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Multi-component Clinical Audit of the WHO Interagency Integrated Triage Tool in a Baghdad's Emergency Departments

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Abstract: Background: The World Health Organization (WHO) Interagency Integrated Triage Tool (IITT) is designed to prioritize patients by acuity in resource-limited emergency units. We audited criterion concordance, care timeliness, selected resuscitation-equipment readiness, and staff training in a general hospital in Baghdad. **Methods:** This prospective single-centre clinical audit combined direct observation of 297 non-traumatic patients aged ≥12 years, 37 resuscitation-area checklist occasions, and 75 staff questionnaires from January to April 2026. Because the locally adapted observation form combined WHO emergency signs with high-risk criteria, analyses distinguished selected emergency signs requiring RED assignment from high-risk criteria requiring at least YELLOW assignment. Times were summarized as median [interquartile range]; categorical results include Wilson 95% confidence intervals (CI). **Results:** Patients had a median age of 53 [31–65] years; 101 (34.0%) were assigned RED, 129 (43.4%) YELLOW, and 67 (22.6%) GREEN. Arrival-to-triage time was available for 262 encounters and was 0 [0–5] minutes; 224/262 (85.5%, 95% CI 80.7–89.2) were triaged within 5 minutes. Fifty-one patients had ≥1 recorded selected emergency sign; 12/51 (23.5%, 95% CI 14.0–36.8) were assigned YELLOW rather than RED. Thirty-one had only high-risk criteria; 1/31 (3.2%, 95% CI 0.6–16.2) was assigned GREEN. First-intervention times were 7 [5–11.2], 12 [10–18], and 15 [10–19] minutes for RED, YELLOW, and GREEN patients, respectively ($p<0.001$). Among assigned RED patients, 72/100 (72.0%, 95% CI 62.5–79.9) received an intervention within 10 minutes. In an exploratory analysis, patients with emergency signs assigned below RED had slower intervention than concordantly assigned RED patients (10 [7–12.8] vs 5 [5–9.5] minutes; $p=0.011$). The crash cart was fully stocked on 25/37 (67.6%) checklist occasions. None of five nurse respondents reported formal triage training, compared with 61/69 (88.4%) physicians (Fisher exact $p<0.001$). **Conclusions:** Triage occurred rapidly, but selected emergency signs were sometimes assigned below RED and these discordant assignments were associated with slower intervention. Priority actions are criterion-based competency training, complete documentation, routine time-to-intervention monitoring, and standardized crash-cart checks. Independent expert re-triage and patient outcomes are required for formal IITT accuracy validation.

Keywords: Emergency Department; Triage; Interagency Integrated Triage Tool; Clinical Audit; Timeliness; Resuscitation Readiness; Iraq.

INTRODUCTION

Emergency care systems must identify time-sensitive illness early and direct limited personnel and resources to patients who need immediate treatment. The WHO Emergency Care System Framework and World Health Assembly Resolution 72.16 identify triage, early resuscitation, trained staff, and functional equipment as core components of timely emergency care. [WHO, 2026; WHO, 2018; WHO, 2019; WHO, 2018]

The WHO, International Committee of the Red Cross, and Médecins Sans Frontières developed the Interagency Integrated Triage Tool (IITT) for facility-based routine triage. The adult tool uses three categories: RED for emergency signs requiring immediate care, YELLOW for urgent or high-risk presentations, and GREEN for patients who can safely wait. [1] The accompanying WHO Basic Emergency Care approach links triage to structured ABCDE assessment and initial management. [WHO, 2018]

Published IITT evaluations from Papua New Guinea support rapid application, reasonable discrimination of time-critical illness, and good inter-rater reliability, but performance varies by setting and reference standard. [Mitchell, R. *et al.*, 2021; Mitchell, R. *et al.*, 2022; Mitchell, R. *et al.*, 2024] Triage research is complicated by the absence of a universally accepted gold standard: expert re-rating, clinical outcomes, and criterion-based rules answer different questions and should not be treated as interchangeable measures of accuracy. [Hinson, J. S. *et al.*, 2019; Zachariasse, J. M. *et al.*, 2019; Twomey, M. *et al.*, 2007]

Iraqi emergency units have historically reported gaps in standardized triage, documentation, training, and readiness. [Khdr, S. A. 2025; Lafta,

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R. K., & Al-Nuaimi, M. A. 2013] More recent Iraqi work suggests that implementation of WHO triage may improve outcomes, but detailed process audits remain limited.[Khdr, S. A. 2025] We therefore performed a multi-component audit of an emergency department in Baghdad to evaluate: (1) concordance of assigned categories with selected IITT emergency and high-risk criteria recorded on a locally adapted form; (2) time to triage, medical evaluation, and first intervention; (3) selected resuscitation-area and crash-cart readiness; and (4) staff training exposure, IITT familiarity, and self-rated confidence.

METHODS

This was a prospective, single-centre, mixed-component clinical audit conducted in the emergency department of Al-Zaafaraniya General Hospital, Baghdad, Iraq, from January through April 2026. The approved protocol covers two emergency departments of the Al-Rusafa Health Directorate — Al-Zaafaraniya General Hospital and Al-Numan Teaching Hospital — where data collection is ongoing; the present report is restricted to the completed Al-Zaafaraniya dataset and is therefore single-centre. The audit comprised patient-level direct observations, repeated resuscitation-area checklist assessments, and an anonymous staff questionnaire. Reporting was prepared with reference to the STROBE checklist for cross-sectional observational studies. [5]

The patient component included non-traumatic patients aged ≥12 years observed during audit sessions. Trauma patients, patients arriving in cardiac arrest, direct intensive-care admissions bypassing triage, and patients declining assessment were excluded. The staff component invited physicians and nurses working in triage. The readiness component included 37 checklist occasions over 18 calendar weeks. No formal sample-size calculation was performed because this was a service audit; all eligible observations available during the audit period were analyzed.

The patient form recorded assigned category, vital-sign documentation, selected clinical signs, transfer to the resuscitation area, and elapsed times to evaluation and intervention. The local form did not reproduce every IITT RED and YELLOW criterion and combined emergency signs with high-risk findings. To align analysis with the WHO adult IITT, recorded severe respiratory distress, stridor, cyanosis, inability to speak, shock signs, severe bleeding, very low blood pressure, altered mental status, seizure, and unconsciousness were treated as selected emergency signs requiring RED assignment. Generic abnormal breathing/hypoxia, isolated severe tachycardia, and AVPU=P/U were treated as high-risk criteria requiring at least YELLOW assignment, unless a selected emergency sign was also present. This mapping was specified for the reanalysis because isolated high-risk vital signs are not automatically RED in the WHO adult IITT.[1]

A trained auditor recorded patient information and process times in real time using the locally adapted form. The readiness checklist assessed 11 selected items: defibrillator availability and function, monitor, oxygen, suction, adult and pediatric bag-valve masks, oropharyngeal airways, laryngoscope and blades, intravenous cannulas, and crash-cart completeness. Staff reported professional role, years of experience, formal triage training, IITT familiarity, WHO Basic Emergency Care completion, confidence in recognizing emergency signs (0–10), and free-text challenges.

The primary patient-level outcome was minimum-category concordance: selected emergency-sign encounters were expected to be RED, and high-risk-only encounters were expected to be RED or YELLOW. Emergency-sign under classification was the proportion of selected emergency-sign encounters assigned YELLOW or GREEN. High-risk under classification was the proportion of high-risk-only encounters assigned GREEN. These are criterion-concordance measures, not validated diagnostic-accuracy estimates. Secondary outcomes were arrival-to-triage time, vital-sign documentation, time to medical evaluation, time to first intervention, the proportion of assigned RED patients receiving an intervention within 10 minutes, selected-item readiness, crash-cart completeness, and staff training indicators.

The spreadsheet contained malformed and incomplete clock entries. Clock times were parsed only when they conformed to a valid 12-hour time or an Excel time fraction; overnight intervals were resolved by adding 24 hours, and intervals >120 minutes were treated as implausible and missing. Elapsed evaluation and intervention times were parsed from the recorded minute fields. Two criterion fields—abnormal breathing/hypoxia and shock signs—contained spreadsheet errors in 244 and 242 records, respectively; positive valid entries were retained, but missing/error entries were not assumed to be negative. One of 37 readiness checklists was incomplete; item-specific denominators are therefore shown, and the

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composite readiness score was calculated for 36 complete checklists. Continuous variables are reported as median [IQR] or mean ±SD as appropriate. Kruskal–Wallis tests compared time distributions across categories; significant omnibus tests were followed by pairwise Mann–Whitney tests with Holm correction. Categorical variables were compared using χ^2 or Fisher exact tests. Wilson 95% CIs are reported for key proportions. Exploratory comparison of intervention time between concordant RED and under classified emergency-sign patients was prespecified during manuscript revision as a process-safety analysis. Two-sided $p<0.05$ was considered statistically significant. Analyses used Python (SciPy and stats models).

The audit used anonymous patient and staff data and was undertaken as a quality-improvement/service-evaluation activity. It was approved by the Training and Human Development Section of the Al-Rusafa Health Directorate, Iraqi Ministry of Health (approval No. 8891, 2 February 2026), following the institutional request submitted by Al-Zaafaraniya General Hospital (No. 423, 21 January 2026), and the topic is listed among the Ministry of Health research priorities. Administrative facilitation for the participating emergency departments was issued under letter No. 9297, 9 February 2026. No individually identifiable patient information was recorded, no aspect of clinical management was altered by the audit, and staff participation was voluntary and anonymous.

RESULTS

The analysis included 297 patient observations, 37 resuscitation-area checklist occasions, and 75 staff questionnaires. One staff questionnaire had an unclassifiable role code and incomplete training fields; it was retained only in the total response count and excluded from role-specific comparisons. Arrival and triage clock times yielded a valid interval for 262/297 (88.2%) patient observations.

Patients had a median age of 53 years [IQR 31–65; range 12–95], 153 (51.5%) were female, and all 297 arrived as walk-in patients. Assigned categories were RED in 101 (34.0%), YELLOW in 129 (43.4%), and GREEN in 67 (22.6%) encounters (Table 1).

Table 1. Characteristics of patient observations (N=297)

Age, years — median [IQR]	53 [31–65]
Age, years — mean ± SD (range)	50.4 ± 20.3 (12–95)
Age group, n (%)	
12–17 years	12 (4.0)
18–39 years	81 (27.3)
40–64 years	114 (38.4)
≥65 years	90 (30.3)
Sex, n (%)	
Female	153 (51.5)
Male	144 (48.5)
Mode of arrival, n (%)	
Walk-in	297 (100.0)
Ambulance/EMS	0 (0.0)
Assigned triage category, n (%)	
RED	101 (34.0)
YELLOW	129 (43.4)
GREEN	67 (22.6)

Turning to the timeliness of care, arrival-to-triage time was 0 [0–5] minutes, and 224/262 (85.5%, 95% CI 80.7–89.2) valid observations were triaged within 5 minutes. The continuous triage-delay distribution differed across categories (Kruskal–Wallis p=0.001), driven by longer delays in GREEN than RED or YELLOW encounters, whereas the proportion meeting the 5-minute benchmark did not differ significantly (χ^2 p=0.114). Vital signs were documented in 259 (87.2%) encounters and were least often recorded in GREEN patients (76.1%; χ^2 p=0.008).

Time to medical evaluation and first intervention both differed across assigned categories (Kruskal–Wallis p<0.001 for each). First-intervention medians were 7 [5–11.2] minutes for RED, 12 [10–18] for YELLOW, and 15 [10–19] for GREEN. Among 100 RED patients with recorded

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intervention time, 72 (72.0%, 95% CI 62.5–79.9) received an intervention within 10 minutes (Table 2; Figure 1).

Table 2. Triage-process timeliness and documentation, overall and by assigned category

Arrival-to-triage time, min — median [IQR] (n)	0 [0–5] (n=262)	0 [0–3] (n=93)	0 [0–3.2] (n=112)	3 [0–5] (n=57)	0.001
Triaged within 5 min, n/N (%)	224/262 (85.5)	83/93 (89.2)	97/112 (86.6)	44/57 (77.2)	0.114
Vital signs recorded, n (%)	259/297 (87.2)	92/101 (91.1)	116/129 (89.9)	51/67 (76.1)	0.008
Time to medical evaluation, min — median [IQR] (n)	5 [5–10] (n=296)	5 [3–6] (n=100)	5 [5–10] (n=129)	10 [5–10] (n=67)	<0.001
Evaluated within 10 min, n/N (%)	284/296 (95.9)	98/100 (98.0)	122/129 (94.6)	64/67 (95.5)	0.419
Time to first intervention, min — median [IQR] (n)	10 [8–18] (n=296)	7 [5–11.2] (n=100)	12 [10–18] (n=129)	15 [10–19] (n=67)	<0.001
Intervention within 10 min, n/N (%)	157/296 (53.0)	72/100 (72.0)	60/129 (46.5)	25/67 (37.3)	<0.001

Tests: *Kruskal–Wallis for continuous times and χ^2 for proportions. The 10-minute intervention benchmark is clinically relevant to assigned RED patients; values for YELLOW and GREEN are shown to describe prioritisation, not category-specific WHO compliance.*

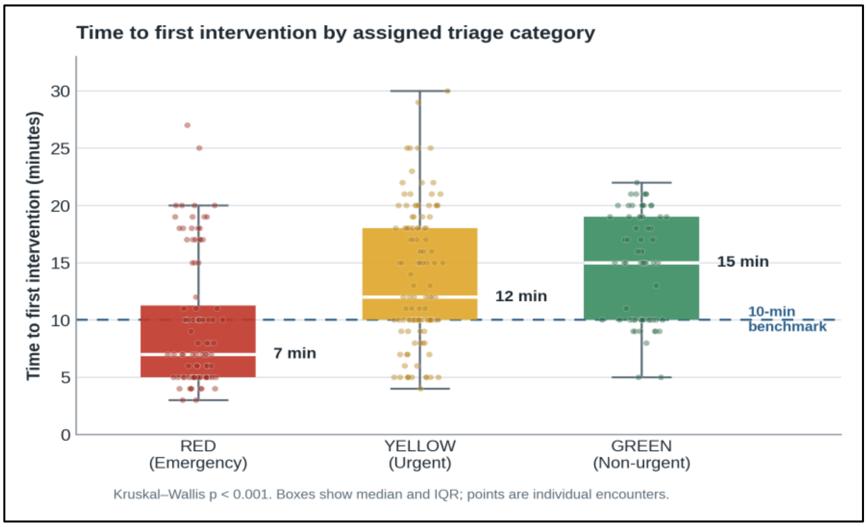

Figure 1. Distribution of time to first intervention by assigned triage category. The dashed line marks 10 minutes. Kruskal–Wallis p<0.001.

Concordance between assigned categories and the recorded criteria was then examined. Fifty-one patients (17.2%) had at least one recorded selected emergency sign. Thirty-nine (76.5%) were assigned RED and 12 (23.5%, 95% CI 14.0–36.8) were assigned YELLOW; none was assigned GREEN. Thirty-one patients (10.4%) had high-risk criteria without a selected emergency sign. Of these, 18 were assigned RED, 12 YELLOW, and 1 GREEN, giving high-risk under classification of 1/31 (3.2%, 95% CI 0.6–16.2). Overall, 13/82 (15.9%, 95% CI 9.5–25.3) criterion-positive encounters were assigned below the minimum category indicated by the recorded criteria, equivalent to 13/297 (4.4%) of all observations (Table 3; Figure 2).

The 12 underclassified emergency-sign encounters included altered mental status (n=5), severe respiratory distress (n=4), very low blood pressure (n=2), shock signs (n=1), and seizure (n=1); some patients had more than one sign. In an exploratory analysis, underclassified emergency-sign patients had a longer time to first intervention than concordantly assigned RED patients (10 [7–12.8] vs 5 [5–9.5] minutes; Mann–Whitney p=0.011). Intervention within 10 minutes occurred in 7/12 (58.3%) versus 33/38 (86.8%), respectively (Fisher exact p=0.046).

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Table 3. Assigned category according to the minimum category indicated by recorded selected criteria

Selected emergency sign(s): expected RED	39	12	0	51
High-risk criterion only: expected ≥YELLOW	18	12	1	31
No selected criterion documented	44	105	66	215
Total	**101**	**129**	**67**	**297**

The "no selected criterion" group cannot be used to estimate over-triage because the local form did not capture the full IITT and two fields were corrupted in most records.

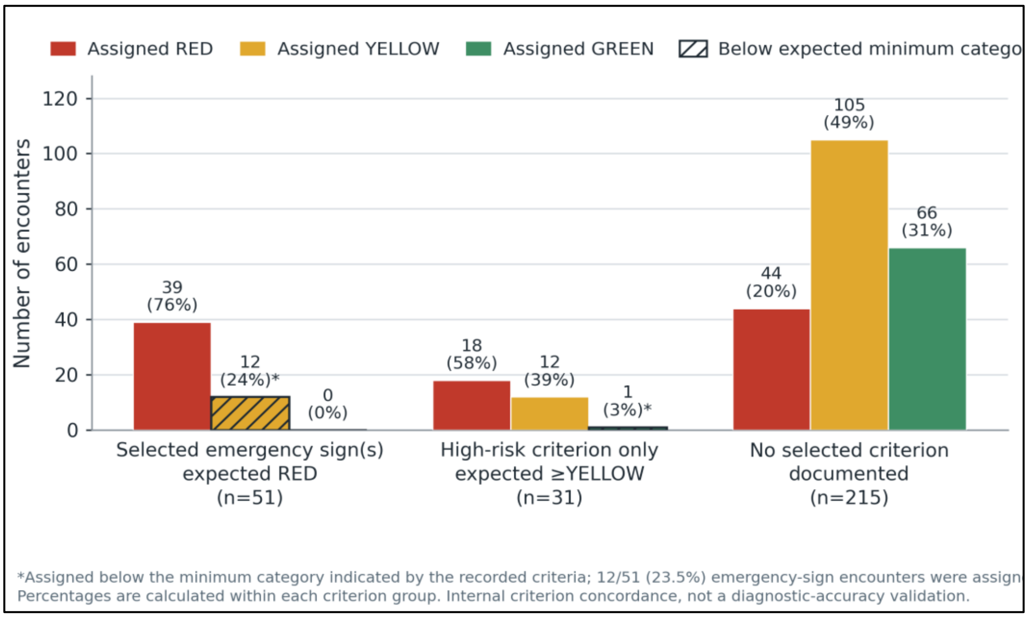

Figure 2. Assigned category within groups defined by the minimum category indicated by the recorded selected criteria. Percentages are calculated within each criterion group. Hatched bars marked with an asterisk indicate encounters assigned below the expected minimum category, comprising 12/51 emergency-sign encounters assigned YELLOW and 1/31 high-risk-only encounters assigned GREEN. The analysis evaluates internal criterion concordance and is not a formal diagnostic-accuracy validation.

Table 4. Frequency of recorded selected emergency and high-risk criteria (N=297)

Severe respiratory distress	17 (5.7)
Stridor	0 (0.0)
Cyanosis	10 (3.4)
Inability to speak	8 (2.7)
Shock signs	10 (3.4)
Severe bleeding	4 (1.3)
Very low BP	12 (4.0)
Altered mental status	20 (6.7)
Seizure	5 (1.7)
Unconsciousness	4 (1.3)
Abnormal breathing / hypoxia (high-risk)	28 (9.4)
Severe tachycardia (high-risk)	21 (7.1)
AVPU = P or U (high-risk)	0 (0.0)

With respect to resuscitation-area readiness, thirty-seven checklist occasions were recorded across 18 calendar weeks; one checklist was incomplete. Among assessed occasions, defibrillator availability and function, monitoring, oxygen, adult and pediatric bag-valve masks, laryngoscope, and intravenous cannulas were documented as ready on every occasion on which they were assessed. Suction and oropharyngeal-airway readiness were each documented on 34/36 (94.4%) complete assessments. The crash cart was fully stocked on 25/37 (67.6%, 95% CI 51.5–80.4) occasions. Among 36 complete checklists, the mean selected-item readiness score was 96.2%, the median was 100%, and 22/36 (61.1%) were fully ready (Figure 3).

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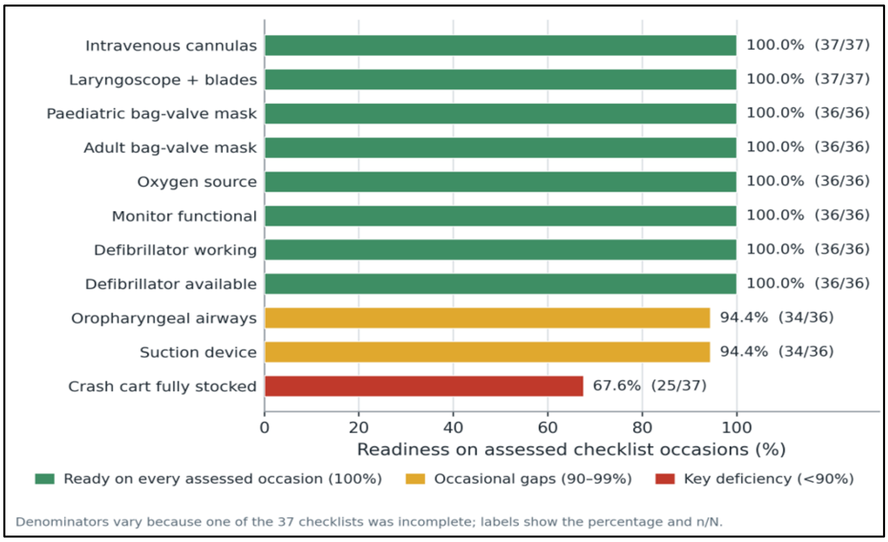

Figure 3. Availability or functionality of 11 selected resuscitation-area items across 37 checklist occasions. Bars are colour-coded by readiness level. Denominators vary because one checklist was incomplete; labels show the percentage and n/N.

Finally, staff training, familiarity, and confidence were assessed. The 75 staff questionnaires comprised 69 physicians, 5 nurses, and 1 incomplete/unclassifiable response. Physicians had a median of 2 [1–2] years of experience, compared with 9 [5–10] years among nurses. Formal triage training was reported by 61/69 (88.4%) physicians and 0/5 nurses; IITT familiarity by 60/69 (87.0%) and 0/5; and WHO Basic Emergency Care completion by 65/69 (94.2%) and 1/5 (20.0%), respectively (all Fisher exact $p<0.001$). Median self-rated confidence was 10 [10–10] among physicians and 7 [5–8] among nurses (Mann–Whitney $p<0.001$). Because only five nurses participated and the total eligible staff denominator was not recorded, these estimates require cautious interpretation.

Free-text responses most often mentioned non-urgent or "cold" presentations (22/74 responses), nursing shortage (21/74), overcrowding (19/74), accompanying relatives (14/74), and simultaneous presentation of multiple critical patients (14/74). These counts were generated by simple keyword coding and should be regarded as descriptive.

Table 5. Staff training and self-rated confidence by professional role

Years of experience — median [IQR]	2 [1–2]	9 [5–10]	<0.001
Formal triage training, n (%)	61 (88.4)	0 (0.0)	<0.001
Familiar with IITT, n (%)	60 (87.0)	0 (0.0)	<0.001
Completed WHO BEC, n (%)	65 (94.2)	1 (20.0)	<0.001
Confidence identifying emergency signs — median [IQR]	10 [10–10]	7 [5–8]	<0.001

DISCUSSION

This audit identified a mixed picture. Triage was generally rapid and assigned category was associated with progressively faster evaluation and intervention. Nevertheless, nearly one-quarter of encounters with a recorded selected emergency sign were assigned YELLOW rather than RED, and these discordant assignments were associated with a clinically meaningful delay in first intervention. The audit also identified incomplete vital-sign documentation, inconsistent crash-cart stocking, and a pronounced self-reported training gap among the small nurse sample.

Considering first the interpretation of criterion concordance, the revised analysis materially changes the interpretation of the original manuscript. The local form had labelled isolated severe tachycardia, generic abnormal breathing/hypoxia, and AVPU=P/U as "red flags," although the WHO adult IITT treats high-risk vital signs as a route to YELLOW when no RED sign is present. [1] Counting YELLOW assignments for such high-risk findings as under-triage would therefore misclassify correct IITT decisions as errors. After separating emergency signs from high-risk criteria, emergency-sign under classification was 23.5%, while high-risk-only under classification to GREEN was 3.2%. The

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former remains clinically important, particularly because altered mental status and severe respiratory distress were among the missed emergency signs.

These findings can be placed alongside the wider IITT evidence base. Direct numerical comparison with prior IITT validation studies is limited because their reference standards differed. The 2021 Papua New Guinea pilot linked triage categories to outcomes and expert assessment, while the 2022 regional study examined predictive validity and inter-rater reliability. [Mitchell, R. *et al*., 2021; Mitchell, R. *et al*., 2022] A 2024 prospective study reported 70.0% sensitivity for eight prespecified time-critical conditions and excellent inter-rater reliability (κ=0.83). [Mitchell, R. *et al*., 2024] Our study did not include independent re-triage, definitive diagnoses, admission, deterioration, or mortality; it therefore assesses adherence to recorded criteria rather than sensitivity, specificity, or predictive validity. This distinction should remain explicit in the title, abstract, and conclusions.

Timeliness deserves particular attention. The median arrival-to-triage interval was very short, and 85.5% of valid observations met the 5-minute benchmark. However, the clinically more important bottleneck was the transition from classification to intervention: 28.0% of assigned RED patients exceeded 10 minutes. The significantly slower intervention among emergency-sign patients assigned below RED supports the process validity of the criterion-concordance finding, although causality cannot be inferred. Prior IITT studies also found short triage-assessment times and clear gradients in outcomes or treatment by assigned category. [Mitchell, R. *et al*., 2021; Mitchell, R. *et al*., 2024] The current audit extends that evidence by showing that a rapid triage encounter alone does not guarantee timely first-line treatment.

Documentation and data quality were further limitations. Vital signs were absent in 12.8% of encounters and most often absent among GREEN patients. In addition, two spreadsheet fields were corrupted in most records, several clock entries were malformed, and the locally adapted form did not capture all WHO RED and YELLOW criteria. These are not merely technical inconveniences: incomplete documentation limits real-time safety checks, prevents valid over-triage estimation, and weakens reproducibility. A redesigned electronic or paper form should separate RED signs, YELLOW signs, and high-risk vital signs exactly as displayed in the WHO tool and should require explicit yes/no completion rather than blank checkboxes.

Readiness of the resuscitation area was another focus. WHO guidance recommends that every emergency unit maintain a designated, continuously available resuscitation area in which equipment, medications, and staff are organized for immediate life-saving intervention. [WHO, 2026] In this audit, the selected core equipment was usually available, but crash-cart completeness was inconsistent. This resembles published observations that repeated checks do not automatically guarantee complete or functional resuscitation carts. [Aljuaid, J., & Al-Moteri, M. 2022] Standardized contents and signed checks are recommended because missing airway, vascular-access, or medication items can delay time-critical care. [Jacquet, G. A. *et al*., 2018] Our readiness result should not be interpreted as full compliance with the entire WHO essential-equipment list because only 11 selected items were audited and crash-cart completeness was recorded as a global yes/no item.

The workforce findings also merit comment. The role-specific training gap is actionable but should not be overgeneralized. None of five nurse respondents reported formal triage training or IITT familiarity, whereas most physicians did. Studies from Iraq, Iran, and Jordan similarly show variable triage knowledge or capability and support structured, recurrent education. [Hajwal, S. K. *et al*., 2025; Aghabarary, M. *et al*., 2023; Malak, M. Z. *et al*., 2022] An observational study in rural Liberia likewise found that emergency-care education combined with triage implementation improved process measures, with triaged patients far more likely to have a complete set of vital signs documented. [Towns, K. *et al*., 2023] The nurse sample here was very small, and nurses had more years of experience than physicians, suggesting that lack of formal exposure—not simply junior status—may explain the difference. Training should include scenario-based competency assessment rather than relying on self-confidence, which was high despite observed classification discordance.

Set in their local and regional context, the findings are consistent with longstanding concerns about protocol use, documentation, and training in Iraqi emergency units.[Lafta, R. K., & Al-Nuaimi, M. A. 2013] A recent Erbil before–after study

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reported lower mortality after WHO triage implementation, but its design cannot isolate which components produced the change. [Khdr, S. A. 2025] The high proportion of non-urgent or "cold" presentations reported by staff is also consistent with the substantial burden of non-urgent visits documented in emergency departments elsewhere in the region. [Al-Otmy, S. S. *et al*., 2020] The present audit identifies specific, measurable process targets—criterion concordance, time to intervention, documentation completeness, and crash-cart readiness—that can support local quality-improvement cycles.

Several strengths and limitations should be weighed when interpreting this audit. Strengths include real-time observation, analysis of several linked components of emergency care, explicit confidence intervals, and reanalysis according to the distinction between WHO RED signs and high-risk criteria. Limitations are substantial. First, the sampling schedule and proportion of all ED presentations observed were not recorded, so selection bias cannot be quantified and the word "consecutive" should be used only if audit-session coverage is documented. Second, the local checklist was incomplete and two fields were corrupted in most records. Third, the same audit process supplied both the recorded signs and assigned category, without independent expert re-triage; formal accuracy, over-triage, and inter-rater reliability cannot be estimated. Fourth, the study recorded process times but not patient outcomes. Fifth, the 37 readiness observations came from a single facility, one checklist was incomplete, and serial observations are not independent. Sixth, the staff survey relied on self-report, included only five nurses, and lacked an eligible-staff denominator. Finally, intervention appropriateness was not retained as a principal outcome because the original form did not specify reproducible adjudication criteria.

These results point to concrete quality-improvement priorities. The most defensible actions are: implement the unmodified WHO adult IITT or a locally translated version with separate RED, YELLOW, and high-risk fields; require complete vital signs and explicit criterion documentation; train all triage staff with competency testing and periodic re-audit; monitor time from arrival and triage to first intervention for RED patients; and use a standardized, itemized crash-cart checklist at the start of each shift. A future multicentre validation should include independent blinded re-triage, inter-rater reliability, patient disposition and outcomes, and a prespecified sample-size calculation.

CONCLUSION

In this Baghdad emergency department, triage was rapid and higher assigned acuity was associated with faster intervention, but selected emergency signs were not consistently assigned RED. Correctly separating WHO emergency signs from high-risk criteria reduced the apparent misclassification compared with the original analysis, yet emergency-sign under classification remained clinically important and was associated with slower first intervention. Incomplete documentation, inconsistent crash-cart stocking, and a nurse training gap were additional modifiable deficiencies. These findings support a focused quality-improvement programme but do not constitute formal validation of IITT accuracy.

DECLARATIONS

Ethics approval. The audit was approved by the Training and Human Development Section, Al-Rusafa Health Directorate, Iraqi Ministry of Health, Baghdad, Iraq (approval No. 8891, dated 2 February 2026), issued in response to the institutional request of Al-Zaafaraniya General Hospital (No. 423, dated 21 January 2026); the topic is listed among the Ministry of Health research priorities. Administrative facilitation for the participating emergency departments was granted under letter No. 9297, dated 9 February 2026. The audit analysed anonymous, routinely collected service data and did not alter patient management.

Consent to participate. Patient data were recorded anonymously as part of a service evaluation carried out under the approval detailed above, and no individually identifiable information was collected; individual patient consent was therefore not sought. Staff participation was voluntary and anonymous, and return of the questionnaire was taken as consent.

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