

Thyroid Function Testing in Hospitalised Patients: Non-Thyroidal Illness and the Test That Should Not Have Been Sent

Gudmund Aarrestad^{1*}, Chiara Mastrogiacom² and Nikoleta Zafeiraki-Poulou³

¹Department of Endocrinology, Ryfylke Institute of Laboratory Medicine, Sauda, Norway. ORCID: 0000-0001-2593-7746

²Department of Clinical Biochemistry, Cilento Centre for Clinical Biochemistry, Salerno, Italy. ORCID: 0000-0003-8864-8399

³Department of Laboratory Medicine, Pitsilia Centre for Clinical Biochemistry, Agros, Cyprus. ORCID: 0000-0001-4497-6345

*Correspondence to: Gudmund Aarrestad, Department of Endocrinology, Ryfylke Institute of Laboratory Medicine, Sauda, Norway, E-mail: g.aarrestad@rilm.no

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Abstract

Thyroid function testing in an acutely unwell hospitalised patient is frequently confounded by non-thyroidal illness syndrome, a pattern of altered thyroid hormone results driven by the systemic illness itself rather than by primary thyroid disease, yet thyroid panels continue to be ordered and acted upon in this setting at a rate that outpaces the clinical value the result actually adds. We review the pathophysiology and recognised patterns of non-thyroidal illness syndrome, then examine ordering and action-taken data from a 3,240-admission acute medical cohort. Thyroid function tests were ordered in 18.6% of admissions, and of the abnormal results returned, 61.2% were judged retrospectively to reflect non-thyroidal illness rather than primary thyroid disease, yet 22.4% of these prompted either endocrine referral or a change in thyroid medication before the acute illness had resolved. We set out the specific result patterns that distinguish non-thyroidal illness from genuine thyroid dysfunction and argue for deferred rather than acute-phase thyroid testing wherever clinically feasible.

Keywords: Non-thyroidal illness syndrome; Thyroid function tests; Sick euthyroid syndrome; Hospitalised patients; Test appropriateness

Introduction

Non-thyroidal illness syndrome -- sometimes called sick euthyroid syndrome -- describes a characteristic alteration in circulating thyroid hormone concentrations occurring in acute or chronic systemic illness without underlying thyroid gland dysfunction, driven by changes in peripheral hormone conversion, binding protein concentration, and hypothalamic-pituitary-thyroid axis regulation during illness rather than by the thyroid gland itself.^[1] The syndrome is well described in the endocrinology literature, yet thyroid function testing continues to be ordered frequently in acutely unwell hospitalised patients, and an abnormal result in this setting is not always correctly attributed to the underlying illness rather than to primary thyroid disease.^[2]

We reviewed ordering and clinical action data from a large acute medical admission cohort to quantify how often thyroid testing is ordered in this setting, how often the resulting abnormality reflects non-thyroidal illness rather than genuine thyroid dysfunction on retrospective review, and how often that abnormal result nonetheless prompted a clinical action before the acute illness had resolved.

The clinical challenge non-thyroidal illness syndrome poses is not primarily diagnostic complexity, the recognised result patterns are well characterised and summarised in the next section, but rather a mismatch between the volume of thyroid testing ordered during acute illness and the number of clinicians at the point of care consistently applying that recognised pattern knowledge before acting on an abnormal result.^[9]

This mismatch matters because the two possible errors are not symmetric in consequence: failing to recognise non-thyroidal illness syndrome and instead treating it as genuine thyroid dysfunction risks an unnecessary medication change with its own attendant risks, particularly over-replacement in a patient whose biochemical picture will normalise on its own as the acute illness resolves, while correctly deferring testing in a patient who genuinely has new thyroid dysfunction risks delaying appropriate treatment, meaning the clinical judgement required is not simply to default to caution in one direction but to apply the specific distinguishing features described below to each case individually.

Recognised Patterns

The most common pattern, seen early in acute illness, is an isolated low total and free triiodothyronine (T3) with normal thyroxine (T4) and thyroid-stimulating hormone (TSH), reflecting reduced peripheral conversion of T4 to T3 during illness; more severe or prolonged illness can additionally show a low T4 and a TSH that is transiently suppressed, low-normal, or occasionally mildly elevated during recovery, a pattern that can superficially resemble central hypothyroidism or, during the recovery-phase TSH rise, primary hypothyroidism.^{[3][4]}

These patterns are distinguished from genuine thyroid dysfunction primarily by their evolution: non-thyroidal illness patterns typically normalise as the underlying illness resolves without any thyroid-specific intervention, whereas genuine primary or central thyroid dysfunction does not resolve simply because the intercurrent illness does.^[5] A single result obtained during acute illness, without this longitudinal context, cannot reliably distinguish the two on its own in many cases.

A further distinguishing feature, beyond the longitudinal evolution described above, is the typical magnitude and pattern of abnormality: non-thyroidal illness syndrome characteristically produces a mild-to-moderate reduction in T3 and sometimes T4 with a TSH that remains within or close to the reference interval during the acute phase, whereas genuine severe primary hypothyroidism typically produces a clearly and substantially elevated TSH even during concurrent acute illness, a distinction that, while not absolute, can help flag which abnormal results most warrant closer scrutiny before any medication change is considered.^[4]

Illness severity itself correlates with the degree of thyroid hormone alteration seen in non-thyroidal illness syndrome, with more severely unwell patients, particularly those requiring intensive care, showing more pronounced and more prolonged alterations than patients with milder acute illness managed on a general medical ward, a gradient consistent with the underlying mechanism being tied to the severity of the systemic illness response rather than being an all-or-nothing phenomenon.^[5]

Cohort Findings

Across 3,240 acute medical admissions over the study period, thyroid function tests were ordered in 18.6% (603 admissions), a rate similar to that reported in comparable published acute admission cohorts. Of the 603 tested, 284 (47.1%) returned at least one result outside the reference interval.

Retrospective review by an endocrinologist blinded to the clinical action taken judged 61.2% (174 of 284) of these abnormal results as most consistent with non-thyroidal illness syndrome rather than primary or central thyroid dysfunction, based on the pattern of results, the absence of prior thyroid disease history, and resolution on repeat testing after recovery where available.^[6] Despite this, 22.4% (39 of 174) of the non-thyroidal-illness-judged results prompted either an endocrinology referral or a change in thyroid medication before the acute illness had resolved, most commonly a levothyroxine dose increase in a patient with pre-existing hypothyroidism whose TSH had risen during the illness-recovery phase.^[7]

Breaking down the 39 actioned non-thyroidal-illness-judged results further, 27 of the 39 involved a levothyroxine dose increase in a patient with known pre-existing hypothyroidism, 8 involved a new endocrinology referral for a patient without prior thyroid disease history, and the remaining 4 involved a levothyroxine dose reduction or temporary cessation in a patient whose results were misattributed to over-replacement rather than to the acute illness itself.^[7]

Admissions to the intensive care unit within the broader acute medical cohort showed a higher thyroid testing rate (31.4%) than ward-level admissions (16.2%), and a correspondingly higher proportion of abnormal results judged as non-thyroidal illness (68.9% versus 57.3%), consistent with the illness-severity gradient described above and suggesting that the intensive care setting, despite its higher testing rate, carries an even greater proportionate risk of result misattribution than the general ward setting if testing and interpretation practices are not adjusted accordingly.

Metric	Value
Admissions with TFTs ordered	603 / 3,240 (18.6%)
Abnormal results	284 / 603 (47.1%)
Judged non-thyroidal illness	174 / 284 (61.2%)
NTI results actioned clinically	39 / 174 (22.4%)

Table 1: Summary of Thyroid Function Testing Ordering and Action-Taken Outcomes Across the 3,240-Admission Cohort.

Discussion

Nearly a quarter of clinically actioned thyroid abnormalities in this cohort were subsequently judged, on review, to reflect the acute illness rather than a genuine change in thyroid status, consistent with published concern that non-thyroidal illness syndrome is under-recognised at the point of clinical decision-making despite being well described in the literature clinicians are trained on.^[8] The most actionable finding here is not that thyroid testing should never be ordered acutely -- genuine acute thyroid emergencies exist and require prompt testing -- but that a stable or previously euthyroid patient developing an abnormal thyroid pattern during unrelated acute illness should, where clinically safe to do so, have testing deferred or repeated after recovery before a medication change is made.

A laboratory comment appended to a thyroid result obtained during documented acute illness, flagging the possibility of non-thyroidal illness syndrome and recommending interpretation with caution or deferred retesting, is a low-cost intervention that several centres have reported reduces inappropriate acute-phase medication changes without delaying management of genuine thyroid emergencies.^{[9][10]}

Comparison with Previously Published Non-Thyroidal Illness Cohorts

This study's finding that 61.2% of abnormal thyroid results in an acute medical cohort reflected non-thyroidal illness rather than genuine thyroid dysfunction is broadly consistent with, though somewhat higher than, several previously published estimates in comparable hospitalised populations.

Earlier published series, generally conducted in intensive care or general medical populations with somewhat different case mix and testing thresholds than this study's cohort, have reported non-thyroidal illness accounting for between roughly a third and somewhat over half of abnormal thyroid results obtained during acute illness, with the proportion generally rising with increasing severity of the underlying illness in the population studied.^{[5][8]}

This study's somewhat higher proportion may reflect this cohort's specific acute medical admission population, which includes a meaningful proportion of patients with significant acute illness severity, including the intensive care unit admissions discussed above, or may reflect differences in how retrospective classification was performed between this study and the prior published series, a methodological difference that is difficult to fully reconcile without access to the detailed classification criteria used in each prior study individually.

Why Levothyroxine Dose Changes Dominate the Actioned Cases

The finding that levothyroxine dose increases in patients with pre-existing hypothyroidism accounted for the large majority of actioned non-thyroidal-illness-judged results warrants separate discussion, since this specific scenario differs in important ways from a de novo abnormal result in a previously euthyroid patient.

A patient with pre-existing hypothyroidism already has an established, pre-illness TSH target and levothyroxine dose on record, and a TSH rise during acute illness in such a patient is particularly likely to be interpreted by a treating clinician as simple under-replacement requiring a dose increase, rather than as a recovery-phase TSH elevation that would be expected to resolve spontaneously as the patient recovers from the acute illness without any dose change at all.^[6]

This interpretive error is understandable given how commonly a rising TSH in a hypothyroid patient does indicate genuine under-replacement outside the context of acute illness, and the key additional piece of context required to avoid it, that the patient is currently acutely unwell and that the TSH rise occurred during the recovery phase of that illness rather than during a period of clinical stability, is not always prominently flagged to the clinician reviewing the result at the point of decision-making.

We would suggest that any laboratory comment addressing non-thyroidal illness syndrome, discussed further below, should explicitly address this specific pre-existing-hypothyroidism scenario, given its disproportionate contribution to actioned cases in this cohort, rather than addressing only the de novo abnormal result scenario in a previously euthyroid patient.

When Acute-Phase Thyroid Testing Remains Appropriate

Nothing in this review should be read as arguing against thyroid testing during acute illness in every circumstance, and it is important to state explicitly the clinical scenarios in which acute-phase testing remains appropriate and should not be deferred.

Suspected myxoedema coma or thyroid storm, both genuine life-threatening endocrine emergencies, require immediate thyroid testing and treatment regardless of any confounding from the acute illness itself, since the clinical cost of delaying diagnosis and treatment in these specific emergencies far outweighs the interpretive complexity non-thyroidal illness syndrome introduces.^[1]

A new, previously undiagnosed and clinically suspected thyroid disorder presenting for the first time during an unrelated acute illness, where the clinical features point specifically toward thyroid disease rather than being incidentally discovered on a panel ordered for another reason, also generally warrants prompt testing and at least provisional action, since deferring investigation of a clinically suspected new diagnosis risks a different kind of avoidable harm than the over-action of

non-thyroidal illness this study has focused on.^[3]

The deferred-testing recommendation this review makes is therefore targeted specifically at the scenario most represented in this study's actioned cases, an incidentally abnormal result in a patient without a specific clinical indication prompting urgent thyroid assessment, rather than at thyroid testing in acute illness as a blanket practice.

Background on Non-Thyroidal Illness Syndrome Mechanisms

The pathophysiological mechanisms underlying non-thyroidal illness syndrome, touched on briefly in the Introduction, warrant fuller description to support the clinical pattern recognition this review emphasises throughout.

Reduced peripheral conversion of T4 to T3, mediated by altered deiodinase enzyme activity during acute illness, is the best-characterised mechanism underlying the early, isolated-low-T3 pattern, with illness-related cytokine signalling and reduced caloric intake both implicated as contributing drivers of this altered deiodinase activity.^[4]

More prolonged or severe illness additionally involves altered hypothalamic-pituitary-thyroid axis regulation at the level of TSH secretion itself, together with changes in thyroid hormone binding protein concentration and binding affinity during acute illness, together producing the more complex low-T4, low-or-normal-TSH pattern seen in more severely or prolonged unwell patients.^[1]

Both mechanisms are understood to represent an adaptive response to acute illness, plausibly reducing metabolic demand during a period of physiological stress, rather than representing a pathological process in its own right, a framing that reinforces why the recommended clinical response is observation and deferred reassessment rather than correction through thyroid hormone supplementation or dose adjustment.

Role of Clinical Decision Support at the Point of Ordering

Beyond the laboratory comment intervention discussed in detail below, several centres have explored clinical decision support interventions at the point of test ordering itself, aiming to reduce inappropriate acute-phase thyroid testing before a potentially confounded result is even generated.

A decision support prompt appearing at the point of ordering, asking the ordering clinician to confirm whether a specific clinical indication for thyroid testing exists, such as suspected myxoedema coma, thyroid storm, or a new clinically suspected thyroid disorder, versus a more routine or incidental ordering rationale, has in several settings been reported to reduce low-yield acute-phase thyroid testing volume, complementing rather than replacing the result-interpretation-stage laboratory comment intervention this review emphasises.^[2]

We would regard point-of-ordering decision support and the result-interpretation laboratory comment as complementary rather than competing interventions, the former aiming to prevent low-value testing before it occurs and the latter aiming to prevent inappropriate action on a result once ordered, and a comprehensive local programme addressing the pattern identified in this study would ideally implement both rather than relying on either alone.

Design and Content of an Effective Laboratory Comment

The laboratory comment intervention referenced in Discussion above is, in our view, the single most readily implementable mitigation arising from this study's findings, and it is worth describing its recommended content in more detail than the brief mention above.

An effective comment should state explicitly that the result was obtained during documented acute illness, name the specific pattern observed, for example low T3 with normal TSH, or low-normal TSH with low T4, and note that this pattern is consistent with non-thyroidal illness syndrome and would be expected to normalise as the acute illness resolves without thyroid-specific intervention, while also noting that repeat testing after clinical recovery is recommended before any medication change is made.^[9]

For a patient with pre-existing hypothyroidism specifically, given the disproportionate contribution of this scenario to actioned cases identified above, the comment should additionally note explicitly that a TSH rise during acute illness recovery in a previously stable hypothyroid patient does not necessarily indicate under-replacement and that a dose change based on this single acute-phase result, without confirmation on a result obtained after clinical recovery, risks over-replacement once the acute illness resolves and the TSH would have normalised regardless.

Several centres implementing a comment of this kind have reported that embedding the specific recommended action, defer or repeat after recovery, rather than only naming the syndrome abstractly, produces a more consistent change in clinician behaviour than a comment naming non-thyroidal illness syndrome without a concrete recommended next step.^[10]

Interdisciplinary Coordination Between Laboratory and Clinical Teams

Addressing the pattern identified in this study effectively requires coordination between laboratory and clinical teams that goes somewhat beyond the single laboratory comment intervention discussed above, and we outline that broader coordination here.

Laboratory scientists and clinical biochemists issuing thyroid results are well positioned to flag a pattern consistent with non-thyroidal illness syndrome at the point of result verification, but are not typically positioned to know, from the laboratory

information system alone, whether the ordering clinician has already considered and appropriately contextualised the result within the patient's acute illness, meaning the comment functions best as a prompt for consideration rather than as a substitute for direct clinical judgement.^[9]

Endocrinology teams, when consulted on a potentially non-thyroidal-illness-confounded result, are well positioned to apply the more detailed pattern-recognition and longitudinal interpretation expertise this review has described, and several of the referrals in this cohort that led to a result being correctly deferred rather than acted on arose specifically from endocrinology input obtained after an initial, more cautious clinical response to the abnormal result.

We would recommend that centres implementing the governance sequence proposed above explicitly define when endocrinology input should be sought, for example whenever a laboratory comment flagging possible non-thyroidal illness accompanies a result that the ordering clinician is nonetheless considering acting on, rather than leaving the decision to seek specialist input to informal, case-by-case judgement alone.

Patient Communication Considerations

Communicating an abnormal thyroid result, subsequently judged to reflect non-thyroidal illness, to a patient and their family requires some care, particularly where the patient is aware that an abnormal result was obtained and may have questions about why no thyroid-specific treatment followed, or, conversely, why a medication change made acutely was later reversed.

For a patient whose result was correctly deferred rather than acted on, clear communication at the time of the acute illness that the result is being interpreted in the context of the acute illness and will be reassessed after recovery, rather than simply not being mentioned at all, helps avoid the impression that an abnormal result was overlooked or ignored.^[3]

For the smaller number of patients in this cohort whose medication was changed acutely and subsequently reversed once the non-thyroidal illness pattern was recognised, clear explanation of why the initial change was made, why it was reversed, and that this reflects the recognised complexity of interpreting thyroid results during acute illness rather than a straightforward error, is important for maintaining patient confidence in their ongoing care, and several of this cohort's endocrinology referrals arising from this scenario specifically noted this communication step in their clinical correspondence.

Regulatory and Guideline Context

Several professional endocrinology and laboratory medicine societies have issued guidance touching on thyroid testing in acute illness, and briefly situating this review's recommendations relative to that existing guidance is useful for readers seeking an authoritative complement to this review's own cohort-based findings.

Existing guidance generally recommends against routine thyroid screening in acutely unwell hospitalised patients without a specific clinical indication, a recommendation this review's findings directly support given the substantial proportion of ordered tests in this cohort that returned results subsequently judged to reflect the illness rather than genuine thyroid disease.^[2]

Existing guidance is generally less specific, however, about what should happen once a test has nonetheless been ordered and returns an abnormal result, an interpretive gap this review's proposed laboratory comment and governance sequence is specifically designed to address, complementing rather than duplicating the existing before-the-fact ordering guidance already published by these professional bodies.

Governance Recommendations for Implementing Centres

Drawing together the interventions discussed throughout this review, point-of-ordering decision support, result-interpretation laboratory comments, and the explicit acute-testing-appropriate scenarios outlined above, we propose the following governance sequence for a centre seeking to address the pattern this study identifies.

First, establish clear local guidance distinguishing the scenarios in which acute-phase thyroid testing remains appropriate from the more routine or incidental ordering scenario most associated with avoidable action in this study, and communicate this distinction to ordering clinicians through existing educational channels.

Second, implement a standardised laboratory comment, along the lines described above, for any thyroid result obtained during documented acute illness showing a pattern consistent with non-thyroidal illness syndrome, with explicit attention to the pre-existing-hypothyroidism scenario given its disproportionate contribution to actioned cases in this cohort.

Third, periodically audit actioned thyroid results against retrospective non-thyroidal-illness classification, following this study's own methodology, to monitor whether the proportion of avoidably actioned results declines following implementation of these measures, providing the centre with its own local evidence of whether the interventions are achieving their intended effect.

Economic Considerations

Reducing avoidable thyroid testing and avoidable clinical action on non-thyroidal illness syndrome results carries a modest but real economic benefit beyond the direct patient safety and clinical appropriateness arguments made elsewhere in this review.

The direct cost of an avoidable thyroid function test, while individually modest, accumulates meaningfully across a cohort of this size, with 603 tests ordered across 3,240 admissions and a substantial proportion of the resulting abnormal results reflecting non-thyroidal illness rather than genuine thyroid disease, suggesting that a deferred-testing approach could meaningfully

reduce overall thyroid testing volume in this population without compromising detection of genuine thyroid emergencies.^[2]

The indirect cost of an avoidable endocrinology referral or medication change, including the clinician and pharmacist time involved and, in the case of an inappropriate dose change, the cost of subsequent monitoring and potential dose correction once the error is recognised, likely exceeds the direct cost of the test itself, reinforcing that the clinical action taken on a result, not only the decision to order the test, is where the larger economic and safety stakes of this issue actually lie.

Why This Pattern Persists Despite Being Well Described in Training

Non-thyroidal illness syndrome is a long-established concept taught in standard endocrinology and internal medicine curricula, and it is worth addressing directly why, despite this, the avoidable-action pattern this study identifies persists in contemporary clinical practice.

Textbook description of a clinical pattern and reliable application of that pattern at the point of a time-pressured, acute clinical decision are not the same thing, and a clinician managing an acutely unwell patient with multiple competing diagnostic and therapeutic priorities may simply not have the abstract teaching about non-thyroidal illness syndrome readily available as an active consideration at the specific moment an abnormal thyroid result appears among many other results requiring review.^[7]

This gap between taught knowledge and applied, point-of-care recognition is precisely the gap the laboratory comment intervention and point-of-ordering decision support described above are designed to close, by surfacing the relevant consideration directly at the point of decision-making rather than relying on the ordering clinician to recall and apply abstract training unprompted in the midst of a busy, multi-priority acute clinical encounter.

Differential Diagnosis Considerations Beyond Non-Thyroidal Illness

Non-thyroidal illness syndrome is not the only confounder of thyroid function testing in a hospitalised patient, and it is worth briefly noting other considerations that a clinician should weigh alongside the non-thyroidal illness pattern described throughout this review.

Several medications commonly used in acutely unwell hospitalised patients, including high-dose glucocorticoids, dopamine infusions, and amiodarone, independently alter thyroid function test results through mechanisms distinct from non-thyroidal illness syndrome itself, and a full medication review should accompany interpretation of an abnormal acute-phase thyroid result alongside consideration of the illness-driven pattern this review has focused on.^[4]

Biotin supplementation and certain other substances known to interfere with immunoassay-based thyroid hormone

measurement represent a further, analytically rather than physiologically driven, potential confounder, distinct in mechanism from both non-thyroidal illness syndrome and medication effects, and should be considered, particularly where the result pattern is unusual or inconsistent with the clinical picture in a way not well explained by either of the other two mechanisms.^[10]

Age and Comorbidity Considerations Within This Cohort

The 3,240-admission cohort studied here spans a broad adult age range typical of an acute medical admission population, and age and comorbidity patterns within the cohort are worth briefly noting as further context for the main findings reported above.

Older patients within the cohort showed both a higher thyroid testing rate and a higher proportion of results judged as non-thyroidal illness than younger patients, plausibly reflecting both a higher burden of pre-existing thyroid disease prompting more frequent testing in this age group and a higher burden of severe acute illness, such as sepsis and multi-organ dysfunction, known to produce more pronounced non-thyroidal illness patterns.^[5]

Patients with multiple comorbidities and polypharmacy, a group overlapping substantially with the older patients just described, also showed a higher rate of the pre-existing-hypothyroidism actioned-case scenario identified as the dominant contributor to avoidable action in this cohort, consistent with this group representing patients already established on levothyroxine therapy prior to the index admission and therefore most exposed to the specific interpretive error this review has focused on.

Study Limitations

This study's findings should be read alongside several limitations.

Retrospective classification of each abnormal result as reflecting non-thyroidal illness or genuine thyroid dysfunction, performed by a single blinded endocrinologist reviewer, while following an explicit, literature-based pattern definition, necessarily involves some element of clinical judgement that a second independent reviewer might occasionally have classified differently, particularly for the smaller number of borderline cases where the result pattern was not unambiguously typical of either category.^[8]

This study was conducted at a single centre, and both the overall testing rate and the specific proportion of actioned non-thyroidal-illness results may differ at other centres with different case mix, different local thyroid testing ordering guidance, or different levels of clinician familiarity with non-thyroidal illness syndrome.

Applicability to Other Hospitalised Populations

This study's cohort was drawn specifically from acute medical admissions, and it is worth briefly considering how the findings might differ in other hospitalised populations not specifically represented in this cohort.

Surgical patients in the immediate post-operative period experience a broadly similar systemic stress response to acute medical illness and would be expected to show a similar non-thyroidal illness pattern, though the specific testing rate and action-taken proportions in this cohort may differ given differing baseline rates of incidental thyroid testing between surgical and medical admission pathways at most centres.^[5]

Paediatric patients, not represented in this adult cohort, show a recognised but somewhat differently characterised pattern of non-thyroidal illness syndrome, and the specific result patterns and reference intervals this review has described for an adult population should not be assumed to transfer directly to a paediatric population without separate validation.

Future Directions

A natural extension of this study would be a prospective intervention trial introducing the laboratory comment described above and measuring whether it reduces the proportion of non-thyroidal-illness-judged results that prompt clinical action, directly testing the specific mitigation this review proposes rather than relying on the retrospective, observational association reported here.

Further research characterising which specific result patterns or clinical contexts carry the highest risk of misattribution, potentially informing a structured decision-support rule rather than a general comment alone, would help refine this mitigation further, particularly given this study's finding that the pre-existing-hypothyroidism scenario accounted for a disproportionate share of actioned cases and might benefit from its own specifically targeted decision support beyond a general comment addressing non-thyroidal illness syndrome broadly.^[1]

Practical Checklist for Clinicians at the Point of Decision-Making

As a closing practical summary, we offer the following checklist for a clinician encountering an abnormal thyroid result in an acutely unwell hospitalised patient.

First, confirm whether the patient has a specific clinical indication warranting urgent thyroid assessment, suspected myxoedema coma, thyroid storm, or new clinically suspected thyroid disease, as distinct from an incidentally abnormal result on a panel ordered for another reason, since the appropriate response differs materially between these two scenarios as discussed above.^[1]

Second, where no such urgent indication exists, review the specific result pattern against the recognised non-thyroidal illness patterns described in this review, low T3 with normal

TSH early in illness, or low-normal TSH with low T4 in more severe or prolonged illness, and consider whether the pattern and the patient's clinical trajectory are more consistent with non-thyroidal illness than with genuine thyroid dysfunction before considering any medication change.

Third, for a patient with pre-existing hypothyroidism specifically, resist the default assumption that a rising TSH during acute illness necessarily indicates under-replacement, and consider deferring any dose change until a repeat result is available after clinical recovery, given this scenario's disproportionate contribution to avoidably actioned results identified in this study's cohort.

Fourth, where any uncertainty remains, use the result as an opportunity to engage with the laboratory comment or local guidance, where available, or to seek endocrinology input specifically framed around the non-thyroidal illness question rather than proceeding directly to a medication change without this input.

Conclusion

Thyroid function testing was ordered in 18.6% of acute medical admissions in this cohort, and 61.2% of abnormal results were judged on review to reflect non-thyroidal illness rather than genuine thyroid dysfunction, yet 22.4% of these prompted a clinical action before the acute illness resolved. Deferred testing where clinically feasible, supported by a laboratory comment flagging the possibility of non-thyroidal illness syndrome on acute-phase results, would reduce this pattern of avoidable action on a result the illness itself, not the thyroid, produced.

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