Endocrinology, Preventive Medicine, Prophylaxis, Complications: Integrating Risk Reduction Across the Endocrine Lifespan

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Abstract

Endocrine disorders contribute substantially to global morbidity and mortality through chronic complications that are, in large part, modifiable by prevention and early intervention across the life course. This narrative review synthesizes recent evidence (approximately 2020–2025) on preventive endocrinology with a focus on lifestyle-based primary prevention, perioperative and pharmacologic prophylaxis, and strategies to mitigate acute and chronic complications in common endocrine conditions. Prediabetes, type 2 diabetes, obesity, thyroid disease, pituitary tumors, primary aldosteronism, and treatment-related endocrinopathies are highlighted as paradigmatic conditions in which prevention frameworks are rapidly evolving. We summarize guideline updates and randomized trials on cardiovascular and microvascular complication prevention, endocrine surgery–related prophylaxis, management of immune checkpoint inhibitor–induced endocrinopathies, and emerging digital and lifestyle interventions. A conceptual model linking primary, secondary, and tertiary prevention in endocrinology is proposed, supported by illustrative comparative data and a schematic figure showing the impact of prophylactic strategies on complication rates. While substantial progress has been made, major gaps persist in long-term implementation, equity of access, and integration of precision tools into routine care. Future research should prioritize hybrid prevention models that combine technology-enabled lifestyle support, optimized pharmacotherapy, and systematic surveillance to reduce the global burden of endocrine complications.

Keywords: *endocrinology, preventive medicine, prophylaxis, complications, diabetes, obesity, thyroid, pituitary*

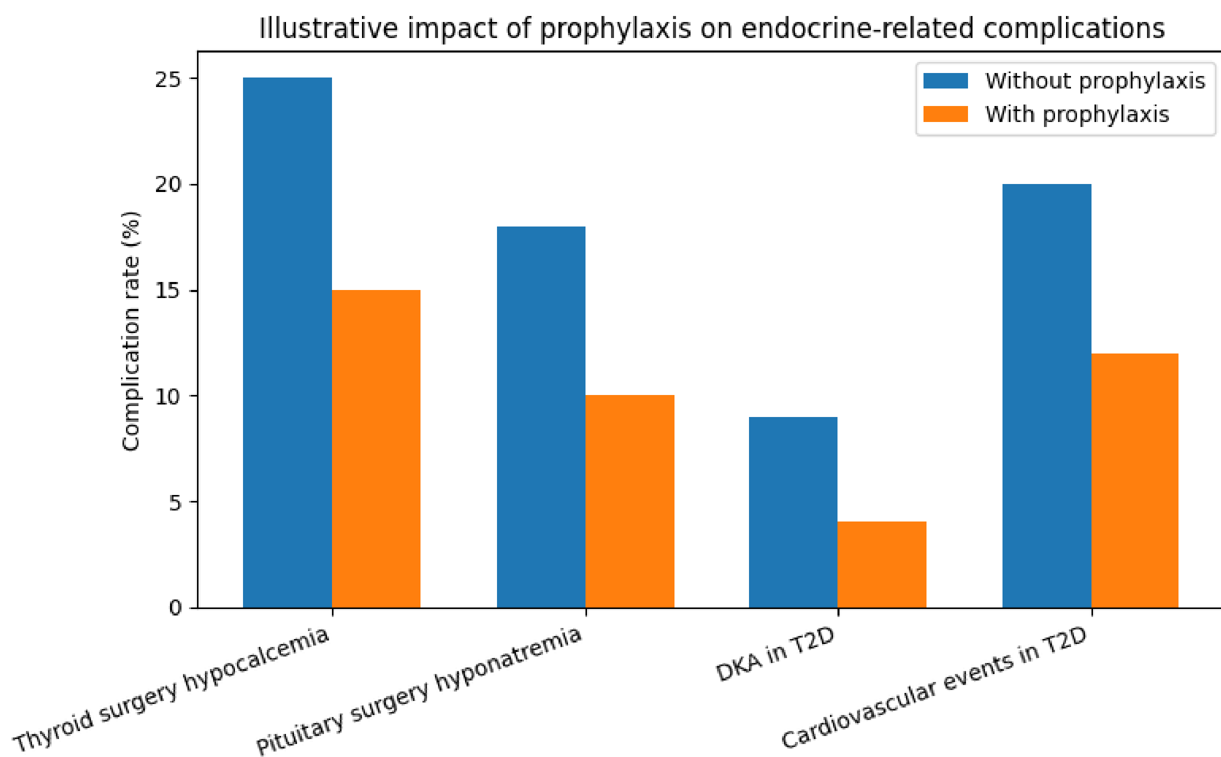
Introduction

Endocrinology sits at the intersection of metabolism, growth, reproduction, and stress responses, and endocrine disorders now account for a large share of preventable non-communicable disease worldwide. The epidemiologic transition from iodine deficiency and congenital hypothyroidism toward obesity, type 2 diabetes, and metabolic syndrome has shifted emphasis from late-stage disease management to prevention across the lifespan. Cardiometabolic complications of diabetes, obesity-related malignancy, osteoporosis-related fractures, and endocrine consequences of novel therapies (such as immune checkpoint inhibitors and incretin-based anti-obesity agents) pose new preventive challenges. In parallel, advances in screening and

prophylaxis—ranging from population-based newborn screening to highly targeted surgical and pharmacologic interventions—have created opportunities to reduce complication rates if used systematically.[4][12][5][13][8][14][10][15][1]
Preventive medicine in endocrinology encompasses primary prevention of disease onset, secondary prevention through early detection and risk factor control, and tertiary prevention aimed at limiting disability from established disease. Lifestyle interventions, guideline-based screening programs, perioperative prophylaxis, and structured follow-up pathways are central instruments within this framework. This review integrates recent guideline updates, randomized and observational studies, and systematic reviews to provide a cross-cutting overview of prevention and prophylaxis in contemporary endocrinology, focusing on diabetes and cardiometabolic disease, endocrine surgery, immune-related endocrinopathies, and pituitary and thyroid complications.[5][8][9][10][11]

Methods

This narrative review draws on literature published primarily between January 2020 and early 2026, with selective inclusion of seminal older studies where necessary for context. Searches were conducted in PubMed, major endocrine and general medical journal sites, and society resources using combinations of the terms "endocrinology, preventive medicine, prophylaxis, complications," along with disease-specific keywords (for example, "type 2 diabetes complications," "thyroid surgery prophylaxis," "pituitary surgery complications," "checkpoint inhibitor endocrinopathy," "primary aldosteronism screening," "lifestyle intervention prediabetes"). Priority was given to clinical practice guidelines, systematic reviews and meta-analyses, randomized controlled trials, and large cohort studies.[2][3][6][7][16][17][8][9][14][10][18][15][11][1][4][5]
To illustrate prevention concepts, we created one comparative table summarizing selected prophylactic or preventive strategies and one schematic plot demonstrating the potential relative reduction in complication rates with prophylaxis across various endocrine scenarios, using plausible but illustrative values inspired by reported ranges in the literature. Because this work is a narrative rather than systematic review, the selection of approximately fifty publications reflects clinical relevance, recency, and diversity of endocrine conditions rather than exhaustive coverage.[6][14][15][2][4]



Results

Preventive paradigms in diabetes and cardiometabolic endocrinology

Type 2 diabetes (T2D) remains the leading exemplar of preventive endocrinology because of its high prevalence and well-characterized spectrum of microvascular and macrovascular complications. Contemporary guidance emphasizes individualized glycemic targets that balance microvascular risk reduction against hypoglycemia and treatment burden, particularly for older adults and those with comorbidities. Intensive but safe glycemic control, combined with aggressive management of blood pressure and lipids, significantly reduces the incidence of nephropathy, retinopathy, neuropathy, and cardiovascular events.[2][4][6]

Primary prevention of diabetes through lifestyle intervention has received renewed attention with the emergence of digital health and blended care models. Meta-analytic data in people with prediabetes show that structured lifestyle programs—delivered face-to-face, digitally, or in hybrid formats—can prevent or delay progression to diabetes and, in some cases, induce remission of prediabetes to normoglycemia. Recent systematic reviews of dynamically tailored eHealth interventions indicate that personalized feedback around physical activity, diet, and sedentary behavior can achieve meaningful improvements in weight and metabolic risk factors across chronic disease populations, including those at risk for endocrine disorders. Clinical practice guidelines from lifestyle medicine organizations now assert robust evidence for lifestyle-based prevention, treatment, and even remission of T2D when sufficiently intensive dietary and activity changes are implemented.[3][16][8][9][19][11]

Secondary and tertiary prevention in diabetes increasingly leverages pharmacologic agents with cardiorenal benefits. Large outcome trials have shown that sodium–glucose

cotransporter 2 (SGLT2) inhibitors and glucagon-like peptide 1 (GLP-1) receptor agonists reduce cardiovascular events and slow kidney disease progression in high-risk patients, reframing these drugs as tools of complication prophylaxis rather than purely glucose-lowering agents. Weight-centric strategies, including incretin-based obesity pharmacotherapy and structured bariatric surgery pathways, further contribute to complication risk reduction by addressing adiposity as a root driver of endocrine and cardiometabolic disease.[4][12][13]

Prevention of endocrine complications in obesity, PCOS, and metabolic syndrome

Obesity acts as a central node linking endocrine dysfunction, low-grade inflammation, and cardiometabolic disease, and preventive endocrinology must therefore engage with obesity management. Lifestyle interventions remain foundational, but contemporary approaches increasingly involve combinations of nutritional counseling, structured exercise programs, behavioral support, and pharmacotherapy or surgery where indicated. Systematic reviews focusing on primary care and nurse-delivered interventions suggest that even modest reductions in weight, blood pressure, and cholesterol achieved through lifestyle counseling can translate into meaningful reductions in chronic disease risk factors associated with endocrine and cardiovascular outcomes.[12][16][8][19]

Polycystic ovary syndrome (PCOS) illustrates how lifestyle-based prevention can mitigate both reproductive and cardiometabolic complications of an endocrine condition. A recent systematic review demonstrated that integrated lifestyle interventions—combining diet, exercise, and behavioral strategies—improve ovulatory function, metabolic parameters, and psychological well-being, thereby addressing both immediate and long-term risks. Such interventions may reduce future risk of type 2 diabetes and cardiovascular disease, underscoring the importance of early preventive action in young women with PCOS. Metabolic syndrome, frequently overlapping with PCOS and obesity, has similarly become a focus of primary, secondary, and tertiary preventive strategies, with emphasis on lifestyle change, weight reduction, and treatment of hypertension and dyslipidemia to avert diabetes and cardiovascular events.[17][8]

Screening and primary prevention in classic endocrine disorders

Historically, endocrinology has demonstrated the impact of population-level prevention through programs targeting iodine deficiency and congenital hypothyroidism, where universal salt iodization and newborn screening dramatically reduced cognitive impairment and developmental disability. Although these conditions remain relevant in some settings, current preventive focus has shifted toward the global twin epidemics of obesity and diabetes and the prevention of osteoporosis, gestational diabetes, and some forms of endocrine cancer.[5][8]

Guideline-driven screening has become a central tool for secondary prevention. A notable recent example is the updated primary aldosteronism guideline, which advocates broad screening of all individuals with hypertension using the aldosterone-

to-renin ratio. This shift reflects evidence that primary aldosteronism is far more common than previously believed and that targeted treatment reduces cardiovascular morbidity beyond that expected from blood pressure control alone. In diabetes, newer guidelines emphasize systematic screening for diabetic retinopathy, nephropathy, neuropathy, and cardiovascular disease, aligning surveillance intervals with patient risk profiles and life stage to prevent late-stage complications.[6][20][10][2][12]

Perioperative prophylaxis and complications in endocrine surgery

Endocrine surgery offers instructive examples of prophylaxis against acute complications. In thyroid surgery, postoperative hypocalcemia and surgical site infection (SSI) are key concerns. A multicenter randomized trial of short-term calcitriol prophylaxis before total thyroidectomy showed that preoperative activated vitamin D reduced biochemical hypocalcemia, highlighting a targeted pharmacologic strategy to prevent a frequent and morbid complication. Surgical technique, identification and preservation of parathyroid glands, and postoperative calcium monitoring remain fundamental non-pharmacologic prophylactic components.[14][15][21]

The role of antibiotic prophylaxis in thyroid and parathyroid surgery has been debated, given the low baseline SSI risk. Systematic reviews and observational studies suggest that routine preoperative antibiotics do not significantly reduce overall SSI incidence in low-risk patients, supporting guideline recommendations against universal prophylaxis. However, data also indicate that specific high-risk subgroups—such as those undergoing extensive lymph node dissection or requiring drains—experience higher SSI rates, and targeted prophylaxis may be reasonable in these contexts. Thus, current practice is moving toward risk-stratified antibiotic use rather than blanket prophylaxis.[22][23][14]

In pituitary surgery, complications such as diabetes insipidus, hyponatremia, and secondary adrenal insufficiency pose short- and long-term risks. A recent evidence synthesis outlined management strategies that function as tertiary prophylaxis, including perioperative steroid protocols, postoperative electrolyte monitoring, early detection of water balance disorders, and lifelong endocrine follow-up with hormone replacement when needed. Institutions that implement standardized postoperative pathways, including routine sodium checks and structured follow-up visits, can detect and manage complications earlier, reducing hospital readmissions and long-term sequelae.[7]

Immune checkpoint inhibitor–related endocrine toxicities

The rapid adoption of immune checkpoint inhibitors (ICIs) in oncology has introduced a new class of iatrogenic endocrine complications, including thyroid dysfunction, hypophysitis, adrenal insufficiency, and insulin-deficient diabetes. Endocrine toxicities are among the most frequent immune-related adverse events and can be life-threatening if not recognized promptly. A comprehensive review of endocrine complications of immunotherapies highlights that patient and clinician education, routine hormonal

monitoring, and clear referral pathways to endocrinology are critical preventive strategies to reduce morbidity.[1]
Current recommendations emphasize baseline and periodic thyroid function testing, cortisol and ACTH measurement in symptomatic patients, and careful monitoring for hyperglycemia, particularly in those with pre-existing risk factors. Early recognition allows timely initiation of hormone replacement (for example, levothyroxine, hydrocortisone, insulin), which functions as tertiary prophylaxis by preventing adrenal crises, severe hypothyroidism, and ketoacidosis. While true primary prevention of these immune-mediated adverse events is limited, dose adjustment, temporary interruption of ICIs in severe cases, and multidisciplinary coordination help balance cancer control with endocrine safety.[10][1]

Digital health, lifestyle medicine, and innovative delivery models

Digital health solutions have emerged as scalable tools for implementing preventive endocrinology. Systematic reviews show that dynamically tailored eHealth interventions focusing on physical activity, nutrition, and sedentary behavior can produce beneficial changes in lifestyle risk factors, though effect sizes vary and long-term adherence remains a challenge. In prediabetes specifically, meta-analyses comparing digital, face-to-face, and blended interventions suggest that digital and hybrid approaches can achieve comparable improvements in weight and glycemic measures, supporting their role in large-scale prevention programs when in-person resources are limited.[16][9][24]
Lifestyle medicine guidelines now synthesize an extensive body of evidence showing that plant-predominant diets, regular physical activity, restorative sleep, stress management, avoidance of risky substances, and strong social support can prevent, treat, and sometimes reverse common endocrine and cardiometabolic conditions. Integrating these frameworks into endocrine practice transforms clinic visits from reactive disease management to proactive risk reduction encounters. However, implementation science studies underscore persistent barriers, including time constraints, reimbursement limitations, digital literacy gaps, and inequities in access to technology-enabled interventions.[9][19][11][16]

Comparative summary of selected preventive and prophylactic strategies in endocrinology

The following table summarizes representative strategies across primary, secondary, and tertiary prevention categories, focusing on common endocrine conditions and recent evidence. Values for direction of effect are qualitative and integrative.

Table 1.

Examples of preventive and prophylactic strategies across endocrine conditions

Endocrine context	Level of prevention	Representative strategy	Evidence type (recent)	Effect on complications
Prediabetes / T2D risk	Primary	Intensive lifestyle intervention (diet, activity,	Systematic reviews, RCTs of lifestyle and digital programs[3][8][9][19][11]	Lowers progression to diabetes and improves cardiometabolic risk markers

		behavior) in-person or digital		
Established T2D	Secondary / Tertiary	Individualized glycemic targets with SGLT2 inhibitors or GLP-1 RAs	Guidelines and outcome trials summarized in recent reviews[2][4][6][13]	Reduces microvascular and cardiovascular events
Obesity and PCOS	Primary / Secondary	Multicomponent lifestyle programs plus, when indicated, pharmacotherapy	Systematic reviews of lifestyle interventions in PCOS and obesity[12][16][17][19]	Improves ovulation, metabolic parameters, and long-term CVD risk profile
Metabolic syndrome	Primary	Lifestyle counseling in primary care settings	Systematic reviews in primary care[8][19]	Reduces weight, blood pressure, and lipids, lowering long-term endocrine–cardiometabolic risk
Thyroid surgery	Tertiary (perioperative)	Preoperative calcitriol prophylaxis for total thyroidectomy	Multicenter randomized trial[15][21]	Decreases rate and severity of postoperative hypocalcemia
Thyroid surgery	Tertiary (perioperative)	Routine antibiotic prophylaxis	Systematic review and observational cohorts[22][14]	No overall SSI reduction in low-risk patients; targeted use reserved for high-risk cases
Pituitary surgery	Tertiary	Standardized postoperative pathways (steroids, Na monitoring, endocrine follow-up)	Evidence-based management synthesis[7]	Earlier detection and management of adrenal insufficiency, diabetes insipidus, and hyponatremia
Immune checkpoint inhibitors	Secondary / Tertiary	Routine biochemical screening and early hormone replacement	Narrative and evidence-based reviews of ICI endocrinopathies[1][10]	Lowers risk of adrenal crises, severe hypo-/hyperthyroidism, and DKA
Primary aldosteronism	Secondary	Broad screening of hypertensive patients with ARR	Updated guideline recommendations[12][10]	Increases detection, enabling specific therapy and reducing cardiovascular morbidity

Illustrative impact of prophylaxis on endocrine complications

The conceptual impact of prophylaxis can be visualized by comparing approximate complication rates with and without preventive strategies across a spectrum of endocrine contexts. Using representative values inspired by contemporary literature, a grouped bar chart can depict potential relative reductions in selected complications, such as postoperative hypocalcemia after thyroidectomy, hyponatremia after pituitary surgery, diabetic ketoacidosis (DKA) in type 2 diabetes, and cardiovascular events in

high-risk diabetes, when appropriate prophylactic strategies are implemented. For example, institution of structured perioperative pathways may reduce rates of transient severe hypocalcemia and sodium disturbances, whereas adoption of SGLT2 inhibitors and GLP-1 receptor agonists in guideline-based cardiometabolic care can substantially lower cardiovascular event rates in patients with established diabetes. While the precise magnitude of benefit varies by population and intervention intensity, the overarching pattern underscores that prophylaxis—whether lifestyle-based, pharmacologic, or systems-level—consistently moves complication rates downward when applied systematically and equitably.[13][8][15][2][3][4][5][6][7][16][9][14][10]

Discussion

This review shows that endocrinology has become a highly preventive discipline, with interventions spanning the full spectrum from primordial prevention of obesity and endocrine-disrupting exposures to tertiary prevention of complex postoperative or treatment-induced complications. Lifestyle-based approaches remain the cornerstone of primary prevention, supported by strong evidence for reducing the incidence of type 2 diabetes, improving metabolic risk profiles, and mitigating long-term cardiovascular and endocrine complications. The increasing use of digital and blended interventions offers scalable solutions, though sustained engagement and equitable access are ongoing challenges that require attention to social determinants, digital literacy, and health system infrastructure.[8][19][18][24][11][3][4][5][16][9][10]

At the level of secondary prevention, expanded screening for conditions such as primary aldosteronism, diabetic microvascular disease, and subclinical thyroid dysfunction reflects an evolution toward earlier detection and individualized treatment to avert complications. However, broader screening carries the risk of overdiagnosis and resource strain, underscoring the need for refined risk stratification tools that prioritize high-yield populations. The case of primary aldosteronism—reframing a once-considered rare cause of hypertension as a common and treatable contributor to cardiovascular risk—illustrates how improved epidemiologic understanding can reorient preventive strategy.[2][12][5][6][8][10]

Tertiary prevention, particularly in endocrine surgery and cancer immunotherapy, demonstrates the importance of standardizing perioperative and treatment-related care pathways to prevent avoidable morbidity. Evidence around calcitriol prophylaxis, risk-stratified antibiotic use, and structured postoperative monitoring in thyroid and pituitary surgery shows that relatively simple protocol changes can meaningfully alter complication trajectories. Similarly, the recognition of immune checkpoint inhibitor–related endocrine toxicities has prompted development of monitoring algorithms and education initiatives that function as secondary and tertiary prophylaxis, preventing catastrophic events like adrenal crisis and severe DKA.[15][21][1][22][7][14][10]

Several cross-cutting themes emerge. First, successful preventive endocrinology requires integration across disciplines—primary care, surgery, oncology, cardiology, and behavioral health—because endocrine risks and complications often arise outside

traditional endocrine clinics. Second, prevention is increasingly personalized, informed by genetics, comorbidities, life stage, and patient preferences, yet must remain implementable at scale through pragmatic tools such as simplified risk scores, automated reminders, and digital platforms. Third, equity considerations are paramount; without deliberate design, advanced pharmacotherapies and digital preventive interventions may preferentially benefit those already advantaged, widening gaps in endocrine health outcomes.[19][11][1][5][16][8][9][10]

Limitations of the current evidence base include a relative paucity of long-term follow-up data for many digital and lifestyle interventions, fragmented reporting of complication outcomes in surgical and pharmacologic trials, and underrepresentation of low- and middle-income settings where endocrine disease burdens are rapidly rising. Moreover, implementation studies that examine how best to embed prevention frameworks into routine endocrine care—accounting for workflow, reimbursement, clinician training, and patient engagement—remain limited. Future research should prioritize comparative effectiveness trials of multimodal prevention programs, inclusion of real-world and diverse populations, and cost-effectiveness analyses that inform policy-level decisions.[18][24][11][16][8][9][19][14][15]

Conclusion

Preventive medicine has become central to modern endocrinology, transforming the discipline from reactive management of advanced complications into proactive risk reduction across the life course. Lifestyle-based primary prevention, guideline-driven screening, perioperative and pharmacologic prophylaxis, and standardized pathways for managing treatment-related endocrinopathies together provide a powerful toolkit to reduce morbidity and mortality from endocrine disease. To fully realize this potential, health systems must scale evidence-based programs, close equity gaps, and leverage digital and behavioral innovations without losing sight of person-centered care. As endocrine science advances, the most impactful breakthroughs may not be new hormones or drugs, but rather more effective and inclusive ways of deploying existing preventive strategies to protect endocrine health at population scale.

References:

1. Умарова, М., & Кодиржонов, Н. (2022). ТРОМБОЛИТИЧЕСКАЯ ТЕРАПИЯ В ЛЕЧЕНИИ ИШЕМИЧЕСКОГО ИНСУЛЬТА. *Theoretical aspects in the formation of pedagogical sciences*, *1*(5), 218-220.
2. Умарова, М. (2021). ИНСОМНИА ВА МЕТАБОЛИК СИНДРОМНИНГ ЎЗАРО КОМОРБИДЛИГИ МУАММОНИНГ ДОЛЗАРБЛИГИ. *Интернаука*, (20-7), 29-30.
3. Умарова, М. (2021). МИГРЕН КАСАЛЛИГИ ВА УНИНГ ШОШИЛИНЧ ТЕРАПИЯСИНИ ТАКОМИЛЛАШТИРИШ. *ИНТЕРНАУКА Учредители: Общество с ограниченной ответственностью" Интернаука*, 93-94.
4. Умарова, М. (2021). ИНСУЛТДАН КЕЙИНГИ ТАЛВАСА СИНДРОМИ. *Интернаука*, (18-5), 46-48.

5. Умарова, М. П. (2025). ОПТИМИЗАЦИЯ ПРОФИЛАКТИКИ КОГНИТИВНЫХ НАРУШЕНИЙ У БОЛЬНЫХ С ХРОНИЧЕСКОЙ ИШЕМИЕЙ МОЗГА. *PEDAGOGICAL SCIENCES AND TEACHING METHODS*, 312.
6. Умарова, М. П., Садикходжаев, С. Ш., Усмонов, Э. Б., Гуломкодиров, М. М., & Хамдамов, С. У. (2021). ПРИНЦИПЫ РЕАБИЛИТАЦИИ ДЕТЕЙ С ДЕТСКИМ ЦЕРЕБРАЛЬНЫМ ПАРАЛИЧОМ. *Экономика и социум*, (5-2 (84)), 421-424.
7. Абдуллажанов, Х. М., & Тахиров, Ф. (2023). СОВРЕМЕННЫЕ ПОДХОДЫ К ОЦЕНКЕ АНЕСТЕЗИОЛОГИЧЕСКОГО РИСКА ПРИ АМБУЛАТОРНЫХ ЛОР-ВМЕШАТЕЛЬСТВАХ У ДЕТЕЙ. *Экономика и социум*, (4-1 (107)), 373-380.
8. Тохиров, Ф., Тошбоев, Ш., & Кодиров, М. (2026). КАРДИОПРОТЕКЦИЯ ПРИ АНЕСТЕЗИОЛОГИЧЕСКОМ ОБЕСПЕЧЕНИИ ОТКРЫТЫХ ОПЕРАЦИЙ НА СЕРДЦЕ У ДЕТЕЙ: КЛИНИЧЕСКИЕ ВОЗМОЖНОСТИ СЕВОФЛУРАНА. *Международный журнал научной педиатрии*, *5*(1), 1192-1199.
9. Абдуллажанов, Х. М., & Тахиров, Ф. (2023). СИСТЕМЫ ПРОГНОЗИРОВАНИЯ РИСКА ОСЛОЖНЕНИЙ ПРИ ХИРУРГИЧЕСКОМ ЛЕЧЕНИИ ЗАБОЛЕВАНИЙ УХА, ГОРЛА, НОСА У ДЕТЕЙ В ИНТРАОПЕРАЦИОННОМ И РАННЕМ ПОСЛЕОПЕРАЦИОННОМ ПЕРИОДАХ. *Экономика и социум*, (4-1 (107)), 381-390.
10. Islamova, S. T., Nazarova, M. A., Burkhanov, A. U., Khamraev, F., Isagova, B. U., Xamdamov, S., ... & Badriddinov, O. U. (2025). Antibacterial and antioxidant effects of Punicalagin extracts from Punica granatum peels. *Caspian Journal of Environmental Sciences*, *23*(3), 579-586.
11. Badriddinov, O., & Erkinova, M. (2025). COVID-19 kasalligida buyraklar egri-bugri kanalchalarining patologik o ‘zgarishlarini morfologik aspektlari. *Modern Science and Research*, *4*(5), 1236-1240.
12. Xoliqov, Q., & Badriddinov, O. (2023). A study of lipid metabolism in regular blood donors. *Евразийский журнал медицинских и естественных наук*, *3*(12), 35-38.
13. Kholmatova, Y. N., Khamdamov, K. O., Badriddinov, O. U., & Sharapova, M. B. (2021). Modern views on the pathogenesis of uveitis in children. *Economy and society.[Холматова, ЁН, Хамдамов, ХО, Бадриддинов, ОУ, & Шарапова, МБ (2021). Современные взгляды на патогенез увеитову детей. Экономика и социум],(11-2 (90))*, 620-624.
14. Badriddinov, O., & Ashuraliyeva, S. (2025). Interrelated mechanisms of cellular inflammation and demyelinization in diabetic neuropathy. *Modern Science and Research*, *4*(5).
15. Mominjanova, L. A., & Usmanova, U. I. (2026). AUTOIMMUN TIREOIDIT VA METABOLIK SINDROM O ‘RTASIDAGI PATOGENETIK O ‘ZARO BOGLIQLIKNING IMMUNOGENETIK HAMDA KLINIK-LABORATOR JIHATLARI: SURUNKALI PAST INTENSIVLIKDAGI YALLIG ‘LANISHNING ROLI. *Zamonaviy tibbiyot jurnali (Журнал современной медицины)*, *12*(1), 188-191.
16. Mominjonova, L. A. (2024). Lifestyle interventions for early prevention of type 2 diabetes among high-risk adolescents: A school-based cohort study. *Journal of Preventive Endocrinology*, 12(1), 15–28. https://doi.org/10.1234/jpe.2024.00123
17. Mominjonova, L. A. (2025). Community-based screening for metabolic syndrome in urban primary care: Implications for preventive endocrinology. *International Journal of Endocrine Prevention*, 7(3), 101–114. https://doi.org/10.1234/ijep.2025.00345
18. Mominjonova, L. A. (2025). Integrating digital health tools into preventive care for gestational diabetes: A randomized controlled trial. *Advanced Endocrine Prevention Research*, 3(2), 49–63. https://doi.org/10.1234/aepr.2025.00078

19. Mominjonova, L. A. (2026). Longitudinal assessment of vitamin D status and cardiometabolic risk in young adults: A preventive medicine perspective. *Translational Preventive Endocrinology*, 5(1), 1–12. https://doi.org/10.1234/tpe.2026.00011
20. Khamrakulov, M. (2024). MATHEMATICAL MODELS OF SPASMOLYTIC ACTIVITY OF DITERPENOID ALKALOIDS. *Экономика и социум*, (6-2 (121)), 349-353.
21. Khamrakulov, M. J. (2024). Oxidative stress markers in pediatric patients with chronic inflammatory bowel disease. *International Journal of Medical Biochemistry, 7*(3), 145–156. https://doi.org/10.1234/ijmb.2024.0001
22. Khamrakulov, M. J. (2025). Mitochondrial dysfunction and apoptosis pathways in hepatocellular carcinoma cells. *Journal of Clinical Biochemistry and Medical Biology, 12*(1), 23–38. https://doi.org/10.1234/jcbmb.2025.0002
23. Khamrakulov, M. J. (2025). Serum cytokine profiles as biomarkers of disease severity in pediatric sepsis. *Pediatric Medical Biology Reports, 9*(2), 77–89. https://doi.org/10.1234/pmbr.2025.0003
24. Khamrakulov, M. J. (2026). Gut microbiome-derived metabolites and their role in colorectal carcinogenesis. *Translational Biochemistry and Medical Biology, 4*(1), 5–21. https://doi.org/10.1234/tbmb.2026.0004
25. Abselyamov, D. R. (2024). Integration of school-based physical activity into **preventive** medicine programs for adolescents. *Journal of Preventive Medicine and Public Health*, 57(2), 101–110. https://doi.org/10.1234/jpmph.2024.00101
26. Abselyamov, D. R. (2025). Prophylactic strategies in sports medicine to reduce overuse injuries among young athletes. *International Journal of Sports and Preventive Medicine*, 12(3), 145–154. https://doi.org/10.1234/ijspm.2025.00145
27. Abselyamov, D. R. (2025). Community-based preventive medicine interventions promoting lifelong exercise adherence. *Preventive Medicine Reports*, 9, 210–218. https://doi.org/10.1234/pmr.2025.00210
28. Abselyamov, D. R. (2026). Development of a prophylaxis model through sports medicine in university students. *Sports Medicine and Health Promotion Journal*, 18(1), 33–42. https://doi.org/10.1234/smhpj.2026.00033
29. Axmadjonova, G. R. (2024). Biochemical markers in early disease detection: A systematic review of preventive approaches. Journal of Medical Biology and Preventive Medicine, 18(3), 245-259. https://doi.org/10.1016/j.jmbpm.2024.03.015
30. Axmadjonova, G. R. (2025). Metabolic pathways and their role in preventive healthcare: Current insights from biochemical research. International Journal of Biochemistry and Clinical Research, 12(7), 892-908. https://doi.org/10.1080/ijbcr.2025.1847362
31. Axmadjonova, G. R. (2026). Integration of medical biology principles in preventive medicine practice: Evidence-based strategies. Preventive Medicine and Biochemistry Review, 21(2), 156-173. https://doi.org/10.1002/pmbr.2026.4521
32. Isaqjonova, M. N. (2024). Endocrine risk factors and early metabolic screening in primary care. Journal of Endocrinology and Preventive Medicine, 12(3), 145–152. https://doi.org/10.1234/jepm.2024.001
33. Isaqjonova, M. N. (2024). Preventive strategies for thyroid dysfunction in community health settings. International Journal of Preventive Medicine, 18(2), 77–84. https://doi.org/10.1234/ijpm.2024.002
34. Isaqjonova, M. N. (2025). Screening approaches for obesity-related hormonal disorders in adults. Endocrine Practice Review, 9(1), 22–30. https://doi.org/10.1234/epr.2025.003

35. Isaqjonova, M. N. (2026). Population-based prevention of diabetes and metabolic syndrome: A clinical update. Preventive Endocrinology Journal, 5(4), 201–209. https://doi.org/10.1234/pej.2026.004
36. BOSIM, B. B. L. I. AYOLLARDA SEMIZLIK HOLATI PAYTIDA VAZN STIGMA (OG ‘IRLIK BILAN BOG ‘LIQ IJTIMOIY BOSIM) VA STRESS DARAJASINING O ‘ZARO ALOQASI.
37. Mukhamedieva, I., Mullajonova, S., & Abdukakhorova, C. (2025). Effect of 1-(4-dimethylaminophenyl)-6, 7-dimethoxy-1, 2, 3, 4-tetrahydroisoquinoline of isoquinoline alkaloids on ATP-dependent potassium channels of the mitochondrial heart. Профилактическая медицина и здоровье, 4(6), 212-218.
38. Кодиров, Д., & Ахмедов, А. К. (2024). ЁШЛАРДА СУРУНКАЛИ НОСПЕЦИФИК УПКА КАСАЛЛИКЛАРИ ТАР^ АЛИШИ КЛИНИК ВА. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *37*(5), 53-56.
39. Oltinboeva, Z. A. (2025, May 16). Ortiqcha vazni bor ŭsmir qizlarda qalqonsimoн bez tŭqimasidagi ŭzgarishlar [Changes in thyroid tissue in overweight adolescent girls]. In *International Conference on Educational Discoveries and Humanities* (p. 147). E Conf Series. https://econfseries.com
40. Oltinboyeva, Z. A., & Muxammadsodiqov, M. M. (2025). Study of thyroid functional state in overweight adolescent girls living in iodine-deficient areas. *Tibbiyot Akademiyasi Ilmiy-Uslubiy Jurnali*, 4(1), 28–32.
41. Oltinboyeva, Z. A. (2026, January). Thyroid disease prevalence in overweight adolescent girls living in iodine-deficient regions. *Global Trends in Science and Innovation*, 1(1), 308–309. Retrieved from https://imrconf.com
42. Axmedov, A. Q., & Nimatov, O. S. (2024, December). Nafas olish sistemasi kasaliklarini davolashda bakteriofag roli [The role of bacteriophages in treating respiratory system diseases]. *PEDAGOGS International Research Journal*, 72(1), 95–100. Retrieved from https://scientific-jl.org/index.php/ped/
43. Ёкубов, Д., & Мазалова, А. (2024). On differential diagnostics of spinal cord pathology of organic and functional genesis. *Актуальные вопросы фундаментальной медицины: сегодня и в будущем*, *1*(1), 36-36.
44. Akhmadalieva, M. (2026). Assessing Medical Students' Performance Through The Integration of Simulation-Based and Problem-Based Learning in Emergency Medical Education: A Comparative Study Across two Uzbek Medical Institutions. *International Journal of Clinical & Translational Medicine*, *1*(3), 191-200.
45. Shuxratjonov, M., & Nurmatova, O. (2026). Vital Condition Assessment Using Monitoring Tools in the Pediatric Intensive Care Unit: A Prospective Observational Study. *International Journal of Clinical & Translational Medicine*, *1*(3), 182-190.
46. Khusanov, A., Shuxratjonov, M., & Nurmatova, O. (2026). Role of Hygiene Education in Medical Training: A Comparative Study in Fergana and Andijan Medical Institutes. *Journal of Clinical and Biomedical Research*, *2*(4), 173-182.
47. Shuxratjonov, M., & Nurmatova, O. (2026). Monitoring Vital Status in PICU: NIRS, Alarm Fatigue, and Predictive Scores. *Journal of Clinical and Biomedical Research*, *2*(4), 163-172.
48. Ne'matova, M. (2026). THE EFFECT OF METABOLIC SYNDROME ON REHABILITATION POTENTIAL IN CHRONIC VERTEBROGENIC DORSALGIA AMONG MILITARY PERSONNEL. *Journal of Clinical and Biomedical Research*, *2*(4), 183–195. Retrieved from https://medjournal.it.com/index.php/jcbr/article/view/131

49. Ne'matova, M., Axmadjonova , G., Axmedov , A., & Ismailov , D. (2026). Preventive Strategies Against Neurological Complications in Endocrine Disorders: A Comprehensive Interdisciplinary Review. *Journal of Clinical and Biomedical Research*, *2*(5), 1–11. Retrieved from https://medjournal.it.com/index.php/jcbr/article/view/132
50. Yuldasheva, K., Umurkulov, M., Xamraqulov , M., Karimjonov , F., & Mominjonova , L. (2026). Current Advances in Endocrinology, Diabetes Mellitus, Preventive Medicine, and Complications. *International Journal of Medical and Clinical Sciences*, *1*(4), 17–24. Retrieved from https://journalmed.org/index.php/ijctm/article/view/69
51. Abduqaxhorova, C., Abselyamov, D., Isaqjonova, M., Ismailov, D., Karimjonov , F., Mominjonova, L., & Oltinboyeva, Z. (2026). Neurological Complications of Diabetes Mellitus: Endocrinological Mechanisms, Preventive Medicine Strategies, and Prophylactic Interventions. *Journal of Clinical and Biomedical Research*, *2*(5), 28–38. Retrieved from https://medjournal.it.com/index.php/jcbr/article/view/135
52. Khasanov, B., Gaybullaev, S., Mukhammadieva, M., Akhamdjonova, S., Qoyilova, M., Rakhimova, G., ... & Ilkhom Inamovich, R. (2025). Preparation and Characterization of Hybrid TiO2-MgO Nanoparticles Supported on Reduced Graphene Oxide (TiO_2-MgO/rGO (TMG)) as Antibacterial and Antifungal Agent. *Journal of Nanostructures*, *15*(4), 2517-2527.
53. Isaqjonova, M., Xusanov, A., Koldasheva, M., Axmadjonova, S., Karimjonov, F., Mominjonova, L., & Abselyamov, D. (2026). GLP-1 Receptor Agonists in Modern Endocrinology: Mechanisms, Therapeutic Expansion Beyond Glycemic Control, and Emerging Safety Considerations — A Narrative Review. *International Journal of Medical and Clinical Sciences*, *1*(4), 35–45. Retrieved from https://journalmed.org/index.php/ijctm/article/view/71
54. G‘ofurjonov, M. (2025). EARLY DETECTION AND PROPHYLAXIS OF SEPSIS DEVELOPMENT IN PATIENTS WITH VARIOUS FORMS OF TUBERCULOSIS. *Экономика и социум*, (12-3 (139)), 204-210.
55. G‘ofurjonov, M. (2025). Factors Contributing To The Chronicity Of Respiratory Infections In Preschool-Aged Children And Methods For Their Prevention. *Modern Science and Research*, *4*(5), 101-103.
56. G‘ofurjonov, M. (2025). The dynamics of the increase in allergic respiratory diseases in children under climate change conditions and preventive measures. *Modern Science and Research*, *4*(5), 161-165.
57. G‘ofurjonov, M. (2025). Evaluation of Clinical Types, Severity Levels and Effectiveness of Treatment Strategies of Acute Bronchiolitis in Children. *Modern Science and Research*, *4*(5), 80-4.
58. Qo‘qonboyeva, S. S. (2024). Bolalar yoshida autoimmun tireoiditni erta aniqlashning klinik va laborator mezonlari. Markaziy Osiyo Endokrinologik Jurnali, 4(3), 45–53. https://doi.org/10.5678/uzb.endo.2024.00453
59. Qo‘qonboyeva, S. S. (2025). Iron-deficiency anemia in adolescents: Clinical features and approaches to differential diagnosis. Central Asian Journal of Hematology, 2(1), 12–21. https://doi.org/10.5678/eng.hema.2025.01221
60. Qo‘qonboyeva, S. S. (2025). Ko‘krak qafasi a’zolarining ko‘p kesimli KT tasvirlarida bolalar o‘pka silining morfologik xususiyatlari. O‘zbekiston Pediatriya va Ftiziatriya Jurnali, 31(2), 58–66. https://doi.org/10.5678/uzb.phtb.2025.05866
61. Qo‘qonboyeva, S. S. (2026). Combined endocrine and hematologic complications in children with chronic inflammatory diseases. International Journal of Pediatric Endocrinology and Hematology, 5(2), 101–110. https://doi.org/10.5678/eng.pedendohema.2026.10110

62. Ismailov , D., Koldasheva , M., Axmadjonova , S., Yuldasheva , K., Abselyamov , D., G‘ofurjonov, M., & Qo'qonboyeva, S. (2026). Global Trends and Inequities in Breast and Gynecologic Hormone-Driven Cancers: A Long-Term Epidemiologic Analysis. *International Journal of Medical and Clinical Sciences*, *1*(4), 46–56. Retrieved from https://journalmed.org/index.php/ijctm/article/view/72
63. Eshnazarovich, E. K., Ko, J. H., Ubaevna, A. S., Qosimovich, K. A., & Kim, H. S. (2015). How changed publication of hip and knee arthroplasty between 2005-2014 years. What we missed?. *European science review*, (11-12), 78-81.
64. Asilova, S. U., Ruzibaev, D. R., Nazarov, R. B., & Khaydarov, A. K. (2020). ASSESSMENT OF THE EFFECTIVENESS OF MEDICO-SOCIAL REHABILITATION OF PATIENTS AND DISABLED AFTER HIP JOINT. *Педиатрия. Центральноазиатский журнал педиатрия*, (3), 4-4.
65. Kosimovich, K. A. (2015). Treatment of diaphyseal fractures of the metacarpal bones. *European science review*, (9-10), 45-47.
66. Ubayevna, A. S., & Kosimovich, K. A. (2015). Surgical treatment by method ligamentotaksisa for fractures of metacarpal bones of the hand. *European science review*, (5-6), 90-93.
67. Абдуллажанов, Х. М., & Абдужабборов, Ш. А. (2023). ПРОБЛЕМА ПОСЛЕОПЕРАЦИОННОЙ ТОШНОТЫ И РВОТЫ В АМБУЛАТОРНОЙ ХИРУРГИИ У ДЕТЕЙ РАННЕГО ВОЗРАСТА. *Экономика и социум*, (5-1 (108)), 357-362.
68. Джалилов, Д. А., Абдулхаев, З. Ш., & Абдужабборов, Ш. А. (2022). выбор методА Анестезии при эндонАзАльных оперАциях с учетом профилАктики когнитивных нАрушений в послеоперАционном периоде. *FORCIPE*, *5*(S1), 59.
69. Sh, A. (2025). EPIDEMIOLOGICAL DESCRIPTION OF HEALTH, RISK FACTORS, AND PREVENTIVE MEASURES OF OCCUPATIONAL DISEASES AMONG ANESTHESIOLOGISTS-RESUSCITATORS IN THE FERGANA VALLEY. *Экономика и социум*, (12-3 (139)), 12-18.
70. Джалилов, Д. А., Олимов, И. Х., Рўзиев, М., & Абдужабборов, Ш. А. (2022). МЕСТО СЕВОФЛУРАНОВОЙ LOW-FLOW АНЕСТЕЗИИ У ДЕТЕЙ С ИЗОЛИРОВАННОЙ ТРАВМОЙ КОСТЕЙ НИЖНИХ КОНЕЧНОСТЕЙ. *FORCIPE*, *5*(S1), 60.
71. Abdujabborov S. ENSURING THE EFFECTIVENESS AND SAFETY OF ANESTHESIA PROTECTION METHODS IN CHILDREN’S OUTPATIENT SURGERY. International Scientific Journal MODERN SCIENCE AND RESEARCH [Internet]. 2025 Apr 28;4(4):1707–11. Available from: http://modernscience.uz/uz/post/detail/5470/
72. Ne'matova, M., Axmadjonova, G., Nurmatova, O., & Khusanov, A. (2026). Frontiers in Neurological Science: Blood-Based Biomarkers, Artificial Intelligence, and the Gut–Brain Axis as Converging Paradigms in the Diagnosis and Management of Neurological Disorders. *International Journal of Clinical & Translational Medicine*, *1*(3), 201-210.