

Non-Contact Tonometry Guidelines

Because so many different models exist, exact operating instructions will not be provided here. Instead, it is expected that the assistant will familiarize him/herself with the manual provided with the equipment used at their practice. The following are some tips and guidelines that are generally universal regardless of the exact type of NCT used.

TIP #1: Do not diagnose. It is best to let the doctor comment on the readings.

TIP #2: It is very important that the patient does not close or “squint” the eye not being tested. A forced partial or full lid closure of the untested eye or “quivering” lids of an anxious patient can easily raise the IOP of the tested eye by 5mmHg or more. This is produced by the bilateral increase in musculature tonicity. Asking the patient to lightly lift his own lid is usually effective in eliminating the undesirable lid-induced effect.

TIP #3: An eye whose corrected vision is inadequate to see the fixation target presents a problem in alignment. When a measurement is made on a misdirected eye, the air-pulse is delivered obliquely, and part of the force is ineffectively vectored tangential to the cornea, thereby requiring greater force (or time) to achieve applanation. Therefore, misalignment causes erroneously higher NCT readings. For the unilaterally blind patient, an external fixation light may be presented to the sighted eye to assist in alignment of the blind eye. Multiple measurements should be made with the blind eye in slightly different positions. Since errors are always on the high side, the lowest reading is the best determination.

TIP #4: Allow 8 - 10 seconds between measurements. Readings taken in too rapid succession will be automatically inhibited to prevent marginal test results.

TIP #5: While experience teaches that elevated intraocular pressure is usually associated with glaucoma, “normal” pressure does not absolutely preclude the presence of glaucoma. In general, a definitive diagnosis of glaucoma is made when disc changes and/or field loss are also present.

TIP #6: When a series of several successive NCT measures of IOP are taken on a given eye, one or more readings may be acquired which appear to be irrelevant or erroneously high. The following three sequences illustrates this observation:

1. 16, 24, 14, 17
2. 18, 20, 26, 19
3. 13, 12, 18, 13

Although the IOP present at that instant was accurately determined, overall averages in each of these cases would yield erroneously high IOP values. In these cases, the underlined disparate measures should be deleted before an average IOP is determined. The following comments offer a rationale for removing these results.

1. An NCT measure is made in a few milliseconds and, because it occurs at random relative to the ocular pulse, one must anticipate a measurement range of 2, 3, or even 4mmHg, due to the pulse amplitude. That would account for the modest variability (2-3mmHg) seen in each of the three sequences. Why, then, is the large departure (underlined) present in each sequence?
2. NCT-IOP measurement is routinely made without retraction of the lid or instruction to the patient regarding blinking. It is worth noting that the measurement requires a smaller palpebral fissure than any other tonometric instrumentation. Not infrequently, a measurement is started after a normal blink has been initiated. Studies show that during a blink, the globe may be retracted into the orbit at least 2.5mm. Such a displacement implies imposition of significant forces on the globe by the lids and/or extraocular muscles. It has been reported that the lid, in a normal blink, develops a pressure of approximately 10mmHg. It follows, therefore, that in addition to the variability associated with the ocular pulse, IOP, as measured by the NCT is subject to the instantaneous and transient influence of the globe's environmental musculature.

CAUTIONS

1. The Safety Lock mechanism is intended to prevent inadvertent contact between the NCT and the patient's eye. Its use is recommended for all IOP measurements. Note that when setting the recommended "safe distance" spacing, the patient's forehead must be properly positioned against the forehead rest.
2. Use of the NCT is contraindicated in instances of:
 - a) Edematous/ulcerated cornea
 - b) Following keratoplasty (corneal surgery)
 - c) Following penetrating trauma