YNHH Laboratory Manual

Clinical Pathology Consultation

Clinical pathology consultations on particular patients can be requested by physicians or other licensed providers

(a) for the purpose of determining the best diagnostic tests and sequence to minimize the time to diagnosis and maximize specificity and sensitivity for a given patient's clinical situation,

(b) for the purpose of interpreting the results of a single test or of a total diagnostic evaluation in the clinical context of a specific patient,

(c) for the purpose of assessing the role, if any, of "therapeutic pathology" (cell therapy and other uses of the laboratory for individualized patient therapeutic care).

Requests for consultations can be made through the EPIC consultation request mechanism for any service (listed under "Laboratory Medicine"), by contacting the Laboratory Call Center, by paging the Laboratory Medicine resident, or by directly contacting any of the Laboratory Medicine attendings. Written consultations are provided.

Some specialized laboratory tests routinely require physician interpretation of the primary data in order to be diagnostically useful. Analogous to a request for a chest x-ray, which includes the request for radiologist interpretation, ordering of these specialized tests includes the request for a pathologist interpretation (consultation).

Such tests include protein and immunoelectrophoreses, hemoglobinopathy evaluation, flow cytometry assays, molecular diagnostic assays, specialized coagulation tests, and some fluorescence and other morphologic assays. These tests are indicated under the individual test listings in this manual.

Flow Cytometry Consultation

When a sample is sent for flow cytometry, the sample is always first reviewed morphologically by a clinical pathologist (Laboratory Medicine physician). This is essential in determining the proper group of immunophenotypic markers and flow cytometry assays to analyze as well as for determining which cell subpopulations (lymphocytes, myeloid cells, erythroid cells, "blast" cells, etc) should be studied. The pathologist also reviews past flow cytometry results on the same patient (if available in the YNHH laboratory) and, when relevant, past surgical or clinical pathology reports on the patient (again, if available at YNHH). Finally, the clinical history is reviewed - in some cases, in order to render the most comprehensive and accurate diagnosis, the ordering clinician will be called prior to performing the flow assay to ascertain key elements of the history. Thus each flow cytometry specimen is highly "individualized" with respect to its analysis.

Because of these considerations, flow cytometry is usually ordered as a "Flow Cytometry Consultation". Under these circumstances, the pathologist will combine all the available information, including morphologic review of the specimen and review of old records and clinical history, and determine the most effective but parsimonious analysis to be carried out in order to render the proper diagnosis. For example, in the case of repeat flow cytometry analysis looking for minimal residual disease in a patient with leukemia, it would be wasteful to carry out a full 'leukemia panel' analysis; instead, a more limited but customized panel targeting the patient's unique leukemic immunophenotypic "fingerprint" is most appropriate. Some Flow Cytometry tests do not require morphologic and clinical review. These include tests such as "T & B Cell Subsets", CD34 Stem Cell Counts, Reticulated Platelets, and the like.

Blood, bone marrow aspirate, lymph node, tissue, cerebrospinal fluid, pleural fluid, peritoneal fluid, pericardial fluid, bronchoalveolar lavage, and apheresis products are the usual specimen types analyzed. CSF specimens generally need to have a minimum white cell count of 10-20 cells per microliter and a

minimum volume of 3 ml (at that white count) for adequate analysis but the laboratory should be contacted about specific patient samples.

Immunophenotypic studies are carried out as a "6-color" correlated data analysis. Note that for ease of reporting, lesser antigenic combinations are reported on the final form but the final diagnosis is rendered on the basis of the more 'sophisticated' analysis. Similarly, although numerical results from a single 'gate', are reported, analysis of a minimum of two gates is actually carried out and, again, used for determining the final flow cytometric diagnosis.

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