Defining the Minimum Clinically Important Difference for Grade I Degenerative Lumbar Spondylolisthesis: Insights from the Quality Outcomes Database

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Minimum clinically Important Difference

First described by Jaeschke and colleagues in 1989
Defined as the **smallest difference** in score that patients perceive as **beneficial**

Previously published studies have attempted to define MCID thresholds for spinal stenosis, pseudarthrosis and adjacent segment disease
Site PIs and coordinators

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- Geisinger Health - Jonathan Slotkin
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- Semmes-Murphey Neurologic and Spine Institute - Kevin Foley
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Methods to evaluate MCID

Anchor based
- Average change between baseline and follow-up within those who improved
- ROC curve-derived MCID

Distribution-based
- Half a standard deviation
- Cohen’s effect size
- Minimum detectable change
None/mild symptoms

Moderate symptoms

Severe symptoms

Mean ODI scores

Difference

Mean ODI scores

Difference

Mean ODI scores

MCID estimates
Anchor used

North American Spine Society (NASS) satisfaction scale

(1) “Surgery met my expectations”
(2) “I did not improve as much as I had hoped but I would undergo the same operation for the same results
(3) “Surgery helped but I would not undergo the same operation for the same results”
(4) “I am the same or worse as compared to before surgery”
## MCID Determinations

<table>
<thead>
<tr>
<th>Method</th>
<th>ODI</th>
<th>EQ-5D</th>
<th>NRS-Leg Pain</th>
<th>NRS-Back Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchor-based</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average change</td>
<td>26.6</td>
<td>0.3</td>
<td>4.6</td>
<td>4.2</td>
</tr>
<tr>
<td>Change difference</td>
<td>17.4</td>
<td>0.2</td>
<td>2.6</td>
<td>2.7</td>
</tr>
<tr>
<td>ROC curve derived</td>
<td>21.5</td>
<td>0.1</td>
<td>4.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Distribution-based</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Half SD</td>
<td>8.1</td>
<td>0.11</td>
<td>1.4</td>
<td>1.3</td>
</tr>
<tr>
<td>Small Cohen’s effect size (0.2)</td>
<td>3.3</td>
<td>0.04</td>
<td>0.6</td>
<td>0.5</td>
</tr>
<tr>
<td>1 SEM</td>
<td>5.1</td>
<td>0.1</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>MDC (95% C.I)</td>
<td>14.3</td>
<td>0.2</td>
<td>1.7</td>
<td>1.6</td>
</tr>
</tbody>
</table>
MDC as the chosen MCID value

The percentage of patients who achieved MCID at 1-year was

- 71% for ODI,
- 58% for EQ5D,
- 79% for NRS-leg pain and
- 76% for NRS-back pain
Conclusions

• The MDC approach appeared to be most appropriate for calculating MCID, because it provided a threshold above the measurement error and it was closest to the mean change difference between “satisfied” and “not satisfied” patients.

• Based on the MDC method, the MCID values are 14.3 points for ODI, 0.2 points for EQ-5D, 1.7 points for NRS-leg pain, and 1.6 points for NRS-back pain.