Myeloma for Beginners

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International Myeloma Foundation
Main Features of Myeloma
Causes of Myeloma

Four Major Factors

- Viruses
- Chemicals (e.g. IL-6)
- Radiation
- DNA Damage

Diagram:

- Myeloma Cell
- Viruses
  - Mφ
  - Dendritic
  - T Cell
- DNA Damage
- Chemicals
- Radiation
Development of Monoclonal Myeloma

Build up of DNA damaged plasma cells:
Myeloma monoclonal population

Trigger Factor(s)
<table>
<thead>
<tr>
<th>Condition</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone issues</td>
<td>30%</td>
</tr>
<tr>
<td>Routine physical</td>
<td>25%*</td>
</tr>
<tr>
<td>Elevated urine/serum protein</td>
<td>15%</td>
</tr>
<tr>
<td>Anemia/fatigue</td>
<td>15%</td>
</tr>
<tr>
<td>Infection</td>
<td>3%</td>
</tr>
<tr>
<td>Renal dysfunction</td>
<td>2%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>10%</td>
</tr>
</tbody>
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Initial Testing

Standard Tests

- **Blood**
  - Complete blood counts
  - Chemistry profile
  - Sβ₂M; Albumin
  - CRP; LDH
  - SPEP: IFE/IEP
  - Quant. Immunoglobulins

- **Urine**
  - UPEP on 24 hr urine

- **Bone marrow asp/biopsy**

- **X-rays**
  - Skeletal survey

Selective Testing

* MRI; PET; CT/ PET
* Serum FREELITE
* Cytogenetics/ FISH
* Molecular testing: GEP; SNPs; proteomics; RNA/ DNA sequencing
Essential Data to Track Response
SPEP/ UPEP and Immunofixation
New Clinical Criteria for Myeloma**

Very Much Dependent Upon Bone Disease Documentation

- **MGUS** PC < 10%; SPIKE < 3.0G/DL
- **Smoldering** not MGUS or MM; D/S stage IA
- **Myeloma (MM*)** “End Organ Dysfunction,” i.e. 1 or more of:
  - Calcium elevation (> 10.5G/DL)
  - Renal insufficiency (CREAT > 2mg/DL)
  - Anemia (HB < 10 or 2G < Normal)
  - Bone disease (Lytic or Osteopenic)

*MM is same as Durie/Salmon stage IB plus stage II/III A/B

** British J. Haemat. 2003; 121: 749-757

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Assessment of Bones Essential

- **X-ray**: full skeletal survey
- **CT scan or MRI** with gadolinium enhancement
- **Whole body FDG/PET or CT-PET**
- **Bone density**
- **Bone molecular studies**, e.g. urinary NTX
Bone Damage

NORMAL

DAMAGED TRABECULAE

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## Prognostic Factors for Staging

### International Staging System $\beta_2M / S. Alb$

<table>
<thead>
<tr>
<th>Stage</th>
<th>Median</th>
<th>Conditions</th>
</tr>
</thead>
</table>
| I     | 6 years | Low $\beta_2M < 3.5^*$  
S. Albumin$^{**} \geq 3.5$ G/DL |
| II    | 4 years | $\beta_2M < 3.5$ but low albumin $< 3.5$ or  
$\beta_2M : 3.5 – < 5.5$ |
| III   | 2 years | High $\beta_2M \geq 5.5$ mg/DL |

* mg/DL  
$^{**}$ Gm/DL  

Based upon 10-15 years follow-up
Tracking Test Results

**Baseline**
- B2M/ Albumin
- Type of “M-spike”; blood/ urine
- Amount of “M-spike”
- Chromosome 13; [4;14]; other
- Bone damage or not
- Kidney damage or not
- Dental evaluation

**Follow-up**
- Monitor all routine tests
- Track M-spike
- Follow-up x-rays/ scans
- Recheck kidney status; creatinine
- Other

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### Advantages for Monitoring

- Allows non-secretory patients to enter trials
- Can reduce use of 24-hr urine testing
- Enables monitoring of patients with normal SPEP or IFE
- Response detected earlier than with other assays
  - Can supplement MRI
Clear Recommendations Required
Mutual Agreement is Very Helpful
Mental Health

- Reduce stress
- Have confidence in the treatment plan
- Expect remission
- Set future plans
- Develop realistic HOPE
To Reduce Stress, Make Changes

Slow down & plan.

Life can be too fast…
Work with Your Doctor

- Keep her/him informed
- Enlist cooperation
- Openly discuss questions/concerns
- Seek the best care feasible
Help Others When You Can