

A UNIQUE 3 DIMENSIONAL GRAPHICAL REPRESENTATION OF DELTA CHECK DATA DEMONSTRATES REQUIREMENT FOR MORE SOPHISTICATED LIS DELTA CHECK PROGRAMS

D. V. TRAN¹, G. S. CEMBROWSKI¹, T. N. HIGGINS², R. N. CAREY³.

¹UNIVERSITY OF ALBERTA HOSPITAL, EDMONTON, AB, CANADA, ²DYNACARE KASPER MEDICAL LABORATORIES, EDMONTON, AB, CANADA, ³PENINSULA REGIONAL MEDICAL CENTER, SALISBURY, MD

Delta checking is a Laboratory Information System (LIS) based tool used to detect patient specimen misidentifications or large analytical errors. Most applications of LIS based delta checking programs are little different from those used in the early 1970's. A delta check is performed by comparing a patient's test result on the present specimen to the result of the same test on the most recent previous specimen. Either absolute or percentage differences are compared to thresholds stored in the LIS. One limitation of current delta checking algorithms is that many of the differences are markedly asymmetric thus complicating the decision-making to recognize out of range deltas. Houwen has provided an alternate method of delta check calculations that mitigates the asymmetrical data differences: $100 \times |R_H - R_L| / R_L$, where R_L and R_H are the lower and higher patient test results. Another limitation is that many health care organizations do not have access to an appropriately sized data base of data differences. We are making available unique graphical summaries of large delta check data bases for both outpatients and inpatients. The graph below shows the approximately 33,000 differences (per Houwen's calculation) obtained from the analysis of 150,048 specimens for glycohemoglobin by three Variant II's operating at Edmonton's referral laboratory. Visual inspection of the graph shows that appropriate limits for delta-checking of glycohemoglobin are time dependent with tighter limits required for earlier comparisons. To optimally apply the information provided by these 3-D graphs, the LIS should be able to calculate Houwen's limits and then allow the setting of limits based on the time between testing. Additionally, the LIS could calculate and store these delta values and generate similar graphs on demand. 3-D delta check graphs for common clinical chemistry analytes may be found at www.mylaboratoryquality.com.

