One Beam

Bilirubinometer

GINEVRI

Quality for life

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The One Beam is a GINEVRI's new concept bilirubinometer designed to give a precise measurement of the bilirubin serum level in newborns by using a simple micro sample of blood. Knowing and understanding the precise bilirubin level is very important and helps in the successful treatment of newborn jaundice, caused by the accumulation of the bilirubin in various tissues of the body, the skin being the most obvious (the classic skin color yellow in jaundice patients). The risk is that this accumulation of bilirubin could also involve the brain tissues, causing irreversible damage to the patient (kernicterus). Unfortunately, for Doctors treating newborns the evaluation of jaundice is made more difficult because of the high level of haemoglobin present in the blood. The One Beam through its ease of use and its remarkable precision, gives the precise information on bilirubin levels and support needed by the Doctors. The One Beam allows for a rapid photo-metric analysis of the total bilirubin in the serum (totals of the conjugated and non-conjugated) using a capillary tube as an optical cell. The bilirubin concentration is determined with a photo-metric measurement at the 455nm and 575nm wavelengths: the first wave length gives important information on the quantity of bilirubin, the second gives an indication of the presence of haemoglobin, the substance which interferes with accurate measurement of the bilirubin level. Thanks to an algorithmic mathematical calculation, the One Beam is capable of eliminate the haemoglobin interference factor allowing accurate results. The results are immediately displayed on the One Beam's LCD screen in mg/dl, or alternatively in µmol/l. The One Beam's important innovation with respect to previous GINEVRI models is the use of a single optical beam which illuminates the sample at one single point, achieved using a special system of automatic filters. Thanks to this system it is possible to have a

- More stable signal – because when the light beam crosses the sample it is cleaned of all frequencies not useful for the measurement, thereby reducing the photo-isomerization phenomenon of the bilirubin which distorts the measurement.
- More precise – because the reading is taken at only one point of the capillary tube which eliminates errors and discrepancies caused by readings taken at two different points.
- Stronger signal – due to the fact that a single beam is used and not one which has been split down into two or more beams.

A special system of collimation and concentration of the light beams allows for a reading even when the sample quantity of serum obtained after centrifugation is very small, as in the case of polycythemia (up to a haematocritic level of 80%), or due to partial filling of the capillary tube.
The One Beam's sophisticated electronics, micro-processor controlled, guarantees better working of the signal which is then transformed into the corresponding bilirubin level and immediately displayed on the LCD screen.
The One Beam with printer allows for immediate printing of the results of every single exam.

PRINCIPLE CHARACTERISTICS

Simplicity of Use: the entire operation consists simply of the taking a blood sample from the newborn (only 60 µl – two drops!), putting this blood sample into a capillary tube and then centrifuging the sample for 5 minutes at 12,000 rpms.
Disposable Single - Use Capillary Tubes: a heparinated capillary tube of 60 µl is used as a disposable single use cell, thus avoiding the necessity for a cuvette or special test tubes which are not absolutely safe, are expensive and are to breaking.
Rapidity of the Exam: the exam is carried out when the centrifuged capillary tube containing the blood sample is placed inside the One Beam.
Completely automatic correction the haemoglobin interference factor: this interference in the sample is automatically corrected, by means of a calculation carried out by the One Beam's micro-controller.

REFERENCES

- Developed in collaboration with the Department of Sensors and Readers of the Roma Tor Vergata University.
- Tested by the UOC of Pediatric, Neonatology, and TIN of the Fatebenefratelli "S.Giovanni Calibita" General Hospital (Roma).

Consumables

11144A73) Capillary Tubes Heparinated, 1000 pcs.
11412B73) Restabil Standard Value 2 High and 2 Low.
1412A73) Restabil Standard Value 4 High and 4 Low.
569) Sealing wax for 1000 capillary tubes.
6442) Thermal paper for the printer (optional), 1 pc.

TECHNICAL SPECIFICATIONS

USE	Measurement of bilirubin level in newborns
SAMPLE	Centrifuged blood
VOLUME	Less than 70 µl
CUVETTE	Capillary tubes (Heparinated glass)
MEASUREMENT	4/30 mg/dl or 68/510 µmol/l
TYPE OF MEASUREMENT	Photometric
HAEMOGLOBIN INTERFERENCE	Automatic compensation
READING TIME	Average 2 seconds
MEASUREMENT RESOLUTION	+/- 0.1 mg/dl or +/- 0.1 µmol/l
MEASUREMENT PRECISION	+/- 1% (FS+ mis.)
SENSOR	Silicon photo-diode
OPTIC FILTER	455 and 575 nm
RESULTS	On LCD Display, on PC through RS232 and Printer(optional)
OTHER FUNCTIONS	Date and Time on Display
WEIGHT	2.0 Kg (2.3 Kg with printer)
DIMENSIONS	15 x 22 x 24cm (Length x Depth x Height)
POWER SUPPLY	230 Vac - 50/60hz - 10/50W

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Quality System
ISO 13485:2012
ISO 9001:2008

CE