Understanding Accuracy in Blood Testing — and Why Clinical Relevance Matters

A common question with any blood testing system is accuracy. In reality, accuracy in biochemical testing is not defined by identical numerical values, because there is no absolute gold standard for most analytes. Even accredited laboratories using high-end analysers may produce slightly different results when testing the same sample. These differences arise from variations in analytical methods, calibration standards, reagents, instrumentation, and sample handling. For this reason, laboratory medicine is based on acceptable analytical and biological variation, rather than exact numerical agreement. What matters clinically is whether results fall within reliable ranges and lead to the same clinical interpretation.

This concept is well established in laboratory medicine. Published data on biological variation show that each analyte has an expected degree of variability, and quality specifications are based on allowable imprecision, bias, and total error rather than identical values. Method comparison guidelines also emphasize that different systems are expected to show small systematic differences, and agreement is assessed using acceptable limits rather than exact matching. These principles apply equally to hospital laboratories, private laboratories, and point-of-care testing systems.

Chairside systems such as Linkor are therefore validated by comparison with established laboratory methods to ensure results fall within accepted analytical variation. The aim is not to reproduce identical laboratory numbers, which is neither expected nor achievable, but to provide clinically reliable information that can identify potential risk factors and support decision-making. Importantly, such systems are designed for screening and monitoring, allowing clinicians to detect potential issues early and plan treatment more safely. They are not intended to provide definitive medical diagnosis. Any abnormal or borderline findings should be interpreted in clinical context and, where appropriate, confirmed through formal laboratory testing and medical evaluation.

These systems are also regulated under European and UK medical device frameworks, including IVDR and MHRA requirements. Manufacturers must demonstrate analytical performance, clinical performance, and safety within the intended use of the device, including comparison with established laboratory methods. This regulatory process ensures reliable performance for screening and monitoring purposes, while recognising that results should be interpreted appropriately and confirmed when clinically indicated.

In practical terms, the value of chairside blood testing lies not in achieving identical laboratory values, but in providing clinically meaningful insight at the point of care. Early identification of systemic risk factors can help improve planning, reduce complications, and support safer clinical outcomes across dental, pharmacy, hair restoration, and wellness settings.

References

References (Vancouver style)

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