Introduction

Chromosome analysis for blood, bone marrow, and solid tumors is addressed by this guideline.

Procedures addressed

The inclusion of any procedure code in this table does not imply that the code is under management or requires prior authorization. Refer to the specific Health Plan's procedure code list for management requirements.

<table>
<thead>
<tr>
<th>Procedures addressed by this guideline</th>
<th>Procedure codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromosome Analysis, Blood or Bone Marrow</td>
<td>88237</td>
</tr>
<tr>
<td></td>
<td>88264</td>
</tr>
<tr>
<td></td>
<td>88291</td>
</tr>
<tr>
<td>Chromosome Analysis, Solid Tumor</td>
<td>88239</td>
</tr>
<tr>
<td></td>
<td>88264</td>
</tr>
<tr>
<td></td>
<td>88291</td>
</tr>
</tbody>
</table>

What are chromosome abnormalities in cancer

Introduction

A chromosome abnormality is any difference in the structure, arrangement, or amount of genetic material packaged into the chromosomes. Chromosome abnormalities have been identified in many types of cancer, including leukemias, lymphomas, and solid tumors.1

Chromosome abnormalities

Chromosome abnormalities can include

- deletions
- duplications
- balanced or unbalanced rearrangements, and
• gain or loss of whole or partial chromosomes.

Some chromosome abnormalities are characteristic of certain types of malignancy, and can be used to classify a type or subtype of cancer. For example, the "Philadelphia chromosome" is defined by a common translocation between chromosomes 9 and 22, and indicates chronic myelogenous leukemia in most cases.¹

**Disease monitoring and treatment response**

These abnormalities can play a key role in the development, diagnosis, and monitoring of cancer.¹

The cytogenetics of a cancer can also change over time or in response to treatment. Therefore, chromosome analysis can be used to monitor disease progression and treatment response.¹

**Test information**

**Introduction**

Chromosome analysis is routinely performed on bone marrow biopsy for the diagnosis and monitoring of leukemia, lymphoma, and other hematological disorders.

**Chromosome analysis**

Chromosome analysis (karyotyping) requires stimulating cells to divide, arresting cell division at metaphase when the chromosomes can be seen microscopically, and staining to visualize the banding patterns.²

Chromosome analysis identifies any differences from normal that can be seen under the microscope. This includes all of the following:

• entire missing or extra chromosomes
• deletions or duplications within a chromosome that are large enough to be seen by microscope, and
• rearrangements including translocations and inversions.

**Chromosome microarray**

Smaller copy number changes can be identified using chromosome microarray.³
Guidelines and evidence

Introduction

This section includes relevant guidelines and evidence pertaining to chromosome analysis for blood, bone marrow, and solid tumors.

National Comprehensive Cancer Network

The National Comprehensive Cancer Network (NCCN) considers chromosome analysis of a bone marrow biopsy to be routine standard of care in the evaluation of acute myeloid leukemia (AML), chronic myelogenous leukemia (CML), multiple myeloma (MM), myelodysplastic syndromes (MDS), and Burkitt’s lymphoma (BL).

American College of Medical Genetics

The American College of Medical Genetics (ACMG, 2010) provides technical laboratory guidelines for chromosome studies for acquired abnormalities:

- “A patient with an acquired clonal chromosomal abnormality or one who is at high risk for developing such an abnormality may have multiple cytogenetic studies during the course of his or her disease.”
- “Bone marrow/blood: In most cases, bone marrow is the tissue of choice for analysis of suspected premalignant or malignant hematologic disorders.”
- “Lymph nodes: Common diagnoses include Hodgkin and non-Hodgkin lymphomas, including follicular, diffuse large B-cell, marginal zone, mantle cell, T-cell, and anaplastic large cell lymphoma.”
- “Solid tumors: Cytogenetic analysis of tumor tissue is performed to detect and characterize chromosomal abnormalities for purposes of diagnosis, prognosis, and patient management.”

Criteria

Chromosome analysis on a bone marrow biopsy is considered medically necessary when performed in the evaluation of leukemia, lymphoma, and other hematological disorders.

References

Introduction

These references are cited in this guideline.


6. American College of Medical Genetics. Section E6.1-6.4 of the ACMG technical standards and guidelines: chromosome studies of neoplastic blood and bone marrow – acquired chromosomal abnormalities. 2016. Available at https://pdfs.semanticscholar.org/34bc/c7ce2ff76bf7637f8c5b9892f823cbd0f68e.pdf