

Systems for early diagnosis of oncological diseases,
predicting the course of the disease, assessing risks

AUTONOMOUS MEDICAL IMAGING AND TESTICULAR STATUS ASSESSMENT TECHNOLOGY

ROBOTIC SYSTEM FOR EARLY DIAGNOSIS
/ SCREENING OF TESTICULAR NEOPLASMS



- Testicular cancer is one of the "youngest" tumors and is the most common malignant tumor in men aged 20-35.
- Testicular tumors account for approximately 2% of all malignant neoplasms in men.
- There are significant proportion of neglected forms

Source: Republican Scientific and Practical Center of Oncology and Medical Radiology named after N.N. Alexandrova

MEDICAL PROBLEM



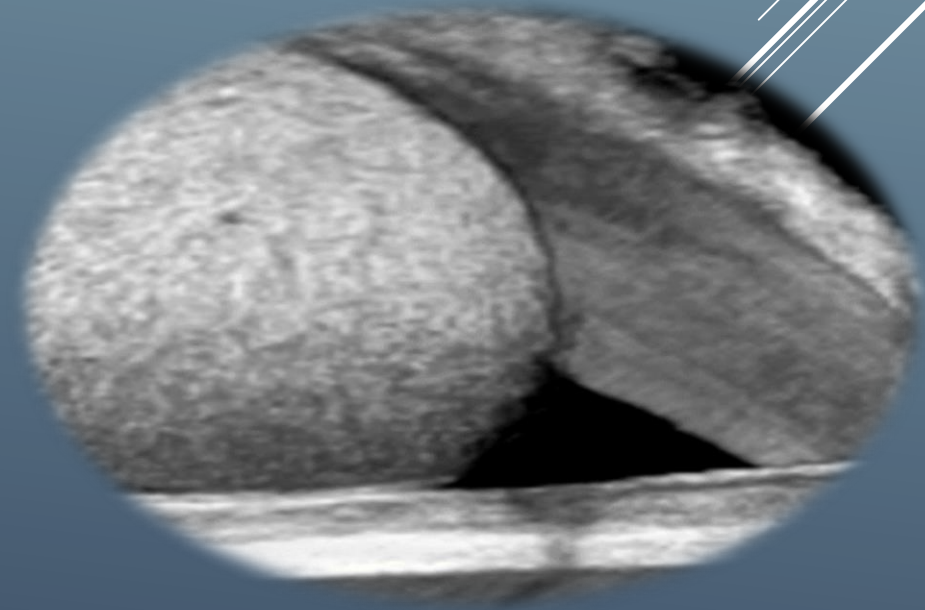
- Low motivation for regular preventive examinations
- Ineffectiveness of self-examination with a small amount of lesion
- Psychological problems for early control in adolescents and young men
- Lack of screening programs
- Quite high cost of screening programs

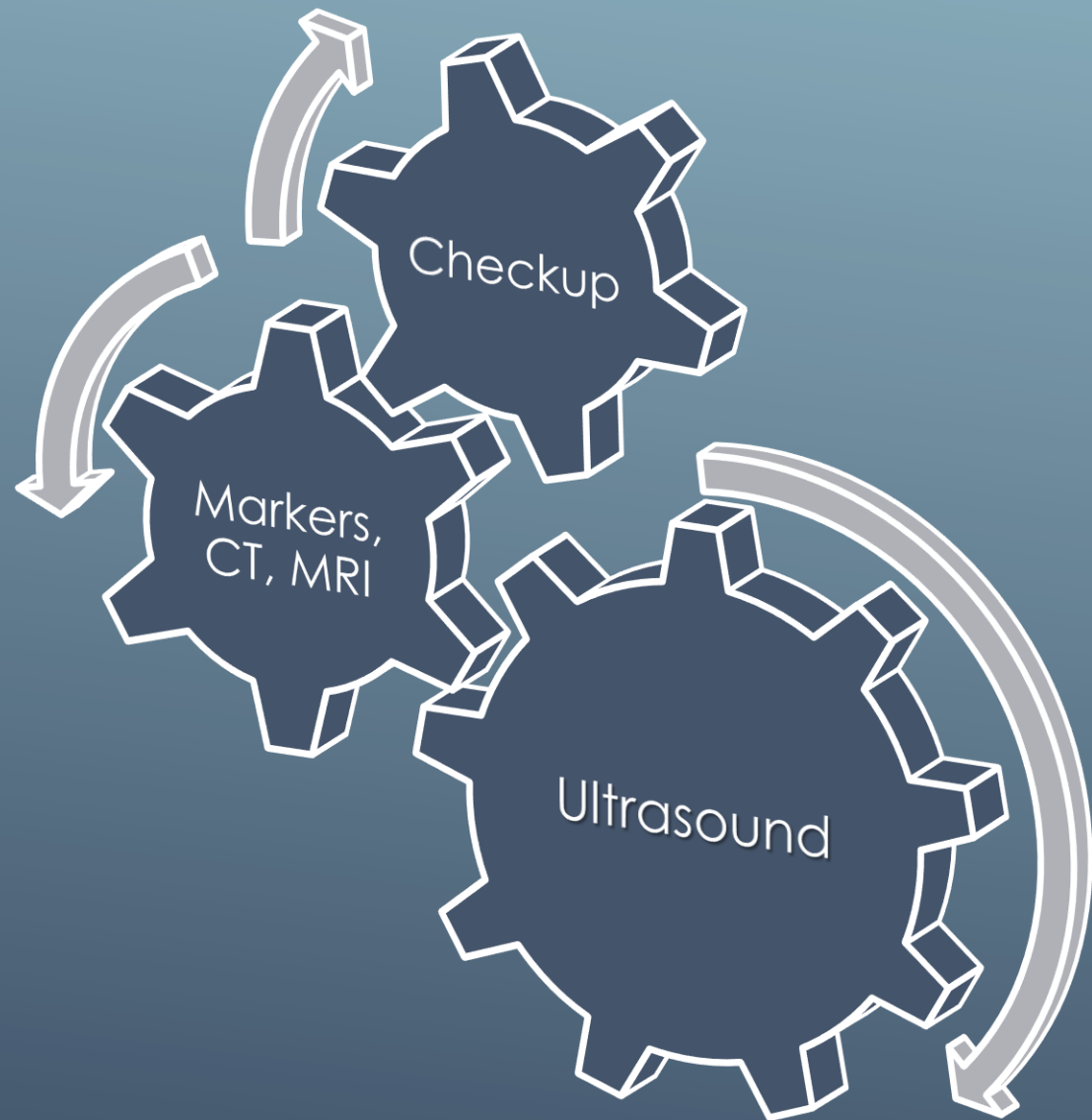
EARLY DIAGNOSIS PROBLEMS



- High-resolution ultrasound is a basis imaging technique for diagnosing testicular lesions

STANDARD:
ULTRASONIC IMAGING





- A solution for the automation of ultrasound examination using robotics and AI

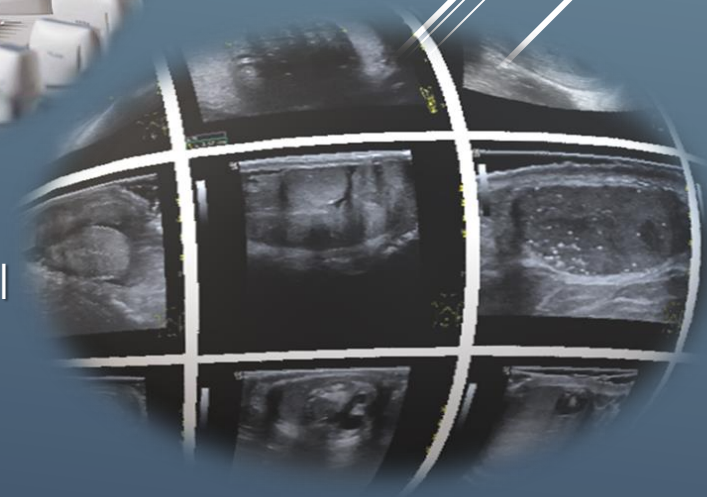
ROBOTEST

Cobot with limited strength



Ultrasound scanner

Image recognition / processing using artificial intelligence



- Data: proprietary dataset of 200 sonograms of verified testicular neoplasms
- Artificial intelligence: f.e. Google Vision
- Collaborative robot

TECHNOLOGY STACK

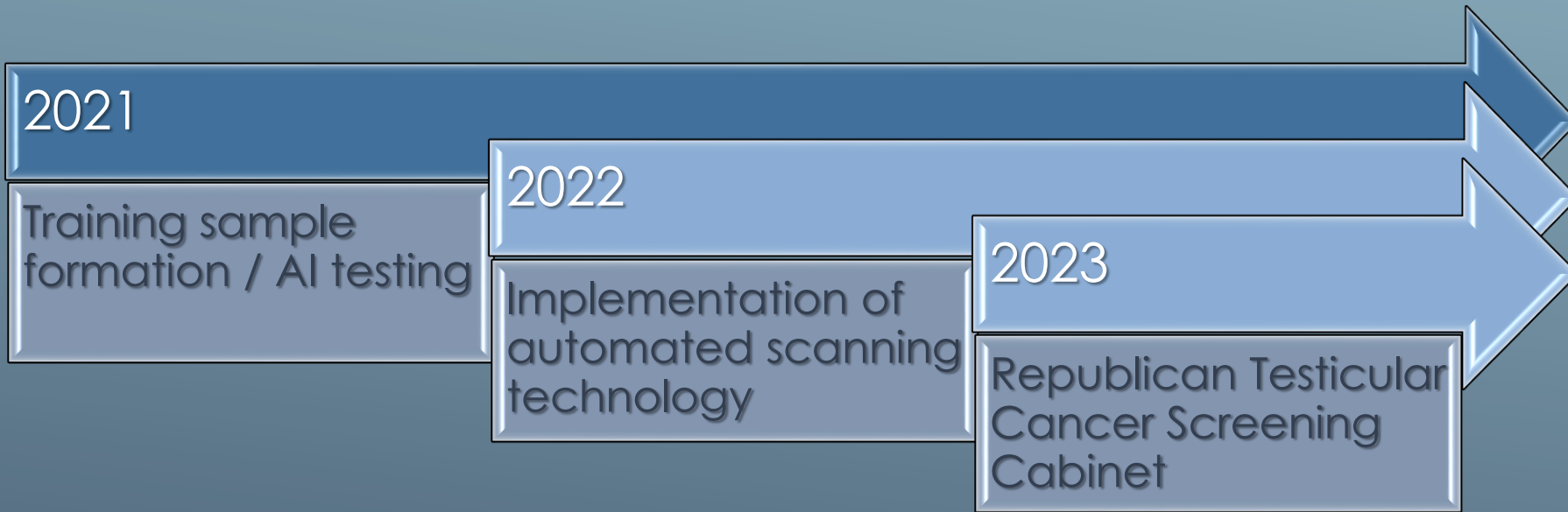


- Application of the “diagnostic imaging standard” for a specific superficial organ
- Automation of the procedure increases motivation for preventive / early screening in young men
- Anatomy, location and pairedness of the organ make it possible to obtain ultrasound scans that are maximally acceptable for recognition and comparative processing of AI.

COMPETITIVE ADVANTAGES OF TECHNOLOGY

- *Status: the solution has been developed, the systematization of the archive of images for deep machine learning is underway*
- *Pilot plan: to form training and examination samples, to determine the diagnostic efficiency of AI; to work out the technology of offline scanning; show results, scale solution*
- *Metrics: saving physician time, screening program effectiveness*
- *Resources: ultrasound room, archive of verified images, cobot*

ROAD MAP



TIMING

- Social significance - improving the quality of early diagnosis of cancer in the most able-bodied group of the male population
- Freeing up the doctor's time in the screening program.
Reduced personnel costs
- The best efficiency of using AI in the processing of ultrasound diagnostic images in offline mode
- PR: The organizer will be the first to introduce a robotic AI system into cancer screening and early diagnosis programs

BENEFITS FOR THE ORGANIZER



Igor Begun,
Candidate of Medical
Sciences



Leonid Kisilev,
Doctor of Medical Sciences



Oleg Bidanov,
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