EDITOR'S CHOICE

How Should We Use Patient-Reported Outcome Measures at the Point of Care in Hand Surgery?

Hand Surgery Quality Consortium*

Purpose Despite the importance of collecting patient-reported outcome measures (PROMs), there are few process guidelines for physicians on how to collect and communicate individualized PROMs in patients at the point of care. The purpose of this study was to develop process guidelines on how to routinely collect and communicate individualized PROMs at the point of care in hand surgery.

Methods A consortium of 9 fellowship-trained hand or upper limb surgeons and experts in quality measure development evaluated the importance, feasibility, usability, and scientific acceptability of 12 candidate process guidelines regarding the collection and use of individualized PROMs at the point of care using a modified RAND/University of California Los Angeles Delphi appropriateness method. The panelists evaluated each candidate process guideline in 2 blinded voting rounds with an intervening face-to-face discussion. Predetermined criteria were used to determine panelist agreement or disagreement.

Results The consortium did not reach a consensus on the validity of any of the 12 candidate process guidelines on the routine collection and communication of individualized PROMs at the point of care in hand surgery. The domains of importance and feasibility had greater median scores than those of usability and evidence.

Conclusions To effectively collect and use PROMs to improve care for individual patients, process guidelines for when and how PROM scores should be collected and communicated with patients are needed. The expert consortium was unable to reach an agreement on any of the candidate process guidelines, often because of limitations in evidence supporting the use of PROMs at the point of care.

Clinical relevance Patient-reported outcome measures continue to guide outcome assessments that reflect patient perspective. Although PROM scores are currently aggregated and used to draw broad conclusions about populations, they can also be used as communication tools or to trigger management decisions (eg, use of therapy) that improve care for individual patients. Process guidelines on how to use PROM scores at the point of care are needed. *(J Hand Surg Am. 2021;46(12):1049–1056.*

Key words Hand surgery, patient-centered care, patient-reported outcome measures, point of care, shared decision making.

Podcast

The assessment of patient outcomes in hand surgery has classically been evaluated using objective measures of patients' function or proxies for function (eg, range of motion and grip strength). In contrast, patient-reported outcome measures (PROMs) provide a method to quantify symptom intensity and the magnitude of limitations from the patient's perspective. In addition to assessing the outcome of care at the end of treatment, PROMs can be collected, and these scores are used to

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Received for publication March 8, 2020; accepted in revised form August 13, 2021.

No benefits in any form have been received or will be received related directly or indirectly to the subject of this article.

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0363-5023/21/4612-0001$36.00/0
https://doi.org/10.1016/j.jhsa.2021.08.010

facilitate shared decision-making in individual patients. In limited instances, they have also been used to inform preoperative treatment planning along care pathways directed toward mitigating risk factors for poor outcomes of hand surgery.[1] As evidence continues to highlight the importance of patient perspective and payers and health systems continue to financially incentivize the collection of PROMs, PROMs may be maximized by also understanding how they can be leveraged to improve ongoing care for an individual patient.[2–4] For example, it is possible that PROM scores can be used to inform decision-making discussions (eg, shared decision-making), but they also serve as a signal to hand surgeons when there is a postoperative complication (eg, sudden increase in pain score and the lack of timely functional improvement).

In some specialties, PROMs are used in "measurement-based care" to longitudinally track data (eg, symptoms) to monitor patient progress and inform treatment decisions. For example, in psychiatry, the incorporation of feedback and treatment progress into patient care has been shown to result in superior outcomes.[5–7] When applied to the treatment of patients with cancer and lung transplants, the collection and use of individualized PROMs has been shown to improve patient-physician communication and patient well-being.[8–11] In hand surgery, research has demonstrated that a patient's PROMs are more strongly associated with return to work after a distal radius fracture compared with objective measures (eg, grip strength and range of motion) and that PROMs can help identify patients who may need modifications in their treatment plan (eg, patients with high pain catastrophizing scores have a higher likelihood of persistent pain and disability).[12,13–15] In an effort to integrate an individual patient's PROMs into patients' visits, frameworks have been developed to guide their use at the point of care, and some health systems have begun integrating individual patients' PROMs into treatment discussions. For example, Sambare et al[1] described the use of PROMs to compare an individual patient's scores with those of patients of similar age, sex, and condition to personalize discussions on total joint arthroplasty. There are also multiple ongoing trials testing individual PROM scores in shared decision-making models considering total joint arthroplasty.[16,17] In some examples, these data were used to discuss a particular patient's likelihood of achieving a clinically meaningful benefit from their treatment choice.[10]

Despite the increased collection of PROMs and the recognized importance of considering patients' perspectives, 2 systematic reviews identified that there was a lack of understanding of how to use PROMs in clinical practice.[18–20] To efficiently and effectively collect and incorporate PROMs for individual patients at the point of care in hand surgery, an improved understanding of how (eg, in isolation, compared with prior individualized data or population data, or shared verbally or graphically) and when (eg, at each patient visit) these measures should be collected and used is needed. The purpose of this study was to reach a consensus on the importance, feasibility, usability, and scientific acceptability of validating candidate process guidelines on how to routinely collect and communicate PROMs at the point of care in hand surgery. If developed, such process guidelines might inform the routine implementation of the use of individual PROM scores for patients in hand surgery practices.

MATERIALS AND METHODS

Identification of candidate process guidelines

Two senior authors (both with extensive experience in guideline and quality measure development, research, and the clinical use of PROM collection and use) conducted a literature review and developed candidate process guidelines for the collection and use of PROMs during the treatment of outpatient hand conditions, based on known quality measures requiring PROM collection used by the Centers for Medicare and Medicaid Services and frameworks for how PROMs can be used at the point of care (Table 1). The merit of these candidate process guidelines was then evaluated by a technical expert panel.

Candidate process guideline evaluation

We used a modified RAND/University of California Los Angeles (UCLA) Delphi appropriateness methodology to evaluate the clinical importance, feasibility, usability, and scientific acceptability (Table 2) of the candidate process guidelines. The consortium had prior experience in measure development using the modified RAND/UCLA Delphi appropriateness methodology and was composed of 9 fellowship-trained hand surgeons and experts in quality, with diverse practice locations and patterns. We used a modified RAND/UCLA appropriateness methodology that produced appropriateness criteria that had face, construct, and predictive validities.[21–26] All the panelists were given the candidate process guidelines, a definition of the domains (ie, importance, feasibility, usability, and scientific acceptability) based on

TABLE 1. Quality Measures and Median Scores for Each Quality Domain

Number	Measure Concept
1	Validated PROMs that are used to assess upper-extremity function and symptoms should be routinely collected at every visit for common conditions. The examples of PROMs include DASH, QuickDASH, PRWE, BCTQ, Michigan Hand, Mayo Wrist, and PROMIS UE.
2	A patient's score on a validated PROM that is used to assess upper-extremity function and symptoms should be verbally communicated with the patient at each visit.
3	A patient's trend in score over time on a validated PROM that is used to assess upper-extremity function and symptoms should be verbally communicated with the patient at each visit.
4	Validated PROMs that are used to assess upper-extremity function and symptoms should be graphically shown to patients, with an explanation of their meaning at each visit.
5	A patient's score on a validated PROM that is used to assess upper-extremity function and symptoms should be verbally communicated with the patient at each visit in reference to a population average for the same condition.
6	A patient's score on a validated PROM that is used to assess upper-extremity function and symptoms should be verbally communicated with the patient in combination with objective clinical findings.
7	A patient's score on a validated PROM that is used to assess upper-extremity function and symptoms that is more than 1 SD worse than the population average for that condition should trigger a consideration of surgery if nonsurgical methods have not helped over time.
8	A patient's score on a validated PROM that is used to assess upper-extremity function and symptoms that is more than 1 SD worse than the population average should trigger an inquiry into stressful circumstances, symptoms of depression, or unhealthy misconceptions.
9	A patient's score on a validated PROM that is used to assess upper-extremity function and symptoms should be recorded in the patient's health record.
10	Validated measures of symptoms of distress (anxiety or depression) are useful for routine collection in patients seeing a hand surgeon. The example includes PHQ-2.
11	Validated measures of less effective thoughts (catastrophic thinking and kinesiophobia) and more effective thoughts (self-efficacy and activation) are useful for routine collection in patients seeing a hand surgeon. The examples include PCS-4 and pain self-efficacy questionnaire.
12	Validated measures of health anxiety (a feeling that something is wrong in spite of reassurance of the contrary; somatoform disorder) are useful for routine collection in patients seeing a hand surgeon. The example includes SHAI-5.

BCTQ, Boston Carpal Tunnel Questionnaire; DASH, Disabilities of the Arm, Shoulder and Hand; PCS, pain catastrophizing scale; PHQ, patient health questionnaire; PROMIS UE, patient-reported outcomes measurement information system upper extremity; PRWE, patient-rated wrist evaluation; QuickDASH, Quick Disabilities of the Arm, Shoulder and Hand; SHAI, Short Health Anxiety Inventory.

the criteria of the Agency for Healthcare Research and Quality (Table 2).[27] The panelists independently rated the candidate process guidelines according to the 4 domains: importance, feasibility, usability, and scientific acceptability.

Modified RAND/UCLA Delphi scoring

The modified RAND/UCLA Delphi consensus-building process uses 2 rounds of independent panelist ratings of guidelines (initial and final) with an intervening face-to-face meeting for a group discussion.[28–31] Each panelist evaluated each candidate process guideline on a scale of 1 (definitely not important, feasible, usable, or supported) to 9 (definitely important, feasible, usable, or supported) with regard to its importance, feasibility, usability, and scientific acceptability before (initial) and after (final) the face-to-face discussion. We calculated the median score for each candidate process guideline based on the final round of voting. We calculated the number of ratings for each decision that were within the same 3-point range (1–3, 4–6, and 7–9). Based on predetermined criteria, agreement for each measure was assigned if no more than 2 of the 9 ratings were outside the 3-point range that included the median score (1–3, 4–6, or 7–9). Validity of a candidate process guideline to be used at the point of care was confirmed if the median score was at least 7 in all 4 domains (importance, feasibility, usability, and scientific acceptability) after the final voting round.

Scoring process

The panelists were provided with aggregate scores for each measure from the initial voting round during the

TABLE 2. Definitions of Terms

Term	Definition
Importance	Relevant to stakeholders: topic area is of interest as well as financially and strategically important to all stakeholders (eg, payers, providers, and patients). Addresses clinically important aspects of health, defined as high prevalence or incidence and notable disease burden. Evidence indicates either poor quality or variations in quality, indicating a need for a guideline (gap in care).
Feasibility	It is possible to apply the guideline accurately, completely, and affordably in the daily practice of upper limb surgery.
Usability	Usable and relevant for ensuring that intended users, including physicians, health systems, and policy makers, can understand the results of the guideline and use them for quality improvement.
Scientific acceptability	Guideline is based on best evidence available and linked to evidence-based practice.

The definitions of importance, feasibility, usability, and scientific acceptability were adapted from "Guidance for Using AHRQ Quality Indicators for Public Reporting or Payment — Appendix B and the National Quality Forum."

face-to-face meeting. We provided supporting literature for each candidate process guideline, and the senior author (a nonvoting consortium member) facilitated a measure-by-measure discussion based on the 4 domains. Supporting literature focused on the collection of validated PROMs in hand surgery and how they were applied at the point of care. Additional literature from other specialties (eg, measurement-based care in psychiatry) was also supplied. The generalizability of this literature was evaluated by the technical expert panel. The final voting round was completed within 1 week of the face-to-face meeting. Data were analyzed, and the results were reported in the final round of the Delphi voting.

RESULTS

The panelists were unable to come to an agreement (eg, no consensus was reached) on the validity of any of the 12 candidate process guidelines based on the strict requirements of the modified RAND/UCLA Delphi process. Unlike the American Academy of Orthopaedic Surgeons clinical practice guideline development process, a consensus on a guideline that lacked strong evidence was not allowed through this process. The ranges of the median scores for each quality domain were as follows: importance: 5.5−7.5, feasibility: 4.0−8.0, usability: 4.0−5.5, and evidence: 2.0−5.0. Limited evidence and concerns for usability were the greatest reasons for not reaching a consensus. The examples of candidate process guidelines that did not reach a consensus include the following: (1) validated PROMs that are used to assess upper-extremity function and symptoms should be routinely collected at every visit, (2) a patient's trend in score over time on a validated PROM that is used to assess upper-extremity function and symptoms should be verbally communicated with the patient at each visit, (3) a patient's score on a validated PROM that is used to assess upper-extremity function and symptoms should be verbally communicated with the patient in combination with objective clinical findings, and (4) validated measures of symptoms of distress (anxiety or depression) should be routinely collected in patients seeing a hand surgeon. Overall, no agreement was reached on any candidate process guideline, meaning that no median score of any of the 4 domains was considered important, feasible, usable, and scientifically supported (Table 3).

DISCUSSION

Although the importance of collecting PROMs from patients has been recognized and well-studied for drawing conclusions at a population level, the interest in the collection and use of PROMs for individual patients to guide management decisions at the point of care is growing. While evaluating how to collect and communicate PROMs with patients, the panel did not reach a consensus on how the results of PROMs should be used during routine clinical care in hand surgery. Our results suggest that as PROM collection becomes routine, there are opportunities to maximize their use as communication tools and tools for measurement-based care.

The incorporation of the collection and use of a patient's PROM data into routine clinical care has great potential. In a randomized controlled trial, Velikova et al[8] examined the effects of the collection

TABLE 3. Quality Measures and Median Scores for Each Quality Domain

Number	Measure Concept	Importance	Feasibility	Usability	Evidence
1	Validated PROMs that are used to assess upper-extremity function and symptoms should be routinely collected at every visit for common conditions. The examples of PROMs include DASH, QuickDASH, PRWE, BCTQ, Michigan Hand, Mayo Wrist, and PROMIS UE.	5.5	5.0	4.5	4.5
2	A patient's score on a validated PROM that is used to assess upper-extremity function and symptoms should be verbally communicated with the patient at each visit.	6.0	8.0	4.5	4.5
3	A patient's trend in score over time on a validated PROM that is used to assess upper-extremity function and symptoms should be verbally communicated with the patient at each visit.	7.0	7.0	4.5	4.5
4	Validated PROMs that are used to assess upper-extremity function and symptoms should be graphically shown to patients, with an explanation of their meaning at each visit.	6.0	5.5	5.0	4.5
5	A patient's score on a validated PROM that is used to assess upper-extremity function and symptoms should be verbally communicated with the patient at each visit in reference to a population average for the same condition.	6.0	5.0	5.0	3.0
6	A patient's score on a validated PROM that is used to assess upper-extremity function and symptoms should be verbally communicated with the patient in combination with objective clinical findings.	7.0	7.5	5.5	5.0
7	A patient's score on a validated PROM that is used to assess upper-extremity function and symptoms that are more than 1 SD worse than the population average for that condition should trigger a consideration for surgery if nonsurgical methods have not helped over time.	6.0	5.0	5.0	4.5
8	A patient's score on a validated PROM that is used to assess upper-extremity function and symptoms that are more than 1 SD worse than the population average should trigger an inquiry into stressful circumstances, symptoms of depression, or unhealthy misconceptions.	7.5	6.0	5.0	3.5
9	A patient's score on a validated PROM that is used to assess upper-extremity function and symptoms should be recorded in the patient's health record.	7.0	6.0	5.0	3.5
10	Validated measures of symptoms of distress (anxiety or depression) are useful for routine collection in patients seeing a hand surgeon. The examples include PHQ-2.	5.0	4.5	4.5	4.0
11	Validated measures of less effective thoughts (catastrophic thinking and kinesiophobia) and more effective thoughts (self-efficacy and activation) are useful for routine collection in patients seeing a hand surgeon. The examples include PCS-4 and pain self-efficacy questionnaire.	7.0	4.0	5.0	2.0
12	Validated measures of health anxiety (a feeling that something is wrong in spite of reassurance of the contrary; somatoform disorder) are useful for routine collection in patients seeing a hand surgeon. The examples include SHAI-5.	5.5	4.0	4.0	2.0

DASH, Disabilities of the Arm, Shoulder and Hand; QuickDASH, Quick Disabilities of the Arm, Shoulder and Hand; PRWE, patient-rated wrist evaluation; BCTQ, Boston Carpal Tunnel Questionnaire; PCS, pain catastrophizing scale; PHQ, patient health questionnaire; PROMIS UE, patient-reported outcomes measurement information system upper extremity; SHAI, Short Health Anxiety Inventory.

and use of PROM scores, emotional well-being, and patient-physician communication in oncology practice. The authors compared the completion of PROMs and feedback of results, the completion of PROMs with no feedback, and no instrument completion prior to the encounter or feedback (ie, control group). They found that patients who completed PROMs had better PROM scores (fewer symptoms) than those in the control group and that patients receiving feedback had greater emotional well-being scores. These benefits have also been demonstrated in the context of hand surgery, where PROMs can be predictive of return to work and can be used to identify patients who may benefit from treatment plan modifications.[1,12–14] Despite the findings of these studies and the potential benefit of the routine collection and communication of individualized PROMs in patients, evidence on real-world PROM collection to improve the management of a patient's hand condition is lacking. Because of the rigid methods used, we were unable to reach a consensus on how and when physicians should use PROMs to potentially benefit individual patients.

The median scores and ranges of the median scores of all 4 domains (importance, feasibility, usability, and evidence) in our study were low. Although the panelists (and likely physicians and health systems) recognized the importance of PROM collection and might have believed that its use in clinical practice is feasible, they did not reach a consensus on the scores of any measure. Barriers to PROM collection and communication have been minimally studied.[32] Although cost, disruption of work flow, and limited guidance on and the understanding of their use and impact have been identified as barriers, further work is needed to identify processes to help overcome these barriers.[32] For example, investigators have started evaluating the remote collection of PROMs (via email, text message, and telephone) that may improve feasibility.[33,34] Despite the literature provided to the panelists and the increasing number of studies on PROMs, evidence in support of the use of PROM scores to guide care for an individual patient had the lowest scores. Usability, as a measure of relevance and assurance that intended users understood and could use the PROM results (eg, the belief that the scores are actionable), was also low. Based on these findings, there are several areas that need to be addressed to improve our understanding of how to collect PROMs and what to do with the scores of individual patients. First, a real-world (eg, pragmatic randomized controlled trials) investigation of the effect of collecting and communicating individualized PROMs at the point of care is needed to ensure that they improve patient care and inform measurement-based care processes or decision support tools (eg, flagging a patient with worsening functional scores) to scale their use. Second, workflows for all practice types should be developed and studied to minimize disruption in clinic flow (eg, usability and feasibility) while also promoting a culture change toward continuous measurement and improvement. For example, technologic platforms, such as text-based or email-based PROM collection, that can be collected outside of a clinic can be used. Even an effective intervention might fail to provide meaningful results without a successful implementation plan. Third, although measurement has few limitations, the bounds of how frequently PROMs need to be collected to contribute to the management of a patient are unknown and could guide feasible collection processes.

These results should be viewed in the context of their limitations. Two senior authors performed a literature review to develop the 12 candidate process guidelines in accordance with known quality measures requiring PROM collection used by the Centers for Medicare and Medicaid Services and frameworks for how PROMs can be used at the point of care. Although this may have introduced a bias, the panelists were provided with supporting literature, and they completed their voting anonymously. Additionally, because no measures were validated, it is unlikely that any meaningful bias was introduced. It is possible that a panel of different members (or different experts creating guidelines) might have reached a consensus on these guidelines. The fact remains that our group did not provide support for the diversity of its members (conditions treated, geographic location, and practice type) and their perspectives despite all being experienced surgeons and experts in quality measure development. Additionally, we recognize that the use of multiple methods is possible for developing a consensus (eg, modified Delphi methods, nominal group techniques, and consensus development conferences). Although no method is superior, it is possible that a less rigid process, such as one that allows for consensus statements despite limited evidence, would have produced different results. As the clinical use and implementation of PROMs for an individual patient continues to be explored, the scientific evidence supporting these measures may have limited their acceptability, which further highlights the importance of a future investigation that addresses the routine collection and use of PROMs in nonresearch settings in hand surgery. It is important to note that the

individual use of PROM data is less-well studied and might be more difficult to reliably estimate, interpret, and communicate, especially when compared with the more prevalent methods of use (eg, research and population-based data usage).

There is mounting evidence to support the use of PROM data in individual patients to guide care decisions in some medical specialties. To effectively integrate such practices into hand surgery, hand surgeons will benefit from a better understanding of when and how to collect and use such data with patients. This investigation, demonstrating that an experienced panel of hand surgeons and experts in quality measure development was unable to reach a consensus on candidate process guidelines for the use of PROMs in individual patients, highlights the importance of directing future research on processes for collecting and communicating PROMs in hand surgery to improve patient health.

ACKNOWLEDGMENTS

This work was supported by a National Institutes of Health K23AR073307-01 award (to R.N.K.) and the Orthopaedic Research and Education Foundation (OREF) Mentored Clinician Scientist Grant. The content of this work is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the OREF. No other authors have any conflicts of interest related to this research and no benefits in any form have been received or will be received related directly or indirectly to the subject of this article.

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