Impact of Psychological and Social Factors on Patient Responses to Pain and Pain Management

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<table>
<thead>
<tr>
<th>Disclosures</th>
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<tr>
<td>Consultant: Johnson &amp; Johnson, Pfizer</td>
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<td>Advisory Board: AcelRx, GSK/Novartis, Pfizer</td>
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<td>Editor-in-Chief: Clinical Journal of Pain</td>
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Therapeutic Armamentarium

- Medication (eg, opioids, antidepressants, anticonvulsants, topicals)
- Surgery
- Neuroaugmentative (eg, nerve block, implantable devices)
- Physical modalities (eg, TENS, ultrasound)
- Complementary (eg, acupuncture, manipulation, yoga, tai chi)
- Psychological (eg, CBT, Contingency Management, Hypnosis, Biofeedback)
- Rehabilitation (eg, Multidisciplinary, Interdisciplinary)
Therapeutic Gains (% Active-Placebo) for Drug Therapies Using an Outcome Equivalent to Patient Expectation Being Met (at least 50% pain reduction) (Moore 2013;154:S77-S86)

<table>
<thead>
<tr>
<th>Drug &amp; Dose</th>
<th>Percent w/Outcome</th>
<th>Drug-Specific Improvement (Active-Placebo)</th>
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<tbody>
<tr>
<td></td>
<td>Active</td>
<td>Placebo</td>
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<tr>
<td><strong>Osteoarthritis – 12 weeks of treatment [6,w6,w7]: Outcome – at least 50% pain intensity reduction</strong></td>
<td></td>
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<tr>
<td>Tanzezumab 10</td>
<td>51</td>
<td>31</td>
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<tr>
<td>Etoricoxib 60</td>
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<td>23</td>
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<tr>
<td>Celecoxib 200</td>
<td>39</td>
<td>22</td>
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<tr>
<td>Naproxen 1000</td>
<td>44</td>
<td>23</td>
</tr>
<tr>
<td>Ibuprofen 2400</td>
<td>39</td>
<td>27</td>
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<tr>
<td>Duloxetine 60/100</td>
<td>40</td>
<td>30</td>
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<tr>
<td><strong>Chronic low back pain – 12 weeks of treatment [5,w6]: Outcome – at least 50% pain intensity reduction</strong></td>
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<tr>
<td>Etoricoxib 60</td>
<td>47</td>
<td>35</td>
</tr>
<tr>
<td>Etoricoxib 90</td>
<td>47</td>
<td>35</td>
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<tr>
<td>Duloxetine 60/100</td>
<td>39</td>
<td>30</td>
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<tr>
<td><strong>Osteoarthritis and chronic low back pain [w13]: Outcome – at least 50% pain intensity reduction</strong></td>
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<tr>
<td>Tapentadol 200–500</td>
<td>30</td>
<td>24</td>
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<tr>
<td>Oxycodone 40–100</td>
<td>21</td>
<td>24</td>
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<tr>
<td><strong>Painful diabetic neuropathy – 12 weeks of treatment [w9–w11]: Outcome – at least 50% pain intensity reduction</strong></td>
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<td>26</td>
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<tr>
<td>Pregabalin 600&lt;sup&gt;b&lt;/sup&gt;</td>
<td>46</td>
<td>30</td>
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<tr>
<td>Gabapentin ≥ 1200&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>23</td>
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<tr>
<td>Lacosamide 400&lt;sup&gt;b&lt;/sup&gt;</td>
<td>35</td>
<td>25</td>
</tr>
<tr>
<td>Pregabalin 300&lt;sup&gt;b&lt;/sup&gt;</td>
<td>38</td>
<td>29</td>
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<tr>
<td><strong>Postherpetic neuralgia – 12 weeks of treatment [w9,w10]: Outcome – at least 50% pain intensity reduction</strong></td>
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<tr>
<td>Pregabalin 600&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>Pregabalin 300&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>11</td>
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<tr>
<td>Gabapentin ≥ 1200&lt;sup&gt;b&lt;/sup&gt;</td>
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<td><strong>Fibromyalgia – 12 weeks of treatment [6,w12]: Outcome – at least 50% pain intensity reduction</strong></td>
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<tr>
<td>Duloxetine 60/100</td>
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<td>17</td>
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<tr>
<td>Pregabalin 600</td>
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<td>15</td>
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<tr>
<td>Pregabalin 450</td>
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<td>15</td>
</tr>
<tr>
<td>Pregabalin 300</td>
<td>19</td>
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Effectiveness of Treatments

No shortage of treatments, just shortage of evidence of benefits

Assessment of 1,016 Cochrane review articles

- 44% of the interventions likely beneficial
- 7% harmful
- 49% inconclusive as to benefit or harm

“One is instantly reminded of the malign influence of fashion on medicine, more than any other science. Even nowadays it is subject to fads although no science is more profitable.” Pliny the Elder, 23-79 AD
So, if overall treatments are only modestly effective…

Why?

Some Possible Explanations

Exclusive Reliance on the Biomedical Model
- Occult pathology
- Peripheral nervous system sensitization
- Central nervous system sensitization
- Genetics

Other Contributing Factors
- Means of assessing pain
- Variability in sensory sensitivity
- Psychological characteristics
- Combination of the interactions among multiple biopsychosocial factors
Characteristics of Biomedical Perspective on Chronic Pain

- Pain viewed as solely a signal of injury directly related to objective physical pathology
- Continual quest to find THE structural cause
- Attempt a “mechanical fix”
- Provide purely symptomatic treatments
- Active provider takes over responsibility and control from the passive patient
Some Challenges to the Biomedical Perspective

- Patients with **minimal objective evidence of pathology** often complain of **intense pain** – **False Negatives** *(Disease Deficit Disorder?)*

- **Asymptomatic** people often reveal objective evidence of structural abnormalities using various imaging procedures – **False Positives** *(Patients in waiting?)*

Prevalence of Abnormal Lumbar Findings in Asymptomatic People

<table>
<thead>
<tr>
<th>Test</th>
<th>Abnormal Findings, %</th>
<th>N</th>
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<tbody>
<tr>
<td>Lumbar Myelograms</td>
<td>24%</td>
<td>71</td>
</tr>
<tr>
<td>CT Scans</td>
<td>36%</td>
<td>58</td>
</tr>
<tr>
<td>Discograms</td>
<td>38%</td>
<td>27</td>
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<tr>
<td>MRI</td>
<td>30%</td>
<td>67</td>
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Some More Challenges to the Biomedical Perspective

- Patients with the same extent of tissue pathology, treated with identical interventions, respond in widely different ways\(^1\)

- **Surgical procedures** designed to inhibit symptoms by severing neurological pathways believe to be the generator(s) of pain may fail to eliminate or even alleviate it substantially in the majority of patients

- Often, even when surgery is a technical success, it is simultaneously a clinical failure -- the patient continues to experience pain and disability despite “correction” of underlying pathophysiology

\(^1\)Gerbershagen et al. Anesthesiology 2013;118:934-44
Even More Challenges to the Biomedical Perspective

- There are only modest correlations among physical impairments, pain reports, disability, and response to treatment

Example

White et al. demonstrated that disease and moderate to severe pain had little impact on achievement of recommended physical activity levels, among people with or at high risk of knee OA assessed using radiographic imaging. They concluded that:

“Neither the disease of OA itself nor knee pain appeared to have substantial impact on the participants’ walking behavior in the normal living setting.”

Fundamental Problem of Pain

So which is the most valid indicant of pain?

Self-report
- Narrative
- Questionnaire

Not highly correlated!

Objective
- History
- Examination
- Lab Tests
- Imaging
- Ambulatory monitoring

Behavior (observable)
- Overt Expression
- Physical Performance
Sensory Sensitivity - Pain Ratings to the Same 48º Heat Stimulus in 321 Healthy Young Adults

Mean = 71.8
Variability of Responses to Same Surgical Treatment

- Subjective pain reports following the same surgical procedure, performed for the same reason vary greatly across patients.

Natural History of Persistent Symptoms: A Person’s/Patient’s Perspective

Awareness and Interpretation of Symptoms

Help/treatment-seeking

Diagnostic uncertainty

PT Frustration

Physician frustration

Multiple costly, invasive diagnostic tests

Suggestion of psychological causation or malingering

Increased symptom reporting, pain behaviors, and help-seeking

Increased emotional distress

Demoralized
The Impact and Burden of Chronic Pain

- Performance of ADLs
- Sleep disturbance
- Work, household chores
- Leisure activities
- Energy

- Marital and family relations
- Intimacy
- Social isolation

- Health care costs
- Disability
- Lost productivity

- Irritable
- Angry
- Anxious
- Depressed

Functional Activities

Socioeconomic consequences

Social Consequences

Emotional Functioning
The Impact of Chronic Pain Severity in the Community

Higher score = Better QoL

Conclusion of a systematic review

“Psychosocial factors and emotional distress should be assessed because they are stronger predictors of low back pain [and many other prevalent chronic pain disorders] than either physical examination findings or severity and duration of pain.”
Psychosocial Factors Have Been Shown to Play a Role in …

- Predicting disability\(^1\)-\(^3\)
- Influencing perceptions and experience of noxious sensations\(^4\)
- Directly affecting physiological processes (CNS, hormonal, peripheral)\(^5\)-\(^6\)
- Affecting emotional responses to pain\(^7\)
- Affecting behavioral responses to pain\(^8\)
- Influencing responses by significant others\(^9\)
- Influence response to treatments\(^10\)-\(^14\)

“New” Way of Thinking About People with Chronic Pain – Biopsychosocial

Must assess and address:

- The biologic basis of impairment and pain
- Individual’s history
- The patient’s attitudes and beliefs, emotions, and behavior
- Coping, social supports, and financial resources available
- Responses by significant others
- Context in which a person/patient resides
- Social, work, and economic impact and influences
If Treatment Only Modestly Effective – Need to Consider….Why and What Can Be Done?

- Create and evaluate strategies to encourage more realistic expectations for symptoms & txs
- Maximize the therapeutic effects of a caring clinician
- Determine how best to facilitate, encourage, & motivate patient self-management
- Develop and evaluate the timing of txs and prevention of misuse and disability
- Develop and evaluate new txs
- Develop txs that address pain and comorbidities
- Determine what works and for whom
- Evaluate tx combinations
- Investigate strategies to facilitate maintenance and generalization of tx benefits and relapse prevention