

# ONE BEAM

Bilirubinometer



# 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  $\mu\text{mol/l}$ ) 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 55 $\mu\text{l}$ -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 55 $\mu\text{l}$  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  $\mu\text{l}$

CUVETTE

Heparinized glass capillary tubes

UNIT OF MEASUREMENT

4/30 mg/dl or 68/510  $\mu\text{mol/l}$

TYPE OF MEASUREMENT

Photometric

INTERFERENCE

Automatic correction

AVERAGE READING TIME

2 s

MAX. RESOLUTION

+/- 0.1 mg/dl o +/- 0.1  $\mu\text{mol/l}$

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)