Measuring Outcomes in Pain Medicine

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Disclosures

• No financial interests in any of the software programs.
• No off-label uses of medications or devices will be discussed in this presentation.
Session Outline

- Why is outcome assessment important?
- Pain assessment measures
- Psychiatric comorbidities
- Function and substance abuse assessment
- Activity data monitoring, QST
- Mobile technologies
- Nonspecific effects of treatment
- Future Directions
YOUNG CHILDREN AND OLDER PEOPLE AS A PERCENTAGE OF GLOBAL POPULATION

Life Expectancy from 1900 - 2100
Aging and Pain

• Heart disease - $309 Billion
• Cancer - $243 Billion
• Diabetes - $188 Billion
• Chronic pain - $560 to $635 billion in 2010 dollars
• Expenses for patients with severe pain were three times higher than those without pain.

Main Factors that Influence Nociceptive Inputs to Affect Pain Perception

- **CONTEXT**
  - Pain beliefs
  - Expectation
  - Placebo

- **MOOD**
  - Depression
  - Catastrophizing
  - Anxiety

- **COGNITIVE SET**
  - Hypervigilance
  - Attention
  - Distraction
  - Catastrophizing

- **CHEMICAL & STRUCTURE**
  - Neurodegeneration
  - Metabolic (e.g. opioidergic, dopaminergic)
  - Maladaptive plasticity

- **INJURY**
  - Peripheral & Central Sensitisation

- **Nociceptive Modulation**

- **Pain Experience**

- **Amplified Input**
  - Aδ or C nociceptive input
Pain Categories

- Acute pain (<6 mo., e.g., postsurgical pain)
- Recurrent acute pain (e.g., migraine headaches)
- Chronic noncancer pain (> 6 mo, e.g., mechanical low back pain)
- Chronic progressive pain (e.g., metastatic disease)
Pain Categories

- Acute pain (<6 mo., e.g., postsurgical pain)
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- Chronic noncancer pain (> 6 mo, e.g., mechanical low back pain)
- Chronic progressive pain (e.g., metastatic disease)
Components

- History: temporal features, intensity, topography, quality, exacerbating/alleviating factors
- Physical Exam: determine existence of underlying pathology
- Lab and Radiographic Tests: appropriate to pain syndrome

Assessment Tools

- Pain Intensity Scales: VAS, NAS, “faces” scale
- Multidimensional Pain Measures: Brief Pain Inventory, McGill Pain Questionnaire
Pain Intensity Rating Scales

Visual Analogue Scale (VAS)

No pain

Numerical Rating Scale

No pain

Categorical Scale

None (0)  Mild (1 – 4)  Moderate (5 – 6)  Severe (7 – 10)

(Turk & Melzack, 2001)
Quantifying Pain

Facial Expression Scale

Pain Intensity Scale

Pain Levels of an Irish Setter

Nil  Mild

Moderate  Severe

Excruciating  Homicidal
FIGURE 10.2. McGill Pain Questionnaire. The descriptors fall into four major groups: sensory, 1 to 10; affective, 11-15; evaluative, 16; and miscellaneous, 17-20. The rank value for each descriptor is based on its position in the word set. The sum of the rank values is the pain rating index (PRI). The present pain intensity (PPI) is based on a scale of 0 to 5. Copyright 1975 Ronald Melzack.
Brief Pain Inventory (Short Form)

Study ID: ______________ Hospital #: ______________

Date: ____________________ Time: ____________________

Name: ____________________

1) Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, and toothaches). Have you had pain other than these everyday kinds of pain today?
   1. yes   2. no

2) On the diagram, shade in the areas where you feel pain. Put an X on the area that hurts the most.

   ![Diagram showing areas of pain]

3) Please rate your pain by circling the one number that best describes your pain at its WORST in the past 24 hours.

   0  1  2  3  4  5  6  7  8  9  10
   0 = No Pain  10 = Pain as bad as you can imagine

4) Please rate your pain by circling the one number that best describes your pain at its LEAST in the past 24 hours.

   0  1  2  3  4  5  6  7  8  9  10
   0 = Does not Interfere  10 = Completely Interferes

5) Please rate your pain by circling the one number that best describes your pain on the AVERAGE.

   0  1  2  3  4  5  6  7  8  9  10
   0 = Does not Interfere  10 = Completely Interferes

6) Please rate your pain by circling the one number that tells how much pain you have RIGHT NOW.

   0  1  2  3  4  5  6  7  8  9  10
   0 = Does not Interfere  10 = Completely Interferes

7) What treatments or medications are you receiving for your pain?

   ________________________________

8) In the past 24 hours, how much RELIEF have pain treatments or medications provided? Please circle the one percentage that most shows how much relief you have received.

   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
   No Relief

9) Circle the one number that describes how, during the past 24 hours, PAIN HAS INTERFERED with your:

   A. General activity:

   0  1  2  3  4  5  6  7  8  9  10
   0 = Does not Interfere  10 = Completely Interferes

   B. Mood

   0  1  2  3  4  5  6  7  8  9  10
   0 = Does not Interfere  10 = Completely Interferes

   C. Walking Ability

   0  1  2  3  4  5  6  7  8  9  10
   0 = Does not Interfere  10 = Completely Interferes

   D. Normal work (includes both work outside the home and housework)

   0  1  2  3  4  5  6  7  8  9  10
   0 = Does not Interfere  10 = Completely Interferes

   E. Relations with other people

   0  1  2  3  4  5  6  7  8  9  10
   0 = Does not Interfere  10 = Completely Interferes

   F. Sleep

   0  1  2  3  4  5  6  7  8  9  10
   0 = Does not Interfere  10 = Completely Interferes

   G. Enjoyment of life

   0  1  2  3  4  5  6  7  8  9  10
   0 = Does not Interfere  10 = Completely Interferes

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قائمة مختصرة بالآلام (لاكتئاب مختصر)

1. خلال عدة أشهر من الزمن، وبصورة متكررة:
   a. تعب أو إرهاق
   b. رغبة دائمت في النوم
   c. فقد مزاج أو إرهاق
   d. قد يعاني من الألم المزمن

2. في المخطط التالي، قل عادةً الآلام التي تشعر بها، ضع عددًا.

3. من فضلك، بُنِّئْ في النقطة الأولى 0، تشير إلى الآلام من الألم.

4. من فضلك، ضع عددًا في النقطة الأولى 0، تشير إلى الآلام من الألم.

5. من فضلك، ضع عددًا في النقطة الأولى 0، تشير إلى الآلام من الألم.

6. من فضلك، ضع عددًا في النقطة الأولى 0، تشير إلى الآلام من الألم.

BPI - Arabic - December, 2009
A mild degree of depression, anxiety, and irritability is a normal psychological response to pain.

30-40% of chronic patients in primary care practices fall into the subgroup with significant psychiatric comorbidity.

50-75% in pain practices with major depression or anxiety disorder.

Bair MJ, 2003
Wasan AD, 2004
Gore M, 2005
Comorbid Psychiatric Disorders and Chronic Pain

• Mood and anxiety disorders 2 to 3 times higher in chronic pain patients.
• Chronic pain significantly increases the risk of major depression.
• There is a higher incidence of personality disorders and substance abuse.
Pretreatment Psychosocial Variables as Predictors of Outcomes Following Lumbar Surgery and Spinal Cord Stimulation: A Systematic Review and Literature Synthesis

James Celestin, MD,* Robert R. Edwards, PhD,† and Robert N. Jamison, PhD†

*Psychiatry Department; †Pain Management Center, Departments of Anesthesiology and Psychiatry, Brigham and Women’s Hospital, Harvard Medical School, Boston, Massachusetts, USA

Celestin et al, Pain Med, 2009
Psychosocial Predictors of Outcome

- A positive relationship was found between one or more psychological factors and poor treatment outcome in 92.0% of the studies.
- Presurgical somatization, depression, anxiety, and poor coping were most useful in predicting poor response.
- Older age and longer pain duration were also predictive of poorer outcome.
Literature Review

- Psychopathology and extreme emotionality negatively predict response to treatment.
- Spinal patients with both anxiety and depression have a 62% worse return-to-work rate.
- Maladaptive beliefs and pessimistic expectations are associated with poorer functional outcomes.
- Pain increases symptoms of depression and preexisting depression adds to risk of pain.

Jamison & Edwards, 2013; Boersman et al., 2005; Harkins et al., 1989; Edwards et al., 2011
Evaluation of Psychiatric Disorders and Emotional Distress

- MMPI-2
- SCL-90-R
- Millon Behavior Health Inventory
- Beck Depression Inventory (BDI-II)
- Hospital Anxiety and Depression Scale (HADS)
- Pain Catastrophizing Scale (PCS)
Effect of Mood on Opioid Therapy

N=459 Pts

HADS Questionnaire (depression and anxiety)

Pts with moderate and high negative affect:
1) reported higher pain scores,
2) had greater disability,
3) reported least benefit from opioids

Jamison et al, Pain Practice, 2013
Catastrophizing

A set of negative cognitions, emotions, attitudes, and beliefs

- Magnification & Exaggeration
- Rumination & Hypervigilance
- Helplessness & Pessimism
Catastrophizing Increases Risk of Poor Outcome

N=115 chronic musculoskeletal pts

SOAPP-R, BPI, PASS, BDI, PCS

High levels of catastrophizing were positively correlated with 1) increased pain sensitivity, 2) increased risk for prescription opioid abuse (p<0.01).

Martel et al., Drug & Alcohol Depend. 2013
Psychiatric Comorbidity

“He’s bipolar.”
Quantitative Sensory Testing (QST)
Explaining the Variability in Pain Report

Involves:
(1) application of standardized noxious stimuli
(2) standardized assessment of responses
Elevated Pain Sensitivity in Chronic Pain Patients at Risk for Opioid Misuse


Department of Anesthesiology, Harvard Medical School, Brigham & Women’s Hospital, Chestnut Hill, Massachusetts.
Changing View of Addiction

Old View

Chronic opioid patient

New View

Addiction

Chronic opioid patient
Risk Assessment

General Considerations

Family history

Environment

Aberrant behaviors

Opioid Abuse Assessment

- **Questionnaires**
  - Screener and Opioid Assessment for Patients in Pain-Revised (SOAPP-R)
  - Current Opioid Misuse Measure (COMM)
  - Opioid Risk Tool (ORT)
  - Diagnosis, Intractability, Risk, and Efficacy (DIRE)
  - Screening Instrument for Substance Abuse Potential (SISAP)
  - Opioid Compliance Checklist (OCC)

- **Urine drug testing (UDT)**

Can mobile technology help?

- Chronic pain assessment
  - Smartphone tracking
- Medical management
- Psychological approaches
  - Remote CBT
- Rehabilitation
  - Activity monitoring
  - Sleep and exercise monitoring
Electronic diaries for monitoring chronic pain: 1-year validation study

Robert N. Jamison\textsuperscript{a, b, *}, Stephen A. Raymond\textsuperscript{c}, Jonathan G. Levine\textsuperscript{d}, Ellen A. Slawsby\textsuperscript{e}, Srdjan S. Nedeljkovic\textsuperscript{a}, Nathaniel P. Katz\textsuperscript{a}

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\textsuperscript{e}Department of Mind Body Medicine, Beth Israel Deaconess Hospital, Boston, MA 02115, USA

Received 18 July 2000; received in revised form 3 October 2000; accepted 12 October 2000
Number of days with one or more pain reports

Patients

0 50 100 150 200 250 300 350 400
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

360 357 355 355 350 327 304 273 269 261 246 237 236 231 224 204 197 184 175 77
PainCAS is a Web-based clinical tool for assessing pain and opioid risk in chronic pain patients.
Patient Name: Smith, Robert H.
Demographics: DOB: Jan. 15, 1947; Male, White, Retired

Chief Complaint

Location: Lower back
Change: Improved
Quality: Pounding
Avg. rating: 7
Frequency: (-) A few times a day

Opioid Risk Assessment

SOAPP Score: 28 ⚠ COMM Score: 15 ⚠

Pain Rating and COMM Scores

Patients in this category are judged to be at a high risk for opioid misuse. Careful and thoughtful planning will be necessary for patients in this category.

*Please review Page 2 for more detailed monitoring recommendations

Medications

Medication allergies: (-)
Current meds: OTC meds, Rx meds
Med side effects: Constipation, Dry mouth

Function

Impact on daily activities: Moderate ↓
Impact on ability to work: (-)

Clinician Report

Pain assessment

Duration: > 3 yrs
Pain rating past wk:
- Current: 6
- Worst: 9
- Least: 3
- Average: 6
Frequency: A few times a day
Variance: It depends
Quality of pain:
- Dull
- Piercing
- Shooting
Functional impact:
- (+) Daily chores, Often
- (+) Ability to move, Sometimes
- (+) Sleeping, Sometimes
- (+) Sexual activity, Sometimes
- (+) Exercise, Almost always
- (+) Social life, Sometimes
- (+) Relationships, Sometimes
Exacerbated by:
- (+) Changes in weather
- (+) Going up and down the stairs
- (+) Temperature changes
Alleviated by: Ø

Currently taking pain meds: (+)
- Reason for visit:
  - No improvement in pain, Referral
- Cause:
  - Surgery, Existing health problem
- Prior pain condition: (+)
- Assistive devices:
  - (+) Brace, Other: Hypospray
- Expectations of Tx:
  - (+) Complete relief, Not at all confident
  - (+) More meds, Moderately confident
  - (+) Sleep better, Slightly confident
Over the past 24 hours, what has been your average pain? (1=least, 10=worst)

How depressed and anxious have you been?

How much has your pain interfered with your daily activities?

How much have things changed? (1=better: 5=same: 10=worst)

How much as your pain interfered with your sleep?

List tasks you achieved and times you achieved them.

Jog around the park
05:22:PM

ADD TASK
REMOVE TASK
Fitbit Tracker

- Small and discreet
- Wear it all day
- Tracks
  - Daily steps
  - Distance
  - Calories burned
  - Activity level
- Even tracks sleep!
**Sleep Data**

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<tr>
<th>TYPICAL FITBIT OWNER SLEEP PATTERN</th>
<th>AVERAGE SLEEP EFFICIENCY</th>
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<tbody>
<tr>
<td>asleep</td>
<td>active</td>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Most people went to bed</th>
<th>Most people fell asleep</th>
<th>Median times awakened</th>
<th>Median time in bed</th>
<th>Median actual sleep time</th>
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<tbody>
<tr>
<td>11pm</td>
<td>10:20 – 11:00 PM</td>
<td>11 – 15 min</td>
<td>8 – 11</td>
<td>7.5 – 8 hrs</td>
<td>7 – 7.5 hrs</td>
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<td>12am</td>
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<td>7am</td>
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Increasing Activity

For Fitbit users who start off living a sedentary lifestyle (<4000 steps/day), these users increase their activity levels by 50% at end of 12 weeks of
Challenges for mHealth Technology

• Information is not enough
✓ Needs to engage
✓ Needs to be relational
✓ Needs to motivate
✓ Needs to be adaptive
✓ Needs to be easy
✓ Needs to be fun
✓ Needs to demonstrate caring
Reasons for patient improvement from treatment

1. Specific effects of treatment
2. Natural history and regression to the mean
3. Nonspecific effects of treatment
   - Attention, interest and concern of physicians
   - Patients and physician expectations
• Some clinicians are more successful in treating pain patients than others.
• They recover better from complications.
• The patients tend to like them.
• Very little has to do with what treatment is being offered for the
What’s their secret?

Highly successful physicians:

- Engage patients and families
- Elicit a better understanding of patient’s perspectives
- Sustain therapeutic relationships
- Demonstrate compassion and accountability
- Manage challenging situations

Elder et al., 2006; Klitzman, 2006, Helpern et al., 2007
What Do Patients Want?

– To feel welcome
– To feel important and informed
– To believe their perspective is understood
– To feel secure that their needs will be met.
Successful Providers Demonstrate the 4Es

- Engage
- Empathize
- Educate
- Enlist

Street et al., 2007
Engage
(Build rapport; professional partnership)

- Greeting: pleasant, warm, consistent
- Eye contact
- Consider barriers
- Nonverbal: show interest
- Be curious: “How are you feeling today?”
- Illicit patient’s story: expectations/concerns
Empathize
(Patient feels seen, heard, accepted)

- Listen: feedback
- Hear: feelings, values, thoughts
- Note: body language and demeanor
- Reflect: understanding
- Acknowledge and legitimize feelings
- Employ appropriate humor
Educate
(Inform and answer questions)

- Assess what the patient understands
- Address key concerns
- Answer with compassion:
  - What will happen
  - Who will be there
  - What risks *(clear, not frightening)*
  - What expectations *(realistic)*
Enlist
(Invitation to involve patient in care)

- Seek patient’s input on plan
- Ask for patient’s agreement and active participation
- Provide options
- Negotiate priorities
- Explain what will happen if a problem
Virtually anything that sends a patient one of four messages - someone is listening to me; other people care about me; my symptoms are explainable; my symptoms are controllable - can bring measurable improvement in health.

Howard Brody, M.D., Ph.D.
Sum: To care for your patients you have to *Really Care* for your patients.
Thank you.

Thank you very much.