Biofeedback within an academic medical center- Pain management clinic

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Objectives

- Define chronic pain and it’s prevalence in US
- Summarize behavioral research
- Define the role of pain psychology and biofeedback
- Summarize communication strategies for physician and patient buy-in
- Explore Case Presentation
- Summarize billing options
IOM report….cultural transformation in pain prevention, care, education, and research and recommended development of “a comprehensive population health level strategy”
Pain: Largest U.S. Public Health Crisis

Prevalence

100M\(^1\) Persistent Pain
Annual Healthcare & Productivity Cost: $560-630 Billion\(^1\)

80M\(^2\) Cardiovascular Disease
Annual Healthcare & Productivity Cost: $309 Billion\(^1\)

29M\(^3\) Cancer
Annual Healthcare & Productivity Cost: $127 Billion\(^1\)

14M\(^4\) Diabetes
Annual Healthcare & Productivity Cost: $243 Billion\(^1\)

328 Million Prescriptions and $13 Billion in Sales\(^5\)

\(^1\) Institute of Medicine 2011: Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research
\(^2\) The Heart Foundation (http://www.theheartfoundation.org/heart-disease-facts/heart-disease-statistics/)
\(^4\) American Diabetes Association (http://www.diabetes.org/diabetes-basics/statistics/)
\(^5\) IMS Health; 2014 data
What is Chronic Pain?

“An unpleasant sensory and emotional [and cognitive] experience associated with actual or potential tissue damage, or described in terms of such damage.”

International Association for the Study of Pain

Stanford University
Experience of pain has 3 components:

- Sensory (pain)
- Cognitive (attention)
- Emotional (fear)
Types of Pain

Acute

- Hurt = Harm
- Etiology
- Treatment Course

Chronic

- Hurt ≠ Harm
- Etiology
- Treatment Course
Chronic Pain Management

**Multidisciplinary Treatments:**
- Self Management
- Psychological & Behavioral
- Pharmacological
- Physical Therapy
- Occupational Therapy
- Procedural Interventions
- Complementary Treatments
Viscous Cycle of Chronic Pain

Pain Cycle

1. Injury, Surgery, Inflammation
2. Peripheral Sensitization
3. Central Sensitization
4. Pain
5. Pain Cognitive Processes
6. Depression & Anxiety
7. Cortical Reorganization
8. Avoidance & Disability
9. Muscle Spasm Deconditioning

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EVIDENCE OF TREATMENTS
Multidisciplinary Treatment


CBT vs ACT

<table>
<thead>
<tr>
<th>CBT Meta Analysis</th>
<th>ACT Meta Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain Intensity</td>
<td>Pain Intensity</td>
</tr>
<tr>
<td>Quality of Life</td>
<td>Quality of Life</td>
</tr>
<tr>
<td>Depression</td>
<td>Depression</td>
</tr>
</tbody>
</table>


Biofeedback

**TABLE 2**
Efficacy ratings for biofeedback interventions in various medical conditions*

<table>
<thead>
<tr>
<th>Level 5: Efficacious and specific</th>
</tr>
</thead>
</table>
| Urinary incontinence in females
| Level 4: Efficacious |
| Anxiety
| Attention deficit disorder
| Headache (adult)
| Hypertension
| Temporomandibular disorders
| Urinary incontinence in males
| Level 3: Probably efficacious |
| Alcoholism/substance abuse
| Arthritis
| Chronic pain
| Epilepsy
| Fecal elimination disorders
| Headache (pediatric migraine)
| Insomnia
| Traumatic brain injury
| Vulvar vestibulitis

TABLE 1
Treatment recommendations on behavioral and physical treatments for migraine from US Headache Consortium evidence-based guidelines

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relaxation training, thermal biofeedback combined with relaxation training,</td>
<td>Grade A</td>
</tr>
<tr>
<td>electromyographic biofeedback, and cognitive-behavioral therapy may be</td>
<td></td>
</tr>
<tr>
<td>considered as treatment options for prevention of migraine.</td>
<td></td>
</tr>
<tr>
<td>Behavioral therapy (ie, biofeedback, relaxation) may be combined with</td>
<td>Grade B</td>
</tr>
<tr>
<td>preventive drug therapy to achieve additional clinical improvement for</td>
<td></td>
</tr>
<tr>
<td>migraine relief.</td>
<td></td>
</tr>
<tr>
<td>Evidence-based recommendations are not yet possible on the use of hypnosis,</td>
<td>Grade C</td>
</tr>
<tr>
<td>acupuncture, transcutaneous electrical nerve stimulation, cervical</td>
<td></td>
</tr>
<tr>
<td>manipulation, occlusal adjustments, or hyperbaric oxygen as preventive or</td>
<td></td>
</tr>
<tr>
<td>acute therapy for migraine.</td>
<td></td>
</tr>
</tbody>
</table>

“Effective pain management is a moral imperative, a professional responsibility, and the duty of people in the healing Professions.”
Evaluations by:
- Medical Providers
- Behavioral Health
- Physical Therapy
- Occupational Therapy

Other Components:
- Weekly team conferences
- Group & individual therapies
- Integrative approaches
Psychology in Pain Management

Biopsychosocial Evaluations

Treatment: Individual & Group

Patient Education

Education: Medical and Psychology

Attendings and Fellows
## Treatment Options: Pain Psychology

<table>
<thead>
<tr>
<th>Stanford Medicine</th>
<th>Spaulding Rehabilitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>➤ ACPA Support Group</td>
<td>➤ Group Functional Restoration Program</td>
</tr>
<tr>
<td>➤ Coping Skills &amp; Movement</td>
<td>➤ Individual Functional Restoration Program</td>
</tr>
<tr>
<td>➤ ACT Group</td>
<td>➤ Movement Groups</td>
</tr>
<tr>
<td>➤ Backs In ACTion</td>
<td>➤ 1:1 sessions: 8-12 (BFB)</td>
</tr>
<tr>
<td>➤ REGAIN</td>
<td></td>
</tr>
<tr>
<td>➤ A.S.A.P</td>
<td></td>
</tr>
<tr>
<td>➤ 1:1 sessions: 4-8 (BFB)</td>
<td></td>
</tr>
</tbody>
</table>
Pain Psychology Treatment

Focus is NOT on “curing” chronic pain, but on increasing function and self-management skills

- Body Mechanics
- ACTIVE Coping Skills
- Time Based Pacing
- Exercise
- Goal Setting
- Self Regulation Techniques
- Cognitive & Behavioral Copings
- Acceptance & Mindfulness Coping
Pain Psychology Treatment

- Neuroscience education
- Cognitive and emotional coping techniques
- Assess and enhance motivation
- Promote helpful behaviors and thoughts
- Improve mood and/or physical function: BFB, CBT, ACT, MI
Coping with Chronic Pain

Management of PAIN

Self regulation
Activity engagement

Psychological Coping Circle
Physical Coping Circle

Self efficacy
Positive emotions

Hope
Brain changes
Decreased sensitivity

Strength
Endurance
Physician Buy-in

- Respect for Pain Psychology
- Lack of responsiveness to biomedical interventions
- Managing complex patients
- Opioid crisis
- Research outcomes: MI, CBT, ACT & Biofeedback
- Education on appropriate referral for treatments
- Open communication (conference, reports, collaboration)
BIOFEEDBACK

“Biofeedback is the process of gaining greater awareness of physiological functions primarily using instruments that provide information on the activity of those same systems, with a goal of being able to manipulate them at will.”
Talking Points for Patients

- All pain has a psychological component
- Seeing a psychologist does not mean pain is not real
- Nervous system: “physical” & “psychological” pain
- Psychosocial problems affect response to medical treatment
- Focus on function and quality of life
Biofeedback Modalities

- Breathing
- Electromyography (EMG)
- Skin Temperature
- Electrodermal Skin Conductance (SC)
- Heart Rate Variability (HRV), BVP & Coherence
Adjunctive Therapies

- Cognitive Behavioral Therapy
- Acceptance and Commitment Therapy
- Mindfulness Based Stress Reduction
- Systematic desensitization
- Fear avoidance
- Relaxation Breathing
- Progressive Muscle Relaxation
- Guided Imagery
- Autogenics
- Hypnosis
Explanation of Biofeedback

- Awareness
- Control
- Generalization
## Biofeedback and Chronic Pain

<table>
<thead>
<tr>
<th>Emotional</th>
<th>Physical</th>
<th>Cognitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional impact on physiology</td>
<td>Faster recovery to baseline</td>
<td>Self-efficacy</td>
</tr>
<tr>
<td>Emotional suffering: Depression</td>
<td>Muscle tension &amp; guarding</td>
<td>Motivation</td>
</tr>
<tr>
<td>Anxiety</td>
<td></td>
<td>Stress-pain interactions</td>
</tr>
<tr>
<td>Fear</td>
<td></td>
<td>Struggle to control pain</td>
</tr>
<tr>
<td>Dread</td>
<td></td>
<td>Somatic preoccupation</td>
</tr>
<tr>
<td>Frustration</td>
<td></td>
<td>Alienation of the body</td>
</tr>
</tbody>
</table>

**Restore:**
- Muscle balance
- Diaphragmatic breathing
- ANS

**Maladaptive thoughts**
CASE EXAMPLE

“I thought that meditation stuff was baloney, but now [after having seen the response] I may actually do it!”
Case example

Identifying Information

37-year-old married man with sudden onset of low back pain while bending and twisting over work bench 1 year prior

Medical Hx

- MRI: L4-5 disc herniation
- Conservative management for 5 months
- Microdiscectomy: No benefit
- Physical therapy: No benefit
- PMH: SI joint dysfunction, Migraines
- Meds: NSAIDs, Elavil
Medical Evaluation Cont.

Diagnostic impression
- Mild persistent lumbar radiculitis
- Left piriformis syndrome
- Deconditioning

Medical Treatment
- Trigger point injections x3 to piriformis
Psychosocial Evaluation

Biopsychosocial Context
- Married, 3 step children
- Stressors: Family, mood, financial
- Employment stability: 17 years
- ↓ Pain coping skills

Psychological Dx
- DSM Dx: Adjustment d/o with mixed mood disturbance
- PCS=32; PHQ-9=10
Psychological Treatment

Focused individual counseling
- MI
- ACT
- Bfb: sEMG, HRV

Group counseling
- Education, self-efficacy and goal-directed focus
- CBT
Biofeedback Treatment

- 4 Sessions: sEMG targeting body mechanics and MTR
- 3 sessions: HRV bfb targeting stress management, anger, and illustrating pain-brain connection
- Regular relaxation practice linked to PT HEP using app
- Patient noted after first HRV session: “I thought that meditation stuff was baloney, but now [after having seen the response] I may actually do it!”
Discharge Status

- 20 reps of strengthening exercises
- 30 minutes of aerobic exercise
- Lift & carry 50 pounds
- Sitting ↑ from 10 - 60 min
- Standing ↑ from 10 - 45 min
- Pain ↓ from 8/10 - 1/10
Discharge Status

- Able to perform dressing, yard work, childcare, and homemaking without increased pain
- Using relaxation, PCMs, pain control strategies
- Independent home exercise program
- Able to return to work as a metal worker
Discharge Status

- Mood improved: Minimal anxiety and return of humor
- Optimistic outlook with realistic goals
- Enhanced self-efficacy
- Restoration of marital and family relationships
- Improved sleep
- PCS: Pre: 32 Post: 8
- PHQ-9: Pre: 10 Post 2
Basic Treatment Protocol

Session 1-2: Intake & stress protocol
Session 3-4: Relaxation training
Session 5-8: Introduction to active biofeedback
Session 9-12: Increasing challenge levels
Session 13-15: Generalization
Additional Sessions: Follow up (as needed)
Session 1: Intake

Session 2: Stress protocol & pain neuroscience education

Session 3-6: BFB w/ CBT, ACT focusing on generalization
BILLING
Billing Codes

Health & Behavior Codes

- Physical health-focused clinical interventions
- ICD-10 dx: Physical health
- Biopsychosocial aspects vs. primary mental health
- Not always reimbursed

Psychotherapy Codes

- Mental-health-focused interventions
- DSM diagnosis codes
- Generally reimbursed at somewhat higher rates
Health and behavior codes (face to face with patient)

- **96150** for evaluation (per 15 min)
- **96152** for individual treatment with biofeedback (per 15 min)
- **96151** for reassessment (per 15 minutes)
- **96153** for a group (2+) (per patient)
- **96154** (family with patient present)
- **96155** (family w/o patient present) (NOT usually reimbursed)
Psychotherapy Codes:

- **90791** for evaluation (no time limit & can be used 2 sessions)
- **90837** for individual psychotherapy (53+ minutes)
- **90834** for individual psychotherapy (38-52 minutes)
- **90832** for individual psychotherapy (16-37 minutes)
- **90853** Group (2+) (per patient) with bfb demo as psychoeducation
- **90846** Family therapy codes patient not present
- **90847** Family therapy codes with patient present
Thank you!

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