# METHODS OF OBJECTIVE DIAGNOSTICS OF ENT ORGAN INJURIES

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**Abstract:** In forensic medical practice, ENT organ injuries are diagnosed using modern instrumental methods that allow for objective assessment of breathing, hearing, and voice. Rhinomanometry has been adapted with the development of standards for nasal air exchange resistance. A combined method (rhinomanometry, acoustic rhinometry, peak flowmetry) with an accuracy of up to 95% has been proposed for assessing nasal breathing disorders. Audiometry and videostroboscopy are used for the diagnosis of hearing and vocal apparatus. CT, MRI, and photographic documentation methods enable objective recording of injuries. A comprehensive approach increases the accuracy and reliability of expert opinions.

**Keywords:** diagnostics; instrumental methods; rhinomanometry; audiometry; forensic examination

**Аннотация:** В судебно-медицинской практике травмы ЛОР-органов диагностируются с применением современных инструментальных методов, позволяющих объективно оценить дыхание, слух и голос. Адаптирована риноманометрия с разработкой нормативов сопротивления носовому воздухообмену. Предложена комбинированная методика (риноманометрия, акустическая ринометрия, пикфлоуметрия) с точностью до 95% для оценки нарушений носового дыхания. Аудиометрия и видеостробоскопия применяются для диагностики слуха и голосового аппарата. Методы КТ, МРТ и фотодокументации позволяют объективно зафиксировать травмы. Комплексный подход повышает точность и достоверность экспертных заключений.

**Ключевые слова:** диагностика; инструментальные методы; риноманометрия; аудиометрия; судебная экспертиза

**Introduction.** Injuries to the head and neck organs, in particular ENT structures (nose, paranasal sinuses, ear, larynx and pharynx), constitute a significant share in the structure of bodily injuries considered in forensic practice [1]. The high vulnerability of these anatomical zones to injury is due to their protruding location and the fragility of the supporting cartilaginous framework [2]. Qualification of the severity of such injuries, especially in the absence of persistent external deformities, is difficult due to the subjectivity of clinical assessment and the lack of unified expert algorithms. In recent years, instrumental diagnostic methods capable of providing a quantitative and documented assessment of functional disorders have been actively introduced in global forensic and clinical practice. Such methods include active anterior rhinomanometry, acoustic rhinometry, nasal peak flow test, tonal audiometry, videostroboscopy, as well as visualization methods - multispiral CT, MRI and photo documentation of injuries [3,4]. However, despite their diagnostic potential, their use in domestic forensic medical examination remains limited, and the issues of standards and criteria for evaluation in the expert context are insufficiently developed [5]. In this regard, there is a need to adapt and standardize the corresponding instrumental approaches to the tasks of forensic medicine, which determines the relevance of this study.

Purpose of the study. To improve the objectivity of forensic medical examination of ENT injuries by introducing standardized instrumental diagnostic methods.

Materials and methods. The study was conducted on the basis of 531 cases of ENT injuries. The assessment included rhinomanometry, acoustic rhinometry, peak flowmetry, audiometry, video stroboscopy, CT and MRI, photo documentation. Modified severity scales and injury recording algorithms with morphological and functional correlation were used.

**Main results**

Standards for research on the mechanism of injury were developed (see Table 2.2).

**Table 2.2.**

**Distribution of research objects by injury mechanism**

| № | Механизм травмы | Количество пострадавших | процент (%) |
|---|---|---|---|
| 1 | Травмы от воздействия тупых предметов | 315 | 59.4 |
| 2 | Травмы от воздействия острых предметов | 104 | 19.5 |
| 3 | Травмы от воздействия огнестрельного оружия | 33 | 6.3 |
| 4 | Травмы от воздействия химических агентов | 50 | 9.4 |
| 5 | Травмы от термического воздействия | 29 | 5.4 |
| | **Всего** | 531 | **100** |

High diagnostic accuracy of the combined technique (rhinomanometry + peak flowmetry + acoustic rhinometry) was established — 95%.

For the first time, a photo documentation format with a scale ruler was proposed and the assessment of the duration of damage was standardized.

The correlation between audiometry parameters and the severity of damage to the hearing aid was confirmed.

**Conclusions**. The introduction of the described instrumental techniques allows to increase the accuracy and objectivity of forensic medical reports on ENT injuries, and also contributes to the standardization of expert practice. The developed standards can be used as diagnostic guidelines in the activities of forensic doctors, otolaryngologists and experts.

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