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Comparison of the diagnostic and prognostic performance of qSOFA, SOFA and NEWS2 in adult patients with suspected sepsis in the emergency department: a literature review

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Abstract

Background: Early recognition of sepsis in the emergency department remains a major clinical challenge due to non-specific presentation, variable disease severity, and the need for rapid decision-making. Several scoring systems, including qSOFA, SOFA, and NEWS2, are used to support risk stratification in patients with suspected infection, but their diagnostic and prognostic performance differs according to clinical context and timing of assessment.

Aim: This review aimed to compare the diagnostic and prognostic performance of qSOFA, SOFA, and NEWS2 in adult patients with suspected sepsis in the emergency department, with particular focus on clinical utility and practical applicability in early risk stratification.

Methods: A structured narrative literature review was conducted using PubMed/MEDLINE. Articles published between 2016 and 2025 were considered, reflecting the period following the Sepsis-3 definitions. Included studies involved adult patients with suspected or confirmed infection or sepsis in an emergency department setting and assessed at least one of the selected scoring systems. Outcomes of interest included sensitivity, specificity, area under the receiver operating characteristic curve, mortality, intensive care unit admission, and clinical deterioration.

Results: The available evidence suggests a consistent trade-off between sensitivity and specificity. qSOFA is simple and highly specific, but its limited sensitivity reduces its usefulness as a stand-alone screening tool, particularly during early triage. NEWS/NEWS2 generally demonstrates higher sensitivity and more favorable performance for early identification of physiological deterioration, although much of the comparative evidence is based on NEWS rather than NEWS2 specifically. SOFA remains closely linked to the Sepsis-3 definition and is useful for confirming and quantifying organ dysfunction, but its dependence on laboratory and clinical variables limits immediate applicability at triage.

Conclusions: No single score appears sufficient as a universal tool for emergency department sepsis assessment. NEWS/NEWS2 may be most useful for early recognition and monitoring, qSOFA for identifying high-risk patients, and SOFA for subsequent organ dysfunction assessment once additional data are available. This staged approach should be interpreted as a practice-oriented synthesis of current evidence rather than a validated clinical pathway.

Introduction

Sepsis remains one of the major challenges in emergency and critical care medicine. It is associated with a high global burden, substantial mortality, and a clinical course in which delayed recognition may rapidly lead to organ dysfunction, shock, and death [1]. In the emergency department (ED), early identification is particularly difficult because patients with infection often present with non-specific symptoms and variable disease severity. As a result, clinicians require tools that can support rapid risk stratification and help identify patients who may benefit from urgent diagnostic and therapeutic interventions.

The Third International Consensus Definitions for Sepsis and Septic Shock, published in 2016, redefined sepsis as life-threatening organ dysfunction caused by a dysregulated host response to infection [2]. Within this framework, organ dysfunction is assessed using the Sequential

Organ Failure Assessment (SOFA) score, and an acute increase of at least two points is considered clinically significant [2,3]. Although SOFA is central to the Sepsis-3 definition and remains important for assessing organ dysfunction, its dependence on laboratory and physiological variables may limit its immediate use during initial ED triage.

To address the need for a simpler bedside tool, the quick Sequential Organ Failure Assessment (qSOFA) score was introduced as part of the Sepsis-3 framework [3]. However, subsequent studies in ED populations have questioned its role as a stand-alone screening instrument, mainly because of its limited sensitivity despite relatively high specificity [4–8]. These concerns are reflected in the 2021 Surviving Sepsis Campaign guidelines, which recommend against using qSOFA alone as a screening tool for sepsis or septic shock [9].

In parallel, early warning scores, particularly the National Early Warning Score (NEWS) and its updated version NEWS2, have gained increasing attention in acute care settings. Unlike qSOFA, NEWS/NEWS2 was designed to detect general clinical deterioration rather than sepsis specifically, but multiple ED studies suggest that it may offer better sensitivity and overall discrimination for identifying patients with suspected infection at risk of poor outcomes [4–7,10]. Nevertheless, the available evidence remains heterogeneous, and the relative performance of qSOFA, SOFA, and NEWS2 depends on whether the intended clinical purpose is early screening, diagnostic classification, or prognostic risk stratification.

Therefore, the question is not simply which score is universally superior, but rather which scoring system is most useful at different stages of ED assessment. A more sensitive score may be preferable for early screening, a more specific score may help identify patients already at high risk, and SOFA remains important for confirming organ dysfunction within the Sepsis-3 framework once sufficient clinical and laboratory data are available. Therefore, a critical appraisal of the available evidence is needed to clarify the role of qSOFA, SOFA, and NEWS/NEWS2 in the early assessment and risk stratification of adult patients with suspected sepsis in the emergency department.

Aim of Study

The aim of this literature review is to compare the diagnostic and prognostic performance of qSOFA, SOFA, and NEWS2 in adult patients with suspected sepsis in the emergency department, with particular focus on their clinical utility, and practical applicability in early risk stratification.

Methods and Materials

This study was designed as a narrative literature review assessing the diagnostic and prognostic performance of qSOFA, SOFA, and NEWS2 in adult patients with suspected sepsis in the emergency department.

A literature search was performed in PubMed/MEDLINE for articles published between January 2016 and December 2025, corresponding to the period following the publication of the Sepsis-3 definitions. The search strategy included combinations of terms related to sepsis, emergency department care, and scoring systems, including: “sepsis”, “suspected sepsis”, “suspected infection”, “emergency department”, “qSOFA”, “SOFA”, “NEWS”, “NEWS2”,

and “National Early Warning Score”. Selected articles were additionally verified using PubMed records, journal websites, and available full-text sources.

Studies were included if they involved adult patients with suspected or confirmed infection or sepsis, were conducted in or relevant to the emergency department setting, and evaluated at least one of the selected scoring systems. Priority was given to studies reporting diagnostic or prognostic outcomes, including sensitivity, specificity, area under the receiver operating characteristic curve, mortality, intensive care unit admission, or clinical deterioration.

Pediatric studies, ICU-only studies without emergency department relevance, purely prehospital studies, case reports, editorials, opinion papers, and articles without extractable data or verifiable DOI/PMID were excluded. Studies evaluating NEWS rather than NEWS2 were included when relevant, as NEWS2 is an updated version of the original NEWS score and much of the comparative ED literature is based on NEWS.

Data were extracted narratively and synthesized descriptively. No formal meta-analysis was performed. The analysis focused on comparative diagnostic accuracy, prognostic value, methodological heterogeneity, and practical applicability of qSOFA, SOFA, and NEWS2 in emergency department risk stratification.

Characteristics of the scores

qSOFA

The quick Sequential Organ Failure Assessment (qSOFA) score was introduced together with the Sepsis-3 definitions as a simplified bedside tool intended to identify patients with suspected infection who are at increased risk of poor outcomes outside the intensive care unit [2,3]. It consists of three clinical variables: altered mental status, respiratory rate of 22 breaths per minute or higher, and systolic blood pressure of 100 mmHg or lower. Each variable is assigned one point, resulting in a total score ranging from 0 to 3. A score of 2 or more is generally considered positive and should alert clinicians to an increased risk of clinical deterioration.

The main advantage of qSOFA is its simplicity. It does not require laboratory testing and can be calculated rapidly at the bedside using routinely available clinical information. This makes it potentially useful in the emergency department, where rapid triage and early identification of high-risk patients are essential. Its high specificity reported in many ED studies suggests that a positive qSOFA may help identify patients who are already significantly ill and at increased risk of adverse outcomes [4–8].

However, qSOFA has important limitations. Its low sensitivity has been repeatedly reported in ED populations, meaning that many patients with sepsis, suspected infection or early organ dysfunction may not be identified if qSOFA is used as the only screening tool [4,6–8,15,18,19]. This is particularly relevant in the earliest phase of ED assessment and triage, when the clinical goal is to avoid missing patients with evolving sepsis or infection-related deterioration. The 2021 Surviving Sepsis Campaign guidelines directly support this concern, recommending against the use of qSOFA compared with SIRS, NEWS or MEWS as a single screening tool for sepsis or septic shock [9]. Therefore, qSOFA may be better interpreted as a rapid bedside high-risk flag rather than a stand-alone diagnostic screening instrument.

SOFA

The Sequential Organ Failure Assessment (SOFA) score is central to the Sepsis-3 definition of sepsis. According to Sepsis-3, sepsis is defined as life-threatening organ dysfunction caused by a dysregulated host response to infection, and organ dysfunction is operationalized as an acute increase in SOFA score of at least two points [2,3]. Unlike qSOFA, SOFA is not a simplified bedside score, but a more comprehensive assessment of organ dysfunction.

SOFA evaluates six organ systems: respiratory, coagulation, hepatic, cardiovascular, central nervous system, and renal function. Each system is scored from 0 to 4 points, giving a total score from 0 to 24. The required variables include $\text{PaO}_2/\text{FiO}_2$ ratio, platelet count, bilirubin concentration, mean arterial pressure or vasopressor requirement, Glasgow Coma Scale score, creatinine concentration, and urine output. This structure makes SOFA more physiologically detailed than qSOFA or NEWS2.

The major advantage of SOFA is its close relationship with the pathophysiological concept of sepsis as organ dysfunction. It provides a structured assessment of disease severity and has prognostic value in patients with suspected or confirmed infection. In this sense, SOFA remains important for diagnostic classification, severity assessment, and comparison across studies using the Sepsis-3 framework.

Its main limitation in the emergency department is practicality. Full SOFA calculation requires laboratory and clinical variables, including oxygenation indices, platelet count, bilirubin, creatinine or urine output, neurological assessment and cardiovascular parameters, which may be incomplete or unavailable during the earliest phase of ED triage [3]. This makes SOFA less suitable for rapid first-line screening at the moment of ED arrival. In practice, SOFA is often more useful after initial diagnostic work-up, when laboratory and clinical data become available, rather than as an immediate triage score [3,16]. Therefore, in ED workflow, SOFA may be best understood as a tool for confirmation and quantification of organ dysfunction rather than as a rapid front-door screening instrument.

NEWS2

The National Early Warning Score 2 (NEWS2) is the updated version of the original National Early Warning Score, developed by the Royal College of Physicians to standardize the assessment of acute illness severity and clinical deterioration [11]. Unlike qSOFA and SOFA, NEWS2 was not developed specifically as a sepsis score. Instead, it is a general early warning system designed to detect physiological deterioration in acutely ill patients.

NEWS2 is based on routinely measured physiological parameters: respiratory rate, oxygen saturation, use of supplemental oxygen, systolic blood pressure, pulse rate, level of consciousness or new confusion, and temperature [11]. Each parameter is assigned a score according to the degree of abnormality, and the total score reflects the severity of acute illness. Compared with the original NEWS, NEWS2 introduced important refinements, including a dedicated oxygen saturation scale for patients at risk of hypercapnic respiratory failure and the inclusion of new confusion in the assessment of consciousness [11].

The main strength of NEWS2 in the emergency department is its ability to detect early physiological deterioration using routinely collected vital signs. The score is based on respiratory rate, oxygen saturation, systolic blood pressure, pulse rate, level of consciousness

or new confusion, and temperature, which makes it suitable for repeated bedside assessment during ED observation [11]. Because NEWS2 evaluates a broader range of physiological abnormalities than qSOFA, it may identify a larger group of patients at risk before full diagnostic information is available. Several ED studies evaluating NEWS or NEWS2 have shown higher sensitivity and better overall discrimination than qSOFA for detecting sepsis-related organ dysfunction, predicting clinical deterioration, or identifying patients at risk of ICU admission or death [6,7,10,12–14]. However, because some of the available comparative evidence refers to NEWS rather than NEWS2 specifically, these findings should be interpreted as supporting the broader NEWS/NEWS2 approach rather than proving the superiority of NEWS2 in every ED population.

The main limitation of NEWS2 is that it is not specific to sepsis. A high NEWS2 score may reflect many forms of acute physiological instability, including respiratory failure, cardiac disease, metabolic disorders, trauma, or other non-infectious conditions. Therefore, NEWS2 should not be interpreted as a diagnostic test for sepsis, but rather as a general early warning tool that supports recognition of clinical deterioration and escalation of care [11]. In patients with suspected infection, however, this lack of specificity may be acceptable at the screening stage, because missing early sepsis is often clinically more dangerous than generating additional false-positive alerts. This interpretation is consistent with studies showing that NEWS/NEWS2 tends to be more sensitive than qSOFA, whereas qSOFA is usually more specific but less reliable as a stand-alone screening tool in the ED [6–8,12–14].

Diagnostic and prognostic performance of qSOFA, SOFA and NEWS2

Diagnostic performance

The diagnostic performance of qSOFA, SOFA and NEWS2 in the emergency department should be interpreted in relation to the clinical purpose of each score. In patients with suspected infection, the main diagnostic challenge is not only to identify established sepsis, but also to recognize patients with evolving organ dysfunction before clinical deterioration becomes obvious. For this reason, sensitivity, specificity and the area under the receiver operating characteristic curve are particularly important when assessing the usefulness of each tool in the ED setting.

qSOFA has consistently demonstrated high specificity but limited sensitivity in ED populations. This pattern means that a positive qSOFA score may identify a subgroup of patients at high risk, but a negative score cannot reliably exclude sepsis or sepsis-related organ dysfunction. In the ED study by Usman et al., NEWS showed the highest accuracy for early identification of sepsis endpoints, whereas qSOFA was limited by low sensitivity despite high specificity [4]. Similar findings were reported by Durr et al., who found that NEWS ≥ 5 had substantially higher sensitivity than qSOFA ≥ 2 for detecting Sepsis-3-defined sepsis in the ED (86% vs 34%), while qSOFA showed higher specificity (90% vs 55%) [7]. This sensitivity-specificity trade-off is clinically important because ED screening tools should ideally minimize false-negative results, especially during the initial assessment of patients with suspected infection.

NEWS and NEWS2 generally appear to perform better than qSOFA as early screening tools. Mellhammar et al. directly compared NEWS2 and qSOFA in two ED cohorts and reported higher AUC values for NEWS2 than qSOFA for a composite outcome including sepsis with organ dysfunction, infection-related mortality within 72 hours, or intensive care due to

infection. In the infected cohort, NEWS2 had an AUC of 0.80 compared with 0.71 for qSOFA, while in the undifferentiated ED cohort the corresponding AUC values were 0.70 and 0.62, respectively [6]. NEWS2 also showed substantially higher sensitivity than qSOFA in both cohorts, although qSOFA remained more specific [6]. These findings support the view that NEWS2 may be more suitable for early identification of patients with infection-related organ dysfunction, particularly when the clinical objective is broad screening rather than confirmation of high-risk disease.

Oduncu et al. also demonstrated the different diagnostic profiles of qSOFA and NEWS in a prospective ED cohort. Using SOFA-defined sepsis as the reference standard, qSOFA had low sensitivity for sepsis diagnosis (23%) but very high specificity (99%). NEWS showed a more balanced profile, with sensitivity of 58% and specificity of 81%, while SIRS had higher sensitivity (77%) but poor specificity (35%) [15]. This suggests that NEWS may occupy an intermediate position between highly sensitive but poorly specific inflammatory criteria and highly specific but insensitive bedside scores such as qSOFA.

SOFA differs from qSOFA and NEWS2 because it is closely linked to the Sepsis-3 definition itself. It is not primarily a rapid triage score, but rather a structured assessment of organ dysfunction. In diagnostic terms, SOFA is valuable because it reflects the conceptual definition of sepsis as infection-related organ dysfunction [2,3]. However, this strength also creates practical limitations in the ED. Full SOFA calculation requires several laboratory and clinical variables, including PaO₂/FiO₂ ratio, platelet count, bilirubin, creatinine or urine output, Glasgow Coma Scale score, and cardiovascular parameters such as mean arterial pressure or vasopressor requirement [3]. Since these data may not be immediately available at triage, SOFA is better suited for organ dysfunction assessment after initial diagnostic work-up than for rapid front-door screening in the emergency department [3,16].

More recent studies have reinforced the idea that no single score provides ideal diagnostic accuracy in isolation. Wanlunghao et al. compared several early sepsis screening tools in a resource-limited ED setting and found that qSOFA had the highest specificity but very low sensitivity. In that study, qSOFA showed sensitivity of 16% and specificity of 91%, whereas NEWS2 showed sensitivity of 68% and specificity of 52%, with a slightly higher AUROC for NEWS2 than qSOFA (0.625 vs 0.577) [18]. Similarly, Hincapié-Osorno et al. evaluated MEWS, NEWS, NEWS2 and qSOFA across different infection foci in ED patients and found that performance varied depending on infection source, further highlighting the heterogeneity of score performance across clinical subgroups [14].

Overall, the diagnostic evidence suggests a consistent pattern across ED studies. qSOFA is highly specific but insufficiently sensitive for stand-alone ED screening, which limits its ability to exclude sepsis or early organ dysfunction when used in isolation [4,6,7,15,18,19]. NEWS/NEWS2 generally appears to offer a more favorable diagnostic profile for early identification of patients with suspected infection or sepsis-related organ dysfunction, mainly because it captures a broader range of physiological abnormalities and has shown higher sensitivity and better overall discrimination than qSOFA in several ED-based studies [4,6,7,15,18]. However, this conclusion should be interpreted with caution because part of the available evidence evaluates NEWS rather than NEWS2 specifically. SOFA remains important within the Sepsis-3 framework for confirming organ dysfunction, but its dependence on laboratory and clinical variables limits its immediate diagnostic utility at triage [2,3,16].

Prognostic performance

The prognostic performance of qSOFA, SOFA and NEWS2 has been evaluated using several outcomes, including in-hospital mortality, 28- or 30-day mortality, intensive care unit admission and early clinical deterioration. Compared with diagnostic performance, prognostic assessment is more dependent on the timing of score calculation, the outcome window used, and the severity of the included population. Nevertheless, several clinically relevant patterns can be identified.

qSOFA was originally introduced as a bedside tool to identify patients with suspected infection who are at increased risk of poor outcomes outside the ICU [3]. Its prognostic value is mainly related to its specificity: patients with a positive qSOFA score often represent a more severely ill subgroup. However, the same limitation observed in diagnostic studies also applies to prognostic use. Because many patients who later deteriorate may not meet qSOFA criteria at presentation, qSOFA can miss a clinically important proportion of patients at risk. In the study by Brink et al., NEWS showed the best discrimination for both 10-day and 30-day mortality in ED patients with suspected sepsis, with AUC values of 0.837 and 0.779, respectively. The corresponding AUC values were lower for qSOFA (0.744 and 0.697) and SIRS (0.646 and 0.631) [5]. Durr et al. similarly found that NEWS outperformed qSOFA not only for sepsis detection, but also for clinically relevant outcomes: for ICU admission, NEWS had sensitivity of 82% compared with 33% for qSOFA, and for 28-day mortality the corresponding values were 88% and 37% [7].

NEWS and NEWS2 have shown strong prognostic performance in several ED-based studies. Brink et al. reported that NEWS had higher AUC values than qSOFA and SIRS for predicting both 10-day and 30-day mortality [5]. Durr et al. similarly found that NEWS outperformed qSOFA not only for sepsis detection, but also for predicting ICU admission and 28-day mortality [7]. These findings support the use of NEWS/NEWS2 as tools for early identification of patients with suspected infection who may require escalation of care.

The value of repeated measurements is particularly relevant in the ED, where a patient's condition may evolve during observation and treatment. Zonneveld et al. assessed serial measurements of NEWS, qSOFA and SIRS in early sepsis and found that NEWS had better prognostic accuracy for predicting ICU admission or death within 72 hours. At the most informative time point, NEWS outperformed qSOFA and SIRS, with AUC differences of 0.092 and 0.137, respectively [10]. This supports the broader concept that repeated physiological assessment may provide additional prognostic information during ED stay. Since NEWS2 is based on routinely measured physiological variables and was designed as an updated version of NEWS, it is clinically plausible to apply this concept to NEWS/NEWS2-based monitoring; however, the direct serial prognostic evidence in this context comes mainly from studies evaluating NEWS rather than NEWS2 specifically [10,11].

Studies evaluating specific patient subgroups also support the prognostic role of NEWS/NEWS2. In immunocompromised ED patients with sepsis, Boekhoud et al. found that NEWS had higher prognostic accuracy than qSOFA for predicting in-hospital mortality, both in the overall cohort (AUC 0.752 vs 0.683) and in immunocompromised patients (AUC 0.757 vs 0.663) [13]. Hincapié-Osorno et al. showed that NEWS and NEWS2 generally performed well for mortality and ICU admission prediction across different infection foci, although performance varied depending on the source of infection. For example, NEWS and NEWS2 achieved the highest AUC for in-hospital mortality in abdominal infections (0.86 for both),

whereas qSOFA showed lower performance in this subgroup (AUC 0.64) [14]. These findings suggest that NEWS2 may be more robust than qSOFA across heterogeneous ED populations, although its performance is not uniform in all clinical contexts.

SOFA has a different prognostic role. Because it measures organ dysfunction across multiple organ systems, it is conceptually well suited to severity assessment and mortality prediction in sepsis. Abdullah et al. compared SOFA, qSOFA and SIRS in ED patients with infection and found that SOFA had better prognostic accuracy than qSOFA and SIRS for 28-day mortality, although the overall predictive performance remained imperfect [16]. Saeed et al., in a multicentre ED study of patients with suspected infection, also included SOFA, qSOFA and NEWS among clinical predictors of disease progression and mortality. In that study, SOFA and qSOFA showed stronger prognostic discrimination than NEWS in some analyses, although the study was primarily focused on the incremental value of biomarkers rather than direct score comparison alone [17].

Taken together, the prognostic literature suggests that qSOFA may be useful for identifying patients who are already at high risk, but its low sensitivity limits its value as the only ED risk stratification tool [5,7,15,18]. NEWS/NEWS2 appears better suited for early prognostic screening and repeated monitoring, particularly for outcomes such as ICU admission, short-term mortality and early deterioration, although not all supporting studies evaluated NEWS2 as a distinct score [5–7,10,13,14]. SOFA remains important within the Sepsis-3 framework and may provide useful prognostic information once laboratory and clinical data are available [2,3,16,17]. Therefore, the prognostic value of each score depends not only on its statistical performance, but also on the timing of assessment, data availability and the clinical decision it is intended to support.

Discussion

The present review highlights that qSOFA, SOFA and NEWS/NEWS2 should not be interpreted as interchangeable tools in the emergency department. Although all three scoring approaches are used in the context of suspected sepsis, they differ substantially in their structure, intended purpose, data requirements and clinical utility. The available evidence suggests a consistent pattern: qSOFA is simple and highly specific but insufficiently sensitive for stand-alone screening; SOFA remains important within the Sepsis-3 concept of organ dysfunction but is limited by the need for laboratory and clinical data; and NEWS/NEWS2 generally appears more suitable for early detection of physiological deterioration and initial ED risk stratification [2–8,10,13–18].

One of the most important findings of this review is the recurrent trade-off between sensitivity and specificity. In the ED, this trade-off has direct clinical consequences. A highly specific score such as qSOFA may help identify patients who are already at high risk of adverse outcomes, but its low sensitivity means that many patients with early sepsis or evolving organ dysfunction may not be detected if qSOFA is used alone [4,6,7,15,18,19]. This is particularly problematic in the early phase of ED assessment, where the clinical priority is often to avoid missed or delayed recognition. The 2021 Surviving Sepsis Campaign guidelines directly support this concern, recommending against the use of qSOFA compared with SIRS, NEWS or MEWS as a single screening tool for sepsis or septic shock [9]. Therefore, qSOFA may be more appropriately understood as a rapid bedside high-risk flag rather than a primary stand-alone screening instrument.

NEWS/NEWS2 offers a different clinical profile. Because these scores incorporate multiple physiological variables, they are more sensitive to early deterioration than qSOFA and may identify a broader group of patients requiring urgent reassessment or escalation of care [6,7,10–14,18]. This makes the NEWS/NEWS2 approach particularly relevant in ED triage and observation areas, where patients may deteriorate before laboratory data or definitive diagnoses are available. The ability to repeat physiological scoring during ED stay is also clinically important, as serial assessment may better reflect dynamic changes in the patient's condition than a single score calculated at presentation [10,11]. However, the strength of NEWS/NEWS2 is also its limitation: these scores are not specific to sepsis. A high NEWS2 score indicates physiological instability, but it does not distinguish infection-related organ dysfunction from respiratory failure, cardiac disease, metabolic disorders, trauma or other acute conditions. Thus, NEWS2 should not be treated as a diagnostic test for sepsis, but rather as an early warning and escalation tool in patients with suspected infection.

SOFA occupies a different position in the diagnostic pathway. Its main strength is conceptual and clinical: it directly reflects organ dysfunction and is embedded in the Sepsis-3 definition of sepsis [2,3]. Compared with qSOFA and NEWS2, SOFA provides a more comprehensive assessment of disease severity across multiple organ systems. Studies evaluating SOFA in ED patients with suspected infection suggest that it may provide better prognostic information than simpler tools once the required data are available [16]. However, its dependence on laboratory variables, oxygenation indices, renal function, coagulation parameters and cardiovascular support limits its usefulness as an immediate front-door screening tool. In practical ED workflow, SOFA is therefore better suited for confirmation of organ dysfunction and severity assessment after initial work-up rather than for rapid triage at arrival.

The findings of this review suggest that the question should not be framed as which score is universally superior. A more clinically useful approach is to consider the intended purpose and timing of each score. NEWS2 may be most appropriate for early screening and repeated monitoring because it is sensitive to physiological deterioration and can be calculated using routinely collected vital signs. qSOFA may be useful for identifying a smaller subgroup of patients at particularly high risk, especially when a positive score is present. SOFA remains essential for defining and quantifying organ dysfunction within the Sepsis-3 framework, particularly after laboratory results become available. In this model, the scores are complementary rather than strictly competitive.

This staged interpretation may be especially relevant in the ED, where decisions are made under time pressure and with incomplete information. At triage, a more sensitive tool may be preferable because delayed recognition of sepsis may postpone early antimicrobial therapy, haemodynamic support, source control and escalation of care, all of which are emphasized in contemporary sepsis guidelines [9]. During subsequent ED observation, repeated physiological scoring may help detect deterioration and guide reassessment, although the strongest serial evidence identified in this review relates mainly to NEWS rather than NEWS2 [10,11]. After laboratory results and additional clinical data are available, SOFA can support diagnostic classification and severity assessment, consistent with its role in the Sepsis-3 framework and with studies showing its prognostic value in ED patients once the required variables are available [2,3,16]. Such an approach is consistent with the broader evidence showing that NEWS/NEWS2 generally performs better for early detection and short-term deterioration, whereas SOFA remains important for organ dysfunction assessment and qSOFA retains value mainly as a specific marker of higher risk [2–7,9,10,13–18].

Several limitations of the available evidence should be considered. First, relatively few studies directly compare qSOFA, full SOFA and NEWS2 in the same adult ED cohort. Many studies compare qSOFA with NEWS or NEWS2, while SOFA is often used as a reference standard or later severity measure rather than as a true triage competitor [6,7,15,18]. Second, many high-yield studies evaluate NEWS rather than NEWS2. Although NEWS2 is an updated version of the original NEWS and shares the same general purpose, this distinction should be acknowledged when interpreting older studies and when formulating conclusions specifically about NEWS2 [10,11]. For this reason, statements based on mixed evidence should preferably refer to the broader NEWS/NEWS2 approach unless the cited study directly evaluated NEWS2. Third, there is considerable heterogeneity across studies in terms of patient selection, sepsis definitions, timing of score calculation, cut-off values and outcomes. Some studies focus on Sepsis-3-defined sepsis, others on suspected infection, organ dysfunction, ICU admission, 28- or 30-day mortality, or composite endpoints. This heterogeneity limits direct comparison and makes pooled interpretation difficult.

There are also limitations related to the design of this review. As a structured narrative literature review, this study synthesized the available evidence descriptively and did not perform a formal meta-analysis. Therefore, no pooled estimates of sensitivity, specificity or AUC were calculated. This approach was chosen because of substantial methodological heterogeneity between studies, including differences in populations, definitions, thresholds, timing of assessment and reported outcomes. In addition, some of the most informative comparative studies evaluated NEWS rather than NEWS2 specifically, which limits the strength of conclusions that can be drawn for NEWS2 as a distinct score. Nevertheless, the consistency of the main pattern across multiple ED studies strengthens the overall conclusion: qSOFA is usually more specific but less sensitive, NEWS/NEWS2 is generally more sensitive and practical for early screening, and SOFA remains valuable for assessing organ dysfunction once sufficient data are available [4–8,10,13–18].

From a practical perspective, the available evidence suggests that the role of each score should be interpreted in relation to the timing and purpose of ED assessment. NEWS/NEWS2 appears most relevant during early triage and repeated observation, qSOFA may identify a smaller group of patients with more advanced physiological compromise, and SOFA remains most useful once laboratory and clinical data are available for organ dysfunction assessment. However, these tools should be viewed as adjuncts to, rather than replacements for, clinical judgement. This proposed staged use should be understood as a practice-oriented synthesis of the available evidence, not as a validated clinical pathway. Future studies should focus on direct head-to-head comparisons of qSOFA, SOFA and NEWS2 in adult ED populations, standardized outcome definitions, serial score measurements, and integrated strategies combining clinical assessment, early warning scores and laboratory markers.

Conclusions

No single scoring system appears sufficient as a universal tool for the assessment of adult patients with suspected sepsis in the emergency department. The available evidence suggests that qSOFA, SOFA and NEWS/NEWS2 serve different clinical purposes and should not be interpreted as interchangeable instruments.

NEWS/NEWS2 generally appears to offer a favorable balance between sensitivity and practical bedside applicability for early ED screening and repeated monitoring. However, this conclusion should be interpreted with caution, as some of the available comparative evidence refers to

NEWS rather than NEWS2 specifically, and score performance may vary across patient subgroups and infection sources [10,13,14]. qSOFA remains valuable as a rapid bedside tool for identifying patients at higher risk of adverse outcomes, but its limited sensitivity makes it unsuitable as a stand-alone screening instrument, particularly at triage [9,19]. SOFA remains important within the Sepsis-3 framework for confirming and quantifying organ dysfunction and may provide useful prognostic information once laboratory and clinical variables are available, although these same requirements limit its immediate use at triage [2,3,16].

In clinical practice, these scores may be most useful when applied according to the stage of ED assessment: NEWS/NEWS2 for early recognition and monitoring, qSOFA for high-risk bedside stratification, and SOFA for subsequent organ dysfunction assessment after initial diagnostic work-up. This staged approach should be considered a practice-oriented interpretation of the available evidence rather than a validated clinical pathway. Future research should focus on direct comparisons of qSOFA, SOFA and NEWS2 in adult ED populations using standardized definitions, clinically relevant outcomes and serial measurements.

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