Diagnostic Spinal Ultrasound

Optum Health Solutions Musculoskeletal (MSK)

Utilization Management Policy
Policy Number: 392

Effective Date: 04/25/2024

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Policy Statement

Diagnostic spinal and paraspinal ultrasound are considered unproven for the evaluation of neuromusculoskeletal disorders, including but not limited to:

- spinal pain (neck and/or back) and radiculopathies, and
- guidance on the rehabilitation of neuromusculoskeletal disorders and back pain.

Scope

In Scope:
All in and out of network programs, involving all provider types, where diagnostic spinal ultrasound is reported.

Out of Scope:
- Therapeutic ultrasound (CPT Code 97035)
- Diagnostic ultrasound when used for newborns and infants for the evaluation of suspected spinal disorders (e.g., congenital cord anomalies, spinal cord tumors, vascular malformations and birth-related trauma)
- Diagnostic ultrasound for any condition in any population other than musculoskeletal spinal disorders
- Diagnostic ultrasound for surgical conditions involving the spine, including needle guidance procedures
- Doppler ultrasound techniques

Description

Diagnostic ultrasound involves the use of high frequency sound waves (3-17 MHz) to image bony and soft tissue structures for the purposes of diagnosing pathology and or guiding real-time intervention procedures. This procedure should not be confused with therapeutic ultrasound which has both thermal and non-thermal effects (e.g. cell repair effects of the inflammatory response). Therapeutic ultrasound frequency takes place in a lower range (0.7 to 3.3 MHz).

Clinical Evidence

Ultrasonography is a noninvasive imaging technique that relies on detection of the reflections or echoes generated as high-frequency sound waves are passed into the body. This technique is commonly used for a number of imaging purposes such as investigation of abdominal and pelvic masses, cardiac echocardiography, and prenatal fetal imaging. Less commonly, it has also been applied to detection of spinal and paraspinal disorders.

The literature describes a fairly wide spectrum of clinical usage for diagnostic musculoskeletal ultrasound, from peripheral conditions, such as carpal tunnel syndrome, rotator cuff pathology, and patella femoral alignment, to more proximal conditions, such as femoral torsion and pelvic floor impairments. The greatest amount of literature comes from studies that investigate the lower spinal segments of subjects with and without lower back pain (LBP). This asymmetry in the research agenda is consistent with the prevalence and financial costs associated with managing LBP in the United States. (Hebert, 2009)

One application of diagnostic spinal ultrasound has been in the investigation of anatomical pathology . The soft tissues of the musculoskeletal system are able to be visualized in great anatomical detail without exposing the patient to radiation associated with CT or the higher costs associated with MRI. Low back pain is a very common complaint and US imaging may be used to assess the peri spinal/peri sacral soft tissues associated with LBP. (Todorov, 2018) Diagnostic spinal ultrasound may also be performed in the rehabilitation of musculoskeletal conditions. In May 2006, an international panel of experts adopted the term ‘rehabilitative ultrasound imaging’ (RUSI) to define the procedure of evaluating muscle and related soft tissue morphology and function during exercise and physical tasks, such as muscle size (thickness and cross-sectional area) and level and timing of muscle activation. (Koppenhaver, 2009)

Compared with computed tomography (CT) and magnetic resonance imaging (MRI), ultrasonography provides less detailed images of bone and the structures within and near bone. However, ultrasonography has the advantages of being simpler, more widely available, requiring no exposure to ionizing radiation, and having less susceptibility to patient movement. (Koppenhaver, 2009)

Ultrasound for Anatomical Pathology

The American Institute of Ultrasound in Medicine (AIUM) Ultrasound Practice Accreditation Council has developed standards for the accreditation of ultrasound practices. These standards serve as a benchmark for ultrasound professionals seeking to meet nationally accepted protocols. Regarding spinal and paraspinal ultrasonography, AIUM indicates “there is insufficient evidence in the peer-reviewed medical literature establishing the value of nonoperative spinal/paraspinal ultrasound in adults for diagnostic evaluations of conditions involving the intervertebral disks, facet joints and capsules, and central nerves”. They consider its use for evaluations, screening, or monitoring of therapy for these disorders as investigational. (2019)

The American College of Radiology (ACR) published appropriateness criteria for inflammatory back pain and known or suspected axial spondylarthritis. This document outlines the imaging used in the diagnosis of this condition and provides evidence-based recommendations for the evaluation process. The mode of imaging is guided by the physical examination findings and medical history. Ultrasound of the spine is addressed in these recommendations and the ACR indicates that it should not be routinely used as an initial imaging modality due to the lack of medical literature supporting its use. (2021)

The joint clinical practice guideline by the American Pain Society (APS) and the American College of Physicians (ACP) recommends MRI or CT in the work-up of serious underlying conditions or severe/progressive neurologic deficits. They also indicate routine imaging and other diagnostic testing should not be performed for nonspecific low back pain. (Chou, 2007)

Todorov et al (2018) performed a literature review on the use of ultrasound in patients with low back pain. The authors evaluated the medical literature on the use of spinal US to assess bony structures, intervertebral discs, sacroiliac joint, and the soft tissues of the lumbar and sacral regions. The advantages of US use in lieu of CT or MRI include a low cost, elimination of radiation exposure and also good visualization of soft tissues. However, there is a paucity of literature on the efficacy of this diagnostic modality for LBP so definitive conclusions cannot be made. The authors encourage more investigation on its use for evaluation of LBP.

A systematic review by Ahmed et al (2018) evaluated the use of spinal US as a diagnostic and therapeutic modality for spinal conditions. Ninety-four papers that utilized US for assessment of the structural elements of the spine (bone, muscle, disc, canal, ligament and joints) met the authors’ inclusion criteria. CT, MRI and radiographs are noted as the most utilized modalities in practice for spinal imaging and interpretation. The authors indicate US has been used to assess spinal curvature, mobility and range of motion but additional data for both normal and pathologic spinal conditions is needed in order to adopt more general utilization of US for the spine. Another limitation noted pertains to the provider education that is necessary in order to use US effectively and accurately for spinal conditions. The authors indicate more robust educational programs are needed in order to increase the confidence in clinical usage.

A systematic review by Ranger et al (2017) investigated the correlation between the multifidi and paraspinal muscle structure and LBP. Twenty-five studies met the authors’ inclusion criteria. A negative correlation was identified between the cross-sectional area (CSA) of multifidus and LBP but the evidence was conflicting for an association between the erector spinae, psoas and quadratus lumborum CSA and LBP. There was also conflicting evidence for an association between multifidus fat infiltration and LBP with limited or no medical evidence for a relationship with other paraspinal musculature. The authors note the need for additional studies which would confirm the association of LBP with multifidi and paraspinal musculature.

A prospective cohort study followed by a validation study by Herraets et al (2020) examined the use of ultrasonography for nerve assessment in chronic inflammatory neuropathies. A cohort of 100 consecutive patients with symptoms suggestive of chronic inflammatory neuropathy underwent ultrasound of the nerve(s), nerve conduction studies (NCS) and other applicable diagnostic testing. Chronic inflammatory neuropathy was confirmed in 38 patients by either NCS or nerve enlargement via US. The sensitivity and specificity of nerve US was 97.4% and 69.4% respectively compared to NCS of 78.9% and 93.5%. The use of nerve US to detect treatment-responsive chronic inflammatory neuropathy was also evaluated by these researchers. The added value of US was noted to be 21.1% versus utilizing NCS alone.

A 2023 systematic review by Daniel et al evaluated the reliability of four non-invasive imaging modalities in the assessment of lumbar spine range of motion (ROM). Low back pain (LBP) is noted as a major cause of disability throughout the world. It is associated with an assortment of spinal conditions which may result in ROM changes of the lumbar spine. The four modalities compared in this review included video fluoroscopy (VF), ultrasound (US), magnetic resonance imaging (MRI) and radiography. Seventeen studies met the authors’ inclusion criteria. VF was identified as an excellent imaging modality for a patient in the recumbent and upright positions but less reliable when assessing repeated movements. US demonstrated good reliability for within- and between-day assessments. A large amount of heterogeneity in methodologies was identified among the studies which evaluated MRI and radiography imaging. Although US is noted as a non-invasive, risk free method of imaging over MRI (which is expensive) and VF and

radiography (which expose the patient to radiation), additional investigation is warranted to confirm it will yield consistent measurements.

Rehabilitative Ultrasound Imaging (RUSI)
A systematic review by Hebert et al (2009) evaluated the studies on RUSI for assessment of abdominal and lumbar trunk musculature. Six studies met the authors' inclusion criteria and were considered to be the highest methodologic quality. Some of these studies reported measurement errors associated with repeated measurements of the same image while other studies documented reliability in measuring the RUSI images. Although the majority of the included studies reported suitable levels of rater reliability, the quality of research on RUSI to measure abdominal and lumbar trunk muscles needs to expand.
Costa et al (2009) performed a systematic review on the use of RUSI to measure abdominal wall muscle thickness and associated changes. Twenty-one studies ultimately met the authors' inclusion criteria. These studies were noted to be of low quality and included healthy subjects with only partial RUSI measurement protocol performed. Changes in muscle thickness were only assessed in six studies which in a clinical setting would be the most important measurement. While these studies provide information on the use of RUSI to evaluate abdominal wall muscles, additional studies are required in order to validate the reproducibility of the muscle thickness changes. There is limited evidence on the use of RUSI to assess the efficacy of a motor control treatment plan.

A systematic review by Koppenhaver et al (2009) assessed RUSI for measuring trunk muscle size and activation . Thirty-seven studies met the authors' inclusion criteria. Of these, criterion-related validity was assessed in 10 studies, 23 studies reported on construct validity, and sensitivity to change was described in 6 studies. Regarding criterion-related validity, five studies evaluated the ability of RUSI to measure muscle activation in comparison with needle EMG. The results were somewhat inconsistent with two studies supporting criterion-related validity and three studies providing partial evidence of criterion-related validity. The likely reasons for inconsistencies included contextual-dependency (reliant upon the muscle involved), the level of muscle contraction (sub-maximal, maximal), the contraction strategy utilized (isometric, concentric, etc.), and variability among participants. No studies were identified for this systematic review that compared changes in ultrasound measurements with external measurements of clinically-relevant outcomes (e.g., pain or disability), or external measurements of importance (e.g., global perceived effect). Studies are needed that investigate the rate of deterioration and extent of atrophy and activation following the occurrence of low back pain. Studies investigating responsiveness are needed to document changes in muscle size and activation in conjunction with patient-important clinical outcomes resulting from training in order to determine what constitutes clinically-important change. The primary limitations across studies were small sample sizes (mean N=10) and a lack of directness, as only a single study included symptomatic (low back pain) patients.
Javanshir et al (2010) conducted a critical review of the literature for ultrasonography of the cervical muscles. A total of 16 studies were extracted for review. Of these, the posterior muscles were assessed in 12 studies. The anterior muscles were evaluated in the remaining 4 studies. There was significant variability in the test positions (prone, supine, sitting) across studies with the prone position employed most frequently. Three studies, comprising 55 healthy subjects, investigated the validity of RUSI for measuring neck musculature dimensions. Conflicting results supporting partial criterion-related validity were obtained when compared to MRI. The primary limitations across studies were small sample sizes (12 studies = N < 30); and a lack of directness (representativeness). Eleven of the studies (69%) included only healthy subjects. The authors indicated additional studies are needed to address the topic of validity of RUSI for the assessment of the neck muscles.
An observational study by Ellis et al (2021) assessed the use of US to measure sciatic nerve excursion when the hip and lumbar spine move during forward bending movements (N=31). US was identified as being moderately reliable to measure sciatic nerve strain when the subjects bent forward with arms crossed and when they performed a full bend with arms hanging freely at their side. US was noted to have excellent reliability to identify sciatic nerve excursion. This study provides additional information on sciatic nerve assessment that may be used in future studies when evaluating and managing patients with entrapment neuropathies.

Coding Information

Note: The Current Procedural Terminology (CPT) code listed in this policy is for reference purposes only. The listing of a service code in this policy does not imply that the service described by the code is a covered or non-covered health service. Coverage is determined by the member's benefit document.

Code	Description
76800	Ultrasound, spinal canal and contents

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Review and Approval History

Date	Description
1/31/2003	Original effective date
11/11/2003	Annual review and approval completed
10/18/2004	Annual review and approval completed
2/14/2006	Annual review and approval completed
4/10/2008	Annual review and approval completed
1/15/2009	Policy reformatted
4/30/2009	Annual review and approval completed
4/08/2010	Annual review and approval completed
10/26/2010	Policy rebranded to “OptumHealth Care Solutions, Inc. (OptumHealth)”
4/07/2011	Policy revised to include rehabilitative ultrasound imaging (RUSI)
4/19/2012	Annual review and approval completed
4/18/2013	Annual review and approval completed
4/17/2014	Annual review and approval completed; Policy rebranded “Optum* by OptumHealth Care Solutions, Inc.”
4/16/2015	Annual review and approval completed
4/21/2016	Updated references and Table 3; Annual review and approval completed
4/20/2017	Annual review and approval completed. Updated references and Table 3. Annual review and approval completed. Legal entity name changed from “OptumHealth Care Solutions, Inc.” to “OptumHealth Care Solutions, LLC.”
4/26/2018	Annual review and approval completed; Updated references and Table 3
4/25/2019	Annual review and approval completed; Updated references and Table 3
4/23/2020	Annual review and approval completed; No significant changes made to the document
4/22/2021	Annual review and approval completed; Updated references and Table 3
5/03/2022	Annual review and approval completed; No significant changes made to the document
6/29/2022	Updated legal entity name “OptumHealth Care Solutions, LLC.” to *Optum™ Physical Health (“Optum”) includes OptumHealth Care Solutions, LLC; ACN Group IPA of New York, Inc.; ACN Group IPA of California, Inc. d/b/a OptumHealth Physical Health of California; Managed Physical Network, Inc.; and OrthoNet Holdings, Inc. which includes OrthoNet New York IPA, Inc., OrthoNet West, Inc., OrthoNet, LLC, OrthoNet of the South, Inc.
4/27/2023	Annual review and approval completed; no significant changes made to the document. Updated contact email from policy.inquiry@optumhealth.com to phpolicy_inquiry@optum.com.
1/10/2024	Annual review completed. Transitioned to new template. No substantive changes to clinical content. Approved by Optum Clinical Guideline Advisory Committee

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