Past Present and Future of Joint Manipulation

Stanley V. Paris  PT., PhD, FAPTA
F.A.A.O.M.P.T., M.C.S.P., B.I.M.

Abstract:
Presented as the first Distinguished Lecturers Award, of the American Academy of Orthopaedic Manipulative Physical Therapists October 2011, the paper begins by addressing the richness of manipulative experience that caused the Founding Fellows to create the Academy. Speaking to his concerns that this richness seems to be forgotten by many practitioners he reviewed also the known effects of manipulation before then evaluating the evidence based literature criticizing much of it for being too basic and taking the profession back to where we were some fifty years ago before specific manipulative techniques were in vogue. Thus the current research is largely on non-specific regional techniques done for effect rather than for pathoanatomical and mechanical consideration. Many of the techniques being studied and promoted as manipulations the current literature do not justify to be called “manipulations” lacking as they do “skilled passive movements to a joint.” The paper argues for remembering that published literature is only one leg of the three legged stool of evidenced based practice, the other legs being patients wishes and culture, and the third being individual therapists expertise. Given the quality of much current physical therapy evidenced based literature Dr. Paris did not think that it was of sufficient scope and quality on which to base our practice. He ended by calling for a paper on continuing educations to be retracted or by its authors or the journal in which it was published.

Introduction of the Speaker
by Robert Rowe
President of the Academy Academy of Orthopaedic Manipulative Physical Therapy (AAOMPT)

Colleagues, friends and distinguished guests it is with great pleasure that I present Dr. Stanley V. Paris, PT, PhD, FAPTA, for the inaugural presentation of the AAOMPT Distinguished Lecturer Award. Dr. Paris is a confirmed professional role model and mentor who is universally recognized as a leader for advancing own physical therapy within the profession and across the healthcare arena.

The nominators who included Freddy Kaltenborn, Ben Massey, Steve McDavitt, Ken Olson, Bill Boissonnault and Rich Nyberg, further endorse his significantly enduring leadership contributions and track record of influence in the development and proliferation of education, research and practice of orthopaedic manual physical therapy nationally and internationally. Within and beyond the spectrum of orthopaedic manual physical therapy Dr. Paris believes very strongly and dearly professes the benefits of physical therapists working together nationally and globally as collaborative experts in health care especially in orthopaedic manual physical therapy (OMPT).

Following his immigration to the United States from New Zealand in 1966 Dr. Paris has been actively involved in international research, clinical practice and teaching in the area of orthopaedic manual physical therapy with a primary specialty of conservative management of the spine. He has been a strong advocate for asserted professional practice, developing collaborative practice relationships, clinical specialization and strengthening leadership across physical therapy.

Dr. Paris’ achievements are vast and generous. Here are a brief summary of a few of them. He is the founder and president of the orthopaedic section of
the American Physical Therapy Association. He is the Founding Chairman of the International Federation of Orthopaedic Manipulative Physical Therapists. He is the founding President of the University of St. Augustine for Health Sciences with institutions and campuses in St. Augustine, FL, San Diego, CA and Austin, TX, that encompasses the Institutes of Physical Therapy and Occupational Therapy as well as a program for the orthopaedic physician assistant. Dr. Paris has received numerous professional awards and honors including APTA’s highest honor in physical therapy as the 37th Mary McMillan Lecturer in 2006, named as a Catherine Worthingham fellow in 2002, founded the APTA’s Orthopaedic Section Paris Award for distinguished service and received a special award from the American Board of Physical Therapists Specialists.

Dr. Paris has served as a director on the APTA’s Board of Directors, is a founding co-editor for the Journal of Manual & Manipulative Therapy. He has published more than 30 articles in a variety of peer reviewed journals. He has hosted a six part series on national public television entitled Pain Cause Prevention and Treatment and produced a movie titled It’s your back. He is the recipient of the 2011 Mildred Elson Award from the World Confederation of Physical Therapy and was recently named as a member of the Board of Trustees of the APTA Foundation for Physical Therapy.

From this brief summary it is clear to me that Dr. Stanley Paris is an icon recognized and appreciated as one of the highest leaders and contributors for the development and practice of orthopaedic manual physical therapy (OMPT). Dr. Paris clearly deserves such an honor and should be recognized as the recipient of the inaugural presentation of the AAOMPT Distinguished Lecturer Award. I’m confident that such a visionary and committed leader will provide a lecture that will continue his relentless quest of advancing OMPT by influencing all who are privileged to witness and reflect on his valuable thoughts and presentation so I would like to present Dr. Stanley Paris.

**Preamble**

Thank you. It indeed it is honor to be the first recipient of this award. I wish to express my profound gratitude to the Academy and I only hope I do justice to their selection for there are many others who deserve this award and so I trust that they like me will live long enough to receive it !!

Some awards such as this carry an added responsibility and that is to make a presentation. They place on the award recipient a challenge at a time that the recipient may well is past their best. I saw such events with Cyriax and Mennell and I felt concerned for them and understood why Stoddard turned down speaking engagements soon after he retired.

I need you to know I have recently retired.

However I do some teaching, principally on the cervical spine, consisting of both examination and manipulative techniques and I am occasionally in the clinic.

When today I use the term “manipulation” know that I use it according to The Guide to Physical Therapist Practice “meaning a skilled passive movement to a joint and related soft tissues etc. etc” which includes both thrust and non-thrust techniques. So again, today when I say “manipulation” I mean the skilled passive movement to a joint – thrust, non-thrust and distraction.

I have led an active professional life but I believe in keeping it in balance if I at times miscalculate and run hard onto the rocks - then so be it.

This photo, while both an embarrassment to my navigation skills does point out that I know something about stabilization, balance and poise under pressure.

![Photo](https://example.com/photo1.png)

However, here is my wife Dr. Catherine Patla being evacuated by the United States Coast Guard and leaving me aboard to balance the boat.

Part of my life balance has been as a slippery customer.

![Photo](https://example.com/photo2.png)
The 23 MILE WIDE AND COLD English Channel has seen me make five solo attempts – I am proud to have succeeded twice in solos and three times in relays.

With the kind permission of the Academy I am privileged to have two guests here today. The first is Dr. Wanda Nitsch the new president of the University of St. Augustine and the second is Jonathan Warren the immediate past president of the New Zealand Society of Physiotherapy and the latest addition to our faculty at the San Diego campus. Would you both please stand and be recognized. Thank you.

Introduction:

The purpose of my paper today is three fold:

First to share the rich paths by which we have gained the science and art of manipulation that led to the formation of this Academy by the Founding Fellows.

Next to speak briefly on the long recognized effects of manipulation. Effects that I think are being neglected in the current literature.

Finally to discuss Evidence Based Practice with an emphasis not on the pyramid demonstration levels of learning – but rather on the three legged stool of clinical evidence, namely: clinical expertise, patients culture and yes the published literature.

I do not apologize for believing that specific segmental joint manipulation is not for all physical therapists any more than neurosurgery is not for all physicians.

Looking back I am thrilled that the profession has embraced manipulation, it was for many years reluctant to do so, refusing the formation of a Section on Manipulation in 1968 and finally and reluctantly agreeing to a section on Orthopaedics in 1974.

But I am disturbed at the fact that CAPTE now requires all students to learn thrust and as a direct result I fear a general dummying down of the art and science of joint manipulation to make thrust available to students - well before they are educationally and skill wise prepared to learn appropriate segmental manipulation (Adopted October 2004 CC-5:39 Patient Client management.)

Consequently I am seeing the instruction of manipulative techniques that do not meet the definition of being a “skilled passive movement.” There is little specificity and thrusts appear more like a “bounce.”

The techniques presently being presented in most clinical prediction rules (CPR) fail that test of being a skilled passive movement to a joint and related tissues etc... and thus do not qualify to be called a manipulation. Students may graduate thinking they know manipulation but I fear not.

I remember the days when graduates thought nothing of coming for two weeks to take their first introductory course on spinal manipulation. There they learned anatomy, biomechanics and effects of manipulation and were trained in patient evaluation this they achieved before they learned non-thrust and later still thrust manipulations. My University, the University of St. Augustine, while barely meeting CAPTE requirements that we teach thrust, instead emphasizes evaluation and non-thrust skills during their professional training and only teaches skilled thrust techniques after they have passed a certification process that tests their written, oral and practical skills.

Today in this fast paced society of ours we have precious little time to adequately instruct and seminars are getting shorter and shorter to accommodate.

If this continues I fear that such students and graduates alike will never realize in the time available for instruction - the full potential of manipulation. They will not sufficiently know its history nor will they know its effects nor have spent the necessary long time for training, seeking out a mentor and adopting a mind set that may one day lead them to become the skilled reflective practitioner that produces the master clinician so represented by the Founders of this Academy.

Today much instruction has succumbed to the pressure for it to be evidenced based relying therefore on recently published papers which use such terms as random controlled trials. Unfortunately as I shall attempt to show, much of our research in this area is basic and misleading. In addition, the teachings of Cyriax, Kaltenborn and Maitland as well as many others including McKenzie and Mulligan and yours truly is being neglected in many of our schools for they practiced and taught mostly prior to the concept of evidenced based practice.

If I am right then this Academy is under threat as today’s graduates and therapists, as well perhaps those of some Fellowships who are being narrowly trained with gross thrust techniques will not come to appreciate the challenge, the art and science of manipulation, and thus will not become stimulated by its demands and thus committed to advance this field.
Manipulation as the Founding Fellows know it may be at risk.

New graduates may see little point in joining this Academy if the Academy does not hold itself up to promoting and displaying the highest standards of clinical examination and management across a broad front of practice – spine and extremities.

When this Academy permitted the instruction of thrust manipulation to first semester students as it did at an earlier conference - then we are truly supporting a dummying down of our work and I should hope that this never occurs again.

The Academy must uphold the highest standards of practice and responsibility and it must continue the opportunity such as has been afforded me today, for open and well intentioned discussion, debate and disagreement if we are to be truly worthy of being a professional organization, and as such lead the entire profession.

Thus you are beginning to see the structure of this presentation. A presentation motivated by a heart felt concern for our future and for the services we deliver to the patient.

If I am today successful in this presentation I would hope that the many who follow to this podium in future years, to deliver this address, will like me take advantage of the opportunity to reflect, critique and advise much in the spirit that the APTA wishes for those who receive its highest award - the McMillan Award. You will be the judge.

1. Overview of the History

I shall begin with a rapid presentation of “a” history of manual and manipulative therapy”. Bringing forth some “key” contributions that each individual or group contributed to our present understanding.

This is a topic that I am quite familiar having written extensively on it and in a modern sense having been part of it.

We have a rich heritage that has come our way beginning with Hippocrates and showing no signs of ending. In the brief time I have I will state what I think each of these persons may have left us with to enrich our practice. I am sure those who adhere to the philosophy of a Maitland or McKenzie will recognize what I have to say - but will see the weaknesses of all too rapid generalizations that time forces on me. Please be understanding.

Here listed are some of the individuals and professional groups that have contributed to our practice today.

Most if not all these names will be familiar to you. If not you will soon hear a little about each of them.

Note there is a break in these names.

- Hippocrates
- Galen
- Bonesetters
- James Mennell MD
- Thomas Marlin MD
- Osteopathy
- Chiropractic
- James Cyriax
- Alan Stoddard
- Freddy Kaltenborn PT
- Robert Maigne MD and Jean Thiery Mieg MD
- Paul Harrington MD
- John Mennell MD
- Geoffrey Maitland PT
- Mariano Rocabado PT
- Bob Elvey PT
- Robin McKenzie PT
- Brian Mulligan PT
- Stanley Paris PT

The first group preceded all of us.

The second group recognizes the major two professions that were at one time principally associated with manipulation of hard and soft tissues.

The third group – well I have known all of them personally. I have had five of them stay at my home and I have received instruction and dare I say come to know all of them with the exception of Robert Maigne who was visited by Kaltenborn, Maitland and Mariano Rocabado - but I did spend time in Paris with his partner Jean Thiery-Meig. His influence has been a factor in Europe especially in France where he made it illegal for physiotherapists to perform manipulation.

Editing Note: While the following slides along with their captions were being presented Dr. Paris spoke about each but not from a prepared manuscript thus the following is an edited version relying more on the captions than on the spoken word.
HIPPOCRATES

Hippocrates ……… Well known as the Father of Medicine, might just as well have been called the Father of Physical Therapy as many of the techniques on the following graphics will show.

While traction is being applied by two aids through levers and harness, Hippocrates is imparting a vertebral manipulation – a glide no doubt.

This is the classic Hippocrates method for reduction of a shoulder dislocation. Note that the patient’s good arm is safely secured, the thumb is used in traction against the sternal end, another pulling the humerus head laterally so as to approach the glenoid fossa. Finally the manipulative force is a downward pull on the arm accompanied by abduction of the arm over the foot to give further lateral leverage before releasing the downward pull on the arm.

GALEN

Combined traction and manual lumbar pressure.

While traction is being applied by two aids through levers and harness, Hippocrates is imparting a vertebral manipulation – a glide no doubt.


While there is much to be learned from the ancients, some techniques might best be left well alone. However, in south east Asia, walking on the back is still practical. The therapist uses their toes to draw their feet along the spine, supported by crutches.
Perhaps the oldest statue or illustration of a manipulation. It appears that the sacroiliac is being manipulated with a backward torsion force. Circa 2500BC Thailand.

During the so-called “dark ages” where medicine gave way to the church, it was the Arabic world that kept alive the once-great practices of the Greek Hippocrates from the island of Cos, and the Roman Galen.


Armourers, those who made protective clothing for knights and soldiers were no doubt the forerunners of orthotics and prosthetics. The device shown here would no doubt straighten the elbow. Might also cause myositis ossifications and Volkmann’s ischemic contractures.
Osteopathy was founded in 1874 by a medical physician named Andrew Taylor Still. He considered that the body would be at best health if the good nutrition was practiced and the blood and lymph circulation was free to bring the body’s defenses to bear on the disease. He advocated visceral and circulatory massage as well as spinal and extremity joint manipulation.
CHIROPRACTIC

Chiropractic was founded by a layman, Daniel David Palmer who believed that the body was in best health if the vertebra were aligned allowing for the vital nerve forces to supply the body. When these vertebra become subluxed they not only may cause pain but lead to disease. The treatment and prevention of disease lay with keeping the vertebra aligned.

MENNELL

Mennell was one of the first physicians to appreciate that the practice of manipulation would be best served by physical therapist. By the late 1890’s he was teaching therapists in the United kingdom how to perform spinal and extremity joint manipulations.

Law of the Nerve

- That a vertebra may become subluxed (out of alignment)
- This may impinge on a nerve
- The ‘vital nerve force’ is interfered with
- Function is altered
- Functional an organic disease may follow
- Treatment is adjustment of the vertebra

He used the then “new” technology of radiology to gain a better insight as to how normal and dysfunctional joints moved.

James Mennell wrote a number of books on massage and manipulation. The most successful was “The Science and Art of Joint Manipulation” Vol. I The Spine and Vol. II The Extremities. Mennell wrote “there is no magic in joint manipulation. When relief of symptoms occurs it must be within the laws of anatomy, pathology and physiology. If the existing laws do not cover the proven clinical facts then those laws must be extended.” Clearly he was a strong man and on occasion used gross techniques.

While some of his techniques may appear to be physically challenging many were not and used the principles of leverage.
THOMAS MARLIN

Marlin in the 1920’s was no doubt the first published practitioner of specific joint manipulation. He had a sound understanding of joint arthrokinematics. Inhibitive Distraction. Did Marlin learn this from some osteopathic text or did he discover it independently as perhaps did Bobath and others in PNF (proprioceptive neuromuscular facilitation) find that pressure over the origin or insertion of a muscle will cause it to relax. The same is true of transverse pressure over the muscle belly - but much less effective. The fingers in the above technique are on the base of the skull and must not be placed over due to the possibility of causing an instability or subluxation.

Here performing inhibitive distraction to the suboccipital muscles. Note that this was also practiced by Still and has been part of eastern treatment of headaches for eons.

Inhibition of the phrenic nerve – NOT RECOMMENDED

This rather risky technique was used to stop hiccups. By giving firm pressure the impulses are apparently interrupted and the hiccups cease. Unfortunately the phrenic nerve also has a role to play with the heart and so one should fear the consequences.

Inhibition of nerve activity comes more under manual therapy than manipulation. Here is a treatment for hiccups. Interestingly James Cyriax's father also practiced a number of nerve inhibition techniques including friction massage to the nerves.

JAMES H CYRIAX

Cyriax who laid claim to founding Orthopaedic Medicine was a considerable force in the United Kingdom working principally from St. Thomas's Hospital. He trained many therapists in his techniques. However many required considerable strength and used great force upon the patient. It was in the 1960's that Maitland visited England and the therapists there received his ideas quite enthusiastically.
His theory was quite simple. It back pain comes on rapidly and does not radiate down the leg it is a torn disc that needs be manipulated back into place. If the pain comes on more gradually and or radiates into the leg it is a disc protrusion and needs to be sucked back with either manual or mechanical traction. Today with modern imaging technology we know his simplistic explanation of back pain to be wrong. Still there is a wealth of knowledge in his texts and writings especially when it comes to the extremities.

Reducing a lumbar disc – torn annulus

He was also an advocate of transverse frictions to stir up the reparative process and to break down any adhesions.

Reducing a cervical disc – torn annulus

ALAN STODDARD

A medical physician he then went on to study osteopathy and developed a set of techniques and skills that this speaker would say were second to none. His ligamentous and facet opposition locking methods protected joints from the manipulative impulse to an adjacent stiff joint. His thrust was along or at right angles to joint planes and they were of extremely high velocity through the smallest possible amplitude.
Upper thoracic facet apposition lock

Classic mid lumbar facet gap employing ligamentous tension

ROBERT MAIGNE
A French physician, who practiced vertebral rather than joint manipulation and who is believed to have had a considerable influence on Maitland.

Maigne advised

“Not everyone is able to practice manipulation, nor spend the necessary long time for self training, or finding an adequate teacher, just as not everyone is able to play billiards or a musical instrument.”

Robert Maigne 1972
France

Sound advice and one of the strengths of physical therapy in that we have so many areas in which we can choose to flourish. By contrast a chiropractor has little choice.

FREDDY KALTENBORN
A mentor to this speaker, I hold that Freddy Kaltenborn was the first clinical scientist in physical therapy. Not satisfied that his treatment were effective he sought to know why and looked to path anatomy and arthrokinematics as the source for his treatment logic. At 89 years of age he is still engaged.

Taken with Kaltenborn about the time of the formation of IFOMPT in Montreal in 1974.
This newspaper photo is of my first visit to him in Oslo Norway in 1960.

His convex concave rules are known to all manual therapists.

He was extremely precise. Manual therapy does not take long to do but the set up might.

PAUL HARRINGTON

Paul Harrington will be remembered for Harrington Rods and their breakthrough in the treatment of scoliosis. He is listed here for when I visited him in 1961 he had a lab that employed bioengineers who knew more about spinal mechanics than I had learned elsewhere. A personal note is that the following slide is of my sister who at age seven had a bad case of poliomyelitis. Harrington performed his surgery on her and took this thirty year old from depending on assistance to get dressed each day to being independent and able to travel abroad alone. Of further interest is that in the months preceding the corrective surgery my father and I (dad being the first male therapist in New Zealand) mobilized her spine each night in order to assist the surgical correction. Harrington gave credit to us both.

JOHN McM MENNELL

John Mennell, son of James Mennell mentioned earlier, was a moiré precise and gentle practitioner. He majored on the extremities and especially the foot which he felt few if anyone understood.

In the accompanying picture taken in 1979, Mennell is seen addressing the Inaugural Class on what would one day become the University of St. Augustine.
GEOFFREY MAITLAND

Shown here with my wife Dr. Catherine Patla, Geoff was a gentlemen and a scholar in every respect of the phrase. He took the most detailed of histories and kept his treatment notes likewise. His techniques were not so much for the treatment of dysfunction, but more for the relief of pain “for that is what brings the patient to us.” Hence he practiced vertebral not joint manipulation.

His grading system is an excellent way to think of manipulations.

MARIANO ROCABADO

Mariano introduced craniomandibular practice to physical therapy. His older sister was incidentally a dentist and encouraged him to work in this area for it seemed that no one was paying attention to the oral facial system.
**ROBERT ELVEY**

Bob introduced neural tension concepts but claimed very little for them saying that they were just a useful adjunct. Some therapists for a time were carried away with these techniques and for a time they were quite a fad.

**ROBIN MCKENZIE**

Robin along with his good friend Brian Mulligan took the first course I taught in New Zealand. He went off to visit Cyriax and Kaltenborn and for a time taught with Kaltenborn. An astute clinical observer he noted that forcing lumbar extension could have a beneficial effect and from that observation developed a complete movement and treatment diagnostic system. While not really manipulative therapy or for that matter manual therapy – those who treat spine need have at least a grasp of his fundamentals.

McKenzie liked to quote Pasteur who said “good fortune favors the prepared mind.”

**BRIAN MULLIGAN**

Eighty years of age and still going strong, he saw the value in “manipulation with movement” and went on to develop a whole range of very useful techniques that show a great understanding of joint arthrokinematics. Bryan with wife Dawn (here shown) have traveled many a mile together.

**STANLEY PARIS**

Since this is “my hour” a few minutes on what I think I might have contributed should be in order.

**Stanley Paris**

**Research**
- Mechanics of the intervertebral disc
  - Positional distraction
- Facet Innervation and pathology

**Philosophy**
- Treat function not pain
  - 6 grades of motion
- Manage by syndromes
- Patient responsibility
Manipulation/Mobilization

- Synonymous terms
  - Manipulation: "the skilled passive movement to a joint".
  - Manipulation: "the skilled passive movement to a joint with a therapeutic intent". (Paris SV., Physical Therapy, Vol. 59, o. 8, 988-995, 1979.)
- Manipulation/Mobilization
  - "A manual therapy technique comprised of a continuum of skilled passive movement to the joints and/or related soft tissues that are applied at varying speeds and amplitudes, including a small amplitude high velocity therapeutic movement."

O – 6  PIVM Grading System

- 0. Ankylosis ignore
- 1. Cons. Restr. hypo non-thrust
- 2. Slight Restr. hypo non thrust +thrust
- 3. Normal
- 4. Slight Incr. hyper stabilize -- ?
- 5. Consid. Incr. hyper stabilize
- 6. Unstable stabilize – fusion ?

Principal Syndromes of the Spine

1. Myofascial States
2. Facet Dysfunction
3. Sacroiliac impairment
4. Ligamentous Weakness
5. Instability
6. Disc Dysfunction
7. Spondylolisthesis
8. Lumbar Spine Stenosis: Central Spine Stenosis Lateral Foraminal Stenosis
9. Cervical spine : Central nerve Stenosis & Myelopathy Lateral Foraminal Stenosis
10. Whiplash Acceleration & Decceleration
11. Other
12. Elevated First Rib
13. Thoracic Outlet Syndrome
14. Headaches
15. Lesion Complex
16. Spondylolisthesis
17. Lumbar Spine: Kissing spines (Bastaps Disease)
18. Cervical Spines: Kissing Lamina
19. Thrombocellular syndrome (Maignes Syndrome).
20. Lateral Shift
21. Scoliosis

I have over the years engaged in a number of research projects and have some 50 published papers partly as a result.

I consider the spinal facet joint to be the principal source of spinal pain followed by myofascial and sacroiliac dysfunctions with the clinical disc the result of the preceding dysfunctions. Thus it could be said that the clinical disc is the denial or failure of precise manipulative therapy and management. None the less, the disc has none the less fascinated me.

In this slide below, and there are hundreds like it, a disc protrusion can be seen on the myelogram to be present in the erect position on the right and then to totally compress the dural sac on extension (backward bending). How then could repetitive backward bending a la McKenzie, reduce a disc extrusion/bulge. The answer is that extension cannot reduce a disc but rather like Codman on the shoulder, repetitive motion by activating the facet joint mechanoreceptors may operate the facet joint mechanism, lessen the noxious stimuli and help centralize the pain enabling pain free motion and functional restoration.

Here in the following slides I had two surgical friends inject my discs and simultaneously had a myelogram. This you could not do on a patient. I then underwent a series of spinal motions, both functional and non-functional while the behavior of the disc and spinal cord was recorded. At one point in the filming, when I was repeatedly performing an incorrect lift, I experienced a sharp pain in the area under study. By repeating this lift we began to show a tear and later an extrusion of nuclear material.
Combined discogram and myelogram

Subject: Stanley Paris 55 years (1992)
Objective: To better understand the biomechanical behavior of the disc
Method: Repeated lifting with twist created the protrusion not present at outset of activities.
Note: while twisting and lifting produced the lesion (see arrow) the subject by repeated backward bending was able to move nucleus to vertebral level above but was unable to reduce it. However pelvic tilting (not shown) did somewhat centralize the protrusion to the disc but not into.

The arrow on the left slide points to a tear and minor extrusion of disc material not originally seen. With repeated forward and backward bending we observed that on forward bending more disc material extruded as would be expected, but that on backward bending the extruded material was forced further back. The above pictures were taken over a 45 minute period. I had several days of disability following this event!

Here you can see an increasing disc protrusion.

For a prolapsed disc irritating or giving pressure on the nerve root producing neurovascular symptoms I devised the following method called "positional distraction" and claim it to be far more efficient than mechanical traction.

Positional distraction is I feel the best way to relieve nerve root pressure and it one of the few techniques that I might have contributed to the management of spinal pain.

Note carefully that the extruded material is not only between the two arrows but some has migrated to the level of the vertebra just above. It might also be noted that from the range of motion and supported by the excessive translation present this is osteoligamentously and unstable joint. However it was not prior to this a problem for the subject had good neuromuscular control which is the essence of stabilization.

Instability occurs when the osteoligamentous and neuromuscular component of the spinal segment are unable to hold the segment against slippage and creep

Positional distraction

Patient is position over a firm bolster with the side with neurovascular symptoms uppermost.
Flexion to the level is added followed by side bending to the level above. The net effect is to gain modest flexion and maximal side bending thus opening up the foramen and relieving the nerve root pressure/irritation. Additional gapping by pressing on the pelvis as shown in the third frame and maintained in the final frame. The position is maintained for increasing periods at twice daily sessions with instruction for the patient to continue at home.

Studying back pain can involve a study of the nerve pathways and my team did an extremely though job and were credited with having discovered several “nerve” and pathways that contribute more to surgery and to those who seek to destroy them, than to physical therapy.

This is the first picture to illustrate that each posterior nerve innervates three spinal facet joints and their related structures.

Going to the political side of my career I have been active in helping form organizations that would advance our practice.

My first efforts to form a section on manipulation within the APTA was in 1967 and it met with considerable opposition. So I formed along with John Mennell seated to the right, and Marjorie Ionta, Chief Physical Therapist at Massachusetts General Hospital, the North American Academy of Manipulative Therapists.

When our number reached 994 the APTA knew we had to be given a base within the APTA. Consequently we agreed on forming the Orthopaedic Section in 1974.
In the same week we also formed IFOMPT – the International Federation of Orthopaedic Manipulative Therapists.

Both these organizations thrived with the Orthopaedic Section becoming the largest Section within the APTA and IFOMPT having some 23 member nations and being now a sub-section of the World Confederation of Physical Therapy.

Schools of Thought

Now I shall place the preceding practitioners that I spoke of in the history into a classification that I have termed Schools of Thought.

The persons and professions displayed here have been the major contributors to our practice. They certainly influenced the practices of the founding Fellows of this Academy.

Schools of Thought

Replacing Material
- Hippocrates
- Chiropractors
- Cyriax

Centralizing Pain
- Codman
- Maitland
- McKenzie

Normalizing Arthrokinematics
- Osteopathy
- Mennell
- Stoddard
- Kaltenborn
- Paris

But then there is a new group emerging that is not in the above slide for it does not yet seem to have a name, or if it does it has escaped me. Yet it is publishing a great deal and they are to be congratulated, conducting RCT and presenting at this Academy and at many other forums and so they need to be identified and recognized.

A number of them are associated with Evidence in Motion (EIM) or appear influenced by EIM so for want of a better term I shall refer to them as the EIM Group.
Practitioners of Precision

Replacing Material
- Hippocrates
- Chiropractors
* Cyriax

Centralizing Pain
- Codman
- Maitland
- McKenzie
* EIM

Normalizing Arthrokinematics
- Osteopathy
- Mennell
- Stoddard
- Kaltenborn
- Paris

In the above slide I have placed an asterisk (*) against the only two groups that show disregard for precision. I have added EIM in the category that focuses on pain relief. But I have titled the slide “Practitioners of Precision.” and placed an asterisk those that so practice. The techniques of EIM non-segmentally specific, as for instance Stoddard, Kaltenborn and even Maitland and McKenzie who closely monitored each response and modified treatment accordingly during each treatment session.

Effects of Manipulation
1. Psychological
2. Mechanical
3. Neurophysiological
4. Biochemical

The clinical prediction rules published by those connected with Evidence in Motion (EIM) show little regard to segmental instabilities or localized stiffness and thus the indication for such a technique does not require a skilled examination of the spine. Just a few questions, a test or two and you might qualify.

The EIM group displays and frequently uses gross spinal stretching techniques that simply do not meet the current definition of "manipulation" i.e. A skilled passive movement to a joint and related tissues etc.”

Now they may be right

I think not, but on the other hand where is the evidence that supports specific spinal manipulation as having superior results.

Precision – in other words “Specific Spinal Manipulation” which was incidentally, the title of my first ever published paper. It was in the New Zealand Medical Journal (NZMJ) in 1963 well before physical therapy journals would publish on this subject.

Effects of Manipulation

While my time is limited I think it important to quickly review the Effects of manipulation for I do believe they are being neglected and quick review is necessary as they will help explain how any manipulation to the spine, will have manipulative effects that may relieve pain while doing precisely little if anything for the underlying dysfunction.
Psychological Effects

- Laying on of skilled hands
- Placebo (active approach versus nothing)
- Demonstrates that movement is not painful
  - Helps with fear avoidance behaviors
- An immediate sound – “crack” or “pop”
- Immediate relaxation of tight musculature

Mechanical Effects

- Reposition vertebra and joints
- Stretch out or snap adhesions
- Restore fiber glide within the capsule

Psychological

- Psychological Changes
  - Placebo (active approach versus nothing)
  - Improvements in depression, mental component scores (not fear avoidance scores)
  - Expectancy

Here on the left is connective tissue at rest and on the right under stress. For the change to take place the healthy tissue needs elasticity (crimp) and glide between the fibers. Traumatic inflammation “glues” up the capsule and prevents such an action. Manipulation, focused on the specific joint or joints gradually coaxes that tissue to yield.

This dissection is of a fresh cadaver which on examination showed a Grade I (considerable restriction at C2/3). Given that it was a cadaver a thrust manipulation was performed. An audible “rip” followed. On dissection it was observed that the capsule was completely torn. Compare with the capsule above which was dissected and was pliable and extensible to pressure.
In this illustration of the right L4 facet joint, adhesions can be seen attaching the facet joint capsule to the underlying bone end. Manipulation can stretch these and on occasion when using precise techniques they are heard and felt to snap.

The arrow point to a loose body in the joint which could perhaps lock it up as does a loose body in the knee or elbow.

In this picture a single specific manipulation to L1/2 on the left allowed for the normal curve to return when side bending. This illustrated that restriction at one level may restrict functionally movement at adjacent levels.

In the above X-Rays note that on the left the symphysis pubis is widely separated and on the right, after a manipulative reduction, it has regained normal spacing. This subluxation occurred to an orthopaedic surgeon who did not hitherto believe the sacroiliac could be a source of pain. The cause was riding a mechanical bull. Note that the X-Ray does not show which sacroiliac is subluxed and nor did a whole series of X-Rays taken immediately after the incident.

The above two X-Rays were taken by the author in the surgeons office. Once the manipulative reduction was complete the corrected position was maintained by a Skultetas binder.

Neurophysiological Effects

Unquestionably repetitive motion produces a centralizing and analgesic effect on pain and its reference. Codman with his shoulder exercises was aware of this as must be McKenzie both of whom use active movements. Maitland using principally passive oscillations again activated this mechanism. It was not until 1966 that Melzack and Wall came up with the Gate Control Theory that said in effect that the stimulation of large fiber efferents will swing shut the gate to the transmission of small fiber nociceptors.

And it was Wyke and Freeman in the 1970’s that found and classified joint mechanoreceptors into four types.

These two events, The Gate Control Theory and the Classification of the Innervation of the Facet Joints greatly assisted the refinement and understanding of the neurophysiological effects of manipulation.
Chemical Effects

Very little is known of these effects but clinically it is evident when the spine subject to a series of manipulations at non symptomatic levels on normal subjects has the subject report “that feels good.” The author has noticed chiropractors at the conclusion of their meeting participate in what is a free for all manipulative session for the same effect.

Time to Look at Evidence Based Practice (EBP)

I do not think that any responsible practitioner can be against EBP but at the same time a responsible practitioner must be aware that “evidence” especially in physical therapy (PT) when compared with large scale multi centered medical studies is pretty thin. Even when we call it with fancy names such as “random controlled trials” it remains thin and in some cases it can be downright misleading.

Note that in this past year alone, two pieces of evidence that were considered solid have been challenged - they being the indications for mammography and the PSA test for prostate cancer - research far more thorough than anything in PT. Surely therefore we should question the validity of PT research which is usually short term and conducted on very small numbers.

I am thus an advocate of evidence “Informed” practice for there is simply not enough solid evidence of a reliable nature on which to “base” practice today.

You are no doubt familiar with the pyramids now illustrated.

Evidence Based Practice Vs Evidence Informed Practice

![Pyramids Illustrating Evidence Based Practice vs Evidence Informed Practice](image-url)
And last year at this Academy Chad Cook flipped it upside down and invited us the question the existing model.

But these pyramids, normal or upside down speak to is just one leg of the **three legged stool** put forward by Sackett who really started this push to evidence.

The three legged stool consists of the **patient's culture**, the **clinician's expertise** and finally the **published literature** at all its levels.

**Case in point**

Here is the MRI of a patient who not only sustained a massive rupture of L3 intervertebral disc in 2002, giving a complete palsy and whole leg sciatica, keeping him on his back in two hospitals, first in Maine and then in Florida, but from the same incident he also had two avulsion fracture of the iliac crest at the insertion of the iliolumbar ligament. The disc rupture is circled in the MRI and the two avulsion fractures can be seen half way down the slide on the left side.

To the surgeons in Maine and Florida, immediate surgery was indicated as the patient was for a full week unable to move from his back lying position.

To the surgeons, the literature strongly supported surgery. But this patient was from a different culture and cultures are key to patient management.
The patient being a PT specializing in the spine did not want spine surgery as a first choice. That simply was not in his culture. Second he had available to him skilled master clinicians, third he also knew the literature - the literature supporting conservative care.

Note that this paper shown above has a massive number of authors, principally non-surgeons. The article concluded that:

“conservative care is equal to or better than surgical care even in the presence of nerve root palsy and sciatica.”

This patient did well beginning with injections around and into the nerve by a radiologist. He was on his feet immediately following the injections using a walker and or crutches and then lecturing two weeks later and stands before you here today at the podium now rarely if ever experiencing back pain.

This is an example of the three legged stool. Patients culture, skilled intervention, with published support.

**Concerns over Image**

I must confess to a concern over our professional image as portrayed in the following images. As one of the many who have worked long and hard for autonomy and for the respect of the PT profession both by lay public and especially the medical profession, I was hugely embarrassed to see this picture representing spinal manipulation published in a medical journal.

I suspect I would be embarrassed having this representing manipulation in any periodical. But where did the authors of the Lumbar Spine CPR publish this picture? Not in the JMMPT or JOSPT or Physical Therapy – no – they choose to publish it in the prestigious and well read Annuals of Internal Medicine.

Pictures say more than words and this one picture misrepresent manipulation and all that many of us have striven for.

It was a most unfortunate event to say the least. It sets us back. It shows a technique that any physician, any PA, any ATC could perform – there is little skill in this technique. It is not manipulation.

What they published I am sure was no doubt a fine paper – but it was unwise and not in our best interests and would have been better published in a PT journal.

Additionally, there are many who argue that CPR are a low level of research and though I won’t mention it I am tempted to have you know that at this years Oxford Debate sponsored by APTA, those against the CPR's won overwhelmingly !!

But most readers of journal articles do not fully understand the levels of research and so they take away an image of what physical therapists are doing when they manipulate from the abstract and the illustrations.

Kudos for the authors but in my opinion an embarrassing setback for the profession.

Likewise these photos where manipulation is performed through clothing by other authors.
And then even JOSPT issues a handout to be provided to patients and again the patient is dressed in the area of treatment.

I was amazed to see published the following article that says for cervical pain all you have to do it to manipulate the thoracic spine – no particular level, no particular side – just manipulate it. This has caused me great concern and anxiety. It is clear that the authors are using the psychological/placebo, neurophysiological and chemical effects of manipulation and ignoring the needs for segmental specificity addressing restrictions and instabilities.

It is why I earlier in this presentation spent a little time speaking to the known effects of manipulation.

Is this really how we wish to demonstrate our professionalism?

Are we next to wear tennis shoes and jeans in the clinic with a T shirt that says “if it aint physical it aint therapy.”?

4. Some Published Research is just too Basic

I find this literature no matter how well meant to be very disturbing. It takes us back to the 1950’s when we did not know any better.

But I have remained silent for I was not asked my opinion – and unlike at the International Society for the Study of the Lumbar Spine (ISSLS), of which I am a Senior Life Member, where papers and presenters are frequently challenged – PT is a much kinder and gentler profession and our views of political correctness hold sway and we rarely challenge – and I believe our failure to do so is to our detriment.

We need to encourage open debate and discussion provided it is not ill intentioned.

However there is a bright light on the horizon - a sign of great things to come.

The authors have recently published this paper.
saying they can get better results if they treat the neck for neck pain.

Wow – that’s quite a revelation - surprise surprise! So they are making progress and I should not despair!!!

I am patiently waiting, almost holding my breath for their next paper. I hope they don’t disappoint me. Could it possibly be?

“Treat the Segmental Dysfunction for Spine Pain Relief”
EIM

The problem is they might take too long to get there. You see the Actuarial Tables in Google only gives me 10.8 more years to live. So Fellows – speed it up please. Use the energy you have to address the big questions. Don’t waste time studying what we knew decades ago and presenting it as new evidence and state of our understanding – dummying down our practice - we are far beyond that.

Let me be clear - While I disagree that students should learn thrust and that thrust can be taught at this Academy to other than those adequately prepared by training, and I support specificity with manipulation, I do not entirely fault the authors of EIM and associates, for journals need articles and we place too much pressure on our members, especially those in academia to have to publish for tenure and other promotions.

Also I challenge those who like me believe in specificity of manipulation for stiff joints and stabilization for others to commit to prove that this is a superior approach for frankly we have not done so and it’s time to do so.

However, all that changes with the next articles. Gloves are now off!

I am about to present an article that I shall use to challenge the quality of our research and the journals that publish it. I shall go even further and call for a retraction of the following article by the authors or the journal itself.

This is the paper published in the peer reviewed Physical Therapy for the entire world to see.

Here is part of the discussion and conclusion the authors came to.

Discussion and Conclusion:

“It appears that a typical CE course does not improve the overall outcomes for patients treated by therapists attending that course.”

From the outset I had a special connection with this article. After all I built a university on the proceeds of continuing education (CE). I suspect that had I seen the article in the journal Physical Therapy in the usual manner, I would have read the abstract, the discussion and conclusions - disagreed with it and placed it aside to read later but probably might never have done so.

However I received a copy of the article prior to its publication as the editors of the journal Physical Therapy sent me a pre publication copy with a request to study it carefully and to take part in an international Podcast for the Journal.

Thus I took a careful look and came to the conclusion that: The article was misleading in several respects,
bordered on dishonesty and I was surprised that Physical Therapy would publish it. This I stated on the Podcast which the chairman said was one of the best Podcasts to date. So at least he encouraged diversity of opinion.

Allow me to explain. I shall make several points.

1. The article concluded in the abstract, which is as far as many people read and thus is of significance and should stand alone and be accurate, that and I quote

“it appears that a typical CE course does not improve the overall outcomes for patients treated by therapists attending that course.”

Now that is a very significant statement as many of you have attended CE courses offered by this Academy, the APTA, the likes of myself and others and now this “randomized controlled study” yes it had that high faluting terminology stated that you might have been wasting your time and money.

2. My suspicions about the intent of the article and its validity were raised when in the very first line of the article they wrote:

“More than 50% of all patients with neck pain are referred to physical therapists.”

Hello, we all know this is not the case. Most with neck pain probably just tough it out and I daresay many more go to doctors or chiropractors - and that physical therapists see a small percentage – 15% by one estimate. Boissonnault I believe.

So I looked at the reference: It’s from a Scandinavian journal and at least one of the authors is Dutch. This article is about CE in America and is published in an American Journal and to quote such a reference from a different culture is a little more than just misleading as the Scandinavian culture of health care services, does not apply in this country especially with regard rehabilitation services.

3. Next they called the course a “typical CE course” but I must point out that there was nothing “typical” about that course and the authors should have known that to be the case.

(i) They said it was for 2 days. OK That may be typical in this day and age – unfortunately.

However it was not two full days but rather two four hour days. That’s not two days. Since when have two half days been two days? Is not such a statement dishonest?

(iii) Next it was given to employees of the one corporation - their own corporation! So this makes it an in-service not a typical CE course.

In a typical CE seminar or course people usually of their own volition or at the urging of their employer, elect to pay the registration fee and often travel some distance to attend just as have you in this audience. Hopefully you come free of clinical and patient care concerns able to focus on the instruction. Not these individuals. In this paper it was an in-service to employees. Nothing more than that and only for one day.

The paper talks if a RCT of a two day CE course when it was nothing but a one day in-service.

Also, while it was about treatment to the cervical spine and thus of interest to this Academy, the authors generalized their findings to all continuing education by stating in the conclusion that “a typical CE course does not improve outcomes etc.”

This article is totally misleading, and today I call for it to be retracted by either the Journal of Physical Therapy or by the Authors.

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Summary and Conclusions

By way of summary and conclusions, I hope that I have drawn attention to the following:

Firstly, that there is a vast richness of science and art in our history which was appreciated and utilized by the Founders of this Academy but today seems to be sadly neglected.

Second, that is important to know the effects of manipulation they being placebo, mechanical, neurophysiological and no doubt chemical.

Third, that while current literature ignores specificity of technique often in favor of gross spinal stretching, specificity addressing as it does the underlying path anatomical findings that can only be detected on a skillful examination should not be neglected in our rush to dummy down our talents so that they can be taught to students of this profession.

Fourth, that before we embrace PT research as worthy of being considered evidence, and speak of evidence based practice - we need to look at the quality of that research and disclose any falsehoods that may exist in it.

Lastly, until we have solid evidence in manipulative physical therapy, that includes studies on the patho-anatomical model and specificity of technique, we should embrace the concept of the three legged stool encompassing as it does not just the literature but equally as important an understanding and respect for the patient’s culture and recognition of clinician’s expertise.
Finally I thank the Academy for this opportunity and I trust that I have honored the purpose of this Award.

Thank You

**Authors Footnote February 2012**

At the Combined Sections Meeting of the APTA held in Chicago February 2012, it was learned that recent graduates of physical therapy assistants programs are practicing spinal and extremity manipulation. The Federation of State Boards found this out on one of their practice surveys. As a result it is their stated intention to write some exam questions on manipulation for future State Board exams for the PTA. This will most likely cause PTA schools to teach manipulation and later for CAPTE to change its educational requirements. This author claims that this sad state of affairs, which could affect all areas of practice and lead eventually to their being no difference in the practice of the DPT and the PTA except the fee they need to charge, is as a direct result of the recent published dumming down of manipulation technique and rationale having to do with spinal manipulation that was presented in the above paper.