

# INTERNATIONAL SCIENTIFIC INTERDISCIPLINARY CONFERENCE

of Young Scientists and Medical Students










**25-27**

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Kharkiv, Ukraine



SECTION	PAGE
 Dentistry and Maxillofacial Surgery	4
 Infectious Diseases, Epidemiology, Dermatology	33
 Internal Medicine	64
 Neurosciences	160
 Obstetrics and Gynecology	187
 Pediatrics and Neonatology	236
 Preventive Medicine, Current Issues in Nursing	255
 Surgery and Traumatology	286
 Theoretical and Experimental Medicine	328

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# ISiC

INTERNATIONAL SCIENTIFIC  
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## DENTISTRY AND MAXILLOFACIAL SURGERY

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*Nemenko Valerii*

## ANALYSIS OF THE POTENTIAL IMPACT OF DRINKING WATER CHEMICAL COMPOSITION ON HUMAN HEALTH

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Introduction. The quality of drinking water is one of the key factors determining public health, life expectancy, and the prevalence of chronic noncommunicable diseases. Under current conditions of anthropogenic pressure and industrialization the chemical composition of water is undergoing significant changes, which increases risks to public health. Particular attention is drawn to the presence in water not only of natural components but also of products of technogenic pollution, and byproducts of water treatment. Given humans constant contact with water and its systematic consumption, even minor deviations in chemical composition can have a cumulative effect and lead to the development of pathological conditions. Materials and Methods. In preparing was analyzed current scientific publications, recommendations from international organizations - particularly the WHO - as well as textbooks and online resources covering water supply hygiene, toxicology, and environmental medicine. Was employed methods of comparison and systematic analysis of the literature. Results. The chemical composition of drinking water is determined by its content of macro- and trace elements, organic compounds, and potentially toxic impurities. Physiologically significant components include calcium, magnesium, sodium, and potassium, which play a role in regulating water-electrolyte balance and the functioning of the cardiovascular system. Insufficient calcium and magnesium levels are associated with an increased risk of cardiovascular disease, while an excess of hardness salts can contribute to the formation of kidney stones. Fluoride content is of particular importance: a deficiency leads to tooth decay, while an excess leads to fluorosis, causing damage to teeth and bones. Nitrates and nitrites entering the water as a result of agricultural activities pose a risk of methemoglobinemia. Heavy metals, such as lead, cadmium, and mercury, have significant cumulative toxicity and affect the nervous system, kidneys, and hematopoietic system. Organic pollutants, including pesticides and phenols, can exhibit carcinogenic and mutagenic effects. Special mention should be made of chlorination byproducts, particularly

trihalomethanes, which form when chlorine interacts with organic substances and are associated with an increased risk of cancer with prolonged exposure. The combined effect of low concentrations of various substances can have adverse health consequences.

Conclusions. The chemical composition of drinking water is a key determinant of human health and requires constant monitoring and control. Both a deficiency and an excess of certain components can lead to the development of various pathologies, underscoring the need to optimize water treatment systems and implement modern purification methods. An in-depth study of the impact of water quality allows for the timely identification of risks and the development of effective preventive measures at the population level.