Guideline for the Reporting of Significant Laboratory Results in Biochemical Genetics

Preamble

The purpose of this Guideline is to ensure patient safety and improve patient care by providing guidance on the timeliness of reporting significant, abnormal test results in the field of Biochemical Genetics (clinical and laboratory). This guideline is intended as an aid as laboratories develop or revise their own specific standard operating procedures and policies, and is an update of the original 2016 CCMG document.

The Centers for Disease Control published laboratory practice recommendations for Biochemical Genetic Laboratories in the United States in 2012\(^1\), clearly stating that the Clinical Laboratory Improvement Amendments (CLIA) regulations for postanalytical systems assessment requirements also apply to Biochemical Genetic testing, and should include (among other criteria):

“Procedures for notifying the test requestor about the test results, including routine tests, urgent tests, abnormal results, and critical values or alert values that warrant immediate medical attention”

For most clinical situations, the standard reporting mechanism used by individual laboratories typically meets the needs of patients and clinicians, as it should follow directly from standard operating procedures, defined laboratory workflows and expected turnaround times for routine testing. Certain circumstances, however, do present exceptions to routine reporting practices. In order to facilitate a timely response to one or more actionable results, the circumstances outlined below may require expedited reporting processes. This guideline seeks to inform a minimum standardized approach, but the local accreditation guidelines should also be consulted.

These circumstances may include:

1. Test results with high positive predictive value that indicate a new diagnosis.
2. A test result that will impact the acute treatment of a patient.
3. Any test result approved to be expedited.
**Classes of Abnormal Biochemical Genetics Test Results**

The following categories represent different classes of abnormal test results commonly used in Laboratory Medicine\(^2\). The following discussion will use the same terminology to describe how they pertain to the Biochemical Genetics laboratory, while highlighting the required attention needed that is distinct from routine result reporting. In each case, examples are provided regarding the types of Biochemical Genetics test results that would fall into each category, as well as recommendations on the timeliness, means and documentation of such communication.

**A. Critical Results**

In laboratory medicine, a “critical result” is defined as a markedly abnormal laboratory result that is life-threatening if treatment is not applied urgently\(^3\). This term has resulted in the establishment of a short list of critical values that automatically trigger the clinical laboratory to urgently communicate the result using paging or calling the treating physician. As in other laboratory specialties, efforts to communicate these results should continue until successful verbal communication, and should be clearly and consistently documented in the patient file, laboratory information system or in alignment with some other laboratory defined practices or databases. The full use of the term “critical”, as typically observed in laboratory medicine, may not be warranted in certain circumstances and the final classification of a laboratory result as critical should be determined by the Laboratory Head (or designate) based on the laboratory reference range(s), the patient’s analytical test history and available clinical information.

It is strongly recommended that each laboratory, in consultation with clinical staff, develop written policies around reporting critical results including specific examples, with the timing and means of such communication. Furthermore, the specific requirements of the Biochemical Genetics laboratory geneticist/specialist to provide an interpretation of the result may restrict laboratory staff from immediate calling-out of critical results and delaying the immediate communication. Therefore, policies should include all contingencies including unavailability of the laboratory geneticist/specialist to provide an interpretation, and communication of critical preliminary findings by designated laboratory staff. As such, the roles and responsibilities of each individual within the path of reporting out critical results should be clearly defined and stated to ensure communication is consistently and efficiently achievable within all reasonable scenarios.

**Examples of Critical Results**

Any result with a high likelihood of indicating a specific diagnosis with immediate treatment implications, for example:

- The presence of succinylacetone
- Elevated branched-chain amino acids with evidence of allo-isoleucine
- Low or absent galactose-1-phosphate uridyltransferase activity
- Amino acid profile suggestive of an urea cycle disorder
B. Significantly Abnormal Results

A “significantly abnormal result” in laboratory medicine is defined as a non-emergent, non-life threatening result that needs attention and follow-up action as soon as possible, but for which timing is not as crucial as a critical result. Within the Biochemical Genetics laboratory, this may include results diagnostic / suggestive for a specific disorder where the patient is not at increased risk of acute morbidity or mortality.

It is recommended that each laboratory, in consultation with clinical staff, develop written policies around reporting significantly abnormal results including specific examples and the means of communication. Furthermore, the roles and responsibilities of each individual within the path of reporting out significantly abnormal results should be clearly defined and stated that the communication should follow the institution’s policies.

Examples of Significantly Abnormal Results

Any result with a high likelihood of indicating a specific diagnosis, but without immediate treatment implications, for example:

- Increased CSF to plasma glycine ratio
- Increased N-acetylaspartic acid
- Low or absent enzymatic activity or abnormal MPS electrophoresis profile that suggests a lysosomal storage disorder
- An abnormal pattern of transferrin isoelectric focusing that suggests a congenital disorder of glycosylation

C. Expedited or Priority Testing:

Results of this nature may include those for which there is a prior agreement between the clinician and laboratory geneticist/specialist, or a specific clinical need for such testing (often judged by whether the result is actionable).

It is recommended that this should be dealt with on a case-by-case basis, or that the laboratory, in consultation with clinical staff, develops written policies around reporting expedited or priority results including specific examples and the means of communication.

Examples of Expedited or Priority Testing/Reporting

- Follow-up testing of a positive newborn screen result
- Tests on an acutely ill patient
- Carrier testing on a couple in which the woman is currently pregnant
Role & Responsibilities of the Laboratory and the Ordering Clinician

Given that critical, significantly abnormal, and expedited or priority test results can have direct implications and serious consequences to patient’s welfare, it is mandatory that such results should be communicated in a timely fashion with reasonable expectations to ensure that appropriate clinical response can occur. The results should be communicated to the ordering and/or treating physician, or the referring laboratory if no referring physician has been clearly stated. The ordering clinician, regardless of scope of practice, has a professional responsibility to provide their contact information to the testing laboratory that will allow direct communication of these results, at any time. It is recommended that there should be a written policy that defines the specific sequence of actions and escalations if contact is not made within the recommended timeframes.

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References