Local Coverage Determination (LCD):
MolDX: MGMT Promoter Methylation Analysis (L36192)

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## Contractor Information

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## LCD Information

### Document Information

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MolDX: MGMT Promoter Methylation Analysis

**Proposed LCD in Comment Period**
N/A

**Source Proposed LCD**
DL36192

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**CMS National Coverage Policy**

Title XVIII of the Social Security Act (SSA), §1862(a)(1)(A), states that no Medicare payment shall be made for items or services that “are not reasonable and necessary for the diagnosis or treatment of illness or injury or to improve the functioning of a malformed body member.”
Coverage Guidance

Coverage Indications, Limitations, and/or Medical Necessity

As required by CR 10901, all billing and coding information has been moved to the companion article, this article is linked to the LCD.

Indications and Limitations of Coverage

This policy provides limited coverage for methylation analysis for hypermethylation of the O-6-methylguanine DNA methyltransferase (MGMT) gene promoter. MGMT methylation analysis testing is considered to be reasonable and necessary for adult patients when the following criteria are met:

- Tumor type is high-grade malignant glioma (e.g. glioblastoma multiforme (GBM), anaplastic astrocytoma) and
- Patients are able to tolerate temozolomide therapy or radiation therapy, and
- The physician will use the MGMT testing results to decide between radiation therapy and chemotherapy alone as 1st line adjuvant treatment, or between temozolomide and other chemotherapy for 1st line adjuvant treatment

Note: This assessment is predicated on the assumption that therapy is considered beneficial for the specific patient.

Summary of Evidence

Cancer is the consequence of genetic alterations that result in a deregulation of important cellular pathways responsible for various essential functions, including cell growth, cell cycle progression, and apoptosis (programmed cell death). One result of these genetic alterations is gliomas. The treatment of high-grade gliomas, especially GBM, remains difficult as no contemporary treatments are curative. For the past several years, the standard treatment for GBM consists of maximal surgical resection, radiotherapy (RT), and concomitant and adjuvant chemotherapy with temozolomide.

Although surgical resection, RT, and chemotherapy with temozolomide are considered standard of care for most patients with high-grade glioma (including GBM and anaplastic astrocytoma), not all patients tolerate these treatments. For patients older than 70 years with a low performance rating, radiation or temozolomide alone is sometimes employed. Temozolomide treatment is not considered inferior to radiation therapy and may be tolerated better than RT by “frail” patients with low performances scores.

In patients for whom temozolomide is not the current standard of care, it has been proposed that MGMT methylation analysis can be used to predict the efficacy of temozolomide treatment. Epigenetic silencing of the MGMT (O-6-
methylguanine–DNA methyltransferase) DNA repair gene, by promoter methylation, leads to a lack of MGMT protein expression. Lack of MGMT protein expression immunohistochemically is related to drug responses in patients with malignant glioma treated with alkylating agents. In particular, MGMT hypermethylation is a known predictive biomarker of response to temozolomide treatment with favorable outcomes in terms of overall survival (OS) and progression free survival (PFS) in GBM patients.

MGMT promoter methylation status is a strong and independent prognostic factor in patients with newly diagnosed GBM and a clinically relevant predictive marker in the subpopulation of elderly GBM patients. MGMT promoter methylation analysis can aid in treatment decisions for patients over 70. For patients older than 70 with a good performance rating, there is evidence of benefit of temozolomide in addition to RT. In patients with lower performance, temozolomide can be used alone as it was found to be equally as effective as RT alone and it has lower toxicity for the frail population. In the temozolomide arm of both the Nordic and German trials, patients with MGMT promoter methylation had longer survival than those without. (9.7 vs 6.8 months; HR, 0.56; 95% CI, 0.34-0.93)

MGMT promoter methylation analysis also has prognostic utility. However, performing MGMT analysis is only recommended by NCCN guidelines for temozolomide guidance and not for overall prognosis prediction. Lattanzio et al confirmed that patients carrying methylation of the MGMT promoter reported a longer OS and PFS than patients with an unmethylated promoter. Wang et al also evaluated the prognostic value of MGMT promoter methylation and TP53 mutation status found similar results.

There is still a lack of consensus on the optimal assay for reliable MGMT promoter methylation testing and a variety of tests are being used in different laboratories. According to Berghoff et al, pyrosequencing is the only method for which an adequately high analytical performance (high intra- and inter-laboratory repeatability and reproducibility) has been demonstrated in a fully published trial. MGMT promoter methylation testing should be performed by an experienced laboratory in which this testing has been validated.

MGMT may also be useful for determining the prognosis of colorectal cancer patients and to identify those requiring more aggressive adjuvant therapies. Future studies will be necessary to determine its clinical utility in this area. Likewise, MGMT methylation may be an important biomarker in subsets of esophageal cancers where temozolomide may be utilized to successfully treat these patients, but where additional research on clinical utility is also needed. MGMT methylation analysis is also mentioned in the literature as a predictive marker for ovarian cancer and melanoma. However, evidence on the use of MGMT testing is unclear in these diagnoses and additional studies are needed on the clinical utility in these cancers.

Analysis of Evidence
(Rationale for Determination)

Level of Evidence:

Quality - Strong

Strenght - Strong

Weight - Moderate

In summary, the current literature and NCCN guidelines support the use of MGMT methylation analysis to predict the usefulness of temozolomide treatment in adult patients with high-grade gliomas.

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General Information

Associated Information

Documentation Requirements

The patient's medical record must contain documentation that fully supports the medical necessity for services included within this LCD. (See “Coverage Indications, Limitations, and/or Medical Necessity”) This documentation includes, but is not limited to, relevant medical history, physical examination, and results of pertinent diagnostic tests or procedures.

Documentation supporting the medical necessity should be legible, maintained in the patient's medical record, and must be made available to the MAC upon request.

Sources of Information

N/A

Bibliography


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**Revision History Information**

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<td>At this time 21st Century Cures Act will apply to new and revised LCDs that restrict coverage which requires comment and notice. This revision is not a restriction to the coverage determination; and, therefore not all the fields included on the LCD are applicable as noted in this policy.</td>
<td>Section of the LCD. )</td>
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<td>R3</td>
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<td>• Creation of Uniform LCDs With Other MAC Jurisdiction</td>
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**Associated Documents**

**Attachments**

N/A

**Related Local Coverage Documents**

Article(s)

A57433 - Billing and Coding: MolDX: MGMT Promoter Methylation Analysis
A54896 - Response to Comments: MolDX: MGMT Promoter Methylation Analysis

**Related National Coverage Documents**

N/A

**Public Version(s)**

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