

AOPT Innovative Practice Award

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Practice Setting: Orthopaedics/Research

Innovation Name: OSPRO Yellow Flag Assessment Tool

- **Description of Practice Innovation:** The Optimal Screening for Prediction of Referral and Outcome Yellow Flag (OSPRO-YF) Screening tool is a comprehensive assessment tool designed to evaluate psychological risk factors, often referred to as “yellow flags,” in patients with musculoskeletal pain. The tool is innovative in its ability to provide accurate estimates of individual, full-length psychological questionnaire scores. It was developed (through funding from an AOPT Clinical Research Network grant) to address the need for comprehensive psychological assessment in a clinically efficient manner. The tool has 7-, 10, and 17-item versions that allow for acceptable trade-offs between estimation accuracy and response burden. It has been translated or is currently undergoing translation into 7 different languages.
- **Application of Practice Innovation:** The OSPRO Yellow Flag tool is intended for use by orthopedic physical therapists to assess psychosocial factors that may influence a patient’s prognosis and response to treatment. By identifying these factors early in the treatment process, therapists can tailor their treatment approaches to address these issues, potentially improving patient outcomes. The tool can be used as a standalone measure to inform prognosis and treatment, or guide education. However, it has also been used in conjunction with other measures, like pain intensity and symptom chronicity, to develop the Personalized Pain Prediction (P3) risk assessment tool for persistent pain following physical therapy. The P3 was published in the Journal of Pain Research in 2021¹ and is currently undergoing external validation.
- **What makes it innovative?:** The OSPRO Yellow Flag tool is innovative because it condenses multiple psychological assessments into a single, concise tool. This reduces the burden on the patient and streamlines the assessment process for the therapist, allowing for a more efficient and effective evaluation of psychological risk factors. The tool and its scoring algorithms can be easily integrated into the EHR. We have also researched and provided guidance on use of a simple summary score², which does not require a computer to calculate. Its multiple versions (7-, 10-, and 17-items) and multiple scoring options provide a high degree of flexibility for clinical application.
- **Unique Attributes of the Innovation:** The OSPRO Yellow Flag tool is available in three forms: 17-item, 10-item, and 7-item versions. Each version provides a high level of accuracy in identifying yellow flags, with the 17-item version providing the highest level of accuracy. Although it looks like a traditional questionnaire and is administered in a similar manner, it is scored and interpreted very differently. Most traditional questionnaires yield a single score for the individual psychological characteristic it measures. The OSPRO-YF functions more like a calculator. It calculates what respondents would score if they were to complete validated, full-length questionnaires measuring depressive symptoms, anxiety, anger, fear-avoidance beliefs (for work and physical activity), kinesiophobia, pain catastrophizing, pain anxiety, self-efficacy (for rehabilitation and pain), and pain acceptance. The OSPRO-YF then indicates, or flags, scores that are in the highest population quartile (top 25%, i.e., scores indicating concerning levels of the characteristic).
- **Impact on the Profession:** The OSPRO Yellow Flag tool has the potential to significantly impact the field of physical therapy by facilitating a more holistic, biopsychosocial approach to patient care. By identifying and addressing psychological risk factors, therapists can provide more targeted and effective treatment, potentially improving patient outcomes. The OPRO-YF has not only impacted clinical care, but also

research. The original tool development paper³ has been cited over 125 times and 30 published studies have reported on use of the tool.

- **Impact/Relevance of Practice Innovation to Patient Care/Treatment:** The OSPRO Yellow Flag tool is highly relevant to patient care as it allows therapists to better understand the psychosocial factors that may be influencing a patient's pain experience and response to treatment. This understanding can inform treatment planning and decision-making, leading to more personalized and effective care.

One of the more innovative applications of the OSPRO-YF in clinical care has been its use in psychological phenotyping. We have used the tool to identify clinically-relevant psychological phenotypes among people with hip and knee osteoarthritis⁴, sports-related injury, non-arthritic hip pain⁵, and in activity military members with low back pain⁶. Collectively, these studies have phenotypes defined by varying levels and types of psychological distress. As one example of how OSPRO-YF phenotyping is applied, the tool is currently used in the Duke Joint Health Program, a comprehensive osteoarthritis management program in Durham, NC. Physical therapists use the tool to identify patients with high distress phenotypes, which then allows them to tailor psychologically-informed treatment to their specific needs. This application of the OSPRO-YF directly contributed to the Program winning the Value Based Health Care (VBHC) Europe Clinical Outcomes Prize, an international award that recognizes innovative programs aimed at improving outcomes and reducing costs of health care for high-impact conditions.

Perhaps the most important testament to its impact is what we hear from clinicians. Recently, one clinician remarked "I wanted to mention how I applied the OSPRO tool this Monday and I cannot thank you enough for this tool." Another stated that it had helped her become more aware of the psychological needs of her patients, which in turn helped her deliver more personalized care. We have also received feedback from patients. Many report that OSPRO-YF has helped facilitate conversations around mental health with their physical therapist, adding that "no one has ever asked me how my pain is affecting me emotionally; that is really important."

- **Outcomes of the Practice Innovation:** In addition to helping to improve clinical outcomes, the OSPRO-YF has also yielded a strong and impactful line of clinical research. Most notably, the OSPRO-YF directly led to the development of the Screening for Pain Vulnerability And REsilience (SPARE) tools^{7,8}. Funded in 2018 by Focus on Therapeutic Outcomes (FOTO), these "second generation" short form and computer adaptive tools were developed using Item Response Theory methods. The SPARE tools serve a slightly different purpose from OSPRO-YF because they are designed to measure 3 broad domains of fear avoidance, negative mood, and positive coping. In 2021, the SPARE tools were integrated into the FOTO core measure set. FOTO is the largest outcomes measurement system used in outpatient physical therapy, with over 23,000 users and 5,000 clinics nationwide. Athletico Physical Therapy, one of the largest physical therapy providers in the US with 900 clinics in 24 states, has made the SPARE tools a mandatory measure set for all new patients. In 2022, the SPARE tools were published in 2 special issues in the journals PTJ: Physical Therapy & Rehabilitation Journal and Clinical Orthopaedics and Related Research– both high impact journals in their respective fields.
- **Cost of Innovation:** There is no cost associated with clinical use of the OSPRO-YF. This was an intentional decision to ensure the tool is widely accessible to clinicians.
- **Training Required for Utilizing the Innovation:** No specific training is required for use of the OSPRO-YF. However, some education may be required to ensure that therapists understand how the tool works and are able to accurately interpret and apply the results of the assessment. To assist with education, we worked with AOPT to develop a free, publicly-available OSPRO-YF website and scoring portal (orthopt.org/yf/). We are currently working on a more advanced website that will contain numerous clinician- and patient-facing resources for both the OSPRO-YF and SPARE tools. This website will be designed as a 'one-stop-shop' for yellow flag screening in orthopedic physical therapy. In 2022, we also published a yellow flag

screening framework in JOSPT⁹, which is a ‘how-to’ guide for integrating the OSPRO-YF and other screening tools into clinical care.

- **Justify AOPT funding this Innovation:** Since its development, the OSPRO-YF has created a substantial return on AOPT’s research investment. The OSPRO Yellow Flag tool has the potential to significantly improve patient care and outcomes in the field of physical therapy. By providing a concise and accurate assessment of psychological risk factors, the tool can inform treatment planning and decision-making, leading to more personalized and effective care. The Innovation Award will also bring more attention to the tool within the physical therapy profession. Marketing of the tool has been a major focus of ours over the last few years to ensure physical therapists know about this important resource. Funding will allow us to expand the scope and content of the new OSPRO-focused yellow flag website, including development of web-based scoring and other resources to facilitate implementation.
- **Benefit(s)/Value to Clinical Practice:** The OSPRO Yellow Flag tool provides significant value to clinical practice by facilitating a more holistic, biopsychosocial approach to patient care. By identifying and addressing psychological risk factors, therapists can provide more targeted and effective treatment, potentially improving patient outcomes. This benefit was directly acknowledged in the aforementioned VBHC Europe Clinical Outcomes Prize.

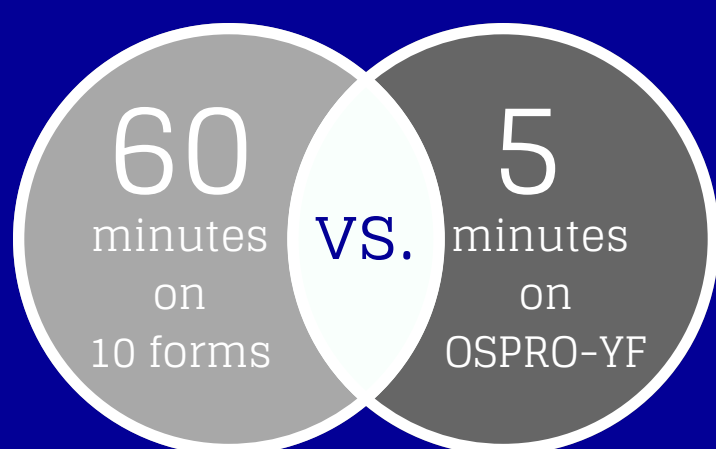
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THE OSPRO-YF

The Optimal Screening for Prediction of Referral and Outcome Yellow Flag Tool

The OSPRO-YF is a tool that measures pain-associated psychological distress. With the OSPRO-YF, you no longer need to administer multiple questionnaires to assess psychological distress.



The OSPRO-YF evaluates the following characteristics and provides score estimates for their associated questionnaires:

Positive Affect/Coping Domain

- Pain Self-Efficacy (PSEQ)
- Self-Efficacy for Rehab (SER)
- Chronic Pain Acceptance (CPAQ)

Negative Mood Domain

- Depression (PHQ-9)
- Anxiety (STAI)
- Anger (STAXI)

Fear Avoidance Domain

- Pain Catastrophizing (PCS)
- Avoidance of Activity (FABQ-PA)
- Avoidance of Work (FABQ-W)
- Fear of Movement (TSK)
- Pain Anxiety (PASS)

WHAT THE OSPRO-YF CAN DO

ESTIMATE SCORES

The OSPRO-YF estimates the predicted scores on each of the 11 full-length questionnaires.

IDENTIFY YELLOW FLAGS

Yellow flags are scores above the 75th population percentile for fear avoidance or negative mood or below 25th percentile for positive affect/coping.

THE BENEFITS OF OSPRO-YF



Consider risk factors

Detect factors that may predict persistent pain or disability.



Inform referrals

When yellow flags are detected, conduct further assessment to aid referral decisions.



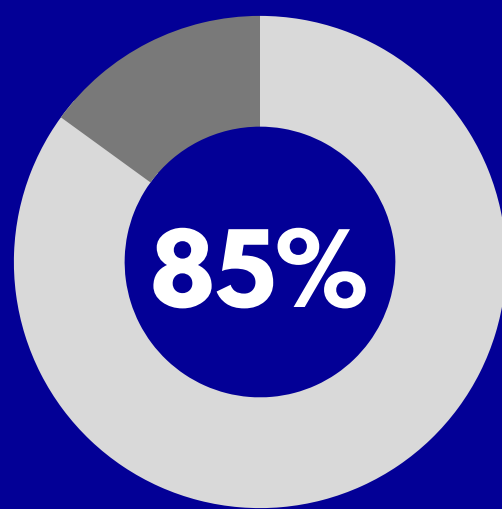
Improve treatment

Modify treatment of psychosocial factors when yellow flags are detected.



Flexible assessment

Use 7-item, 10-item, or 17-item versions.



Did you know?
The OSPRO-YF can identify the presence of yellow flags with a minimum of 85% accuracy

Want to give OSPRO-YF a try? Click here: www.orthopt.org/yf

APPENDIX A

OSPRO-YF ASSESSMENT TOOL

Negative Mood Domain

Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at All	Several Days	More Than Half the Days	Nearly Every Day
1. Poor appetite or overeating*†	0	1	2	3

Read each statement and circle the appropriate number to the right of the statement to indicate how you generally feel.

	Almost Never	Sometimes	Often	Almost Always
2. I am content	1	2	3	4
3. Some unimportant thoughts run through my mind and bother me*	1	2	3	4
4. I am a hotheaded person*†	1	2	3	4
5. When I get mad, I say nasty things	1	2	3	4
6. It makes me furious when I am criticized in front of others	1	2	3	4

Fear-Avoidance Domain

Circle the number next to each question that best corresponds to how you feel.

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
7. I wouldn't have this much pain if there weren't something potentially dangerous going on in my body*†	1	2	3	4

Using the following scale, please indicate the degree to which you have these thoughts and feelings when you are experiencing pain.

	Not at All	To a Slight Degree	To a Moderate Degree	To a Great Degree	All the Time
8. I can't seem to keep it out of my mind*†	0	1	2	3	4

Circle the number from 0 to 6 to indicate how much physical activities affect your current pain.

	Completely Disagree					Completely Agree	
9. Physical activity might harm my painful body region	0	1	2	3	4	5	6
10. I cannot do physical activities which (might) make my pain worse*†	0	1	2	3	4	5	6
11. My work is too heavy for me*†	0	1	2	3	4	5	6

APPENDIX A

Use the rating scale below to indicate how often you engage in each of the following thoughts or activities.

	Never						Always
12. During painful episodes it is difficult for me to think of anything besides the pain	0	1	2	3	4	5	6

Positive Affect/Coping Domain

Please rate how confident you are that you can do the following things at present, despite the pain.

	Not at All Confident						Completely Confident
13. I can live a normal lifestyle, despite the pain	0	1	2	3	4	5	6

Please rate the truth of each statement as it applies to you.

	Never True						Always True
14. It's OK to experience pain*	0	1	2	3	4	5	6
15. I lead a full life even though I have chronic pain*	0	1	2	3	4	5	6
16. Before I can make any serious plans, I have to get some control over my pain	0	1	2	3	4	5	6

Please rate your degree of certainty in performing various tasks during rehabilitation based on the following statements.

	I Cannot Do It										Certain I Can Do It
17. My therapy no matter how I feel emotionally*†	0	1	2	3	4	5	6	7	8	9	10

Abbreviation: OSPRO-YF, Optimal Screening for Prediction of Referral and Outcome cohort yellow flag assessment tool.

*Items included in the 10-item version.

†Items included in the 7-item version.