Optimizing the Collegiate EMS to ALS Handoff: A Prospective Evaluation of Two Structured Mnemonics

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Abstract

The Gator Emergency Medical Response Unit (GEMRU) is a non-transport collegiate EMS agency that transfers patient care to advanced life support (ALS), creating potential communication gaps during handoff. This prospective quality improvement study evaluates the completeness, duration, and subjective usability of two structured handoff mnemonics (GATOR and SWAMP) during simulated ALS transfers. Ten EMT Leads/Supervisees completed four baseline medical and trauma scenarios with their usual verbal handoffs. After formal training on the mnemonics, they completed similar post-intervention scenarios with access to the mnemonics. Handoff report completeness was assessed by the frequency of reportable elements mentioned, and report duration was also recorded. Responder confidence, usability, and perceived effectiveness were measured using a five-point Likert scale. Post-intervention reports showed large inclusion of key elements, including time of injury/condition (45% to 86%), but some elements minimally decreased, such as patient demographics (100% to 98%). Mean handoff duration increased from 28.7 to 37.9 seconds. Responders reported high confidence, usability, and clarity with mnemonics, with median Likert scores of 4-5 and 67-100% agreement. Overall, structured mnemonics improved handoff content and quality and can be used to support standardized communication across other collegiate EMS agencies.

Introduction

Verbal handoffs are a critical point of communication and vulnerability between Basic Life Support (BLS) and responding Advanced Life Support (ALS) units. Many factors such as time pressure and environmental stress can increase the likelihood for miscommunication. Although standardized mnemonics exist for the transition between ALS and the emergency department[1], there are none currently accepted for that of BLS to ALS.

A prior GEMRU study[2] identified variability and omission of key elements during verbal handoffs and initiated the development of two structured mnemonics: GATOR and SWAMP. This project evaluates whether education and exposure of these mnemonics improves handoff communication content and quality from collegiate EMS providers like GEMRU.

Development

GATOR and SWAMP structured handoff mnemonics were co-developed during a prior GEMRU research project and implemented in Fall 2025 through structured training for EMT Leads and Supervisees. The tools were introduced as standardized communication aids to support verbal transfer of care to ALS during simulated scenarios.

Implemented Tools

GATOR: Structured handoff mnemonic for medical calls.

General Impression: Pt demographics, chief complaint, conscious and breathing?

Assessment Findings: Time since symptoms began, A&Ox?, quality and radiation of pain, pertinent vitals

Treatment Provided: Treatments administered + response

Ongoing Concerns: Suspected condition(s), changes in condition, further risks

Relevant History: Medications, past medical history, relevant allergies, events leading up, last oral intake (only if important)

MEDICAL

SWAMP: Structured handoff mnemonic for trauma calls.

Scene Details: What happened? Pt demographics, mechanism of injury, conscious and breathing?

Wounds: Major trauma findings (DCAPBTLS), bleeding

Assessment Findings: Time since symptoms began, A&Ox?, quality and radiation of pain, pertinent vitals

Medical Interventions: Airway management, bleeding control, stabilization, medications

Patient Response: Changes in condition, response to treatment

TRAUMA

Evaluation

The program was evaluated using a prospective pre–post design with verbally delivered medical and trauma scenarios. Baseline handoffs (October 2025) were compared with post-training handoffs (December 2025) using nearly identical scenarios. Reports were assessed for completeness, duration, and responder confidence and usability.

Baseline Handoffs → **Mnemonic Training** → **Post-Intervention Handoffs**

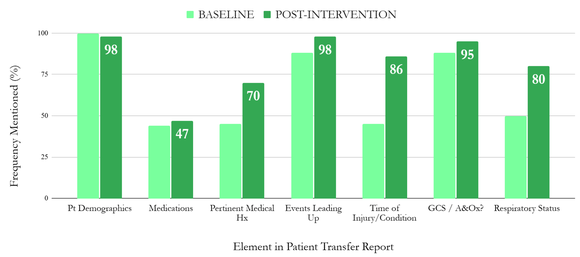

Figure 1. Pre–Post Comparison of Key Handoff Elements in Verbal Transfer Reports Comparison of baseline and post-intervention verbal handoff reports demonstrating the frequency (%) with which selected clinical elements were communicated.

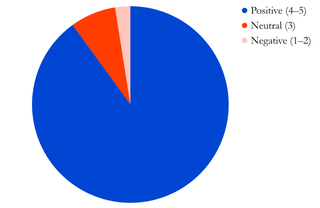

Figure 2. Overall Responder Confidence and Usability Ratings
Aggregated Likert-scale responses across survey items (4–5 positive, 3 neutral, 1–2 negative).

Discussion/Conclusion

Overall, there is a **positive correlation between implementation of the GATOR and SWAMP mnemonics and communication of key handoff elements**. Deliberate use of the mnemonics and increased cognitive load may explain the **increase in report duration from 28.7 to 37.9 seconds** and the **slight dip in patient demographics (100% to 98%)**. **Time of injury/condition greatly improved (45% to 86%)**, potentially from emphasis during mnemonic training. Figure 1 shows only elements demonstrating meaningful change across medical and trauma-related calls.

Challenges include responder turnover and ever-updating training, which may have altered the baseline data. Continued integration into GEMRU training alongside multidisciplinary training[1] can continue to support communication improvement.

References

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