



Integrative and Functional Nutrition Training 2023

Supplement Savvy:

Everything You Need to Know to Become an Expert in Dietary Supplements

Best Practices Workshop

Unit 1B

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Nutrition Supplements Best Practices





Supplement Best Practices

- RDA vs Therapeutic Levels of nutrients?
- Powders/liquids, tablets, capsules, gummies?
 - Gummies? Usually not advised unless for very young – just another excuse to have sweet!
 - Those with absorption issues may do better with liquids/powders, and capsules and will always be better with divided doses



Pay attention to serving size and dosing instructions, especially when comparing supplements

Supplement Facts Serving Size: 1 Capsule Servings Per Container: 100						
Amount Per Serving		%Daily Value				
Vitamin D₃ (as cholecalciferol)	5,000 IU	1250%				

Other Ingredients: Stabilized rice bran and vegetarian capsule (hypromellose).



Supplements Should Contain Minimal, "Extra" Ingredients:

- Yeast
- Fillers
- Colorings
- Preservatives

- Hydrogenated oils
- Polyethylene glycol
- High fructose corn syrup

Note: tablets must contain binders and caps/powders often time have flow agents Capsules may have less extra ingredients vs tablets overall



Choose Chelated Minerals

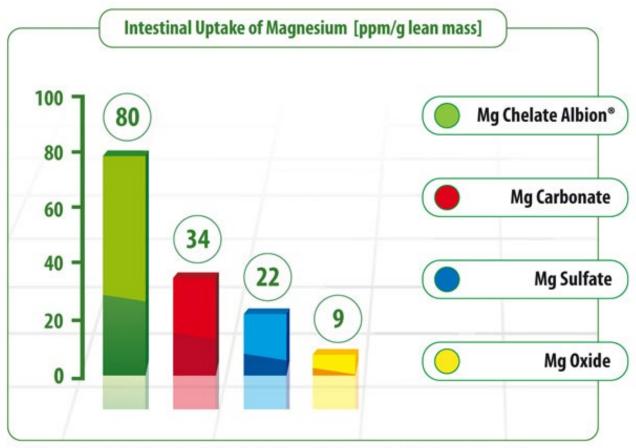
- Better absorption bound to an amino acid or Kreb's Cycle intermediate
- Examples: citrate, glycinate, arginate, oritate, malate, fumarate,
 & succinate
 - The amino acid, glycine, is the smallest amino acid, which makes it an ideal chelating agent. Because it is small, it is easily absorbed through the intestinal wall. It also forms stable bonds with minerals and doesn't release them prematurely. An example of a mineral chelated with glycine is magnesium bisglycinate
- Avoid elemental carbonate, sulfate, and oxide as sole source

^{1.} Wegmüller R, Tay F, Zeder C, Brnic M, Hurrell RF. Zinc absorption by young adults from supplemental zinc citrate is comparable with that from zinc gluconate and higher than from zinc oxide. J Nutr. 2014;144(2):132-136. doi:10.3945/jn.113.181487

^{2.} Blancquaert L, Vervaet C, Derave W. Predicting and Testing Bioavailability of Magnesium Supplements. Nutrients. 2019;11(7):1663. Published 2019 Jul 20. doi:10.3390/nu11071663



Magnesium Absorption



Albion® Magnesium Amino Acid Chelate was absorbed at a rate that was:

*2.3 times greater than magnesium carbonate, *3.6 times greater than magnesium sulfate, *8.8 times greater than magnesium oxide.

source: Magnesium: Wide Spread Benefits. Albion Research Notes 1992: Volume 1, No. 2



Best Practices:

- Can you open up caps and add to food?
 Yes but...
 - Some nutrients taste bad careful
 - Many vitamins can be destroyed by heat don't add to anything heated
- Watch cross-over nutrients in multiple products
 - Imbalanced nutrients article in handouts
- Vitamins can oxidize affected by heat, air, and light do not buy vitamins in a clear plastic bottle!
 - Watch pill boxes need to be opaque and airtight. Caution transferring large amounts to these type of containers!
 - Do not store in a clear plastic baggie! Also, maybe not good to put in pocket (body heat)



Best Practices:

- Mind expiration dates only choose products that have!
- Always ask your clients to check with you before adding anything on their own!
- Make vitamins accessible to ensure consistency of intake
 - Don't store out of sight if you'll forget to take otherwise.
 - Typically, don't store in the fridge or bathroom (humidity)
- Create a supplement intake direction sheet for your clients so it's easy for them to now what to take when – with food or without



Supplement Record

My Dietary Supple	Date							
Enter all of the Dietary Supplements, Prescription Drugs, and Over-the-Counter Medicines that You Take.								
What I'm Using Dietary supplement, prescription drug or over-the-counter medicine (product name and active ingredients)	What It Looks Like Color, shape, size, markings, etc.	How Much Dose	How to Use and When	Start/Stop Dates	Why I'm Using	Who Told Me to Use and How to Contact		
EXAMPLE: Calcium – Calcium Carbonate	White oval tablet	500 mg	Take orally, 1 time a day with food	9/15/18 to present	Bone health	Dr. S. Smith (800) 555-1212		





Patient Protocol Template (Handout provided)

When	Supplement	Dose
Rising		
Brand	Supplement name	10 mg
	Supplement name	1 cap
	Supplement name	2 tabs
Breakfast		
Mid Morning		
Lunch		
Mid Afternoon		
Wild Arterilloon		
Dinner		
Before Bed		



Swallowing Issues



- A study by researchers from the University of Heidelberg in Germany may help people with pill swallowing difficulties.
 - two techniques that can help people improve their ability to get medicine down
 - Pop-Bottle method: The result: a 60% improvement in swallowing over the old method of just taking a sip of water from a cup and trying to swallow
 - an improvement of 89% over the old method of taking a sip of water from a cup and trying to swallow
- Some have an aversion to swallowing pills based on a past adverse event
- Others have physical issue that affects their swallowing ability

Julia T. Schiele, Hendrik Schneider, Renate Quinzler, et al. Two Techniques to Make Swallowing Pills Easier. The Annals of Family Medicine Nov 2014, 12 (6) 550-552; DOI: 10.1370/afm.1693



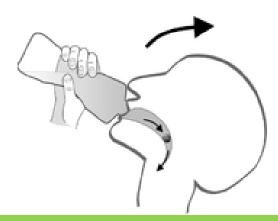
Two Methods to Help with Swallowing Pills

How to Swallow Pills More Easily

Do you have trouble swallowing tablets or capsules, especially large ones? Do they stick in your mouth or throat? Do you have an unpleasant feeling while swallowing? If so, these tips might help. Something called the "pop-bottle method" can help you swallow tablets. And the "lean forward technique" can help with swallowing capsules. Here's how:

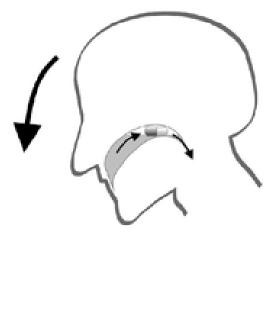
Pop-bottle method for tablets

- Fill a flexible plastic water bottle or pop bottle with water.
- Put the tablet on your tongue and close your lips tightly around the opening of the bottle.
- Take a drink from the bottle, keeping contact between the bottle and your lips by pursing your lips and using a sucking motion. Swallow the water and the pill right away.
- Don't let air get into the bottle as you swallow. You should feel the bottle squeeze in on itself as you swallow.



Lean-forward technique for capsules

- 1. Put the capsule on your tongue.
- Take a medium sip of water, but do not swallow yet.
- Bend the head forward by tilting your chin slightly toward your chest.
- Swallow the capsule and the water with the head bent forward.



Julia T. Schiele, Hendrik Schneider, Renate Quinzler, et al. Two Techniques to Make Swallowing Pills Easier. The Annals of Family Medicine Nov 2014, 12 (6) 550-552; DOI: 10.1370/afm.1693



Tips on Getting Children to Take Supplements

- If swallowing is an issue, open caps, or crush tabs and add to liquids or pudding, applesauce, yogurts or sorbets
 - If the addition to a liquid changes the color, consider giving in an opaque or sippy cup.
 - Do not heat a food after adding supplements, though may be okay to add to already warmed (not hot) food.
 - Powdered or liquid supplements can be added to juice pops
- Add fish oil to nut butter
- Mommy/Daddy "Just like me method"

Compart P and Laake D. The ADHD and Autism Nutritional Supplement Handbook: The Cutting-Edge Biomedical Approach to treating the Underlying Deficiancies and Symptoms of ADHD and Autism. Fair Winds Press; Reprint edition (March 1, 2016)



More Methods...

- Use a Thick Drink
 - such as a milkshake, smoothie, or papaya juice. It's believed that this strategy
 works because people with sensitive gag reflexes find that their reflex is eased
 by the thickness of the beverage, allowing them to swallow the vitamin more
 easily.
- Add a Banana
 - Take a vitamin with a bite of banana. For this, take a bite of banana and chew it into a mash without swallowing. Then, place the vitamin in your mouth in the center of the banana mash. Take a big sip of water and swallow the vitamin and the banana mash together. Combining the vitamin with some mashed banana will help soothe a sensitive gag reflex. Mashed potato may work the same
 - Some will place the pill inside a banana
- Use a Straw
 - Much like the pop-bottle method, using a straw distracts your brain from focusing on the act of swallowing a vitamin or pill. By using a straw to suck up liquid and wash down your vitamin, your brain will focus on the action of sucking up the water and sealing the straw off with your lips at the same time. There are even special straws that are designed to facilitate swallowing vitamins.



More Methods

Drink Water

The old fashioned way to take a vitamin or pill is to swallow it with water, but this actually isn't the optimum method. While most people place a pill or vitamin on their tongue and then drink water to wash it down, it may help to perform the action in reverse. Take a large sip of water before placing the pill in your mouth, and concentrate on the idea of successfully swallowing it. The pill may wash down your throat with the large gulp of water.

Let it float

Multivitamins in a capsule form more float, unlike tablets, which
often sink because they are heavier than water, capsules are
usually lighter than water, which can sometimes make them easier
to swallow.



Considerations

- Trouble with the coordination of any of the nerves and muscles involved in the swallowing process can lead to choking or getting food or liquid into your lungs, potentially causing a type of pneumonia.
 - Consider "histamine reactions", even that which is brought on by stress
 - Reflux/heartburn; people with scarring of the esophagus
 - Stroke victims and other neurological disorders (i. e. Parkinson's or Alzheimer's)
 - Dry mouth, often times from medication side effects
- Consider supplements that can be absorbed through the skin (glutathione, zinc, vitamin D); transdermal applications, or check with a compounding pharmacist
 - Alternative for those post gastric surgery?
 - Though, issues with absorbency and reactions to adhesives may be a concern, and little evidence exists to support their effectiveness



Transdermal Delivery?

- Some studies are looking at the effectiveness of vitamin patches for people who have undergone bariatric weight loss surgery, a procedure that can make it difficult to absorb nutrients by mouth.
- However, the results have not been promising.
 - For instance, one small review published in 2019 looked at how people who underwent laparoscopic gastric bypass surgery responded to either a multivitamin patch or pill.
 - 81% of patients who used the patches experienced a deficiency in vitamin D, compared with just 36% who took oral supplements.
 - Those using patches also had lower blood levels of vitamins B1 and B12, suggesting that some nutrients may not be well absorbed through the skin.

Saurabh S, Gao Y, Maduka S, Smith L, Lasley R, Singh N. Is Transdermal Multivitamin Patch Effective in Gastric Bypass Patients? Obes Surg. 2019 Dec;29(12):3818-3823. doi: 10.1007/s11695-019-04070-5. PMID: 31302845.





Problem With Patches

"A dietary supplement must be intended for ingestion," an FDA spokesperson explained over an email exchange. "Because of this, transdermal patches cannot be dietary supplements and, therefore, are not regulated as supplements. Generally, the FDA considers any patch product that is promoted as a dietary supplement with claims to affect the structure or function of the body to be an unapproved new drug."

Onstot L. Medically reviewed: Cody, Stanford F and Sauragh S, Here's Why Vitamin Patches Aren't Worth Your Time or Money. https://www.wellandgood.com/do-vitamin-patcheswork/. August 14th, 2023. Retrieved September 30, 2023.



What NOT to Do!

- Don't throw vitamins towards the back of your mouth. This is more likely to activate your gag reflex and make swallowing pills more difficult.
- Don't tip your head back too far when trying to swallow pills or vitamins, as this can close off the throat and make the process more difficult.
- Caution with crushing a pill, or opening a vitamin capsule, also, cutting a pill with a pill splitter and swallowing the smaller pieces one by one.
 - Can alter the state of a supplement, as in the case of a timerelease formula
 - Sharpe edges can effect swallowing
 - Some vitamins taste bad and this could affect compliance
 - Ask your clients to check with you first



More Research on **Swallowing Issues**

- Schiele JT, Quinzler R, Klimm HD, Pruszydlo MG, Haefeli WE. Difficulties swallowing solid oral dosage forms in a general practice population: prevalence, causes, and relationship to dosage forms. Eur J Clin Pharmacol. 2013;69(4):937–948.CrossRefPubMedGoogle Scholar
- Llorca PM. Discussion of prevalence and management of discomfort when swallowing pills: orodispersible tablets expand treatment options in patients with depression. Ther Deliv. 2011;2(5):611–622.CrossRefPubMedGoogle Scholar
- Osterberg L, Blaschke T. Adherence to medication. N Engl J Med. 2005;353(5):487–497.CrossRefPubMedGoogle Scholar
- Yamamoto S, Taniguchi H, Hayashi H, et al. How do tablet properties influence swallowing behaviours? J Pharm Pharmacol. 2014;66(1):32–39.CrossRefPubMedGoogle Scholar
- Fowler JF Jr. A helpful aid for pill swallowing: the pop-bottle method. Cutis. 1986;37(6):461.PubMedGoogle Scholar
- MacLeod AD, Vella-Brincat J, Frampton C. Swallowing capsules. Palliat Med. 2003;17(6):559.FREE Full TextGoogle Scholar
- Sakuma T, Kida I. Relationship between ease of swallowing and deglutition-related muscle activity in various postures. J Oral Rehabil. 2010;37(8):583–589.PubMedGoogle Scholar
- Kaplan BJ, Steiger RA, Pope J, Marsh A, Sharp M, Crawford SG. Successful treatment of pill-swallowing difficulties with head posture practice. Paediatr Child Health. 2010;15(5):e1–e5.PubMedGoogle Scholar
- Osmanoglou E, Van Der Voort IR, Fach K, et al. Oesophageal transport of solid dosage forms depends on body position, swallowing volume and pharyngeal propulsion velocity. Neurogastroenterol Motil. 2004;16(5):547– 556.CrossRefPubMedGoogle Scholar
- Chisaka H, Matsushima Y, Wada F, Saeki S, Hachisuka K. Dynamics of capsule swallowing by healthy young men and capsule transit time from the mouth to the stomach. Dysphagia. 2006;21(4):275–279.PubMedGoogle Scholar



Economic Factors Impacting Adherence

Especially when it comes to supplements...

- Educate client about the benefits, both direct and indirect
- Provide weekly/monthly cost breakdown
- If necessary, rank recommendations
- Provide HSA/FSA forms



Choosing a simple multivitamin may not be so simple!





Basic Multivitamin/Mineral

- For some, a one-a-day is fine but for many, this is not the case.
 - Best made to give in multiple doses
 - One-a-day can only provide so much (water-soluble) at once, that can be absorbed
 - Fat-soluble vitamins will be retained, which is why we can't recommend anyone take a one-a-day more than once a day
- Vitamins best taken with food
 - Herbs usually best between meals
 - Individual minerals vary on best timing
 - Competition for absorption/receptors



Be Mindful of Duplicate Ingredients

 Dietary supplements may contain 100% or more of daily nutrient intake recommendations; therefore, use of two or more dietary supplements could lead to intakes above recommended upper limits if the products contain any of the same ingredients!

Bailey RL, Gahche JJ, Lentino CV, et al. Dietary supplement use in the United States, 2003-2006. J Nutr 2011;141:261–6. doi.10.3945/jn.110.133025



Criteria for Choosing a Multivitamin



- All main vitamins <u>and minerals</u> contained but...
 - With or without Iron?
 - Vitamin E: Natural vs. Synthetic?
- Vitamin A: Beta Carotene vs.
 Vitamin A?
- Gender or condition specific?



Basic Multivitamin

Iron, No Iron?

- Determine need
- Determine contraindications
- Follow up monitoring
- Give calcium (other minerals) separately?



Active B Vitamins to cover genomically weak converters?

- B2: Riboflavin 5-Phosphate
- B6: Pyridoxal 5-Phospahte
- Folic acid: 5-methyl tetrahydrofolate
- B12: Methylcobalamin



Comprehensive Multivitamin

"Everything, but the kitchen sink" vitamins often contain extras such as digestive enzymes, probiotics, EFA and herbs - use with caution:

- May not store as well
- Quality issue (oxidation)
- Is there even enough of each ingredient to make a difference? (next slide)



Specialty Multivitamin

- Gender Specific & Condition Specific
- For Diabetics
 - added chromium, etc
- For Heart Health:
 - added L-carnitine, garlic, etc
- Cancer specific
 - Copper? Iron?

But, do they have enough added ingredients

to make a difference?



Children's Multi Flintstones

The #1 Children's Vitamin Brand in the US ... a shocking list of unhealthy ingredients, including:

- Aspartame
- Cupric Oxide
- Coal tar artificial coloring agents (FD&C Blue #2, Red #40, Yellow #6)
- Zinc Oxide
- Sorbitol
- Ferrous Fumarate
- DL-alpha tocopherol (synthetic vitamin E)
- Hydrogenated Oil (Soybean)
- GMO Corn starch



Top Pharma-Brand of Children's Vitamins Contains Aspartame, GMOs. & Other Hazardous Chemicals. Top Pharma-Brand of Children's Vitamins Contains Aspartame, GMOs. https://www.greenmedinfo.com/blog/top-us-brand-childrens-vitamins-contains-aspartame-gmos-other-hazardous-chemicals1?utm_campaign=Daily+Newsletter%3A+Top+Pharma-Brand+of+Children%27s+Vitamins+Contains+Aspartame%2C+GMOs%2C+%26+Other+Hazardous+Chemicals+%28YzjMmV%29&utm_medium=email&utm_source=Daily+Newsletter&_ke=eyJrbF9lbWFpbCl6ICJpZm1udHJkQGdtYWlsLmNvbSlsICJrbF9jb21wYW55X2lkljoglksydlhBeSJ9. Published July 3, 2015. Accessed January 18, 2021.



What About "Whole Food" Sourced Vitamins?



- More bioavailable? (not necessarily)
- Potential allergy issue? (yes)
- Therapeutic levels? (not usually)
 - Especially for those who don't take full dosing (common)
- Contamination?

(can occur more often)

ConsumerLab Finds Quality Issues In Greens & Whole Foods Supplements. Nutraceuticals World. https://www.nutraceuticalsworld.com/issues/2016-10/view_breaking-news/consumerlab -finds-quality-issues-in-greens-whole-foods-supplements/. Accessed January 18, 2021.



General Guidelines for Children

- The vitamin status of a child depends on many factors and most of the clinical studies do not take into account the different access to adequate nutrition of children coming from different countries and the consequent major differences in micronutrients or vitamin deficits between low-income and high-income countries.
- Vitamin supplementation is indicated in all those conditions in which a
 vitamin deficiency is found, either because of a reduced intake due to
 scarce availability of certain foods, unbalanced or restrictive diets, or
 inadequate absorption. Even in children with Western-style diets it is
 important to search for risk factors that could influence vitamin status,
 as deficiencies are a common finding also in this population.
 - Best to assess thoroughly via testing
- Generally, adult dosing is based on a 150 lb reference adult.
 Many base children's dosing relative to this

Martini L, Pecoraro L, Salvottini C, Piacentini G, Atkinson R, Pietrobelli A. Appropriate and inappropriate vitamin supplementation in children. J Nutr Sci. 2020 Jun 5;9:e20. doi: 10.1017/jns.2020.12. PMID: 32577225; PMCID: PMC7288613.



IV Nutritional Therapies

- Intravenous (IV) therapy gives vitamins, minerals, and amino acids directly into the bloodstream to correct intracellular nutrient deficiencies.
- Oral intake of therapeutic doses is often not possible due to absorption limitations from the digestive process.
- Patients can get up to 10 times the nutrients in one treatment as they could orally in one day.

^{1.} Gaby AR (2002) Intravenous Nutrient Therapy: the "Myers' Cocktail". Alternative Medicine Review 7 (5): 389 – 403.

^{2.} Ali A, Njike VY, Northrup V, et al. Intravenous Micronutrient Therapy (Myers' Cocktail) for Fibromyalgia: A Placebo-Controlled Pilot Study. *The Journal of Alternative and Complementary Medicine*. 2009;15(3):247-257. doi:10.1089/acm.2008.0410



IV Nutritional Therapies

- Very large doses can be administered via IV without gastrointestinal side effects, which can limit dosing.
- Example: vitamin C. Tolerated in fairly small amounts orally before causing stomach upset. In contrast, large doses of C, beneficial for the immune system, can be administered safely and without stomach side effects with an IV delivery route.



Is There a Real Need?

- More than just an issue of not getting enough from our food, proponents of vitamin and mineral drips point to other barriers to optimal nutrient status and intake such as:
 - Poor digestion and absorption
 - Food allergies and sensitivities
 - Chronic inflammation
 - Chronic diseases

Ali A, Njike VY, Northrup V, Sabina AB, Williams AL, Liberti LS, Perlman Al, Adelson H, Katz DL. Intravenous micronutrient therapy (Myers' Cocktail) for fibromyalgia: a placebocontrolled pilot study. J Altern Complement Med. 2009 Mar;15(3):247-57. doi: 10.1089/acm.2008.0410. PMID: 19250003; PMCID: PMC2894814.



Popular IV "Cocktails" Include:

- Alpha Lipoic Acid IV is used for diabetes, diabetic neuropathy, liver disease and stroke and brain disorders.
- **Glutathione** IV for cataracts, glaucoma, alcoholism, asthma, cancers, heart disease, high cholesterol, AIDs, Chronic Fatigue, Alzheimer's disease, Osteoarthritis, Parkinson's disease, diabetes, COPD, allergies, IBS, Crohn's and impaired liver function.
- Chelation IV therapy uses either calcium EDTA or disodium EDTA to remove heavy metals, improve blood flow, and remove chemicals that damage arteries. Chelation therapy has shown benefits for hypertension, heart disease, cognitive issues, poor circulation, autism, diabetic complications, and more.



Popular Cocktails Include:

- Rapid Mineral Replacement (RMR) IV protocol infuses high concentrations of minerals to quickly boost energy and alkalinize the body. It is used for stress-related disorders, exhaustion, or a general sense of depletion.
- Magnesium IV uses high dose magnesium in the treatment of atrial and ventricular arrhythmias after myocardial infarction. Other indications for it include asthma, COPD, neuropathic pain, hypertension, PVCs, fatigue, fibromyalgia, Chronic Fatigue Syndrome and Coronary Artery Disease.
- High-dose Vitamin C IV has demonstrated anti-tumor effect in various cancers, an effect not seen with oral Vitamin C. It is also used for reducing the side effects of chemotherapy and radiation



Popular Cocktails Include:

- Meyer's Cocktail is an IV vitamin and mineral therapy for chronic fatigue, fibromyalgia, depression, muscle spasm, asthma, hives, Congestive Heart Failure, angina, infections, and Senile Dementia. It is also used to help prevent cold and flus or just give the system a boost in energy.
- Liver Detoxification glutathione, alpha lipoic acid, and high dose vitamin C.
- **Dr. Gallagher's Cocktail** vitamin C, glutathione repair enzyme systems, and promote optimal nervous system function.



Popular Cocktails Include:

- Heart Health magnesium, trace minerals, vitamins and more to treat atherosclerosis, heart disease, hypertension, etc.
- Migraine IV utilizes high concentrations of magnesium, riboflavin and other ingredients to relieve acute episodes of migraine and decrease further episodes.
- Hangover Recovery Accelerator, which is popular with business professionals and millennials, replenishes with saline, B vitamins, vitamin C and glutathione.

Reenee. IV Nutritional Therapies. https://vitamincoach.com/index.php/medical-services/iv-nutritional-therapies. Accessed January 18, 2021.



Are IV Nutrients Overly Accessible?

- YES!
- Commonly called IV Lounges
- Popular among celebrities
- As with all wellness fads, it begs the question 'is there any evidence for their claims?', and 'at the very least, are they safe?'.



Nutritionists should be a "go-to" resource for doctors!

- With the lack of clinical education on nutrition and supplements in healthcare, well-trained Nutritionists need to share research and best practices with the doctors they work with.
- Nutritionists make your value known!
 - With your colleagues and doctors alike



Next Up...

Let's Explore Multivitamins!

