

icare
TONOLAB

FAST, EASY & ACCURATE TONOMETER

Tonometry without pressure



**NO ANESTHESIA
NO CALIBRATION**

www.icaretonometer.com

WORLD WIDE APPROVALS AND PATENTS

TONOLAB tonometer is developed for IOP and glaucoma research; for easy and accurate IOP measurement on rodents (mouse/rat). The tonometer is based on a measuring principle, in which a very light probe is used to make momentary contact with the cornea. This inductive/impact principle is also known as the rebound method. The Icare technology has worldwide official approvals, patents and satisfied users all over the world. Clinical studies show that Icare TONOLAB is accurate and comfortable to the subject.

SAFE, PAINLESS AND HYGIENIC PROCEDURE

Measuring IOP with the Icare TONOLAB is safe and painless. The disposable light weight probe touches the cornea very gently for only a fraction of a second. As no topical anesthetic or disinfection is needed, the whole procedure is over rapidly and disturbance to the animal is minimal.

ICARE FINLAND

is the original developer of rebound technology in tonometers. Today the light weight, hand held, portable Icare tonometers are approved and recommended by professionals all over the world.



STUDY REFERENCES

Rebound tonometry in conscious, conditioned mice avoids the acute and profound effects of anesthesia on intraocular pressure

“Rebound tonometry can be used to obtain accurate IOP measurements in conscious, restrained mice while avoiding the rapid and profound ocular hypotensive effects of general anesthesia.”

J Ocul Pharmacol Ther. 2008 Apr

Manometric calibration and comparison of tonolab and Tonopen tonometers in rats with experimental glaucoma and In normal mice

“In mouse and rat eyes, including rats with chronic IOP elevation, the TonoLab accurately reflected manometrically set IOP in an efficient manner.”

J Glaucoma. 2006 Dec

Comparison of invasive and non-invasive tonometry in the mouse

“The rebound tonometer has a significant advantage over cannulation tonometry in that it permits longitudinal IOP measurement in conscious mice.”

Exp Eye Res. 2006 Jun



ICARE® TONOLAB REBOUND TONOMETER

Previously, non-invasive intraocular pressure (IOP) data have been obtained in rats and mice using the Tono-Pen XL®, a hand-held device based on the strain gauge principle. However it has proven difficult to acquire proficiency in measuring IOP in these animals using this method. Data acquisition is also highly operator-dependent, and the device underestimates IOP, particularly at higher IOP values. This is because the Tono-Pen XL® is designed for use in humans, in which the eye is much larger with different corneal mechanical properties. Topical anesthesia is also required prior to obtaining readings.

Some inroads have been made using the Goldmann applanation tonometer in rats and mice for non-invasive IOP measurements. But the instrument has to be modified, and two people are required to take measurements.

The use of topical anesthesia and fluorescein is required.

The newly designed tonometer from Icare, the TONOLAB, is based on a different principle from either the Tono-Pen XL® or the Goldmann tonometers.

Unlike previous instruments of varying designs intended for use only in humans, the TONOLAB has been specifically designed for use in rats and mice.

The TONOLAB operates on the rebound principle. A disposable lightweight probe, weighing between 11 and 13mg, and incorporating a smooth Teflon tip, strikes the eye at a speed of 10 to 20 cm/sec, propelled by a solenoid, with a force of only 50 to 300µN.

Most of the kinetic energy (about ¼ µJ) of the probe is rebounded from, rather than absorbed by, the eye, thus topical anesthesia is not required.

Indeed, conscious animals show no sign of irritation or discomfort, even after repeated measurements. The small impact force also means that there are no issues with pseudofacility. Motion parameters during the collision (deceleration, impact time) are measured electronically and related to IOP via an internal algorithm. The instrument takes six individual readings and then displays the mean with an estimate of standard deviation (expressed as high, medium, low, or very low).

Using the TONOLAB, accurate and reproducible data (confirmed in operator-blind calibration studies) have been generated quickly and easily, by multiple operators, all in conscious animals without the need for topical anesthesia or fluorescein.

This instrument has become a choice for easy, non-invasive measurement of rodent IOP.

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