



The 9th International Conference of Anesthesiology and
Intensive Care

ABSTRACTS

DOI: 10.52340/geoanesthesia

2-3 October, 2026

BATUMI, GEORGIA

Geoanesthesia[®] 2026

The 9th International Conference of Anesthesiology and Intensive Care

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Conference (G1): “SEPSIS”.

Friday, 2 October, 2026

11:00-14:00 Session I (Room Camelia)

Moderators: Ivane Chkhaidze (GE), Tinatin Chikovani (GE)

11:00-11:20 **Ivane Chkhaidze (GE)** - Antibiotic therapy of severe pneumonia in a pediatric hospital.

11:20-11:40 **Maka Tevzadze, Irma Kakauridze (GE)** - Diagnosis and management of severe sepsis in patients with congenital immunodeficiency in the pediatric critical care department.

11:40-12:00 **Giorgi Kikava, Giorgi Bezhashvili, Maka Tevzadze (GE)** - Massive transfusion in pediatric patients: indications and recommendations.

12:00-12:20 **Tinatin Chikovani (GE)** - Routine Blood Tests: A Gateway to Precision Medicine.

12:20-12:40 **Levan Ratiani, Ketevan Machavariani, Luiza Gabunia (GE)** - Novel and emerging biomarkers of sepsis.

12:40-13:00 **Ilia Nakashidze (GE)** - Energy and plastic provision of a patient with septic shock.

13:00-13:20 **David Kazaishvili (GE)** - Correlation of Cerebrospinal Fluid Lactate Levels in Meningitis of Different Etiologies.

13:20-13:40 **David Sergeenko (GE)** - Sepsis prevention. The pseudo-savings trap.

13:40-14:00 **Tamar Gogichaisvili (GE)** - The forgotten organ in sepsis: the endothelium.

14:00-15:00 Coffee break

15:00-18:00 Session II (Room Camelia)

Moderators: Nikoloz Kvachadze (GE), Iamze Agdgomelashvili (GE)

15:00-15:20 **Nikoloz Kvachadze (GE)** - Challenges in sepsis management-what is new in surviving sepsis guideline 2026.

15:20-15:40 **Otar Dikhamindjia (GE)** - A rare clinical case of E. coli-induced encephalitis.

15:40-16:00 **Alexander Loladze (GE)** - Burn-induced sepsis: early recognition and the role of modern markers.

16:00-16:20 **Mariam Labuchidze (GE)** - Albumin as a component of volume resuscitation: its role in hypovolemia and shock in septic and non-septic patients.

16:20-16:40 **Iamze Agdgomelashvili (GE)** - Managing the Septic Patient in the Operating Room: A goal-directed Anesthetic Approach.

16:40-17:00 **Tsotne Samadashvili (GE)** - ICU patient with sepsis in the operating room.

17:00-17:20 **Vladimir Makhinov (RU)** - Obstetric sepsis.

17:20-17:40 **Ilia Nakashidze (GE)** - Pathogenetic mechanisms of microcirculatory disorders in septic shock.

17:40-18:00 Pati Gabunia (GE) - Sepsis induced liver injury (SILI) and its management.

Saturday, 3 Oct, 2026

10:00-13:00 ***Session III (Room Camelia)*** (English-Georgian, simultaneous translation)

Moderators: Mariam Jashi (GE), Antonio Artigas (ES)

10:00-10:20 **Mariam Jashi (GE)** - 2030 Global agenda for Sepsis.

10:20-10:50 **Dario Petrone (IT)** - Beyond the standard: Extracorporeal Life Support for advanced and refractory Septic patients.

10:50-11:20 **Djillali Annane (FR)** - The use of corticosteroids in sepsis.

11:20-11:50 **Harutyun N. Mangoyan (AM)** - Mind Games in Sepsis or why rational clinicians make irrational decisions.

11:50-12:20 **Antonio Artigas (ES)** - New insights of cell therapy in Sepsis and ARDS.

12:20-12:40 **Manuel Gonzalez Sanchez (ES)** - Beyond Survival: Early Rehabilitation and PICS Prevention in Septic ICU Patients.

12:40-13:00 **Anssi Pölkki (FI)** - Updates in quantifying the severity of organ dysfunction in critically ill patients.

13:00-14:00 ***Coffee break***

14:00-17:00 ***Session IV (Room Camelia)*** (English-Georgian, simultaneous translation)

Moderators: Evangelos J. Giamarellos-Bourboulis (GR), Manu Malbrain (BE)

14:00-14:20 **Evangelos J. Giamarellos-Bourboulis (GR)** - Precision immunotherapy: an emerging hope for sepsis management.

14:20-14:40 **Manu Malbrain (BE)** - The role for natural agents with anti-inflammatory and antioxidative properties in sepsis? Potential usefulness of Xanthohumol.

14:40-15:00 **Manuel Gonzalez Sanchez (ES)** - Reversing the decline: evidence-based strategies for the rehabilitation of Septic Patients.

15:00-15:30 **Evangelos J. Giamarellos - Bourboulis (GR)** - Macrolides for severe pneumonia.

15:30-16:00 **Djillali Annane (FR)** - Long term sequels of sepsis.

16:00-16:30 **Manu Malbrain (BE)** - The role of human factors and leadership when implementing sepsis stewardship.

16:30-17:00 **Antonio Artigas (ES)** - Early diagnosis of Sepsis in the Emergency room.

17:00-17:30 **Conclusion**

17:30-18:00 **Closing ceremony**

Conference (G2): Modern Anesthesiology: Practice, Challenges and Innovation (Georgian, English)

Friday, 2 October, 2026 (Room Begonia)

11:00-14:00 *Session I (Room Begonia) - Current issues in anesthesiology*

Moderators: Nino Ninidze (AT), Nikolozi Rtveliashvili (GE)

11:00-11:20 Nino Ninidze (AT) - A paradigm shift in fibromyalgia syndrome (FMS).

11:20-11:40 Nikolozi Rtveliashvili (GE) - Intrathecal drug delivery system, adapted version for low income countries (case report).

11:40-12:10 Sabine Maria Sator (AT) - Multimodal pain therapy.

12:10-12:30 Tamta Darsalia (GE) - Enhanced recovery after thoracic surgery (ERATS): the role of ultrasound guided regional anesthesia.

12:30-12:50 Nikolozi Rtveliashvili (GE) - Nefopam as an Adjuvant Analgesic to Morphine in Cancer Patients.

12:50-13:10 Andro Atoshvili (GE) - The influence of geomagnetic activity on pain management and post-operative complications: technological challenges.

13:10-13:30 Nino Ninidze (AT) - Between evidence and activism: when do interventional blocks help and why do they cause harm when incorrectly indicated?

13:30-14:00 Nino Ninidze (AT) - Issues of pain treatment implementation in Georgia.

14:00-15:00 *Coffee break*

15:00-18:00 *Session II (Room Begonia) - Current issues in anesthesiology*

Moderators: Ketevan Arabidze (GE), Andrey Varvinskiy (UK)

15:00-15:20 Frank Aldrige (UK) - Anaesthesia for max - facial surgery.

15:20-15:40 Ketevan Arabidze (GE) - Awake intubation.

15:40-16:00 Alexander Zlotnik (IL) - Guidelines for management of tracheal intubation in critically ill patients.

16:00-16:20 Richard Hughes (UK) - Anaesthesia for ENT surgery.

16:20-16:40 Tatyana Kutseva (RF) - Anaesthesia for thoracic surgery.

16:40-17:00 Andrey Varvinskiy (UK) - Difficult airway case mix based on career long experience.

17:00-17:20 Alexander Zlotnik (IL) - Aspiration during Cesarean delivery: a new about the old paradigm.

17:20-17:40 Aleksandre Kakauridze (GE) - The Critical Airway: when anatomy is not the only problem.

17:40-18:00 Irina Shchedrina (RU) - Emergency Cesarean section complicated by intrapartum hemorrhage: an obstetrician-gynecologists perspective.

Saturday, 3 October, 2026 (Room Begonia)

10:00-13:00 ***Session III Difficult Airway.***

Coordinator: Andrey Varvinskiy (UK), Shota Nakashidze (GE)

Moderators: Andrey Varvinskiy (UK), Richard Hughes (UK), Frank Aldridge (UK), Tatiana Kutseva (RU), Samvel Agalariani (GE), Shota Nakashidze (GE), Zurab Zakariashvili (GE), Stefane Chilingarashvili (GE), Evgeny Tkachenko (RU)

10:00-11:30 Samvel Agalariani (GE), Richard Hughes (UK) - Videolaryngoscopy.

Main goal: Teach the basic principles of video laryngoscopy (VL) including hyper angulated blade VL and use of adjuncts.

11:30-13:00 Andrey Varvinskiy (UK), Tatiana Kutseva (RU) - Supraglottic Airway Devices (SADs)

Main goal: Teach the basic principles of insertion of SADs, differences between 1st Generation and 2nd Generation SADs.

13:00-14:00 ***Coffee break***

14:00-17:00 ***Session IV Difficult Airway***

Coordinator: Andrey Varvinskiy (UK), Shota Nakashidze (GE)

Moderators: Andrey Varvinskiy (UK), Richard Hughes (UK), Frank Aldridge (UK), Tatiana Kutseva (RU), Samvel Agalariani (GE), Shota Nakashidze (GE), Zurab Zakariashvili (GE), Stefane Chilingarashvili (GE), Evgeny Tkachenko (RU)

14:00-15:30 Richard Hughes (UK), Frank Aldridge (UK) - Flexible bronchoscopy.

Main goal: Teach the basics of Awake Tracheal intubation.

Two components: Airway topicalization and navigating the airway with a bronchoscope or VL to successfully intubate the trachea in the awake patient.

15:30-17:00 Andrey Varvinskiy (UK), Shota Nakashidze (GE) - Emergency front of the neck access (eFONA) in adult and in pediatric practice

Main goal: Front of neck techniques to access the airway in the event of a “Can't Intubate Can't Oxygenate” scenario.

DAS scalpel bougie tube technique on neck with palpable airway anatomy. Explain benefits of Rapifit bougie oxygenation.

Video link to explain Impalpable anterior neck anatomy (IANA) technique of Scalpel finger tube.

17:00-17:30 **Conclusion**

17:30-18:00 **Closing ceremony**

Conference (G3): Ultrasound Guided Regional Anesthesia techniques. (In memoriam prof. Ivan Kiss)

(Georgian, English) - /Hybrid /

Friday, 2 October, 2026 (Orchimimosa)

11:00-14:00 ***Session I (Orchimimosa)***

Moderators: Arij Berkovitch (FR), Vakhtang Shoshiashvili (GE)

11:00-12:00 **Zurab Zakariashvili (GE) - Neck Blocks. Cervical Plexus.**

12:00-13:00 **Arij Berkovitch (France), Stefane Chilingarashvili (GE), Svetlana Eremina (RU) - Upper Limb. Plexus Brachialis:** Supraclavicular, Infraclavicular and Peripheral Nerves.

Plexus lumbalis blocks: N. Femoralis, N. Femoralis cutaneous lateralis, N. Obturatorius.

Plexus sacralis block: N. Ischiadicus.

13:00-14:00 **Stefane Chilingarashvili (GE), Svetlana Eremina (RU) -**

PENG (Pericapsular Nerve Group) Block, Genicular Nerve block.

iPACK (Infiltration between the Popliteal artery and capsule of the Knee) block.

Fascia Iliaca block. LEENA (Lower extremity enhanced nerve analgesia).

14:00-15:00 ***Coffee break***

15:00-18:00 ***Session II (Orchimimosa)***

Moderators: Nikolozi Rtveliashvili (GE), Shota Nakashidze (GE)

15:00-16:00 **Shota Nakashidze (GE) - Interfascial Blocks of the Abdominal Wall:**

- TAP (Transversus abdominis plane) block.

- QLB (Quadratus lumborum blocks) block.

- M. Rectus abdominis sheath block (thoracoabdominal nerves T7-T12).

- Ilioinguinal Nerve block (plus Iliohypogastric nerve).

16:00-17:00 **Nikolozi Rtveliashvili (GE) - Interfascial Blocks in Pediatrics:**

- TAP block.

- QLB block.

- Paravertebral block.

17:00-18:00 **Vasil Khachiashvili (GE) - Interfascial Blocks of the Chest Wall and Back:**

- Pectoral nerve (PECS I and II).
- Serratus anterior plane.
- Erector spinae plane.
- Intercostal nerve.

Practical classes in groups on mannequins and pig biomaterial.

18:00-18:10 **Stefane Chilingarashvili (GE)** - Presentation of the “Atlas of region anesthesia”.

Saturday, 3 October, 2026 (Orchimimosa)

10:00-13:00 *Session III*

Moderators: Arij Berkovitch (FR), Vakhtang Shoshiashvili (GE)

10:00-10:45 **Arij Berkovitch (FR)** - US guided neuraxial anesthesia epidural, spinal.

10:45-11:30 **Nikolozi Rtveliashvili (GE)** - Ultrasound guided caudal anesthesia.

11:30-12:30 **Vakhtang Shoshiashvili (GE)** - Topographic anatomical landmarks for performing blocks of the plexus brachialis et lumbaris: Upper and Lower Extremity.

12:30-13:00 **Tea Gubeladze (GE)** - The role of ultrasound elastography for peripheral blockades.

13:00-14:00 ***Coffee break***

14:00-17:30 *Session IV (Orchimimosa)*

Moderators: Vakhtang Shoshiashvili (GE), Vasil Khachiashvili (GE)

14:00-15:00 **Arij Berkovitch (FR), Vasil Khachiashvili (GE), Svetlana Eremina (RU), Nikolozi Rtveliashvili (GE)** - Practical exercises performing blocks on pig biomaterial.

15:00-15:45 **Vakhtang Shoshiashvili (GE)** - Bodypainting on mannequins: studying topoanatomical anatomy.

15:45-16:00 **Arij Berkovitch (FR)** - LAST (Local Anesthetic Systemic Toxicity). What is new?

16:00-16:30 **Anzor Kvashilava (GE)** - Surgical Management of Complications of Nerve Blocks.

16:30-17:00 **Irakli Tortladze, Mariam Labuchidze (GE)** - Radiation Safety Culture in the Intensive Care Department.

17:00-17:30 **Conclusion**

17:30-18:00 **Closing ceremony**

2.10.2026. 14:00 - 15:00 Hall. Poster Session

1. **Mariam Muradashvili** – Mitochondrial dysfunction in sepsis-induced multiple organ dysfunction syndrome (MODS)
2. **Nino Telia** – Endothelia dysfunction in sepsis: early detection of microcirculatory impairment and organ hypoperfusion
3. **Ana Tsintsadze** – Early Hemodynamic Support in Septic Shock: Fluid Resuscitation, Norepinephrine, Vasopressin and Hydrocholorisone
4. **Nodar Tsintsadze** – Lactate in Sepsis: A marker of Hypoperfusion or metabolic stress?
5. **Tsitsino Zhorzholiani** – Microbiological Analysis and Antimicrobial Resistance Patterns in Bacteriological Studies at Batumi Republican Clinical Hospital
6. **Niko Kharadze** – Sepsis as Immune Response Dysregulation: From Hyperinflammation to Immunosuppression
7. **Enriko Jgenti** – IL-6 Trans-Signaling as a Primary Driver of Vascular Permeability and Septic Shock
8. **Emil Akhmedovi** – Aneurysmal Subarachnoid hemorrhage (?)
9. **Ramin Dumbadze** – When Treatment Becomes the Treat: Severe Sepsis Secondary to Immunosuppression in GPA
10. **Nutsa Mamulaishvili** - Total Organic Synthesis of Frondosin D, a potent IL-8 Inhibitor via Oxyanionic 5-exo dig/Claisen Rearrangement Reaction.

03.10.2026. 12:30 - 13:30 Room Orchimimoza. Breakout session.

Prof. Manu Malbrain: IFAD mini breakout session. (At the end of the session 3, G3 and during the coffee)

Address scientific part:

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COMPARATIVE CHARACTERISTICS AND DYNAMICS OF IL-1 β AND IL-17 IN ISCHEMIC AND HEMORRHAGIC STROKE.

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DOI: 10.52340/geoanesthesia.2026.09.01

Keywords: ischemic stroke, hemorrhagic stroke, IL-1 β , IL-17, neuroinflammation, microglia.

Background. Neuroinflammation is one of the principal mechanisms of secondary brain injury following stroke. Interleukin-1 β (IL-1 β) is a key mediator of the early innate immune response and contributes to endothelial activation, blood–brain barrier disruption, and inflammatory cell recruitment. Interleukin-17 (IL-17) is involved in Th17-mediated inflammation, endothelial injury, and the maintenance of neuroinflammatory responses. The comparative dynamics of these cytokines in ischemic and hemorrhagic stroke remain insufficiently investigated.

Objective. To compare baseline IL-1 β and IL-17 concentrations in ischemic and hemorrhagic stroke and evaluate their changes during treatment.

Materials and Methods. This single-center pilot observational study included 35 patients: 22 with ischemic stroke and 13 with hemorrhagic stroke. Plasma IL-1 β and IL-17 concentrations were measured at admission and reassessed during treatment. The concentrations of both cytokines were expressed in pg/mL. Paired measurements were available for 20 patients with ischemic stroke and 7 patients with hemorrhagic stroke. Data are presented as median and interquartile range: Me [Q1–Q3]. Between-group differences were assessed using the Mann–Whitney U test, and paired measurements were analyzed using the Wilcoxon signed-rank test. The Benjamini–Hochberg procedure was applied to adjust for the two simultaneously analyzed cytokines.

Results. At admission, IL-1 β concentrations were higher in patients with ischemic stroke than in those with hemorrhagic stroke: 3.499 [2.564–9.479] versus 2.479 [2.338–2.811] pg/mL; $p=0.015$. The difference remained statistically significant after adjustment for multiple comparisons: $q=0.031$. Baseline IL-17 concentrations did not differ significantly between the groups: 1.801 [1.611–2.522] pg/mL in ischemic stroke and 2.129 [1.616–2.546] pg/mL in hemorrhagic stroke; $p=0.682$.

In the paired ischemic stroke subgroup, IL-1 β decreased from 3.499 [2.633–6.533] to 2.525 [2.323–3.242] pg/mL, although the difference did not reach statistical significance: $p=0.053$. IL-17 increased from 1.857 [1.672–2.574] to 2.123 [1.801–2.984] pg/mL; $p=0.079$. Neither result remained statistically significant after adjustment for multiple comparisons.

In patients with hemorrhagic stroke, median IL-1 β concentrations were 2.479 [2.132–2.598] pg/mL at the first measurement and 2.318 [2.199–2.329] pg/mL at the second measurement; $p=0.375$. IL-17 concentrations were 1.665 [1.547–2.871] and 1.715 [1.504–2.282] pg/mL, respectively; $p=0.578$.

Discussion. The higher baseline IL-1 β concentration observed in ischemic stroke is consistent with early activation of innate immunity following cerebral ischemia. Recent experimental evidence indicates that microglia become one of the principal sources of IL-1 β in ischemic brain tissue during the hyperacute phase [1]. IL-1 β is also considered an important contributor to blood–brain barrier disruption and the expansion of secondary ischemic injury [2]. The absence of significant IL-17 changes may reflect a more variable or

delayed activation of the Th17-mediated response. Marked IL-1 β outliers and the small paired hemorrhagic stroke subgroup limit the interpretation of mean concentrations.

Conclusions. Ischemic stroke was associated with a higher baseline IL-1 β concentration than hemorrhagic stroke. No significant between-group difference in IL-17 or statistically confirmed changes in IL-1 β and IL-17 during treatment were identified.

References

1. Bourne JH, Suthya AR, Wanrooy BJ, et al. Microglia are prominent producers of inflammatory cytokines during the hyperacute phase of ischemic stroke. *Communications Biology*. 2025;8:1193. doi: 10.1038/s42003-025-08636-1.
2. Matys P, Mirończuk A, Starosz A, et al. Expanding Role of Interleukin-1 Family Cytokines in Acute Ischemic Stroke. *International Journal of Molecular Sciences*. 2024;25(19):10515. doi: 10.3390/ijms251910515.

THE INFLUENCE OF GEOMAGNETIC ACTIVITY ON PAIN MANAGEMENT AND POST-OPERATIVE COMPLICATIONS: TECHNOLOGICAL CHALLENGES

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DOI: 10.52340/geoanesthesia.2026.09.02

Keywords: geomagnetic activity, multimodal analgesia, electroencephalography (EEG), neuromodulation, mental defeat, technological challenges.

Introduction: Recent 2026 evidence from the American Academy of Pain Medicine (AAPM) and leading peer-reviewed journals (*PAIN, Pain Medicine*) demonstrates that acute and chronic pain management has shifted beyond traditional monotherapy (opioid reliance) toward multimodal, non-opioid strategies and advanced interventional techniques. Pain perception is intrinsically linked to central nervous system maladaptation and neural network reorganization, particularly within the anterior cingulate cortex (ACC). The impact of external environmental triggers, specifically space weather and geomagnetic activity, on these bioelectric and structural neural pathways represents one of the most critical and under-researched technological challenges in modern biomedicine.

Objective: This study aims to evaluate the correlation between geomagnetic activity (measured by the Kp-index) and post-operative pain intensity, the efficacy of multimodal analgesia, and early post-operative complications, while establishing a technological framework for objective monitoring and clinical management.

Methods: This prospective observational study will include patients undergoing elective minimally invasive procedures or regional interventions (e.g., radiofrequency ablation - RFA, nerve blocks). Subjective pain trajectories and cognitive factors, such as mental defeat, will be captured digitally using Ecological Momentary Assessment (EMA) and VAS/NRS scales. To achieve objective quantification, cortical hyperexcitability and central pain sensitization will be tracked via **electroencephalography (EEG)** and transcranial **ultrasound stimulation**, while localized muscle hypertonicity will be measured via **surface electromyography (EMG)**. Multi-layered clinical datasets will be processed through artificial intelligence (AI) algorithms and cross-referenced with real-time geomagnetic metrics.

Expected Results: It is hypothesized that elevated geomagnetic activity days (when the te strength can reach maximum) will significantly correlate with increased neural network excitability (evidenced by EEG), muscle spasms (evidenced by EMG), and a higher incidence of subjective mental defeat. This cascade is expected to temporarily blunt the efficacy of standard non-opioid multimodal protocols, necessitating breakthrough technological neuromodulation (e.g., Spinal Cord Stimulation - SCS). Furthermore, the study will highlight the current technological gap in Electronic Health Record (EHR) systems regarding the lack of automated integration with space weather platforms.

Conclusion: This study addresses a profound technological barrier at the intersection of heliogeophysics and clinical algology. The findings will lay the groundwork for personalized, space-weather-adaptive neuromodulatory and pharmacological guidelines to optimize post-operative outcomes.

SEPSIS OR POISONING? A DIFFERENTIAL-DIAGNOSTIC CHALLENGE IN THE USE OF ADDICTIVE COMPOUNDS

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DOI: 10.52340/geoanesthesia.2026.09.03

Keywords: toxicology; sepsis; differential diagnosis; addictive compounds; secondary bacterial infection; emergency medicine

Introduction. In emergency and intensive care practice, clinicians frequently encounter patients presenting with impaired consciousness, hemodynamic instability, and multi-organ dysfunction - a clinical picture that may equally correspond to septic shock or to severe intoxication caused by addictive compounds [1]. In toxicologically low-resource settings, where toxicological screening (including qualitative testing) is practically unavailable, differential diagnosis becomes even more challenging. Furthermore, the use of addictive compounds itself increases the risk of genuine bacterial complications - infections related to intravenous use [5] or aspiration, as well as immune suppression caused by the myelosuppressive effect of alcohol [6] - which often become superimposed on the initial toxic presentation at a later stage.

Case illustration. A 27-year-old male patient was admitted in an unconscious state, with respiratory failure (SpO₂ 82%), unstable hemodynamics (BP 70/52 mmHg), miotic pupils, and hypoglycemia. History indicated intake of alcohol, cannabis, and suspected methadone; a transient response to naloxone was observed. Initial laboratory findings revealed severe mixed metabolic acidosis with a high anion gap [3], massive cytolytic liver injury with a shock-type pattern, severe coagulopathy, and acute kidney injury requiring repeated hemodialysis. CRP was within normal limits on admission, consistent with a primary toxic/shock process [2]; by the second week, a rise in CRP was observed, corresponding to bronchoscopically confirmed aspiration pneumonia - a genuine secondary bacterial complication superimposed on the primary toxic condition. Empirical antibacterial therapy, detoxification, hemodialysis, and supportive intensive care led to a gradual favorable outcome.

Aim. To identify objective clinical and accessible laboratory criteria that assist emergency physicians in toxicologically low-resource settings in: a) differentiating primary toxic and septic complications, and b) promptly recognizing genuine bacterial infection superimposed at a later stage.

Discussion. In initial assessment, priority should be given to objective toxidromic signs, which do not depend on verbal information [1] - this is particularly important, as history-taking is often of limited reliability due to stigma and legal fears associated with illicit substance use. Among readily available routine laboratory parameters, the anion/osmolar gap and differential white blood cell count (including screening for agranulocytosis in chronic alcohol users [6]) are informative; the absolute lactate value alone is insufficient for differentiation, since hyperlactatemia occurs both in tissue-hypoperfusion (type A) and non-hypoxic (type B) states [4] - its mechanism of origin and clearance dynamics are more informative than a single value. At later stages, dynamic monitoring (CRP trend, new clinical/radiological signs) is critical for the timely recognition of genuine secondary infection [2], particularly in intravenous substance users (risk of bacteremia/endocarditis) [5] and chronic alcohol users (myelosuppression) [6].

Conclusion. Toxic and septic complications frequently not only mimic one another but also evolve into one another over time. An accurate, timely, and stage-adapted diagnostic-therapeutic approach - one that accounts for both the primary toxic process and the risk of a genuine superimposed secondary bacterial complication - is decisive for preserving patient survival, particularly in toxicologically low-resource settings.

References

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PREINFUSION PREPARATION FOR CESAREAN SECTION: EFFECT ON THE INCIDENCE OF SPINAL- INDUCED HYPOTENSION

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DOI: 10.52340/geoanesthesia.2026.09.04

Background

Spinal anesthesia is the method of choice for elective cesarean delivery; however, it is frequently associated with arterial hypotension due to sympathetic blockade, decreased systemic vascular resistance, and reduced venous return. Severe hypotension may be accompanied by nausea, vomiting, impaired uteroplacental perfusion, and the need for vasopressor administration. One component of preventing hemodynamic disturbances is rational fluid therapy before spinal anesthesia. Therefore, assessment of the effectiveness of crystalloid preinfusion before spinal anesthesia remains clinically relevant.

Objective

To evaluate the effect of preinfusion with a balanced crystalloid solution on the incidence and severity of arterial hypotension during spinal anesthesia for elective cesarean delivery.

Materials and Methods

The study included 320 pregnant women with singleton term pregnancies undergoing elective cesarean delivery under spinal anesthesia. The patients were divided into two groups of 160 each. In the main group (Group I), prior to spinal anesthesia, patients received a 15–20-minute preinfusion of the balanced hyperosmolar crystalloid solution Rheosorbilact. In the comparison group (Group II), fluid therapy was performed using Ringer's solution. In both groups, spinal anesthesia was performed with 0.5% hyperbaric Longocaine Heavy at a standard dose.

Systolic, diastolic, and mean arterial pressure, heart rate, incidence of hypotensive episodes, need for vasopressor support, incidence of nausea and vomiting, and neonatal status according to Apgar scores were assessed. Arterial hypotension was defined as a decrease in systolic blood pressure of more than 20% from baseline or a systolic blood pressure below 90 mmHg.

Results and Discussion

Following the development of spinal block, more stable hemodynamics were observed in the main group. The incidence of arterial hypotension was 21.7% compared with 53.3% in the comparison group ($p < 0.05$). A marked decrease in systolic blood pressure of more than 20% from baseline was recorded in 13.0% of patients in Group I and 36.7% in Group II ($p < 0.05$). The need for vasopressor support was lower in the Rheosorbilact preinfusion group—10.4% versus 32.5% ($p < 0.05$). Episodes of nausea and vomiting were also less frequent, occurring in 8.6% of patients in Group I compared with 25.0% in Group II. No clinically significant between-group differences in neonatal Apgar scores were observed.

The significant differences between the study groups were apparently related to the use of different solutions for preinfusion. Within 15–20 minutes after intravenous administration, crystalloid solutions are redistributed into the interstitial compartment, with only approximately 15–20% of the administered volume remaining in the intravascular space. The use of the hyperosmolar crystalloid solution

Rheosorbilact promotes redistribution of interstitial fluid into the intravascular compartment at a ratio of approximately 1:1.2 and helps maintain the intravascular volume effect for up to one hour.

Conclusion

Preinfusion with the balanced hyperosmolar crystalloid solution Rheosorbilact before spinal anesthesia for elective cesarean delivery improves hemodynamic stability, reduces the incidence and severity of arterial hypotension, and decreases the need for vasopressor support compared with conventional crystalloid administration. Nevertheless, preinfusion should be considered a component of a comprehensive strategy for the prevention of spinal anesthesia-induced hypotension, together with timely hemodynamic monitoring and rational use of vasopressors.

EVALUATION OF THE EFFICACY AND SAFETY OF SPINAL ANESTHESIA BASED ON HYPERBARIC BUPIVACAINE COMBINED WITH DEXMEDETOMIDINE AND KETAMINE IN GYNECOLOGICAL LAPAROSCOPIC

Surgery

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DOI: 10.52340/geoanesthesia.2026.09.05

Background

In gynecology, particularly during laparoscopic surgery, the choice of the optimal anesthetic technique remains a subject of ongoing debate. Currently, general balanced anesthesia with mechanical ventilation is considered the standard approach. However, under conditions of carbon dioxide pneumoperitoneum and the Trendelenburg position, this technique may be associated with adverse hemodynamic changes, including increased afterload and impaired organ perfusion. This is particularly relevant in patients at increased risk of cardiovascular complications, as general anesthesia may contribute to greater perioperative hemodynamic instability. At the same time, neuraxial anesthesia is considered a relatively more physiological technique, imposing less stress on the cardiovascular and respiratory systems. Current evidence supports its safety provided that adequate monitoring and standardized protocols are implemented.

Objective

To evaluate the efficacy and safety of spinal anesthesia during gynecological laparoscopic surgery.

Materials and Methods

The study included 620 patients who underwent elective and emergency laparoscopic gynecological procedures. The patients' age ranged from 19 to 65 years, and their body mass index (BMI) ranged from 18.5 to 34.9 kg/m².

The main indications for surgical treatment included chronic inflammatory diseases of the uterine appendages, benign neoplasms of the uterus and ovaries, as well as emergency conditions such as ectopic pregnancy and ovarian apoplexy.

The following laparoscopic procedures were performed: laparoscopic cystectomy, tubotomy, salpingectomy, oophorectomy, and hysterectomy. All patients were classified as ASA physical status I–II. Preoperative preparation included elastic compression of the lower extremities and administration of H₂-receptor blockers. Premedication consisted of intramuscular midazolam administered 30 minutes before surgery. Spinal anesthesia was performed at the L3–L4 intervertebral level using 0.5% hyperbaric bupivacaine (Bupivacaine, Longocaine Heavy) at a standard dose. Spontaneous ventilation was maintained throughout the procedure, with supplemental oxygen administered via nasal insufflation. To reduce psychological and positional discomfort, controlled sedation with dexmedetomidine (Kvanadex) at a dose of 0.5–1.0 µg/kg was used. Comprehensive monitoring was performed, including assessment of: central hemodynamic parameters, including echocardiographic assessment; pulse oximetry; acid–base status; blood gas parameters; serum electrolytes; lactate levels; hematocrit. Blood gas analysis and the assessment of major metabolic parameters were performed using a UCARE6000 Wondfo (Rain Sen Da). Fluid therapy was administered using crystalloid solutions at a rate of 10–12 mL/kg/h, including 0.9% sodium chloride solution, Ringer's solution, or Reosorbilact.

Results and Discussion

Following spinal anesthesia, a tendency toward a moderate decrease in mean arterial pressure (MAP), cardiac output (CO), and systemic vascular resistance (SVR) was observed. After creation of pneumoperitoneum and placement of the patients in the Trendelenburg position, no significant hemodynamic changes were observed; only a slight reduction in systemic vascular resistance persisted. Following completion of surgery and release of the pneumoperitoneum, hemodynamic parameters returned to baseline values. Cardiac output remained stable throughout the surgical procedure. Acid–base status and blood gas parameters remained generally stable. Following the establishment of pneumoperitoneum and placement in the Trendelenburg position, moderate respiratory alkalosis and metabolic acidosis without an increased anion gap were observed. During the early postoperative period, there was a significant reduction in the need for opioid analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs) for postoperative pain management.

Conclusion

Spinal anesthesia with preserved spontaneous ventilation provides a stable hemodynamic profile during gynecological laparoscopic surgery. Neuraxial anesthesia may reduce the adverse cardiovascular effects associated with pneumoperitoneum and the Trendelenburg position. 0.5% hyperbaric bupivacaine provides an adequate level of surgical anesthesia for procedures lasting up to 2.5 hours. Controlled sedation with dexmedetomidine does not have a significant adverse effect on spontaneous respiration or acid–base status.

Age over 45 years should be considered a risk factor for the development of perioperative cardiovascular complications.

QUANADEX AS A COMPONENT OF ANESTHETIC MANAGEMENT FOR CESAREAN SECTION IN WOMEN WITH PREECLAMPSIA

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DOI: 10.52340/geoanesthesia.2026.09.06

Background

Preeclampsia is a severe complication of pregnancy that accounts for approximately 70,000 maternal and 500,000 perinatal deaths worldwide each year. Severe forms of the disease frequently necessitate delivery by cesarean section, which remains the definitive treatment. The main anesthetic techniques include general multicomponent anesthesia with mechanical ventilation and neuraxial anesthesia. However, general anesthesia is associated with the risks of difficult intubation, a hyperdynamic hemodynamic response, and drug-induced neonatal depression, whereas neuraxial anesthesia may be accompanied by hemodynamic disturbances and insufficient postoperative analgesia.

In 2011, the European Medicines Agency authorized the use of dexmedetomidine (Quanadex), a highly selective α_2 -adrenergic receptor agonist, as a sedative agent. Dexmedetomidine has sedative, anxiolytic, and analgesic properties and can be used as an adjunct during general and regional anesthesia and for sedation in intensive care settings. Despite the available evidence, a comprehensive assessment of its effects on both the mother and newborn in preeclampsia remains insufficient.

Objective

To evaluate the effects of intravenous Quanadex administration during cesarean section under spinal anesthesia in women with preeclampsia on maternal vital physiological systems and early neonatal adaptation.

Materials and Methods

The inclusion criteria were preeclampsia, gestational age of 37–39 weeks, and ASA physical status II. Exclusion criteria included cardiovascular disease, morbid obesity, and refusal of spinal anesthesia.

All women were divided into two groups. In Group I (n=105), premedication consisted of diphenhydramine (0.2 mg/kg) and diazepam (Sibazon) 2.5 mg. Subarachnoid puncture was performed at the L3–L4 interspace using 25–26 G pencil-point needles. A standard dose of 0.5% hyperbaric Longocain Heavy solution was administered intrathecally over 2 minutes.

In Group II (n=108), Quanadex was administered intravenously at a rate of 0.6–0.8 $\mu\text{g/kg/h}$ starting at the time of premedication. Surgery was initiated 4–6 minutes after the development of all clinical signs of an adequate surgical level of spinal anesthesia.

No specific replacement of intraoperative blood loss was performed. The total volume of intraoperative infusion therapy was 10–12 mL/kg and consisted of crystalloids (Rheosorbilact and a balanced crystalloid solution). If bradycardia below 55 beats/min occurred, atropine 0.3 mg was administered intravenously.

Vital physiological functions were assessed using standard clinical parameters. Central hemodynamics were evaluated by echocardiography. Acid–base status, electrolytes, lactate, glucose, and hematocrit were measured using a UCARE6000 blood gas analyzer (Wondfo/Rain Sen Da). N-terminal pro-B-type natriuretic peptide (NT-proBNP), cystatin C, interleukin-6 (IL-6), and S100 β protein were determined using a Finecare FIA Meter III Plus, Model FS-205 (Wondfo) immunofluorescence analyzer. Sedation was assessed using the Richmond Agitation–Sedation Scale (RASS). Neonatal status was assessed using Apgar scores at 1 and 5 minutes after birth.

Results and Discussion. At baseline, the hemodynamic status of the patients was characterized by hypertensive–hypodynamic dissociation. Acid–base assessment revealed subcompensated metabolic acidosis accompanied by mild hypoxemia.

Comparative assessment of the effects of dexmedetomidine and diazepam on the level of consciousness using the RASS demonstrated that dexmedetomidine-induced sedation was characterized by easier arousability, allowing more effective interaction and communication between patients and medical personnel.

After delivery of the fetus, the level of sedation also remained moderate in Group I, whereas in Group II it was mild (RASS -2 ± 0.1), which had a favorable effect on the mother's psycho-emotional state and facilitated early interaction with the newborn.

Changes in hemodynamic parameters, NT-proBNP levels, and acid–base status demonstrated greater hemodynamic stability in Group II, accompanied by attenuation of the stress response to surgical and anesthetic interventions. At the most traumatic stage of surgery, IL-6 levels in Group I were 30.6% higher than those in Group II, and at the end of surgery they remained 28% higher.

Newborns in Group I, whose mothers received diazepam as part of premedication during spinal anesthesia, had lower Apgar scores at both 1 and 5 minutes after birth. They also demonstrated subcompensated metabolic and respiratory acidosis, increased blood lactate levels (3.8 ± 0.09 mmol/L), moderate hypoxemia, and higher S100 β concentrations. These changes were associated with greater respiratory depression and impaired early neonatal adaptation in Group I.

Conclusion

Patients receiving dexmedetomidine (Group II) were more readily arousable than those receiving diazepam and demonstrated better hemodynamic stability and more effective antinociceptive protection against surgical and anesthetic stress, without pronounced arterial hypotension and with only moderate bradycardia. The use of dexmedetomidine was not associated with significant adverse neonatal outcomes.

RADIATION SAFETY CULTURE IN THE INTENSIVE CARE DEPARTMENT

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DOI: 10.52340/geoanesthesia.2026.09.07

Keywords: intensive care unit, dose length product (DLP); ultra-low and low-dose computed tomography (ULDCT/LDCT); cancer risk.

Abstract

The aim of this commentary review was to summarize the main research evidences on radiation exposure and to underline the best clinical and radiological practices to limit radiation exposure in intensive care unit (ICU) patients. Radiological imaging is essential for management of patients in an ICU despite the risk of ionizing radiation exposure in monitoring critically ill patients, especially in those with prolonged hospitalization. In optimizing radiation exposure reduction for ICU patients, multiple parties and professionals must be considered, including hospital management, clinicians, radiographers, and radiologists. Modified diagnostic reference levels for an ICU patients, based on UK and USA guidance, may be proposed, especially considering the frequent repetition of X-ray diagnostic procedures in an ICU patients. Best practices may reduce radiation exposure in ICU patients with particular emphasis on justification and radiation exposure optimization in conventional radiology, interventional radiology and CT. CT contributes most predominately to radiation exposure in an ICU patients.

In the present some cases report, we demonstrate high specificity (>94%) of individualized ultra-low-dose CT (ULDCT) in detecting infiltrative changes. The radiation dose of ULDCT was more than 10 times lower than that of standard CT scans and some time for chest Area significantly lower than traditional X-rays. While the visualization quality for mediastinal structures and the skeletal system was reduced, the assessment of lung tissue remained precise and reliable. Its high sensitivity, specificity, and minimal radiation exposure make it particularly advantageous for patients requiring multiple follow-up scans. Implementing targeted protocols based on individual patient needs is recommended to increase ULDCT usage in daily working in an ICU also.

SUSPECTED CULTURE-NEGATIVE SEPTICEMIA PRESENTING AS RECURRENT POLYSEROSITIS IN A PATIENT WITH ADVANCED HIV INFECTION: A DIAGNOSTIC DILEMMA

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DOI: 10.52340/geoanesthesia.2026.09.08

Keywords: Advanced HIV, Suspected Septicemia, Culture-Negative Sepsis, Polyserositis, Pericardial Effusion, Pleural Effusion.

Background: Septicemia in advanced HIV infection is a life-threatening condition that often presents with atypical clinical manifestations due to severe immunosuppression. Identifying the causative pathogen is critical, yet culture-negative sepsis or septicemia occurs frequently, posing a profound diagnostic and therapeutic challenge for clinicians managing opportunistic conditions.

Case Presentation: A 49-year-old male with advanced HIV infection (baseline CD4 count: 99 cells/mm³), who discontinued antiretroviral therapy (ART) in 2022, was admitted in January 2026 with clinical features highly suggestive of systemic septicemia, including progressive dyspnea, chest discomfort, and hemodynamic instability. Examination revealed severe recurrent polyserositis, characterized by a massive pericardial effusion (1200 mL drained) and bilateral pleural effusions. Despite the clear clinical presentation of an overwhelming systemic infection, extensive microbiological workups—including repeated blood cultures, pericardial fluid cultures, and pleural fluid cultures—failed to isolate any pathogenic bacterial or fungal flora. Initial empirical broad-spectrum antibiotic therapy combined with NSAIDs and the reinitiation of ART (DTG/3TC/TDF) resulted in temporary clinical stabilization.

Three months later, the patient suffered a severe clinical relapse with worsening respiratory failure, massive right-sided pleural effusion, persistent pericardial fluid, and mediastinal lymphadenopathy. A secondary diagnostic workup for suspected septicemia was urgently initiated. Multiple repeat cultures of blood, sputum, and drained serous fluids remained persistently negative for pathological flora. Molecular and smear examinations for latent opportunistic pathogens, including Tuberculosis, were also negative. Given the persistent systemic inflammatory responses and the absence of an isolated organism, culture-negative septicemia secondary to an occult opportunistic source remained the primary working diagnosis. Alternative etiologies, such as HIV-associated lymphoma or atypical presentation of disseminated infections, were also considered. The patient demonstrated gradual stabilization following aggressive empiric treatment modifications, including broad-spectrum antimicrobials and adjunctive corticosteroid therapy.

Conclusion: This case underscores that suspected septicemia in advanced HIV infection can present as recurrent polyserositis without yielding positive cultures from any biological fluid. In severely immunocompromised patients, a lack of microbial growth must not delay aggressive, empirical broad-spectrum antimicrobial therapy, and highlights the need for advanced molecular or tissue-based diagnostic modalities to uncover occult infectious sources.

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NEW BIOMARKERS IN SEPSIS: RECENT ADVANCES, CLINICAL READINESS, AND PERSONALIZED MEDICINE

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DOI: 10.52340/geoanesthesia.2026.09.09

Keywords: Sepsis; Biological Biomarkers; Endotyping; Point-of-Care Testing; Presepsin; MR-proADM; Transcriptomics; Machine Learning; Immunoparalysis; Personalized Medicine

Background: Sepsis is a biologically complex and dynamic syndrome defined by a dysregulated host response to infection leading to organ dysfunction. Given its high clinical heterogeneity, conventional diagnostic approaches and static biomarkers often fail to capture real-time disease trajectories, leaving critical gaps in early identification, risk stratification, and targeted intervention.

Objective: To review emerging sepsis biomarkers across multiple biological domains, evaluate their dynamic prognostic and diagnostic capabilities, and assess their current clinical readiness within personalized care frameworks.

Key Domains & Findings:

- **Established vs. Point-of-Care (POC) Biomarkers:** Traditional markers (lactate, CRP, PCT) remain foundational for assessing hypoperfusion and guiding antibiotic de-escalation, though they lack specificity for sepsis endotypes [2, 8]. Novel POC and near-term markers (presepsin, MR-proADM, nCD64, calprotectin, PSP) offer rapid, high-accuracy signaling for early infection, severe endothelial stress, and acute clinical deterioration [4,5].
- **Prognostic Kinetics & Immunophenotyping:** Serial dynamics outperform static baseline measurements. Persistent elevations of cytokines such as IL-6 correlate with elevated 28-day mortality [1,9], whereas alterations in surface markers like mHLA-DR and sIL-7R identify distinct immunoparalysis phenotypes, laying the groundwork for phenotype-guided immunomodulatory therapies.
- **Omics, Epigenetics & Digital Health:** Next-generation tools—including organ-specific cfDNA methylation signatures for sepsis-associated AKI [10], non-coding RNAs like LncRNA HOTTIP [3], transcriptomic multigene panels [7], and targeted lipidomics—enable deep biological endotyping. When integrated with machine learning platforms, multi-omic profiles substantially improve risk prediction models compared to standard clinical scores [6].

Conclusion & Clinical Readiness: While routine markers remain the current standard, near-term biological tests (MR-proADM, presepsin, nCD64) demonstrate high diagnostic and prognostic value. High-dimensional omics and transcriptomic panels require further standardization of assays, prospective validation, and workflow integration before widespread adoption. Optimal clinical utility relies on combining rapid dynamic biomarker profiles, advanced multi-omics/AI modeling, and rigorous clinical assessment.

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ULTRASOUND-GUIDED GENICULAR NERVE BLOCK FOR CHRONIC KNEE OSTEOARTHRITIS PAIN: A CASE REPORT

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DOI: 10.52340/geoanesthesia.2026.09.10

Keywords: knee osteoarthritis, chronic knee osteoarthritis pain, Ultrasound guidance, Pain Management, Regional Anesthesia,

Background

Chronic knee osteoarthritis is a common cause of persistent pain and functional limitation. Genicular nerve blockade is a minimally invasive, motor-sparing technique that can provide both diagnostic and therapeutic pain relief.

Case Presentation

A 65-year-old woman with knee osteoarthritis and a body mass index of 46 kg/m² presented with persistent knee pain and functional limitation. Considering the chronic nature of her symptoms and the patient's significant obesity, an ultrasound-guided therapeutic genicular nerve block was performed. The superior medial, superior lateral, and inferior medial genicular nerves were targeted. At each target, 3 mL of 0.5% ropivacaine combined with 10 mg of triamcinolone was administered.

Following the procedure, the patient experienced a marked reduction in pain, with the pain score decreasing to 1/10. At four-week follow-up, the pain score remained low at 2/10, with the patient reporting sustained functional improvement. Clinically meaningful analgesia was maintained for approximately two months. No procedure-related complications were observed.

Conclusion

This case demonstrates the potential role of ultrasound-guided genicular nerve blockade as a therapeutic option for chronic knee osteoarthritis pain. The combination of local anesthetic and corticosteroid provided substantial and sustained analgesia, with clinically meaningful pain relief maintained for approximately two months. Genicular nerve blockade may represent a valuable minimally invasive component of multimodal interventional pain management, particularly in patients with significant obesity.

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BODYPAINING ON MANNEQUINS: STUDYING TOPANATOMICAL ANATOMY.

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DOI: 10.52340/geoanesthesia.2026.09.11

Keywords: Topographic Anatomy, Bodypainting, Medical Education, Virtual Dissection, Synthetic Mannequins, Active Learning.

Background:

Mastering topographic (regional) anatomy requires translating three-dimensional spatial relationships, fascial boundaries, and neurovascular trajectories into clinical practice. While cadaveric dissection remains a traditional benchmark, reduced access, high maintenance, and modern curricular shifts have accelerated interest in alternative pedagogical tools. Bodypainting—the schematic projection of underlying structures onto a surface—is well-established as a cost-effective, active-learning modality that enhances surface anatomy comprehension, active retention, and tactile palpation skills. Recent advancements have expanded bodypainting beyond live peer models to include synthetic physical mannequins (such as ultrasound phantoms) and interactive virtual 3D ecosystems. Bodypainting is also used in real clinical practice.

Objective:

This narrative review synthesizes current literature on the application of bodypainting across physical synthetic mannequins and virtual platforms, evaluating how this dual-modality framework enhances topographic anatomy acquisition, spatial retention, and procedural orientation.

Key Findings:

- **Physical Bodypainting (Synthetic & Phantom Mannequins):** Literature highlights that applying tactile markings and color-coded pathways directly onto physical models leverages cognitive load theory via multisensory integration (kinesthetic, visual, tactile). It establishes crucial haptic feedback, aiding learners in mapping superficial landmarks to deeper target structures—a vital competency for palpation, surface projection, and needle-to-target alignment in image-guided procedures.
- **Virtual Bodypainting (3D Digital Platforms):** Digital annotation, dynamic multi-layer texturing, and virtual plane-slicing (e.g., Anatomage, Sectra, 3D software ecosystems) overcome the physical limitation of opacity. Virtual platforms allow learners to isolate fascial planes, perform non-destructive volumetric sectioning, and correlate surface landmarks directly with cross-sectional imaging (CT/MRI).
- **Synergistic Dual-Modality Impact:** Review of comparative educational outcomes indicates that combining physical surface mapping with digital multi-layer rendering bridges the gap between external landmarking and internal 3D architecture, resulting in superior cross-sectional depth perception compared to either modality used in isolation.
- **In Clinical Practice:** Body painting helps teach and visualize surface anatomy before performing various peripheral nerve blocks, including scalp blocks, superficial cervical plexus blocks, brachial plexus blocks, blocks at the elbow and wrist, paravertebral and intercostal blocks, truncal blocks, lower extremity blocks, and foot blocks. While primarily used as an educational tool, anatomical surface mapping can also assist during nerve stimulation-guided blocks; however, it is an **optional adjunct**, not a mandatory requirement.

Conclusions & Educational Implications:

Integrating body painting across both physical human models and virtual platforms offers a highly complementary pedagogical strategy. Physical models provide the tactile and spatial grounding necessary for surface anatomical projection, while digital platforms deliver the volumetric transparency required for deep topographic comprehension. Medical curricula and simulation centers can leverage this dual-modality approach to optimize active learning and long-term knowledge retention in regional anesthesia and surface anatomy. Furthermore, body painting serves as a valuable practical tool for enhancing landmark identification in daily clinical practice.

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MULTIMODAL PERIOPERATIVE PAIN MANAGEMENT: AN EVIDENCE-BASED MULTIDISCIPLINARY STRATEGY

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DOI: 10.52340/geoanesthesia.2026.09.12

Keywords: multimodal analgesia; postoperative pain; opioid-sparing anaesthesia; regional analgesia; fascial plane blocks; enhanced recovery after surgery (ERAS).

Background: Postoperative pain remains common despite decades of guidance; nearly half of adults experience moderate or severe pain after surgery [1]. Inadequately controlled acute pain impairs function and recovery and is a modifiable risk factor for chronic postsurgical pain, which affects approximately one in ten patients overall and occurs more frequently after selected high-risk procedures [2].

Objective: To synthesise current evidence on multimodal perioperative analgesia and present a practical, multidisciplinary framework spanning the preoperative, intraoperative, post-anaesthesia care, ward and discharge phases.

Methods: Contemporary guidelines and consensus statements, landmark mechanistic studies, systematic reviews and enhanced-recovery literature were narratively reviewed. Evidence was integrated into a framework emphasising procedure-specific analgesia, opioid-sparing strategies, local or regional techniques and continuity across clinical handoffs.

Key findings: Multimodal analgesia is grounded in nociceptive physiology. Surgical pain is generated and processed through transduction, transmission, modulation and perception and may be amplified by peripheral and central sensitisation [3,4]. Because no single intervention adequately addresses the entire pathway, combining complementary agents and techniques can improve analgesia while reducing reliance on high doses of any single drug class.

The regimen should be tailored to the procedure and patient. When not contraindicated, a practical foundation commonly includes paracetamol, an NSAID or COX-2 inhibitor, and local or regional anaesthesia when appropriate [1,5,6]. Opioids remain essential for breakthrough or severe acute pain but should be titrated as one component of the plan rather than used as its sole foundation. Selected adjuncts include ketamine for opioid-tolerant patients or when central sensitisation is a major concern, dexmedetomidine with attention to bradycardia and hypotension, and dexamethasone for antiemetic and procedure-dependent analgesic benefit [1]. Routine perioperative gabapentinoid use is not supported by a 281-trial meta-analysis showing no clinically meaningful analgesic benefit and increased dizziness and visual disturbance [7].

The 2026 American Society of Anesthesiologists guideline strongly recommends fascial plane blocks to reduce pain and/or opioid requirements during the first 24 hours after open cardiothoracic, abdominal, retroperitoneal and pelvic surgery and mastectomy; it also recommends them after minimally invasive abdominal procedures [5]. The guideline acknowledges limitations in the evidence, including methodological heterogeneity, inconsistent outcome measurement and small single-centre studies.

Effective implementation requires continuity across handoffs: preoperative risk assessment and patient education; a procedure-specific intraoperative plan; structured assessment of movement-evoked pain in recovery and on the ward; scheduled baseline analgesia; an explicit rescue pathway; and deliberate opioid

stewardship at discharge [1,6]. These elements align analgesia with enhanced-recovery goals, including mobilisation, pulmonary and gastrointestinal recovery and shorter hospital stay [8].

Conclusion: Multimodal perioperative pain management is not simply the administration of more drugs. It is the coordinated, procedure-specific and risk-adjusted use of complementary interventions across the entire surgical pathway. The persistent gap in postoperative pain relief is therefore both a pharmacological and an organisational problem, requiring multiple disciplines to work as one.

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MICROBIOLOGICAL PROFILE AND ANTIMICROBIAL RESISTANCE ANALYSIS OF BACTERIOLOGICAL STUDIES AT BATUMI REPUBLICAN CLINICAL HOSPITAL

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DOI: 10.52340/geoanesthesia.2026.09.13

Keywords: Antimicrobial resistance; healthcare-associated infection; *Klebsiella pneumoniae*; *Pseudomonas aeruginosa*; bacteriological surveillance; Batumi Republican Clinical Hospital.

Background: Environmental and equipment bacteriological surveillance is a core infection prevention and control (IPC) tool, particularly against the backdrop of rising global antimicrobial resistance (AMR).

Objective: We describe the results of environmental, equipment, and sterile-material bacteriological surveillance conducted for Batumi Republican Clinical Hospital by the Adjara Division Zonal Diagnostic Laboratory (2024–2026) and discuss them in the context of recent Georgia-based AMR literature.

Methods: We retrospectively analyzed 137 unique laboratory records collected over three surveillance phases (February–March 2024; August–December 2025; January–March 2026), compiled from the institution's official laboratory reports. No antimicrobial susceptibility testing (antibiogram) was performed on these records — identification only.

Results: Of 137 samples, 132 (96.4%) showed no bacterial growth; 5 samples (3.6%) yielded *Klebsiella pneumoniae* (n=3), *Pseudomonas aeruginosa* (n=1), and *Klebsiella planticola* (n=1), all in the last quarter of 2025.

Discussion: As our dataset contains no susceptibility data, antimicrobial resistance is discussed with reference to published Georgian studies (Mgeladze et al., 2026; 2025) and the WHO Bacterial Priority Pathogens List (2024), which document high resistance rates for *K. pneumoniae* and *P. aeruginosa* in Georgian hospitals.

Conclusion: Our institution's environmental surveillance data show a generally favorable microbiological picture, but the sporadic detection of priority pathogens, together with the reviewed literature, supports incorporating antimicrobial susceptibility testing into future surveillance protocols.

IPACK BLOCK FOR PERSISTENT POSTERIOR KNEE PAIN AFTER TOTAL KNEE ARTHROPLASTY: A CASE REPORT

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Keywords: IPACK, total knee arthroplasty, Ultrasound guidance, Pain Management, Regional Anesthesia

Background

Effective postoperative analgesia is essential for early mobilization and rehabilitation following total knee arthroplasty (TKA). Despite multimodal analgesia and opioid administration, posterior knee pain may remain difficult to control. The IPACK (Interspace between the Popliteal Artery and Capsule of the Knee) block is an ultrasound-guided technique designed to provide posterior knee analgesia while minimizing motor blockade.

Case Presentation

A 54-year-old woman underwent total knee arthroplasty and subsequently developed severe persistent pain localized predominantly to the posterior aspect of the knee. Despite opioid-based analgesia, the patient continued to report significant pain, particularly during mobilization. An ultrasound-guided IPACK block was performed as an adjunct to the existing analgesic regimen.

A progressive improvement in pain was observed following the block. Within 40 minutes, the patient's posterior knee pain had markedly subsided, with pain intensity decreasing to 1/10 during walking. At 60 minutes after the block, the patient was mobilized and able to walk. No clinically significant motor impairment or procedure-related complications were observed.

Conclusion

This case demonstrates the potential effectiveness of the IPACK block in treating persistent posterior knee pain following total knee arthroplasty. Its rapid analgesic effect and preservation of motor function may facilitate early mobilization and rehabilitation, making the IPACK block a valuable component of multimodal analgesia after TKA.

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PRESENTATION OF ATYPICAL AUTOIMMUNE MENINGOENCEPHALITIS IN A 15-YEAR-OLD ADOLESCENT

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DOI: 10.52340/geoanesthesia.2026.09.15

Keywords: Atypical, Encephalitis, Autoimmune

Background

Autoimmune meningoencephalitis is a severe inflammatory disorder in which an aberrant immune response targets the central nervous system, including the brain parenchyma and meninges. Clinical manifestations may develop rapidly over days to weeks and can include encephalopathy, memory impairment, psychiatric or behavioral changes, seizures, headache, and other neurological symptoms. Early recognition, appropriate antibody testing, and prompt initiation of immunotherapy are essential to optimize neurological recovery and clinical outcomes. [1]

Objective

To describe an unusual and diagnostically challenging presentation of autoimmune meningoencephalitis in a 15-year-old adolescent presenting initially with predominantly gastrointestinal symptoms and subsequently developing acute neurological deterioration and generalized seizures.

Case Presentation

A 15-year-old adolescent presented to the Emergency Department at approximately 5:00 AM with a three-day history of fever, chills, and diarrhea. On the morning of admission, he developed multiple episodes of vomiting and was transported to the Emergency Department by ambulance. Following an additional episode of vomiting in the ED, he was admitted because of dehydration and an inability to tolerate oral fluids.

During the initial hours of hospitalization, the patient remained afebrile, with stable hemodynamic and respiratory parameters. He was fully conscious and had no further episodes of vomiting. However, at approximately 8:00 PM on the same day, he developed recurrent fever and chills, with a temperature of 38.5°C, followed by an acute change in mental status characterized by disorientation.

A central nervous system infection was initially suspected. Notably, meningeal signs remained negative throughout the hospitalization. A comprehensive diagnostic workup was therefore initiated. Contrast-enhanced brain computed tomography (CT) was performed and demonstrated no clinically significant abnormalities. Urine toxicology screening for morphine/opioids (MOP), phencyclidine (PCP), cocaine (COC), amphetamines (AMP), tetrahydrocannabinol (THC), and buprenorphine (BUP) was negative. Laboratory investigations revealed normal C-reactive protein, glucose, serum electrolytes, and sodium levels, as well as normal liver and kidney function. Abdominal ultrasonography showed no clinically significant abnormalities.

The patient had no focal neurological deficits, headache, or recurrent vomiting. Although he provided inappropriate or inconsistent answers to several questions, his mother reported a previous diagnosis of childhood attention-deficit/hyperactivity disorder (ADHD) and stated that similar episodes of disorientation had occurred previously, potentially obscuring the significance of his altered mental status.

The patient was subsequently prepared for lumbar puncture. Before the procedure could be performed, however, he developed a generalized tonic-clonic seizure accompanied by eye deviation. The seizure was

terminated following administration of intravenous diazepam 10 mg, with supplemental oxygen provided during the event.

During the postictal period, the pupils were bilaterally dilated but remained reactive to light. Spontaneous movement was preserved in all four extremities; however, the patient remained unconscious. Given the acute neurological deterioration and the need to definitively exclude central nervous system infection, the decision was made to transfer the patient to a specialized pediatric center of excellence for further evaluation and management.

Lumbar puncture performed at the receiving institution revealed no significant abnormalities, making an infectious etiology less likely. In view of the clinical presentation, acute encephalopathy, new-onset generalized seizures, and the absence of evidence supporting CNS infection or metabolic/toxic causes, autoimmune meningoencephalitis was suspected. The patient was treated with high-dose corticosteroid therapy, resulting in marked clinical improvement. [2;3]

Conclusion

This case illustrates a rare and diagnostically challenging presentation of autoimmune meningoencephalitis in a young adolescent. The absence of classical neurological and meningeal symptoms, combined with an initial predominance of gastrointestinal manifestations, complicated early recognition of the underlying neurological disorder. The patient's condition deteriorated rapidly, progressing from nonspecific gastrointestinal symptoms and subtle cognitive changes to generalized tonic-clonic seizures and impaired consciousness.

An increasing body of evidence suggests that autoimmune encephalitis and related inflammatory CNS disorders may occasionally present with nonspecific or gastrointestinal symptoms. Therefore, clinicians should maintain a high index of suspicion for autoimmune meningoencephalitis in patients presenting with an unexplained febrile gastrointestinal illness who subsequently develop subtle alterations in cognition, behavior, or consciousness, even in the absence of classical meningeal signs. Early recognition and timely initiation of immunotherapy may be critical in preventing severe neurological complications and improving clinical outcomes.

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TOPOGRAPHIC ANATOMICAL LANDMARKS FOR PERFORMING BLOCKS OF THE PLEXUS BRACHIALIS ET LUMBARIS

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DOI: 10.52340/geoanesthesia.2026.09.16

Keywords: Plexus brachialis; Plexus lumbalis; Regional Anesthesia; Topographic Anatomy; Nerve Blocks; Psoas Compartment.

Background and Objective:

Successful regional anesthesia of the upper and lower extremities relies heavily on a precise understanding of peripheral nervous system architecture and surface landmarks. While ultrasound guidance is widely used for performing peripheral nerve blocks, the identification of surface topographic and deeper osteomuscular landmarks remains vital for safe needle positioning, block success, preventing neurovascular complications, and executing successful rescue blocks. This abstract synthesizes the definitive topographic anatomical landmarks required to perform blocks of the *plexus brachialis* (brachial plexus) and *plexus lumbalis* (lumbar plexus).

Anatomical Landmarks for Plexus Brachialis Blocks:

The brachial plexus is a nerve network comprising the anterior rami of the lower 4 cervical spinal nerves and the first upper thoracic spinal nerve (C5, C6, C7, C8, T1), with additional branches from C4 and T2. The spinal nerves of the brachial plexus then continue to form the roots, trunks, divisions, cords, and branches [1]. It is targetable at four distinct anatomical levels depending on the surgical site:

- **Interscalene Level:** Targetable in the interscalene groove between the anterior and middle scalene muscles, at the level of the cricoid cartilage and anterior tubercle of C₆. Key surface markers include the posterior border of the sternocleidomastoid muscle (SCM) and the external jugular vein crossing it.
- **Supraclavicular Level:** Positioned superior to the clavicle, posterior and lateral to the subclavian artery at the level of the first rib. The midpoint of the clavicle serves as the primary osseous landmark.
- **Infraclavicular Level:** Bounded by the coracoid process superiorly and the pectoralis major and minor muscles anteriorly. The needle target is the cords of the plexus surrounding the axillary artery deep to the clavipectoral fascia.
- **Axillary Level:** Located in the apex of the axilla, where the terminal nerve branches surround the axillary artery. The main palpable landmarks are the axillary arterial pulse and the margins of the biceps brachii and coracobrachialis muscles.

Anatomical Landmarks for Plexus Lumbalis Blocks:

The lumbar plexus is formed within the body of the psoas muscle by the 4 spinal nerves of L1 to L4. In 60% of people, the lumbar plexus receives a contribution from the nerve root of T12 as well [2]. It is localized predominantly within the posterior third of the psoas major muscle (the psoas compartment). Access strategies rely heavily on fixed bony landmarks due to the depth of the plexus:

- **Psoas Compartment Approach (Chayne/Winnie Landmarks):** A line connecting the highest points of both iliac crests (Tuffier's line, roughly crossing the L_4 spinous process or $L_4 - L_5$ interspace) is drawn. The injection site is mapped 4–5 cm lateral to the midline spinous processes along this line, targeting the space anterior to the L_4 transverse process.
- **Femoral / Fascia Iliaca Approaches:** For distal approach to the lumbar plexus nerves, the inguinal ligament (extending from the anterior superior iliac spine to the pubic tubercle) acts as the critical barrier. The femoral nerve lies distal to the inguinal ligament, approximately 1 cm lateral to the femoral arterial pulse, deep to the *fascia lata* and *fascia iliaca*. From medial to lateral: vein, artery, nerve.

Conclusion: Thorough mastery of classical surface anatomy, combined with contemporary real-time imaging, serves as the dual standard for modern regional anesthesia. Recognizing these landmarks minimizes the risk of vascular puncture, neuraxial misplacement, or hemo/pneumothorax, ensuring high block efficacy and maximal patient safety.

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SUSPECTED CULTURE-NEGATIVE SEPTICEMIA COMPLICATED BY SEVERE DRUG-INDUCED ERYTHRODERMA AND POLYSEROSITIS IN AN ADVANCED HIV PATIENT ON ANTI-TUBERCULOSIS THERAPY: A CASE REPORT

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DOI: 10.52340/geoanesthesia.2026.09.17

Keywords: Advanced HIV, Suspected Septicemia, Culture-Negative Sepsis, Erythroderma, Polyserositis, Drug Hypersensitivity.

Background: Sepsis and septicemia in advanced HIV/AIDS patients present significant diagnostic difficulties due to profound immune disruption. When complicated by opportunistic co-infections like tuberculosis (TB), clinical management is further obscured by multi-organ failure and life-threatening adverse drug events, such as culture-negative systemic inflammation mimicry and severe cutaneous hypersensitivity reactions [1].

Case Presentation: A 44-year-old female diagnosed with advanced HIV infection (baseline viral load 298,000 copies/mL) presented with a 2-month history of generalized lymphadenopathy, wasting syndrome, and infective endocarditis. Following positive TB cultures, she was stabilized on first-line anti-TB therapy (Isoniazid, Rifapentin, Pyrazinamide, Moxifloxacin) and antiretroviral therapy (DTG/3TC/TDF). Two months later, she experienced an acute clinical deterioration characterized by high fever, toxic liver injury with severe cholestasis (total bilirubin 25.9 mg/dL), worsening anemia, and severe polyserositis with bilateral pleural effusions. Concurrently, she developed a generalized dermatological crisis with diffuse erythema, infiltration, massive ichthyosis-like scaling, and palmar/plantar desquamation, accompanied by an IgE surge (>2500 IU/mL). Due to persistent spikes in systemic inflammatory markers and clinical instability, occult septicemia was strongly suspected. However, extensive biological fluid cultures—including repeated blood, sputum, and serous effusions—remained negative for pathological flora. Suspected culture-negative septicemia secondary to epithelial barrier damage or drug-induced hypersensitivity (DRESS/erythroderma) was managed by immediately discontinuing the culprit anti-TB drugs. Treatment with intravenous dexamethasone (4mg/day), intensive emollient care, albumin, and ademetionine infusions yielded rapid hemodynamic stabilization and cutaneous resolution, while ART was successfully maintained (CD4 count rebounded to 809 cells/mm³).

Conclusion: This case highlights that advanced HIV patients can exhibit a critical overlap between suspected culture-negative septicemia and severe systemic drug hypersensitivity reactions. When vital epithelial barriers are compromised, differentiation between occult sepsis and toxic erythroderma is challenging. Early recognition, immediate withdrawal of hepatotoxic or dermatotoxic anti-TB agents, and aggressive supportive therapy are vital to ensure survival without interrupting antiretroviral control.

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SEPSIS-INDUCED RESPIRATORY COMPLICATIONS AND ACUTE RESPIRATORY DISTRESS SYNDROME (ARDS)

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Abstract

Introduction: Sepsis is a life-threatening organ dysfunction caused by a dysregulated host response to infection, with the lungs being the most frequent and early target organ damaged. The spectrum of sepsis-induced respiratory complications ranges from mild hypoxemia to severe, life-threatening acute respiratory distress syndrome (ARDS).

Objective: The objective of this review is to provide a comprehensive systematization of the epidemiological indicators, pathophysiological mechanisms, and contemporary therapeutic management strategies for sepsis-induced respiratory complications and ARDS.

Global data indicate that sepsis serves as the underlying etiology in 30-50% of patients hospitalized with ARDS. Within intensive care units (ICUs), ARDS develops in 6-10% of septic patients, whereas in cases of severe sepsis and septic shock, this rate reaches up to 40%. The mortality rate associated with sepsis-induced ARDS remains high, ranging between 35% and 45%. The pathophysiological hallmark of sepsis-associated ARDS involves the excessive production of pro-inflammatory cytokines (TNF- α , IL-1, IL-6), neutrophil aggregation, endothelial leak, and alveolar edema. Neutrophils release proteolytic enzymes and reactive oxygen species (ROS), damaging the alveolar-capillary membrane. Disruption of both epithelial and endothelial barriers increases vascular permeability, resulting in the accumulation of protein-rich exudate within the alveoli. Damage to type II pneumocytes reduces surfactant production, leading to alveolar collapse, microatelectasis, and ventilation-perfusion mismatch.

Diagnosis and Assessment The diagnosis of ARDS is based on the Berlin Definition criteria: **Timing (Onset):** Respiratory failure symptoms must manifest or worsen within 1 week of a known clinical risk factor (e.g., pneumonia, sepsis, trauma). **Radiological Findings (Imaging):** Chest radiograph or computed tomography (CT) scan reveals bilateral infiltrates that are not fully explained by lung collapse, nodules, or pleural effusion. **Origin of Edema:** Respiratory failure and pulmonary edema must not be fully explained by heart failure or fluid overload (hypervolemia). **Oxygenation and Severity Classification :** The severity of the condition is determined by the ratio of arterial oxygen partial pressure to fractional inspired oxygen (PaO₂/FiO₂ ratio) while the patient is receiving positive end-expiratory pressure (PEEP) or continuous positive airway pressure (CPAP) of ≥ 5 cm H₂O. **Expanded Support:** Diagnosis now permits high-flow nasal oxygenation (HFNO ≥ 30 L/min) rather than relying solely on invasive mechanical ventilation. **Ultrasound:** Lung ultrasound (LUS) has been officially integrated alongside chest radiography for thoracic visualization. **New Index:** As an alternative to arterial blood gas analysis (PaO₂), using pulse oximetry data with an SpO₂/FiO₂ ≤ 315 index is also acceptable.

Contemporary Therapeutic Strategies Effective sepsis management entails the immediate initiation of antimicrobial therapy and timely source control. For respiratory support, lung-protective ventilation plays a pivotal role; specifically, limiting tidal volume to 4-8 mL/kg of predicted body weight and maintaining plateau pressure below 30 cm H₂O, which significantly reduces the risk of volutrauma and barotrauma. Furthermore, adequate PEEP titration and selection of optimal parameters are essential to prevent alveolar collapse. In severe ARDS (PaO₂/FiO₂ < 150), prone positioning for at least 16 hours per day significantly

reduces mortality. Concurrently , implementing conservative fluid therapy effectively decreases duration of mechanical ventilation and ICU length of stay.

Conclusion Sepsis-induced respiratory complications and ARDS remain leading causes of morbidity and mortality in intensive care. Early identification of epidemiological risk factors, clear understanding of pathophysiology, and timely implementation of lung –protective ventilation protocols are critically important for improving patient outcomes .

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SEPSIS IN DERMATOLOGY: FROM SKIN BARRIER DYSFUNCTION TO LIFE-THREATENING INFECTION

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DOI: 10.52340/geoanesthesia.2026.09.19

Keywords: sepsis; dermatology; skin barrier; skin and soft tissue infection; necrotizing soft tissue infection; early recognition

Abstract

Sepsis is a life-threatening medical emergency resulting from a dysregulated host response to infection and subsequent organ dysfunction. Its global burden remains substantial: the Global Burden of Disease 2021 analysis estimated approximately 166 million cases and 21.4 million sepsis-related deaths worldwide in 2021 [1]. Prevention and early recognition therefore remain major challenges across different fields of medicine. This review focuses on the role of dermatology in recognizing sepsis, dermatological conditions that may predispose to systemic infection, relevant cutaneous manifestations, and the importance of timely diagnosis.

The relationship between sepsis and dermatology is bidirectional: the skin may represent the primary source of infection leading to sepsis, while systemic infection may itself produce diagnostically and prognostically relevant cutaneous manifestations [2]. Dermatologists may recognize potentially severe skin and soft tissue infections (SSTIs) before progression to sepsis and may also identify cutaneous manifestations of evolving systemic infection. Early findings such as skin mottling and alterations in acral skin temperature may reflect impaired peripheral perfusion [2]. In patients with sepsis and septic shock, the extent of mottling can be quantified using the mottling score; greater extension reflects more severe peripheral hypoperfusion and is associated with poorer prognosis. The skin may additionally provide etiological clues in specific infections, including meningococcal purpura [2].

Disruption of the epidermal barrier provides another important link between dermatology and systemic infection. Extensive burns, chronic wounds and ulcerations, and inflammatory dermatoses associated with impaired barrier function facilitate microbial invasion. In atopic dermatitis, epidermal barrier defects, type 2 inflammation, cutaneous dysbiosis, and *Staphylococcus aureus* colonization contribute to increased susceptibility to both cutaneous and, less commonly, systemic infections [3]. Extensive burns are particularly important because loss of the skin's protective barrier, together with post-burn immune dysfunction, substantially increases susceptibility to invasive infection and sepsis [4].

Among SSTIs, necrotizing soft tissue infections (NSTIs), including necrotizing fasciitis, necrotizing cellulitis, and clostridial myonecrosis, represent a particularly important diagnostic challenge because of their rapid progression, extensive tissue destruction, and potential progression to sepsis and septic shock. Early recognition is primarily clinical and requires a high index of suspicion, particularly when severe pain disproportionate to cutaneous findings and rapidly progressive erythema or edema are present.

Early NSTI may closely resemble uncomplicated cellulitis or erysipelas. A systematic review of 1,463 patients found that initial misdiagnosis occurred in almost three-quarters of cases; the most frequent early manifestations were swelling (80.8%), pain (79.0%), and erythema (70.7%) [5]. Timely recognition is therefore critical. A 2025 study of 121 patients with necrotizing fasciitis reported mortality of 5.7% when diagnosis occurred within six hours, compared with 13.2% when diagnosis was delayed beyond

six hours [6]. Furthermore, a systematic review and meta-analysis involving 6,051 patients found mortality of 19% when surgical treatment was performed within six hours compared with 32% when surgery was delayed beyond six hours [7]. These findings emphasize the potential importance of early clinical recognition and immediate multidisciplinary, particularly surgical, assessment.

Conclusion

The relationship between dermatology and sepsis extends beyond the skin as a potential source of infection. Disruption of the cutaneous barrier may facilitate invasive infection, while skin findings may provide early visible evidence of systemic deterioration and valuable diagnostic or prognostic information. Early recognition of severe SSTIs, particularly NSTIs, and their differentiation from uncomplicated cellulitis or erysipelas may prevent critical diagnostic and therapeutic delays. Dermatologists may therefore play an important role in both identifying infections at risk of progression to sepsis and recognizing cutaneous manifestations of established systemic infection, facilitating prompt multidisciplinary intervention and potentially improving patient outcomes.

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COMPARATIVE CHARACTERISTICS AND DYNAMICS OF IL-20 AND VEGF IN ISCHEMIC AND HEMORRHAGIC STROKE.

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DOI: 10.52340/geoanesthesia.2026.09.20

Keywords: ischemic stroke, hemorrhagic stroke, IL-20, VEGF, neuroinflammation, endothelial dysfunction.

Background. Ischemic and hemorrhagic stroke are accompanied by a systemic inflammatory response, endothelial injury, and alterations in angiogenic activity. Interleukin-20 (IL-20), a member of the IL-10 cytokine family, is involved in the regulation of inflammation and endothelial function, whereas vascular endothelial growth factor (VEGF) has complex effects, including stimulation of angiogenesis, support of neurovascular remodeling, and increased vascular permeability. Changes in IL-20 and VEGF in different types of stroke remain insufficiently understood.

Objective. To compare IL-20 and VEGF concentrations at admission and evaluate their dynamics during treatment in patients with ischemic and hemorrhagic stroke.

Materials and Methods. This single-center pilot observational study included 35 patients: 22 with ischemic stroke and 13 with hemorrhagic stroke. Plasma IL-20 and VEGF concentrations were determined at admission and reassessed during treatment. The concentrations of both biomarkers were expressed in pg/mL. Paired measurements were available for 20 patients with ischemic stroke and 7 patients with hemorrhagic stroke. Because of the skewed distribution of the data, results are presented as median and interquartile range: Me [Q1–Q3]. Independent groups were compared using the Mann–Whitney U test, while paired measurements were analyzed using the Wilcoxon signed-rank test. The Benjamini–Hochberg procedure was applied to adjust for multiple comparisons.

Results. At admission, IL-20 concentrations did not differ significantly between patients with ischemic and hemorrhagic stroke: 2.157 [2.131–2.281] versus 2.150 [2.130–3.297] pg/mL, respectively; $p=0.973$. Baseline VEGF concentrations were also comparable: 305.334 [215.704–640.000] versus 287.979 [231.228–581.526] pg/mL; $p=0.932$.

In patients with ischemic stroke, no significant change in IL-20 was observed: 2.172 [2.126–2.298] pg/mL at the first measurement and 2.164 [2.107–2.220] pg/mL at the second measurement; $p=0.869$. VEGF concentrations were 338.531 [228.146–672.396] and 440.825 [248.898–694.495] pg/mL, respectively; $p=0.841$.

In patients with hemorrhagic stroke, IL-20 concentrations also remained unchanged: 2.150 [2.089–2.756] versus 2.116 [2.116–2.665] pg/mL; $p=0.469$. In contrast, VEGF concentrations decreased from 564.535 [259.603–581.526] to 186.996 [163.542–235.060] pg/mL; nominal $p=0.047$. However, this difference did not remain statistically significant after adjustment for the two comparisons: $q=0.094$.

Discussion. The findings demonstrated no differences in baseline IL-20 or VEGF concentrations between the two stroke types. The observed reduction in VEGF in hemorrhagic stroke may reflect temporal changes in endothelial activation and vascular permeability. Current evidence suggests that the relationship between VEGF and cerebrovascular injury is complex and stroke subtype-dependent, with intracerebral hemorrhage and different ischemic stroke subtypes potentially showing divergent associations with VEGF [1]. The absence of a baseline difference in VEGF is also consistent with evidence indicating that circulating VEGF cannot be considered a specific causal marker of ischemic stroke [2]. Interpretation of the observed VEGF dynamics is limited by the small number of paired observations in the hemorrhagic stroke group.

Conclusions. Baseline IL-20 and VEGF concentrations did not differ between ischemic and hemorrhagic stroke. A trend toward decreased VEGF during treatment was observed in hemorrhagic stroke, but this finding requires confirmation in a larger cohort. No significant changes in IL-20 were identified.

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PERICAPSULAR NERVE GROUP (PENG) BLOCK FOR EARLY REHABILITATION AFTER TOTAL HIP ARTHROPLASTY: A CASE REPORT

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DOI: 10.52340/geoanesthesia.2026.09.21

Keywords: Pericapsular Nerve Group, Hip arthroplasty, Ultrasound guidance, Pain Management, Regional Anesthesia

Background

Effective postoperative analgesia is essential for early mobilization and rehabilitation following total hip arthroplasty (THA). In patients with obesity and respiratory comorbidities, minimizing opioid requirements is particularly important. The Pericapsular Nerve Group (PENG) block is an ultrasound-guided regional anesthesia technique designed to provide analgesia of the hip joint while potentially preserving quadriceps motor function.

Case Presentation

A 74-year-old patient with a body mass index of 34 kg/m², a history of obstructive sleep apnea and chronic obstructive pulmonary disease underwent total hip arthroplasty. Considering the patient's increased risk of opioid-related respiratory complications and the importance of early postoperative mobilization, an ultrasound-guided PENG block was performed as part of a multimodal analgesic strategy.

Following the procedure, the patient demonstrated excellent pain control. Pain intensity during movement decreased from 10/10 preoperatively to 2/10 postoperatively, while pain at rest was practically absent. Adequate analgesia allowed early mobilization and facilitated postoperative rehabilitation. No clinically significant motor impairment or block-related complications were observed.

Conclusion

This case demonstrates the potential value of the PENG block as a component of multimodal analgesia following total hip arthroplasty. In elderly patients with obesity and respiratory comorbidities, the technique may provide effective analgesia while reducing the need for systemic opioids and facilitating early rehabilitation. Further clinical studies are warranted to evaluate its efficacy and safety in high-risk surgical populations.

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THE ROLE OF ULTRASOUND ELASTOGRAPHY FOR PERIPHERAL BLOCKADES

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DOI: 10.52340/geoanesthesia.2026.09.22

Keywords: Ultrasound elastography; Peripheral nerve block; Perineural oedema; Inflammatory neuropathy; Strain elastography; Shear-wave elastography

Background. Ultrasound guidance is essential in contemporary regional anaesthesia [1]. B-mode imaging depicts anatomy, needle position and local-anaesthetic spread, but provides limited information about tissue mechanics and injection-induced deformation. Strain elastography displays relative tissue deformation, whereas shear-wave elastography (SWE) estimates stiffness from shear-wave propagation. These techniques may therefore add mechanical contrast to conventional imaging.

Objective. To critically evaluate ultrasound elastography as an adjunct to peripheral nerve blockade, with particular emphasis on identifying altered mechanical properties associated with inflammatory oedema in the nerve and surrounding perineural tissues.

Evidence synthesis. In a translational study of 83 Thiel-cadaver blocks and two patient blocks, strain visibility during injection was rated better with sonoelastography than with B-mode imaging ($p=0.04$), and patient recordings showed a dose response between 1 and 5 mL of local anaesthetic [2]. In a subsequent Thiel-cadaver study, 20 trainee anaesthetists assessed 40 median-nerve injections. Fused B-mode/elastography improved recognition of intraneural injection compared with B-mode alone (diagnostic odds ratio 21.7 versus 7.4; $p<0.001$), as well as diagnostic confidence and interobserver reliability [3]. In a clinical feasibility study involving 11 patients and 110 paired images, nerve diameter measured on SWE and B-mode showed no systematic difference; inter-rater reliability for nerve area was high for both modalities. Importantly, the blocks themselves were guided using B-mode, while SWE remained investigational [4].

Perineural inflammatory oedema. This is a relevant pre-block target because oedema and inflammation can blur tissue planes and alter compliance. Elastography can map stiffness and heterogeneity across the nerve–perineural interface, highlighting a mechanically abnormal region when morphologic change is subtle. In a clinical study of ulnar neuropathy at the cubital tunnel, the affected nerve was significantly stiffer on SWE than nerves in symptomatic control groups (66.8 kPa versus 21.2 and 33.9 kPa); the disease process may include ischaemia, inflammation, oedema and fibrosis [5]. This supports elastography as a complementary marker of an abnormal nerve–perineural complex, but not as a specific test for oedema alone.

Clinical implications. Before blockade, combined B-mode and elastography may help identify inflammatory or oedematous change and define a safer tissue plane. During injection, elastography may improve visualisation of early tissue deformation and small-volume injectate spread and support recognition of a suspected intraneural injection. Interpretation is vulnerable to probe pressure, motion, anisotropy, depth, region-of-interest placement and platform-specific colour scales. Because increased or decreased stiffness is not disease-specific, the elastogram must be correlated with B-mode morphology, Doppler findings and the clinical context.

Conclusion. The principal added value of ultrasound elastography may be the detection of abnormal mechanical patterns caused by inflammatory oedema in and around a peripheral nerve, followed by better-

informed planning of the block. It remains an adjunct rather than a stand-alone diagnostic, guidance or safety modality and must not replace B-mode anatomy, continuous needle-tip visualisation, assessment of injectate spread or established monitoring. Standardised protocols and prospective outcome studies are required before routine adoption.

Conflict of interest. The author is employed by Mindray.

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OBSTETRIC SEPSIS

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DOI: 10.52340/geoanesthesia.2026.09.23

Introduction and relevance

Obstetric sepsis is the second-leading cause of maternal mortality. It is also the primary cause of severe maternal morbidity (SMM) during both the antepartum and postpartum periods, and the third-leading cause at delivery [1, 2].

The World Health Organization defines obstetric (maternal) sepsis as organ failure caused by infection during pregnancy, childbirth, post-abortion or postpartum period. It is the third most prevalent reason for maternal death. According to statistics, sepsis caused 11 percent of maternal fatalities worldwide [1, 2, 3].

Data from the California Pregnancy Associated Mortality Review (CA-PAMR) committee report estimate that 63% of maternal deaths from sepsis had a good or strong chance to have been preventable. Furthermore, for each maternal death, there are 50 women/birthing people, who experience life-threatening morbidity from sepsis [1].

In the Russian Federation, septic complications rank fifth in the structure of maternal mortality. According to the Ministry of Health of the Russian Federation, the share of septic complications tended to increase in 2018 and amounted to 7.5% in the structure of maternal mortality [1].

According to the Global Study of Maternal and Neonatal Sepsis (GLOSS, 2020), which was conducted in 52 countries, the incidence of maternal infection was 70.4 (95% CI 67.7-73.1) per 1,000 live births, and the incidence of adverse outcomes (severe near-miss obstetric complications and maternal death) was 10.9 (95% CI 9.8-12.0) per 1,000 live births. The highest values were observed in low- and middle-income countries, and the lowest in high-income countries [4].

According to the latest SSC 2026 recommendations, sepsis is defined as life-threatening organ dysfunction caused by an impaired body response to infection (Sepsis-3 concept), and septic shock is defined as the most severe form of sepsis with circulatory failure and a high risk of mortality [5].

Obstetric and Gynecological Sepsis - It most often occurs due to the introduction of infection into the uterus during childbirth, abortion, or acute extragenital inflammatory diseases during pregnancy and childbirth.

Infection during the act of childbirth or abortion (prolonged labor, prolonged waterless interval, birth trauma, retention of parts of the chorion or placenta in the uterus, accumulation of blood, criminal intervention, etc.) contribute to the development of local and then generalized infection [6, 7, 8, 9].

The purpose of the study

To study the possibility of organ-preserving surgery on the uterus in the case of obstetric peritonitis after a caesarean section.

Methodology

Conditions: in-depth clinical and laboratory examination (including dynamic study of sepsis markers and the possibility of microbiological express diagnostics), related specialists, a well-equipped intensive care unit with the possibility of extracorporeal detoxification, conditions for postoperative rehabilitation.

The clinical base of the study is the Leningrad Regional Clinical Hospital (a large multidisciplinary hospital of level III, with a capacity of ~1300 beds). According to regional routing, the hospital's gynecology department is an "external observation" department where patients with postpartum infection are hospitalized. 16 women with obstetric peritonitis due to uterine suture failure underwent organ-preserving surgery with metroplasty and secondary uterine suturing. Study period, January 2023 - July 2026.

Results

790 ml – average blood loss, 100% - perioperative antibiotic prophylaxis was performed, 100% - endomyometritis preceded peritonitis, 18.8% - combination with wound infection of the anterior abdominal wall, the debut of symptoms was noted at the end of the first week after childbirth (2-3 days after discharge from the hospital), the diagnosis of "peritonitis" was established on the 4th-5th day after the manifestation of endomyometritis.

93.8% - CS performed on an emergency basis, 100% - single-row continuous suture on the uterus, 43.8% - CS performed against the background of a long waterless interval, 25% - complications occurred during CS (difficulty in extracting the fetus, additional hemostasis, etc.), there were no patients after repeated CS.

Conclusion:

Late diagnosis of postpartum endometritis and irrational treatment can lead to further spread of the infection and the development of extremely severe complications, such as pelvic abscesses, pelvic vein thrombophlebitis, peritonitis, and even sepsis.

The use of organ-preserving surgeries in the complex treatment of obstetric peritonitis in case of failure of the uterine sutures is an alternative to the traditional obstetric tactics based on uterine extirpation (removal of the primary focus of infection).

The presented treatment algorithm was used in a multidisciplinary, well-equipped hospital.

24-hour supervision by a multidisciplinary team (obstetricians-gynecologists, surgeons, anesthesiologists-resuscitators).

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THE ROLE OF PROLONGED LOW-DOSE 20% ALBUMIN INFUSION IN THE MANAGEMENT OF POSTOPERATIVE HYPOVOLEMIA AFTER MAJOR ABDOMINAL SURGERY

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DOI: 10.52340/geoanesthesia.2026.09.24

Keywords: albumin; 20% human albumin; hyperoncotic albumin; postoperative hypovolemia; hemodynamic instability; fluid therapy; major abdominal surgery; volume resuscitation; critical care.

Background

Postoperative hypovolemia and hemodynamic instability remain major challenges following extensive abdominal surgery. Although crystalloids constitute the standard initial approach to intravascular volume replacement, large-volume crystalloid administration may contribute to positive fluid balance, tissue edema, and impaired organ function. Albumin, particularly hyperoncotic 20% albumin, may provide intravascular volume expansion with a substantially lower infused volume. However, the clinical value of prolonged low-dose albumin administration in postoperative hypovolemia remains insufficiently defined.

Objective

To evaluate the clinical role of prolonged low-dose 20% human albumin infusion in patients with postoperative hypovolemia and hemodynamic instability following major abdominal surgery.

Methods

This draft describes a comparative study of 100 adult patients following major abdominal surgery. Fifty patients received 20% human albumin at 5 mL/h for 24 hours in addition to standard postoperative care, while 50 patients received crystalloid-based fluid therapy. The primary outcome was time to hemodynamic stabilization. Secondary outcomes should include arterial pressure, serum lactate, vasopressor requirements, cumulative fluid administration, fluid balance, urine output, renal function, and clinically relevant fluid overload.

Results

In the preliminary dataset provided for manuscript development, hemodynamic stabilization occurred within 24 hours in the albumin group, whereas stabilization required more than 24 hours in the crystalloid group. Complete statistical analysis of individual patient-level data is required before definitive effect estimates, confidence intervals, and P values are reported.

Conclusions

Prolonged low-dose infusion of 20% human albumin may represent a potentially useful strategy for selected patients with postoperative hypovolemia following major abdominal surgery. The preliminary observation of earlier hemodynamic stabilization warrants confirmation in adequately powered prospective randomized studies. This strategy should not be interpreted as evidence supporting routine albumin administration for postoperative resuscitation.

DIFFICULT AIRWAY MANAGEMENT NEW TRENDS AND CONTEMPORARY APPROACHES

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DOI: 10.52340/geoanesthesia.2026.09.25

Keywords: difficult airway; videolaryngoscopy; awake tracheal intubation; high-flow nasal oxygen; airway ultrasound; emergency front-of-neck airway.

Background: Difficult airway management remains one of the most safety-critical areas in anesthesiology, emergency medicine, and critical care. Failure to establish oxygenation or tracheal intubation may rapidly cause severe hypoxemia, aspiration, hemodynamic instability, brain injury, or death. Practice has shifted from a device-centered model to structured, anticipatory, oxygenation-focused strategies emphasizing first-attempt success, fewer repeated attempts, early recognition of failure, and timely rescue. Guidelines also incorporate physiological risk, human factors, and procedural planning alongside anatomical assessment [1,7].

Objective: This narrative review summarizes contemporary trends and evidence-based approaches in difficult airway management, focusing on videolaryngoscopy, awake tracheal intubation, high-flow nasal oxygenation, supraglottic airway rescue, point-of-care airway ultrasonography, emergency front-of-neck airway access, and structured team-based algorithms.

Methods: International guidelines, systematic reviews, meta-analyses, and selected clinical studies were reviewed. Sources included the 2022 American Society of Anesthesiologists Practice Guidelines, Difficult Airway Society guidance on awake and unanticipated difficult tracheal intubation, and evidence concerning videolaryngoscopy, high-flow nasal oxygen, and airway ultrasonography [1-7].

Results and Discussion: Modern difficult airway management begins with risk stratification beyond prediction of difficult laryngoscopy. Evaluation should include anticipated difficulty with facemask ventilation, supraglottic airway placement, tracheal intubation, aspiration risk, rapid oxygen desaturation, physiological reserve, emergency invasive airway access, and available rescue resources [1,7]. Awake tracheal intubation should be considered when difficult intubation is anticipated with expected difficulty in ventilation, increased aspiration risk, inability to tolerate brief apnea, or difficulty with emergency airway rescue [1].

Awake intubation remains important in selected high-risk patients because preservation of spontaneous ventilation and airway tone provides an additional safety margin. Recommended practice includes adequate topical anesthesia, continuous supplemental oxygen, cautious sedation, limitation of attempts, and confirmation of tracheal placement using visualization and capnography [2].

Videolaryngoscopy is central to contemporary airway practice. Compared with direct laryngoscopy, randomized evidence demonstrates improved glottic visualization and higher first-attempt success, including in emergency and critical care settings [3,4]. However, visualization does not ensure successful tube delivery. Appropriate stylet configuration, positioning, device familiarity, and first-attempt preparation remain essential. Repeated laryngoscopy should be avoided because it increases trauma, bleeding, edema, and subsequent difficulty with ventilation [1,7].

An oxygenation-first strategy is fundamental. Preoxygenation should be optimized with appropriate positioning. High-flow nasal oxygen can prolong apnea tolerance and delay desaturation during airway instrumentation, but it does not provide effective alveolar ventilation, and carbon dioxide continues to accumulate during apnea [5].

The physiologically difficult airway has gained importance. Severe hypoxemia, hypotension, right ventricular dysfunction, and profound metabolic acidosis may precipitate peri-intubation deterioration despite an anatomically straightforward airway. Hemodynamic optimization, individualized preoxygenation, an appropriate induction strategy, and anticipation of cardiovascular collapse are integral to planning [7].

When intubation fails, second-generation supraglottic airway devices can provide rescue oxygenation and may facilitate subsequent intubation. Persistent failure to oxygenate despite optimized facemask and supraglottic ventilation constitutes a cannot-intubate, cannot-oxygenate emergency and requires prompt progression to emergency front-of-neck airway access rather than repeated unsuccessful attempts [7].

Point-of-care airway ultrasonography is an evolving adjunct that may assist in identifying the cricothyroid membrane, confirming tracheal tube position, and assessing selected predictors of difficult laryngoscopy. Its diagnostic performance is promising, but variability in techniques and thresholds limits standardization; it should therefore complement rather than replace clinical airway assessment [6].

Human factors are equally important. Modern algorithms emphasize explicit Plan A-B-C-D strategies, early expert assistance, closed-loop communication, cognitive aids, role allocation, limitation of attempts, and simulation-based training [7]. High-risk extubation also requires deliberate planning that considers the likelihood and consequences of failed reintubation [1].

Conclusion: Contemporary difficult airway management is a structured, oxygenation-centered, context-sensitive process. Practice has shifted from isolated prediction of difficult intubation toward anticipation of the entire airway and oxygenation pathway. First-attempt optimization, preserved oxygenation, timely rescue, physiological stabilization, and disciplined team-based escalation contribute to safer clinical airway management.

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Evaluation of the Efficacy and Safety of Spinal Anesthesia Based on Hyperbaric Bupivacaine Combined with Dexmedetomidine and Ketamine in Gynecological Laparoscopic Surgery

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DOI: 10.52340/geoanesthesia.2026.09.26

Background

In gynecology, particularly during laparoscopic surgery, the choice of the optimal anesthetic technique remains a subject of ongoing debate. Currently, general balanced anesthesia with mechanical ventilation is considered the standard approach. However, under conditions of carbon dioxide pneumoperitoneum and the Trendelenburg position, this technique may be associated with adverse hemodynamic changes, including increased afterload and impaired organ perfusion. This is particularly relevant in patients at increased risk of cardiovascular complications, as general anesthesia may contribute to greater perioperative hemodynamic instability. At the same time, neuraxial anesthesia is considered a relatively more physiological technique, imposing less stress on the cardiovascular and respiratory systems. Current evidence supports its safety provided that adequate monitoring and standardized protocols are implemented.

Objective

To evaluate the efficacy and safety of spinal anesthesia during gynecological laparoscopic surgery.

Materials and Methods

The study included 620 patients who underwent elective and emergency laparoscopic gynecological procedures. The patients' age ranged from 19 to 65 years, and their body mass index (BMI) ranged from 18.5 to 34.9 kg/m².

The main indications for surgical treatment included chronic inflammatory diseases of the uterine appendages, benign neoplasms of the uterus and ovaries, as well as emergency conditions such as ectopic pregnancy and ovarian apoplexy.

The following laparoscopic procedures were performed: laparoscopic cystectomy, tubotomy, salpingectomy, oophorectomy, and hysterectomy. All patients were classified as ASA physical status I–II. Preoperative preparation included elastic compression of the lower extremities and administration of H₂-receptor blockers. Premedication consisted of intramuscular midazolam administered 30 minutes before surgery. Spinal anesthesia was performed at the L3–L4 intervertebral level using 0.5% hyperbaric bupivacaine (Bupivacaine, Longocaine Heavy) at a standard dose. Spontaneous ventilation was maintained throughout the procedure, with supplemental oxygen administered via nasal insufflation. To reduce psychological and positional discomfort, controlled sedation with dexmedetomidine (Kvanadex) at a dose of 0.5–1.0 µg/kg was used. Comprehensive monitoring was performed, including assessment of: central hemodynamic parameters, including echocardiographic assessment; pulse oximetry; acid–base status; blood gas parameters; serum electrolytes; lactate levels; hematocrit. Blood gas analysis and the assessment of major metabolic parameters were performed using a UCARE6000 Wondfo (Rain Sen Da). Fluid therapy was administered using crystalloid solutions at a rate of 10–12 mL/kg/h, including 0.9% sodium chloride solution, Ringer's solution, or Reosorbilact.

Results and Discussion

Following spinal anesthesia, a tendency toward a moderate decrease in mean arterial pressure (MAP), cardiac output (CO), and systemic vascular resistance (SVR) was observed. After creation of pneumoperitoneum and placement of the patients in the Trendelenburg position, no significant hemodynamic changes were observed; only a slight reduction in systemic vascular resistance persisted. Following completion of surgery and release of the pneumoperitoneum, hemodynamic parameters returned to baseline values. Cardiac output remained stable throughout the surgical procedure. Acid–base status and blood gas parameters remained generally stable. Following the establishment of pneumoperitoneum and placement in the Trendelenburg position, moderate respiratory alkalosis and metabolic acidosis without an increased anion gap were observed. During the early postoperative period, there was a significant reduction in the need for opioid analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs) for postoperative pain management.

Conclusion

Spinal anesthesia with preserved spontaneous ventilation provides a stable hemodynamic profile during gynecological laparoscopic surgery. Neuraxial anesthesia may reduce the adverse cardiovascular effects associated with pneumoperitoneum and the Trendelenburg position. 0.5% hyperbaric bupivacaine provides an adequate level of surgical anesthesia for procedures lasting up to 2.5 hours. Controlled sedation with dexmedetomidine does not have a significant adverse effect on spontaneous respiration or acid–base status.

Age over 45 years should be considered a risk factor for the development of perioperative cardiovascular complications.

THE IMPACT OF STRESS FACTORS ON STUDENTS WORKING IN RESUSCITATION, ADMISSION, AND INTENSIVE CARE UNITS – CONSIDERING PERSONALITY PSYCHOTYPES

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DOI: 10.52340/geoanesthesia.2026.09.27

Keywords: Sleep patterns, neuroticism, stress.

The health status of the future generation is one of the priority issues and significant challenges in modern medicine. During their university studies, students' mental, psychological, and physical well-being is adversely affected by a range of factors. Particularly significant among these are time constraints resulting from demanding daily academic and work schedules, socialization issues linked to information-related working concurrently in various medical facilities to foster professional growth or improve their financial situation; our study focuses specifically on those employed in resuscitation, emergency admission, and intensive care units. The deterioration of health observed among medical students stems from various risk factors—including heavy academic workloads, disrupted rest, sleep, and dietary patterns, increased stress, and irregular study and work-related physical exertion—leading to a dramatic rise in borderline health conditions, chronic diseases, and depression. A significant determinant of depression levels is the degree of socialization, which is linked to an individual's personality type—specifically, the extent to which they are introverted or extroverted. Assessing levels of neuroticism and the tendency toward introversion is also a key area of interest [4]. stress, financial concerns, and chronic disruptions to work, rest, and dietary routines [1]. An analysis of scientific literature regarding the factors underlying these challenges confirms the need for an in-depth study of this group's health status; the rise in neuroticism among students—driven by increased stress—has drawn significant public attention to the mental health of adolescents and young adults [2; 3]. Many students begin

The aim of the study was to assess the psycho-emotional and health status of students working under heavy workloads in these departments. The study was conducted in several stages. In the first stage, respondents completed an online questionnaire titled "Consequences of Sleep Disorders Among Students Working in Intensive Care Units." Although 189 students completed this questionnaire, the study included only those who also completed the Eysenck psychological questionnaire; this group consisted of 152 respondents.

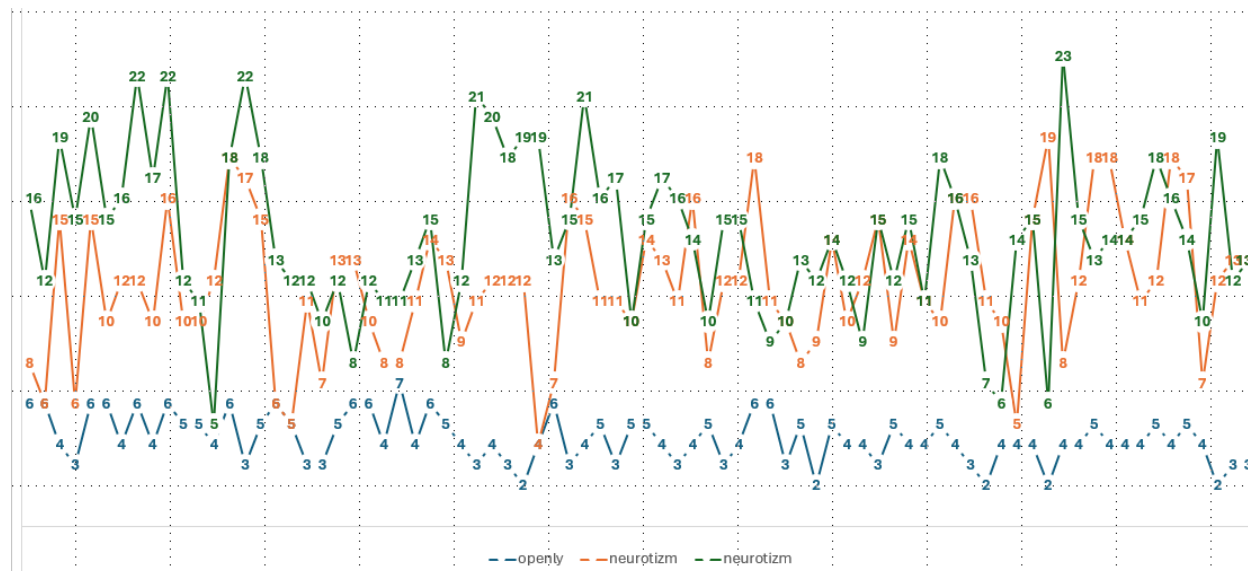
The questionnaires were filled out following lectures and seminars.

It should be noted that the vast majority of respondents were either ethnic Georgians or citizens of Georgia of other nationalities studying in Georgian-language medical degree programs (specifically, students in years 4 through 6 of the curriculum).

A case-control study was conducted, and the data were processed using SPSS statistical software. Thus, students are constantly exposed to a complex combination of factors; consequently, studying the risk factors affecting their health constitutes a significant area of research and provides a solid foundation for the effective primary prevention of adverse effects during their studies.

The questionnaire proved ideal for gathering the information relevant to our study. Students completed it at the end of their classes.

Results: The study surveyed students from Georgian-language faculties across three different universities who work in resuscitation, emergency admission, and intensive care units. The findings indicate a notably high risk of elevated neuroticism among medical students—31.3% (n=62)—which proved to be significantly higher than that observed among non-medical students in Georgian-language faculties (OR=17.406; CI=1.11-2.72; $p<0.05$).



Conclusion: Medical students successfully manage to engage in both work and academic activities despite the impact of stress. While the majority manage to function in both key areas, they often do so by neglecting vital factors such as adequate sleep, a balanced daily routine, and the management of demanding study and work schedules.

Further large-scale research is required to conduct a detailed analysis of these risk factors. The analysis of the challenges faced by students and their underlying causes underscores the necessity of developing and implementing healthy lifestyle programs.

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EMERGENCY CESAREAN SECTION COMPLICATED BY INTRAPARTUM HEMORRHAGE: AN OBSTETRICIAN-GYNECOLOGIST'S PERSPECTIVE

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DOI: 10.52340/geoanesthesia.2026.09.28

Introduction and relevance

Delivery by cesarean section (CS) is a method of delivery in which the baby is born through surgical intervention involving an incision in the wall of the pregnant uterus, extraction of the fetus and placenta, and subsequent restoration of the uterus's integrity. As of 2024, the cesarean section rate in the Russian Federation was approximately 31.2%. In some regions and large perinatal centers, this figure reached 40–50% [1, 2].

It is important to note that CS is an aggressive method of delivery that carries a risk of complications for the mother (bleeding, infection, damage to adjacent organs, etc.). At the same time, there is no direct correlation between an increase in the frequency of CS and perinatal mortality rates. The optimal frequency of CS remains a subject of debate in obstetric practice [1, 3].

The expediency of expanding indications for CS is justified by three goals: reducing perinatal mortality (PS), childhood, and, according to some obstetricians, maternal injuries. The latter argument is not convincing enough, since considering CS as a gentle method of delivery for the fetus, one must be aware that it is certainly aggressive for the mother. Therefore, in the context of a constant decrease in the population health index, it is a mistake to assume that the expansion of indications for COP is associated with an improvement in the somatic and reproductive health of women [4, 5].

The obvious result of the excessive focus on CS was a decline in the obstetric professionalism and the qualifications of obstetricians in the art of managing childbirth. For most young specialists, applying obstetric forceps, managing childbirth in the case of breech presentation of the fetus, rotating the second fetus in a twin pregnancy to a foot presentation with subsequent extraction, etc., is an insurmountable task.

The purpose of the study

Modern algorithms for managing massive blood loss after childbirth via cesarean section are presented. The main causes of massive blood loss in the postpartum period and the consequences of incorrect treatment tactics are examined (a clinical case is provided).

Results

The prevalence of postpartum bleeding (more than 500 ml) worldwide is approximately 6% of all pregnancies, and the prevalence of severe postpartum bleeding (more than 1000 ml) is 1.96%. All leading global organizations – the World Health Organization, The American Academy of Family Physicians, the Royal College of Obstetricians and Gynaecologists (RCOG), the International Federation of Obstetricians and Gynecologists, the French National College of Obstetricians and Gynecologists, the American College of Obstetricians and Gynecologists, and the Russian Society of Obstetricians and Gynecologists primarily focus their efforts on the prevention and treatment of this complication of pregnancy and childbirth [6,7].

The main reasons for failures in providing medical care for blood loss in obstetrics are delays in stopping bleeding (surgical and conservative hemostasis) and in initiating effective intensive therapy (replenishing the circulating blood volume). To change this situation, it is necessary to implement at all levels the main stages of treatment for blood loss that have proven their effectiveness. These stages are outlined in clinical guidelines (treatment protocols).

Terms and definitions:

- Intraoperative (intrapartum) bleeding during a cesarean section (CS) is blood loss that occurs directly during the operation.
- 1000 ml or more during operative delivery, or any clinically significant volume of blood loss leading to hemodynamic instability.
- The normal blood loss during a cesarean section (CS) is up to 1000 ml. This volume is considered physiological and, in most cases, is tolerated by women without any concomitant pathology without difficulty.
- Physiological blood loss is blood loss of <10% BCC or <0.5-0.7% of body weight, or <5 ml/kg (<500.0 ml).
- Massive blood loss is a simultaneous loss of more than 1,500 ml of blood (25-30% BCC) or 2,500 ml of blood (50% BCC) in 3 hours.

Stages of providing medical care to patients with blood loss in obstetrics

Organization. Identification of risk factors for the development of massive blood loss and routing of patients at risk (abruption and abnormalities of placental attachment, multiple pregnancy, preeclampsia/arterial hypertension during pregnancy, congenital and acquired disorders in the hemostasis system) to a higher (3rd) level of care.

Prevention

In modern obstetrics, effective prevention of massive blood loss includes [1, 2, 8]:

- active management of the third stage of labour (active management of the third stage of labour, AMTSL);
- use of uterotonics (oxytocin, prostaglandins, carbetocin, methylergometrine);
- uterine balloon tamponade.

It should be noted that uterotonics and balloon tamponade of the uterus do not exclude or replace each other and should be used especially in emergency care in conditions of limited resources (low-resource settings). So, In the conditions of the Regional Perinatal Center in Yekaterinburg, the placement of an intrauterine balloon for preventive purposes is carried out up to 170 times a year. During a cesarean section, preventive measures in cases of high risk factors also include ligation of the uterine arteries and, in some situations, the application of compression sutures to the uterus.

- Damage control surgery
- Damage control resuscitation) – a timely and effective technology for maintaining vital functions in conditions of massive blood loss and shock. - - The principle of “hemostasis control” involves the timely detection and correction of acute hemostasis disorders (coagulopathy, DIC syndrome) during delivery and in the postpartum period [9].

Goals: With effective bleeding control and intensive therapy, the criteria for a positive effect in massive blood loss and hemorrhagic shock are achieved

within 3-4 hours.:

- There is no hemorrhagic syndrome of any localization, nature or intensity.
- Systolic blood pressure >90 mmHg without vasopressors.
- The hemoglobin level is more than 70 g/l.
- There are no clinical and laboratory signs

of coagulopathy (fibrinogen more than 2.0 g/l, platelets more than 50×10^9 , international normalized ratio, activated partial thromboplastin time less than 1.5 of the norm, norm on the thromboelastogram).

- The rate of diuresis is more than 0.5 ml/kg per hour.
- Saturation of mixed venous blood is more than 70%.
- Consciousness and adequate spontaneous breathing are restored.
- If the treatment goals for blood loss are not achieved within the next 3–4 hours, and arterial hypotension persists or worsens (vasopressors are used), anemia, or oliguria, then the first priority is to rule out ongoing bleeding [1, 10].

A clinical case of massive postpartum hemorrhage, analysis of clinical and tactical errors

From the medical history: childbirth 3, pregnancy term 41 weeks, transferred for labor stimulation to the maternity department at the hospital at the place of residence. Amniotomy was performed, labor was enhanced with an oxytocin solution according to the protocol.

The childbirth was complicated by signs of fetal distress, and an operative delivery was performed using vacuum extraction of the fetus.

After the delivery of the placenta, 500 ml of blood was released, and bleeding continues.

Manual examination of the uterine cavity was performed under intravenous anesthesia. Total blood loss: 990 ml.

After 6 hours, hemoglobin was 69 g/L, platelet count was 71, blood pressure was 100/70, pulse was 124 per minute, diuresis was significantly reduced, and an ultrasound of the pelvic organs revealed free fluid in the pelvic cavity.

Total blood loss: 2530 ml. Given the massive bleeding, grade 4 hemorrhagic shock, and DIC syndrome, a repeat laparotomy is indicated, with the scope of the operation expanded to include hysterectomy without adnexa.

Infusion and transfusion therapy was carried out according to the massive blood loss protocol. Total blood loss: 4266 ml. Anuria.

Transferred to the Leningrad Regional Clinical Hospital, Intensive Care Unit 1.

Diagnosis: Early postpartum hypotonic bleeding.

Massive blood loss syndrome. Grade 4 hemorrhagic shock. Multiple organ dysfunction syndrome. DIC syndrome. Acute kidney failure. Anuria. Severe anemia.

As a result, the development of hemorrhagic shock of grade 4, acute kidney injury with the development of acute renal failure, DIC syndrome and multiple organ failure, the addition of respiratory failure and pulmonary edema, pulmonary embolism, stroke, and a fatal outcome.

Conclusion

Providing emergency care for massive bleeding in obstetrics is one of the priority tasks for reducing maternal morbidity and mortality. Given the available capabilities for providing conservative and surgical hemostasis, replenishing hypovolemia, and ensuring adequate oxygen transport, it is extremely important to determine not only the list of treatment measures but also the pace at which care is provided.

When determining the pace of assistance, the priorities of each stage become clearer, which makes it possible to plan the necessary stock of both medications and consumables. Currently, it is quite obvious that it is necessary to develop organ-preserving technologies when providing emergency care in cases of obstetric bleeding, which requires appropriate training for obstetricians and gynecologists. Intensive therapy for massive blood loss should also be based on modern medications for infusion therapy, a clear definition of the indications for the use of blood components and isolated coagulation factors, and the use of effective hemostatic medications. Timely control of bleeding, combined with adequate intensive therapy, makes it possible to implement an organ-preserving approach and prevent the development of a critical condition even under conditions of limited resources.

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THE CRITICAL AIRWAY: WHEN ANATOMY IS NOT THE ONLY PROBLEM

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DOI: 10.52340/geoanesthesia.2026.09.29

Keywords: critical airway; physiologically difficult airway; tracheal intubation; peri-intubation hypoxemia; hemodynamic collapse; point-of-care ultrasound

Background

Tracheal intubation is one of the most frequently performed life-saving procedures in modern anesthesia and critical care. Traditionally, difficult airway management has focused primarily on anatomical predictors of difficult facemask ventilation, laryngoscopy, and tracheal intubation. However, critically ill patients may experience severe peri-intubation complications despite an anatomically uncomplicated airway. Hypoxemia, hypotension, severe metabolic acidosis, and right ventricular dysfunction can make induction of anesthesia and transition to positive-pressure ventilation physiologically hazardous [1–3].

The concept of the physiologically difficult airway emphasizes that successful tracheal intubation does not necessarily equate to successful airway management. In critically ill populations, peri-intubation hypoxemia, cardiovascular collapse, and cardiac arrest remain important adverse events [3,4].

Objective

This presentation aims to introduce a physiology-first approach to the critical airway, emphasizing recognition and optimization of physiological risk before induction rather than focusing exclusively on anatomical airway difficulty.

Content

The presentation proposes a practical framework based on four major physiological threats: severe hypoxemia, characterized by limited oxygen reserve, rapid desaturation, and intolerance of apnea; hemodynamic instability, related to loss of sympathetic tone, reduced venous return, and cardiovascular collapse following induction and positive-pressure ventilation; severe metabolic acidosis, in which compensatory hyperventilation may be essential for maintaining pH and interruption of spontaneous ventilation can precipitate rapid deterioration; and right ventricular failure, particularly in patients with pulmonary embolism, pulmonary hypertension, or severe acute hypoxic pulmonary vascular disease.

For each threat, the presentation addresses three questions: How is the risk recognized? Why is induction dangerous? How should the airway strategy be modified?

Particular emphasis is placed on pre-intubation optimization, including advanced preoxygenation strategies, non-invasive ventilation or high-flow nasal oxygen when appropriate, hemodynamic optimization, individualized selection and dosing of induction agents, and preservation of spontaneous ventilation in selected patients. Consensus recommendations for the physiologically difficult airway support an individualized approach to pre-intubation optimization and airway management [2]. Current difficult-airway guidance also supports considering awake airway management when patients are unlikely to tolerate even brief apnea or when airway rescue may be challenging [5].

Point-of-care ultrasound (POCUS) is incorporated as a rapid bedside tool for identifying relevant physiological abnormalities, including right ventricular dysfunction, left ventricular systolic function, and pulmonary pathology that may alter the airway plan. Ultrasound is an adjunct to, rather than a substitute for, clinical assessment and preparation.

The presentation also distinguishes a difficult airway from a critical airway. While a difficult airway primarily concerns technical challenges, a critical airway requires simultaneous management of airway anatomy and physiological reserve. Risk may therefore arise from the patient's inability to tolerate apnea, induction, or positive-pressure ventilation [1–4].

Conclusion

The most dangerous airway may not be the airway that is difficult to intubate, but the airway attached to a patient who cannot tolerate induction, apnea, or positive-pressure ventilation. A successful airway strategy should therefore begin before the laryngoscope enters the mouth. Recognition of physiological risk, optimization of oxygenation and circulation, appropriate selection of technique and drugs, and anticipation of peri-intubation deterioration are essential components of modern critical airway management.

The central question should shift from: “Can I intubate this patient?” to: “Can this patient tolerate intubation?”

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