

had practiced it. Notably, only 5% of the participants ($n = 25$) expressed confidence in their knowledge of how to perform it accurately. These findings suggest a need to incorporate mandatory first aid training (e.g., at the primary school level) to establish foundational knowledge of first aid and early emergency responses [8]. However, first aid education for children requires careful consideration of age-appropriate teaching methods and materials [14].

The study also recorded behavioral observations: some participants, particularly the younger ones without prior first-aid experience, showed hesitation toward physical contact with the standardized patient. Such reluctance may have several underlying causes, including personality, previous experience, and social or contextual factors described in the literature [15, 16, 17]. Reported barriers such as fear of inappropriate touching or of causing injury can reduce bystander assistance [18, 19], although such findings appear region-specific and were not confirmed in the Czech data [20, 21]. This aspect was not systematically assessed in the present study and warrants dedicated investigation.

Limitations

A limitation of this study is its limited applicability to clinical practice, as it was conducted using a single standardized patient and relied on subjective assessment; thus, it does not account for anatomical and physiological differences among individuals. Additionally, pathophysiological differences may influence the applicability of a single recommended angle across diverse populations. A literature review

showed that there are currently no studies defining the most suitable angle of inclination and rotation of the head, and it is not possible to compare the specific results of the present study.

Because of a lack of scientific evidence, the determination of optimal ranges is based on a subjective assessment of a standardized patient; it may not be fully appropriate for all affected individuals.

Another limitation of the study is the absence of direct assessment of airway patency during movement and objective measurement of secretion drainage.

Conclusions

This study evaluated head movement during the recovery position in unconscious individuals when performed by the study group. For this study, exploratory study-specific reference ranges of 20–40° for head tilt and 90–110° for spinal rotation were derived from one standardized patient. A total of 347 participants (69.4%) achieved these cervical spine angles when performing the recovery position. These findings suggest that a significant proportion of the study group were able to perform the recovery position and support the need for further research evaluating head positioning during the recovery position.

List of abbreviations

- ERC: European Resuscitation Council
- CPR: Cardiopulmonary Resuscitation
- ILCOR: The International Liaison Committee on Resuscitation

AUTHORS' DECLARATION: AI use statement: Following the completion of the manuscript, ChatGPT-4.0 was used for language refinement. The authors have reviewed all the edits made using artificial intelligence and take full responsibility for the final content of the manuscript. **Originality statement:** The submitted paper is an original work and has not been published or submitted for peer-review elsewhere in any form. The preliminary results were presented in the form of a lecture at a specialist conference organized by the Chamber of Paramedics of the Emergency Medical Services of the Czech Republic in March 2025 (with no written proceedings). **Conflict of interest statement:** The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article. **Agreement with the article's content:** All authors have read the manuscript, and agree to its text and its submission to the *Anesteziologie a intenzivní medicína* journal. **Availability of data and materials:** The dataset used and analyzed during the current study is available from the corresponding author on reasonable request. **Authors' contribution:** conceptualization – PB, NL, DP, methodology – PB, DP, personal participation in the conduct of the research or experiment – PB, NL, AP, writing (original draft) – PB, NL, AP, writing (review and editing) – PB, DP, guidance and coordination – PB, DP, validation – DP, formal analysis – PB, AP, data management – PB, NL, DP, project administration – PB, fundraising – PB. **Funding statement:** This article was supported by the Student Grant Competition CTU SGS25/075/OHK5/1T/17. **Acknowledgments:** The authors would like to thank all those who gave their time and contributed to the research results. **Ethics committee:** The research was granted a waiver by the Ethics Committee of the Emergency Medical Services (EMS) of the Karlovy Vary Region, under Approval Number ZZSKVK/EK/01/2025.

REFERENCES

1. Handley JA. Recovery position. *Resuscitation*. 1993;26(1):93-95. doi: 10.1016/0300-9572(93)90168-P.
2. Olasveengen MT, Semeraro F, Ristagno G, Castren M, Handley A, Kuzovlev A, et al. European Resuscitation Council Guidelines 2021: Basic Life Support. *Resuscitation*. 2021;161:98-114. doi: 10.1016/j.resuscitation.2021.02.009.
3. Truhlář A, Černá Pařízková R, Dizon J, Djakow J, Drábková J, Franěk O, et al. Doporučené postupy pro resuscitaci ERC 2021: souhrn doporučení. *Anest. intenziv. med.* 2021;32(Suppl. A):8-70. doi:10.36290/aim.2021.043.
4. Turner S, Turner I, Chapman D, Howard P, Champion P, Hatfield J, et al. A comparative study of the 1992 and 1997 recovery positions for use in the UK. *Resuscitation*. 1998;39(3):153-160. doi: 10.1016/S0300-9572(98)00144-0.
5. Djärv T, Rogers J, Semeraro F, Brädde L, Cassan P, Cimpoesu D, et al. European Resuscitation Council Guidelines 2025: First Aid. *Resuscitation*. 2025;215(Suppl. 1):110752. doi: 10.1016/j.resuscitation.2025.110752.
6. Zarisfi F, Pek JH, Oh HHJ, Loke JH, Lim SH. Singapore First Aid Guidelines 2021. *Singapore Med J*. 2021;62(8):427-432. doi: 10.11622/smedj.2021112.
7. Zideman DA, Singletary ME, Borra V, Cassan P, Cimpoesu CD, De Buck E, et al. European Resuscitation Council Guidelines 2021: First Aid. *Resuscitation*. 2021;161:270-290. doi: 10.1016/j.resuscitation.2021.02.013.
8. Wilks J, Pendergast D. Skills for life: First aid and cardiopulmonary resuscitation in schools. *Health Educ J*. 2017;76(8). doi: 10.1177/0017896917728096.
9. Fulstow R, Smith GB. The new recovery position, a cautionary tale. *Resuscitation*. 1993;26(1):89-91. doi: 10.1016/0300-9572(93)90167-O.
10. Douma JM, Handley JA, Mackenzie E, Raitt J, Orkin A, Berry D, et al. The recovery position for maintenance of adequate ventilation and the prevention of cardiac arrest: A systematic review. *Resuscitation Plus*. 2022;10:100236. doi: 10.1016/j.resplu.2022.100236.
11. Rathgeber J, Panzer W, Günther U, Scholz M, Hoeft A, Bahr J, et al. Influence of different types of recovery positions on perfusion indices of the forearm. *Resuscitation*. 1996;32(1):13-17. doi: 10.1016/0300-9572(96)00952-5.
12. Navarro-Patón R, Freire-Tellado M, Fernández-González N, Basanta-Camiño S, Mateos-Lorenzo J, Lago-Ballesteros J. What is the best position to place and re-evaluate an unconscious but normally breathing victim? A randomised controlled human simulation