WILDERNESS & EXPEDITION MEDICINE | POSTER PRESENTATION | PILOT STUDY

Faster to the sickest casualty: FiRST vs SALT vs MITT in a live-action mass-casualty simulation

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PILOT STUDY
18 triagers
6 runs · 90 encounters
15 casualties per run

43.0 s **FiRST** to first correct **Unstable** identification — vs 105.5 s (MITT) and 158.5 s (SALT)

76.7% **FiRST** mean accuracy — vs **93.3%** (MITT) and **90.0%** (SALT), descriptively

p = 0.303 No evidence of an accuracy difference — and **not** evidence that the methods are equivalent

BACKGROUND: JUDGE SPEED AND ACCURACY TOGETHER

- Mass-casualty incidents overwhelm resources. The first sort must find casualties needing immediate care — **fast** enough for treatment and evacuation to follow.
- Speed alone is not enough. Under-triage misses the sickest; over-triage wastes scarce resources on casualties who do not need immediate care.
- Systematic reviews find **no triage system clearly best**. Simpler first-pass methods need direct, head-to-head testing.

METHODS: ONE LANE, THREE METHODS

- **Prospective live-action pilot**, 5 May 2026, Claytor Nature Center, Bedford, Virginia. IRB LHS2526052.
- **18 triagers** (doctoral students), randomly assigned. **6 runs** — 2 per method. Each run: 15 casualties, 3 triagers × 5 casualties = **90 encounters**.
- Same teaching format for all three methods the day before; same lane briefing. Same 15 live role-players in every run, randomly positioned; triagers chose their own route.
- Times from video-verified score sheets, rebuilt as a continuous active timeline (handoffs excluded). Category-assignment time used for decisions.

REFERENCE STANDARD: HOW METHODS WERE COMPARED

Eight experts were invited; **3 returned complete ratings and agreed unanimously** on every casualty under every method. Their ratings are the reference standard.

Harmonised	FiRST	SALT	MITT
Unstable	Unstable	Immediate	P1
Stable	Stable	Delayed / Minimal	P2 / P3
Dead / Expectant	Expectant / Dead	Expectant / Dead	P4 / Expectant

Casualty mix: Patients 1–3 Unstable, 4–13 Stable, 14–15 Dead / Expectant.

Co-primary outcomes: time to first correct Unstable identification; undertriage rate. **Secondary:** total active completion time, overtriage, harmonised accuracy.

CONTEXT: SIMPLIFICATION HAS HELPED ELSEWHERE

- The NHS Ten Second Triage Tool averaged **10.2 s per casualty vs 40.5 s for MITT alone**, with similar accuracy (80.3% vs 79.3%) in a 2026 live simulation. A different method — context, not evidence about FiRST.
- That result supports testing a simpler first pass. It does not show that simplification is free: this pilot found a descriptive accuracy and overtriage cost.

READING THE RESULT: THE OPERATOR MATTERS TOO

- Patient 3 met Unstable criteria in the algorithms — the miss was in **recognising the cue under load**, not only in the flowchart. Future training must target cue recognition, not just memorising steps.
- This pilot did **not** test whether faster triage leads to earlier treatment, evacuation, or better survival. That link still needs evidence.

THE FIRST ALGORITHM: THREE CATEGORIES, FEW STEPS

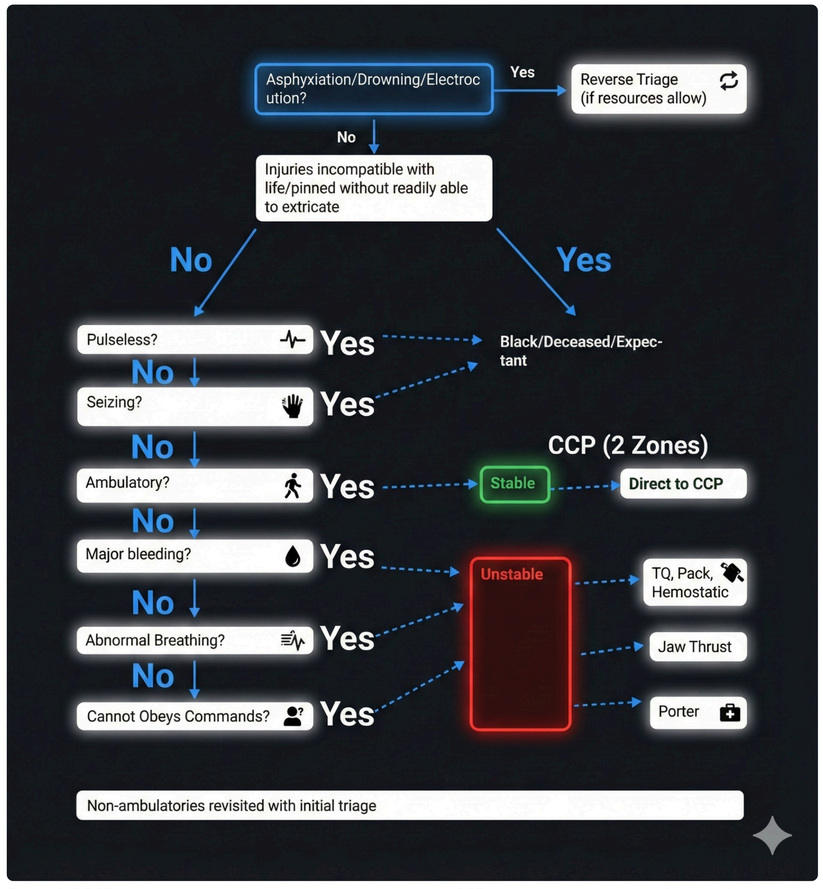


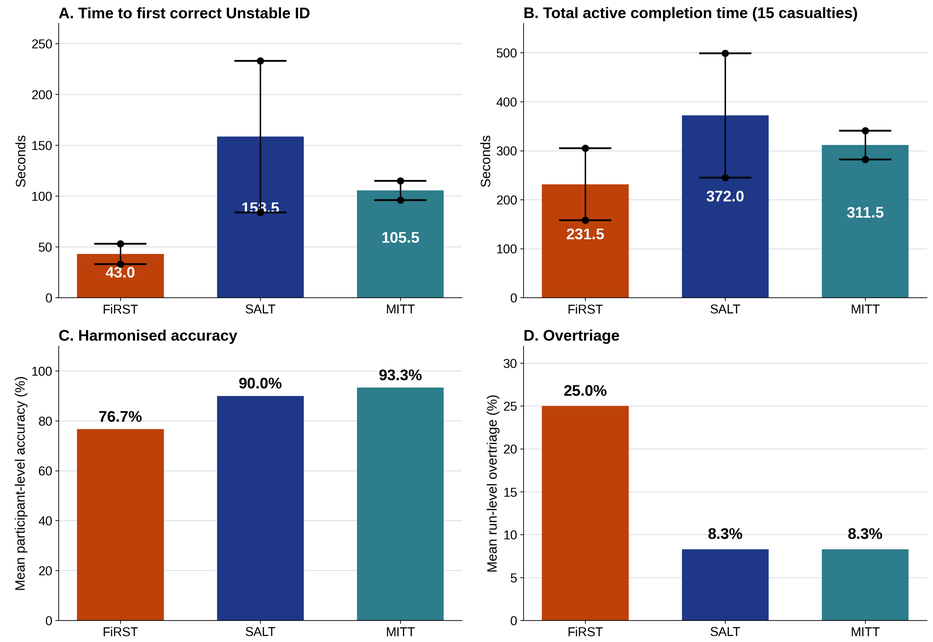
Figure 1. FiRST primary triage algorithm, as supplied by the authors. CCP = casualty collection point (2 zones). Non-ambulatory casualties are revisited after the initial pass.

WHAT FIRST DOES DIFFERENTLY

- **Three categories only** — Unstable, Stable, Expectant / Dead. No Delayed vs Minimal split on the first pass; finer sorting is deferred.
- **Checks in order:** reverse-triage circumstances, then injuries incompatible with life or inability to extricate; pulseless or seizing → Expectant / Dead; ambulatory → Stable to CCP.
- **Unstable** if major bleeding, abnormal breathing, or cannot obey commands. Interventions on the first pass are limited to rapid measures — tourniquet / packing / haemostatic, jaw thrust — then assisted movement to the CCP.

FiRST was developed in 2025 by co-author Giancarlo Spinelli, from an earlier framework called Minimalist Expedited Triage Theory (METT). The name was changed before this study to avoid confusion with MITT. The developer role is disclosed below.

RESULTS: FASTER, LESS ACCURATE — DESCRIPTIVELY



Bars are means. In A–B the dots are the **2 runs per method** — note the wide ranges. Timing was compared descriptively only (2 runs per method).

Outcome (mean)	FiRST	SALT	MITT
First Unstable ID, s (range)	**43.0 (33–53)**	158.5 (84–233)	105.5 (96–115)
Total time, s (range)	**231.5 (158–305)**	372.0 (245–499)	311.5 (282–341)
Accuracy % (median; range)	76.7 (80; 40–100)	90.0 (90; 80–100)	93.3 (100; 80–100)
Overtriage % (mean, run-level)	25.0	8.3	8.3
Undertriage (of 6 Unstable)	1 (16.7%)	1 (16.7%)	0 (0%)

Accuracy test: exact omnibus permutation test on participant-level accuracy (18 values; 17,153,136 allocations): **p = 0.303**. No evidence of a difference — not evidence of equivalence. Clustering within runs was not modelled.

ERRORS CLUSTERED: LOOK AT THE CASUALTY

Undertriage — 2 events, both Patient 3. Severe dyspnoea, tachycardia, tachypnoea, absent radial pulse, unable to walk — but oriented and obeying commands. Patient 3 met Unstable criteria, yet was missed once with FiRST and once with SALT. No undertriage for Patients 1–2.

Overtriage — 10 events, 8 of them Dead / Expectant. Patient 15 × 6 and Patient 14 × 2 were upgraded to Unstable; only 2 events upgraded Stable casualties (Patients 9 and 12).

The two failure modes differ: subtle physiology missed, while non-survivable injury was repeatedly upgraded. Aggregate accuracy alone hides that distinction.

Take-home: a speed signal worth testing — not a verdict, and not free.

FiRST reached the first unstable casualty sooner, descriptively, but with lower accuracy and more overtriage. The next study must test whether that speed is reproducible **without** the classification cost — and train the cues that failed here: subtle instability, and the threshold for Dead / Expectant.

WHAT A LARGER STUDY NEEDS

More independent runs and participants; more casualties per triager (one error here = 20 points); a broader expert panel; different but equivalent casualty sets; and casualty-level error analysis kept alongside overall accuracy.

Limitations. Pilot: only 2 runs per method; triagers clustered within runs; 5 encounters per triager; same 15 casualty profiles; reference panel of 3 experts; controlled simulation, not a real incident. Findings are preliminary signals, not superiority or equivalence.

Disclosures. Giancarlo Spinelli developed FiRST. No funding. De-identified data available from the corresponding author on reasonable request.

Selected references. Bazyar J et al. *Arch Acad Emerg Med.* 2022;10:e32. Marcussen CE et al. *Injury.* 2022;53:2725–2733; *Dan Med J.* 2023;70(11). Vassallo J et al. *Emerg Med J.* 2022;39:800–802 (MITT). Park CL et al. *Scand J Trauma Resusc Emerg Med.* 2026;34:82 (Ten Second Triage Tool).