

# GEORGIAN MEDICAL NEWS

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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии  
საქართველოს სამედიცინო სიახლენი

## GEORGIAN MEDICAL NEWS

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**GMN: Georgian Medical News** is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

**GMN: Медицинские новости Грузии** - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

**GMN: Georgian Medical News** – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებშიდან.

## WEBSITE

[www.geomednews.com](http://www.geomednews.com)

## К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman (Кириллица)**, для текста на грузинском языке следует использовать **AcadNusx**. Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи.** Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - <http://www.spinesurgery.ru/files/publish.pdf> и [http://www.nlm.nih.gov/bsd/uniform\\_requirements.html](http://www.nlm.nih.gov/bsd/uniform_requirements.html). В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректуре авторам не высылаются, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

**При нарушении указанных правил статьи не рассматриваются.**

## REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or computer-printed on a single side of standard typing paper, with the left margin of 3 centimeters width, and 1.5 spacing between the lines, typeface - **Times New Roman (Cyrillic)**, print size - 12 (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: [http://www.nlm.nih.gov/bsd/uniform\\_requirements.html](http://www.nlm.nih.gov/bsd/uniform_requirements.html)  
[http://www.icmje.org/urm\\_full.pdf](http://www.icmje.org/urm_full.pdf)

In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

**Articles that Fail to Meet the Aforementioned  
Requirements are not Assigned to be Reviewed.**

## ავტორთა საყურადღებო!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე, დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx**. შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემავსებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრაფიის ფოტოსურათები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგების ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფხიხლებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

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## THE USE OF ANKLE BLOCK FOR ACUTE ANKLE FRACTURE REDUCTION: A REVIEW OF CURRENT LITERATURE

Arnab Sain, Ahmed Elkilany, Minaal Ahmed Malik, Nauman Manzoor, Nadine Khayyat, Hoosai Manyar, Michele Halasa, Jack Song Chia, Fahad Hussain, Hamdoon Asim, Kanishka Wattage, Anushka Jindal, Justin Wilson, Hannah Burton, Wilam Ivanga Alfred, Vivek Deshmukh, Zain Sohail.

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### Abstract.

Ankle fractures are common injuries treated in accident and emergency (A&E) departments, often requiring prompt reduction to restore joint alignment. Traditional pain management methods, including intravenous sedation and general anaesthesia, carry risks of systemic complications. The ankle block, a form of regional anaesthesia, is increasingly used for ankle fracture reduction due to its ability to provide localized pain relief while minimizing systemic side effects. This article reviews the techniques, recent trends, advantages, and disadvantages of ankle blocks in A&E settings. Ultrasound guidance has enhanced the precision and success of the procedure, leading to improved outcomes. Despite challenges, such as the need for specialized training and occasional incomplete analgesia, the ankle block is emerging as a preferred opioid-sparing alternative. Continued advancements in regional anaesthesia and training programs are expected to broaden its use in emergency care. Further research may focus on optimizing techniques to ensure consistent results.

**Key words.** Ankle block, regional anaesthesia, ultrasound-guided nerve block, ankle fracture, pain management, emergency department.

### Introduction.

Ankle fractures are among the most frequent injuries encountered in accident and emergency (A&E) departments, particularly after falls, slips, or motor vehicle accidents. These fractures can involve various parts of the ankle joint, such as the lateral, medial, or posterior malleolus, and often require immediate reduction to restore proper alignment for pain relief and avoid complications like neurovascular compromise. Closed reduction and application of back-slab is the preferred initial management [1].

Traditionally, pain management methods like intravenous (IV) sedation, general anaesthesia, or local anaesthetic injections at the fracture site have been used. However, these methods come with risks such as respiratory depression, delayed recovery, and potential inadequacy of pain control. The use of regional anaesthesia techniques, particularly the ankle block, has been gaining popularity for these procedures due to its ability to offer localized pain relief with fewer systemic side effects [2,3].

### Techniques for Performing the Ankle Block.

An ankle block involves the administration of local anaesthetic to block the sensory nerves that innervate the foot and ankle. It targets five key nerves: the tibial, superficial peroneal, deep peroneal, sural, and saphenous nerves, which together provide sensory coverage to the entire foot and ankle. The block is particularly effective because it can achieve complete anaesthesia of the foot, allowing for pain-free manipulation of

fractures without affecting the patient's level of consciousness.

**1. Superficial Peroneal Nerve Block:** This nerve is blocked at the level of the lateral malleolus, just beneath the skin. The nerve provides sensation to the dorsal aspect of the foot. The injection is typically performed by palpating the lateral malleolus and injecting the anaesthetic subcutaneously along its anterior border [4].

**2. Deep Peroneal Nerve Block:** The deep peroneal nerve provides sensation to the space between the first and second toes. It is located deep to the extensor hallucis longus tendon. To block this nerve, the injection is made between the tendons of the extensor hallucis longus and extensor digitorum longus, just proximal to the ankle joint [5].

**3. Tibial Nerve Block:** The tibial nerve provides sensation to the sole of the foot and passes posterior to the medial malleolus. The nerve is blocked by injecting the anaesthetic behind the medial malleolus, just above the level of the ankle joint [6].

**4. Sural Nerve Block:** The sural nerve innervates the lateral aspect of the foot and ankle. It is blocked by injecting local anaesthetic subcutaneously along the posterior border of the lateral malleolus [7].

**5. Saphenous Nerve Block:** The saphenous nerve provides sensation to the medial aspect of the foot and is blocked by injecting the anaesthetic anterior and inferior to the medial malleolus, just beneath the skin [8].

For all nerve blocks, a local anaesthetic such as lidocaine or bupivacaine is used. Bupivacaine is often preferred for its longer duration of action, which provides pain relief that can last for hours post-procedure. In some cases, ultrasound guidance is employed to improve the accuracy of the injection, allowing for direct visualization of the nerves, thus reducing complications and improving the success rate of the block [9].

### Recent Trends.

With advancements in medical technology and a shift towards opioid-sparing approaches in pain management, the use of ankle blocks in emergency settings has increased. Ultrasound-guided nerve blocks are particularly noteworthy. This technology allows clinicians to visualize nerves in real-time, increasing the precision of the block and reducing complications like nerve injury or vascular puncture [10].

Research has shown that the use of ultrasound significantly improves the success rate of ankle blocks. Studies have found that patients who received ultrasound-guided ankle blocks had better pain relief and fewer complications compared to those who received blind injections. Moreover, patients reported higher satisfaction with their overall treatment experience [11].

Additionally, the ankle block has extended beyond fracture reduction to other procedures, such as wound debridement, soft



tissue repair, and minor foot surgeries. This shift is part of a broader trend in emergency medicine to minimize the use of opioids, which carry risks of addiction and adverse side effects [12].

Finally, more A&E departments are now offering training programs in regional anaesthesia, particularly ultrasound-guided techniques. As the use of ankle blocks grows, this training ensures that emergency physicians are equipped to perform these blocks safely and effectively [13].

#### **Pros of Ankle Block in Ankle Fracture Reduction.**

The ankle block offers several advantages, making it a valuable tool in emergency departments:

**1. Effective Pain Control:** The ankle block provides excellent pain relief during and after the procedure. Patients typically experience numbness within 10–20 minutes of the injection, and the analgesia can last for several hours, making it ideal for procedures requiring sustained pain relief [14].

**2. Minimal Systemic Side Effects:** Unlike IV sedation or general anaesthesia, the ankle block has no significant impact on respiratory or cardiovascular function. This makes it particularly useful in patients with comorbid conditions where systemic anaesthesia might pose a risk [15].

**3. Shorter Recovery Time:** Patients are fully conscious and can often be discharged sooner than those receiving IV sedation. This leads to a shorter length of stay in the A&E department, improving efficiency and reducing resource use [16].

**4. Opioid-Sparing:** The ankle block reduces or eliminates the need for opioid analgesia, minimizing the risk of opioid-related side effects such as nausea, vomiting, or respiratory depression. This also supports the ongoing efforts to reduce opioid use in emergency care settings [17].

**5. Patient Satisfaction:** Patients who receive ankle blocks often report higher satisfaction, primarily due to the effective pain relief and the avoidance of sedation-related side effects [18].

#### **Cons of Ankle Block in Ankle Fracture Reduction.**

While beneficial, ankle blocks have some limitations:

**1. Technical Skill Required:** Ankle blocks can be challenging to perform, particularly for less experienced clinicians. The risk of an incomplete block is higher when ultrasound guidance is not used, and inadequate nerve blockade can result in continued pain during the procedure [19].

**2. Delayed Onset:** While effective, the block can take 10–20 minutes to provide full analgesia, which may be a drawback in situations where immediate pain relief is needed [19].

**3. Risk of Nerve Injury:** Although rare, there is a risk of nerve damage if the injection is poorly executed. This risk is significantly reduced when the block is performed with ultrasound guidance [19].

**4. Incomplete Analgesia:** In some cases, not all nerves are fully anesthetized, leading to residual pain. This is more common when blocks are performed using the traditional "blind" technique without ultrasound guidance [11,19].

**5. Not Suitable for All Injuries:** These include patient refusal, site infection, and allergies to medications, infection, hematoma or significant bruising at the site or pre-existing nerve injuries. A relative contraindication is an awake patient [11,19,20].

## **Discussion.**

The ankle block is increasingly favoured for its ability to provide excellent pain relief while minimizing systemic complications. For patients who are at higher risk for adverse effects from general anaesthesia, such as the elderly or those with comorbid conditions, the ankle block is a safer alternative. Research continues to support its use, with ultrasound-guided blocks showing particularly high success rates.

However, the need for specialized training remains a challenge. Performing an effective ankle block requires familiarity with the relevant anatomy and the use of ultrasound guidance. As emergency physicians receive more training in these techniques, the use of ankle blocks is likely to become more widespread in A&E settings.

One issue that still needs to be addressed is the occasional failure to achieve complete analgesia. Future research may focus on standardizing the procedure to minimize incomplete blocks and ensure consistent results [5-11,19,20].

## **Conclusion.**

The ankle block is an effective, opioid-sparing alternative to traditional methods of pain control in A&E for ankle fracture reduction. Its benefits, including effective pain relief, minimal systemic side effects, and faster recovery, make it an excellent option for many patients. Advances in ultrasound technology and the increasing emphasis on regional anaesthesia training are likely to expand its use further. However, the technique does require a high level of skill, and it may not be suitable for all types of injuries, such as open fractures.

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