



EFFECTIVE DATE: 09|03|2010
POLICY LAST UPDATED: 04|02|2020

OVERVIEW

Thermography is a noninvasive imaging technique that measures temperature distribution in organs and tissues. The visual display of this temperature information is known as a thermogram. Thermography has been proposed as a diagnostic tool for treatment planning and for evaluation of treatment effects for a variety of conditions.

MEDICAL CRITERIA

Not applicable

PRIOR AUTHORIZATION

Not applicable

POLICY STATEMENT

BlueCHiP for Medicare

The use of all forms of thermography is not covered as the evidence is insufficient to determine the effects of the technology on health outcomes.

Commercial Products

The use of all forms of thermography is considered not medically necessary as the evidence is insufficient to determine the effects of the technology on health outcomes.

COVERAGE

Benefits may vary between groups and contracts. Please refer to the appropriate Benefit Booklet, Evidence of Coverage, or Subscriber Agreement for applicable not medically necessary/not covered benefits/coverage.

BACKGROUND

Interpretation of the color patterns is thought to assist in the diagnosis of many disorders such as complex regional pain syndrome (previously known as reflex sympathetic dystrophy), breast cancer, Raynaud phenomenon, digital artery vasospasm in hand-arm vibration syndrome, peripheral nerve damage following trauma, impaired spermatogenesis in infertile men, degree of burns, deep vein thrombosis, gastric cancer, tear-film layer stability in dry-eye syndrome, Frey syndrome, headaches, low back pain, and vertebral subluxation.

Infrared radiation from the skin or organ tissue reveals temperature variations by producing brightly colored patterns on a liquid crystal display. Thermography involves the use of an infrared scanning device and can include various types of telethermographic infrared detector images and heat-sensitive cholesteric liquid crystal systems.

Thermography may also assist in treatment planning and procedure guidance by accomplishing the following tasks: identifying restricted areas of perfusion in coronary artery bypass grafting, identifying unstable atherosclerotic plaque, assessing response to methylprednisone in rheumatoid arthritis, and locating high undescended testicles.

For individuals who have an indication for breast cancer screening or diagnosis who receive thermography, the evidence includes diagnostic accuracy studies and systematic reviews. The relevant outcomes are overall survival, disease-specific survival, and test validity. Using histopathologic findings as the reference standard, a series of systematic reviews of studies have evaluated the accuracy of thermography to screen and/or diagnose breast cancer and reported wide ranges of sensitivities and specificities. To date, no study has demonstrated whether thermography is sufficiently accurate to replace or supplement mammography for breast cancer diagnosis. Moreover, there are no studies on the impact of thermography on patient management or health outcomes for patients with breast cancer. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have musculoskeletal injuries who receive thermography, the evidence includes diagnostic accuracy studies and a systematic review. Relevant outcomes are test validity, symptoms, and functional outcomes. A systematic review of studies on thermography for diagnosing musculoskeletal injuries found moderate levels of accuracy compared with other diagnostic imaging tests. There is a lack of a consistent reference standard. This evidence does not permit conclusions as to whether thermography is sufficiently accurate to replace or supplement standard testing. Moreover, there are no high-quality or randomized studies on the impact of thermography on patient management or health outcomes for patients with musculoskeletal injuries. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have TMJ disorder who receive thermography, the evidence includes a systematic review. The relevant outcomes are test validity, symptoms, and functional outcomes. A systematic review of studies on thermography for diagnosing TMJ disorder found a wide variation in accuracy compared to other diagnostics. There is a lack of a consistent reference standard. The evidence does not permit conclusions as to whether thermography is sufficiently accurate to replace or supplement standard testing. Moreover, there are no studies on the impact of thermography on patient management or health outcomes for patients with TMJ disorder. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have miscellaneous conditions (eg, herpes zoster, pressure ulcers, diabetic foot) who receive thermography, the evidence includes diagnostic accuracy studies. The relevant outcomes are test validity, symptoms, and functional outcomes. There are one or two preliminary studies on each of these potential indications for thermography. Most studies assessed temperature gradients or the association between temperature differences and the clinical condition. Due to the small number of studies for each indication, diagnostic accuracy could not adequately be evaluated. The clinical utility of thermography for any of these miscellaneous conditions has not been investigated in studies considered. The evidence is insufficient to determine the effects of the technology on health outcomes.

CODING

BlueCHiP for Medicare and Commercial Products

There is no specific code for thermography therefore, thermography services should be reported using the following unlisted code.

93799 Unlisted cardiovascular service or procedure

RELATED POLICIES

Not applicable

PUBLISHED

Provider Update, June 2020

Provider Update, April 2019

Provider Update, March 2018

Provider Update, March 2017

Provider Update, April 2016

Provider Update, August 2015

REFERENCES

1. Centers for Medicare & Medicaid Services (CMS). National Coverage Determination for Thermography (220.11). 1992; <https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?NCDId=164&ncdver=1&DocID=220.11>. Accessed July 22, 2019.
2. Vreugdenburg TD, Willis CD, Mundy L, et al. A systematic review of elastography, electrical impedance scanning, and digital infrared thermography for breast cancer screening and diagnosis. *Breast Cancer Res Treat.* Feb 2013;137(3):665-676. PMID 23288346
3. Fitzgerald A, Berentson-Shaw J. Thermography as a screening and diagnostic tool: a systematic review. *N Z Med J.* Mar 9 2012;125(1351):80-91. PMID 22426613
4. Omranipour R, Kazemian A, Alipour S, et al. Comparison of the accuracy of thermography and mammography in the detection of breast cancer. *Breast Care (Basel).* Aug 2016;11(4):260-264. PMID 27721713
5. Rassiwalla M, Mathur P, Mathur R, et al. Evaluation of digital infra-red thermal imaging as an adjunctive screening method for breast carcinoma: a pilot study. *Int J Surg.* Dec 2014;12(12):1439-1443. PMID 25448668
6. Sanchis-Sanchez E, Vergara-Hernandez C, Cibrian RM, et al. Infrared thermal imaging in the diagnosis of musculoskeletal injuries: a systematic review and meta-analysis. *AJR Am J Roentgenol.* Oct 2014;203(4):875-882. PMID 25247955
7. Han SS, Jung CH, Lee SC, et al. Does skin temperature difference as measured by infrared thermography within 6 months of acute herpes zoster infection correlate with pain level? *Skin Res Technol.* May 2010;16(2):198-201. PMID 20456100
8. Park J, Jang WS, Park KY, et al. Thermography as a predictor of postherpetic neuralgia in acute herpes zoster patients: a preliminary study. *Skin Res Technol.* Feb 2012;18(1):88-93. PMID 21605168
9. Romano CL, Logoluso N, Dell'Oro F, et al. Telethermographic findings after uncomplicated and septic total knee replacement. *Knee.* Jun 2012;19(3):193-197. PMID 21441031
10. Oliveira AL, Moore Z, T OC, et al. Accuracy of ultrasound, thermography and subepidermal moisture in predicting pressure ulcers: a systematic review. *J Wound Care.* May 02 2017;26(5):199-215. PMID 28475447
11. Nakagami G, Sanada H, Iizaka S, et al. Predicting delayed pressure ulcer healing using thermography: a prospective cohort study. *J Wound Care.* Nov 2010;19(11):465-466, 468, 470 passim. PMID 21135794
12. Wu CL, Yu KL, Chuang HY, et al. The application of infrared thermography in the assessment of patients with coccygodynia before and after manual therapy combined with diathermy. *J Manipulative Physiol Ther.* May 2009;32(4):287-293. PMID 19447265
13. Hara Y, Shiraishi A, Yamaguchi M, et al. Evaluation of allergic conjunctivitis by thermography. *Ophthalmic Res.* Mar 5 2014;51(3):161-166. PMID 24603108
14. Singer AJ, Relan P, Beto L, et al. Infrared thermal imaging has the potential to reduce unnecessary surgery and delays to necessary surgery in burn patients. *J Burn Care Res.* Nov/Dec 2016;37(6):350-355. PMID 26720102
15. Qaseem A, Lin, JS, Mustafa, RA, Horwitch, CA, Wilt, TJ. Screening for Breast Cancer in Average-Risk Women: A Guidance Statement From the American College of Physicians. *Ann. Intern. Med.*, 2019 Apr 9. PMID 30959525
16. Dong F, Tao C, Wu J, et al. Detection of cervical lymph node metastasis from oral cavity cancer using a non-radiating, noninvasive digital infrared thermal imaging system. *Sci Rep.* May 8 2018;8(1):7219. PMID 29739969
17. Agazzi A, Fadanelli G, Vittadello F, et al. Reliability of LoSCAT score for activity and tissue damage assessment in a large cohort of patients with Juvenile Localized Scleroderma. *Pediatr Rheumatol Online J.* Jun 18 2018;16(1):37. PMID 29914516
18. Jones B, Hassan I, Tsuyuki RT, et al. Hot joints: myth or reality? A thermographic joint assessment of inflammatory arthritis patients. *Clin Rheumatol.* Apr 20 2018. PMID 29679167
19. Gatt A, Falzon O, Cassar K, et al. The application of medical thermography to discriminate neuroischemic toe ulceration in the diabetic foot. *Int J Low Extrem Wounds.* Jun 2018;17(2):102-105. PMID 29947290

20. Gatt A, Falzon O, Cassar K, et al. Establishing differences in thermographic patterns between the various complications in diabetic foot disease. *Int J Endocrinol*. 2018;2018:9808295. PMID 29721019
21. Balbinot LF, Robinson CC, Achaval M, et al. Repeatability of infrared plantar thermography in diabetes patients: a pilot study. *J Diabetes Sci Technol*. Sep 2013;7(5):1130-1137. PMID 24124938
22. Hazenberg CE, van Netten JJ, van Baal SG, et al. Assessment of signs of foot infection in diabetes patients using photographic foot imaging and infrared thermography. *Diabetes Technol Ther*. Jun 2014;16(6):370-377. PMID 24690146
23. Sardanelli F, Aase HS, Alvarez M, et al. Position paper on screening for breast cancer by the European Society of Breast Imaging (EUSOBI) and 30 national breast radiology bodies from Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Israel, Lithuania, Moldova, The Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Spain, Sweden, Switzerland and Turkey. *Eur Radiol*. Jul 2017;27(7):2737-2743. PMID 27807699
24. Mainiero MB, Lourenco A, Mahoney MC, et al. ACR Appropriateness Criteria breast cancer screening. *J Am Coll Radiol*. Nov 2016;13(11s):R45-r49. PMID 27814813
25. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Breast Cancer Screening and Diagnosis. Version 2.2018. 2018; https://www.nccn.org/professionals/physician_gls/pdf/breast-screening.pdf. Accessed July 19, 2018.
26. U.S. Preventive Services Task Force. Breast Cancer: Screening. 2016; <http://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/breastcancer-screening1>. Accessed July 19, 2018.

CLICK THE ENVELOPE ICON BELOW TO SUBMIT COMMENTS

This medical policy is made available to you for informational purposes only. It is not a guarantee of payment or a substitute for your medical judgment in the treatment of your patients. Benefits and eligibility are determined by the member's subscriber agreement or member certificate and/or the employer agreement, and those documents will supersede the provisions of this medical policy. For information on member-specific benefits, call the provider call center. If you provide services to a member which are determined to not be medically necessary (or in some cases medically necessary services which are non-covered benefits), you may not charge the member for the services unless you have informed the member and they have agreed in writing in advance to continue with the treatment at their own expense. Please refer to your participation agreement(s) for the applicable provisions. This policy is current at the time of publication; however, medical practices, technology, and knowledge are constantly changing. BCBSRI reserves the right to review and revise this policy for any reason and at any time, with or without notice. Blue Cross & Blue Shield of Rhode Island is an independent licensee of the Blue Cross and Blue Shield Association.

