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Signs and Symptoms of Myofascial Pain: An International Survey of Pain Management Providers and Proposed Preliminary Set of Diagnostic Criteria

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Abstract

Objective. Myofascial Pain Syndrome (MPS) is highly prevalent in pain medicine, yet there is no "gold standard" or set of validated diagnostic criteria for clinical or research use. A survey collected clinician perspectives on MPS to foster the development of a formal case definition for empirical validation.

Design. International survey

Methods. Clinician members of the International Association for the Study of Pain and the American Academy of Pain Medicine received a survey of the symptoms and signs of MPS and expected response to treatment. Write-in fields were available for each category and to suggest relevant diagnostic studies.

Results. Two hundred fourteen responses were received from 4,143 surveys mailed. The most essential components of MPS were tender spots that recreate symptoms when palpated. MPS was also associated with muscle stiffness, decreased range of motion of the affected joints, worsening symptoms with stress, palpable taut band or tender nodule, and referred pain with palpation of the tender spot. Diagnostic studies are reported to be useful for ruling out other pathology, but not to confirm the presence of the condition.

Conclusions. These results were used to propose a set of preliminary diagnostic criteria; expert consensus for case definition and subsequent empirical validation are required for standardization in research and clinical management of MPS.

Key Words. Myofascial Pain; Muscle Pain; Signs; Symptoms; Survey

Introduction

Myofascial Pain Syndrome (MPS) is common in primary medical practice [1] and very common in the subspecialty of pain management [2,3]. It is also regarded as a source of confounding symptoms that can mimic many other musculoskeletal and visceral diagnoses [4]. Despite this, there are still no widely accepted diagnostic or classification criteria for clinical practice or

research. There is no "gold standard" test for the diagnosis of MPS; diagnosis relies on clinical judgment based on traditional signs and symptoms [4]. However, without a validated set of diagnostic criteria, generalizable clinical research into the disorder is essentially impossible.

Authors have proposed preliminary criteria for the diagnosis [4,5], but there remains a remarkable variability in the criteria used in research on myofascial pain [6]. The most frequently cited source for diagnosis, *Myofascial Pain and Dysfunction, The Trigger Point Manual* [4], includes multiple recommendations for sets of diagnostic criteria, including "minimum acceptable," and "recommended" criteria, as well as admonishments to standardize and validate diagnostic criteria to improve the quality and standardization of clinical treatment and research. It is difficult to compare and interpret the findings of the studies that refer to this text for description of diagnostic methods without further explanation [6,7].

In the absence of a diagnostic "gold standard," the most appropriate method to define a reliable and useful case definition for use in research and clinical care is stepwise: survey, expert consensus, and empirical validation [8]. Conditions that are difficult or impossible to objectively measure have used a similar approach. These include headache [9], fibromyalgia [10], temporomandibular joint disorder [11], psychiatric disorders [12], and complex regional pain syndrome [8].

Experts in MPS were surveyed about 10 years ago regarding important factors in clinical diagnosis [13]. Thought-provoking research in the field of MPS has been published in the intervening years, but there still has not been a concerted effort to validate or standardize the diagnosis of MPS. This article reports findings from an international survey recently undertaken and compares this briefly to the previous results. This is the first step in the generation of a case definition of myofascial pain.

Methods

Approval for exemption from review for human subjects was granted by the Northwestern University Institutional Review Board. Paper surveys were mailed to all clinician members with viable addresses in the membership lists of the International Association for the Study of Pain from 2011 and the American Academy of Pain Medicine from 2012. Respondents from the United States could return the completed survey by fax, using an included preaddressed and prestamped envelope, or using a link to complete the survey online. Due to postage restrictions, international respondents could return responses via fax or using the online survey only. Distribution of the questionnaire began in September 2011 and responses were accepted until the end of June 2012.

Survey

See Appendix for the full text of the survey. Basic demographic information was collected: primary specialty, country of practice, age, years in practice, and percentage of patients seen in practice with MPS. Respondents were then asked to indicate whether MPS is a distinct clinical entity, whether it is distinct from fibromyalgia, and whether it can be a primary or secondary condition. Lists were then provided for six palpatory findings, 20 signs, and symptoms, and 10 responses to various treatments commonly associated with MPS. These list items were derived from a thorough search of the literature regarding myofascial pain, discussions with professionals working in the area of chronic pain, the prior survey [13] and our clinical experience. We read all available English language papers indexed using the terms "myofascial pain," "myofascial pain syndrome," and "trigger point," in Medline published between 1997 and 2012 to inform and modify the adaptation of the previous survey list of signs and symptoms. Respondents were asked to select whether each item was "essential," "associated," "irrelevant," or "exclusionary" to the diagnosis of MPS. Write-in fields were available for each category. Finally, respondents were asked to write-in diagnostic tests and imaging studies that they considered "essential," "associated," or "exclusionary" to the diagnosis of MPS.

There were differences between this survey and the previous survey [13] that were carefully considered. New questions and items were added that were relevant to the interim developments in the literature, or that merit attention in the classification of MPS. "Trigger point" was an independent item in the previous survey, while in the updated survey, the reported characteristics of the trigger point were presented in isolation as the definition of trigger point has been modified since that time and remain a topic of ongoing discussion [6]. Finally, another classification category was added for completeness of the construct, which was "exclusionary."

Statistical Analysis

The analyses for this study were largely descriptive. A χ^2 analysis compared three specialties (anesthesiology, physiatry, all other) with each of the six items with the highest agreement among respondents, with P values < 0.05 considered statistically significant. The Statistical Package for the Social Sciences (SPSS IBM®, version 17, Chicago, IL, 2011).

Results

Four thousand one hundred fourty-three surveys were mailed and 214 were returned, for a response rate of 5.2%. One hundred fifty-one responses were from North America (146 from the USA), 14 were from Central or South America, 33 were from Europe, and 16

Table 1 Respondent specialty

Anesthesiology	101 (47.4%)
Physiatry	51 (23.9%)
Neurology	9 (4.2%)
Neurosurgery	8 (3.8%)
Psychiatry	4 (1.9%)
Physical therapy	4 (1.9%)
Chiropractic	1 (0.5%)
Osteopathy	1 (0.5%)
Other	34 (16.0%)

Responses reported as n (%).

were from Asia. The great majority of the respondents were anesthesiologists (47.4%) or physiatrists (23.9%). The remaining specialties were (in descending order of number of responses) neurology, neurosurgery, psychiatry, physical therapy, chiropractic, osteopathy, and other (Table 1). The range of years of practice varied from 1 to 51, and average was 19.9 years. All percentages reported below are based on the number of valid responses that were available for each item.

Is MPS a Distinct Diagnosis?

Seventy-six percent of all respondents indicated that MPS was a distinct clinical entity, and 72% reported MPS was distinct from fibromyalgia (Table 2). The estimated prevalence of myofascial pain among respondents' patients was 31.6%. Seventy-seven percent believed that MPS could be a primary condition. Sixty-two percent of respondents indicated that MPS could also cause secondary conditions, though more than 20% replied "not sure" to this question. There was near unanimous (93%) agreement that MPS can result secondary to another condition (Table 3).

Palpatory Findings in MPS

Only two of the survey items were endorsed as *essential* for the diagnosis of MPS by more than 50% of the respondents: a tender spot causing local pain (72%), and recognition of symptoms upon palpation of the tender spot (58%) (Table 4). More than 90% of the respondents agreed that all the listed palpatory findings were *essential* to or *associated* with the diagnosis of MPS, with the exception of 88% endorsing the finding "tender nodule within taut band." Write-in responses echoed the items listed, with several responses emphasizing the importance of a combination of the listed items in the diagnosis of MPS.

Table 2 MPS as a diagnostic entity

	Yes	No	Not Sure
Is MPS a distinct clinical entity?	161 (76%)	30 (14%)	20 (10%)
Is MPS distinct from fibromyalgia?	151 (72%)	35 (17%)	25 (12%)

Responses reported as n (%).

Table 3 MPS as primary or secondary condition

	Yes	No	Not Sure
Can MPS be a primary condition?	161 (77%)	26 (12%)	22 (11%)
Can MPS be a secondary condition?	194 (93%)	7 (3%)	8 (4%)
Can MPS cause secondary conditions?	131 (62%)	50 (24%)	29 (14%)

Responses reported as n (%).

Signs and Symptoms of MPS

No signs or symptoms were judged *essential* to the diagnosis of MPS by greater than 50% of respondents. More than 25% reported local muscle pain (43%), decreased pressure pain threshold (31%), soft tissue pain (29%), nonfocal neurological exam (29%), and regional pain (27%) as essential. More than 80% of the respondents judged local muscle pain, soft tissue pain, symptoms worse with stress, regional pain, lower pressure pain threshold, muscle stiffness or spasms, nonfocal neurological exam, and painful or painless limitation of range of motion as *essential* or *associated* with the diagnosis of MPS. The items with the highest *exclusionary* ranking were widespread pain (22%), autonomic changes (19%), sensory changes (15%), and dizziness/vertigo (10%). More than 40% considered widespread pain, sensory changes, autonomic changes, and dizziness/vertigo *irrelevant* or *exclusionary*. Sixty percent reported dizziness/vertigo to be *irrelevant* (Table 5). Write-in responses did not reveal concern that important items had been omitted from the survey.

Response to Treatment

The majority of respondents did not categorize any response to any specific treatment as *essential* to the diagnosis of MPS. Improvement after injection of local anesthetic came close at 43%. All the listed positive responses to treatment were considered *essential* or *associated* with MPS by more than 80% of respondents except to heat and cold (Table 6). Write-in responses did not indicate important items had been omitted from the survey, though some

Table 4 Palpatory findings of MPS

	Essential	Associated	Irrelevant	Exclusionary
Tender spot causing local pain*	148 (72%)	48 (23%)	9 (4%)	2 (1%)
Recognition of symptoms upon palpation of tender spot*	117 (58%)	72 (35%)	12 (6%)	1 (<1%)
Taut band*	76 (36%)	118 (57%)	14 (7%)	0 (0%)
Tender spot referring pain/dysesthesia*	72 (35%)	122 (58%)	10 (5%)	3 (2%)
Tender nodule*	70 (34%)	115 (56%)	17 (8%)	4 (2%)
Tender nodule within taut band†	60 (29%)	123 (59%)	23 (11%)	1 (<1%)

Responses reported as n (%).

* >90% of respondents judged these to be "essential to" or "associated with" the diagnosis of MPS.

† >80% of respondents judged these to be "essential to" or "associated with" the diagnosis of MPS.

respondents reported improvement in MPS with nonsteroidal anti-inflammatory drugs and muscle relaxers, while others reported poor response to these medications.

Imaging and Diagnostic Tests

Write-in fields provided for imaging and diagnostics revealed general agreement that these tests are used to rule out other conditions rather than to confirm or support a diagnosis of MPS.

Responses by Specialty

Surgeons were slightly less likely than average to report MPS as a primary condition (54.5 vs 77%) or distinct from fibromyalgia (45.5 vs 71%). They also reported tender spot with local pain as less essential (50 vs 72%) and decreased range of motion as more essential (50 vs 12%). Nonsurgeons were more likely than average to mark MPS as distinct (92.9 vs 77%), and different from fibromyalgia (85.7 vs 71%). Otherwise, the most represented specialties had similar responses to the questions in the survey, and the χ^2 analysis did not reveal

Table 5 Signs and symptoms of MPS

	Essential	Associated	Irrelevant	Exclusionary
Local muscle pain*	90 (43%)	108 (52%)	8 (4%)	1 (<1%)
Lower pressure pain threshold*	64 (31%)	108 (53%)	27 (13%)	6 (3%)
Soft tissue pain*	61 (29%)	129 (62%)	19 (9%)	0 (0%)
Non focal neurological exam	59 (29%)	87 (43%)	52 (25%)	6 (3%)
Regional pain (not widespread)*	57 (27%)	118 (57%)	25 (13%)	7 (3%)
Muscle stiffness or spasms	46 (22%)	146 (71%)	14 (7%)	0 (0%)
Limitation of ROM*	25 (12%)	142 (68%)	39 (19%)	3 (1%)
Worse with stress*	22 (10%)	152 (75%)	31 (15%)	0 (0%)
Muscle weakness, fatigue, decreased work tolerance	16 (8%)	145 (70%)	41 (20%)	5 (2%)
Widespread pain	17 (8%)	95 (47%)	47 (23%)	45 (22%)
Sleep disturbance	15 (7%)	141 (68%)	50 (24%)	1 (<1%)
Worse with temperature/weather changes	13 (6%)	131 (64%)	59 (29%)	3 (1%)
Postural imbalance	13 (6%)	121 (58%)	73 (35%)	1 (<1%)
Articular dysfunction	10 (5%)	114 (55%)	69 (33%)	14 (7%)
History of repetitive injury and/or poor workplace ergonomics	9 (4%)	149 (72%)	49 (23%)	1 (<1%)
Depression/anxiety	8 (4%)	130 (63%)	64 (31%)	4 (2%)
History of trauma	7 (3%)	122 (59%)	76 (37%)	2 (1%)
Sensory changes	6 (3%)	105 (51%)	64 (31%)	31 (15%)
Autonomic changes	5 (3%)	97 (47%)	65 (31%)	40 (19%)
Dizziness/vertigo	0 (0%)	62 (30%)	122 (60%)	20 (10%)

Responses reported as n (%).

* >80% of respondents judged these to be "essential to" or "associated with" to the diagnosis of MPS.

Table 6 Association of MPS symptoms with response to treatment

	Essential	Associated	Irrelevant	Exclusionary
Injection of local anesthetic*	89 (43%)	101 (49%)	15 (7%)	3 (1%)
Physical therapy*	67 (32%)	126 (61%)	13 (6%)	1 (<1%)
Dry needling or saline injection*	52 (25%)	118 (57%)	30 (15%)	6 (3%)
Manual therapy*	49 (24%)	142 (69%)	14 (16%)	2 (1%)
Spray and stretch technique*	36 (18%)	146 (71%)	20 (10%)	3 (1%)
Aerobic exercise*	27 (13%)	140 (69%)	31 (15%)	5 (3%)
Modalities (TENS, US, etc.)*	19 (9%)	146 (71%)	38 (19%)	1 (<1%)
Restorative sleep*	17 (8%)	151 (73%)	36 (17%)	3 (2%)
Heat	17 (8%)	139 (68%)	48 (24%)	0 (0%)
Cold	11 (5%)	116 (57%)	67 (33%)	9 (5%)

Responses reported as n (%).

* >80% of respondents judged these to be "essential to" or "associated with" to the diagnosis of MPS.

any significant differences. Comparison between responses from surgeons and nonsurgeons should be interpreted with care as there were few surgeon respondents.

Comparison to Previous Survey

A similar survey performed in 1998 revealed similar opinions and degrees of agreement [13]. Respondents to the previous survey were more certain that MPS was a legitimate diagnosis (88.5%) distinct from fibromyalgia (81.5%) [13]. Greater than 50% reported regional pain, trigger points, and normal neurologic examination as essential to the diagnosis. When combining the essential and associated categories, there was more than 80% agreement for regional pain, normal neurologic examination, presence of trigger points, reduced pain with local anesthetic injection (or spray and stretch), taut bands, tender points, "dull," "achy," or "deep" pain, palpable nodules, pain that is exacerbated by stress, decreased range of motion, and "ropiness." Diagnostic tests and imaging were generally considered irrelevant in the diagnosis of MPS. The similarities in responses are clear. The exception appears to be the perceived importance of normal findings on neurologic examination.

Remarkable specialty differences were noted in the previous study. This study did not demonstrate the degree of disagreement among specialties, though surgeons responding to both surveys tended not to value the distinction between MPS and fibromyalgia.

Discussion

Our study demonstrates that MPS is considered among pain specialists to be a distinct and common pain syndrome, which can be primary or secondary to another condition. MPS is regarded as local or regional pain with tender spots that recreate symptoms when palpated; there may be associated muscle stiffness, decreased range of motion of the affected joints, worsening symptoms with stress, palpable taut band or tender nodule, or referred pain with palpation of the tender spot. Diagnostic studies are reported to be useful for ruling out other suspected pathology, but are not at this time used to confirm a diagnosis of MPS. Our survey respondents perceived MPS as a local or regional syndrome, though some experts have asserted that widespread myofascial pain is quite common in chronic pain [14]. The distinction between "widespread myofascial pain" and fibromyalgia is recognized to be problematic [15–17].

The estimated prevalence of myofascial pain (31.6%) was lower than, but comparable to, a survey performed in Germany wherein specialists who commonly treat pain (rheumatologists, orthopedists, and pain physicians) estimated the prevalence of myofascial trigger points at 52.6% among their patients [3], and is also lower than other estimates of the prevalence of MPS [2,3]. The estimated prevalence we reported reflects the training, practice patterns, and belief systems among our survey respondents. The average was skewed lower by survey respondents whose practice was not primarily pain.

These survey data indicate that there is a general consensus of the signs and symptoms that constitute MPS. The best use of survey data in the development of a set of diagnostic criteria is to guide consensus meetings, and ultimately to select signs, symptoms, and tests for consideration in the empirical validation process [18]. Based on this survey data, a preliminary and tentative set of diagnostic criteria have been generated to initiate dialog among concerned clinicians and researchers, with the goal of further revision followed by subsequent validation (Figure 1).

The essential items were selected as those with greater than 50% of respondents reporting "essential." The "pick from" items were those from palpatory

Myofascial Pain Syndrome can be diagnosed when the following criteria have been met*:

- A tender spot is found with palpation, with or without referral of pain ("trigger point")
- Recognition of symptoms by patient during palpation of tender spot

AND at least three of the following**:

- Muscle stiffness or spasm
- Limited range of motion of an associated joint
- Pain worsens with stress
- Palpation of taut band and/or nodule associated with tender spot

* These items were judged by more than 50% of respondents as "essential" to the diagnosis

** These items from palpatory findings and signs and symptoms were judged by more than 80% of respondents as "essential" or "associated with" the diagnosis. Items with conceptual redundancy were combined.

Considerations:

- It is important to rule out other conditions that may manifest as local muscle tenderness. Consider also that these conditions may coexist with Myofascial Pain Syndrome.
    - If a comorbid condition exists that likely contributes to the presence of Myofascial Pain Syndrome, it should be listed to allow for subgroup classification.
- Local or regional pain from Myofascial Pain Syndrome may coexist with widespread pain syndromes.
- It is recommended for research purposes that the symptoms be present for 3 months to improve stability of the symptoms over the course of study

Figure 1 Proposed set of Diagnostic Criteria for MPS.

findings and signs and symptoms that had greater than 80% respondents reporting either "essential" or "associated with." Items with conceptual redundancy were not repeated. The diagnosis of myofascial pain associated with temporomandibular joint dysfunction has been validated using a similar process to that recommended, but it is unknown whether this case definition overlaps with MPS in other body areas [11].

The inclusion of "response to treatment" items was deeply debated. This category is fraught with potential misinterpretation, given the wide range of endorsed treatments in our survey and the lack of anatomical specificity of nearly all the included items. We excluded these items from this proposed list, pending further consensus discussion. The historically dominant clinical response of pain provocation and then analgesia with needle penetration of the painful trigger point is potentially useful in the characterization of the syndrome, but there are limitations to its inclusion in a set of diagnostic criteria. There is no systematic evaluation of the degree to which pain from nonmuscle soft tissue or skeletal structures responds to needle penetration or injection into nearby muscles. There is likewise no evaluation of the degree to which non-trigger point muscle pain responds to needle penetration or injection. Furthermore, it may be unclear whether the needled muscle was the actual anatomical target, given that muscles often overlap and trigger points may exist at multiple discreet loci within a muscle. Nevertheless, the absence of a clear and immediate improvement in symptomatology after an analgesic injection into the

posited painful muscle is evidence against the primary role of that muscle in the presenting pain syndrome. A systematic approach to the performance of and interpretation of confirmatory muscle needling should be established and validated if included in a set of diagnostic criteria.

Efforts have been made to document the reliability of the physical examination findings that have been used in the diagnosis of trigger points, generally considered the hallmark of myofascial pain. The results of these studies have been extensively reviewed, and show inconsistent study design, with generally poor reliability of palpatory findings even among clinicians with experience and specialized training [6,7,19]. The exceptions are the most general findings: tenderness to palpation and recognition of familiar pain [20]. These are the same items on the present survey with the highest rate of endorsement as "essential" to the diagnosis of MPS. Unfortunately, these features do not have the ability to discriminate among musculoskeletal pain conditions.

Future studies of MPS have the advantage of recent contributions to the understanding of trigger point physiology. Microdialysis techniques have been used to examine the internal biochemical milieu of trigger points [21–23]. There have also been three proposed imaging modalities that may demonstrate specific changes in intramuscular anatomy in patients with trigger points: ultrasound elastography, ultrasound Doppler blood flow, and magnetic resonance elastography [24–26]. These findings must be replicated, and compared carefully with physical examination findings for further validation, especially using a control set of subjects with nontrigger point-related musculoskeletal pain. These methods may eventually allow the development of an objective standard for the diagnosis of trigger points.

Future studies face many challenges as well. Previous studies of the reliability of palpatory findings have regularly compared patients with nonspecific diagnoses in whom incidental myofascial pain was documented, and have commonly used pain-free controls for their comparisons [27,28]. It must be emphasized that the most meaningful role of diagnostic criteria for MPS would be to distinguish patients with MPS from individuals with similar symptoms that should be attributed to other conditions or that will not respond to treatment that is effective for MPS; discrimination between patients with MPS and pain-free controls is clinically irrelevant. The investigation of asymptomatic or "latent" trigger points can offer insight into the spectrum of muscle pathophysiology [21,22,26] and associated motor control changes [29,30], but should not be substituted for the investigation of symptomatic or "active" trigger points that are relevant to symptom-oriented clinical practice.

It is essential for researchers framing the discussion to decide whether conceptually MPS is a discrete pain syndrome or whether MPS is a condition defined by the presence of trigger points. This is important as there are diagnoses in which trigger points may be considered a secondary finding (i.e., radiculopathy [31], zygapophyseal joint pain [32], visceral pain [14], endocrine abnormalities [14], and peripheral nerve compression [33]). Another fundamental question must be addressed: does the treatment of trigger points improve symptoms attributable to MPS, or does treatment of trigger points alleviate symptoms from conditions that cause or coexist with MPS?

There are several limitations of our study. The survey participants were nearly all clinician members of the International Association for the Study of Pain or the American Academy of Pain Medicine: those with interest and expertise in a field with a high proportion of patients with MPS. Our results may, therefore, be less reflective of the opinions of the broader medical community. A small proportion of surveys were returned, and the greatest number of returned surveys was from the United States. Nevertheless, we had representation from each inhabited continent except Africa. Our survey requested responses for factors that were common in the published literature on MPS, so it is possible that important but unpublished factors were unintentionally omitted. To balance this possibility, write-in fields were provided; these responses did not reveal any widely held beliefs that were missing from our survey. The comparisons between the results of this data and the data from the previous survey are not perfect, because the content was updated and the structure was improved.

It is imperative that those who have experience in the research and treatment of MPS collaborate in an effort to empirically derive and validate a set of diagnostic criteria for MPS that can be uniformly used in clinical and research efforts. These criteria must be validated against the emerging technologies that may offer objective quantification of attributes of myofascial trigger points. The agenda for MPS must be to combine clarity in case definition with reliable clinical diagnosis and rigorous research methods, with subsequent implementation of data-driven interventions.

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References

1 Skootsky SA, Jaeger B, Oye RK. Prevalence of myofascial pain in general internal medicine practice. West J Med 1989;151:157–60.

2 Fishbain DA, Goldberg M, Meagher BR, et al. Male and female chronic pain patients categorized by DSM-III psychiatric diagnostic criteria. Pain 1986;26:181–97.

3 Fleckenstein J, Zaps D, Rüger LJ, et al. Discrepancy between prevalence and perceived effectiveness of treatment methods in myofascial pain syndrome: Results of a cross-sectional, nationwide survey. BMC Musculoskelet Disord 2010;11:32.

4 Simons DG, Travel JG, Simons LS. Myofascial Pain and Dysfunction: The Trigger Point Manual; Vol. 1. The Upper Half of Body, 2nd edition. Lippincott Williams & Wilkins, Baltimore MD, Philadelphia PA; 1998.

5 Fischer AA. New developments in diagnosis of myofascial pain and fibromyalgia. Phys Med Rehabil Clin N Am 1997;8:1–21.

6 Tough EA, White AR, Richards S, et al. Variability of criteria used to diagnose myofascial trigger point pain syndrome-evidence from a review of the literature. Clin J Pain 2007;23:278–86.

7 Myburgh C, Larsen AH, Hartvigsen J. A systematic, critical review of manual palpation for identifying myofascial trigger points: Evidence and clinical significance. Arch Phys Med Rehabil 2008;89:1169–76.

8 Harden RN, Bruehl S, Perez RSGM, et al. Validation of proposed diagnostic criteria (the "Budapest criteria") for complex regional pain syndrome. Pain 2010;150:268–74.

9 Society HCS of the IH. The International Classification of Headache Disorders: 2nd edition. Cephalalgia 2004;24:1-160.

10 Wolfe F, Clauw DJ, Fitzcharles M, et al. The american college of rheumatology preliminary diagnostic criteria for fibromyalgia and measurement of symptom severity. Arthritis Care Res 2010;62:600–10.

11 Schiffman EL, Truelove EL, Ohrbach R, et al. The Research Diagnostic Criteria for Temporomandibular Disorders. I: Overview and methodology for assessment of validity. J Orofacial Pain 2010;24(1):7–24.

12 Association AP. Diagnostic and Statistical Manual of Mental Disorders DSM-IV, 4th edition. American Psychiatric Association, Washington DC; 1994.

13 Harden RN, Bruehl SP, Gass S, et al. Signs and symptoms of the myofascial pain syndrome: A national survey of pain management providers. Clin J Pain 2000;16:64–72.

14 Gerwin RD. Classification, epidemiology, and natural history of myofascial pain syndrome. Curr Pain Headache Rep 2001;5:412–20.

15 Ge H-Y, Nie H, Madeleine P, et al. Contribution of the local and referred pain from active myofascial trigger points in fibromyalgia syndrome. Pain 2009; 147:233–40.

16 Wolfe F, Simons DG, Fricton J, et al. The fibromyalgia and myofascial pain syndromes: A preliminary study of tender points and trigger points in persons with fibromyalgia, myofascial pain syndrome and no disease. J Rheumatol 1992;19:944–51.

17 Alonso-Blanco C, Fernández-de-las-Peñas C, Morales-Cabezas M, et al. Multiple active myofascial trigger points reproduce the overall spontaneous pain pattern in women with fibromyalgia and are related to widespread mechanical hypersensitivity. Clin J Pain 2011;27:405–13.

18 Harden RN. Objectification of the diagnostic criteria for CRPS. Pain Med 2010;11:1212–5.

19 Lucas N, Macaskill P, Irwig L, et al. Reliability of physical examination for diagnosis of myofascial trigger points: A systematic review of the literature. Clin J Pain 2009;25:80–9.

20 Gerwin RD, Shannon S, Hong CZ, et al. Interrater reliability in myofascial trigger point examination. Pain 1997;69:65–73.

21 Shah JP, Gilliams EA. Uncovering the biochemical milieu of myofascial trigger points using in vivo microdialysis: An application of muscle pain concepts to myofascial pain syndrome. J Bodyw Mov Ther 2008;12:371–84.

22 Shah JP, Danoff JV, Desai MJ, et al. Biochemicals associated with pain and inflammation are elevated in sites near to and remote from active myofascial trigger points. Arch Phys Med Rehabil 2008;89:16–23.

23 Moraska AF, Hickner RC, Kohrt WM, et al. Changes in blood flow and cellular metabolism at a myofascial trigger point with trigger point release (ischemic compression): A proof-of-principle pilot study. Arch Phys Med Rehabil 2013;94:196–200.

24 Chen Q, Basford J, An K-N. Ability of magnetic resonance elastography to assess taut bands. Clin Biomech (Bristol, Avon) 2008;23:623–9.

25 Sikdar S, Shah JP, Gebreab T, et al. Novel applications of ultrasound technology to visualize and characterize myofascial trigger points and surrounding soft tissue. Arch Phys Med Rehabil 2009;90:1829–38.

26 Ballyns JJ, Shah JP, Hammond J, et al. Objective sonographic measures for characterizing myofascial

trigger points associated with cervical pain. J Ultrasound Med 2011;30:1331–40.

27 Njoo KH, Van der Does E. The occurrence and inter-rater reliability of myofascial trigger points in the quadratus lumborum and gluteus medius: A prospective study in non-specific low back pain patients and controls in general practice. Pain 1994;58:317–23.

28 Gerber LH, Sikdar S, Armstrong K, et al. A systematic comparison between subjects with no pain and pain associated with active myofascial trigger points. PM&R 2013;5:931–8.

29 Ibarra JM, Ge H-Y, Wang C, et al. Latent myofascial trigger points are associated with an increased antagonistic muscle activity during agonist muscle contraction. J Pain 2011;12:1282–8.

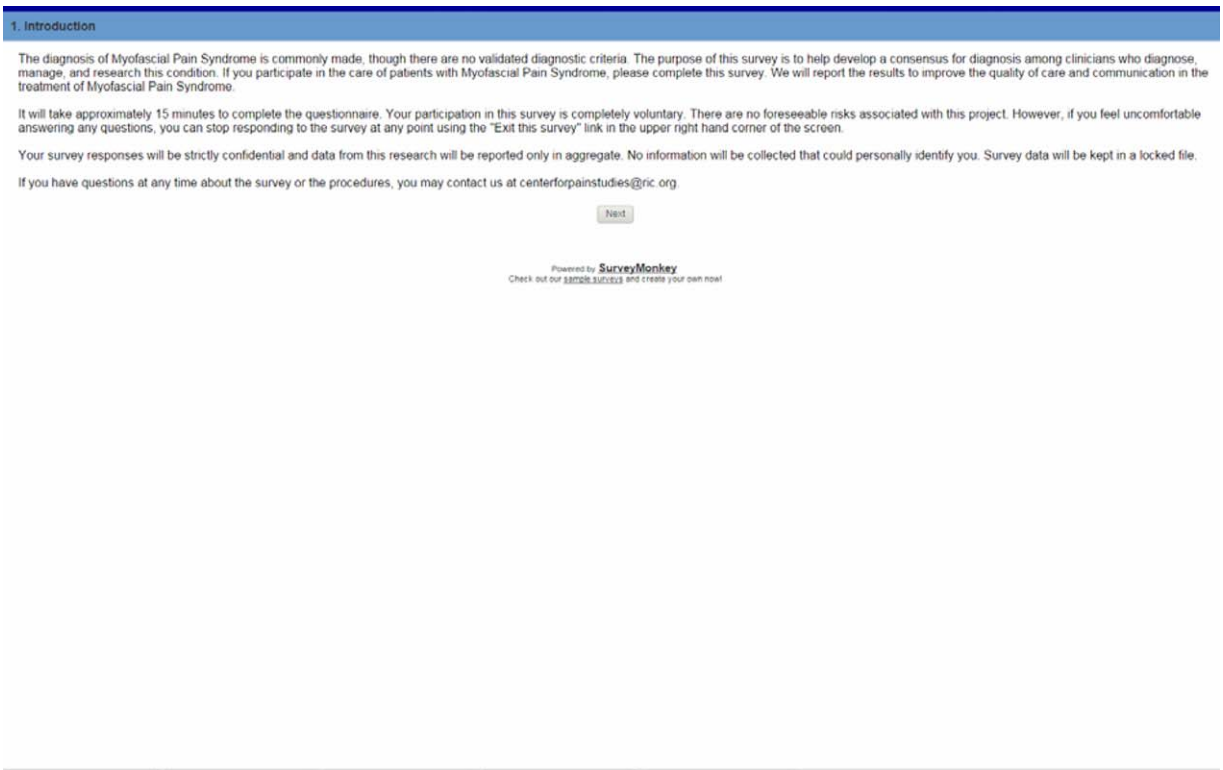
30 Lucas KR, Rich PA, Polus BI. Muscle activation patterns in the scapular positioning muscles during loaded scapular plane elevation: The effects of latent myofascial trigger points. Clin Biomech (Bristol, Avon) 2010;25:765–70.

31 Gunn CC. Radiculopathic pain: Diagnosis and treatment of segmental irritation or sensitization. J Musculoskelat Pain 1997;5:119–34.

32 Bogduk N, Simons DG. Neck pain: Joint pain or trigger points? In: Vaerøy, H. and Merskey, Harold, eds. Progress in Fibromyalgia and Myofascial Pain. Vol 6. Pain Research and Clinical Management. Amsterdam: Elsevier; 1993:267–273.

33 Quintner JL, Cohen ML. Referred pain of peripheral nerve origin: An alternative to the “myofascial pain” construct. Clin J Pain 1994;10:243–51.

Appendix



1. Introduction

The diagnosis of Myofascial Pain Syndrome is commonly made, though there are no validated diagnostic criteria. The purpose of this survey is to help develop a consensus for diagnosis among clinicians who diagnose, manage, and research this condition. If you participate in the care of patients with Myofascial Pain Syndrome, please complete this survey. We will report the results to improve the quality of care and communication in the treatment of Myofascial Pain Syndrome.

It will take approximately 15 minutes to complete the questionnaire. Your participation in this survey is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can stop responding to the survey at any point using the "Exit this survey" link in the upper right hand corner of the screen.

Your survey responses will be strictly confidential and data from this research will be reported only in aggregate. No information will be collected that could personally identify you. Survey data will be kept in a locked file.

If you have questions at any time about the survey or the procedures, you may contact us at centerforpainstudies@ric.org.

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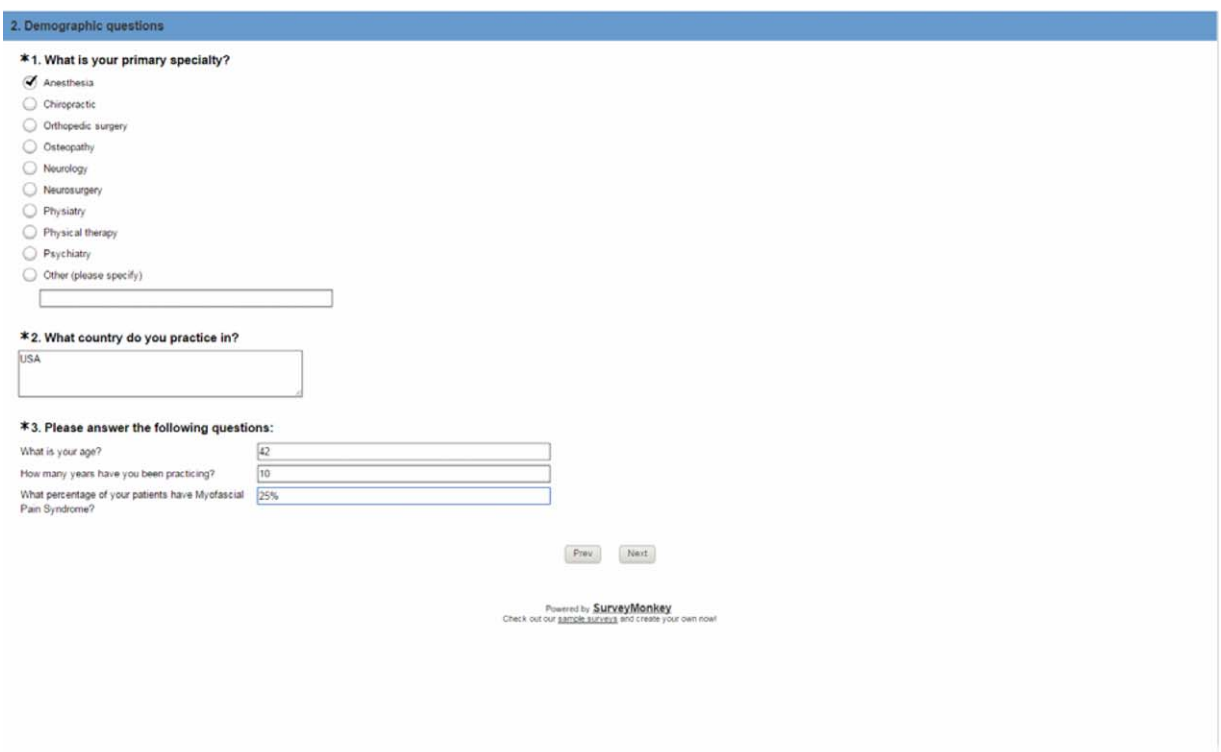

2. Demographic questions

*1. What is your primary specialty?

- [x] Anesthesia
- [ ] Chiropractic
- [ ] Orthopedic surgery
- [ ] Osteopathy
- [ ] Neurology
- [ ] Neurosurgery
- [ ] Physiatry
- [ ] Physical therapy
- [ ] Psychiatry
- [ ] Other (please specify)

*2. What country do you practice in?

USA

*3. Please answer the following questions:

What is your age?	42
How many years have you been practicing?	10
What percentage of your patients have Myofascial Pain Syndrome?	25%

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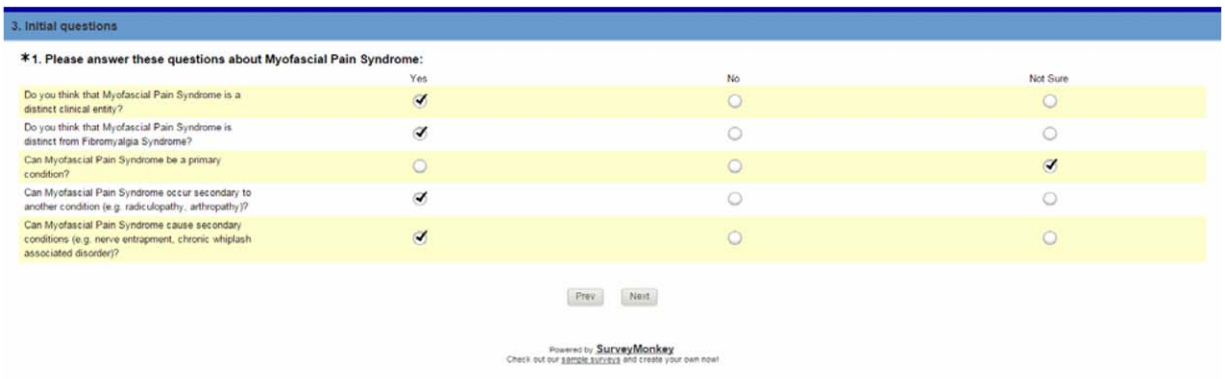

3. Initial questions

*1. Please answer these questions about Myofascial Pain Syndrome:

	Yes	No	Not Sure
Do you think that Myofascial Pain Syndrome is a distinct clinical entity?	✓	○	○
Do you think that Myofascial Pain Syndrome is distinct from Fibromyalgia Syndrome?	✓	○	○
Can Myofascial Pain Syndrome be a primary condition?	○	○	✓
Can Myofascial Pain Syndrome occur secondary to another condition (e.g. radiculopathy, arthropathy)?	✓	○	○
Can Myofascial Pain Syndrome cause secondary conditions (e.g. nerve entrapment, chronic whiplash associated disorder)?	✓	○	○

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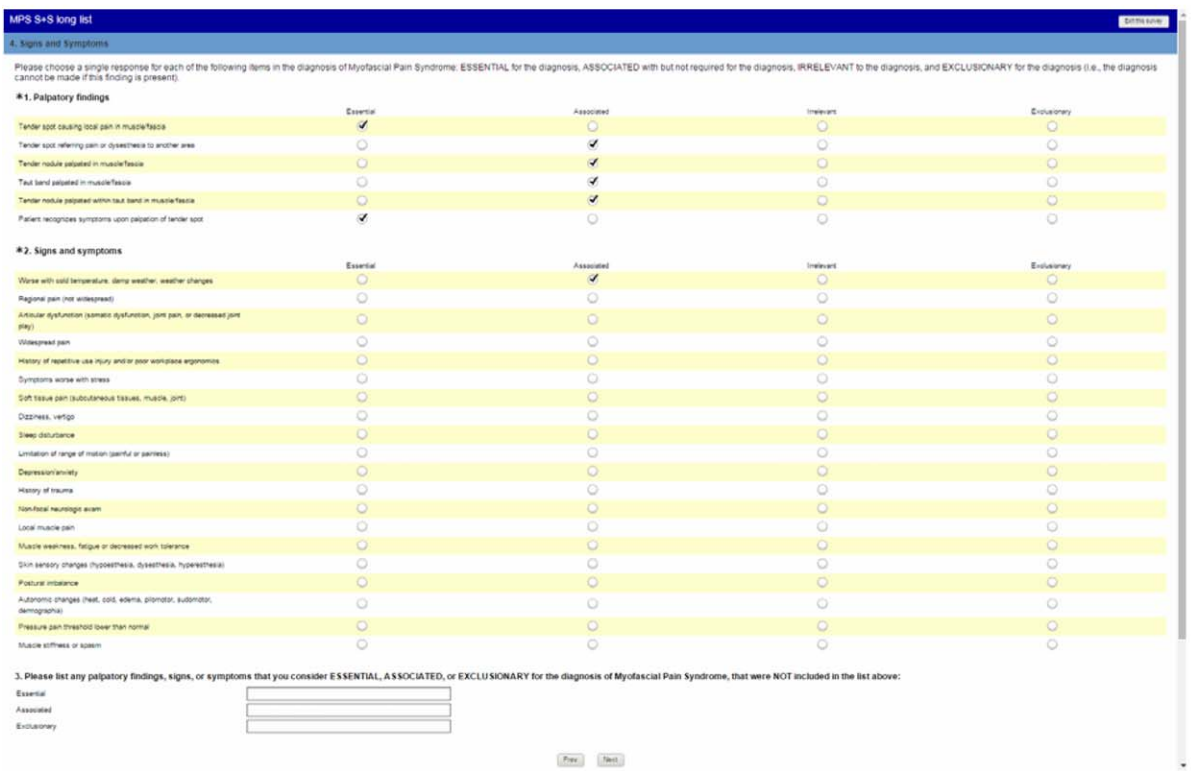

MPS S+S long list

4. Signs and Symptoms

Please choose a single response for each of the following items in the diagnosis of Myofascial Pain Syndrome: ESSENTIAL for the diagnosis, ASSOCIATED with but not required for the diagnosis, IRRELEVANT to the diagnosis, and EXCLUSIONARY for the diagnosis (i.e., the diagnosis cannot be made if this finding is present).

*1. Palpatory findings

	Essential	Associated	Irrelevant	Exclusionary
Tender spot causing local pain in muscle/fascia	✓	○	○	○
Tender spot referring pain or dysesthesia to another area	○	✓	○	○
Tender nodule palpated in muscle/fascia	○	✓	○	○
Taut band palpated in muscle/fascia	○	✓	○	○
Tender nodule palpated within taut band in muscle/fascia	○	✓	○	○
Patient recognizes symptoms upon palpation of tender spot	✓	○	○	○

*2. Signs and symptoms

	Essential	Associated	Irrelevant	Exclusionary
Worse with cold temperature, damp weather, weather changes	○	✓	○	○
Regional pain (not widespread)	○	○	○	○
Articular dysfunction (somatic dysfunction, joint pain, or decreased joint play)	○	○	○	○
Widespread pain	○	○	○	○
History of repetitive use injury and/or poor workplace ergonomics	○	○	○	○
Symptoms worse with stress	○	○	○	○
Soft tissue pain (subcutaneous tissues, muscle, joint)	○	○	○	○
Dizziness, vertigo	○	○	○	○
Sleep disturbance	○	○	○	○
Limitation of range of motion (painful or painless)	○	○	○	○
Depression/anxiety	○	○	○	○
History of trauma	○	○	○	○
Non-focal neurologic exam	○	○	○	○
Local muscle pain	○	○	○	○
Muscle weakness, fatigue or decreased work tolerance	○	○	○	○
Skin sensory changes (hypoesthesia, dysesthesia, hyperesthesia)	○	○	○	○
Postural imbalance	○	○	○	○
Autonomic changes (heat, cold, edema, pilomotor, sudomotor, dermographia)	○	○	○	○
Pressure pain threshold lower than normal	○	○	○	○
Muscle stiffness or spasm	○	○	○	○

3. Please list any palpatory findings, signs, or symptoms that you consider ESSENTIAL, ASSOCIATED, or EXCLUSIONARY for the diagnosis of Myofascial Pain Syndrome, that were NOT included in the list above:

Essential
Associated
Exclusionary

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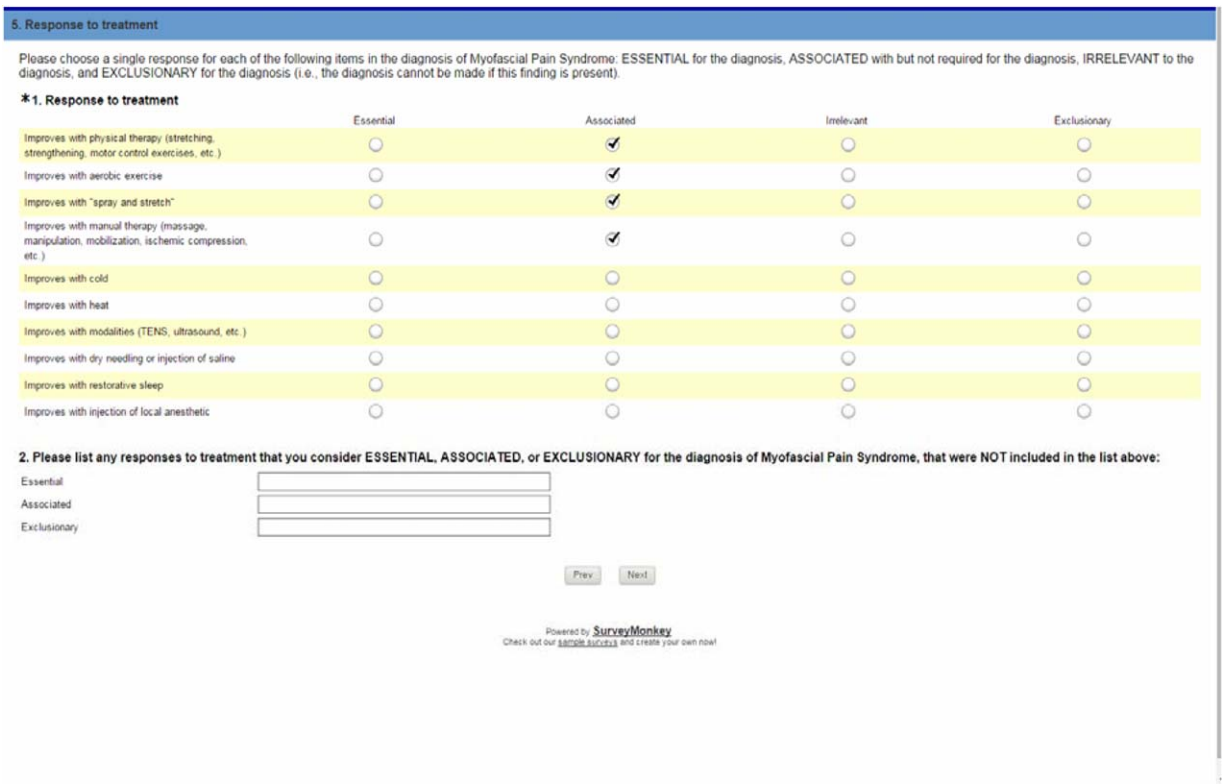

5. Response to treatment

Please choose a single response for each of the following items in the diagnosis of Myofascial Pain Syndrome: ESSENTIAL for the diagnosis, ASSOCIATED with but not required for the diagnosis, IRRELEVANT to the diagnosis, and EXCLUSIONARY for the diagnosis (i.e., the diagnosis cannot be made if this finding is present).

*1. Response to treatment

	Essential	Associated	Irrelevant	Exclusionary
Improves with physical therapy (stretching, strengthening, motor control exercises, etc.)	○	✓	○	○
Improves with aerobic exercise	○	✓	○	○
Improves with "spray and stretch"	○	✓	○	○
Improves with manual therapy (massage, manipulation, mobilization, ischemic compression, etc.)	○	✓	○	○
Improves with cold	○	○	○	○
Improves with heat	○	○	○	○
Improves with modalities (TENS, ultrasound, etc.)	○	○	○	○
Improves with dry needling or injection of saline	○	○	○	○
Improves with restorative sleep	○	○	○	○
Improves with injection of local anesthetic	○	○	○	○

2. Please list any responses to treatment that you consider ESSENTIAL, ASSOCIATED, or EXCLUSIONARY for the diagnosis of Myofascial Pain Syndrome, that were NOT included in the list above:

Essential
Associated
Exclusionary

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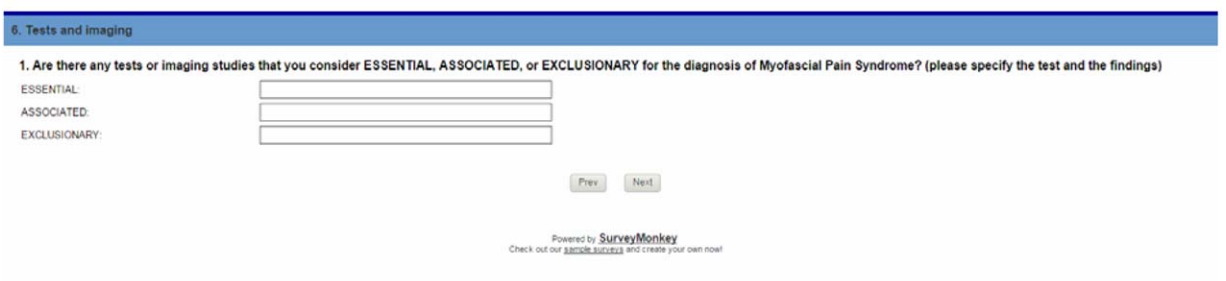

6. Tests and imaging

1. Are there any tests or imaging studies that you consider ESSENTIAL, ASSOCIATED, or EXCLUSIONARY for the diagnosis of Myofascial Pain Syndrome? (please specify the test and the findings)

ESSENTIAL:
ASSOCIATED:
EXCLUSIONARY:

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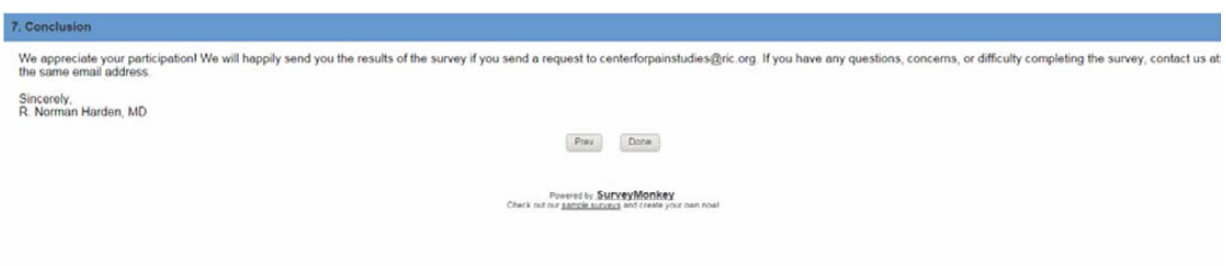

7. Conclusion

We appreciate your participation! We will happily send you the results of the survey if you send a request to centerforpainstudies@ric.org. If you have any questions, concerns, or difficulty completing the survey, contact us at the same email address.

Sincerely,
R. Norman Harden, MD

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