Infrascanner

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Abstract- The Infrascanner is a new device developed to detect intracranial hemorrhages immediately for patients with traumatic brain injury, using Near Infrared technology. A tool like this can be used anywhere and by anyone, and can prevent further brain damage.

I. Introduction

TRAUMATIC brain injuries have been known throughout history, with evidence such as ancient Mesopotamians drilling holes into skulls [2]. It was not until the 20th century that neuroscience truly started to develop [2]. Both World Wars led countries to develop traumatic brain rehabilitation centers, and it wasn't until the 1970s that brains were able to be viewed by CT and MRI scans. CT scans on patients, specifically juveniles, is dangerous as its radiation is equivalent to 400 chest x-rays to the head. The Infrascanner solves this problem using its non-invasive, non-ionizing Near Infrared technology.

II. Methods

The Infrascanner is named after the near-infrared technology it uses. The device takes advantage of the light absorbing qualities of hemoglobin which is located within blood. The Infrascanner composes of a light diode that emits near-infrared waves, and a scanner that is able to detect how much light reflects back. With this knowledge it is able to detect where there is hemorrhaging, as extravascular blood usually absorb ten-fold more light than intravascular blood. A display panel then shows the person administering the test where the hemorrhaging occurs.

III. Results

The Infrascanner is extremely accurate, it is able to detect both intra-axial and extra-axial hemorrhaging. Studies show tha with the use of The Infrascanner they are able to reduce CT scan rates, due to the ability to detect hemorrhages. This allows patients to stay safe from radiation, and it will reduce health care costs. The Infrascanner was successful in 94% of patients in one study (103 out of 110). Although it cannot detect all hemorrhages deep within the brain or small hemorrhages it is still able to detect those that are wihin 2.5 cm of the brain's surface, as well as hemorrhages greater than 3.5 mL.

IV. Discussion

The Infrascanner is a device that may soon be as popular and commonly found as an AED. It's application varies in multiple settings; from warfare to a sport field. Hospitals can use it for initial testing as well as monitoring patients that have already been diagnosed with intracranial hemorrhaging. Also its portability is a major factor as it is only a hand-held device it can virtually go anywhere, and it is easy to use so almost everyone can use it. Although it can't detect every hemmorhage it can detect a majority of them. It's price is a limitation for household use, costing $19,500 per unit, but military and healthcare facilities will be able to purchase such devices. The new Infrascanner 2000 is military grade, following specifications from the Marine Corps. This allows it to use AA batteries, and have warfare durability. This device can truly save someones life by detecting hemorrhaging before it is too late and more brain damage occurs, or fatality.

Resources

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