Chronic Myelogenous Leukemia - Adult  
(Greater than or equal to 18 years old)

**INITIAL EVALUATION**

1. If T315I, consider ponatinib

2. Continue TKI or Clinical trials

3. Stem cell transplant or Clinical trials

4. Consider treatment discontinuation

**TREATMENT**

- Bone marrow aspiration and cytogenetics
- PCR in peripheral blood
- Mutation analysis

- Alternate TKI
- Stem cell transplant or Clinical trials

- Continue TKI or Clinical trials

- Bone marrow aspiration and cytogenetics on months 6 and 12
- PCR (peripheral blood) every 3 months for 1 year (or until MMR), then every 6 months

**SURVEILLANCE**

- PCR monthly for 6 months, then every 2 months for 6 months, then every 3 months for 12 months, then every 6 months thereafter

- Consider treatment discontinuation

- Stem cell transplant after second chronic phase

- Surveillance

Hyper-CVAD = hyper-fractionated cyclophosphamide, vincristine, doxorubicin, and dexamethasone

MMR = major molecular response

TKI = tyrosine kinase inhibitors

1. See Physical Activity, Nutrition, and Tobacco Cessation algorithms; ongoing reassessment of lifestyle risks should be a part of routine clinical practice


3. If T315I, consider ponatinib

**Disclaimer:** This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson’s specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient’s care. This algorithm should not be used to treat pregnant women.

**Notes:** Consider Clinical Trials as treatment options for eligible patients. Leukemia patients should be referred and treated at a comprehensive cancer center.
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APPENDIX A: Definition of the Response of TKIs (any TKI) as First-line Treatment¹

<table>
<thead>
<tr>
<th></th>
<th>Optimal</th>
<th>Warning</th>
<th>Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>NA</td>
<td>High risk or</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>CCA/Ph+, major route</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 months</td>
<td>BCR-ABL1 less than or equal to 10% and/or Ph+</td>
<td>BCR-ABL1 greater than 10% and/or Ph+</td>
<td>Non-CHR and/or Ph+ greater than 95%</td>
</tr>
<tr>
<td></td>
<td>less than or equal to 35%</td>
<td>equals 36-95%</td>
<td></td>
</tr>
<tr>
<td>6 months</td>
<td>BCR-ABL1 less than 1% and/or Ph+ equals 0</td>
<td>BCR-ABL1 equals 1-10% and/or Ph+</td>
<td>BCR-ABL1 greater than 10% and/or Ph+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>equals 1-35%</td>
<td>equals 35%</td>
</tr>
<tr>
<td>12 months</td>
<td>BCR-ABL1 less than or equal to 0.1%</td>
<td>BCR-ABL1 greater than 0.1-1%</td>
<td>BCR-ABL1 greater than 1% and/or Ph+</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>greater than 0</td>
</tr>
<tr>
<td>Then, and at any time</td>
<td>BCR-ABL1 less than or equal to 0.1%</td>
<td>CCA/Ph- (-7 or 7q-)</td>
<td>Loss of CHR, loss of CCyR, confirmed loss of MMR², mutations and CCA/Ph+</td>
</tr>
</tbody>
</table>

The definitions are the same for patients in chronic phase, accelerated phase, and blastic phase and apply also to second-line treatment, when first-line treatment was changed for intolerance. The response can be assessed with either a molecular or a cytogenetic test, but both are recommended whenever possible. Cutoff values have been used to define the boundaries between optimal and warning and between warning and failures. Because cutoff values are subjected to fluctuations, in case of cytogenetic or molecular data close to the indicated values, a repetition of the tests is recommended. After 12 months, if an MMR is achieved, the response can be assessed by real quantitative polymerase chain reaction (RQ-PCR) every 3 to 6 months, and cytogenetics is required only in case of failure or if standardized molecular testing is not available. Note that MMR (MR³ or better) is optimal for survival but that a deeper response is likely to be required for a successful discontinuation of treatment.

CCA/Ph+ = clonal chromosome abnormalities in Ph+ cells
CCyR = complete cytogenetic response
CHR = complete hematologic response
MMR = confirmed loss of MMR²
NA = not applicable
Ph = philadelphia chromosome

¹ Per European LeukemiaNet (ELN) criteria
² In 2 consecutive tests, of which one with a BCR-ABL1 transcripts level greater than or equal to 1%
SUGGESTED READINGS


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