MAGNESIUM BASICS

There has been increased attention and research focus on magnesium recently due to its role in many vital biological functions such as heartbeat regulation, muscle contraction, and protein synthesis. Magnesium is the 4th most abundant mineral in the body with 50-60% stored in our bones, 1% found in our blood and remaining magnesium is stored in cells and tissues. Despite the importance of magnesium, many American adults fail to consume the recommended dietary allowance (RDA). A magnesium supplement may help fill nutrient gaps for this essential mineral.

PHYSIOLOGICAL FUNCTIONS OF MAGNESIUM

Magnesium helps support nerve, muscle and heart function and is involved in over 300 reactions in the body. This key mineral also plays a role in energy metabolism support, specifically in the production of adenosine triphosphate (ATP) or cellular energy, for our body. Magnesium also supports healthy bones.

DIETARY MAGNESIUM REQUIREMENTS

The US Food and Nutrition Board (FNB) recommends a dietary allowance magnesium intake of 310–320 mg for American females (≥19 y) and 400–420 mg for American males (≥19 y).

The table below outlines the Recommended dietary Allowance (RDA) for magnesium for all age groups as well as different life stages including pregnancy and lactation.

<table>
<thead>
<tr>
<th>AGE</th>
<th>MALE</th>
<th>FEMALE</th>
<th>PREGNANT</th>
<th>LACTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–3 years</td>
<td>80 mg</td>
<td>80 mg</td>
<td></td>
<td></td>
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<tr>
<td>4–8 years</td>
<td>130 mg</td>
<td>130 mg</td>
<td></td>
<td></td>
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<tr>
<td>9–13 years</td>
<td>240 mg</td>
<td>240 mg</td>
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<td></td>
</tr>
<tr>
<td>14–18 years</td>
<td>410 mg</td>
<td>360 mg</td>
<td>400 mg</td>
<td>360 mg</td>
</tr>
<tr>
<td>19–30 years</td>
<td>400 mg</td>
<td>310 mg</td>
<td>350 mg</td>
<td>310 mg</td>
</tr>
<tr>
<td>31–50 years</td>
<td>420 mg</td>
<td>320 mg</td>
<td>360 mg</td>
<td>320 mg</td>
</tr>
<tr>
<td>51–70 years</td>
<td>420 mg</td>
<td>320 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>71+ years</td>
<td>420 mg</td>
<td>320 mg</td>
<td></td>
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</tr>
</tbody>
</table>

FOOD SOURCES OF MAGNESIUM

Magnesium is found in a variety of foods but at varying levels. Foods that are good sources of magnesium include dark green vegetables, beans and peas, whole grains, as well as nuts and seeds. It is important to include magnesium-rich foods in the diet when possible to help meet individual daily requirements. To meet the RDA for magnesium, you must consume at least 4–8 servings of magnesium-rich foods daily.

DIETARY SUPPLEMENTS

More than 40% of American adults have inadequate magnesium intake from diet alone. If a diet is lacking in magnesium rich foods, you may want to determine an appropriate supplement regimen to help you fill in the gap from your dietary intake. There are various forms of magnesium available such as: magnesium oxide (most common form), magnesium citrate (highly absorbable form†), magnesium glycinate, magnesium gluconate, and magnesium chloride. If additional magnesium is warranted, different strengths of magnesium supplements are offered for the varying needs of consumers. Some individuals may experience mild transient gastrointestinal discomfort (e.g. diarrhea) with use of magnesium supplements. The FNB has set a tolerable upper limit (UL) of ≤ 350 mg for daily magnesium intake from supplements for healthy adults. However, magnesium needs and response to magnesium salts may vary within individuals, particularly those with certain conditions that may need higher levels. You should consult with your healthcare professional to determine the right form and strength to meet your needs.
FACTORS AFFECTING MAGNESIUM STATUS

A variety of factors can affect one’s magnesium status including: age, health conditions, lifestyle factors, nutrient interactions, and medication use.

- **Age:** Mature adults tend to consume less dietary magnesium, and magnesium absorption decreases while urinary magnesium excretion tends to increase with age.¹

- **Health Conditions:** Gastrointestinal disorders (Crohn’s disease, malabsorption syndromes, celiac disease, bariatric surgery, and/or any surgical removal of the intestine or intestinal inflammation due to radiation) may lead to magnesium depletion. Renal disorders and long-term use of certain diuretics may result in increased urinary loss of magnesium.²,³

- **Lifestyle Factors:** Poor dietary intake and gastrointestinal issues from chronic alcoholism also leads to increased urinary loss of magnesium.²,⁴

- **Nutrient Interactions:** High intakes of phosphorus may cause an increase in magnesium excretion, and therefore, a decrease in intestinal magnesium absorption.¹

- **Medication Interactions:** There are some medications that may deplete magnesium from the body including: acid suppressing drugs (i.e. proton pump inhibitors), antibiotics, anti-neoplastic and diuretics drugs.¹,²,⁹–¹⁵ If individuals have impaired kidney function and/or are taking medications, they should use caution with magnesium supplements and consult their healthcare professional before use as magnesium may affect the effectiveness of certain medications. For example, it is important to take magnesium supplements two hours apart from bisphosphonates as magnesium may affect absorption of bisphosphonates.⁶

SO WHAT SHOULD HEALTHCARE PROFESSIONALS DO?

Work with your patients to understand their magnesium needs, and encourage them to consume magnesium-rich foods, such as dark green vegetables, nuts, and seeds regularly. For those who are still unable to meet their needs, discuss the potential to use magnesium supplements as a safe and effective way to incorporate additional magnesium into their diet.

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REFERENCES

5. EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA). Scientific Opinion on the substantiation of health claims related to magnesium and “normal health”, reduction of tiredness and fatigue, contribution to normal psychological functions, maintenance of normal blood glucose concentrations, maintenance of normal blood pressure, protection of DNA, protection of cells from oxidative damage, maintenance of the normal function of the immune system, maintenance of normal blood pressure during pregnancy, resistance to mental stress, reduction of gastric acid levels, maintenance of normal fat metabolism and maintenance of normal muscle contraction. EFSA Journal 2010;10(1):1-14.

These materials are intended for educational purposes only.

*Magnesium citrate is a more highly absorbable form than magnesium oxide

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