

Limited Liability Company "Evidence-Based Medicine"

**AUTOMATED ELECTRONIC SYSTEM OF
DIAGNOSIS AND TREATMENT OF
INTUSSUSCEPTION IN CHILDREN ON THE
BASIS OF VOLUMETRIC-MANOMETRIC TEST
"AESDI"**



ABOUT COMPANY

**Limited Liability Company "Evidence-Based
Medicine"**

Togliatti, Samara Region, Russia.

**The company was founded on February 11, 2008.
Since 2012 the company is a resident of Technopark
"Zhiguli valley".**

**The company's field of activity is the development
and production of medical devices.**

ABOUT THE PRODUCT

- **"Automated electronic system for diagnosing intussusception of intestines in children on the basis of volumetric-manometric test" - innovative development.**
- **Products with a similar application in the Russian Federation are not produced. Foreign patents are not known. Direct analogs are unknown.**

THE RELEVANCE OF THE PROBLEM

- **Acute intussusception of the intestine to this day remains the most important problem of abdominal surgery of childhood.**
- **Invagination of the intestine in children is 40-50% among all forms of acute intestinal obstruction and 60-70% among the acquired obstruction.**

OBJECTIVES

- **Reduce the number of diagnostic errors and complications in the treatment of children with intestinal intussusception**
- **Eliminate radiation exposure to patients and medical personnel**
- **To reduce the number of unjustified surgical interventions of intussusception in children**

Disadvantages of existing radiation methods of diagnosis and treatment of intussusception:

- low informativeness
- increased radiation dose to the child, the surgeon and his assistants during the procedure



Drawbacks of ultrasonography:

- A certain subjectivity of evaluations, which depends on various characteristics of the image - the interposition of structures of different density between the sensor and the object, a complex process of interaction of ultrasound with tissue, leading to the appearance of artifacts and interference.**
- The practical experience of the researcher also matters, because the use of the real-time mode makes it difficult to standardize the scanning positions and their comparison is rather conditional.**

ABOUT TECHNOLOGY THERAPEUTIC AND DIAGNOSTIC SYSTEM



- Automatic injection into the intestine of a volume of air calculated taking into account the body weight of the patient, at a given pressure.
- On the basis of changes in the parameters of intestinal pressure, a conclusion is made about the presence or absence of intussusception, or its spreading

Solution to the problem:

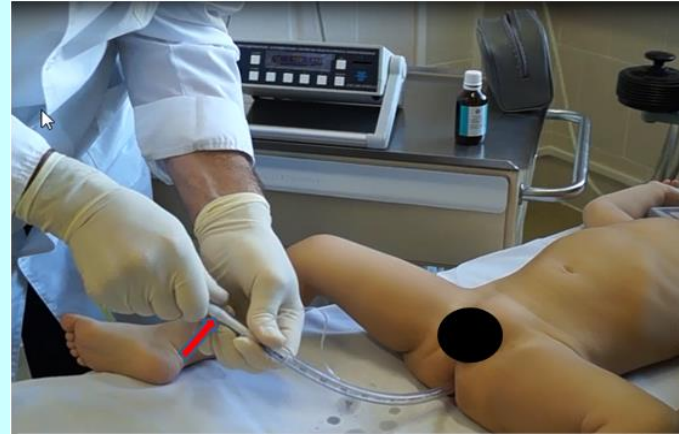
- The radiation load on the patient and medical personnel is excluded;
- The reliability of intestinal intussusception diagnostics is increased, creates the convenience for performing manipulation
- The results of the study are recorded on electronic media.



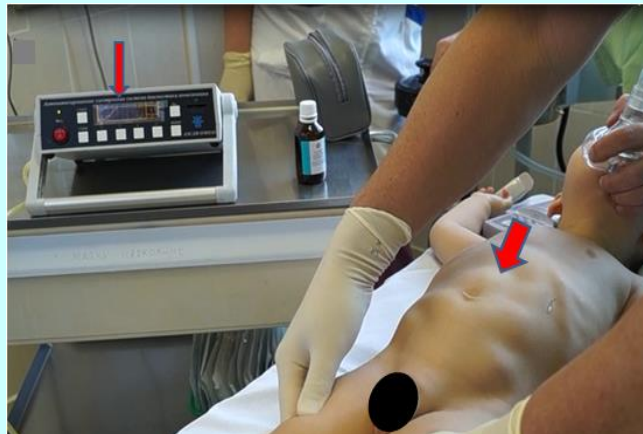
A methodology for automated diagnosis of intussusception and desinvagination



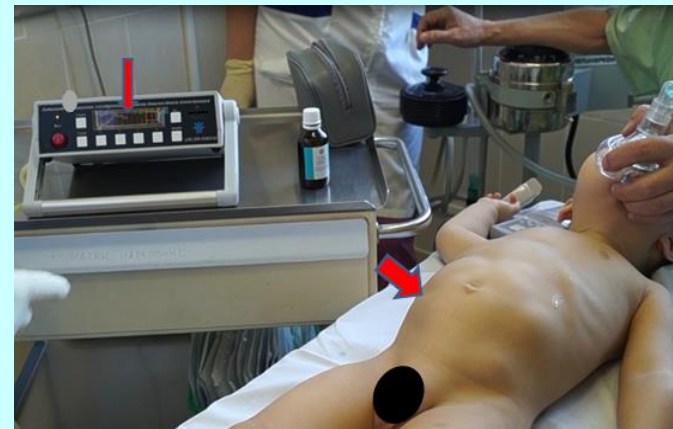
1. Installing a catheter with a cuff in the rectum ampoule



2. Connecting the catheter to the device "AESDI-SMP"

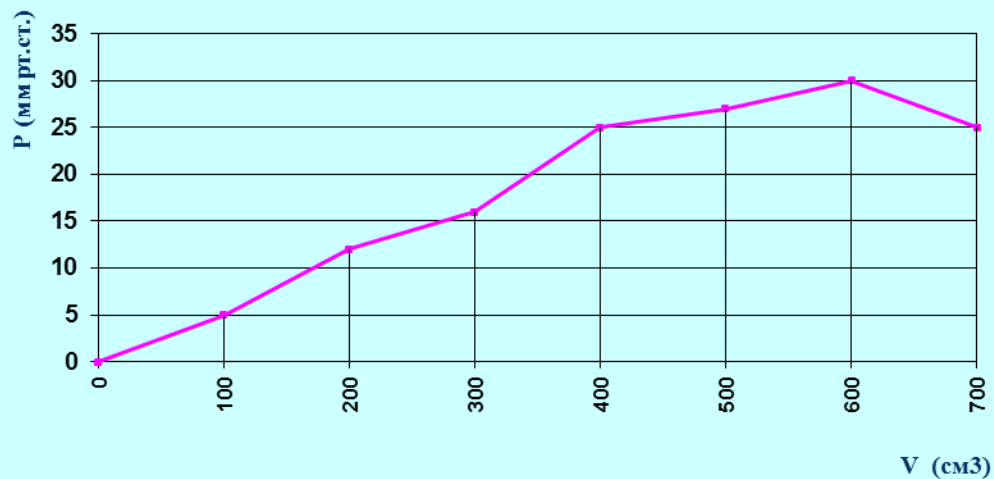


3. The device records the presence of intussusception.



4. The moment of invagination

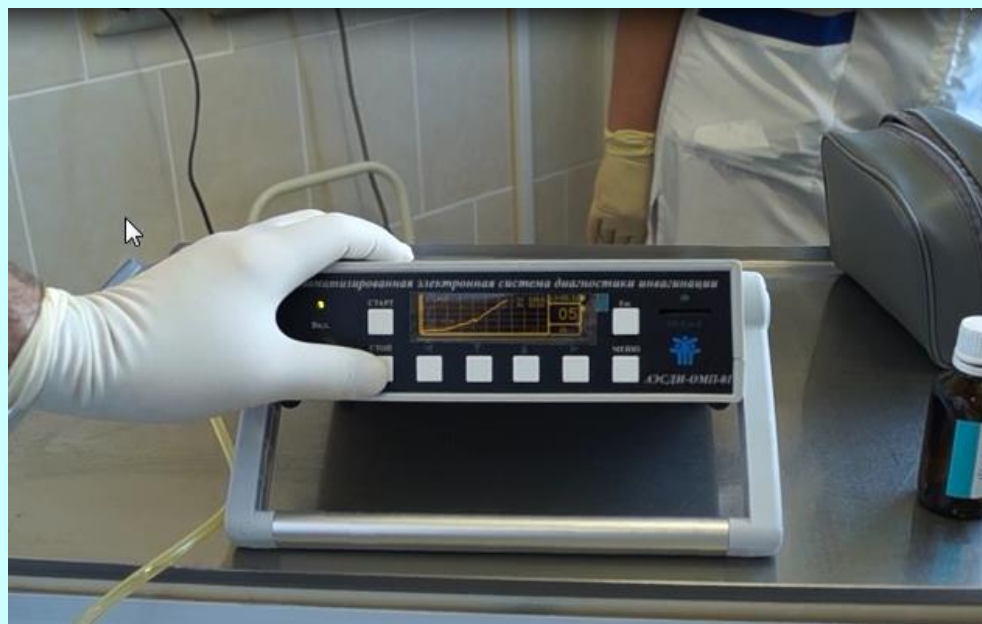
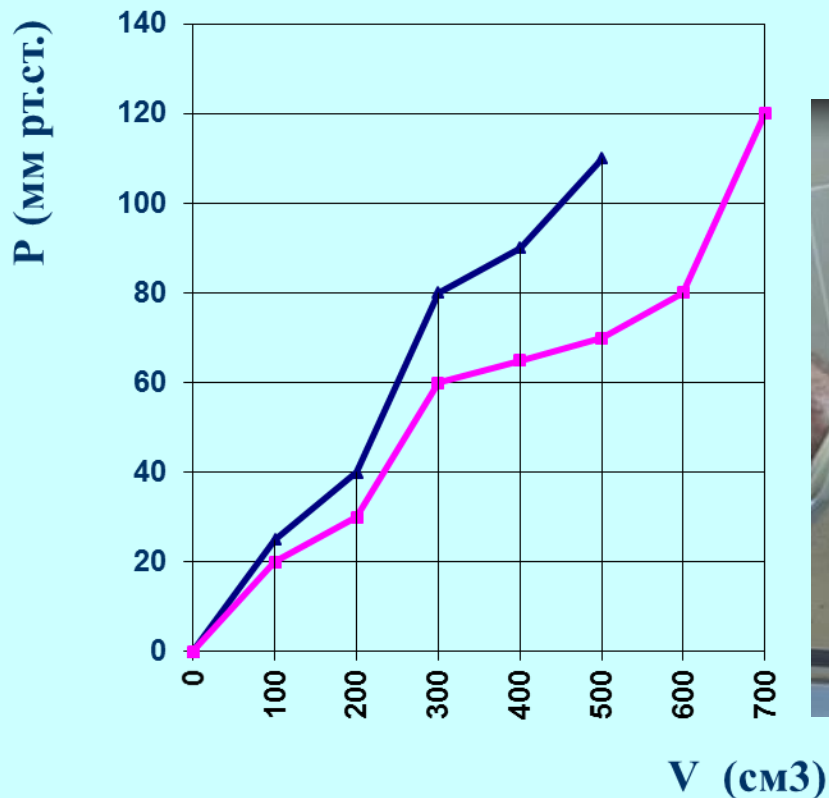
Schedule changes internal intestinal pressure, in the absence of intussusception



— График ОМП у ребенка 4 месяцев (масса тела 8 кг) с отсутствием инвагинации.

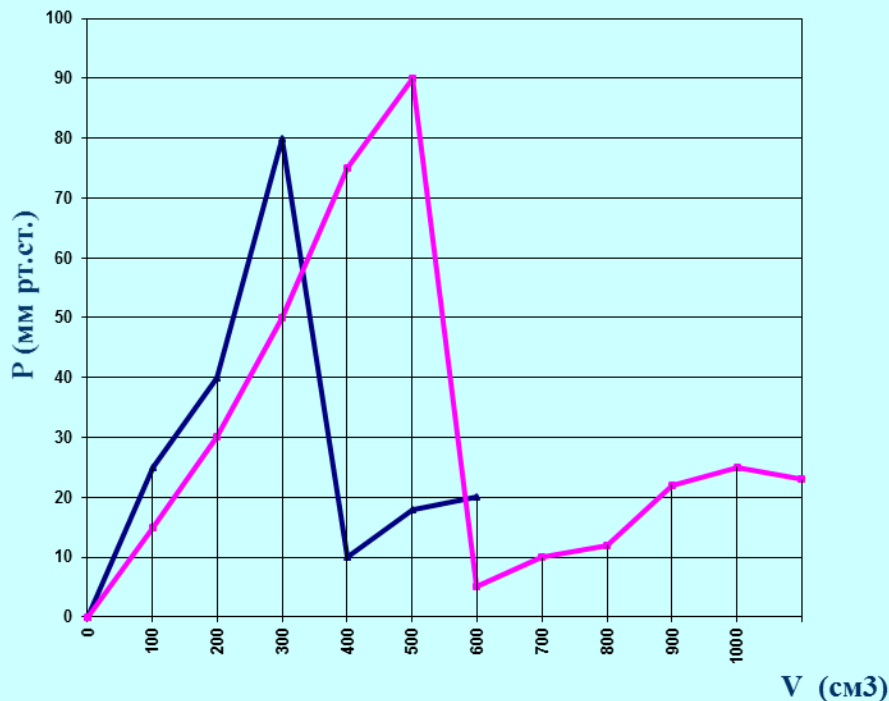


Schedule changes internal intestinal pressure in the presence of intussusception. Treatment operative.



- График 1. ОМП положительная у ребенка 3,5 месяцев (масса тела 6,4 кг) с тонкокишечной инвагинацией.
- График 2. ОМП положительная у ребенка 4 месяцев (масса тела 8 кг) с подвздошно-слепо-ободочной инвагинацией.

Schedule changes internal intestinal pressure with conservative disinvagination of the intestine.

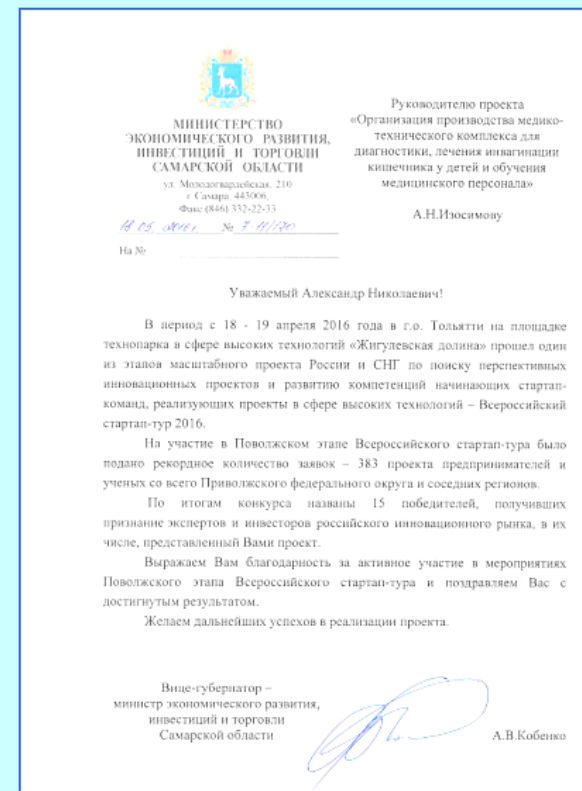


- График 1. ОМП положительная у ребенка 3 месяцев (масса тела 6 кг)
- График 2. ОМП положительная у ребенка 11 месяцев (масса тела 9 кг)

CONCLUSIONS

- **Application of the device "AESDI" allows to exclude radiation load on the patient and medical personnel;**
- **The device provides control over the spread of intussusception;**
- **The automation of the research creates the convenience for manipulation and allows you to record the research conducted on electronic media, which is an essential requirement of evidence-based medicine;**
- **It is possible to use the device for early diagnosis and treatment of intestinal intussusception in hard-to-reach and remote areas.**

LLC "Evidence-Based Medicine" is the finalist of the All-Russian competition of innovative projects Startup Village 2016 in Skolkovo with the project "Organization of the production of a medical and technical complex for diagnosis, treatment of intussusception in children"



Patents

- Patent for invention № 2150231 "A method for diagnosing intussusception of intestines in children". Registered in the State Register of Inventions of the Russian Federation on 10.06.2000. / V.V. Polyakov, A.N. Izosimov /
- Patent for invention No. 2558478 "A method for diagnosing intussusception in children". Registered in the State Register of Inventions of the Russian Federation July 3, 2015 / A.N. Izosimov /



Monographs, articles

- **Experimental substantiation of new methods of diagnosis and treatment of intussusception in children / Izosimov A. N., Plechev V. V., Gumerov A. A., Shakirov, V. V. // Russian Bulletin of pediatric surgery, anesthesiology and critical care medicine. – 2017. - No. 1. – S. 24-30.**
- **Invagination of the intestines in children: monograph / A.N. Izosimov, V.V. Plechev. - Germany: LAMBERT Academic Publishing, 2015. - 118 p.**
- **Automated electronic system for diagnosis of intestinal invagination in children on the basis of volumetric-manometric test / A.N. Izosimov, O.V. Petinov, I.D. Berezin, A.A. Izosimov // Fundamental and applied research in America, Europe and Asia: materials of the II International Scientific Congress, New York (USA) September 27, 2014. - P. 22-28.**
- **Experience of application of the automated electronic system of diagnostics and treatment of intestinal invagination in children on the basis of volumetric-manometric test (AESDI-OMP) / A.N. Izosimov // Creative surgery and oncology. - 2014. - No. 1. - P. 13-17.**
- **Value of volumetric-manometric test for diagnostics and control over the expansion of intestinal invagination in children / A.N. Izosimov // Bulletin of the Samara State University. - 2004. - No. 4 (34). - pp. 159-165.**

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