Mapping Physical Functions of the Shoulder to ASES and PROMIS Scores

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Disclosures

Dr. Voloshin reports personal fees from Innomed, personal fees from Arthrex, personal fees from Smith & Nephew, personal fees from ZimmerBiomet, personal fees from Arthrosurface

All other co-authors have nothing to disclose
Purpose

Recently, increased emphasis has been placed on using patient reported outcome (PRO) measures to assess the effectiveness of treatments.

We sought to map specific physical functions of the shoulder to ASES and PROMIS scores.

This would assist in evaluation of the clinical significance of changes in scores and could help in counseling patients in clinical practice.
Methods

3500 completed ASES forms were available for review.

2900 PROMIS PF (physical function), 2850 PROMIS PI (pain interference) and 985 PROMIS UE (upper extremity) scores were simultaneously collected.
Methods

The ASES specifically asks about physical functions:

• putting on a coat, sleeping on the affected side, washing one’s back/doing up bra, managing toileting, combing hair, reaching a high shelf, lifting 10 pounds, throwing a ball

Responses are stratified into unable to do, very difficult to do, somewhat difficult and not difficult.

For our investigation, responses were grouped into two categories:

• high function response (somewhat difficult or not difficult to do)
• low function response (unable or very difficult to do)
Methods

Receiver operating characteristic (ROC) curves were calculated to determine 90% positive predictive value (PPV) and 90% negative predictive value (NPV) cutoffs for the presence of a high ability to perform a function for ASES, PROMIS PF, PROMIS PI and PROMIS UE scores.

Example: ASES PPV cutoff score for reaching a high shelf would be the score above which at least 90% of people answered as having high function in reaching a high shelf.
ASES Score Physical Function Map. The green area represents the area where at least 90% of people would be expected to have high function for a given activity (the activity is either somewhat or not difficult to do). The red area represents the area where at least 90% of people would be expected to not have high function for a given activity (the activity is very difficult or unable to be done).
PROMIS PF Score Physical Function Map
PROMIS UE Score Physical Function Map
PROMIS PI Score Physical Function Map
Discussion/Conclusion

Physical function “maps” were created for ASES, PROMIS PF, PROMIS UE and PROMIS PI scores

Potential applications:

• Evaluate the clinical significance of scores
  • MCID for shoulder arthroplasty – 21 (Tashjian et al 2017) to 23 (Werner et al 2016) points
  • ASES 90% NPV and PPV cutoff scores for reaching a high shelf were 43 and 68 - difference of 25 points

• Counsel patients in clinical practice
  • Solberg et al developed a predictive model that uses a patient’s preoperative VAS pain score, ASES Function score, VR-12 MCS score, age, sex, and type of arthroplasty to predict outcomes after shoulder arthroplasty, including ASES scores
  • Patient 1 achieves a theoretical ASES Total score of 67, and Patient 2 achieves a theoretical ASES Total score of 90
ASES Score Physical Function Map. Patient 1 can be counseled that he or she can reasonably expect to be able to reach a high shelf at 1 year postoperatively; his or her ability to wash one’s back, sleep on the affected side, lift 10 pounds and throw a ball are uncertain. On the other hand, patient 2 can be counseled that he or she can reasonably expect to be able to perform all of those activities at 1 year postoperatively.
References

