BRC Baekrokdam Research Commons
백록담 리서치 커먼스
Independent Open Research Journal

WORKING PAPER BRC-2026-W104 Published 2026-08-15 Creative Commons Attribution 4.0 International

What the thermal adjective does not decide

Yeonseung Choe [1] **Baekrokdam Research Commons (BRC)** [1]

[1] Baekrokdam Research Commons (BRC), Republic of Korea

Article type	Submitted	Published	Persistent ID
Counter-hypothesis	2026-08-15	2026-08-15	BRC-2026-W104
Last updated	**Review status**	**License**	**Correspondence**
2026-08-15	Awaiting public assessment	Creative Commons Attribution 4.0 International	Baekrokdam Research Commons (BRC)

Canonical URL https://research.baekrokdam.com/en/articles/localized-back-heat-negative-evidence-safety-boundaries

Suggested citation Choe Y, Baekrokdam Research Commons (BRC). What the thermal adjective does not decide. Baekrokdam Research Commons. 2026; BRC-2026-W104.

Abstract

“Heat” or “burning” may matter clinically, but the word alone cannot establish cause, risk, imaging need, or reassurance. This counter-hypothesis combines inconsistent descriptor evidence, selection and missingness in dorsal sensory cohorts, construct differences across thermography and sensory testing, and the conditional context of selected NICE guidelines. Those guidelines do not use thermal wording as a stand-alone decision rule; they depend on population, tempo, distribution, and associated findings. Research phenotyping must therefore remain separate from safety decisions, and this paper does not offer individual clinical instructions.

Keywords: counter-hypothesis · safety boundary · thermal wording · over-inference · conditional judgment

One adjective, two unsafe shortcuts

A report of recurrent heat or burning localized to the back invites two opposite shortcuts. One treats the thermal adjective as a self-sufficient danger signal; the other treats an apparently isolated adjective, or its absence from a guideline, as reassurance. The verified source set supports neither move. No retrieved source evaluated this complaint as a stand-alone red flag, and targeted full-document searches of the current NG127 and NG234 PDFs found no heat, warmth, burning, skin-temperature, or temperature wording in their recognition or referral criteria. [1, 2]

Those are bounded source findings, not conclusions about an individual or about every possible cause. A thermal word cannot be substituted for the populations, associated findings, tempo, function, and context that the verified pathways actually use. Conversely, silence within two scoped UK guidelines cannot establish benignity, a non-referral rule, or exclusion of neurological, malignant,

dermatological, vascular, autonomic, or other processes. This note therefore asks what the sources permit us not to infer before later sections reproduce the exact qualified constellations. It is not a diagnosis, differential, generic warning list, Korean pathway, or patient-specific instruction. [1, 2]

What the bounded safety search did not find

On 14 August 2026, a bounded PubMed countersearch combined title-or-abstract terms for back pain, thoracolumbar pain, or thoracic pain with red flag or red flags, diagnostic accuracy or likelihood ratio, and systematic review or meta-analysis. The relevance-sorted search returned nine records, and all nine were screened at title, publication-type, and indexed-abstract level under the prespecified rule. Seven were retained for retrieval as safety or counterevidence sources, one remained a discovery lead, and one was excluded.

The records addressed selected low-back-pain, thoracolumbar-pain, emergency-department, malignancy, fracture, infection, or cauda-equina contexts. None selected participants for recurrent localized back heat or burning, and none added a new claim-changing evidence role for this cluster. That zero is a screening yield within one exact, systematic-review-focused query. It is not a prevalence estimate, proof that direct studies or serious causes do not exist, or permission to replace the evaluated features with a thermal complaint.

The countersearch was designed to challenge overconfident safety language, not to inventory every primary diagnostic study or complete a formal risk-of-bias synthesis. Its records are indirect for this phenotype, several overlap in condition or primary-study coverage, and their diagnostic-accuracy details were not promoted from indexed abstracts into passage-verified results. The permitted conclusion is narrower: within this bounded search, isolated recurrent back heat was not represented as an evaluated redirect, so later safety language must remain attached to exact verified populations and constellations rather than to the adjective alone.

Why burning does not name a mechanism

The word burning can describe pain quality, pain provoked by heat or cold, an itch-associated dysesthesia, felt warmth, or another experience; those constructs are not interchangeable. An eight-study systematic review of English-language descriptors in neuropathic low-back-pain populations explicitly separated evoked thermal hyperalgesia from hot, burning, or cold pain quality. Four included studies reported discrimination by hot, burning, or cold descriptors, two did not, and one reported discrimination for hot but not cold pain. No included study reported sensitivity, specificity, or likelihood ratios for an individual descriptor, and heterogeneity prevented meta-analysis. The review therefore treated the temperature-related evidence as conflicting rather than as a stable mechanism classifier. [3]

The conflict is not merely numerical. Studies differed in whether wording was offered in a questionnaire or generated by participants, in the construct and timeframe of temperature questions, and in how neuropathic pain was classified. In three studies, the same questionnaire supplied both the

classification and the component descriptors being evaluated, creating common-method and circularity risk. The review found no uniform gold-standard reference test and recurring index-test and reference-standard limitations. Its conclusion was correspondingly bounded: current evidence was insufficient to support or refute sensory descriptors as identifiers of neuropathic low-back pain. That evidence cannot assign a neuropathic label to recurrent localized back heat, establish equivalence with Korean wording, or convert a descriptor into a lesion or cause. [3]

A selected single-centre retrospective comparator offers a second caution. Among two itch-defined groups, burning was recorded for 19 of 28 assessed participants with brachioradial pruritus and 9 of 27 with notalgia paraesthetica; the exact Neuroderm prompt, offered response options, coding, and missing-data mechanism were not reproduced. In the notalgia group, the paper says 21 participants underwent MRI and its pathology categories also total 21, yet it reports scan-to-symptom concordance with a denominator of 22. That conflict is unresolved, so no precise concordance rate should be repaired or repeated. The same study found no paired lesional-versus-non-lesional intraepidermal nerve-fibre-density difference in notalgia (paired n=24; p=0.47), but a null local comparison without healthy controls neither proves the absence of neuropathy nor excludes another mechanism. Imaging and nerve-fibre findings were also inputs to case assignment, available denominators varied, and diabetes counts conflicted elsewhere in the report. These observations resist a simple descriptor, scan, biopsy, or single-mechanism explanation; they do not create a diagnostic, imaging, biopsy, reassurance, or referral rule for localized back heat. [3,4]

Why a test result does not settle the sensation

Quantitative sensory testing applies controlled stimuli and records evoked detection, pain, or other responses; it does not directly measure spontaneous felt heat or skin temperature. In a 15-person pilot of dermatologist-confirmed unilateral subscapular itch, DFNS-standardized QST compared the rated itchiest back site with the mirrored contralateral site. The reported sensory measures did not differ between sites at P greater than 0.10 apart from higher mechanical-evoked itch at the symptomatic site. Deviations from published age-, sex-, and trunk-site-matched reference data were mainly bilateral: both sites showed lower sensitivity to warm-to-cold-to-warm changes, lower pinprick pain sensitivity, and greater repeated-pinprick wind-up. Paradoxical heat sensations were reported on at least one trial at 4 of 15 symptomatic sites and 2 of 15 contralateral sites, but one contralateral response was footnoted as cold during warming and not technically paradoxical heat; the source supplies no corrected cell. These results neither make bilateral findings irrelevant nor make a null side comparison an exclusion test. [5]

The pilot's exact paradoxical-heat stimulus sequence, trial count, response definition, and scoring remain unverified because the linked supplement was not lawfully acquired through the checked ordinary public routes. Its external reference comparison was not an internally recruited healthy-control comparison, and the authors warned of possible false positives, uncertain transfer across dermatomal levels and national reference populations, and the inability of QST alone to establish the proposed mechanism. A separate abstract-level systematic review of spinal-pain populations reinforces the proxy problem: pooled pain-threshold correlations were weak for pain intensity

(r=-0.15, 95% CI -0.18 to -0.11) and disability (r=-0.16, 95% CI -0.22 to -0.10). The abstract reported no evidence of moderation by primary versus remote site, back versus neck condition, acute versus chronic pain, or mechanical versus thermal induction, but that is not proof of subgroup equivalence. Thermal temporal summation had a sparse pooled correlation with pain intensity of 0.26 (95% CI 0.09 to 0.42); the exact contributing-study count, thermal subgroup definitions and estimates, heterogeneity, and study-level methods are unavailable without lawful full text. Neither source studied spontaneous recurrent localized back heat or supplies a diagnostic threshold, mechanism assignment, individual prediction, or reassurance rule. [5, 6]

Infrared thermography measures another construct again: skin-surface temperature under particular preparation, environmental, regional, and timing conditions. In a one-group pilot of young volunteers, unilateral trunk-fatigue exercise was followed by thermograms at baseline, 10 minutes, and about 24 hours. At 10 minutes the treatment-side back was relatively warmer than the non-treatment side by 0.54 degrees Celsius in the upper regions and 0.32 degrees Celsius in the lower regions, calculated from reported group means; nevertheless, all four back-region means were cooler than baseline. No side asymmetry was reported before exercise or at follow-up. The study measured general fatigue and delayed soreness rather than localized warmth or burning, did not test participant- or region-level symptom-temperature associations, and did not image the reported 48-hour soreness peak. Surface temperature was explicitly distinguished from deep-muscle activity, native left-right direction was removed by treatment-side alignment, measurement precision and a clinically meaningful threshold were not established, and post-exercise analysis denominators conflicted with the stated 33-person final sample. A relative group asymmetry under exercise provocation is therefore not objective confirmation of spontaneous back heat; a normal or symmetric thermogram cannot exclude its presence or cause. [5, 6, 7]

Neurological urgency lives in a constellation

Before the two source-bounded sections below are read, NICE NG127 and NG234 should be understood as selected, question-relevant UK source boundaries. They are not a comprehensive assessment, exhaustive red-flag set, diagnostic or imaging rule, Korean pathway, or patient-facing triage tool. The referral intervals, coordinator routes, and MRI timings that follow are reported as content of those sources, not instructions to the reader. Each retains its source-specific population, associated findings, tempo, exceptions, evidence basis, and jurisdiction; neither supplies a replacement checklist or local pathway.

The current UK NICE guideline NG127 does not make an isolated sensory adjective a neurological redirect. For adults, it recommends immediate neurological assessment when symmetrical numbness progresses rapidly over hours to days and is accompanied by weakness or imbalance. For persistent altered sensation predominantly in the distal limbs, the examination context changes the route: brisk deep-tendon reflexes lead to assessment for possible brain or spine disease, whereas depressed reflexes lead to consideration of peripheral neuropathy, specified basic cause checks, and neurological

referral when no cause is found. These are adult, distribution-, tempo-, association-, and examination-qualified patterns. They do not convert recurrent heat or burning confined to the back into numbness, a distal-limb pattern, or a stand-alone referral criterion. [1]

NG127 also limits how stable radiculopathy language can be used. Stable cervical radiculopathy present for at least six weeks is not routinely referred unless pain is uncontrolled, symptoms are disabling, or specified factors are present: age under 20 years, gait disturbance, clumsy or weak hands or legs, brisk limb reflexes, extensor plantar responses, or new bladder or bowel disturbance. Stable lumbar radiculopathy of at least six weeks is likewise not routinely referred unless pain is uncontrolled or symptoms are disabling, with management cross-referred to NG59. The six-week wording is not a universal waiting period, the cervical exception list is not a generic checklist for every back sensation, and neither recommendation licenses calling localized heat radiculopathy. [1]

The cauda-equina recommendation is narrower and more urgent: immediate assessment is tied to severe low-back pain radiating into a leg together with newly disturbed bladder, bowel, or sexual function, or new perineal numbness. The guideline rationale identifies that complete constellation as a medical emergency. Within NG127, immediate referral means specialist assessment within hours, or faster when necessary; urgent referral means within two weeks; unqualified referral and consideration of referral are routine. These definitions belong to this UK guideline and should not be silently transferred to another jurisdiction or detached from the named radiating pain and new functional or perineal findings. Isolated non-radiating warmth or recurrent back heat does not satisfy this source-defined constellation. [1]

The authority of the recommendations and the limits of their evidence must appear together. For the adult sensory-symptom section, NICE states that the committee developed recommendations from knowledge and experience because the reviewed evidence yielded nothing able to support recommendations. The patterns are therefore consensus safety boundaries, not validated diagnostic-accuracy estimates for sensory wording. Targeted searches across the complete 86-page guideline found no passage naming back heat, localized heat or warmth, burning, skin temperature, or temperature as a recognition or referral criterion. That non-finding establishes neither benignity nor neurological exclusion: NG127 uses other constructs, and it does not evaluate the target phenotype. Applying its UK routes in Korea would require separately verified local clinical and service governance. [1]

Cancer context changes the pathway

The current UK NICE guideline NG234 does not make recurrent localized back heat, burning, or any single vivid sensory adjective a cancer signal. Its recognition frame keeps three elements distinct: a past, current, or suspected cancer context; named characteristics of spinal pain; and named symptoms or signs of cord compression. The pain list includes severe unremitting or progressive pain, mechanical pain, pain aggravated by straining, night pain that disturbs sleep, localized tenderness, and exertional leg claudication. The cord-compression list instead includes bladder or bowel

dysfunction, gait difficulty, limb weakness, neurological signs of cord or cauda-equina compression, numbness, paraesthesia or sensory loss, and radicular pain. Heat quality alone is not interchangeable with either list. [2]

NG234 assigns different routes to different qualified constellations. A person with a past or current cancer diagnosis and a named symptom or sign of cord compression enters the immediate MSCC-coordinator route and is treated as an oncological emergency. Past or current cancer combined with a listed spinal-pain characteristic instead leads to advice through the coordinator within 24 hours. For someone without a past or current cancer diagnosis, urgent oncology assessment requires both a listed pain characteristic and an independently suspected cancer; isolated back heat cannot supply that suspicion. These source routes must not be collapsed into a generic warning-sign list or applied to any back sensation without the cancer, pain, neurological, and functional qualifiers. [2]

Imaging timing follows the qualified pathway rather than an adjective. Suspected metastatic spinal cord compression under the emergency recommendation leads to MRI as soon as possible and always within 24 hours. Clinical suspicion of spinal metastases without suspected cord compression leads to MRI within one week to guide treatment. NG234 also limits escalation: overnight MRI is reserved for an urgent diagnosis needed for immediate treatment, and screening MRI solely to detect early cord compression is not recommended for people with diagnosed spinal metastases who have no cord-compression symptoms or signs. For a person with past or current cancer, low-back pain, and no clinical evidence of spinal metastases or MSCC, the guideline uses tailored information about named changes and urgent contact if symptoms change or worsen; it does not turn one earlier negative assessment into permanent reassurance. None of these provisions supports routine or urgent MRI for recurrent localized heat by itself. [2]

The evidentiary boundary is as important as the pathway. NG234's recognition rationale draws on comparative and undiagnosed-cancer symptom evidence together with committee experience, but the recommendation PDF provides no diagnostic-accuracy estimate for an individual recognition factor or for the target thermal phenotype. Its imaging rationale reports important limitations, including very low sensitivity for plain radiographs combined with neurological assessment and no material improvement in major clinical outcomes from a randomized screening-MRI trial in a high-risk population. These findings bound pathway design; they do not diagnose or exclude malignancy from one symptom. Targeted searches across the complete 77-page guideline found no back-heat, localized heat or warmth, burning, skin-temperature, or temperature wording. That source-specific silence neither reassures nor excludes malignant, neurological, dermatological, vascular, autonomic, or other causes. NG234 is UK guidance; its coordinator roles, timings, service configuration, and referral logistics do not establish a Korean pathway. [2]

What can travel, and what cannot

What travels from the verified NICE material is narrower than a referral pathway: the discipline of keeping population, associated findings, urgency, exceptions, and evidence uncertainty attached to one another. NG127 and NG234 are UK guidance. Their routes, urgency definitions, MSCC-coordinator role, service configuration, emergency contacts, imaging access, and referral logistics cannot be

represented as Korean practice without a separately verified current Korean pathway and qualified local review. Before any publication-ready package, the current versions, replacement or correction status, exact cited passages, and Korean implementation context must be checked again.

The evidentiary gaps must travel too. The safety countersearch was bounded and abstract-screened rather than exhaustive. The PMID 23711482 QST review remains abstract-only; thermal subgroup definitions, counts, estimates, heterogeneity, study-level methods, and full risk-of-bias features are unavailable. The main PMID 38835743 article is verified, but its supplementary methods were not lawfully acquired, so the exact paradoxical-heat stimulus sequence, trial count, response definition, and scoring cannot be stated. In PMID 28902951, exact Neuroderm prompts are unreported and the 21 notalgia MRIs versus 22-person concordance denominator must remain unresolved. None of these limits licenses completion by inference, silent denominator repair, access bypass, or a claim that a normal scan, biopsy, QST result, or thermogram excludes a cause. [6, 5, 4]

Representation is also a safety boundary. Recurrent back heat, 배열, 화끈거림, burning, warmth, hot pain, paraesthesia, paradoxical heat, and objective skin temperature are not bilingual synonyms or interchangeable constructs. Source labels such as numbness, tingling, altered sensation, radicular pain, severe unremitting pain, and localised tenderness must remain visible rather than being translated into heat language. The distinct NG127 and NG234 constellations and timings cannot be compressed into a generic warning-sign checklist. This scholarly note is not patient-facing, does not provide self-triage or individualized advice, and requires separate clinical governance, Korean-language review, usability testing, and named escalation ownership before any patient-facing adaptation is drafted.

The note must be redesigned if its evidence changes shape. A direct diagnostic or safety study of the target phenotype would require a formal diagnostic review or study update. A materially different current Korean pathway would require a jurisdiction-specific review. Changes to NG127 or NG234 require passage reverification; newly lawful full text or supplementary methods require independent revision of the affected evidence component. Direct evidence in an unrepresented dermatological, vascular, infectious, trauma, cardiopulmonary, autonomic, systemic, musculoskeletal, positional, or referred lane requires its own accountable source universe before extension or splitting. If completeness appears to demand a danger score, imaging rule, reassurance statement, universal checklist, or patient-specific advice, that is a stop-and-redesign condition, not permission to invent one. For now this is an accountable private draft component: not clinically governed, bilingual, adversarially reviewed, publication-ready, released, peer reviewed, or a version of record.

Declarations

Author contributions (CRediT)	Yeonseung Choe: Conceptualization, Methodology, Clinical framing, Research-system design · Baekrokdam Research Commons (BRC): Investigation, Data curation, Writing – original draft, Evidence verification
Data availability	Only public literature was used. The evidence ledger linking citations to passages, permitted claims, and prohibited inferences is downloadable with this article.
Funding	No external funding.
Competing interests	The authors and publisher share research infrastructure with Baekrokdam Korean Medicine Clinic. This relationship does not support treatment-effect claims or causes not examined in this work.
AI use disclosure	AI tools assisted retrieval, structuring, bilingual drafting, and format conversion. Citations were verified at passage level, and claim boundaries, counter-hypotheses, bibliographic links, and form fit were rechecked by internal publication gates. BRC retains publication accountability.
Ethics	This public-literature work contains no individual patient data. Any human-participant implementation of the protocol requires separate ethics review and consent.

References

1. National Institute for Health and Care Excellence. Suspected neurological conditions: recognition and referral (NG127). Updated 2026. Source
2. National Institute for Health and Care Excellence. Spinal metastases and metastatic spinal cord compression (NG234). Updated 2026. Source
3. Sensory descriptors which identify neuropathic pain mechanisms in low back pain: a systematic review. PMID 32609541. https://doi.org/10.1080/03007995.2020.1790349
4. Brachioradial Pruritus and Notalgia Paraesthetica: A Comparative Observational Study of Clinical Presentation and Morphological Pathologies. PMID 28902951. https://doi.org/10.2340/00015555-2789
5. Quantitative sensory testing in notalgia paresthetica reveals small fiber-type-specific differences in non-pruritic sensitivity: a pilot study. PMID 38835743. https://doi.org/10.1097/PR9.0000000000001162
6. Relationship between quantitative sensory testing and pain or disability in people with spinal pain-a systematic review and meta-analysis. PMID 23711482. https://doi.org/10.1016/j.pain.2013.05.031
7. Effects of Unilateral Muscle Fatigue on Thermographic Skin Surface Temperature of Back and Abdominal Muscles—A Pilot Study PMID 35324650. https://doi.org/10.3390/sports10030041