



# **Leukemia and Lymphoma Overview**

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**CALGB CRA Orientation  
Disease Modules**

**Leukemias**

## Topics

- Acute leukemias
  - Acute lymphocytic leukemia (ALL)
  - Acute myelogenous (granulocytic) leukemia (AML or AGL, rarely ANLL)
- Chronic leukemias
  - Chronic myelogenous (granulocytic) leukemia (CML, or CGL)
  - Chronic lymphocytic leukemia (CLL)
- Multiple myeloma

## Diagnostic Studies

- Peripheral blood
- Bone marrow
- Cytogenetics
- Flow cytometry
- Cytochemistry (special stains)
- Molecular markers
- For myeloma - SPEP, UPEP, Quantitative immunoglobulins, immunoelectrophoresis

## Staging

- Most leukemias are not staged
- Chronic lymphocytic leukemia (CLL)
  - 5 Stages (Rai-Sawitsky) classification, 0 - IV
  - Based upon lymphocyte numbers, adenopathy, anemia, thrombocytopenia
- Multiple myeloma
  - 3 stages, based upon multiple factors: hemoglobin, M protein, calcium, bone lesions

## Prognostic Factors

- Vary with leukemia type
  - AML
    - 7 subtypes, M1 through M7 (M3 especially important)
    - Cytogenetics
  - ALL
    - Cytogenetics
  - CGL
    - Sokal classification

## Treatment - Acute Leukemias

- Chemotherapy
  - Induction
  - Consolidation/re-induction
  - Maintenance
- Central nervous system prophylaxis-intrathecal chemotherapy
- Supportive therapy
  - Growth factors

## Treatment - Acute Leukemias

- High dose chemotherapy with stem cell rescue
- Monoclonal antibody
  - Mylotarg (anti CD 33 Antibody)
  - Campath-1H (anti CD 52 Antibody)
- For acute promyelocytic leukemia (M3)
  - All-trans retinoic acid (ATRA)

## Treatment - Chronic Leukemias

- CLL - chlorambucil, cyclophosphamide, prednisone, fludarabine, rituximab, Campath 1-H
- CML - Hydroxyurea,  $\alpha$ -interferon, Gleevec
- MM - alkeran/prednisone, thalidomide, dexamethasone, VAD (vincristine, adriamycin, dexamethasone), bortezomib, stem cell transplant

## Response Assessment

- Complete (hematologic) response
  - ANC >1500, Plt >100, Marrow < 5% Blasts
  - Maintain > 4 weeks
- Partial response
- New categories of response: CR-plt
  - CR without complete ANC and/or Platelet
- Relapse

## Follow-up

- Blood counts
- Bone marrows
- Cytogenetics
- Other genetic markers
- Myeloma - SPEP, UPEP, bone x-rays,
  - $\beta$ 2 microglobulin

CALGB CRA Orientation  
Disease Modules

Lymphomas

## Topics

- Hodgkin's Disease (HD)
- Non-Hodgkin's Lymphomas (NHL)

## Special Considerations

- Leukemia-lymphoma?
- Transformation from one cell type to another
- HD - nodal until disseminated
- NHL - frequently extranodal

## Diagnostic Studies

- Lymph node biopsy
- Bone marrow aspiration and biopsy
- Flow cytometry
- Genetic studies
- Cytogenetics

## Staging Studies

- Bone marrow aspiration and biopsy
- CTs
- Radionuclide scans: bone, Gallium, PET
- GI x-rays
- Spinal fluid analysis
- Others

## Staging

- Same system for HD and NHL
- 4 Stages
  - I One lymph node group
  - II Two lymph node groups
  - III Nodes above and below diaphragm
  - IV Organ involvement
- Add “A” for no systemic symptoms, “B” for systemic symptoms, “E” for extranodal disease, “X” for bulky adenopathy

## Prognostic Factors

- Stage - which factors in systemic symptoms, extranodal disease, and tumor bulk
- Histologic subtype
  - Hodgkin’s Disease
    - Lymphocyte dominant
    - Nodular sclerosing
    - Mixed cellularity
    - Lymphocyte depletion

## Prognostic Factors

- Stage - which factors in systemic symptoms, extranodal disease, and tumor bulk
- Histologic subtype
  - Non Hodgkin's Disease (up to 17 subtypes)
    - Follicular/diffuse
    - Cell type
    - Patterns

## Prognostic Factors

- Histologic subtype
  - Non Hodgkin's Disease
    - Low grade (indolent)
    - Intermediate grade
    - High grade (aggressive)

## Treatment

- Chemotherapy
- Radiation therapy
- Monoclonal antibodies - with or without radiolabel or toxin (Rituximab, Zevalin)
- High dose chemotherapy with stem cell rescue

## Response Assessment

- Complete response
- Partial response
- Stable disease
- Progression/relapse

## Follow-up

- Relapse
- Survival
- Toxicity (including second malignancies)
- Quality of life