Evaluation of a treatment-based classification algorithm for low back pain
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Background
Many individual studies have investigated subgroups of low back pain (LBP) that respond best to certain interventions. A classification algorithm was created to combine these individual study sub-grouping criteria into a clinical decision-making guide that is mutually exclusive and comprehensive. In order to do this, certain changes to the individual study criteria had to be made. This study aims to evaluate these changes.

Methods
• 250 patients with acute/subacute LBP were recruited from USA and Australia
• Each patient underwent a standardized assessment and was classified into a treatment group using the classification algorithm
• Each patient was also classified using the individual study subgrouping criteria
• 31 patients were assessed twice to determine the reliability of the classification algorithm

Main Results

Prevalence rates: Individual Study Sub-grouping Criteria

<table>
<thead>
<tr>
<th>Treatment subgroup</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient who meet multiple subgroups (Prevalence rate is &gt; 25% )</td>
<td></td>
</tr>
<tr>
<td>Manipulation</td>
<td>21 \pm 9 (93.1)</td>
</tr>
<tr>
<td>Stabilization</td>
<td>6 \pm 9 (7.9)</td>
</tr>
<tr>
<td>Specific Exercise</td>
<td>44 \pm 9 (5.6)</td>
</tr>
<tr>
<td>Traction</td>
<td>4 \pm 9 (5.0)</td>
</tr>
</tbody>
</table>

Patient who meet only one subgroup (Subgroup combination prevalence rate is < 25%)

<table>
<thead>
<tr>
<th>One subgroup</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient who have more than one classification</td>
<td></td>
</tr>
<tr>
<td>Manipulation + Stabilization</td>
<td>1 \pm 9 (1.0)</td>
</tr>
<tr>
<td>Manipulation + Specific Exercise</td>
<td>5 \pm 9 (5.6)</td>
</tr>
<tr>
<td>Manipulation + Traction</td>
<td>3 \pm 9 (3.6)</td>
</tr>
<tr>
<td>Stabilization + Specific Exercise</td>
<td>2 \pm 9 (2.2)</td>
</tr>
</tbody>
</table>

Reliability of the Classification Decision using the Algorithm

• Inter-rater reliability was moderate (kappa = 0.52; 95% CI 0.27 to 0.77)
• Reliability of clear classification was good (kappa = 0.69; 95% CI 0.42 to 0.96)
• Reliability of unclear classifications was poor (kappa = 0.23; 95% CI -0.21 to 0.66)

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Conclusions
This provides important clinical data to guide potential revisions to the algorithm. That 25% of patients do not meet any of the treatment subgroups based on the individual study criteria suggests using the algorithm with these patients, we would need to use the bottom table. However, 34% of patients have unclear classifications when using the algorithm = 9% of patients that should have clear classification but don't.

Future directions of research:
Further research is needed to explore the treatment options for patients that meet more than one subgroup – which treatment should they get? Future research should also explore the potential addition of other treatments to the algorithm (which guide unclear classifications).
Manipulation Classification

Stabilization Classification

Specific Exercise Classification

Traction Classification

Which Sub-Group does the patient fit best?

Does patient have symptoms distal to the buttock and signs of nerve root compression?

YES

NO

Does the patient:  
1. Centralize with 2 or more movements in the same direction (ie, flexion or extension) OR...  
2. Centralize with movement in one direction and peripheralize with an opposite movement

Does the patient:  
1. Have duration of symptoms <16 days AND...  
2. No symptoms distal to the knee

Does the patient 3 or more:  
1. Average SLR ROM >91°  
2. Positive prone instability test  
3. Positive aberrant movements  
4. Age <40 years

Does the patient:  
1. Peripheralize with extension movement OR...  
2. Positive crossed straight leg raise test

Does the patient:  
1. Centralize with 2 or more movements in the same direction (ie, flexion or extension) OR...  
2. Centralize with movement in one direction and peripheralize with an opposite movement

Which Sub-Group does the patient fit best?

Specific Exercise Classification

MANIPULATION

Factors favoring  
• Hypomobility with spring testing  
• Low FABQ scores (FABQ <19)  
• Hip internal rotation ROM >35°

Factors against  
• Symptoms below the knee  
• Increasing episode frequency  
• Peripheralization with motion testing  
• No pain with spring testing

STABILIZATION

Factors favoring  
• Hypermobility with spring testing  
• Increasing episode frequency  
• 3 or more prior episodes

Factors against  
• Discrepancy in SLR ROM (>10°)  
• Low FABQ scores (FABQPA <9)

SPECIFIC EXERCISE

Factors favoring  
• Directional preference for extension or flexion  
• Centralization with motion testing  
• Peripheralization in direction opposite centralization

Factors against  
• Low back pain only (no distal sx)  
• Status Quo with all movements

TRACTION

Factors favoring  
• Peripheralization of symptoms with no ability to centralize with movement

Factors against  
• Low back pain only (no distal sx)  
• No signs of nerve root compression