 2006

• In better position to develop, organize, and use our clinical science

• Larger number of PhDs in sciences
  – their research is important
  – but so is their ability to specify direct applications of science to clinical practice
  – help distinguish between scientifically valid explanations and pseudoscientific explanations
Physical Therapy Academia
Academia - Move Precisely

• PT educational programs to be true academic unit,
  – produce the highest level professional practitioner, and
  – make substantial contributions to the body of knowledge of the profession.

• Graduates should be skilled in
  – performing a standardized basic exam,
  – making accurate diagnoses for **basic conditions**, 
  – designing appropriate management programs
  – implementing basic treatment programs
Academia - Move Precisely

• Students to attain a relatively high level of skill in developing treatment programs while they are in the academic environment

• no longer possible for the clinical environment to provide instruction for those with low level skills
Academia - Move Precisely

- Professional clinical doctorate programs to produce clinicians skilled in
  - rendering diagnoses and prognoses
  - selecting and implementing optimal management strategies
  - justifying their decisions and actions using evidence from the literature
  - communicating with professional colleagues in manner that conveys expertise in the movement system
Academia - Move Precisely

• Post-professional clinical doctorate programs to be developed to produce scholar-clinicians who will
  – contribute to our professional body of knowledge,
  – by integrating information obtained through critical analysis of the literature,
  – applying the information in clinical practice,
  – disseminating the information in the form of case reports.
We must not Take the Path of Least Resistance

- Continue the proliferation of programs that lack the resources to provide
  - a strong education in clinical science,
  - a highly skilled practitioner, or
  - to contribute to the body of professional knowledge

- Introduce students to clinical tests and skills, with the expectation that basic proficiency will be acquired during clinical education.
We must not Take the Path of Least Resistance

• Introduce students to a wide variety of treatment techniques with the expectation that they will select and apply these techniques at their own discretion.

• Continue to tell students that they should be diagnosticians and then only teach them about the decision-making process without requiring them to make diagnoses of various types multiple times.
We must not Take the Path of Least Resistance

• Devote time in the professional curriculum to student research that detracts from the time available for students to become skilled in examination, diagnosis, treatment planning, and treatment.
Clinical Innovators

- Berta Bobath
- Maggie Knott
- Florence Kendall
- Margaret Rood
- Signe Brunnstrom
- Maitland
- Kaltenborn
- McKenzie
Typical faculty member in 1950’s to 1960’s

- Not a master clinician
- Not respected for clinical skills
- “Those who can practice do, those who cannot, teach.
- Heavy teaching load, prohibited practice
- Were not expected to do research
1980’s Change in Educational Program Model

• Adopting standards of academic units in other clinical disciplines
  – requiring faculty research, practice, and teaching
• Reaching a critical mass
• Best and brightest joining faculties
• Becoming source of clinical innovation and research needed to advance clinical science of PT
Implications of New Model for Entry-level Student and Clinician

- Students taught by physical therapist scientists
- Students taught by specialized master clinicians
- Student base of knowledge and fundamental skills can exceed the average clinician because of the level of material provided by faculty experts.
- Similar to medical students receiving their education by leading scientists and practitioners.
Today’s Clinical Environment

• Rapid pace forcing therapists to model less than optimal practice patterns.
• Students follow the example of clinicians
• Academic programs should not expect clinical facility to provide the direction for the student to establish his practice patterns.
Importance of Clinical Experience

• Opportunity to participate in intensive patient care
• Setting in which to evaluate clinical performance
• Exposure to a variety of clinical skills
• Guidance by experienced clinicians
The Trend of Physical Therapy Programs and the Academic Model

• Fewer programs following this model
• Proliferation of programs without resources of
  – highly prepared faculty with skills in
  – research
  – teaching, or
  – practice that is
  – required to prepare students for the scope of today’s practice
Student Preparation Before Leaving Academia

- Able to demonstrate that he can perform an exam,
- Make a diagnosis
- Develop a treatment program,
- Implement that program
- Within time constraints that are similar to those imposed in the majority of clinical facilities
Faculty Responsibilities

- Design a curriculum that provides concentrated practice in a standardized examination,
- Practice in designing an appropriate exercise program,
- Practice in implementing the program, with criticism from experienced faculty clinicians.
- Forego introduction to a wide variety of techniques.
Diagnostic Categories to Direct Physical Therapy Treatment

- Provide precise focus for education
- Provide precise focus for practice
- Medical diagnoses direct physician’s pharmacological or surgical intervention, do not direct PT treatment of movement system impairments.
Movement System Diagnoses

- Diagnoses for PT should be of
  - Syndromes of Movement System Impairments
  - Subdivisions of
    - Musculoskeletal
    - Neuromuscular
    - Cardiopulmonary
    - Integumentary
  - Tissue impairments
  - Movement impairments
Student Research

• Detracts from time student has to learn the profession of PT.
• Research is a profession
• Cannot learn two professions in two to three years
• Students can do research as independent studies, not as part of curriculum
Professional Clinical Doctorate

- Training in content upon which the decisions are to be made
- Education should provide information
  - about which decisions are to be made
  - upon which to base decisions,
- Lots of practice in making decisions.
Professional Clinical Doctorate

- Product consistent with product of other clinical doctorate programs
- Acquire expertise in an anatomical or physiological system (movement system)
- Expertise in the normal and abnormal structure and function of the system
- Diagnose abnormal conditions, establish prognosis
- Select most appropriate treatment option
Post Professional Clinical Doctorate

• Programs to produce scholar-clinicians and diagnosticians
• Updates in basic science, medical science, clinical science.
• Course work in critical analysis of literature
• Prepare case studies - contribute to body of knowledge
• Different degree title - not DPT
Physical Therapy Practice
Highly Individualized Patient Management

• Trend that developed in 1960’s and 1970’s with patients with central nervous system dysfunction
• Still lack standardized approaches in examination and treatment
• Patient’s unique problems addressed after an exam and determination of a diagnosis
• Modify treatment according to patient’s special needs
Diagnosis First and Treatment Second

• Other practitioners and the public should seek consultation for
  – DIAGNOSIS FIRST
  – Treatment second

• Billing code for PT evaluation initiated in
  – 1998
  – Evaluation performed by MD
Practice - Move Precisely

- Promote the development and use of diagnostic categories that direct physical therapy
- Develop and utilize standard examinations and terminology
- Emphasize treatment that is based on a thorough knowledge of basic anatomy and kinesiology
Practice - Move Precisely

• Pursue knowledge of underlying science with as much commitment as we pursue the latest treatment methods

• Recognize our responsibility to protect patients from treatment fads that have highly questionable scientific bases

• Maintain adequate standards of practice, demanding adequate time for exam, diagnosis, treatment
We must not Take the Path of Least Resistance

- Using approaches to examination and treatment that are highly eclectic and not based on standards consistent throughout the profession.
- Pursuing fads without pursuing a clear understanding of the relevant scientifically based explanation for the methods.
We must not Take the Path of Least Resistance

- Communicating in a manner that typifies non-profession personnel
- Compromising professional standards of care by providing only partial treatment in order to meet unreasonable demands for productivity
Diagnosis to Direct Physical Therapy is Important
A Foundation of the Basics

• Strong knowledge of anatomy and kinesiology
• Skill in muscle length and strength testing
• Skill in movement analysis
Best Available Evidence

• Low back pain when lumbar spine is extended
  – Contract abdominals to posteriorly tilt pelvis
  – Not leap of logic to use such a treatment strategy
• Yet some more readily believe the
  – two halves of the pelvis can be adjusted relative to each other
  – than abdominals tilt pelvis, or
  – That the transversus muscle tilts the pelvis
Moving Precisely?

Taking the Path of Least Resistance?
Documentation of Exercise Programs

- Dying bug
- The clam
- The chicken wing
- Hip hinging
- The skater’s exercise
Accomplishments of Physical Therapists

- Use wide variety of interventions
- Treat extensive number of conditions
- High degree of responsibility
- High level of expertise
- Must find the time to use what we have accomplished
- Cannot practice like technicians because of lack of time
Balance in Physical Therapy Practice

• Cost effectiveness
• Efficiency
  – with
• Adequate time for examination, diagnosis, and treatment
You of this generation

• Will carry the torch through the night of the next few years
• To provide a bright world for physical therapy in this century
Your Role

• Move Precisely
  – Use and expand our scientific foundation
  – Do not be misled by fads that lack substance
  – Do not be weakened by unreasonable demands
    • that compromise your responsibilities
    • to your patients and to your profession.
Do Not Take Path Of Least Resistance

• Failing to practice
  – and to communicate in a manner
  – that reflects the science & ethics of the profession
The World Needs Our Professional Services

• Much to give
• To aide the physically challenged
• To guide the physically able
  – Young or Old
• Society needs us so they can follow the path
• Of moving precisely toward
• Optimum health
Moving Precisely?

Taking the Path of Least Resistance?