



EXCLUSIVE WEBINAR PRESENTATION

**DIETARY SUPPLEMENT USE
IN OLDER ADULTS**

HELP, HYPE, OR HOPE?

**EARN
1 CEU**

PRESENTED BY
Dr. Christine Rosenbloom, PhD, RDN, LD, FAND

WEDNESDAY, JUNE 10, 2020
2-3 PM EDT

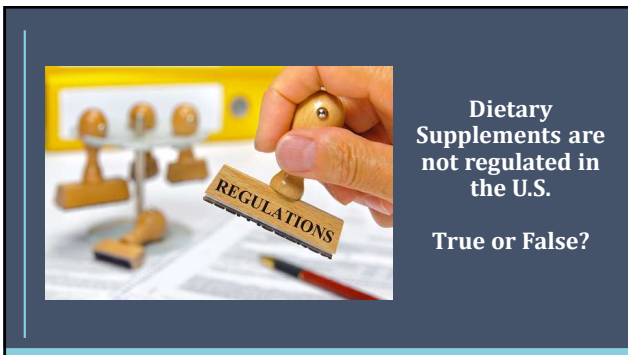
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Learning Objectives

1. Understand the regulations governing dietary supplement use in the U.S.
2. Discuss the research to support the use of common dietary supplements used by older adults.
3. Recognize the potential hazards of polypharmacy when multiple dietary supplements, prescription drugs, and over-the-counter medications are co-ingested.
4. List evidence-based resources on dietary supplements.

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**Dietary
Supplements are
not regulated in
the U.S.**

True or False?

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False

- Dietary supplements are regulated, but not as well as some would like
- FDA regulates both finished dietary supplements and dietary ingredients
- FDA regulates dietary supplements under a different set of regulations than those covering foods and drugs



<https://www.fda.gov/food/dietary-supplements>

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Under the Dietary Supplement Health and Education Act of 1994 (DSHEA):

- Manufacturers and distributors of supplements and ingredients are prohibited from marketing products that are adulterated or misbranded
- Manufacturers are responsible for evaluating the safety and labeling of their products before marketing to ensure that they meet all the requirements of DSHEA and FDA regulation
- FDA is responsible for taking action against adulterated or misbranded dietary supplement product after it reaches the market

<https://www.fda.gov/food/dietary-supplements>

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Regulations: What's Missing?

SAFETY & EFFICACY

FDA is not authorized to review dietary supplement products for safety and effectiveness before they are marketed.



<https://www.fda.gov/food/dietary-supplements/information-consumers-using-dietary-supplements>

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Structure Function Claims

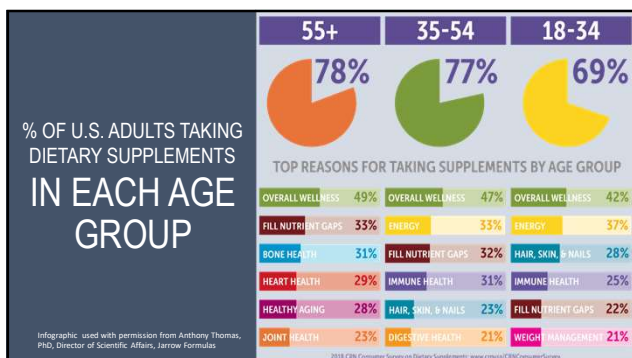
- Concept is confusing to consumers
- Supplements can claim “supports bone health,” but not “prevents osteoporosis”
- Disclaimer must appear:

"This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent disease."



<https://www.consumer.ftc.gov/articles/0261-dietary-supplements>

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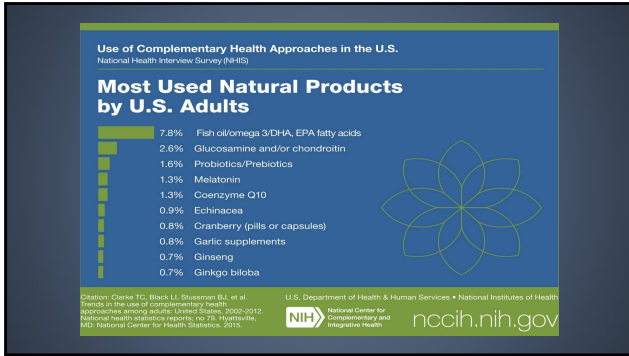
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Top 12 Most Popular Supplements: 55+ adults

1. Multivitamin Minerals (MVMs)	7. Omega 3s
2. Vitamin D	8. Green tea extract
3. Vitamin C	9. Magnesium
4. Protein	10. Probiotics
5. Calcium	11. Vitamin E
6. Vitamin B complex	12. Turmeric

2018 CRN Consumer Survey on Dietary Supplements

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Multivitamin-Minerals (MVM)

- No standard or regulatory definition, such as what nutrients it must contain and at what levels
- Use is highest in:
 - Women
 - Older adults
 - Those with higher education and income
 - Those with healthier lifestyles and diets
 - Those with lower BMIs
 - Residents of the western U.S.

<https://ods.od.nih.gov/factsheets/MVMMS-HealthProfessional/>; Gaihe JJ, Bailey RL, Pottischman N, Dwyer JT. Dietary supplement use was very high among older adults in the United States in 2011-2014. J Nutr. 2017;147:1968-76.

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Multivitamin-Minerals

- Numerous observational studies and RCTs have found no reduction in chronic diseases in MVM users
- Limitations to research on MVMs and disease risk reduction:
 - Most are observational
 - RCTs are short-term (median length of time in the longest trial is 11 years)
 - Impossible to tease out MVM use from confounding variables
 - MVM formulas varied widely, as did dose of nutrients

<https://ods.od.nih.gov/factsheets/MVMMS-HealthProfessional/>; U.S. Preventive Services Task Force. Routine vitamin supplementation to prevent cancer and cardiovascular disease: recommendations and rationale. Ann Intern Med 2003;139:51-55


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Multivitamin-Minerals

- Can help meet nutrient requirements
- Can help supplement nutrients when food intake is reduced
- Can help older adults meet vitamin B12 intake
 - Those over 50 need 2.4 mcg B12/day from crystalline forms found in fortified foods or supplements

<https://www.eatrightpro.org/-/media/eatrightpro-files/practice/position-and-practice-papers/position-papers/micronutrient-supplementation.pdf>



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Choosing Multivitamin-Minerals

- Evaluate the need for a supplement
- Choose a 50+ or "senior" or "silver" formula that contains close to the RDA or AI for nutrients
- Choose a well-known brand to insure GMPs
- MVM is not a replacement for healthy foods
- MVM can't provide all the nutrients needed for good health




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Meet Cathy

- 69-year-old, active adult with osteopenia, mild HTN, and osteoarthritis
- Good appetite, stable weight (BMI 26.4), exercises daily
- Supplement intake includes:

• High potency MVM gummies	• B-complex
• Vitamin C (2 gm/day)	• Magnesium (200 mg/day)
• Calcium (1 gm/day)	• Biotin (2.5 mg/day)
• Vitamin D (1000 IU/day)	• Gelatin capsules



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Vitamin D

- It's complicated!
- Endogenous production
 - 7-dehydrocholesterol
 - Cholecalciferol (D3)
 - Calcidiol (25OHD)
 - Calcitriol (1,25(OH)2D)
- Dietary intake
 - Cholecalciferol (D3)
 - Ergocalciferol (D2)
- VDBP

Reijnen & Soeters. Vitamin D: A magic bullet or a myth. Clin Nutr. <https://doi.org/10.1016/j.clnu.2019.12.028>

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Vitamin D

- Despite years of research there is no consensus on the definition of Vitamin D deficiency
- What is agreed upon is that plasma or serum 25(OH)D concentration should be used to assess Vitamin D status
 - Reflects both diet and skin synthesis
 - Long half life of 2-3 weeks
- Consensus that older adults are at risk of insufficiency

Reijnen & Soeters. Vitamin D: A magic bullet or a myth. Clin Nutr. <https://doi.org/10.1016/j.clnu.2019.12.028>. NIH Office of Dietary Supplements: Vitamin D Fact Sheet for Health Professionals. <https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/>; Consumer Lab https://www.consumerlab.com/reviews/vitamin_d_supplements_review/Vitamin-D/

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Serum 25(OH)D Concentrations and Health

nmol/L	ng/mL	Health Status
Less than 30	Less than 12	Associated with vitamin D deficiency leading to osteomalacia in adults
30 to less than 50	12 to less than 20	Generally considered inadequate for bone and overall health in healthy individuals
Greater than or equal to 50	Greater than or equal to 20	Generally considered adequate for bone and overall health in healthy individuals
Greater than 125	Greater than 50	Emerging evidence links potential adverse effects to such high levels, particularly >150 nmol/L (>60 ng/mL)

Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes for Calcium and Vitamin D. Washington, DC: National Academy Press, 2010. NIH Office of Dietary Supplements: Vitamin D Fact Sheet for Health Professionals. <https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/>

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RDA for Vitamin D

Age	Male	Female
51 to 70	600 IU (15 mcg)	600 IU (15 mcg)
>70	800 IU (20 mcg)	800 IU (20 mcg)

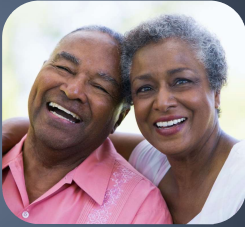
- For every 1 ng/mL increase, an additional 100 IU/day is needed
- Individuals with obesity may need to double the amount
- It can take 6 weeks to see improvement and reach peak
- Take supplement with largest meal of the day
- D2 or D3?
- Don't over do it

Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes for Calcium and Vitamin D. Washington, DC: National Academy Press, 2010. NIH Office of Dietary Supplements: Vitamin D Fact Sheet for Health Professionals, Consumer Lab https://www.consumerlab.com/reviews/vitamin_d_supplements_review/vitamin_d/

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Meet David

- 65-year-old, African-American male, recently retired from insurance sales
- Post-status hip replacement surgery from osteoarthritis
- Ht" 6'0"; Wt 240 pounds; BMI 32.5
- Vitamin D status: 15 ng/mL
- Dairy-free diet (lactose intolerance), doesn't like seafood



Powe CE, Evans MK, Wenger J, et al. Vitamin D-Binding Protein and Vitamin D Status of Black Americans and White Americans. *N Engl J Med*. 2013; 369(21): 1991-2000

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Magnesium

- Co-factor in more than 600 enzyme systems helping to regulate protein synthesis, nerve and muscle function, blood pressure, and glucose control
- RDA for 51+ adults is 420 mg/day for males and 320 mg/day for females
- Widely available in foods and generally foods high in fiber are good sources of Mg (nuts, seeds, whole grains, leafy greens)
- Tap and bottled water can be a good source but ranges from 1 mg/L to 120 mg/L

<https://ods.od.nih.gov/factsheets/Magnesium-HealthProfessional/>

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Magnesium

- Older adults have lower intakes of Mg (half of all Americans don't get enough)
- Mg absorption from the gut decreases and renal magnesium excretion increases with age
- Older adults are also more likely to have chronic diseases or take medications that alter magnesium status, which can increase their risk of magnesium depletion
- Some evidence suggests that Mg intake is significantly associated with sarcopenia

<https://ods.od.nih.gov/factsheets/Magnesium-HealthProfessional/>; van Dronkelaar C, van Velzen A, Abdelrazek M, et al. Minerals and sarcopenia: the role of calcium, iron, magnesium, phosphorus, potassium, selenium, sodium, and zinc on muscle mass, muscle strength, and physical performance in older adults: A Systematic Review. JAMDA. 2018;19:6-11.

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Magnesium

- DV was increased to 420 mg from 400 mg
- MVM have only about 100 mg, some less
- More than 350 mg from supplements can cause diarrhea so UL from supplements (not diet) is set at 350 mg/day

Nutrition Action Health Letter, March 2020 <https://ods.od.nih.gov/factsheets/Magnesium-HealthProfessional/>

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Magnesium and Medications

Medication	Concerns
Bisphosphonates	Mg-rich supplements decrease absorption of drug; take at least 2 hours apart from supplements
Antibiotics	Mg binds with drug; take supplements 2 hours before or 4-6 hours after drug
Loop Diuretics	Increases Mg excretion in urine leading to depletion
Proton Pump Inhibitors	Long term use causes hypomagnesium and in about a quarter of patients, supplements doesn't raise MG levels so may need to be D/C

<https://ods.od.nih.gov/factsheets/Magnesium-HealthProfessional/>

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Omega-3s (EPA and DHA)

- No RDA for EPA or DHA but most expert groups endorse intakes of 250-300 mg/day EPA and DHA for cardiovascular health
- Translates into ~2 servings of fatty fish each week
- Although older adults tend to consume more fish that are high in ω -3 fatty acids compared to younger adults, their intake remains suboptimal, with a mean of 0.19 ± 0.02 oz/day
- ALA, found in flaxseed, chia seeds, walnuts, and other plant foods is converted at a low rate to EPA (~8 to 20%) and DHA (~0 to 9%)

https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/; Papanikolaou Y, Brooks J, Reider C, Fulgoni V.LJ, III U.S. Adults are not meeting recommended levels for fish and omega-3 fatty acid intake: Results of an analysis using observational data from NHANES 2003-2008. *Nutr J*. 2014;13:31.

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Omega-3s (EPA and DHA)

We often think about EPA and DHA for heart health, research also supports their role in cognition, vision, and muscle health:

- Dietary ω -3 and ω -6 fatty acids intake might be inversely associated with low cognitive performance for participants aged 60 years or older in the U.S.
- Anabolic role on skeletal muscle is thought to be related to reduction in pro-inflammatory cytokines
- Recent evidence supports a higher protein intake recommendation of 1.0 to 1.2 g/kg/day in healthy older adults; an evenly distributed mealtime protein intake or minimal protein per meal may be beneficial
- In addition, vitamin D supplementation of 800 to 1000 IU, particularly when vitamin D status is low, and doses of ~3 g/day of ω -3 fatty acids may be favorable for physical function, muscle mass, and strength

Xue D, Shiru L, Jiahao C, et al. Association of ω -3 and ω -6 fatty acids intake with cognitive performance in older adults: NHANES 2011-2014. *Nutr J*. 2020; 19: 25
Tessier AJ & Chevalliers S. An Update on Protein, Leucine, Omega-3 Fatty Acids, and Vitamin D in the Prevention and Treatment of Sarcopenia and Functional Decline. *Nutrients*. 2018;10(8): pii: E1099. doi: 10.3390/nu10081099.

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Meet Bonnie


- 80-year-old female who practices yoga daily, walks 3 miles a day, and describes herself as a pescatarian
- Her favorite fish include salmon and Arctic Char and she enjoys shrimp and scallops
- She also uses omega-3 fortified eggs every morning
- She wants to know if she should add an omega-3 supplement
 - Evaluate her seafood choices
 - Evaluate her fortified food choices
 - Consider Omega-3 index testing
 - Levels of 8 to 12% are associated with better overall health



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Turmeric (Curcumin)

- A yellow-orange Indian spice containing 3 phenolic curcuminoids with ~77% being curcumin
- Poor bioavailability
- Rapidly absorbed, metabolized and excreted
- Ingesting it with black pepper extract, piperine, can increase bioavailability 20-fold



https://naturalmedicines.therapeuticresearch.com/databases/food_herbs-supplements/DA/26/
<https://www.consumerlab.com/reviews/turmeric-curcumin-supplements-spice-review/turmeric-professional.asp?productid=662>

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Turmeric

Appears to have properties as:

- Antioxidant
- Anti-inflammatory
- Antibacterial
- Anticancer

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Turmeric

- Some evidence in small clinical studies for use in osteoarthritis and hyperlipidemia. Also used for inflammatory conditions such as irritable bowel syndrome (IBS), Crohn disease, rheumatoid arthritis (RA), and others, but there is insufficient reliable information to rate its effectiveness for these uses
- Likely safe when turmeric products containing up to 8 grams of curcumin are used orally. Side effects are most common at higher doses and may include gastrointestinal complaints such as nausea, diarrhea, constipation, and dyspepsia
- Should not be used in those with gallbladder disease

https://naturalmedicines.therapeuticresearch.com/databases/food_herbs-supplements/professional.asp?productid=662

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Turmeric

Consumer Lab found prices for 500 mg curcuminoids to range from \$0.20 to \$11.56

McCormick Ground Turmeric was found to have the highest concentration of curcumins of spices evaluated (and the least filth!)

<https://www.consumerlab.com/reviews/turmeric-curcumin-supplements-spice-review/turmeric/#>

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Meet William

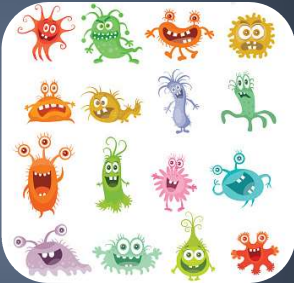
- 71-year-old male, with hyperlipidemia and strong family history of coronary artery disease
- He is very fit and active and wants to do all he can to stay healthy
- He recently discovered Dr. Michael Greger's book, "How Not to Die," and the book convinced him to become a vegetarian
- He also started taking turmeric as the fresh ground root purchased from an Asian market; he grates the root and eats about ¼ cup per day, added to soups, stews, eggs, and golden milk
- After 2 weeks, he started to experience stomach upset and heartburn



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Probiotics

Probiotics are "live microorganisms that, when administered in adequate amounts, confer a health benefit on the host."




WHO/FAO definition

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Probiotics: Three Questions

When someone asks if they should take a probiotic, start with 3 questions:

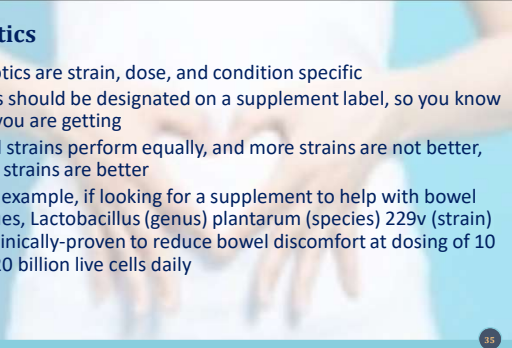
1. What is the reason for taking a probiotic supplement?
2. Is there a specific health problem that you are trying to alleviate by taking a probiotic supplement?
3. What dietary sources of probiotics are you consuming? And, is your diet rich in not only probiotics, but prebiotics and dietary fiber?



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Probiotics

- Probiotics are strain, dose, and condition specific
- Strains should be designated on a supplement label, so you know what you are getting
- Not all strains perform equally, and more strains are not better, better strains are better
 - For example, if looking for a supplement to help with bowel issues, Lactobacillus (genus) plantarum (species) 229v (strain) is clinically-proven to reduce bowel discomfort at dosing of 10 to 20 billion live cells daily

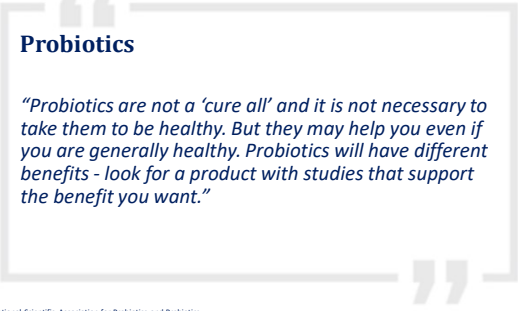


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Probiotics

“Probiotics are not a ‘cure all’ and it is not necessary to take them to be healthy. But they may help you even if you are generally healthy. Probiotics will have different benefits - look for a product with studies that support the benefit you want.”


International Scientific Association for Probiotics and Prebiotics



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Meet Gail


- 80-year-old, healthy female who sees ads for probiotics and asks if she should take one
- Let's go back to the 3 questions...
 1. What is the reason for taking a probiotic supplement?
 2. Is there a specific health problem you are trying to alleviate?
 3. What dietary sources of probiotics are you consuming and is your diet rich in probiotics, prebiotics, and dietary fiber?



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CoQ10

- CoQ10 is a naturally occurring antioxidant used for energy production within cells
- Synthesized in heart, liver, kidneys, and pancreas
- Levels naturally decline with age; peaking about age 60
- Levels also decline with statin use, ~16-54%




<https://www.consumerlab.com/reviews/CoQ10-Ubiquinol-Supplements-Review/CoQ10/>

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CoQ10


- After absorption, 90% of CoQ10 is converted to active form, ubiquinol
- Only small amounts are in foods, so supplements are common
- Best evidence for supplementation is in congestive heart failure (CHF)
 - Doses of 100- 300 mg BID appear effective



<https://www.consumerlab.com/reviews/CoQ10-Ubiquinol-Supplements-Review/CoQ10/>

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CoQ10




- Despite claims that CoQ10 can prevent or treat statin-associated muscle symptoms (SAMS), evidence is equivocal
- In a recent systematic review with 294 participants in the CoQ10 supplemented group vs. 281 in placebo, the authors concluded supplementation with 100 to 600 mg/day (30 days to 3 months) ameliorated SAMSs, implying that CoQ10 supplementation might be complementary

Qu H, Guo M, Chal H, et al. Effects of Coenzyme Q10 on statin-induced myopathy: an updated meta-analysis of randomized control trials. J Am H Assoc. 2018;7(15)

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CoQ10

- However, the majority of published papers, from systematic reviews to meta-analysis to expert opinion, find no benefit of supplementation
- Reasons include:
 1. Varied definitions of SAMS
 2. Poorly understood etiology of SAMS
 3. Inconsistent statin effect on CoQ10 levels




Tan JT & Barry AR. Coenzyme Q10 supplementation in the management of statin-associated myalgia. Am J Health-Syst Phar. 2017;74(11):786-793.
Nikolic D, Banach M, Chianetta R et al. An overview of statin-induced myopathy and perspectives for the future, Expert Opin on Drug Safety. 2020.
Kennedy K, Koller V, Sankova E. Effect of coenzyme Q10 on statin-associated myalgia and adherence to statin therapy: a systematic review and meta-analysis. Atherosclerosis. 2020;299:1-6.

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Consider Polypharmacy

A study was designed to identify changing patterns in medication use, including prescription, over-the-counter, and dietary supplements, in adults 62-85 years of age:

- Major findings regarding prescription medications included a robust increase in the use of five or more prescription medications
- There was a substantial increase in the number of people taking five or more medications and supplements (not just prescription medications), a significant decline in use of over-the-counter medications, and a significant increase in the use of dietary supplements
- An estimated 15% of older Americans are at risk of major drug-drug interactions, compared to 8.4% in 2005



Quinn DM, W. Ilder J, Schumm LR et al. Changes in prescription and over-the-counter medication and dietary supplement use among older adults in the United States, 2005 vs 2011. JAMA Intern Med 2016; 176:473-482.

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Summary

Over 75% of older adults take dietary supplements **with little guidance** from health care professionals on safety, efficacy, dosage, forms, or potential for drug interactions

It is within the RDNs scope of practice to **provide guidance** on dietary supplements

We have an **obligation** to give evidence-based advice about the risk-benefits of dietary supplement use

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Resources

FDA Tips for Older Dietary Supplement Consumers

- <https://www.fda.gov/food/information-consumers-using-dietary-supplements/tips-older-dietary-supplement-users>

NIH National Center for Complementary and Integrative Health

- <https://www.nccih.nih.gov/>

Office of Dietary Supplements

- <https://ods.od.nih.gov/>

Position paper on micronutrient supplementation

- <https://www.eatrightpro.org/L/media/eatrightpro-files/practice/position-and-practice-papers/position-papers/micronutrientsupplementation.pdf>

Consumer Lab (subscription required)

- <https://www.consumerlab.com/>

Natural Medicines (subscription required but free with some DPG memberships)

- <https://naturalmedicines.therapeuticevidence.com/>

International Scientific Association for Probiotics and Prebiotics

- <https://isapscience.org/>

"Gut Insight" by JoAnn Hattner & Susan Anderes

- <http://gutinsight.com/>

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Questions?

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Credit Claiming

You must complete a brief evaluation of the program in order to obtain your certificate. The evaluation will be available for 1 year; you do not have to complete it today.

CREDIT CLAIMING INSTRUCTIONS:

1. Login to CE.TodaysDietitian.com
2. Click "My Courses" and select this webinar's title
3. Click "Take Course" on the webinar description page
4. Select "Start/Resume" to complete the course and submit the evaluation
5. Download and print your certificate
