MEDICAL POLICY – 2.04.73
Intracellular Micronutrient Analysis

BCBSA Ref. Policy: 2.04.73
Effective Date: March 1, 2019
Last Revised: Feb. 5, 2019
Replaces: N/A

RELATED MEDICAL POLICIES:
None

Select a hyperlink below to be directed to that section.

POLICY CRITERIA | CODING | RELATED INFORMATION
EVIDENCE REVIEW | REFERENCES | HISTORY

∞ Clicking this icon returns you to the hyperlinks menu above.

Introduction

Micronutrients are essential vitamins and minerals. Getting enough of them is important for good health. It’s rare in the United States to have medical conditions caused by lack of nutrients like vitamins A, B1, B12, C, D, and selenium. Most people get enough vitamins and minerals through their diet or over-the-counter vitamins. Blood samples are a proven way to measure the level of essential nutrients. Other tests have been created that look at nutrient levels inside cells. These tests are unproven. There are no published medical studies showing whether the cell tests are more accurate or useful than standard blood tests at measuring levels of vitamins or minerals. There are also no randomized controlled trials — studies that randomly put people in different study groups — exploring whether the cell tests are effective to screen for or diagnose nutrient deficiencies.

Note: The Introduction section is for your general knowledge and is not to be taken as policy coverage criteria. The rest of the policy uses specific words and concepts familiar to medical professionals. It is intended for providers. A provider can be a person, such as a doctor, nurse, psychologist, or dentist. A provider also can be a place where medical care is given, like a hospital, clinic, or lab. This policy informs them about when a service may be covered.
Intracellular micronutrient panel testing is considered investigational.

### Coding

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPT</td>
<td></td>
</tr>
<tr>
<td>82310</td>
<td>Calcium; total</td>
</tr>
<tr>
<td>82725</td>
<td>Fatty acids, nonesterified</td>
</tr>
<tr>
<td>84590</td>
<td>Vitamin A</td>
</tr>
<tr>
<td>84591</td>
<td>Vitamin, not otherwise specified</td>
</tr>
<tr>
<td>84999</td>
<td>Unlisted chemistry procedure</td>
</tr>
<tr>
<td>86353</td>
<td>Lymphocyte transformation, mitogen (phytomitogen) or antigen induced blastogenesis</td>
</tr>
<tr>
<td>88348</td>
<td>Electron microscopy, diagnostic</td>
</tr>
</tbody>
</table>

**Note:** CPT codes, descriptions and materials are copyrighted by the American Medical Association (AMA). HCPCS codes, descriptions and materials are copyrighted by Centers for Medicare Services (CMS).

### Related Information

When reviewing intracellular micronutrient panel testing, the entire panel is to be reviewed as a whole versus the individual elements of the panel.

### Benefit Application

This testing is currently only available through two reference laboratories: SpectraCell Laboratories and IntraCellular Diagnostics.
**SpectraCell Laboratories**

According to SpectraCell Laboratories, their total antioxidant function testing (SPECTROX®) is reported using CPT code 86353.

**IntraCellular Diagnostics**

IntraCellular Diagnostics uses electron microscopy for which CPT code 88348 might be reported.

---

**Evidence Review**

**Description**

Commercial laboratories offer panels of tests evaluating intracellular levels of micronutrients (essential vitamins and minerals). Potential uses of these tests include screening for nutritional deficiencies in healthy people or those with chronic disease and aiding in the diagnosis of disease in patients with nonspecific symptoms.

**Background**

**Vitamin Deficiencies**

Micronutrients collectively refer to essential vitamins minerals necessary in trace amounts for health. Clinical deficiency states (states occurring after prolonged consumption of a diet lacking the nutrient and is treated by adding the nutrient to the diet) have been reported for vitamins A, B1, B12, C, D, selenium, and other micronutrients. Classic nutritional deficiency diseases are uncommon in the United States; most people derive sufficient nutrition from their diets alone or in combination with over-the-counter multivitamins.

Laboratory tests are available for individual micronutrients and are generally used to confirm suspected micronutrient deficiencies. Testing is performed by serum analysis using standardized
values for defining normal and deficient states. In addition, some commercial laboratories offer panels of vitamin and mineral testing that also use serum analysis.

**Diagnostic Testing**

This policy evaluates novel laboratory tests that measure the intracellular levels of micronutrients. This testing, also known as intracellular micronutrient analysis, micronutrient testing, or functional intracellular analysis is sometimes claimed to be superior to serum testing because intracellular levels reflect more stable micronutrient levels over longer time periods than serum levels, and because intracellular levels are not influenced by recent nutrition intake. However, the relation between serum and intracellular levels of micronutrients is complex. The balance of intracellular and extracellular levels depends on a number of factors, including the physiology of cellular transport mechanisms and the individual cell type.

At least two commercial laboratories offer intracellular testing for micronutrients. Laboratories perform a panel of tests evaluating the intracellular level of various micronutrients (eg, minerals, vitamins, amino acids, fatty acids). The test offered by IntraCellular Diagnostics evaluates epithelial cells from buccal swabs and assesses levels of intracellular mineral electrolyte (ie, magnesium, calcium, potassium, phosphorous, sodium, chloride). SpectraCell Laboratories offers a panel of tests that evaluates the intracellular status of micronutrients within lymphocytes in blood samples. The micronutrients measured by the test include:

- Vitamins: A, B1, B2, B3, B6, B12, C, D, K; biotin, folate, pantothenic acid
- Minerals: calcium, magnesium, zinc, copper
- Antioxidants: alpha lipoic acid, coenzyme Q10, cysteine, glutathione, selenium, vitamin E
- Amino acids: asparagine, glutamine, serine
- Carbohydrate metabolism: chromium, fructose sensitivity, glucose-insulin metabolism
- Fatty acids: oleic acid
- Metabolites: choline, inositol, carnitine

The SpectraCell micronutrient panel may include SPECTROX™ for evaluation of the total antioxidant function.
Summary of Evidence

For individuals with chronic diseases or nonspecific generalized symptoms who receive intracellular micronutrient analysis, the evidence includes observational studies. The relevant outcomes are symptoms and change in disease status. No studies were identified that evaluated clinical validity or clinical utility of intracellular micronutrient testing compared with standard testing for vitamin or mineral levels. Limited data from observational studies are available on correlations between serum and intracellular micronutrient levels. No randomized controlled trials or other comparative studies were identified evaluating the direct health impact of intracellular micronutrient testing. Moreover, there are insufficient data to construct a chain of evidence that intracellular micronutrient testing would likely lead to identifying patients whose health outcomes would be improved compared with alternative approaches to patient management. The evidence is insufficient to determine the effects of the technology on health outcomes.

Ongoing and Unpublished Clinical Trials

A search of ClinicalTrials.gov in December 2018 did not identify any ongoing or unpublished trials that would likely influence this policy.

Practice Guidelines and Position Statements

No guidelines or statements were identified.

Medicare National Coverage

There is no national coverage determination.

Regulatory Status

Clinical laboratories may develop and validate tests in-house and market them as a laboratory service; laboratory-developed tests must meet the general regulatory standards of the Clinical Laboratory Improvement Amendments. Laboratories that offer laboratory-developed tests must be licensed by the Clinical Laboratory Improvement Amendments for high-complexity testing.
To date, the U.S. Food and Drug Administration has chosen not to require any regulatory review of this test.

References


History

<table>
<thead>
<tr>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/13/11</td>
<td>New Policy – Add to Pathology/Laboratory section.</td>
</tr>
<tr>
<td>07/25/12</td>
<td>Related Policies Update – Title to 2.01.01 has been changed to include: (i.e., Multiple Chemical Sensitivities)</td>
</tr>
<tr>
<td>09/11/12</td>
<td>Replace policy. Literature search through May 2012 resulted in no changes to the Description or Rationale sections. No additions to the reference list. Policy statement is unchanged.</td>
</tr>
<tr>
<td>09/18/12</td>
<td>Update Related Policy – Add 2.04.508.</td>
</tr>
<tr>
<td>09/27/13</td>
<td>Replace policy. Policy updated with literature search through June 21, 2013. No change to policy statement. Within the Policy Guidelines it was clarified that the entire panel needs to be reviewed versus the individual elements of the panel. CPT codes 82310, 82725, 84590 and 84591 as these refer to the individual elements.</td>
</tr>
<tr>
<td>05/21/14</td>
<td>Update Related Policies. Changed title for related policy 2.04.508.</td>
</tr>
<tr>
<td>09/08/15</td>
<td>Annual Review. Policy updated with literature review through June 15, 2015; no references added. No change to policy statement.</td>
</tr>
<tr>
<td>08/01/16</td>
<td>Annual Review, approved July 12, 2016. No references added. No change to policy statement.</td>
</tr>
<tr>
<td>Date</td>
<td>Comments</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>03/01/19</td>
<td>Annual Review, approved February 5, 2019. Policy updated with literature review through October 2018; no references added. Policy statement unchanged.</td>
</tr>
</tbody>
</table>

**Disclaimer:** This medical policy is a guide in evaluating the medical necessity of a particular service or treatment. The Company adopts policies after careful review of published peer-reviewed scientific literature, national guidelines and local standards of practice. Since medical technology is constantly changing, the Company reserves the right to review and update policies as appropriate. Member contracts differ in their benefits. Always consult the member benefit booklet or contact a member service representative to determine coverage for a specific medical service or supply. CPT codes, descriptions and materials are copyrighted by the American Medical Association (AMA). ©2019 Premera All Rights Reserved.

**Scope:** Medical policies are systematically developed guidelines that serve as a resource for Company staff when determining coverage for specific medical procedures, drugs or devices. Coverage for medical services is subject to the limits and conditions of the member benefit plan. Members and their providers should consult the member benefit booklet or contact a customer service representative to determine whether there are any benefit limitations applicable to this service or supply. This medical policy does not apply to Medicare Advantage.
Discrimination is Against the Law

Premera Blue Cross complies with applicable Federal civil rights laws and does not discriminate on the basis of race, color, national origin, age, disability, or sex. Premera does not exclude people or treat them differently because of race, color, national origin, age, disability or sex.

Premera:
- Provides free aids and services to people with disabilities to communicate effectively with us, such as:
  - Qualified sign language interpreters
  - Written information in other formats (large print, audio, accessible electronic formats, other formats)
- Provides free language services to people whose primary language is not English, such as:
  - Qualified interpreters
  - Information written in other languages

If you need these services, contact the Civil Rights Coordinator.

If you believe that Premera has failed to provide these services or discriminated in another way on the basis of race, color, national origin, age, disability, or sex, you can file a grievance with:
Civil Rights Coordinator - Complaints and Appeals
PO Box 91102, Seattle, WA 98111
Toll free 855-332-4535, Fax 425-918-5592, TTY 800-842-5357
Email AppealsDepartmentInquiries@Premera.com

You can file a grievance in person or by mail, fax, or email. If you need help filing a grievance, the Civil Rights Coordinator is available to help you.


Getting Help in Other Languages

This Notice has Important Information. This notice may have important information about your application or coverage through Premera Blue Cross. There may be key dates in this notice. You may need to take action by certain deadlines to keep your health coverage or help with costs. You have the right to get this information and help in your language at no cost.

Call 800-722-1471 (TTY: 800-842-5357).

For Arabic:
- يوم هذه الإشعار معلومات هامة. قد يحتوي هذا الإشعار معلومات مهمة يخصك، مثل:
- هذه الإشعار معرفة لك، بما يمكن أن يختلف عليه من قبل من يكتب هذه المعلومات، في هذا الإشعار.
- إذا كنت بحاجة إلى أوامر مجانية للحصول على معلومات محاسبة أو معلومات مساعدة أو معلومات أخرى في هذه الإشعار، يرجى الاتصال بمكتب الترجمة والمكتبة في نيويورك.
- يمكنك الحصول على هذه المعلومات والمعلومات المجانية من قبل دوائر ترجمة أماكن مختلفة.
Call 800-722-1471 (TTY: 800-842-5357).

For Chinese:
- 本通知有重要的訊息。本通知可能有關於您透過 Premera Blue Cross 提交的申請或保險的重要訊息。本通知可能有重要日期。您可能需要在截止日期之前採取行動。以保留您的健康保險或費用補貼。您有權利免費以您的母語得到本訊息和幫助。請撥電話 800-722-1471 (TTY: 800-842-5357).

For French (Creole):

For German (Deutsche):

For Oromo (Cushite):

For Italian (Italiano):
Premera Blue Cross is notifying you of certain key dates for maintaining your health insurance or help with costs. You may be able to take measures to avoid losing your insurance. You have the right to receive this information and help in any language without cost. Call 800-722-1471 (TTY: 800-842-5357) for help.

日本語（Japanese）:
この通知は重要な情報を含んでいます。これは、Premera Blue Crossの申請または補償範囲に関する重要な情報が含まれている場合があります。この通知には記載されている可能性がある重要な日付をご確認ください。健康保険やサポートを維持するうえには、特定の期間に行動を取られなければなりません。あなたの言語による情報とサポートが無料で提供されます。電話番号: 800-722-1471 (TTY: 800-842-5357)までおっけください。

한국어 (Korean):
본 통지서에는 중요한 정보가 들어 있습니다. 즉 이 통지서는 귀하의 신청에 관하여 그리고 Premera Blue Cross를 통해 커버리를 관할 정보를 포함하고 있을 수 있습니다. 귀하는 귀하의 건강 커버리를 계속 유지하거나 비용을 절약하기 위해서 일정한 마감일까지 조치를 취해야 할 필요가 있을 수 있습니다. 귀하의 이러한 정보와 승인을 귀하의 언어에 비용 부담없이 얻을 수 있는 권리가 있습니다. 800-722-1471 (TTY: 800-842-5357)로 전화하십시오.

ไทย (Thai):
ประกาศนี้อาจมีข้อมูลสำคัญเกี่ยวกับการดำเนินการตามประกันสุขภาพของคุณ Premera Blue Cross โดยมีการติดต่อในภาษีของคุณในกรณีที่คุณจะต้องการประโยชน์ที่มีกำหนดไว้ โปรดติดต่อ Premera Blue Cross ที่ 800-722-1471 (TTY: 800-842-5357).

Русский (Russian):
Настоящее уведомление содержит важную информацию. Это уведомление может содержать важную информацию о вашем заявлении или страховом покрытии через Premera Blue Cross. В этом уведомлении могут быть ключевые даты. Вам, возможно, потребуется принять меры к определенным предельным срокам для сохранения страхового покрытия или помощи с расходами. Вы имеете право на бесплатное получение этой информации и помощь на вашем языке. Звоните по телефону 800-722-1471 (TTY: 800-842-5357).

Română (Romanian):