

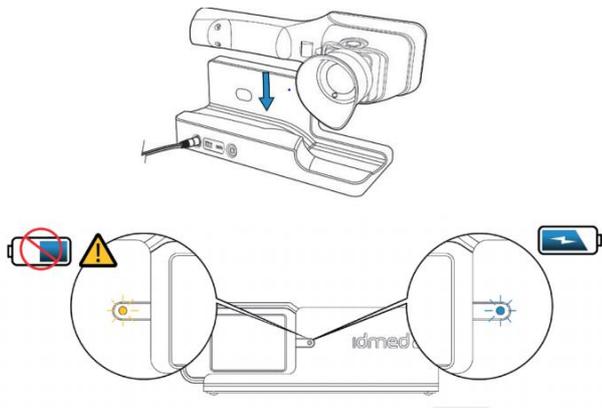
Assessment Of Pupil Diameter And Reactivity To Light Using The NeuroLight Pupillometer



A Learning Resource for ICU and SHDU Nursing Staff

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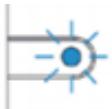
Storage and Charging



To recharge the battery, place the unit on its charging station



Yellow light indicator ON → Remove the NeuroLight and adjust its position on the charging station



Blue light indicator ON → Charging in progress

Turning the device ON/OFF

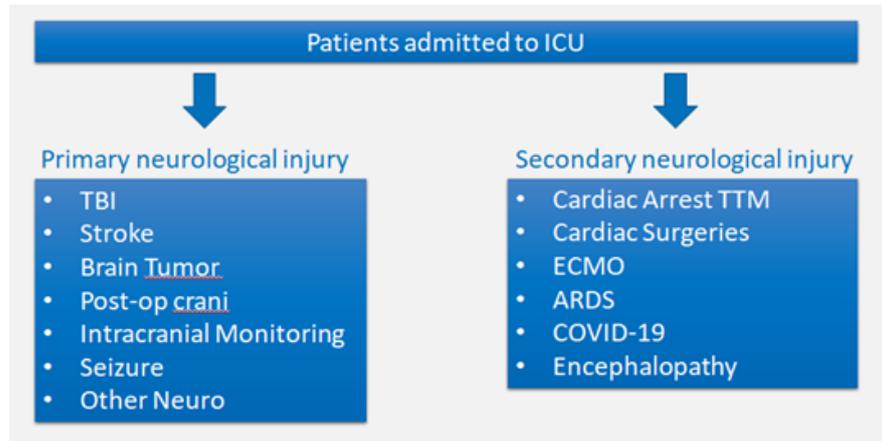
The NeuroLight switches on automatically when the device is held in the hand (movement detection)

The device switches off automatically if it is not used for 2 minutes or if it is repositioned on its charging station

Cleaning

- Under no circumstances should the NeuroLight or any of its components or accessories, other than the eyecup, be in direct contact, immersed, sprayed or filled with any liquid.
- The eyecup, the only part in contact with the patient, is removed from the device and cleaned in the same way as the NeuroLight itself. Once it is cleaned, it can be put back in place on its charging station.
- The lens should always be free of stains or scratches to avoid the risk of distorting the measurements made. It should be cleaned with a lint-free cloth and wiped carefully to avoid any stains or reflections.

NeuroLight devices and contexts for use



Fitting the positioning eyecup

The NeuroLight has a latex-free silicone eyecup so it can be positioned on the patient's face. The eyecups are re-usable – they are **not** disposable, and must be cleaned or changed before each patient. This eyecup is the only part that makes physical contact with the patient. When applied correctly, the eyecup blocks out any ambient light. The eyecup is placed on the NeuroLight device by pushing it gently onto the black lens.

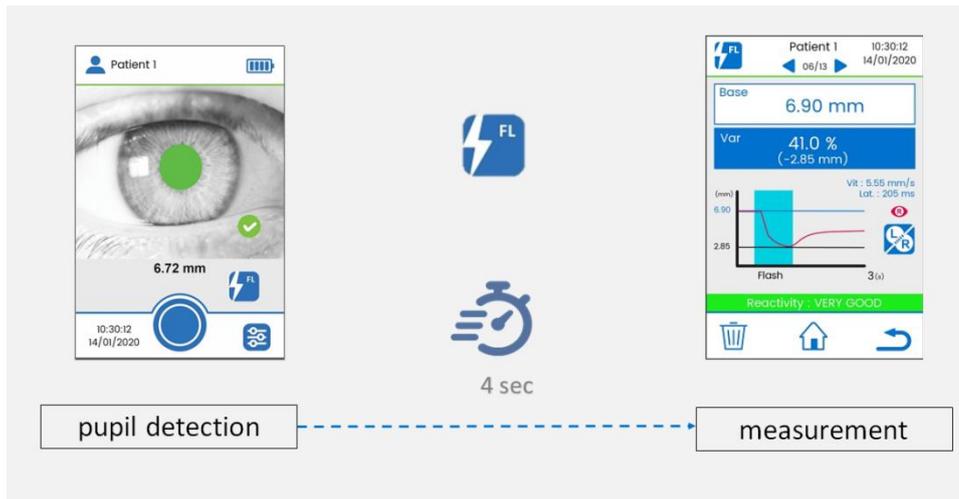


Positioning of the NeuroLight

To obtain accurate measurements the NeuroLight must be positioned correctly on the eye of the patient. The black silicone eyecup on the NeuroLight must be in contact with the upper and lower part of the eye socket bone without pressing. In this way, there will never be any pressure on the eye-ball itself. It should never be in contact with the patient's eye. The operator must hold the device vertically and firmly to prevent any movements whilst filming.



Pupil detection and measurement



Position the eyecup

Open the patient's eyelid and hold it open

Make sure the eyecup is carefully positioned. Remember the eyecup is designed to block out ambient light

Observe for confirmation that the NeuroLight is ready to take a measurement

When the pupil is detected it will appear as a green circle and a tick confirms that the image can be taken

- ✓ The NeuroLight is ready to take a measurement. Press the trigger button (gen 2) press camera (gen 3)
- ✗ The NeuroLight does not detect the pupil. It is impossible to measure. Position the device again.

How to obtain image

To take the image, steadily hold the gen 2 device and press the green trigger button that is located to the rear of the handle. When using the gen 3 device → steadily hold → press camera and hold for 4 seconds

A pre-calibrated flash then stimulates the pupil and captures precise pupil size and reactivity within 0.1mm

Measurement takes just 4 seconds

The NeuroLight will display the pupil size and reactivity

Rotate the eyecup and measure the second eye. Compare the results

Assess and compare the results

Pupil size

Normal pupil size is between 2mm and 5mm

- Pupil diameter is $\leq 2\text{mm}$ indicates miosis
 - A constriction response is the narrowing of the pupil, which may be caused by scleral buckles or drugs such as opiates/opioids or medications used to treat hypertension.
- Pupil diameter is $\geq 5\text{mm}$ indicates mydriasis
 - A dilation response is the widening of the pupil, and may be caused by adrenaline, anti-cholinergic agents such as MDMA, cocaine, amphetamines, dissociatives and some hallucinogenics.

Pupil reaction

VERY GOOD
Reactivity

GOOD
Reactivity

WEAK
Reactivity

VERY WEAK
Reactivity

NULL
Reactivity

Anisocoria detection

The NeuroLight displays an alert for anisocoria. This alert occurs when there is unequal diameter i.e. greater than 0.5mm between both pupils. Display of both pupils shows comparison between the right & the left eye.

Anisocoria occurs in up to 20% of the population and is often entirely harmless. However, it can be a sign of more serious medical problems. Dilated pupils or pupils that are unequal in size can be a sign of serious conditions affecting the brain, including stroke, bleeding or tumour. Head trauma may also produce dilated or unequal pupils that accompany other brain injuries.

