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Erratum to "Sigma metrics in quality control- An innovative tool" International Journal of Clinical Biochemistry and Research 2021;8(4):253–259

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The Corresponding author updates some of the details in this published article, updates are given below and updated in the online version.

Erratum

In Introduction Section Page No. 254: "Therefore, the quality management model is an important tool that looks at the entire system and helps the laboratory in achieving efficient laboratory performance."

1. **Changes:** A strong quality management model is mandatory so that the lab work is performed efficiently and each stage in its workflow operates without mistakes.

In Introduction Section Page No. 254: "Although, these tools are important, the exact number of errors occurring in the system cannot be quantitated and it is difficult to provide a direct and integrated assessment of the performance of the analytical system"

2. **Changes:** Although these tools play an important role, an exact quantitation of errors is often difficult. Counting errors becomes a subjective phenomenon which leads to difficulties in providing a correct and objective assessment of the analytical performance. As an answer to this dilemma, an assessment method based on quantitative Sigma metrics is often used. The Six sigma model is like a bull's eye graph, which graphically displays the degree to which any result deviates from its target. Sigma (σ) is the mathematical symbol of standard deviation (SD). Motorola Company introduced it as part of their quality improvement; on seeing remarkable success, many companies adopted six sigma principles as their operational motto. This system's main advantages are that it helps reduce cost, prevent errors, and detects variability in the system.

In Introduction Section Page No. 254: "The higher the number of methods with a sigma metric of 5 or better, the lower the costs for reagents, supplies, and control material required to monitor the performance of the methods."

3. **Change:** When a larger number of analytes or methods perform at higher than 5 sigma, the cost for controls, reagents and other supplies required to monitor these methods correspondingly decrease.

In Discussion Section Page No. 257: "The parameters which demonstrate wide variation in the sigma values for both the levels of QC should be evaluated with caution. The method needs to be re-evaluated and the Westgard multi-rules have to be strictly followed. Also the number of QC runs need to be increased so as to abolish this discrepancy."

4. **Change:** The parameters showing wide differences in sigma results at different levels of QC should be carefully and meticulously evaluated. A thorough root cause analysis and troubleshooting should be conducted for those analytes. A change in QC techniques, including run number and strictly abiding by Westgard multirules should be performed, and results are to be re-analysed.

In Discussion Section Page No. 257: "A QGI value less than 0.8 (QGI < 0.8) indicates that the precision of the corresponding analyte needs to be improved, whereas a value greater than 1.2 (QGI > 1.2) indicates that the accuracy of the analyte needs to be improved. A QGI value between 0.8 and 1.2 (0.8 ≤ QGI ≤ 1.2) indicates that the accuracy and precision of the analyte need to be simultaneously improved. 9"

5. **Changes:** A QGI value less than 0.8 (QGI < 0.8) is an indicator that the precision is affected, whereas if the result is greater than 1.2 (QGI > 1.2), it points towards improving accuracy. A QGI value falling between 0.8 and 1.2 (0.8 ≤ QGI ≤ 1.2) means that both the precision and accuracy of the corresponding analyte is affected and has to be simultaneously corrected after thorough evaluation. 10

In Discussion Section Page No. 257: "El Sharkawy et al., in 2018, proposed a harmonised protocol for sigma calculation and highlighted the importance of selecting TEa goals. 11 Sigma metric changes according to the chosen TEa goal and each lab should have a standardised criterion for selecting the same, as under-or overestimation of sigma metric will affect patient results. The world is yet to reach a consensus regarding the most ideal quality goal to be used, and herein lies the biggest challenge of using sigma metrics. 21 Nevertheless, it cannot be denied, that sigma metric analysis is a revolutionary quality assessment tool. The old 'one size fits all model of quality management is now recognised as insufficient to meet the time and cost-saving demands of the modern lab."

6. **Changes:** El Sharkawy et al., in 2018, proposed a harmonised protocol for sigma calculation and highlighted the importance of selecting TEa goals. 12Sigma metric calculation changes according to the chosen TEa goal and each lab should have a selection criterion for choosing the same. The lab world is yet to reach a consensus regarding the most ideal quality goal to be used, and this is the biggest challenge of using sigma metrics. A false estimation of sigma metric leads to overwork for the laboratory personnel and error in patient results. 22 However, in the evolution of lab processes, sigma metric analysis is considered a revolutionary quality assessment tool. The old 'one size fits all model of quality management is considered outdated and incapable of meeting the ever-changing cost and efficiency demands of the modern lab.

In Conclusion Section Page No. 258: This is one of the first studies in Qatar to gauge analytical clinical laboratory performance using six sigma metrics."

7. **Changes**: To the best of our knowledge, this is possibly one of the first studies in Qatar to gauge analytical clinical laboratory performance using six sigma metrics.

The authors and the publisher would like to apologize for any inconvenience or misunderstanding.

The corrected supplementary data is now available online: