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DISASTER AND EMERGENCY

M E D I C I N E J O U R N A L

Chest compression technique for infants and neonates — where are we?

Authors: Marek Solecki, Bartosz Wojciech Maj, Monika Tomaszewska

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[Letter to the Editor]

**CHEST COMPRESSION TECHNIQUE FOR INFANTS AND NEONATES — WHERE
ARE WE?**

[Short title: Infants and neonates chest compression]

Marek Solecki¹ <https://orcid.org/0009-0006-2246-7412>, Bartosz Wojciech Maj² <https://orcid.org/0009-0001-0333-698X>,

Monika Tomaszewska¹ <https://orcid.org/0000-0001-9913-2406>

¹Department of Clinical Research and Development, LUXMED Group, Warsaw, Poland

²Department of Public Health, International European University, Kyiv, Ukraine

ADDRESS FOR CORRESPONDENCE:

Bartosz Maj, Department of Public Health, International European University, 42 V
Academician Glushkov Avenue, 03187 Kyiv, Ukraine, e-mail: majbartosz@wp.pl

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To the Editor,

The necessity of developing a new chest compression technique for infants and neonates has become increasingly apparent due to the limitations of the current methods. Both the two-finger technique (TFT) and the two-thumb encircling hands technique (TTT) are essential in neonatal resuscitation, yet each has significant drawbacks impacting their effectiveness and

the physical strain on the rescuer [1, 2]. This text explores the limitations of these techniques and underscores the need for a more efficient and less physically demanding method.

The TFT involves using the middle and ring fingers to compress the lower half of the sternum. Despite its straightforward approach, TFT often results in inconsistent compression depth, which can compromise the quality of cardiopulmonary resuscitation (CPR) [3]. Research, such as the study by Christman et al. [4], has shown that the two-thumb technique achieves greater depth and less variability in compressions compared to TFT. Additionally, TFT requires significant finger strength and endurance, leading to rescuer fatigue during prolonged resuscitation efforts. Proper finger placement is also a challenge, with many providers failing to position their fingers correctly, further reducing the method's effectiveness.

Conversely, the TTT, which involves encircling the chest with both hands and compressing with the thumbs, generates higher systolic pressures and more consistent compressions. Various studies have demonstrated the preference for this method due to its ability to produce deeper and more uniform compressions. For instance, studies have demonstrated that TTT generates higher systolic pressures, which are crucial for effective resuscitation. However, TTT also has its limitations. The encircling nature of TTT can restrict chest recoil and ventilation, potentially reducing the overall effectiveness of CPR. Jahnsen et al. [5] found that TFT achieved higher tidal volumes and minute ventilation compared to TTT, highlighting a significant drawback of the latter. Furthermore, maintaining the encircling position can cause hand pain and discomfort over time, impacting the rescuer's performance.

Given these limitations, there is a clear need for a new chest compression technique that addresses these issues. An ideal method should ensure effective compressions with consistent depth and minimal variability, optimizing the chances of successful resuscitation. It should also minimize physical strain and fatigue on the rescuer, allowing for longer and more effective performance. Reducing hand pain and discomfort is crucial to maintaining proper technique and continuing resuscitation without compromising performance [6].

Several potential solutions could be explored to develop a new technique. Mechanical assistance devices, for instance, can help maintain consistent compression depth and reduce physical strain. These devices can be designed to ensure proper alignment and pressure distribution, improving CPR efficiency. Additionally, ergonomically designed tools that fit comfortably in the rescuer's hands can help distribute force more evenly, reducing hand pain and improving comfort [7]. Hybrid techniques that combine elements of both TFT and TTT or

introduce new hand positions can also be explored to maximize benefits while minimizing drawbacks [6, 8, 9].

In conclusion, developing a new chest compression technique for infants and neonates is essential to improving CPR effectiveness and reducing the physical toll on rescuers. By addressing the limitations of current methods and exploring innovative solutions, we can improve resuscitation outcomes and ensure that rescuers perform at their best during critical moments. Future research and clinical trials are necessary to identify and validate the most effective techniques and tools, leading to better survival rates and quality of life for neonates and infants in emergencies.

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Author contributions

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Conflict of interest

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