EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 01, Issue 11, November 2025
brightmindpublishing.com
ISSN (E): 3061-6972

MODERN COMPUTER TECHNOLOGIES IN THE DIAGNOSIS AND TREATMENT OF GYNECOLOGICAL DISEASES: ROLE AND SIGNIFICANCE

Atakhanov Sanjarbek Anvarovich
Assistant of the Department of Biomedical Engineering, Biophysics and Information Technologies Fergana Medical Institute of Public Health

Mirzayeva Mokhchekhra Mashhurjon qizi
1st-Year Student, Pediatrics Faculty, FMIPH

Abstract
In recent years, gynecological diseases have significantly increased worldwide, becoming a serious problem linked to lifestyle and environmental factors. This article discusses the types of gynecological diseases, their causes, diagnostic methods, treatment approaches, and their impact on women's health. The role of modern information technologies in the diagnosis and treatment of such diseases is also highlighted. Digital technologies allow early detection, development of effective treatment strategies, and improvement of healthcare quality.

Keywords: Gynecological diseases, artificial intelligence, telemedicine, early diagnosis, electronic medical records, cyst, computed tomography, ultrasound.

Introduction

Every person inherits genetic traits from their parents, including predispositions to certain diseases. Gynecological diseases affect the uterus, ovaries, mammary glands, and other organs of the female reproductive system. These conditions influence reproductive health, the menstrual cycle, and overall well-being. Today, the prevention and timely detection of gynecological diseases are highly important. Information technologies — such as ultrasound, CT, MRI, and digital diagnostic tools — play a vital role in improving accuracy and efficiency.

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 01, Issue 11, November 2025
brightmindpublishing.com
ISSN (E): 3061-6972

DIAGNOSIS OF GYNECOLOGICAL DISEASES

1. Ultrasound Examination (Ultrasound Imaging)

Ultrasound helps identify structural changes in the uterus and ovaries using high-frequency sound waves. The method is safe, painless, and allows rapid visualization of internal organs.

Advantages: no radiation, painless, quick results, safe for pregnant women.

Types of ultrasound:

• Transabdominal — performed through the abdominal wall.
• Transvaginal — offers high accuracy and detailed visualization.
• Transrectal — used rarely for specific diagnostic purposes.

2. Laboratory Tests

Main laboratory evaluations:

• Complete blood count — detects infections and inflammation.
• Biochemical analysis — evaluates liver, kidney, and endocrine function.
• Urinalysis — identifies urinary tract abnormalities.
• Hormonal testing (progesterone, FSH, etc.).
• PAP-test — early detection of cervical cancer.

3. Genetic Testing

Genetic tests reveal mutations associated with ovarian cancer, cervical cancer, breast cancer, endometriosis, and other diseases.

Advantages:

• assessment of genetic predisposition,
• improved diagnostic accuracy,
• identification of hereditary abnormalities,
• selection of personalized treatment strategies.

4. Colposcopy

A visual examination of the cervix using an optical magnification device. Colposcopy is effective for detecting precancerous lesions and HPV-related abnormalities.

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 01, Issue 11, November 2025
brightmindpublishing.com
ISSN (E): 3061-6972

5. Hysteroscopy

An endoscopic procedure allowing direct visualization of the uterine cavity.

Detects:

• polyps,
• fibroid nodules,
• endometriosis,
• Asherman's syndrome,
• improper placement of intrauterine devices.

ROLE OF INNOVATIVE TECHNOLOGIES

1. Genomic Technologies (NGS, Bioinformatics, AI)

• NGS identifies thousands of mutations simultaneously.
• Artificial intelligence predicts disease risks.
• Microchip technology enables home-based genetic mini-tests.

2. Advanced Ultrasound: 3D/4D Imaging

• Produces three-dimensional visualization.
• Doppler ultrasound evaluates blood flow.
• AI minimizes diagnostic errors by analyzing imaging data.

3. Artificial Intelligence in Gynecology

AI processes large clinical datasets (laboratory tests, imaging, genetic data), predicts disease progression, and supports decision-making.

• Big Data — compares similar clinical cases.
• Deep Learning — detects pathologies on ultrasound/MRI images.
• Robotic-assisted systems — ensure safer minimally invasive surgeries.

4. Electronic Medical Records (EMR)

EMRs store all patient information in a unified system: test results, imaging, pregnancy history, prescriptions.

Benefits:

• strengthened data security,
• telemedicine integration,

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 01, Issue 11, November 2025
brightmindpublishing.com
ISSN (E): 3061-6972

• cloud-based storage,
• access via mobile applications.

CONCLUSION

Modern computer technologies significantly enhance the accuracy of diagnosing and treating gynecological diseases. High-precision imaging, genomic research, AI-based clinical support systems, and digital patient records improve the efficiency of healthcare, accelerate diagnostic processes, and enable personalized treatment. In the future, robotics, telemedicine, artificial intelligence, and large-scale data analytics will further advance the prevention, early detection, and optimized treatment of gynecological conditions, becoming essential components of high-quality medical practice.

References

1. Солиев, У. А. (2021). Неоценимый вклад Узбекистана в победу в Великой Отечественной войне. Молодой ученый, (17), 325-328.
2. Салиева, Н. С. (2023). Concepts competence and competence. European Journal of Interdisciplinary Research and Development, 16, 316-321.
3. Мадаминов, А. А. (2025). ИННОВАЦИОН ТЕХНОЛОГИЯЛАРНИНГ ЖАМИЯТ ТАРАҚҚИЁТИГА ФУНКЦИОНАЛ ТАЪСИРИНИНГ ИЖТИМОИЙФАЛСАФИЙ ЖИҲАТЛАРИ. Экономика и социум, (5-1 (132)), 1272-1275.
4. Djurayevna, M. M. (2023). The Impact of Non-linguistic Elements on Phonostylistic Changes. American Journal of Research in Humanities and Social Sciences, 18, 153-157.
5. Туйчиева, О. С. (2021). Методика преподавания латинского языка в медицинских высших учебных заведениях. Молодой ученый, (1), 66-67.
6. Akbarov, D., Umarov, S., Abdurakhmonova, M., Nurmatova, I., Karimova, G., & Karimov, U. (2025, October). Application of logical operations and table replacements in basic transformations of hash function algorithms. In American Institute of Physics Conference Series (Vol. 3377, No. 1, p. 060002).
7. Jurayeva, M. T. K. (2022). Some opinions about social forms in teaching German. Oriental renaissance: Innovative, educational, natural and social sciences, 2(5-2), 372-376.

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 01, Issue 11, November 2025
brightmindpublishing.com
ISSN (E): 3061-6972

8. Исроилова, С. М. (2024). ФОРМИРОВАНИЕ КОММУНИКАТИВНОЙ КОМПЕТЕНЦИИ СТУДЕНТОВ В ПРОЦЕССЕ ОБУЧЕНИЯ РУССКОМУ ЯЗЫКУ. Экономика и социум, (5-2 (120)), 1066-1071.
9. Karimov, A., & Muxammadjonov, X. (2020). Information technologies: Information education and informatics. Экономика и социум, (8 (75)), 40-43.
10. Mamatkhonova, M. (2025). THE RELEVANCE OF USING INNOVATIVE TECHNOLOGIES IN UZBEK LANGUAGE LESSONS. Journal of Science, Research and Teaching, 4(8), 1-5.
11. Karimovna, M. O. (2022). Linguocultural features of phraseology in Uzbek and German languages. Galaxy International Interdisciplinary Research Journal, 10(6), 481-482.
12. Abdurahimova, M. (2025). SUKUT PSIXOFIZIOLOGIYASI. Farg'ona davlat universiteti, (1), 72-72.
13. Ганиев, М. М. (2023). ВЛИЯНИЕ НЕРВНОЙ СИСТЕМЫ НА ЗДОРОВЬЕ. SO 'NGI ILMIY TADQIQOTLAR NAZARIYASI, 6(12), 426-430.
14. Anvarov, A. (2025). THE ROLE OF REVERSIBLE EDUCATION IN THE DEVELOPMENT OF PROFESSIONAL EDUCATIONAL COMPETENCIES OF STUDENTS OF MEDICAL EDUCATION. Журнал академических исследований нового Узбекистана, 2(6, 2-qism), 135-138.
15. Yusupaliyevna, H. S. (2024). MODEL AND TECHNOLOGY FOR THE DEVELOPMENT OF PROFESSIONAL ABILITIES OF STUDENTS IN MEDICAL EDUCATION. INNOVATIVE DEVELOPMENTS AND RESEARCH IN EDUCATION, 3(28), 399-403.
16. Ergasheva, S. (2019). CRITERIA FOR THE EDUCATIONAL PROCESS IN FORMATION OF COMMUNICATIVE COMPETENCE OF FUTURE MEDICAL PERSONNEL. European Journal of Research and Reflection in Educational Sciences Vol, 7(12).
17. Каримова, М. (2025). Развитие профессиональных навыков через аутентичную компетенцию. Общество и инновации, 6(1/S), 217-221.
18. Xasanov, I. M. (2019). Problems of employment in Uzbekistan. Образование и наука в России и за рубежом, (16), 156-158.
19. Komilova, M. (2023). O 'ZBEK TILIGA XITOY TILIDAN O 'ZLASHGAN OZIQ-OVQAT NOMLARI TAHLILI. Oriental renaissance: Innovative, educational, natural and social sciences, 3(20), 54-56.

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 01, Issue 11, November 2025
brightmindpublishing.com
ISSN (E): 3061-6972

20. Каxорова, Т. (2022). Tibbiy ta'lim jarayonida ingliz tilini o 'rgatishda interaktiv didaktik materiallardan foydalanish metodikasini shakllantirish va 3D interaktiv ta'lim dasturi. Общество и инновации, 3(2), 52-55.
21. Nodira, U. (2022). THE ENHANCEMENT OF METHODOLOGY IN THE MODERN EDUCATION. INTERNATIONAL JOURNAL OF SOCIAL SCIENCE & INTERDISCIPLINARY RESEARCH ISSN: 2277-3630 Impact factor: 8.036, 11(11), 31-33.
22. Ахмедова, У. Э. (2018). ИСПОЛЬЗОВАНИЕ ИННОВАЦИОННЫХ ТЕХНОЛОГИЙ В РАЗВИТИИ ВИДОВ РЕ-ЧЕВОЙ ДЕЯТЕЛЬНОСТИ НА ЗАНЯТИЯХ РУССКОГО ЯЗЫКА В МЕДИЦИНСКОМ ВУЗЕ. Инновации в образовании и медицине. Материалы V Все, 18.
23. Atakhonov, S., & Turobova, F. (2025, November). THE ROLE OF MODERN COMPUTER TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE IN THE DIAGNOSIS AND TREATMENT OF CHILDREN'S DISEASES. In International Conference on Medicine & Agriculture (Vol. 1, No. 1, pp. 92-95).
24. Anvarovich, A. S. (2025). HOMILADORLIKDA IRSIY VA IRSIY BO 'LMAGAN KASALLIKLARNI ANIQLASHDA ZAMONAVIY DIAGNOSTIKA APPARATLARI VA SUN'IY INTELLEKTNING O 'RNI. Научный Фокус, 3(29), 129-133.
25. Ataxanov, S., & To'xtamurodova, M. S. (2025). INTERNETGA QARAMLIK OQIBATIDA NEVROLOGIK TIZIMDA ANOMALIYALARNING PAYDO BO'LISHI. Modern Science and Research, 4(6), 255-259.
26. Anvarovich, A. S. (2025). O 'PKA SHAMOLLASHINING PEDIATRIK HOLATLARDA KECHISHI VA ASORATLARI. THE THEORY OF RECENT SCIENTIFIC RESEARCH IN THE FIELD OF PEDAGOGY, 3(33), 1-4.