Electronic Chronic Pain Questions (eCPQ)
Background Situation

The Problem With Capturing Chronic Pain Data Today

- No structured, systematic means for capturing chronic pain data that is widely adopted*
  - Viewed as a symptom of multiple conditions and never a disease in itself
  - Internists and multiple HCP specialists diagnose and treat chronic pain conditions
  - The 3 main types of pain are not easily assessed—no simple test or widely adopted PRO tool
    - Multiple guidelines by painful condition and/or by class of drug (eg, for opioids)
- Validated scales for pain assessment are not broadly utilized
- Existing EHR data capture solutions offered by some EHR vendors fall short of health system needs
  - Integrated delivery networks and medical groups view existing EHR pain modules as too long and cumbersome
  - The modules are not used because they do not offer a clear path on integration into current workflows

EHR, electronic health record; HCP, health care providers; PRO, patient-reported outcome.

Unlike Patient Data in Other Chronic Diseases, Chronic Pain Assessment and Data Are Not Captured Systematically in EHRs

Structured data fields exist for diabetes information in most EHRs, making extraction, reporting, and analysis easy

Pain data are rarely recorded. When done, it is usually in the open notes fields in most EHRs, making extraction, reporting, and analysis difficult

Captured in structured data fields
- HbA1c
- Blood pressure
- LDL
- Retinopathy
- Nephropathy
- Neuropathy

NOT Captured in structured data fields
- Pain severity or intensity
- Pain location and duration
- Impact of pain on patient’s function, mood, and sleep
- Pathophysiologic type of pain (nociceptive, neuropathic, or sensory hypersensitivity)

Chronic Pain Conditions Can Be Classified Based Upon Type of Pain Pathophysiology

Three Main Types of Pain Pathophysiology

- **NOCICEPTIVE PAIN**: Pain related to damage of somatic or visceral tissue, due to trauma or inflammation. **EXAMPLES**: rheumatoid arthritis, osteoarthritis, gout.

- **NEUROPATHIC PAIN**: Pain related to damage of peripheral or central nerves. **EXAMPLES**: painful diabetic peripheral neuropathy, postherpetic neuralgia.

- **SENSORY HYPERSENSITIVITY**: Pain without identifiable nerve or tissue damage; thought to result from persistent neuronal dysregulation. **EXAMPLE**: fibromyalgia.

## Recommended Medication Classes for Different Conditions/Types of Chronic Pain

### Types of Pain

<table>
<thead>
<tr>
<th>Type of Pain</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOCICEPTIVE PAIN</strong></td>
<td>Pain related to damage of somatic or visceral tissue, due to trauma or inflammation</td>
<td>RA, OA, gout</td>
</tr>
<tr>
<td><strong>NEUROPATHIC PAIN</strong></td>
<td>Pain related to damage of peripheral or central nerves</td>
<td>Painful DPN, PHN</td>
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<tr>
<td><strong>SENSORY HYPERSENSITIVITY</strong></td>
<td>Pain without identifiable nerve or tissue damage; thought to result from persistent neuronal dysregulation</td>
<td>FM</td>
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### First line (based on strength of clinical evidence)
- Nonsteroidal anti-inflammatory drugs (NSAIDs), acetaminophen
- Treatment of underlying inflammatory condition may include corticosteroids, biologics and disease-modifying agents

### Opioid use

- **When other treatment options are inadequate**, opioids should be considered for the management of pain severe enough to require daily, around-the-clock, long-term treatment
- **Opioids should be avoided** in patients with sensory hypersensitivity

### References
# Identifying the Key Concepts in Chronic Pain From Literature and Guidelines

<table>
<thead>
<tr>
<th>Source</th>
<th>Details</th>
<th>Pain</th>
<th>Physical Functioning</th>
<th>Social Functioning</th>
<th>Emotional Functioning</th>
<th>Global Improvement/Tx Satisfaction</th>
<th>Symptoms and AEs</th>
<th>Sleep/Fatigue</th>
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<tr>
<td>IMMPACT Turk et al 2003</td>
<td>• Core outcome recommendations for chronic pain clinical trials</td>
<td>√</td>
<td>√</td>
<td>(Supplemental)</td>
<td>√</td>
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<td></td>
<td>• Consensus meeting with 27 experts from academia, government agencies, and pharmaceutical industry</td>
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<tr>
<td>IMMPACT Turk et al 2008</td>
<td>• IMMPACT patient input – focus groups to identify domains, survey to evaluate importance</td>
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<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
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<tr>
<td>S-TOPS Haroutiunian et al 2012</td>
<td>• University of Utah – Pain Management Center Treatment Outcomes in Pain Survey</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
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<td>National Pain Audit 2012</td>
<td>• UK audit – quality of specialist pain services for people with long-term pain</td>
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<td>WHO 2008</td>
<td>• Scoping document – treatment guidelines for chronic pain</td>
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<td>CPAIN</td>
<td>• Chronic Pain Impact Network</td>
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Electronic Chronic Pain Questions (eCPQ) Module Overview

### What it IS

- A recommended set of questions to help support chronic pain assessment
- An electronic module/workflow for data capture
- Based on existing guidelines

### What it IS NOT

- A clinical diagnostic tool or treatment pathway
- A mobile device

**Objectives**

- Designed to enable **systematic, structured collection of discrete data** on pain in a format that allows for extraction, analysis, and aggregation
- Designed to enable physicians to **more appropriately and efficiently assess chronic pain** and to help clinicians better **diagnose, treat, and monitor** patients with chronic pain
Electronic Chronic Pain Questions (eCPQ)*

CHRONIC PAIN?

Have you had pain most days in the past 3 months?
   (Y/N)

PAIN INTENSITY & LOCATION

What was your average pain over the last week?
   (0–10 NRS Scale)

Where is your pain?
   (Diagram)

IMPACT ON FUNCTION, SLEEP, & MOOD

Thinking of the past week…
   How much did pain interfere with your usual activities?
   How much did pain interfere with your sleep?
   How much did pain interfere with your mood?
   (0–10 NRS Scale for each item)

PAIN QUALITY & TYPE

ID PAIN® Screener
   Did the pain feel like pins and needles? (Y/N)
   Did the pain feel hot/burning? (Y/N)
   Did the pain feel numb? (Y/N)
   Did the pain feel like electrical shocks? (Y/N)
   Is the pain made worse with the touch of clothing or bed sheets? (Y/N)
   Is the pain limited to your joints? (Y/N)

Score: < 3
   Consider Nociceptive Pain

Score: ≥ 3
   Consider Neuropathic Pain

“Sensory Hypersensitivity” or Fibromyalgia-like Pain

Did you have trouble thinking or remembering in the past week?
   Were you sensitive to bright lights, loud noises, or smells in the past week?
   (0–10 NRS Scale for each item)

Other information to help diagnose sensory hypersensitivity can be derived from medical history and other eCPQ questions. It includes:
   • Widespread pain from body map image / locations? (Y/N)
   • Marked impairment of mood, sleep, and function? (Y/N)
   • Medical history of ≥1 other sensory hypersensitivity condition? (Y/N)

Consider Sensory Hypersensitivity
   “Mostly Yes”

*For the purposes of this presentation, the eCPQ questions have been paraphrased. NRS, numeric rating scale.
Prospective Psychometric Validation of eCPQ at William Beaumont Health

**Objectives**

- To assess the feasibility usability and potential benefits of integrating the eCPQ into an existing EHR system
- To evaluate the psychometric properties, test-retest reliability and performance of the eCPQ
  - Redundancy of Measurement
    - Are any questions redundant
  - Concurrent Validity
    - Is the instrument measuring the purported construct that it aims to measure
  - Discriminative Validity
    - Does the measure distinguish among groups known to differ on a relevant dimension

**Methods**

- **Study Design:** Prospective validation of eCPQ in a primary care setting. This study had both quantitative and qualitative components. No investigational drugs, devices, or invasive procedures were administered or evaluated as part of this study.
- **Quantitative Component:**
  - Study staff administered eCPQ
  - Physician reviewed and discussed with patients
    - Patients completed paper-based: POQ-SF; SF-36 Version 1 Acute; HADS; MOS Sleep Problem Index I; FSQ
  - Patients invited to complete eCPQ online at home
- **Qualitative Component:**
  - 1-on-1 interview following patients’ clinic visit
  - Subset of study staff were invited to take part in 1-on-1 interview

FSQ, Fibromyalgia Survey Questionnaire; HADS, Hospital Anxiety and Depression Scale; MOS, Medical Outcomes Survey; POQ-SF, Pain Outcomes Questionnaire-Short Form; SF-36, MOS 36-Item Short Form Health Survey.
Disposition of Study Subjects

Patients Consented/Enrolled (N = 455)

- Partially or Fully Completed DataFax Packets (n = 429)
  - No demographic data in packet (n = 10)
- Partially or Fully Completed w/ Demographic Data (n = 419)

Unique eCPQ IDs (n = 397)

- Unique eCPQ IDs w/ Partially or Fully Completed eCPQ Data in EHR (n = 395)
  - eCPQ IDs w/ Partially or Fully Completed Web Survey #1 (n = 115)
  - eCPQ IDs w/ Partially or Fully Completed Web Survey #2 (n = 84)
- eCPQ IDs w/ Partially or Fully Completed eCPQ Data AND Partially or Fully Completed DataFax Packets (n = 392)
- No eCPQ data (n = 2)

Analysis Sample

Lost Packet/Not in DataFax (n = 5)
- Blank DataFax Packet (n = 21)
  - Ran out of time (n = 5)
  - Withdrew (n = 11)
  - Went to ER (n = 2)
  - Language barrier (n = 1)
  - Unknown (n = 2)

- No DataFax data (n = 3)
- Duplicate/triplicate IDs assigned (n = 13)
## Demographics of Study Subjects

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total (N = 395)</th>
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<tbody>
<tr>
<td><strong>Age, Years</strong></td>
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<tr>
<td>Mean (SD)</td>
<td>43.4 (16.4)</td>
</tr>
<tr>
<td>Range (min, max)</td>
<td>18-95</td>
</tr>
<tr>
<td><strong>Gender, n (%)</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>269 (68.1)</td>
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<tr>
<td><strong>Race, n (%)</strong></td>
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</tr>
<tr>
<td>White or Caucasian</td>
<td>277 (70.1)</td>
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<tr>
<td>Black or African American</td>
<td>53 (13.4)</td>
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<tr>
<td>Asian</td>
<td>16 (4.1)</td>
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<tr>
<td>Other</td>
<td>28 (7.1)</td>
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<tr>
<td>Missing</td>
<td>21 (5.3)</td>
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<tr>
<td><strong>Employment, n (%)</strong></td>
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<tr>
<td>Employed, Full-time</td>
<td>153 (38.7)</td>
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<tr>
<td>Employed, Part-time</td>
<td>54 (13.7)</td>
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<tr>
<td>Homemaker</td>
<td>36 (9.1)</td>
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<tr>
<td>Student</td>
<td>17 (4.3)</td>
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<tr>
<td>Unemployed</td>
<td>36 (9.1)</td>
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<tr>
<td>Retired</td>
<td>41 (10.4)</td>
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<tr>
<td>On Disability</td>
<td>33 (8.4)</td>
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<tr>
<td>Other</td>
<td>5 (1.3)</td>
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<tr>
<td>Missing</td>
<td>20 (5.1)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total (N = 395)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
<td></td>
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<tr>
<td>Elementary/Primary School</td>
<td>5 (1.3)</td>
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<tr>
<td>Secondary/High School</td>
<td>109 (27.6)</td>
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<tr>
<td>Some College</td>
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<tr>
<td>College Degree</td>
<td>101 (25.6)</td>
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<tr>
<td>Postgraduate Degree</td>
<td>33 (8.4)</td>
</tr>
<tr>
<td>Other</td>
<td>12 (3.0)</td>
</tr>
<tr>
<td>Missing</td>
<td>20 (5.1)</td>
</tr>
</tbody>
</table>
Mean Scores for eCPQ Questions 2–7 Among Subjects who Self-Reported Chronic Pain for Most Days or Every Day for the Past 3 Months on Question 1 and Those who Did not Self-Report Chronic Pain

In addition, nearly 19% of patients with chronic pain had an ID Pain score of ≥3 (likely indicative of neuropathic pain), whereas only 1.7% of patients without chronic pain had an ID Pain score of ≥3

*P < 0.0001.
Percentage of Subjects with HADS Scores Indicating Moderate or Severe Depression and Anxiety Among Those Who Self-Reported Chronic Pain Versus Those Who Did not Report Chronic Pain

* P < 0.05.
† P = 0.08.
Psychometric Validation: Conclusions

- eCPQ displayed concurrent validity by aligning with ancillary measures.

- eCPQ showed evidence of being a valid, reliable, and reproducible measure for identifying patients experiencing chronic pain.

- Patients and staff generally viewed the eCPQ favorably.
eCPQ Workflow Case Example

Implementation at a large integrated pain clinic in the Midwest

Integration into GE Centricity EHR System

Patient completes paper eCPQ in waiting room when checking in at each visit

Nurse/MA inputs patient answers into eCPQ form in EHR

Provider can see individual longitudinal eCPQ results during each patient visit

Office feedback: Does not interrupt normal workflow and takes only a few minutes

- Results beneficial at individual patient visits, as well as from a population perspective
  - Periodically (every 6 months) eCPQ aggregate results analyzed from an entire clinic population perspective
  - Results provide information on how well clinic is managing patients with chronic pain, (pain, functioning, mood, and sleep)

Note: This is one example of how an office has implemented the eCPQ into its EHR system; the process can be customized for individual practices, institutions, and EHR systems.
Summary

- eCPQ was designed to address an existing gap in collecting data in patients with chronic pain
  - ID Pain questionnaire helps to identify the pain type
    - Developed in a multicenter study of 586 patients with chronic pain of nociceptive, mixed, or neuropathic etiology
    - Validated in a multicenter study of 308 patients
  - Additional questions, combined with other information already collected, help to identify patients with sensory hypersensitivity conditions such as fibromyalgia
    - This portion of the eCPQ is currently under further study

- Psychometric validation of eCPQ in 397 patients with chronic pain was completed in the primary care setting (Beaumont Health)

- Used in a number of different settings, easy to complete, well received by patients and staff
  - Allows clinicians to efficiently identify patients with chronic pain and systematically assess and monitor their symptoms over time
  - May help to enhance patient care, facilitate patient-provider communication, and improve evidence-based treatment planning