

Expert Answers

From the IFCC Committee on Clinical Applications of Cardiac Bio-Markers

CARDIAC Q&A SERIES II: POINT OF CARE HIGH-SENSITIVE CARDIAC TROPONIN ASSAYS

What key difference should I be aware of if I have a point of care (POC) troponin assay at one site and a central laboratory assay at another?

A point of care (POC) cardiac troponin assay is a troponin assay first and foremost. The only difference is that it uses whole blood (and can often use plasma as well) for measurement. You should consider that there are two different troponin assays methods present in your health care system, and you will need to use different and assay dependent cutoffs. It is therefore important to flag the results so that you know which one comes from the POC system and which one comes from the central lab and supply the correct reference intervals and clinical cutoffs. Ideally, if both assays use the same antibody, manufacturer, and are validated for consistency, their results could be interpreted consistently, allowing for more seamless comparison between the two methods.

Key reference: Collinson P, Aakre KM, Saenger A, Body R, Hammarsten O, Jaffe AS, et al. Cardiac troponin measurement at the point of care: educational recommendations on analytical and clinical aspects by the IFCC Committee on Clinical Applications of Cardiac Bio-Markers (IFCC C-CB). *Clin Chem Lab Med* 2023 May 25;61:6:989-98

Additional references: Byrne RA, Rossello X, Coughlan JJ, Barbato E, Berry C, Chieffo A, et al. 2023 ESC Guidelines for the management of acute coronary syndromes. *Eur Heart J* 2023 Oct 12;44:38:3720-826

How should POC and central lab troponins be used together?

A point of care (POC) cardiac troponin assay is a troponin assay that uses whole blood as matrix. When comparing a point of care assay with a central lab assay you are looking at two different troponin methods and they will provide different troponin values and not have the same cut-offs. It is therefore important that each troponin method is used within its own pathway with defined values (metrics) for the assay used. Most importantly, a change in troponin values (delta) should not be calculated using the results from different methods. The POC assay is typically best used as part of a separate Emergency Department accelerated diagnostic protocol pathway while the central lab assay is more suitable for patients who are being admitted or are likely to be admitted. In patients needing to be admitted and troponin change assessed, possibilities for remeasuring central laboratory troponin on the sample collected at ED presentation might be beneficial to see the initial results and determine if there is dynamic of the troponin changes concentrations from the beginning. If this does not occur, a sample should be taken once the decision is made to assess serial changes and tested using the same assay for both the first and subsequent tests (re-baselining). In these cases, possibilities for remeasuring central laboratory troponin on the sample collected at presentation might be beneficial to see the dynamic of the troponin changes from the beginning.

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Additional references: IFCC Cardiac Biomarkers Reference Tables. <https://ifcc.org/ifcc-education-division/emd-committees/committee-on-clinical-applications-of-cardiac-bio-markers-c-cb/biomarkers-reference-tables/>

What evidence is needed, recommended, and what gaps should be closed when comparing different POC troponin solutions?

The evidence that is needed in the assessment of POC assays depends on the intended clinical use. If the assay is intended for aiding in the diagnosis of myocardial infarction (MI) or rule-out or rule-in of MI in the Emergency Department the documented performance of the POC assay should be the same as for central laboratory assays including appropriate regulatory approval that documents analytical performance and clinical application. If accelerated diagnostic protocol pathways are used with the POC solution, it should be a high-sensitivity troponin method with evidence based delta (change) values.

Additionally, one needs to consider:

1. Is there independent published validation of the assay performance of the POC system using whole blood in the intended clinical environment by the potential users?
2. What is the reliability of the system in its intended clinical environment (how many failed assays occur on average and how robust is the analyser)?
3. How practical and usable is the system in its intended clinical environment (sample handling, user interface, connectivity to Information Technology systems)?
4. Is there an appropriate quality assurance framework that can be used with the system?

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Additional references: Christenson RH, Frenk LDS, de Graaf HJ, van Domburg TSY, Wijnands FPG, Foolen HWJ, et al. Point-of-Care: Roadmap for Analytical Characterization and Validation of a High-Sensitivity Cardiac Troponin I Assay in Plasma and Whole Blood Matrices. *J Appl Lab Med* 2022 Jun 30;7:4:971-88

The information provided above is a brief summary of common questions and answers developed by consensus of the IFCC CB committee, however it is important to recognise that greater knowledge and understanding is recommended and can be sourced from the referenced resources and <https://ifcc.org/ifcc-education-division/emd-committees/committee-on-clinical-applications-of-cardiac-bio-markers-c-cb/> including links to detailed papers, podcasts and presentations.