Bone Marrow Algorithmic Testing Tracks

Track 1: Acute leukemia
Track 2: Treated acute leukemia
Track 3: Cytopenias / Myelodysplastic syndrome
Track 4: Suspected Chronic Myelogenous Leukemia
Track 5: Other Myeloproliferative Neoplasm or Myeloproliferative / Myelodysplastic
Track 6: Plasma cell dyscrasia
Track 7: Lymphoma / Chronic Lymphocytic Leukemia
Track 8: Other

Track 1: Acute Leukemia (new diagnosis or relapse)

Standard evaluations
Hematopathology morphologic evaluation
Flow Cytometry
Cytogenetics
Pathology Summary Report

Contingent studies

\[ \begin{align*}
FLT3 \\
NPM1 \\
CEBPA
\end{align*} \]

If the patient has AML

\[ \begin{align*}
PML/RARA \ t(15;17) \ FISH & \quad \text{STAT if suspicion for APL} \\
PML/RARA \ \text{Quantitative PCR} & \quad \text{if } PML/RARA \ FISH \text{ is positive} \\
RUNX1/RUNX1T1 \ t(8;21) \ FISH & \quad \text{If suspicious} \\
CBFB/MYH11 \ \text{inv(16) FISH} & \quad \text{If suspicious} \\
KIT \ \text{exon 8 & 17} & \quad \text{If } CBFA \text{ or } CBFB \text{ is abnormal by FISH} \\
KMT2A (MLL) \ 11q23 \ FISH & \quad \text{If suspicious or if karyotype is normal}
\end{align*} \]

\[ \begin{align*}
BCR/ABL1 \ FISH & \quad \text{If ALL} \\
BCR/ABL \ \text{quantitative PCR} & \quad \text{If } BCR/ABL \ FISH \text{ is positive}
\end{align*} \]

Track 2: Treated Acute Leukemia

Standard evaluations
Hematopathology morphologic evaluation
Flow Cytometry
Cytogenetics
Contingent studies

FISH for specific abnormalities    If previously abnormal

\textit{PML/RARA} Quantitative PCR
\textit{BCR/ABL} P190 Quantitative PCR    If previously abnormal and not tested in last 4 weeks
\textit{BCR/ABL} P210 Quantitative PCR

Repeat TRACK 1 (new leukemia)    If relapsed (recurrent leukemia after apparent remission)

Track 3: Cytopenias or Myelodysplastic syndrome

Standard evaluations
Hematopathology morphologic evaluation
Flow Cytometry
Cytogenetics

Contingent studies

MDS FISH Panel    If cytogenetics yields <20 cells and there is evidence of MDS by morphology

Pathology Summary Report    If new diagnosis of MDS

Track 4: Suspected or Known Chronic Myelogenous Leukemia

Standard evaluations
Hematopathology morphologic evaluation
Flow Cytometry
Cytogenetics
\textit{BCR/ABL} FISH

Contingent studies

\textit{BCR/ABL} PCR quantitation    If FISH is positive
\textit{BCR/ABL} Quantitative PCR P210    If P210 positive in the past
\textit{BCR/ABL} Quantitative PCR P190    If P190 positive in the past

Pathology Summary Report    If new diagnosis of CML
Track 5: Myeloproliferative & Myelodysplastic/Myeloproliferative (not CML)

Standard evaluations
Hematopathology morphologic evaluation
Flow Cytometry
Cytogenetics

Contingent studies
BCR/ABL1 FISH  if not done before and JAK2V617F is negative

PDFRA FISH  If prominent unexplained eosinophilia and not previously preformed
PDFRB FISH  If prominent unexplained eosinophilia and not previously preformed
FGFR1 FISH  If prominent unexplained eosinophilia and not previously preformed

PDGFRB FISH  If morphology suggests CMML
JAK2V617F  If morphology suggests MPN and not previously preformed
JAK2 Exon 12  If morphology suggests PCV and JAK2V617F is negative

CALR  If not previously done, and JAK2 is negative, and morphology is suggestive but NOT definitive for ET or MF
MPL  If not previously done, and JAK2 is negative, and morphology is suggestive but NOT definitive for ET or MF
KIT D816V  If suspicion (pathologic or clinical) of Mast Cell Disorder and not previously done

Pathology Summary Report  If new diagnosis of MPN or MDS/MPN
Also may be used to summarize negative or inconclusive results

Track 6: Plasma Cell Dyscrasias

Standard evaluations:
Hematopathology morphologic evaluation
Flow Cytometry

Contingent studies:
Karyotype  If diagnostic of myeloma (≥10% plasma cells)
Myeloma FISH Panel*  If new diagnosis of myeloma (≥10% plasma cells) or re-staging and ≥10% plasma cells

Pathology Summary Report  If new diagnosis of myeloma
Track 7: Lymphoma / Chronic Lymphocytic Leukemia

Standard evaluations
Hematopathology morphologic evaluation

Contingent studies:
Flow Cytometry If evaluating for NHL or CLL (not needed for Hodgkin lymphoma)
MYC/IGH FISH If DLBCL involves marrow and MYC gene status is unknown
BCL2/IGH FISH If DLBCL is present, MYC FISH is positive and BCL2 is unknown
CLL FISH Panel If marrow is involved and FISH not done within the past year or if requested by the clinician for re-staging

Pathology Summary Report If new diagnosis of CLL

Note: ZAP-70 and IGVH mutation can only be ordered on peripheral blood and must be ordered by the Clinician.
If these tests have been ordered they will be included in the Pathology Summary.

Track 8: Other indications (hemolytic anemia, solid tumor staging, etc.)

Standard evaluations:
Hematopathology morphologic evaluation

Contingent studies:
Based on findings in marrow and flow cytometry

Abbreviations: AML= acute myeloid leukemia; APL = acute promyelocytic leukemia; ALL= acute lymphoblastic leukemia; MDS = myelodysplastic syndrome; CML = chronic myelogenous leukemia; MPN = myeloproliferative neoplasm; CMML = Chronic myelomonocytic leukemia; DLBCL = Diffuse Large B-Cell Lymphoma; CLL = Chronic lymphocytic Leukemia