Holistic Improvement of Low Back pain through Physical Therapy Implementation
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Conflict of Interest Disclosure Information

- NONE!

New Emphasis In Healthcare

- IOM Core Competencies for all Health Professionals in the 21st Century
  - Provide patient-centered care
  - Work in multidisciplinary teams
  - Employ evidence-based practice
  - Apply quality improvement
  - Utilize informatics
- IOM (2001)
Reports to the Nation on the State of Healthcare System

- The IOM summed up many problems in our healthcare system in their report, *Crossing the Quality Chasm: A New Health System for the 21st Century* (2001), not the least of these is the lag time in research application. They estimate that it **takes an average of 17 years for new knowledge discovered by random controlled trial to be integrated into practice and even then use is highly unequal and varied.**

Implications of Chronic Low Back Pain

- 2%-10% of Americans are affected
- 1% of working population is totally incapacitated
- Americans spend at least $50 billion dollars yearly due to it
- Most frequent cause of hospitalization
- Second leading cause of missed work
- Third most common reason for surgery

  - Healthy People (2010)

Treatment Options

- Many modalities are used to treat it including:
  - Non-steroidal anti-inflammatories
  - Physical therapy (PT)
  - Opiates
  - Steroid injections
  - Nerve ablations
  - Surgery
  - Implanted devices
Physical Therapy

- Is included in the joint practice guidelines of the American College of Physicians and the American Pain Society as a treatment for CLBP being found by them to have good evidence and moderate benefit as a treatment option.
  - Chou, Oaseem & Snow (2007)

Multiple studies demonstrate that PT is helpful in the treatment and control of CLBP for example:

- Cochrane Database of Systematic Reviews (CDSR)—63 randomized controlled trials representing 6390 participants found PT somewhat effective in reducing pain and improving function
  - van Tulder, Malmivaara & Koes (2011)
Physical Therapy (con’t)

- Review of nine trials comparing CLPB patients treated with PT after episode of LBP found only 32% of patients treated with PT had recurrence while 65% of those in non-intervention group had recurrence.

- Macedo, Bostwick & Maher (2013)
Synopsis of Studies

- Approximately 25 research articles/studies were found regarding PT and CLBP and 10 were used in this review representing well over 282 randomized controlled trials or studies.
- Exclusion criteria included children, pregnant women, acute back pain less than three months and pilot studies.
- Without exception, all research findings demonstrated the benefits of exercise/physical therapy in relation to chronic pain in general and chronic low back pain in particular.

Problem Statement

- Even though PT is found to be an effective treatment for CLBP a review of 150 charts at a local pain management center (Comprehensive Pain Specialists Saginaw-Fashion Square {CPS-FS-S}) found it was seldom being recommended.

What do we do now?
Why Is It So Hard?

Solution: Quality Improvement Project

- Evidence-based best practice
- Conceptual Framework:
  - Lewin’s force field analysis model
    - Unfreeze
    - Move
    - Refreeze
  - Lewin (1951)

Unfreezing

- Communication to all involved of why change is necessary while dealing with doubts and concerns:
  - Education of all staff (evidence-based best practice guidelines)
  - Education regarding the role of each staff member
  - Education of patients through flyers
  - Project launch breakfast day of implementation
Moving

- Continuous reminders to all about project and updates on progress
- Alert on provider's daily schedules by scheduler and nursing assistant (NA) re: all patients with diagnosis of LBP who have recently had injections
- Alert to provider by scheduler and NA on daily schedule of anyone returning s/p PT
- Handouts given to patients regarding evidence-based material in relation to importance and advantages of PT

Refreezing

- Communication to insure change is now part of CPS-FS culture and continues
- Updates given to staff throughout project to motivate continued participation/support
- Results disseminated to all staff at end of project (6 month duration) at celebratory brunch to help staff find closure and assure future changes will also be successful

Refreezing (con't)

- Continuation of evidence-based educational materials regarding the importance and advantages of PT will remain readily available for providers to give to patients
- Prompts to providers in EMR to consider PT as a treatment option will continue
- Ongoing updates obtained by random chart audits communicated to all staff during bi-monthly staff meetings for one year after project completion to ensure continuation of referral to PT
Methodology

- Setting and Resources
  - CPS-FS-S: Local, well-established pain management center
  - 18,000 patients served yearly
  - 47% with CLBP as primary diagnosis
  - Twenty-six staff members including five NPs, four physicians, and a fellow
  - Physical therapy facility in the area which uses evidence-based best practice PT participated in the project.

Methodology (con’t)

- Project Population:
  - Age: over age 18
  - Those without significant heart disease or other serious illnesses, no vertebral fracture, mets or acute disc herniation
  - Insurances:
    - Medicare: 44%
    - BCBS: 22%
    - Commercial: 12%
    - Health Plus: 11%
    - ACH: 4%
    - Auto: 3%
    - Medicaid: 2%
    - Workman’s Compensation: 2%

Business Plan

- During the past 17 years CPS-FS-S established a successful, large practice involving all types of chronic pain but LBP is the primary patient complaint. In an attempt to improve outcomes by decreasing pain and disability thus improving quality of life (QOL), an exercise protocol (referral to PT) was implemented with patients who had completed interventional treatment. This involved minimal additional cost to the patient or practice with the potential to improve the health and wellness of those patients thus further enhancing the image of CPS-FS-S by providing for current and future viability.
Budget

- Minimal expenditures;
- Paper and ink for handouts and promotional materials
- Total cost: < $500

Stakeholders

- Research has shown that in order for any new project to be successful, there must be buy-in from stakeholders which are defined as any person or group of people who can influence the project or have an interest in the project’s conclusion.*
- The key stakeholders at CPS-FS-S (physicians & NPs) were cohesive and supportive in this project as well as were staff with less influence but who were equally important.
- The patient stood the chance to reap the most benefit but was the hardest to convince.

Interdisciplinary Committee

- A committee composed of members from each discipline represented in the project:
  - 2 NPs
  - 1 Physician
  - Physical Therapist
  - Scheduler
  - Nursing Assistant
  - Reception/check out
- Met monthly to monitor progress and make modifications or changes based on input from staff and patients.
Screening Tool

- A screening tool developed by a multidisciplinary team of physicians, NPs and a physical therapist was used by each provider to aid in assessing a patient’s candidacy for PT.
- The provider recorded in the patient’s chart their response to PT recommendation.
Data and Sources

- Descriptive Statistics were used to describe participants in the project and included:
  - Age, sex, BMI, medications, referral to PT (yes or no), participants response to referral (yes/no/not asked/currently in PT/just completed/screened out through tool), number of visits to PT, and available insurance coverage for PT (yes or no)
  - These were updated at each visit

Data and Sources (con’t)

- All data was extracted from the EMR system, Aprima, which had been utilized by CPS-FS-S for over four years. All pertinent information for the project contained in this system including age, sex, BMI, and medications were used to describe the sample. Other appropriate information such as whether referral was recommended, response to PT referral recommendation and available insurance coverage for PT was also gathered and updated at each visit.
Table 1. Summary Statistical Descriptive of Total Subjects by Category (Total Population n=375)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
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<tbody>
<tr>
<td>Age</td>
<td>62.38</td>
<td>23.00</td>
<td>90.00</td>
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<tr>
<td>BMI</td>
<td>31.81</td>
<td>17.90</td>
<td>51.30</td>
</tr>
<tr>
<td>Number of Visits</td>
<td>9.79</td>
<td>4.00</td>
<td>21.00</td>
</tr>
<tr>
<td>Meds</td>
<td>1.56</td>
<td>.00</td>
<td>6.00</td>
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Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Meds</th>
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<tr>
<td></td>
<td>4</td>
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PT (asked)

<table>
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<tr>
<th>Response</th>
<th>Not Asked</th>
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<tbody>
<tr>
<td>Yes</td>
<td>338</td>
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<tr>
<td>No</td>
<td>373</td>
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Currently In PT

<table>
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<th>Screened out/tool</th>
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<tbody>
<tr>
<td>90.10</td>
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<tr>
<td>9.90</td>
</tr>
<tr>
<td>32.80</td>
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<tr>
<td>47.50</td>
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Data Analysis and Evaluation

A control charts was used to illustrate progress of the project.
With this visual aid one can readily observe and analyze patterns of process variation from special causes (non-routine events) or common causes (built into the process).
The ideal outcome is a gradual decrease in the number of non-referrals over time.

Control Chart Data

<table>
<thead>
<tr>
<th>Time Point</th>
<th>Week</th>
<th>Proportion of those not referred</th>
<th>Total number of patients, appropriate for PT referral</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1-3</td>
<td>3</td>
<td>27</td>
</tr>
<tr>
<td>6</td>
<td>4-6</td>
<td>9</td>
<td>36</td>
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<tr>
<td>9</td>
<td>7-9</td>
<td>5</td>
<td>47</td>
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<tr>
<td>12</td>
<td>10-12</td>
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<tr>
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<td>25-27</td>
<td>1</td>
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Proportion of Patients Not Referred

Value shown is the proportion of patients in three week segments that was not referred to PT. A special cause violation is seen at week 6 being one point outside +/- sigma limit (more than 3 sigma deviations from the mean).

Data Analysis and Evaluation (con’t)

Secondary measures included a Repeated-measures ANOVA test which was utilized to illustrate the difference between the Global Pain Scale (GPS) prior to procedures, following procedures and after completion of PT.

This was used to test the differences among the means of the three related groups, at three points in time:
- Pre Injections
- Post Injections
- Post PT

Global Pain Scale

The GPS is a brief screening tool that assesses:
- physical pain
- affective effects of pain
- specific clinical outcomes
- the degree to which the pain interferes with ADLs

Gentile, Woodhouse, Lynch, Mank, McJunkin (2011)
Repeated Measures ANOVA

When examining the results of the repeated measures ANOVA two outliers were identified through examination of boxplots with both being in Time 3 (after PT). Even though this is rare it does occasionally occur. Data were normally distributed with Shapiro-Wilks > 0.05 at all three data collection points. The repeated measures ANOVA with a Greenhouse-Geisser correction determined that the mean of Global Pain Scale (GPS) differed statistically significantly between time points (F (1.870, 112.215) = 15.704, p < .000).

Results

Bonferroni Comparison of GPS Scores by Time (95% CI)
Results of Repeated Measures ANOVA

Pairwise Comparisons

<table>
<thead>
<tr>
<th>Measure: GPS</th>
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<tbody>
<tr>
<td>95% Confidence Interval for Difference</td>
</tr>
<tr>
<td>Lower Bound</td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>3</td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
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Based on estimated marginal means

Post hoc tests using the Bonferroni correction revealed that there was a decrease in the GPS after injections from pre-injection score (41.21 ± 2.26 vs 35.84 ± 2.389, respectively) which was not statistically significant (p = .157). Global Pain Scores also decreased post PT to 26.85 ± 2.107 which was statistically significantly different to pre PT (p < .157) and post PT (p < .000). Therefore we can conclude that there was a difference in the GPS between pre and post injections but a statistically significant difference between post injection and post PT. It appears that injections in combination with PT elicit a statistically significant decrease in pain, improvement in HRQoL and decrease in disability in this population.
Timeline

- Education of staff began early March, 2016
- Data collection began March 14, 2016 and continued until September 15, 2016
- Dissemination of results, November, 2016

What Did We Learn?
How Will That Effect What We Do in the Future?

- Transparency is important
- Continue chart reviews for one year-make results public
- Continue using the screening tool
- Fax PT order & demographic information to facility of patient’s choice
- Publicize results of project to patients
- Consider placing PT reminder on charts of all patients that are following up after any procedure
- Frequent Physical Therapist presentation at staff meetings

Significance and/or Implications

- Improve the “lag time” in research application which is estimated by the IOM to be 17 years*.
- Two NPs at CPS-FS-S have their DNP and are currently undertaking other quality improvement projects
- Results of this project will be shared with the other two division of CPS and could impact those practices also
  *IOM (2001)
Significance and/or Implications

- Could result in referrals to PT earlier in the treatment regiment for CLBP as well other chronic pain conditions
- Could affect healthcare as a whole by motivating the patient to assume some control over their pain by implementing self-care instead of relying on the medical community for every issue that befalls them

Significance and/or Implications

- But most of all:
  - It will be exciting to see the results and response of healthcare providers and patients as they realized the importance of their involvement in chronic pain management when everyone is fully engaged
References