ONE BEAM

Bilirubinometer

GINEVRI

neo-tech for life

One Beam

One Beam is GINEVRI's new concept bilirubinometer designed to achieve accurate bilirubin serum level measurements in newborns through the analysis of micro-blood samples. Knowledge of accurate bilirubin levels is essential helping in the successful treatment of neonatal jaundice caused by bilirubin aggregation in various body tissues, skin in particular (classic yellow skin colour observed in jaundice patients). Bilirubin aggregation could involve brain tissues causing irreversible patient damage (kernicterus). Newborns require constant monitoring of bilirubin levels. Through its ease of use and remarkable accuracy One Beam provides required support to doctors. One Beam allows for a prompt photometric analysis of bilirubin in the serum (conjugated and non-conjugated total) using a capillary tube as an optical cell. Bilirubin concentration is determined through a photometric measurement at 455nm and 575 nm wavelengths: the first wave length indicates bilirubin levels while the second informs on any interfering agent presence, essentially haemoglobin. A mathematical model accounts for haemoglobin interference resulting in an accurate bilirubin result. The HD OLED display indicates both bilirubin (mg/dl and µmol/l) and interfering agent (g/dl) values. One Beam uses a single optical beam projected onto a fixed point of the sample due to a particular automatic filtering system. The system achieves a "clean" light beam free of any disturbing frequencies reducing negative bilirubin photo-isomerization effects thus ensuring a stable signal. An accurate signal is also achieved as a only one point on the capillary tube is measured eliminating any errors observed in past generation devices with two measure points. Lastly a stronger signal results due to the use of a single rather than a split beam. A particular collimation and beam concentration system allows for reading results even with limited serum sample quantities obtained after centrifugation, as in polycythemia cases (up to 80% haematocritic levels) or partial capillary tube filling. Advanced microprocessor controlled electronic technology enables better signal processing transformed into the corresponding bilirubin level promptly indicated on the display. An optional printer enables quick printing of any test results.

MAIN CHARACTERISTICS

Ease of use: complete operation consists in taking a blood sample from the newborn (less than 55µl-two drops!), place it into the capillary tube then centrifuging for a period of 5 minutes at 12.000 rpm.

Disposable single-use capillary tube: an heparinized capillary tube of a 55µl or less volume is used as a disposable single-use cell avoiding the need for unsafe, expensive or breakable cuvettes and other special test tubes.

Quick-test: testing is promptly executed once the centrifuged capillary tube is inserted into the One Beam.

Total self-correction: the microcontroller detects and corrects any interfering agent presence.

REFERENCES

- Developed together with the Department of Sensors of Tor Vergata University (Rome).

- Tested by UOC of Pediatric, Neonatology and TIN of the "S.Giovanni Calibita" Fatebenefratelli General Hospital (Rome).

Consumables

11412B73) Restabil Standard Value, 2 High and 2 Low
11144A73) Heparinized capillary tubes, pack of 1.000 pcs

569) Sealing wax for 1.000 capillary tubes
6442) Thermal printing paper, 1 pc
12957A73) Lancets, pack of 10.000 pcs
V05-038575) PREMATURE Lancets, pack of 1000 pcs
V05-031025) NEWBORN Lancets, pack of 1000 pcs

TECHNICAL SPECIFICATIONS

USE	Measurement of total bilirubin levels in newborns
SAMPLE	Centrifuged blood
VOLUME	Less than 55 µl
CUVETTE	Heparinized glass capillary tubes
UNIT OF MEASUREMENT	4/30 mg/dl or 68/510 µmol/l
TYPE OF MEASUREMENT	Photometric
INTERFERENCE	Automatic correction
AVERAGE READING TIME	2 s
MAX. RESOLUTION	+/- 0.1 mg/dl o +/- 0.1 µmol/l
MAX. ACCURACY	+/- 1% (FS+ mis.)
SENSOR	Silicon photodiode
OPTICAL FILTERS	455 and 575 nm
RESULTS OUTPUT	OLED display, PC, Printer (optional)
ADDITIONAL FUNCTIONS	Date and Time display
DIMENSIONS	15x22x24 cm (WxDxH)
WEIGHT	2 Kgs (2,3 Kgs with printer)
POWER SUPPLY	230 Vac, 50/60 Hz, 15VA (25VA with printer)

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Quality System ISO 13485:2016 ISO 9001:2015