Discussion

Troponin Reporting Units

The Cardiac Markers Survey will have a notable reporting change in the proficiency testing programs offered in 2021 for both troponin I and troponin T. High-sensitivity troponin results in the high-sensitivity (HCRT, HCRTI, and HTNT) programs will need to be reported in different concentration units, nanograms per liter (ng/L), as opposed to contemporary troponin results in the CRT, CRTI, and TNT5 programs which will continue to report using the current units (micrograms per liter (ug/L) or nanograms per milliliter (ng/mL).

The 4th Universal Definition of Myocardial Infarction, along with the International Federation for Clinical Chemistry Committee on Clinical Applications of Cardiac Biomarkers (IFCC C-CB), recommend reporting high-sensitivity troponin concentrations in ng/L, as well as reporting results in whole numbers. Thus, a contemporary cTn assay result of 0.014 ng/mL (µg/L) will be 14 ng/L for an hs-cTn assay. The improved analytical sensitivity of hs-cTn assays affords the ability to report lower values but if different units are not used there is significant potential for misinterpretation of results or serial results.

As an example, with a **high sensitivity** (hs-cTn) assay it is notable that reporting results with contemporary units (ng/mL) would lead to inappropriate interpretation of serial results:

If reported in wrong units (ng/mL)		**If reported in appropriate hs-cTn units (ng/L)**	
Troponin 1	0.009 ng/mL	Troponin 1	9 ng/L
Troponin 2	0.016 ng/mL	Troponin 2	16 ng/L
Misleading – serial change appears insignificant			

Subsequently, with a **contemporary** (cTn) assay it is notable that reporting results with high-sensitivity units (ng/L) leads to inappropriate interpretation of serial results:

If reported in appropriate contemporary cTn units (ng/mL)		**If reported in wrong units (ng/L)**	
Troponin 1	0.01 ng/mL	Troponin 1	10 ng/L
Troponin 2	0.02 ng/mL	Troponin 2	20 ng/L
		Misleading – serial change appears significant	

In the current era of electronic medical records reporting, test results to multiple decimal places can lead to misinterpretation of results and contribute to medical error. Reporting high-sensitivity troponin results in whole numbers and with appropriate concentration units (ng/L) avoids ambiguity of reporting results containing numerous zeros after the decimal point.

References:

1. Thygesen K, Alpert JS, Jaffe AS et al. Fourth Universal Definition of Myocardial Infarction. *Circulation* 2018;138: e618-e651.

2. Wu AHB, Christenson RH, Greene DN et al. Clinical Laboratory Practice Recommendations for the Use of Cardiac Troponin in Acute Coronary Syndrome: Expert Opinion from the Academy of the American Association for Clinical Chemistry and the Task Force on Clinical Applications of Cardiac Bio-Markers of the International Federation of Clinical Chemistry and Laboratory Medicine. *Clinical Chemistry* 2018;64: 645–655.

3. Sinnott M, Eley R, Steinle V et al. Decimal numbers and safe interpretation of clinical pathology results. *J Clin Pathol* 2014;67: 179–81.

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