# ERRORS IN CLINICAL LABORATORY RESEARCH: THEIR NATURE, CAUSES, AND THERAPEUTIC IMPLICATIONS

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**Introduction.** Diagnostic errors, such as missing, delayed, or inaccurate diagnoses, are a common type of medical error and preventable iatrogenic harm. Mistakes committed during the laboratory testing process can lead to diagnostic errors. Examining the types, causes, and clinical consequences of errors—including diagnostic errors—that arise during clinical laboratory testing was the aim of this retrospective research using voluntary event reports. The pre- and post-analytical stages, which currently appear to be more prone to errors than the analytical phase, have drawn the attention of laboratory professionals in a number of studies published in the last 20 years [1,2]. This is true despite the fact that the frequency of laboratory errors varies widely based on the phases of the complete testing procedure that was evaluated and the study design. In particular, it has been discovered that there is a significant frequency of errors and a risk of errors that could put patients in danger during the pre-pre- and post-analytical stages of the cycle, which are normally beyond the laboratory's control [3]. The 2008 release of a Technical Specification by the International Organization for Standardization, which emphasized the need for a patient-centered approach to testing errors, was essential in obtaining information and changing public attitudes around laboratory errors. Potential diagnostic errors are often caused by issues with the laboratory testing process. Despite their propensity to offer little insight into the origins and clinical implications of diagnostic errors associated with clinical laboratory testing process errors, voluntary incident reports are a valuable resource for study on these topics [4,5].

**Material and methods.** In the presented manuscript, we have considered measures that serve to reduce diagnostic errors by interpreting scientific research conducted by the authors. 600 voluntarily incident reports pertaining to diagnostic testing were chosen by the authors from among all incident reports that were filed with the Utrecht University Medical Center during a two-year period. All of the reports pertaining to the clinical laboratory research method have been incorporated from these incident reports. We have determined the following to be responsible for these incidents: Clinical consequences: the kind and extent of the patient's harm, including the diagnostic error; cause: technological, organizational, or human factors; and nature: the point in the testing process where the error occurred.

**Results.** There were about 330 reports in all that were analyzed. Approximately 78% of errors occurred in the preanalytical phase, 14% in the analytical phase, and 8.0 percent in the postanalytical phase (with an additional 1.0% unknown). The most common reason (greater than 58.0%) was human factors. Comparatively speaking, severe clinical impact happened more frequently in the analytical and postanalytical phases (30% and roughly 29%, respectively) than in the preanalytical period (40%). More than 190 cases (almost 60%) had a possible diagnostic error as a result, mostly a possible diagnostic process delay (more than 50.0%).

**Conclusions.** Potential diagnostic errors are frequently the result of mistakes made during the laboratory testing procedure. Voluntary incident reports are a useful resource for

studying diagnostic error associated with errors in the clinical laboratory testing process, despite their propensity to provide insufficient details on causes and clinical consequences.

The nature, effects, and clinical importance of errors in laboratory testing were better recognized thanks to this study. Although most errors occur in the preanalytical procedures, faults in the analytical and postanalytical phases have a bigger clinical impact. Errors in laboratory testing often lead to potential diagnostic errors, specifically a delay in the diagnosis process. To be an even more useful source for funding diagnostic test safety, voluntary event reports need to contain more comprehensive and consistent information, especially on the cause and clinical impact.

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