

PROCEDURAL EXPOSURE TO LOW-FREQUENCY INTERVENTIONS DURING PARAMEDIC TRAINING

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BACKGROUND & OBJECTIVE

Paramedic training relies heavily on opportunistic clinical exposure in an unpredictable prehospital environment. While routine procedures may be encountered frequently, rare and high-risk interventions may occur too infrequently to provide sufficient experience for skill acquisition. This study quantified real-world procedural exposure during paramedic training, with a focus on rare and high-risk interventions, and examined the extent to which trainees were exposed to these procedures during clinical training.

DISCUSSION

Routine clinical exposure during paramedic training was substantial, but exposure to rare and high-risk procedures was markedly limited. Several procedures were performed only once or not at all by most trainees, despite their clinical importance in time-critical emergencies.

Tracheal intubation provides a particularly clear example: although nearly all trainees performed at least one intubation, the mean exposure was only 3.35 procedures per trainee, substantially below the procedural volumes described in published learning-curve literature.

These findings suggest that opportunistic clinical exposure alone may not reliably provide sufficient experience for rare procedures. Competency-based education, deliberate practice, and targeted simulation may therefore complement clinical exposure and help ensure preparedness for low-frequency, high-stakes interventions.

KEY FINDINGS

Routine clinical exposure was substantial – Trainees encountered more than 200 patients and approximately 78 clinical shifts during training.

Rare procedures were genuinely rare – Several critical interventions were performed by only a minority of trainees, with thoracic procedures occurring in **≤5%** of trainees.

METHODS

This retrospective observational cohort study included 66 paramedic trainees completing training during January–February 2026 within Magen David Adom (MDA), Israel's national emergency medical services organization; procedural data were extracted from the centralized computerized clinical documentation system, which records and verifies trainee activity during supervised clinical training, and outcomes were summarized as mean ± SD and the proportion of trainees performing each procedure at least once.

Procedure	Mean ± SD	Performed 1 ≤time(%)
Tracheal intubation	2.26 ± 3.35	95.5%
Intraosseous access (IO)	0.80 ± 0.64	47.0%
Laryngeal mask airway (LMA)	0.69 ± 0.36	27.3%
Electrical cardioversion	0.69 ± 1.33	66.7%
Transcutaneous pacing	0.86 ± 0.50	35.8%
Emergency childbirth	1.92 ± 1.64	56.1%
Nasogastric tube insertion	0.61 ± 0.32	25.8%
Needle or tube thoracostomy	0.05 ± 0.15	4.5%