Professional Progress: Evidence into Physical Therapy Practice

Bill Koch PT, DPT, Cert MDT, OCS, FAAOMPT
Chris Kramer PT, DPT, OCS, FAAOMPT

Brief History of Manipulation

The History is on our side

http://www.apta.org/StateIssues/Manipulation/
Britt Smith PT, DPT, OCS, FAAOMPT
Cameron MacDonald PT, DPT, OCS, FAAOMPT
Stanly Paris PT, PhD, FAPTA

()
History of Manipulation

- Hippocrates, Father of Medicine
  - 460-355 B.C.
  - Wrote “On Setting Joints by Leverage”
  - Spinal Traction with manual pressure
  - Reduction of dislocated shoulders with similar leverages used today

Bone Setters

- Friar Moulton
  - Published, “The Complete Bone-Setter”, 1656

- Bone setting flourished in Europe 1600-early 1900’s
  - No formal training
  - Techniques passed down within families
  - Clicking sounds thought to be due to moving bones back into place
  - “Forerunner” of orthopedic surgery
Sir Herbert Barker

- Most famous bonesetter – Knighted by King George V

**THE LOW BACK**

**TECHNIQUE OF MANIPULATION FOR THE SACRO-ILIAC AND LUMBO-SACRAL REGION. AGAIN THE PATIENT LIES ON A VERY LOW PLINTH WHICH IS A POINT OF TECHNIQUE TO BE NOTED**

Osteopathy

Andrew Still founded Osteopathy in 1874

- 1896 founded the first school of Osteopathy in Kirksville, Missouri

- “Rule of the Artery” - Manipulate the spine to restore blood flow and restore body’s innate healing ability

- Osteopaths currently licensed to practice medicine in all states
Chiropractic Founded 1895

"Chiropractors do not manipulate; they do not use the process of manipulating; they adjust."


History of Chiropractic

- DD Palmer, a magnetic healer and green grocer applied an "adjustment" to Harvey Lillard in September 1895 to the T4 vertebra that resulted in restoration of lost hearing.

- Concept of "subluxation" as a causal factor in disease and the revelation that adjustments can restore the body’s innate healing abilities.

- Roentgen discovered x-rays around the same period (1895).
Chiropractic Heritage Belief

- Chiropractors claim to be the first professionals to develop manipulation.

- Chiropractors have a 110+ year history of practicing and protecting their right to manipulate and all others are infringing on their practice.

- Manipulation/Manual Therapy is not proprietary.

Physical Therapy in Sweden (1813)

Per Henrik Ling “Father of Swedish Gymnastics” founded Royal Central Institute of Gymnastics (RCIG) in 1813.

Medical gymnastics

Swedish word for physical therapist is “sjukgymnast” = “gymnast of the sick”

Practitioners came from throughout Europe to learn PT techniques at RCIG including Jonas H. Kellgren (1837-1916).

Kellgren was the Father-in-Law of Edgar Cyriax.
What does US Physical Therapy history say about "manipulation"?

- Mary McMillan, 1st president of APTA (founded 1921)

  - The four branches of physiotherapy: "namely-manipulation to muscle and joint, therapeutic exercise,... electrotherapy, and hydrotherapy."

McMillan’s 1921/1925 book is based on the teachings of Ling and RCIG in Sweden

- “Medical gymnastics” and “therapeutic exercise” are synonymous terms
- Massage (manipulation) are “movements done upon the body”
- Exercises are “movements done with a part of the body”
Manipulation in American PT

• 1925 – 1939: Yearly publications in Physical Therapy literature on Manipulation and related topics
• 1940 – mid 1970’s: The word “manipulation” is not widely used in the literature
  • Mobilization/articulation used to separate PT from chiropractic
• Mistake?

Physical Therapists who advanced practice of manipulation

• Freddy Kaltenborn
  • The Spine, ...Mobilization 1961
  • First to relate manipulation to arthrokinematics

• Geoffrey Maitland
  • “Vertebral Manipulation”, 1964
  • Treats “reproducible signs”
  • Oscillatory techniques (Grades I-V)
Physical Therapists who advanced practice of manipulation

- Stanley Paris
  - *Spinal Lesion, 1965*
  - Educated PT’s in U.S. in manual therapy
  - Founding member of AAOMPT and first president of the Orthopaedic Section

  - Not in agreement with new CAPTE and entry level requirements.
  - Concerned about “dumbing down” of manipulation.

Historical Summary

- No one profession invented or owns Manipulation
  - Techniques are not proprietary

- Effects of manipulation often based on unproven theories
  - “Law of the nerve”
  - “Subluxation theory”

- Manipulation has been a vital part of the scope of PT practice since the inception of the profession
Thrust Manipulation
Legal and Regulatory Issues

Wake me when it’s over!
WAIT!

Legislative Background

- Since 1993, 30 state chapters have had to defend their right to use manual therapy.
- Physical therapists have chosen not to use the term manipulation and use mobilization in an effort to better align themselves with the AMA and distant themselves from the chiropractic community.
- However many physical therapists have shied away from using thrust manipulation for a variety of different reasons.
Manipulation Curriculum in Physical Therapy Programs

- In 2002, only 44% of the physical therapy programs were teaching thrust manipulation.
- Of the 65 that were not teaching it, only 51% had plans on integrating it into clinical practice.
  - 42% had no plans
  - 7% were undecided


Preparation

**TABLE 3.** Faculty assessment of graduates. At graduation, how well prepared are your graduates in examination, evaluation, and intervention skills to implement joint manipulation as an intervention?

<table>
<thead>
<tr>
<th>Level of Preparation</th>
<th>Rating (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (not prepared)</td>
<td>6.8</td>
</tr>
<tr>
<td>2</td>
<td>15.9</td>
</tr>
<tr>
<td>3</td>
<td>43.2</td>
</tr>
<tr>
<td>4</td>
<td>25.0</td>
</tr>
<tr>
<td>5 (well prepared)</td>
<td>9.1</td>
</tr>
</tbody>
</table>
Are we prepared?

- There is a growing body evidence that supports thrust manipulation.
- This data was collected in 2002 and published in 2004 but how many people are currently using manipulation in their practice?

APTA Manipulation Task Force

- 2003 Manipulation Education Manual was developed.
  - Support educational institutions in thrust manipulation from an EBM (evidence based model).
  - Demonstrating inclusion in CAPTE, Guide to Physical Therapy Practice and A Normative Model of Physical Therapist Professional Education
Manipulation Education Manual (MEM)

- Joint Manipulation/Mobilization - a manual therapy technique comprising a continuum of skilled passive movements to the joints and/or related soft tissue that are applied at varying speeds and amplitudes, including a small-amplitude/high-velocity therapeutic movement.

- Guide to Physical Therapy Practice

Manipulation Education Manual (MEM)

- Thrust manipulation was defined as..

  “high velocity, low amplitude therapeutic movements within or at end range of motion.”
CAPTE in January 2006

“Provide physical therapy interventions to achieve patient/client goals and outcomes. Interventions include manual therapy techniques (including mobilization/manipulation thrust and nonthrust techniques).

Position on Thrust Manipulation

- January 2009, APTA publishes White Paper on Thrust Manipulation

- A white paper is an authoritative report or guide that helps solve a problem. White papers are used to educate readers and help formulate policy decisions.
White Paper on Thrust Manipulation

- Establishes our use of thrust manipulation
  - Defines
  - History
  - Safety
  - Training
  - Research

References


Do We Need to Standardize Care for Low Back Pain?

Multiple Treatment Options
Are there practice patterns in Physical Therapy???
If so what do they look like and are they in line with current best evidence of practice?

Management of Work-Related Low Back Pain: A Population-Based Survey of Physical Therapists
• 330 Physical Therapists were questioned
• LBP both radiating and non-radiating
• Canadian health system
Reported practice patterns


Physical Therapy Management of Low Back Pain: An Exploratory Survey of Therapist Approaches

- 274 Physical Therapists were surveyed
- Non work comp patient population in Canada
- Needed to see more than 10% of their patient population a week for LBP.
Reported practice pattern


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WE SEEM RANDOM
Guidelines for Low Back Pain
Are physical therapists adherent?

27%
Adherent care....UGH!

PRIMARY CARE REFERRAL OF PATIENTS WITH LOW BACK PAIN TO PHYSICAL THERAPY
What about physicians?

They aren’t perfect....


Referral to PT went down 20%
Referral to Buddies went up 7%
A Treatment-Based Classification Approach to Low Back Syndrome: Identifying and Staging Patients for Conservative Treatment

- Delitto proposed a 3 tiered classification system in 1995
  - First phase do they belong in my clinic? DA
  - Based on historical information, behavioral symptoms and clinical signs.
  - Utilized Oswestry, Pain Diagram, Numeric Pain Rating Scale
  - Emphasis on returning mobility as soon as possible.


Proposed stages of recovery

- **Stage I – Acute**
  - ODI < 50%
  - Increase ROM

- **Stage II – Subacute**
  - ADL emphasis
  - ODI < 30%

- **Stage III – Higher level**
  - Higher level activities – work/sports
Delitto et al. recommended that manipulation for those with acute mechanical low back pain.

This was in 1995!
Comparison of Classification-Based Physical Therapy With Therapy Based on Clinical Practice Guidelines for Patients with Acute Low Back Pain


**Fritz et al. results**

**Table 5. Four-Week Outcomes**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline (n)</th>
<th>Four-Week (n)</th>
<th>Mean Within-Group Change (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modified Oswestry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guideline-based group</td>
<td>42.9 (37)</td>
<td>32.4 (32)</td>
<td>11.5 (18.1)</td>
</tr>
<tr>
<td>Classification-based group</td>
<td>42.9 (41)</td>
<td>21.4 (38)</td>
<td>22.5 (19.3)</td>
</tr>
</tbody>
</table>

- Patients treated with the classification system were more likely to return to work at 4 weeks.
- Patients treated with the classification system were more satisfied with their treatments at weeks.
- The treatment based classification system was not more costly and showed trends of reducing costs compared to clinical practice guidelines.
An Examination of the Reliability of a Classification Algorithm for Subgrouping Patients With Low Back Pain

- Is the treatment based classification system can it be reliable among other practitioners?
- System is simplified from original Delitto et al. work.

Reliability results...

- Reliability was dependent on both the individual examination as well as the classification decision making algorithm
- Overall the classification decision-making algorithm showed good inter-rater reliability, regardless of experience of the examiner.
Reliability of a Treatment-Based Classification System for Subgrouping People With LBP

- No previous exposure to the treatment based classification system
- Based on 3 categories – manipulation, stabilization and specific exercise
- Most likely to agree on specific exercise
- Least likely to agree on stabilization

### Evaluation of a Treatment-Based Classification Algorithm for Low Back Pain

<table>
<thead>
<tr>
<th>Treatment Subgroup</th>
<th>Individual Subgroup Criteria</th>
</tr>
</thead>
</table>
| Manipulation† (must meet 4 or more criteria) | Duration of symptoms <14 days  
At least one hip with less than 35° of medial (internal) rotation  
Lumbar hypomobility  
No symptoms distal to the knee  
Fear-Avoidance Beliefs Questionnaire work subscale score <18 |
| Stabilization‡ (must meet 3 or more criteria) | Age <40 y  
Average straight leg raise >90°  
Absence of movement present  
Positive prone instability test |
| Specific exercise§ (must meet 1 or more criteria) | Demonstrated centralization or a directional preference (an improvement in pain intensity) during repeated movement testing in any one position (standing, sitting, or lying) |
| Traction†† (must meet all criteria) | Signs and symptoms of nerve root compression (positive straight leg raise or reflex, sensory, or muscle strength deficit) and  
Pain or numbness extending distal to the buttock in the previous 24 hours and  
Peripheralization of pain with extension or positive crossed straight leg raise |

- Purpose of study was to determine if people actually met the subgroups
- What the prevalence of the subgroups were
- To assess inter-rater reliability for the classification
TBC algorithm results

<table>
<thead>
<tr>
<th>Treatment Subgroup</th>
<th>Comprehensive Algorithm</th>
<th>Clear Classification</th>
<th>Unclear Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Patients</td>
<td>Prevalence, % (95% CI)</td>
<td>No. of Patients</td>
</tr>
<tr>
<td>Manipulation</td>
<td>100</td>
<td>43.0 (25.9 to 64.1)</td>
<td>78</td>
</tr>
<tr>
<td>Stabilization</td>
<td>44</td>
<td>17.4 (12.9 to 22.3)</td>
<td>19</td>
</tr>
<tr>
<td>Specific exercise</td>
<td>77</td>
<td>30.8 (25.1 to 36.3)</td>
<td>44</td>
</tr>
<tr>
<td>Traction</td>
<td>24</td>
<td>9.6 (6.0 to 13.3)</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>250</td>
<td>150</td>
<td>165</td>
</tr>
</tbody>
</table>

- 25% of the patients met the criteria for more than one subgroup
- 25% of the patients did not meet the criteria for any group
- 50% then met the criteria for one group
- Reliability of the algorithm was deemed usable in the clinic.

Identifying Subgroups of Patients With Acute/Subacute “Nonspecific” LBP- RCT

- Purpose to identify those with LBP receiving match vs unmatched to a particular subgroup upon initial evaluation.
- Grouped into one of three groups
  - Stabilization
  - Manipulation
  - Specific Exercises
- Symptoms lasting < 90 days
- Treatment sessions lasting a total of 4 weeks
- Results
  - Matched treatment demonstrated greater change after 4 wks
  - ODI differences on avg was 7 pts at 4 wks and 8 points at long term follow up (appox 1 year).
Matched vs Unmatched

Manipulation sub-category:
Is there a group that will do really well?
A Clinical Prediction Rule for Classifying Patients with LBP Who Demonstrate Short-Term Improvement With Spinal Manipulation

• Flynn et al set out to find a group of people that would respond well to spinal manipulation with acute LBP.
• Success determined by 50% improvement with 2 treatments
• Key factors were...
  1. No pain distal to the knee
  2. Pain lasting less than 16 days
  3. Hip IR of greater than or equal to 35 degrees
  4. Hypomobility of one lumbar spinal segment
  5. FABQ of less than or equal to 19.

Flynn et. al results...

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>SENSITIVITY</th>
<th>SPECIFICITY</th>
<th>+ LR</th>
<th>- LR</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>.19</td>
<td>1</td>
<td>INFINITE</td>
<td>NA</td>
</tr>
<tr>
<td>+4</td>
<td>.63</td>
<td>.97</td>
<td>24.83</td>
<td>95</td>
</tr>
<tr>
<td>+3</td>
<td>.94</td>
<td>.64</td>
<td>2.61</td>
<td>68</td>
</tr>
<tr>
<td>+2</td>
<td>1</td>
<td>.15</td>
<td>1.18</td>
<td>49</td>
</tr>
<tr>
<td>+1</td>
<td>1</td>
<td>.03</td>
<td>1.03</td>
<td>46</td>
</tr>
</tbody>
</table>

• The presence of 4 out of 5 variables in the CPR increased the likelihood of success with manipulation from 45% to 95%
A CPR To Identify Patients with LBP Most Likely To Benefit from Spinal Manipulation: A Validation Study

• Flynn established criteria used....
  1. No pain distal to the knee
  2. Pain lasting less than 16 days ( +LR 4.4 alone)
  3. Hip IR of greater than or equal to 35 degrees
  4. Hypomobility of one lumbar spinal segment
  5. FABQ of less than or equal to 19.

• Childs set out to validate the CPR, could someone else reproduce it?
  • Used 4 groups
    • + CPR manipulation/exercise
    • - CPR manipulation/exercise
    • + CPR exercise only
    • - CPR exercise only

Childs validation resultss
Medical Care Consumption (6 mos)

<table>
<thead>
<tr>
<th></th>
<th>Manipulation</th>
<th>Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overall</td>
<td>+ rule</td>
</tr>
<tr>
<td></td>
<td>(n=52)</td>
<td>(n=18)</td>
</tr>
<tr>
<td>Have you taken any medications</td>
<td>36.5%</td>
<td>27.8%</td>
</tr>
<tr>
<td>for back pain in the past week?</td>
<td>41.2%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>- rule</td>
</tr>
<tr>
<td></td>
<td>(n=40)</td>
<td>(n=16)</td>
</tr>
<tr>
<td>Are you presently seeking</td>
<td>11.5%</td>
<td>11.1%</td>
</tr>
<tr>
<td>treatment for back pain?</td>
<td>11.8%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>+ rule</td>
</tr>
<tr>
<td></td>
<td>(n=40)</td>
<td>(n=16)</td>
</tr>
<tr>
<td>Have you missed any time</td>
<td>9.6%</td>
<td>5.6%</td>
</tr>
<tr>
<td>at work in the past 6 weeks</td>
<td>11.8%</td>
<td></td>
</tr>
<tr>
<td>due to back pain?</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>- rule</td>
<td>(n=24)</td>
</tr>
<tr>
<td></td>
<td>(n=24)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25%</td>
<td></td>
</tr>
</tbody>
</table>

The Two Factor Rule

Fritz et al. found that two factors were reliable indicators for good outcomes with spinal manipulation.

- Symptom duration of less than 16 days
- No symptoms extending past the knee

Specificity = 92%, +LR of 7.2

Fritz JM, Childs JD and Flynn TW. Pragmatic application of a clinical prediction rule in primary care to identify patients with low back pain with a good prognosis following a brief spinal manipulation intervention. BMC Family Practice. 2005; 6:1-8.
FROM THIS INFORMATION OUR IDEA WAS BORN

References:


