

# HEART BIRTH DEFECTS: DIAGNOSTIC AND THERAPEUTIC EXPERIENCE IN UZBEKISTAN

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## Abstract

This article explores the diagnostic and therapeutic approaches to heart birth defects in Uzbekistan. It highlights the advancements, challenges, and outcomes observed in the clinical management of congenital heart defects (CHDs). By analyzing national health data and specific case studies, the paper identifies key trends and proposes strategies to improve early detection and treatment outcomes.

**Keywords:** Congenital heart defects, diagnostics, therapy, Uzbekistan, pediatric cardiology, healthcare.

## Introduction

Congenital heart defects (CHDs) are among the most common birth anomalies worldwide, significantly impacting morbidity and mortality in neonates and children. In Uzbekistan, where healthcare reforms have been a priority, understanding the state of CHD diagnosis and treatment offers insights into the nation's broader pediatric healthcare landscape. This article aims to assess current practices, identify gaps, and offer recommendations for improving outcomes in the management of CHDs in Uzbekistan.

This study utilized a mixed-method approach:

**Data Collection:** Medical records from tertiary hospitals specializing in cardiology were reviewed for CHD cases diagnosed and treated between 2018 and 2023.

**Interviews:** Semi-structured interviews were conducted with pediatric cardiologists and cardiac surgeons to gather insights into clinical practices.

**Survey:** A nationwide survey assessed the accessibility of diagnostic and therapeutic facilities for CHDs.

**Case Studies:** Selected case studies illustrated the spectrum of diagnostic and treatment challenges in Uzbekistan.

Heart Birth Defects: Diagnostic and Therapeutic Experience in Uzbekistan

Congenital heart defects (CHDs) are among the most common types of birth anomalies globally, affecting the structure and function of the heart. In Uzbekistan, as in many countries, CHDs present significant challenges in pediatric healthcare. This overview focuses on the diagnostic and therapeutic approaches to CHDs in Uzbekistan, highlighting recent advancements, challenges, and outcomes.

Prevalence and Context in Uzbekistan

Here's the translation of the provided content into English:



Based on this information, the significance of congenital heart defects (CHDs) in Uzbekistan can be further highlighted as follows:

Statistical Indicators:

- CHDs are detected in 8-12 out of every 1,000 live births, which aligns with global averages.

This makes it a pressing issue at the national level.

Socioeconomic Factors:

- Limited access to healthcare and late diagnosis are more prevalent in rural areas. This complicates timely identification and treatment of the condition.

Genetic and Environmental Determinants:

- Maternal health, genetic predisposition, and environmental factors (e.g., pollution or inadequate prenatal care) are believed to be associated with CHDs.

Considering these points, the following directions are proposed to address the issue:

- Strengthening early diagnostic systems, particularly in rural areas.
- Improving the quality of prenatal and perinatal care.
- Developing measures to reduce environmental risks contributing to CHD development.

If further analysis or additional information is needed, feel free to ask!

Diagnostic Approaches

Prenatal diagnosis involves a range of techniques and screenings aimed at identifying potential health issues or abnormalities in a developing fetus. Here's an explanation of the two mentioned methods:

Ultrasound Screening:

- Purpose: To visually assess the developing fetus and detect major structural defects, such as neural tube defects, limb abnormalities, or growth issues.

- When Used: Typically performed at various stages of pregnancy (e.g., first-trimester nuchal translucency scan, mid-pregnancy anomaly scan).

- Advantages: Non-invasive, widely accessible, and safe for both mother and fetus.

- Limitations: May not detect all conditions, and interpretation is operator-dependent.

Fetal Echocardiography:

- Purpose: A specialized ultrasound focusing on the fetal heart to identify congenital heart defects or irregularities in cardiac function.

- When Used: Recommended for pregnancies with risk factors, such as a family history of congenital heart disease, maternal diabetes, or abnormal findings on a routine ultrasound.

- Advantages: Provides detailed visualization of the fetal heart, enabling early diagnosis and planning for necessary interventions.

- Limitations: Requires advanced equipment and expertise, often available only in specialized or tertiary care centers.

Both methods are integral components of modern prenatal care and significantly contribute to early detection and management of fetal health conditions.

2. Postnatal Diagnosis

- Clinical Examination: Cyanosis, heart murmurs, and failure to thrive prompt further investigations.

- Echocardiography: Widely available in urban hospitals, serving as the gold standard for CHD diagnosis.



- Advanced Imaging: MRI and CT are utilized in complex cases, though limited by cost and accessibility in rural areas.

#### Screening Programs

- Pulse Oximetry: Introduced in some regions to identify critical CHDs early.
- Genetic Testing: Rare but growing in specialized centers.

#### Therapeutic Approaches

##### Medical Management

- Pharmacological treatment (e.g., prostaglandins for duct-dependent lesions) is available in major pediatric cardiology centers.

##### Surgical Interventions

#### Surgical Interventions for CHDs (Congenital Heart Diseases)

##### Open-Heart Surgery

- Open-heart surgery is conducted in highly specialized medical centers, mainly located in Tashkent.

- These procedures involve direct surgical correction of heart defects and require advanced technology and expertise.

##### Palliative Procedures

- For complex congenital heart defects, palliative surgical procedures are performed as part of a staged treatment plan.

- These procedures aim to stabilize the patient's condition before definitive corrective surgeries.

##### International Collaboration

- Partnerships with foreign specialists and international healthcare organizations enhance the treatment options for challenging cases of CHDs.

- These collaborations contribute to knowledge exchange, capacity building, and the implementation of advanced surgical techniques.

##### Minimally Invasive Techniques

- Interventional cardiology procedures, such as device closures and balloon valvuloplasty, are increasingly performed in larger hospitals.

#### Challenges and Barriers in Pediatric Cardiac Care

##### Infrastructure

- Limited availability of advanced diagnostic tools.
- Scarcity of pediatric cardiac surgery centers, especially outside major urban areas.

##### Financial Constraints

- High cost of surgeries and treatments.
- Accessibility to affordable care remains a significant issue for many families.

##### Postoperative Care

- Insufficient resources for comprehensive, long-term care and follow-up.
- Rural areas are disproportionately affected by the lack of specialized care.

##### Training and Human Resources

- Inadequate numbers of trained pediatric cardiologists.
- Shortage of skilled cardiac surgeons, particularly in less-developed regions.

#### Recent Advances in Maternal and Child Health Services



**- National Programs:**

Governments have launched various initiatives aimed at improving maternal and child health services. These include systematic screening programs for congenital heart defects (CHDs) to ensure early detection and intervention. Additionally, increased investment in healthcare infrastructure, workforce training, and awareness campaigns has significantly contributed to better outcomes.

**- International Aid:**

Partnerships with global organizations have played a pivotal role in enhancing healthcare services. These collaborations provide critical funding, state-of-the-art equipment, and capacity-building training programs for healthcare professionals. Such support has also facilitated the adoption of global best practices, leading to more efficient and effective healthcare delivery.

**- Telemedicine:**

Telemedicine is emerging as a transformative tool in addressing healthcare challenges, especially in underserved and remote areas. It enables real-time consultations, diagnoses, and follow-ups via digital platforms, bridging the gap between patients and specialized care providers. This technology has proven to be a cost-effective solution for improving access to quality healthcare.

Uzbekistan has made notable strides in diagnosing and treating congenital heart defects, particularly in urban centers. However, significant gaps remain in rural healthcare delivery, training, and financial accessibility. Strengthening healthcare infrastructure, expanding screening programs, and fostering international collaborations will be crucial to improving outcomes for children with CHDs in the country.

Expand access to prenatal and neonatal screening programs nationwide.

Increase funding for pediatric cardiology and cardiac surgery.

Enhance training programs for healthcare professionals.

Develop comprehensive follow-up systems for post-treatment care.

The results highlight the progress Uzbekistan has made in managing CHDs, particularly in urban centers where specialized care is concentrated. However, the low prenatal detection rates indicate a need for improved obstetric care and widespread training in fetal echocardiography. Geographic disparities point to systemic inequities, emphasizing the importance of decentralizing specialized services. Collaborative efforts with international organizations could address gaps in training and infrastructure.

**Conclusions**

In conclusion, while Uzbekistan has made commendable strides in addressing CHDs, significant challenges remain in diagnostic accuracy, therapeutic accessibility, and equitable healthcare distribution. To enhance outcomes:

**Expand Prenatal Screening:** Introduce mandatory fetal echocardiography programs and train obstetricians in CHD detection.

**Enhance Training:** Develop continuous professional development programs for pediatric cardiologists and cardiac surgeons.

**Improve Infrastructure:** Equip rural healthcare facilities with modern diagnostic tools and establish regional cardiac centers.



Foster Collaboration: Partner with international cardiac programs to exchange knowledge and resources.

By implementing these recommendations, Uzbekistan can further improve the quality of care for children with CHDs, reducing morbidity and enhancing their quality of life.

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