Improving Patient Reported Outcome (PRO) Collection Rate at Penn Orthopaedics

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What are Patient Reported Outcomes?

**Patient Reported Outcomes (PRO):** A PRO is a measurement of any aspect of a patient's health status that comes directly from the patient (i.e., without the interpretation of the patient's responses by a physician or anyone else)\(^1\)

- PROs follow a survey format which patients complete themselves or with assistance
- PROs can be tailored to a specific condition e.g. Knee Osteoarthritis Outcome Score (KOOS) and the Hip Osteoarthritis Score (HOOS)
- PROs measure and can track over time:
  - Severity of symptoms
  - Effect on patient’s quality of life
  - The condition’s effect on a patient’s mental health
  - Patient satisfaction

\(^1\) USFDA 2006. doi: 10.1186/1477-7525-4-79
KOOS, JR. KNEE SURVEY

INSTRUCTIONS: This survey asks for your view about your knee. This information will help us keep track of how you feel about your knee and how well you are able to do your usual activities.

Answer every question by ticking the appropriate box, only one box for each question. If you are unsure about how to answer a question, please give the best answer you can.

Stiffness
The following question concerns the amount of joint stiffness you have experienced during the last week in your knee. Stiffness is a sensation of restriction or slowness in the ease with which you move your knee joint.

1. How severe is your knee stiffness after first waking in the morning?
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □

Pain
What amount of knee pain have you experienced the last week during the following activities?

2. Twisting/pivoting on your knee
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □

3. Straightening knee fully
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □

4. Going up or down stairs
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □

5. Standing upright
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □

Function, daily living
The following questions concern your physical function. By this we mean your ability to move around and to look after yourself. For each of the following activities please indicate the degree of difficulty you have experienced in the last week due to your knee.

6. Rising from sitting
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □

7. Bending to floor/pick up an object
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □

HOOS, JR. HIP SURVEY

INSTRUCTIONS: This survey asks for your view about your hip. This information will help us keep track of how you feel about your hip and how well you are able to do your usual activities.

Answer every question by ticking the appropriate box, only one box for each question. If you are unsure about how to answer a question, please give the best answer you can.

Pain
What amount of hip pain have you experienced the last week during the following activities?

1. Going up or down stairs
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □

2. Walking on an uneven surface
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □

Function, daily living
The following questions concern your physical function. By this we mean your ability to move around and to look after yourself. For each of the following activities please indicate the degree of difficulty you have experienced in the last week due to your hip.

3. Rising from sitting
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □

4. Bending to floor/pick up an object
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □

5. Lying in bed (turning over, maintaining hip position)
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □

6. Sitting
   None □ □ □ □ □
   Mild □ □ □ □ □
   Moderate □ □ □ □ □
   Severe □ □ □ □ □
   Extreme □ □ □ □ □
Broad Significance

**Patient Care:**
- Focuses on “patient-centered” healthcare\(^1\)
- Important for studying clinical effectiveness over time\(^1\)
- Helps track patient progress over time

**Business:**
The Center for Medicare and Medicaid services (CMS) describes that effective 2015\(^2\):

“[Providers] will be measured on:
- Quality
- Resource use
- Clinical practice improvement
- Meaningful use of certified EHR technology”

However:
- Only 18% of hospitals use PROs\(^3\)
- 72% of surveyed hospitals who said they “rarely” or “never” use PROs also said they plan to begin using the measures within 1 to 3 years. \(^3\)

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\(^1\) Ahmed et al. 2012 “Function and Outcomes Research for Comparative Effectiveness in Total Joint Replacement and Quality Improvement (FORCE-TJR)”


\(^3\) [https://www.healthcatalyst.com/news/survey-fewer-than-2-in-10-hospitals-regularly-use-patient-reported-outcomes/?utm_source=Newsletter&utm_medium=email&utm_campaign=patient_centered_analytics&mkto_tok=eyJpIjoiWXpKa11ptV1m1NVGMzWWpZNCIsInQiOiJTSTIITbzd0NldTbTcrbkFRSEtu9In0%3D](https://www.healthcatalyst.com/news/survey-fewer-than-2-in-10-hospitals-regularly-use-patient-reported-outcomes/?utm_source=Newsletter&utm_medium=email&utm_campaign=patient_centered_analytics&mkto_tok=eyJpIjoiWXpKa11ptV1m1NVGMzWWpZNCIsInQiOiJTSTIITbzd0NldTbTcrbkFRSEtu9In0%3D)
Significance to Penn Medicine Orthopaedics

Patient Care:
The PRO collection rate to date leaves room for significant improvement:
• 10% at best and as low as 4%
• Other departments collect at 75-80%
• To join the national database Function and Outcomes Research for Comparative Effectiveness in Total Joint Replacement and Quality Improvement (FORCE-TJR) a 85-90% completion of PROs is optimal

PROs are critical in orthopaedics:
• Physicians cannot assess how a joint replacement impacts a patient’s daily life

Business:
• High PRO collection rates can demonstrate high-quality care
• Payers are becoming more and more interested in Value-Based Payment

1 Ayers et al. 2013
Aims/Project Overview

1.) Model clinical workflow in Penn Orthopaedics department

2.) Observe and model workflows of Departments of Pain Management and Rheumatology

3.) Develop new workflow using a rapid cycle improvement method to increase response rate

4.) Collect patient observations about current PRO collection methods

4.) Drive PRO collection rate to 50% -- an aggressive but reachable goal
Methods: Orthopaedic Workflow

First goal:
- Observe the workflow and collection of PROs
- Conduct a time-study

Original Penn Orthopaedics Workflow:

- Patient checks-in
  - 5-7 min
- Patient brought back to take X-Rays
  - 10-25 min
- Patient seen by Physician
  - 10-45 min
- Patient brought to 2nd waiting
  - 30-45 min
- Patient roomed/Rooming functions completed
Methods: Rheumatology and Pain Management

Secondary Goals:

- Compare Penn Orthopaedics workflow with Rheumatology and Pain Management workflows
- Focus on methods of PRO collection across departments

Penn Rheumatology and Pain Management Workflow:

Patient checks-in ➔ Vital signs taken ➔ Patient roomed ➔ Patient seen by Physician

Survey pulled up by LPN/MA for patient to complete prior to physician entering
Qualitative Results: Observations from Patients

- Too many surveys; patient “forgets which doctor it’s from” and doesn’t do them
- The surveys are too long
- If patient comes in several times that month, they still have to fill out the same survey every single time
- Patients don’t know why they have to fill out the surveys
  - Only one patient said that someone had told them why the surveys are important
- Patients have not been getting reminders to fill them out on MyPennMedicine (MPM) online portal
- For some patients an “N/A” option might be applicable that does not appear
- One patient expressed impatience that the physician would ask the same questions that had been asked on the survey
## Qualitative Results: Root Cause Analysis

<table>
<thead>
<tr>
<th>Why response rate is poor</th>
<th>Addressing the Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff unfamiliarity with PRO system in Epic</td>
<td>Walkthrough of how to pull up patient surveys</td>
</tr>
<tr>
<td>Concerns over workflow and fear of being short-staffed</td>
<td>New, amended workflow should not impact flow greatly; this data can bring staffing concerns to the department</td>
</tr>
<tr>
<td>Unsure of purpose/value of PROs in general</td>
<td>A staff meeting/lecture where PRO importance is made clear to all levels of healthcare staff would be useful</td>
</tr>
</tbody>
</table>
Qualitative Results: Workflow Development

**Aggressive goal:** Improve response rate to 50% with minimal workflow impact

**Methods to Accomplish This Goal:**

- Check-in encouragement for patients to sign up for MPM
- Have LPN briefly explain purpose of survey after rooming
- Patient must fill out surveys before being seen by doctor
- Use short form KOOS JR/HOOS JR and PROMIS 10 to avoid survey fatigue
- Include additional reminder to sign up online in after-visit reports
- Additional survey question concerning reminders: email vs text
Ideal Penn Orthopaedics Workflow:

1. **Patient checks-in**
   - Reminded to sign up for MPM by front office staff

2. **Patient brought back to take X-Rays**

3. **Patient brought to 2nd waiting room**
   - LPN checks “flag” and pulls up captive survey

4. **Patient seen by Physician**
   - After Visit Summary reminds patient of ease of MPM

5. **Patient completes survey before being seen**

6. **Purpose of survey briefly explained**
   - Patient roomed/Rooming functions completed
Quantitative Results: Evaluating Amended Workflow

Three testing stages:

1st stage: Active Observation
- Observe compliance and workflow

2nd stage: Collection
- Assist patients with survey

3rd stage: Facilitation
- Assist only patients who need help and otherwise lessen friction with new workflow
Quantitative Results: Total PRO Completion

Total PRO Completion Rate As Percentage of Total Assigned to Provider

<table>
<thead>
<tr>
<th>Provider</th>
<th>Tuesday - Observation</th>
<th>Wednesday - Completion</th>
<th>Thursday - Facilitation</th>
<th>Monday - Facilitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>26.67%</td>
<td>31.58%</td>
<td>49.18%</td>
<td>N=15</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td>N=38</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td>N=27</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td>N=61</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td>N=45</td>
</tr>
</tbody>
</table>

N=26  96.15%
N=45  75.56%
Quantitative Results: Assisted PRO Completion

Assisted PRO Completion Rate As Percentage of Total Assigned to Provider

<table>
<thead>
<tr>
<th>Provider</th>
<th>Tuesday- Observation</th>
<th>Wednesday- Completion</th>
<th>Thursday- Faciliation</th>
<th>Monday- Faciliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>40.00%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>46.67%</td>
<td>66.67%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>80.00%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>96.15%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>93.33%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N=5       N=15       N=27       N=10       N=26       N=15
Quantitative Results: PRO Daily Totals

PRO Completion Rate As Percent of Daily Total

<table>
<thead>
<tr>
<th>Clinic Day</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Monday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation</td>
<td>30.19%</td>
<td>49.18%</td>
<td>81.13%</td>
<td>75.56%</td>
</tr>
<tr>
<td>Completion</td>
<td>22.64%</td>
<td>33.96%</td>
<td>47.17%</td>
<td></td>
</tr>
<tr>
<td>N= 53</td>
<td>N= 61</td>
<td>N= 53</td>
<td>N= 45</td>
<td></td>
</tr>
</tbody>
</table>

Quantitative Results: PRO Daily Totals

N= 61

quantitative results: PRO daily totals

Observation

Completion

Clinic Day

Facilitation

A B C D E
Future Directions

- Pilot use of tablets to increase MPM sign-up
- MPM mobile/email alerts
- Allocating personnel resources
- Participate in the FORCE-TJR and American Joint Replacement Registry (AJRR) database and use their analysis to improve patient care
- Provider use of the PROs in clinical examinations
  - Look at aggregate analysis over time by individuals/cohorts
Limitations

- Completion rate may have been influenced by presence of outside observer - Hawthorne effect
- This workflow pertains to a specific department and is therefore not easily generalizable
- PRO adoption across Penn Medicine is still in its early phases
- Optimal use of PROs and integration into clinical practice by providers has not yet been fully realized
Lessons Learned

- Familiarity with Quality Improvement research methodology

- Ability to interact effectively with a diverse team of healthcare professionals

- Developed Patient-Researcher interaction skills

- Experienced pilot study design process

- Utilized basic implementation science

- Witnessed the benefits of more immediate interventions in healthcare through a QIPI process
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