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Physical examination techniques for the assessment of pelvic floor myofascial pain: a systematic review

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Abstract

BACKGROUND: Myofascial pain is characterized by the presence of trigger points, tenderness to palpation, and local or referred pain, and commonly involves the pelvic floor muscles in men and women. Pelvic floor myofascial pain in the absence of local or referred pain has also been observed in patients with lower urinary tract symptoms (LUTS), and we have found that many patients report an improvement in these symptoms after receiving myofascial-targeted pelvic floor physical therapy.

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IMPLICATIONS AND CONTRIBUTIONS:

- This systematic review was performed in order to summarize and synthesize published examination strategies for the assessment of pelvic floor myofascial pain.
- Examination components for assessment of pelvic floor myofascial pain varied considerably and were often undefined.
- We present a consensus examination sequence based on the findings of this systematic review that includes key examination components that should be included in a comprehensive evaluation for pelvic floor myofascial pain.

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The authors report no conflict of interest

CONDENSATION: This systematic review investigates published examination techniques for assessment of myofascial pelvic pain, and offers a recommended examination based upon consensus within the literature.

This work was accepted for poster presentation at the 44th annual scientific meeting of the Society of Gynecologic Surgeons, Orlando, Florida, March, 2018.

OBJECTIVE: To systematically review the literature for examination techniques used to assess pelvic floor myofascial pain in women.

STUDY DESIGN: We performed a systematic literature search using strategies for the concepts of pelvic floor disorders, myofascial pain, and diagnosis in Ovid Medline 1946-, Embase 1947-, Scopus 1960-, Cochrane Central Register of Controlled Trials, Database of Abstracts of Reviews of Effects, and Cochrane Database of Systematic Reviews. Articles were screened by three authors and included if they contained a description of a pelvic myofascial physical examination.

RESULTS: Fifty-five studies met our inclusion criteria. Overall, examination components varied significantly among the included studies and were frequently undefined. A consensus examination guideline was developed based on the available data and includes use of a single digit (62%, 34/55) to perform transvaginal palpation (75%, 41/55) of the levator ani (LA; 87%, 48/55) and obturator internus (OI; 45%, 25/55) muscles with a patient-reported scale to assess the level of pain to palpation (51%, 28/55).

CONCLUSIONS: Physical examination methods to evaluate pelvic musculature for presence of myofascial pain varied significantly and were often undefined. Given the known role of pelvic floor myofascial pain in chronic pelvic pain and link between pelvic floor myofascial pain and lower urinary tract symptoms, physicians should be trained to evaluate for pelvic floor myofascial pain as part of their physical examination in patients presenting with these complaints. Therefore, the development and standardization of a reliable and reproducible examination is needed.

Keywords

Pelvic floor myofascial pain; physical examination; lower urinary tract symptoms

INTRODUCTION

Myofascial pain arising from the pelvic [levator ani (LA)] and internal hip [obturator internus (OI)] muscles and connective tissue is common in patients with chronic pelvic pain (CPP) and pelvic floor disorder symptoms¹⁻³. It has also been observed in men with chronic prostatitis, men and women with bladder pain syndrome/interstitial cystitis, and women with vulvar pain⁴. Myofascial pain is characterized by the presence of trigger points¹, tenderness to palpation, and local or referred pain⁴, which can result in debilitating CPP. In one study, 60–85% of patients with CPP reported tenderness upon physical examination of the LA and OI muscles^{5,6}.

Multiple theories exist regarding the etiology of myofascial pain though none have been validated in the literature. One theory suggests that myofascial pain derives from metabolic changes occurring at the level of the motor endplate that causes hyperactivity of the muscle or microscopic muscle damage⁴. It has also been proposed that myofascial pain involves changes, such as glial cell proliferation and neuronal cell loss, in the central nervous system, which could explain the referred pain patterns seen in myofascial pain pathology⁷. Finally, the chronic muscle contraction/spasm associated with myofascial pain has been theorized to be a compensatory mechanism for impairments in the levator ani architecture or high functional demands on the pelvic floor⁴.

Pelvic floor myofascial pain in the *absence* of local or referred pain has also been observed in patients with lower urinary tract symptoms (LUTS) and other pelvic floor disorders like pelvic organ prolapse^{2,3,5,8}. Preliminary data from our institution also support a correlation between the presence of myofascial pain in the LA and OI muscles and the degree of lower urinary tract symptom bother^{9,10}. We have found that these patients often report significant improvement in their LUTS after receiving myofascial-targeted pelvic floor physical therapy. As the possibility of an association between subclinical pelvic floor myofascial pain (i.e. pelvic floor myofascial pain identified on physical examination but not associated with symptomatic pelvic pain) and LUTS has received little study to date, few physicians may be trained to assess pelvic floor myofascial pain in the differential diagnosis for patients presenting with these symptoms. LUTS and other visceral symptoms are often attributed solely to the end organ (bladder, bowel, uterus, and ovaries) and the pelvic floor muscles are not explored.

Unfortunately, a standardized and reproducible protocol for assessing LA and OI myofascial pain does not currently exist, and few providers evaluate for pelvic floor myofascial pain even in patients presenting with pelvic pain. Considering the growing evidence correlating myofascial pain with chronic pelvic pain syndromes and emerging data suggesting a link between subclinical myofascial pain and LUTS, as well as the availability of myofascial-targeted therapies, a thorough and evidence based physical examination for myofascial pain is necessary. As we are primarily interested in further understanding the relationship between pelvic floor myofascial pain and LUTS in patients who may seek care from general or subspecialist gynecologists, we sought examination strategies for the assessment of myofascial pain in adult women. Furthermore, although some components of the pelvic floor myofascial examination may be similar in males and females, the approach to access these muscles is different so we chose to focus on examination strategies in women for this systematic review. This will both aid in assessment of and guide treatment for patients presenting with pelvic floor symptoms including pelvic pressure, heaviness, and lower urinary tract symptoms. The objective of our study is to systematically review the literature on examination techniques for the diagnosis of LA and OI myofascial pain in women.

MATERIALS AND METHODS

A comprehensive literature search was performed using strategies created by a medical librarian for the concepts of pelvic floor disorders, myofascial pain, and diagnosis using the following terms for: 1) pelvic floor disorders: “pelvic floor disorders,” “disorders of the pelvic floor,” “pelvic floor dysfunctions,” “dysfunctions of the pelvic floor,” “pelvic floor diseases,” “diseases of the pelvic floor,” and “syndrome of the pelvic floor”; 2) myofascial pain: “myofascial pain syndromes,” “spasm,” “trigger points,” “pain,” “ache,” “myalgia,” “chronic pain,” “myofascial pain,” “painful defecation,” “dysuria,” “pelvic girdle pain,” “pelvic pain,” “perineal pain,” “postoperative pain,” “vaginal pain,” “vulvodynia,” “muscle spasm,” “myofascial syndrome,” “muscle soreness,” “muscle tenderness,” and “pelvic pain syndrome”; and 3) assessment methodology: “diagnosis,” “differential diagnosis,” “sensitivity and specificity,” “physical examination,” “evaluation,” and “assessment”. Studies containing any of the terms for all three concepts (pelvic floor disorders, myofascial pain, and assessment) were captured and reviewed for eligibility. These strategies were

implemented in Ovid Medline 1946-, Embase 1947-, Scopus 1960-, Cochrane Central Register of Controlled Trials, Database of Abstracts of Reviews of Effects, and Cochrane Database of Systematic Reviews. We reviewed the references of the identified studies to add any additional relevant studies.

All searches were completed in June 2017 and results were exported to EndNote. The full strategies for Ovid Medline, Embase, Cochrane Library, and Scopus are available in the supplementary material. We defined the following inclusion criteria: 1) adults (>18 years), 2) majority female (>50% of study population), and 3) studies reporting a description of the pelvic floor myofascial examination.

The results of the systematic search were screened independently by two authors (MM, NS) and were included if there was any mention of a pelvic examination used to assess pelvic muscle pain. The resulting studies were then reviewed thoroughly and independently by three authors (MM, NS, JL) and were included if they met the aforementioned inclusion criteria. All study designs that included a pelvic floor myofascial pain examination as part of their protocol were included. Articles were excluded if they exclusively reported on children/adolescents, males constituted more than 50% of the studied population, or the study described pelvic pain in the setting of a known mesh complication. In the event of a disagreement, the authors reviewed the study together and came to a consensus regarding whether it satisfied criteria for inclusion. Data extracted from included studies were study design, year of publication, study objective, inclusion criteria, exclusion criteria, concomitant pelvic floor disorders, primary diagnosis, diagnostic tools utilized, measured outcomes and results, and specific characteristics of the physical examination. Data extraction was performed in duplicate by two authors (MM, NS) independently. Disagreements were resolved through discussion and consensus. From these data, a recommended examination sequence was developed that incorporated components when used by multiple studies. In the event that examination components differed among included studies, the component cited in the majority of the studies was selected for inclusion in the recommended examination sequence. In order to assess the quality of examination descriptions and procedures, a scoring system was developed whereby studies were given one point for each key examination component reported in the study. The conduct and reporting of this systematic review closely adhered to the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. This study was prospectively registered with PROSPERO (registration number CRD42017073701) and was exempt from IRB review.

RESULTS

The initial search identified 5,112 publications, 2,075 of which were duplicates: 1,823 removed by the automatic duplicate finder in EndNote and 252 duplicates removed by a medical librarian. We screened the resulting 3,037 publications and excluded 2,633 based on predefined inclusion and exclusion criteria, resulting in 404 full-text articles reviewed. As very few of these studies were performed to evaluate the pelvic floor myofascial examination itself, but instead used this examination as part of their research protocol for other study goals, we included all article types (from randomized controlled trials to expert

opinion and review articles) to capture as many examination descriptions as possible. This resulted in a total sample size of 55 studies, including 9460 patients of which 9437 (99.8%) were women (Table 1, Figure 1).

Of the 55 included studies, examination technique details were extracted from two randomized controlled trials, six prospective cohort studies, eight retrospective cohort and case-control studies, 19 cross sectional studies, and 20 general review articles or expert opinion pieces (Table 1). There were no systematic reviews. Objectives of the included studies varied widely with 11 testing an intervention, 21 reporting on diagnostic criteria/pathology, and 23 evaluating findings/symptoms upon examination. Only two of the 55 included manuscripts, only two studied the examination itself. One study defined terminology for investigators studying and reporting pelvic floor muscle evaluation, and specified that patient positioning and number of digits used in palpation should be reported⁴⁹.

The level of detail for included examination components varied greatly among the studies. Most (49/55, 89.0%) did not document counseling or consent prior to beginning the pelvic examination. Likewise, the majority of studies did not describe the position of the patient during the examination. Only 19/55 (34.5%) reported patient positioning, and of those, the majority (15/19, 78.9%) were dorsal lithotomy. Many studies (13/55; 23.6%) did not describe whether the examination was approached transvaginally or transrectally. The majority that did specify route suggested using a transvaginal examination (36/42, 85.7%). No studies included an isolated transrectal approach, but six (14.3%) recommend both transvaginal and transrectal approaches for the complete examination. Most authors used a single digit for palpation (34/55, 61.8%), but many (19/55, 34.5%) did not specify the number of digits to use on palpation, and most (38/55, 69.1%) did not explicitly mention use of gloves or lubrication.

The majority of studies (39/55, 70.9%) lacked a description of the method used to orient the examiner to the relevant muscles (Table 1). Of the 16 studies that did describe a specific method for orientation, all (16/16, 100%) used the clock-face method with the introitus at the center, the pubic bone at 12 o'clock and the anus at 6 o'clock.

Among the included studies, there was a general agreement that the LA should be examined in some capacity (48/55, 87.3%), but the inclusion of the OI, piriformis, and other sites was variable (Table 2). Less than half (27/55, 49.1%) specified whether the OI should be included in the examination, and seven (12.7%) included palpation of the piriformis. Nearly one-third of the studies (17/55, 30.9%) recommended palpating the LA muscles only or did not specify any particular muscle sites beyond "pelvic floor muscles". Of the studies that recommended examination of the LA muscles, some suggested palpation of the LA in general (23/55, 41.8%) whereas others specified which muscular components of the LA should be identified and palpated (28/55, 50.9%). Additionally, studies differed in the order and method of palpation of the various pelvic floor muscles. Only 17/55 studies (30.9%) recommended a preferred order of palpation. Of those, 6 (35.3%) described muscle palpation beginning with the superficial muscles (bulbospongiosus, ischiocavernosus, and superficial transverse perineal muscles) then proceeding to the deeper muscles

(pubococcygeus, iliococcygeus, and coccygeus). Twenty-six out of 55 studies (47.3%) lacked instruction on the technique of palpating muscles, specifically, whether the muscle should be palpated at an isolated location or along the length of the muscle. Of the 29 studies that did specify a technique, the majority (20/29, 69.0%) recommended palpation of an isolated location.

There was also variation in the use of instruments to standardize pressure and measure pain/pressure thresholds. Most studies (49/55, 89.1%) did not attempt to standardize the amount of pressure applied to muscle. More recent studies (6/55, 10.9%) incorporated vaginal pressure algometers in an effort to increase inter-rater reliability and define pain/pressure thresholds (Table 1).

Twenty-eight studies (50.9%) assessed pain on palpation of the pelvic floor muscles as part of the physical examination, and most 17 (60.7%) used a 0–10 patient-reported scale (0–10; 0=None, 1–3=mild pain, 4–6=moderate pain, and 7–10= severe pain; Table 1). Additional sites that were often examined included external genitalia, vestibule, urethra, bladder, anus, abdomen, and vaginal wall. Twenty-three articles (41.8%) also included evaluation of pelvic floor musculature strength in addition to pelvic pain.

Table 3 outlines our recommended examination sequence based on the little consensus reported in the literature. The recommended examination includes counseling for the patient prior to the examination, identifying muscle location based on a clock-face method, palpating muscles at single sites mid-muscle belly using a single digit, and quantifying self-reported pain upon palpation using a 0–10 validated scale (0–10; 0=No pain, 1–3=Mild pain, 4–6=Moderate pain, and 7–10=Severe pain). Specifically, muscle palpation should include the bilateral LA and OI muscles, and trigger points should be noted. A vaginal pressure algometer can be considered in an attempt to standardize pressure applied on examination. Visual inspection and observation of the function of the pelvic floor should occur throughout the examination.

We assessed study quality based on whether or not studies reported eight key examination components. Studies were given one point for each key component reported and were then ranked by score with higher scores representing “higher quality” studies (Table 4). Only one study reported all 8 key components while three studies did not report any of the key components.

CONCLUSIONS

Despite the prevalence of pelvic floor myofascial pain in patients with CPP, no standardized protocol for the physical examination of myofascial pelvic pain currently exists. Findings from this systematic review illustrate that techniques for pelvic myofascial examination vary significantly and commonly are poorly defined among both investigational studies and clinical reviews. Furthermore, the overall level of evidence to guide standardization of a pelvic myofascial examination is poor. As a result, it is difficult to draw conclusions about the best methods to execute the myofascial pelvic pain examination, but here we recommend an examination sequence based upon the limited consensus within the literature to date.

As with all systematic reviews, this review is limited by the quality of the studies available for inclusion. Very few studies evaluated the examination itself, and no studies tested the validity or reproducibility of the examination for pelvic floor myofascial pain. Additionally, very few studies utilized vaginal pressure algometers or other methods to standardize the pressure applied during palpation, or consistent anatomic landmarks for identification of the ideal sites for palpation are lacking. Finally, as no quality appraisal tool exists to evaluate pelvic floor (or other) myofascial pain examination techniques, we had to generate an informal tool based on key examination components. This tool assigned points to studies based on whether or not key components were included within the examination description.

Despite the aforementioned limitations, we believe the common elements of previous examinations – i.e., our consensus-based guidelines – provide a good foundation upon which to build an evidence-based protocol for the assessment of pelvic myofascial pain. Going forward, these examination elements should be tested and validated as reliable indicators of the presence and severity of pelvic floor myofascial pain in women. A standardized, evidence-based examination protocol is necessary to reduce misclassification as investigators begin studying the association between pelvic floor myofascial pain and other pelvic floor disorders like CPP and LUTS. Clinically, a standardized pelvic floor myofascial examination will improve the identification of patients with pelvic floor myofascial pain as a contributing factor in their CPP, LUTS, or other pelvic floor disorder symptoms and who may benefit from myofascial-targeted therapies. Once this evidence-based, standardized examination is established, efforts can then turn to promoting physician education regarding the importance of assessing pelvic floor myofascial pain in women presenting with pelvic floor disorder symptoms.

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Appendix

PICO Question: What evidence-based examination strategies exist in the literature for the assessment of pelvic floor myofascial pain in adult women?

P (patients): Adult women

I (intervention): Examination strategies

C (comparison, optional): none

O (outcome): diagnosis/assessment of pelvic floor myofascial pain

Complete Search Strategy

Ovid Medline

06/06/17

929 results

(Exp Pelvic Floor Disorders/OR "pelvic floor disorder".mp. OR pelvic floor disorders.mp. OR disorder of the pelvic floor.mp. OR disorders of the pelvic floor.mp. OR myofascial pelvic pain syndrome.mp. OR pelvic floor dysfunction.mp. OR pelvic floor dysfunctions.mp. OR dysfunctions of the pelvic floor.mp. OR dysfunction of the pelvic floor.mp. OR pelvic floor disease.mp. OR pelvic floor diseases.mp. OR diseases of the pelvic floor.mp. OR pelvic floor syndrome.mp. OR pelvic floor syndromes.mp. OR syndromes of the pelvic floor.mp. OR syndrome of the pelvic floor.mp. OR (myofascial adj2 (pelvic OR pelvis)).mp. OR Exp Pelvic Floor/OR (pelvi* adj3 (floor or levator or diaphragm* OR coccygeus)).mp. AND (Exp Pain/OR Exp myofascial pain syndromes/OR Exp Spasm/OR Exp Trigger Points/OR (trigger adj1 (point* or area*)).mp. OR spasm*.mp. OR pain*.mp. or ache*.mp. or myalgia*.mp. OR (muscle adj1 (soreness or tenderness)).mp.) OR (exp myofascial pain syndromes/or myofascial pain syndromes.mp. or myofascial pain syndrome.mp.) and (pelvis.mp. or pelvic.mp.) OR (pelvic pain syndrome.mp. AND (myalgia.mp. OR myofascial.mp.)) AND (Exp diagnosis/or Exp differential diagnosis/or Exp "Sensitivity and specificity"/or (sensitivity adj2 specificity).mp. or Exp Physical examination/or exam*.mp. or Diagnos*.mp. OR diagnosis.fs. OR symptom*.mp. OR evaluat*.ti. OR evaluat*.ab. or assessment*.mp. OR map*.mp.)) not (exp Male/not (exp Female/and exp Male/))

Embase

06/06/17

2,417 results

'pelvic floor disorder'/exp OR 'pelvic floor disorder' OR 'pelvic floor disorders' OR 'disorder of the pelvic floor' OR 'disorders of the pelvic floor' OR 'pelvic floor dysfunction':ti,ab,de OR 'pelvic floor dysfunctions' OR 'dysfunctions of the pelvic floor' OR 'dysfunction of the pelvic floor' OR 'pelvic floor disease' OR 'pelvic floor diseases' OR 'diseases of the pelvic floor' OR 'pelvic floor syndrome' OR 'pelvic floor syndromes' OR 'syndromes of the pelvic floor' OR 'syndrome of the pelvic floor' OR myofascial NEAR/2 pelvic OR myofascial NEAR/2 pelvis OR 'pelvis floor'/exp OR (pelvi* NEAR/3 (floor OR levator OR diaphragm* OR coccygeus)):ti,ab,de AND ('pain'/de OR 'abdominal pain'/de OR 'cystalgia'/de OR 'inflammatory pain'/exp OR 'inguinal pain'/exp OR 'myalgia'/exp OR 'chronic pain'/de OR 'myofascial pain'/exp OR 'painful defecation'/exp OR 'dysuria'/exp OR 'pelvic girdle pain'/exp OR 'pelvic pain'/exp OR 'perineal pain'/exp OR 'postoperative pain'/exp OR 'vaginal pain'/exp OR 'vulvodynia'/exp OR 'muscle spasm'/exp OR 'trigger point'/exp OR 'myofascial syndrome' OR trigger NEAR/1 (point* OR area*) OR spasm* OR pain*:ti,ab OR ache* OR myalgia* OR muscle NEAR/1 (soreness OR tenderness)) OR ('myofascial pain syndrome':ti,ab AND ('pelvis':ti,ab,de OR 'pelvic':ti,ab,de)) OR ('pelvis pain syndrome'/exp AND (myalgia OR myofascial)) AND ('diagnosis'/exp OR 'differential diagnosis'/exp OR 'sensitivity and specificity'/exp OR 'physical examination'/exp OR exam*:ti,ab,de OR diagnos*:ti,ab,de OR symptom*:ti,ab,de OR evaluat*:ti,ab,de OR

assessment*.ti,ab,de OR map*.ti,ab,de) NOT ('male'/exp NOT ('female'/exp AND 'male'/exp))

Cochrane Library

06/06/17

Cochrane Database of Systematic Reviews– 135 results

Cochrane Central Register of Controlled Trials – 11 results

Database of Abstracts of Reviews of Effect – 206 results

((([mh “Pelvic Floor Disorders”] or “pelvic floor disorder” or “pelvic floor disorders” or “disorder of the pelvic floor” or “disorders of the pelvic floor” or “myofascial pelvic pain syndrome” or “pelvic floor dysfunction” or “pelvic floor dysfunctions” or “dysfunctions of the pelvic floor” or “dysfunction of the pelvic floor” or “pelvic floor disease” or “pelvic floor diseases” or “diseases of the pelvic floor” or “pelvic floor syndrome” or “pelvic floor syndromes” or “syndromes of the pelvic floor” or “syndrome of the pelvic floor” or (myofascial near/2 (pelvic OR pelvis)) OR [mh “Pelvic Floor”] or (pelvi* near/3 (floor or levator or diaphragm* or coccygeus)))

AND

([mh Pain] or [mh “myofascial pain syndromes”] or [mh Spasm] or [mh “Trigger Points”] or (trigger near/1 (point* or area*)) or spasm* or pain* or ache* or myalgia* or (muscle near/1 (soreness or tenderness))))

OR ([mh “myofascial pain syndromes”] AND (pelvis OR pelvic)) or (“pelvic pain syndrome” AND (myalgia OR myofascial)))

and

([mh diagnosis] or [mh “differential diagnosis”] or [mh “Sensitivity and specificity”] or (sensitivity near/2 specificity) or [mh “Physical examination”] or exam* or Diagnos* or [mh diagnosis/ae] or symptom* or evaluat*.ti,ab. or assessment* or map*.ti,ab.))

not ([mh Male] not ([mh Female] and [mh Male]))

Scopus

06/09/17

1,380 results

(((((TITLE-ABS-KEY (“pelvic floor disorder”)) OR (TITLE-ABS-KEY (“pelvic floor disorders”)) OR (TITLE-ABSKEY (“disorder of the pelvic floor”)) OR (TITLE-ABS-KEY (“disorders of the pelvic floor”)) OR (TITLE-ABS-KEY (“myofascial pelvic pain syndrome”)) OR (TITLE-ABS-KEY (“pelvic floor dysfunction”)) OR (TITLE-ABS-KEY (“pelvic floor dysfunctions”)) OR (TITLE-ABS-KEY (“dysfunctions of the pelvic floor”))

OR (TITLE-ABS-KEY (“dysfunction of the pelvic floor”)) OR (TITLE-ABS-KEY (“pelvic floor disease”)) OR (TITLE-ABS-KEY (“pelvic floor diseases”)) OR (TITLE-ABS-KEY (“diseases of the pelvic floor”)) OR (TITLE-ABS-KEY (“pelvic floor syndrome”)) OR (TITLE-ABS-KEY (“pelvic floor syndromes”)) OR (TITLE-ABS-KEY (“syndromes of the pelvic floor”)) OR (TITLE-ABS-KEY (“syndrome of the pelvic floor”)) OR (TITLE-ABS-KEY (myofascial W/2 (pelvic OR pelvis))) OR (TITLE-ABS-KEY (pelvi* W/3 (floor OR levator OR diaphragm* OR coccygeus))) AND ((TITLE-ABS-KEY (“myofascial syndrome”)) OR (TITLE-ABS-KEY (trigger W/1 (point* OR area*))) OR (TITLEABS-KEY (spasm*)) OR (TITLE-ABS-KEY (pain*)) OR (TITLE-ABS-KEY (ache*)) OR (TITLE-ABS-KEY (myalgia*)) OR (TITLE-ABS-KEY (muscle W/1 (soreness OR tenderness)))) OR (((TITLE-ABS-KEY (“myofascial pain syndromes”)) AND ((TITLE-ABS-KEY (pelvis OR pelvic))) OR (TITLE-ABS-KEY (“pelvic pain syndrome”)) AND (TITLE-ABS-KEY (myalgia OR myofascial)))) AND ((TITLE-ABS-KEY (sensitivity W/2 specificity)) OR (TITLEABS-KEY (exam*)) OR (TITLE-ABS-KEY (diagnos*)) OR (TITLE-ABS-KEY (symptom*)) OR (TITLE (evaluat*))OR (KEY (evaluat*)) OR (TITLE-ABS-KEY (assessment*)) OR (TITLE-ABS-KEY (map*)))) AND NOT (((KEY (male)) AND NOT ((KEY (male)) AND (KEY (female))))))

[Clinicaltrials.gov](https://clinicaltrials.gov)

06/06/17

34 results

pelvic floor disorders AND pain AND diagnosis AND EXACT NOT “Male” [GENDER]

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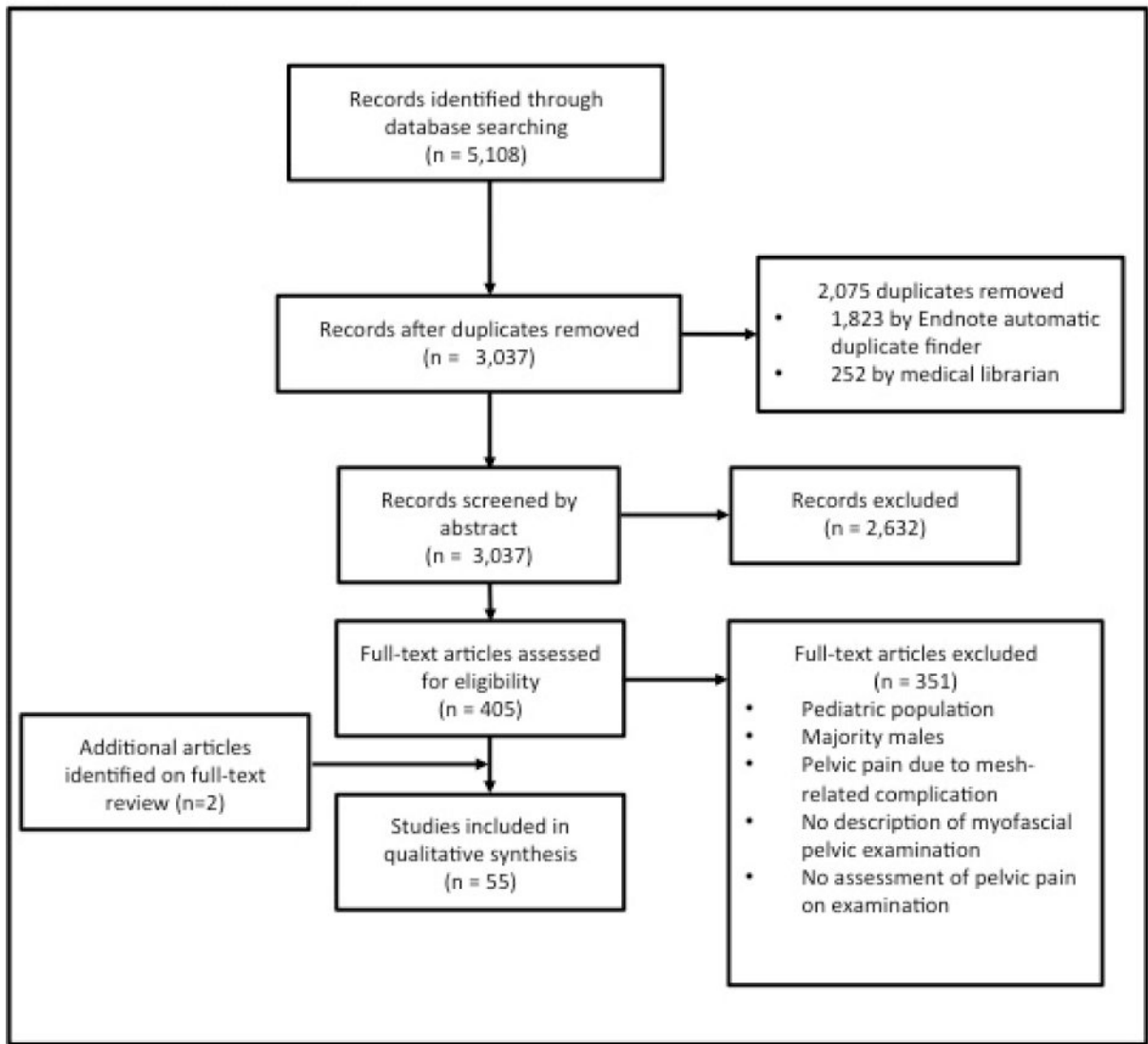


Figure 1:
PRISMA diagram for study selection

Table 1.

Physical examination characteristics of studies that assessed pelvic myofascial pain in adult women, published 1997–2017.

Reference	Study Type	Patient Position	Route	Digits	Clock-face orientation (Y/N)	Order of exam specified (Y/N)	Palpation technique	Vaginal algometer (Y/N)	Pain scale	Strength Assessment (Y/N)
Carrico et al, 2008 ¹¹	RCT	NS	TV	1	N	N	S	N	0–10, VAS	N
Fitzgerald et al, 2009 ¹²	RCT	NS	NS	NS	N	N	NS	N	None	N
De Souza Montenegro et al, 2010 ¹³	PC	DL	TV	1	N	N	NS	N	0–2*, NRS	N
Lamvu et al, 2015 ¹⁴	PC	DL	TV	1	Y	Y	S	N	0–10, VAS	Y
Langford et al, 2007 ¹⁵	PC	DL	TV	1	N	Y	L	N	0–100, VAS	N
Morrissey et al, 2015 ¹⁶	PC	NS	TV	1	N	N	NS	N	0–4, NRS	Y
Oyama et al, 2004 ¹⁷	PC	NS	NS	NS	N	N	NS	N	0–4, NRS	N
Sillem et al, 2016 ¹⁸	PC	DL	TV	1	N	N	NS	N	None	N
Adelowo et al, 2013 ¹⁹	RC	NS	TV	1	N	N	NS	N	0–10, NRS	N
Bassaly et al, 2011 ²⁰	RC	NS	NS	NS	N	N	NS	N	0–10, VAS	N
Bedaiwy et al, 2013 ²¹	RC	NS	TV	NS	N	N	NS	N	0–10, NRS	N
Bendana et al, 2009 ²²	RC	DL	TV	2	Y	Y	L	N	None	N
Goetsch, 2007 ²³	RC	NS	TV	NS	N	N	NS	N	None	N
Dos Bispo et al, 2016 ²⁴	CC	DL	TV	1	N	Y	NS	N	None	Y
Williams et al, 2015 ²⁵	CC	NS	NS	NS	N	N	NS	N	0–10, NRS	N
Zohoun et al, 2012 ²⁶	CC	NS	TV	1	Y	Y	S	Y	None	N
Kavvadias et al, 2013 ²⁷	CS	DL	TV	1	N	Y	S	N	0–10, VAS	Y

Reference	Study Type	Patient Position	Route	Digits	Clock-face orientation (Y/N)	Order of exam specified (Y/N)	Palpation technique	Vaginal algometer (Y/N)	Pain scale	Strength Assessment (Y/N)
Fenton et al, 2013 ²⁸	CS	DL	TV	1	Y	Y	S	Y	0-10, NRS	N
Peters et al, 2007 ²⁹	CS	NS	NS	NS	N	N	S	N	0-10, VAS	N
Phillips et al, 2016 ³⁰	CS	NS	TV	NS	N	N	S	N	0-10, NRS	N
Adams et al, 2013 ²	CS	NS	NS	NS	N	N	NS	N	None	N
Adams et al, 2014 ³¹	CS	NS	NS	NS	N	N	NS	N	None	Y
Bhide et al, 2015 ³²	CS	DL	TV	1	N	N	S	N	1-10, VAS	N
De Souza Montenegro et al, 2010a ³³	CS	DL	TV	1	N	N	NS	N	0-2* ,NRS	N
Fitzgerald et al, 2011 ³⁴	CS	DR	TV	1	Y	N	L	N	None	Y
Hellman et al, 2015 ³⁵	CS	NS	TV	NS	N	N	S	Y	0-10, NRS	N
Loving et al, 2014 ³⁶	CS	DL	TV	1	Y	N	S	Y	0-10, NRS	Y
Peters et al, 2008 ³⁷	CS	NS	TV	NS	N	N	S	N	0-10, VAS	N
Tu et al, 2007 ³⁸	CS	DL	TV	1	Y	N	S	N	None	N
Tu et al, 2008a ³⁹	CS	DL	TV	1	Y	N	L	N	0-3* ,NRS	Y
Tu et al, 2008b ⁴⁰	CS	DL	TV	1	Y	N	S	Y	0-100, NRS	Y
Tu et al, 2006 ⁴¹	CS	NS	TV	1	N	N	NS	N	0-10, VAS	N
Witzeman et al, 2015 ⁴²	CS	NS	TV	1	N	Y	S	Y	None	N
Yong et al, 2014 ⁴³	CS	NS	NS	1	N	N	NS	N	A/M/M/S	N
Reissing et al, 2005 ⁴⁴	CS	NS	Both	1/2	Y	Y	S	N	None	Y
Albrecht et al, 2015 ⁴⁵	EO	NS	TV	1	N	Y	L	N	None	Y

Reference	Study Type	Patient Position	Route	Digits	Clock-face orientation (Y/N)	Order of exam specified (Y/N)	Palpation technique	Vaginal algometer (Y/N)	Pain scale	Strength Assessment (Y/N)
Pastore & Katzman, 2012 ³	EO	SHL	TV	1	Y	Y	S	N	None	N
Sartoni, 2010 ⁴⁶	EO	NS	TV	1	N	Y	L	N	None	N
Steege, 1997 ⁴⁷	EO	NS	TV	1	Y	Y	S	N	None	N
Haylen et al, 2010 ⁴⁸	EO	NS	TV	NS	N	N	S	N	None	Y
Messelink et al, 2005 ⁴⁹	EO	DL+	NS	NSH	N	N	NS	N	None	Y
Apte et al, 2012 ⁵⁰	R	SHL	Both	1	Y	Y	NS	N	None	Y
Aredo et al, 2017 ⁵¹	R	NS	NS	1	N	N	L	N	None	N
Burrick, 2009 ⁵²	R	NS	TV	1	N	N	NS	N	None	Y
Faubion et al, 2012 ⁵³	R	NS	Both	2	N	N	NS	N	None	Y
Fitzgerald & Kotarinos, 2003 ⁵⁴	R	NS	TV	NS	N	Y	L	N	0-10, NRS	Y
Gyang et al, 2013 ⁵⁵	R	NS	TV	1	Y	Y	S	N	None	Y
Hartmann, 2010 ⁵⁶	R	NS	TV	1	N	N	NS	N	None	Y
Peters & Carrico, 2006 ⁵⁷	R	NS	TV	1	Y	N	S	N	0-10, VAS	N
Prather & Camacho-Soto, 2014 ⁵⁸	R	NS	NS	1	N	N	NS	N	None	Y
Prather et al, 2007 ⁵⁹	R	NS	NS	NS	N	Y	NS	N	None	Y
Prather et al, 2009 ⁶⁰	R	NS	Both	NS	Y	N	S/L	N	None	Y
Prendergast & Weiss, 2003 ⁶¹	R	DL	Both	1	N	N	NS	N	None	Y
Spitznagle, 2014 ⁴	R	NS	NS	NS	N	N	NS	Y	None	N
Vercellini et al, 2009 ⁶²	R	NS	Both	1	N	N	NS	N	None	N

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CC, case-control; CS, cross-sectional; PC, prospective cohort; RCT, randomized controlled trial; RC, retrospective cohort; EO, expert opinion; R, review; DL, dorsal lithotomy; DR, dorsal recumbant; SHL, supine hook-lying; NS, not specified; 1, single digit; 2, two digits; 1/2 choice of 1 or 2 digits; S, single site within the muscle; L, along the length of the muscle belly; TV, transvaginal; TR, transrectal; Y, yes; N, no; NRS, numeric rating scale; VAS, visual analogue scale; A/M/M/S, absent, mild, moderate, or severe.

* Three studies used physician-reported scales rather than patient-reported.

Table 2.

Sites designated as part of the physical examination in studies that assessed pelvic myofascial pain in adult women, published 1997–2017.

Reference	Muscles Palpated					Additional Sites Examined															
	PF	LA	OI	Puborectalis	Pubococcygeus	Pubococcygeus	Ischiooccygeus	Coccygeus	Priformis	"Perineal Body"	Bulbospongiosus	Ischio cavernosus	TP	ATFP	Abdominal wall*	Vestibule	Vaginal wall	Ext genitalia/vulva	USL	Other**	
Carriço et al., 2009 ³¹																					
Fitzgerald et al., 2009 ²⁷	✓																				
De Souza Montenegro et al., 2010 ³²		✓																			
Langford et al., 2007 ³³																✓	✓				
Montenegro et al., 2012 ³⁴				✓	✓	✓	✓	✓													
Oyama et al., 2011 ³⁵				✓	✓	✓	✓	✓													
Adhikari et al., 2013 ³⁶				✓	✓	✓	✓	✓													
Bansaly et al., 2011 ³⁷				✓	✓	✓	✓	✓													
Reidway et al., 2013 ³⁸				✓	✓	✓	✓	✓													
Reidway et al., 2013 ³⁹				✓	✓	✓	✓	✓													
Gravita, 2007 ⁴⁰				✓	✓	✓	✓	✓													
Dono-Bispo et al., 2016 ⁴¹	✓			✓	✓	✓	✓	✓													
Montenegro et al., 2012 ³⁴				✓	✓	✓	✓	✓													
Montenegro et al., 2012 ³⁴				✓	✓	✓	✓	✓													
Kravdakis et al., 2013 ³⁷				✓	✓	✓	✓	✓													
Fenton et al., 2013 ⁴²				✓	✓	✓	✓	✓													
Peters et al., 2009 ²⁷				✓	✓	✓	✓	✓													
Peters et al., 2009 ²⁷				✓	✓	✓	✓	✓													
Adams et al., 2013 ⁴³				✓	✓	✓	✓	✓													
Adams et al., 2014 ⁴⁴				✓	✓	✓	✓	✓													
De Souza Montenegro et al., 2010 ³²				✓	✓	✓	✓	✓													
Fitzgerald et al., 2011 ²⁷				✓	✓	✓	✓	✓													
Hollman et al., 2015 ⁴⁵				✓	✓	✓	✓	✓													
Hollman et al., 2015 ⁴⁵				✓	✓	✓	✓	✓													
Reidway et al., 2013 ³⁸				✓	✓	✓	✓	✓													
Reidway et al., 2013 ³⁹				✓	✓	✓	✓	✓													
Tru et al., 2009 ⁴⁶				✓	✓	✓	✓	✓													
Tru et al., 2009 ⁴⁶				✓	✓	✓	✓	✓													
Tru et al., 2009 ⁴⁶				✓	✓	✓	✓	✓													
Tru et al., 2009 ⁴⁶				✓	✓	✓	✓	✓													
Witzman et al., 2012 ⁴⁷				✓	✓	✓	✓	✓													
Yong et al., 2014 ⁴³				✓	✓	✓	✓	✓													
Reisinger et al., 2005 ⁴⁸				✓	✓	✓	✓	✓													
Albrecht et al., 2015 ⁴⁹				✓	✓	✓	✓	✓													
Patore & Kitzman, 2012 ⁵⁰				✓	✓	✓	✓	✓													
Sironi et al., 2016 ⁵¹				✓	✓	✓	✓	✓													
Stegge et al., 1997 ⁵²				✓	✓	✓	✓	✓													
Myler et al., 2010 ⁵³				✓	✓	✓	✓	✓													
Morison et al., 2005 ⁵⁴				✓	✓	✓	✓	✓													
Adams et al., 2012 ⁴³				✓	✓	✓	✓	✓													
Adams et al., 2014 ⁴⁴				✓	✓	✓	✓	✓													
Butrick et al., 2009 ⁵⁵				✓	✓	✓	✓	✓													
Faubion et al., 2012 ⁵⁶				✓	✓	✓	✓	✓													
Goane et al., 2013 ⁵⁷				✓	✓	✓	✓	✓													
Herrmann, 2010 ⁵⁸				✓	✓	✓	✓	✓													
Peters & Carriço, 2006 ²⁷				✓	✓	✓	✓	✓													
Prather & Camacho-Soto, 2014 ⁵⁹				✓	✓	✓	✓	✓													
Prather et al., 2007 ⁶⁰				✓	✓	✓	✓	✓													
Prather et al., 2009 ⁶¹				✓	✓	✓	✓	✓													
Prendergast & Weiss, 2003 ⁶²				✓	✓	✓	✓	✓													
Spitznagel, 2014 ⁶³				✓	✓	✓	✓	✓													
Vercellini et al., 2009 ⁶⁴				✓	✓	✓	✓	✓													

PF, pelvic floor; LA, levator ani; OI, obturator internus; TP, transverse perineal muscles; ATFP, arcus tendineus fascia pelvis; USL, uterosacral ligament.

* Abdominal wall includes rectus abdominis.

** Other sites examined include the adnexa^{28,47,52}, bladder and urethra^{27,35,43,51,52,55,58,62}, anorectal raphae³⁵, anus/rectum^{36,44,50,53,55,59,60}, pelvis³⁹, buttock³⁹, sacroiliac joint^{39,55}, iliopsoas³⁹, hamstring³⁹, hip flexor³⁹, and coccyx^{44,50,59,60}, sphincter urethra and compressor urethra^{3,46}, cervix^{47,52,53}, adductor muscles⁴⁹, clitoris⁵⁰, pubovaginalis^{50,54},

iliopsoas⁶¹, anal sphincter^{60,61,62},
uterus⁵¹, sacrococcygeus ligaments^{53,59,60}, urogenital triangle⁵³, quadratus lumborum^{54,61}, gluteal muscles^{49,54,59,61}, pubic symphysis^{55,59,60}, anterior superior iliac spines⁵⁵,
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Table 3:

Recommended Structure for Physical Examination of Pelvic Myofascial Pain

Examination Method	Supporting References
1) Provide counseling to patient about the pelvic examination process. Explain thoroughly the steps that are a part of the examination and pay particular attention in trying to ease the fear and hesitancy that the patient may have. Finally obtain consent to begin physical examination.	6/55 studies documented counseling and/or consent of patient prior to start of physical examination
2) Ask patient to sit in the lithotomy position for examination	14/55 studies used the lithotomy position for examination of pelvic musculature
3) Begin the unidigital transvaginal examination by inserting a gloved, lubricated index finger into the vaginal introitus	34/55 studies palpated muscles with single digit Of these, 19/34 studies palpated muscles with palmar side of the index finger
	42/55 studies performed a transvaginal exam for the pelvic musculature
	17/55 studies explicitly mentioned gloving and/or lubrication of examining digit
4) Utilize clock face orientation with the pubic symphysis at 12 o clock and the anus at 6 o clock to localize pelvic floor muscles	16/55 studies utilized clock face orientation to locate pelvic floor muscles
5) Start with unidigital palpation of superficial pelvic floor musculature and then proceed to deep pelvic floor musculature.	17/55 studies specified order for pelvic muscle palpation Of these, 6/17 studies started with superficial PFM and then moved to deep PFM palpation
6) Use the following clock face positions to palpate the superficial and then deep PFM.	
Superficial Layer: Bulbospongiosus (2 and 10 o clock), Ischiocavernosus (1 and 11 o clock), Superficial transverse perineal muscles (3 and 9 o clock)	Number of studies that assessed superficial muscles: bulbospongiosus (12/55), ischiocavernosus (9/55), superficial transverse perineal muscles (13/55)
Deep Layer: Pubococcygeus (7 and 11 o clock for left side; 1 and 5 o clock for right side), Iliococcygeus (4 and 8 o clock), Coccygeus (5 and 7 o clock; requires deeper digital insertion)	Number of studies that assessed deep muscles: pubococcygeus (22/55), iliococcygeus (24/55), coccygeus (18/55), unspecified levator ani (25/55)
7) Then palpate obturator internus at 2 and 10 o clock	25/55 studies palpated obturator internus for tenderness Of these, 5/25 studies specified palpating obturator internus after palpating pelvic floor muscles
8) During palpation, apply pressure to specific sites predefined on each of the pelvic floor muscles and obturator internus. Consider vaginal pressure algometer to standardize amount of pressure being applied to each site.	21/55 studies used site specific palpation and did not palpate along length of muscle
	6/55 studies used a vaginal pressure algometer
9) Use a graded scale (either NRS or VAS) to assess patient reported pain after palpation of each site	28/55 studies used patient reported scores to assess muscle tenderness
	25/55 studies used graded scale to assess muscle tenderness
	9/55 studies used visual analogue scale and 15/55 studies use numerical rating scale
10) Additional items that can be included in examination:	
external genitalia, vestibule, urethra, bladder, anus, abdomen, vaginal wall	31/55 studies that assessed additional non-muscular sites for tenderness
strength of pelvic floor musculature	23/55 studies evaluated the strength of the pelvic floor musculature

Table 4.

Assessment of the quality of pelvic floor myofascial pain examination descriptions among studies included in the systematic review.

Reference	Patient Position	Route	Single or double digit palpation	Orientation to identify muscles	Order of exam	Palpation technique	Pain scale	Strength Assessment	Score (8 max)
Lamvu et al, 2015 ¹⁴	X	X	X	X	X	X	X	X	8
Kavvadias et al, 2013 ²⁷	X	X	X		X	X	X	X	7
Fenton et al, 2013 ²⁸	X	X	X	X	X	X	X		7
Loving et al, 2014 ³⁶	X	X	X	X		X	X	X	7
Tu et al, 2008 ^{a,39}	X	X	X	X		X	X	X	7
Tu et al, 2008 ^{b,40}	X	X	X	X		X	X	X	7
Langford et al, 2007 ¹⁵	X	X	X		X	X	X		6
Bendana et al, 2009 ²²	X	X	X	X	X	X			6
Fitzgerald et al, 2011 ³⁴	X	X	X	X		X		X	6
Reissing et al, 2005 ⁴⁴	X	X	X	X	X	X		X	6
Pastore & Katzman, 2012 ³	X	X	X	X	X	X			6
Apte et al, 2012 ⁵⁰	X	X	X	X	X			X	6
Gyang et al, 2013 ⁵⁵	X	X	X	X	X	X		X	6
Dos Bispo et al, 2016 ²⁴	X	X	X		X			X	5
Zolhoun et al, 2012 ²⁶		X	X	X	X	X			5
Bhide et al, 2015 ³²	X	X	X			X	X		5
Albrecht et al, 2015 ⁴⁵		X	X		X	X		X	5
Tu et al, 2007 ³⁸	X	X	X	X		X			5
Steege, 1997 ⁴⁷		X	X	X	X	X			5
Fitzgerald & Kotarinos, 2003 ⁵⁴		X			X	X	X	X	5
Peters & Carrico, 2006 ⁵⁷		X	X	X		X	X		5
Morrissey et al, 2015 ¹⁶		X	X				X	X	4
Carrico et al, 2008 ¹¹		X	X			X	X		4
De Souza Montenegro et al, 2010 ^{b13}	X	X	X				X		4

Reference	Patient Position	Route	Single or double digit palpation	Orientation to identify muscles	Order of exam	Palpation technique	Pain scale	Strength Assessment	Score (8 max)
De Souza Montenegro et al, 2010 ⁴³	X	X	X				X		4
Witzeman et al, 2015 ⁴²		X	X		X	X			4
Sarton, 2010 ⁴⁶		X	X		X	X			4
Prather et al, 2009 ⁶⁰		X		X		X		X	4
Prendergast & Weiss, 20 03 ⁶¹	X	X	X					X	4
Sillem et al, 2016 ¹⁸	X	X	X						3
Adelowo et al, 2013 ¹⁹		X	X				X		3
Phillips et al, 2016 ³⁰		X				X	X		3
Hellman et al, 2015 ³⁵		X				X	X		3
Peters et al, 2008 ³⁷		X				X	X		3
Tu et al, 2006 ⁴¹		X	X				X		3
Haylen et al, 2010 ⁴⁸		X				X		X	3
Butrick, 2009 ⁵²		X	X					X	3
Faubion et al, 2012 ⁵³		X	X					X	3
Hartmann, 2010 ⁵⁶		X	X					X	3
Bedaiwy et al, 2013 ²¹		X					X		2
Peters et al, 2007 ²⁹						X	X		2
Yong et al, 2014 ⁴³			X				X		2
Messelink et al, 2005 ⁴⁹	X							X	2
Aredo et al, 2017 ⁵¹			X			X			2
Prather & Camacho-Soto, 2014 ⁵⁸			X					X	2
Prather et al, 20 07 ⁵⁹					X			X	2
Vercellini et al, 2009 ⁶²		X	X						2
Oyama et al, 2004 ¹⁷							X		1
Bassaly et al, 2011 ²⁰							X		1
Goetsch, 2007 ²³		X							1

Reference	Patient Position	Route	Single or double digit palpation	Orientation to identify muscles	Order of exam	Palpation technique	Pain scale	Strength Assessment	Score (8 max)
Williams et al, 2015 ²⁵							X		1
Adams et al, 2014 ³¹								X	1
Adams et al, 201 ³²									0
Spitznagle, 201 ⁴⁴									0
Fitzgerald et al, 2009 ¹²									0

Studies received one point for each examination component specified in the description of the examination. Studies with the highest scores included the most specific examination description and were judged to be of higher quality of examination reporting.