Acute Myeloid Leukemia: Testing Algorithm

Clinical suspicion for acute leukemia (peripheral blood vs bone marrow)

YES

Order standard testing:
- LCMS / Leukemia/Lymphoma Immunophenotyping, Flow Cytometry, Varies (triage, acute panel)
- CHRBM / Chromosome Analysis, Hematologic Disorders, Bone Marrow
- Cytochemical stains as determined by reviewing pathologist

Diagnostic criteria met for acute myeloid leukemia (AML)

YES

Possible acute promyelocytic leukemia (APL), follow Acute Promyelocytic Leukemia: Guideline to Diagnosis and Follow-up

GENETIC TESTING FOR PROGNOSTIC AND THERAPEUTIC PURPOSES

Acute leukemia, NOT AML, consider:
- B-cell acute lymphoblastic leukemia (ALL)
- T-cell ALL
- Blastic plasmacytoid dendritic cell neoplasm

Question acute leukemia ambiguous lineage
- Follow Acute Leukemias of Ambiguous Lineage Testing Algorithm

NO

Follow World Health Organization criteria for further evaluation and subclassification

Order the appropriate genetic testing on all AML cases:
- FLT / FLT3 Mutation Analysis, Varies
- NGSHM / OncoHeme Next-Generation Sequencing for Myeloid Neoplasms, Varies (including: CEBPA, NPM1, IDH1, IDH2, etc)
- NGAML / Next-Generation Sequencing, Acute Myeloid Leukemia, 11-Gene Panel, Varies
- NGAMT / Next-Generation Sequencing, Acute Myeloid Leukemia, Therapeutic Gene Mutation Panel (FLT3, IDH1, IDH2, TP53), Varies

Consider baseline molecular minimal residual disease (MRD) testing for NPM1, FISH probe testing for inv(16), or FISH probe testing for t(8;21), if applicable.

Reflexive testing performed based on initial pathologic and genetic findings:
- In the event of an unsuccessful/ambiguous cytogenetic result the appropriate AML fluorescence in situ hybridization (FISH) is performed based on patient age:
  - Adult (≥31 years)
    - AMLAF / Acute Myeloid Leukemia (AML), FISH, Adult, Varies
  - Pediatric (≤30 years)
    - AMLPF / Acute Myeloid Leukemia (AML), FISH, Pediatric, Varies
- Monocytic differentiation: Specify FISH probes for KMT2A (11q23) and inv(16), order AMLMF / Acute Myeloid Leukemia (AML), Specified FISH, Varies
- Morphologic suspicion of abnormal eosinophils: Specify FISH probes for inv(16) MYH11(R)/CBFB(G), order AMLMF
- For core-binding factor AML: Specify FISH probes for t(8;21) or inv(16), order AMLMF. Also order KITE / KIT Mutation Exons 8-11 and 17, Hematologic Neoplasms, Sequencing, Varies or NGAML if NGSHM was not performed