NEAR-INFRARED-BASED HEMATOCRIT PREDICTION OF

DRIED BLOOD SPOTS: AN IN-DEPTH EVALUATION

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DRIED BLOOD MICROSAMPLING: A VALUABLE TOOL

Multiple advantages: patient centricity, minimally invasive, less expensive, simplified logistics, etc.









NIR-BASED PREDICTION OF THE HEMATOCRIT

> Non-contact approach:

- Spectroscopic technique based on molecular overtone and combination vibrations of covalent bonds
- ➢ Fast, robust, non-destructive









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STUDY OBJECTIVES

Extensive evaluation of a commercially available NIR set-up:

Performance of the calibration model Method validation & stability ➢ Robustness > Method comparison and application



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► Validation:

► Accuracy: maximum bias of 0.012 L/L

➢ Precision: maximum total imprecision of 4.5 %

≻ Stability:





Calibration model







100 μL



Angle 45°

Application

Method comparison:

Conventional Hct measurement (via a hematology analyzer) vs. NIR- based Hct prediction

=> Small systematic and proportional differences, but within limits





Calibration model

Validation

Robustness

Method comparison

Application

\blacktriangleright Application of the method on capillary DBS (n=36)

> NIR-based Hct vs Hct measured with a Hct centrifuge











CONCLUSION

NIR – based Hct prediction is:

Accurate and precise > Hct can still be predicted after 1 month of storage of the DBS at RT or lower ➢ Robust

NIR – based Hct prediction is:

- > Applicable on capillary samples, however the predicted Hct is currently underestimated (- 0.043 L/L). > This may be corrected for by an arbitrary correction factor - future
 - research needed.



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