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Utilization of Common Dietary Supplements in Chronic Disease Management

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Disclosure Statement

- I have no relevant financial or nonfinancial relationships in the products or services described, reviewed, evaluated or compared in this presentation.

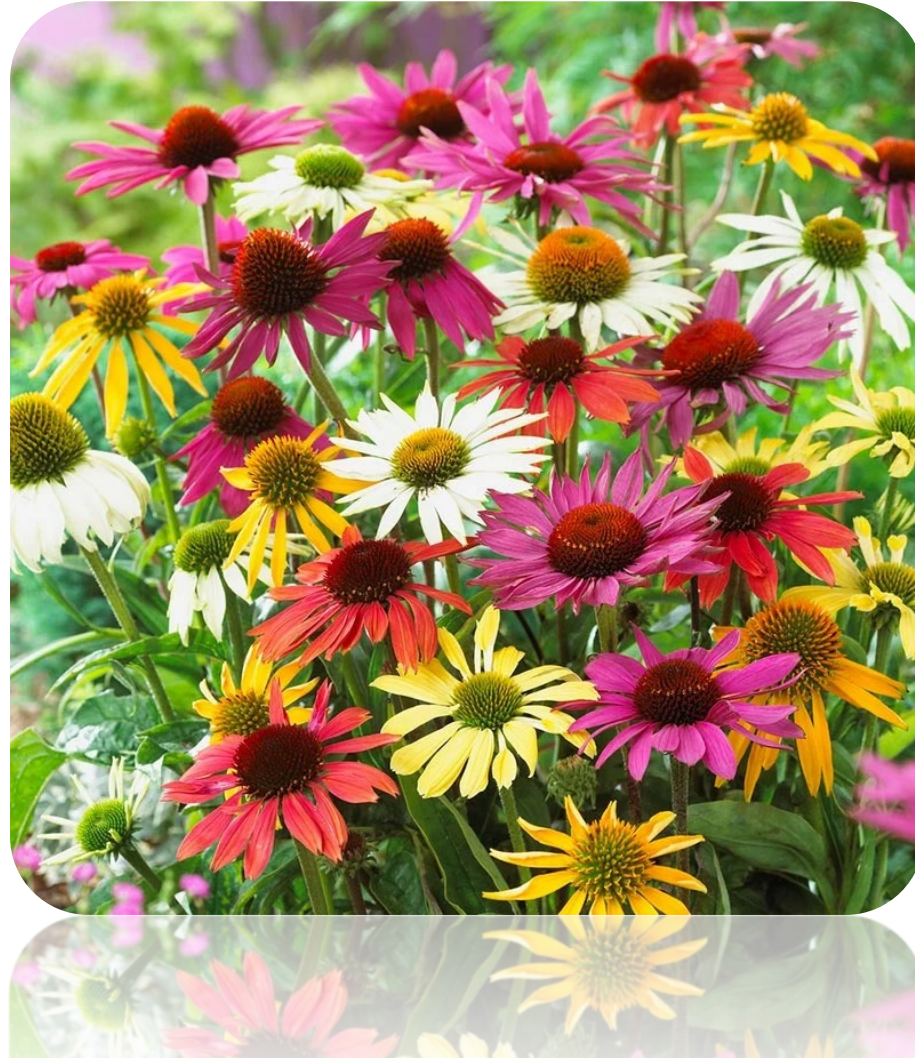
Quote

- “ The greatest medicine of all is to teach people not to use it”
 - Socrates

Objectives

- Identify common herbal supplements and interactions
- Explain the use of database for provider
- Understand the basis and mechanism of action of integrative therapies
- Discuss the safety of dietary supplements, and common herbal therapies used in primary care

Name that plant



Implicit Bias

Negative attitude which one is not consciously aware

- Patients avoid revealing to PCP alternative or adjunct therapies
- Clinician knowledge



Overcoming Implicit Bias

- Improve skills/knowledge
- View patient as a whole person
- Understand people and their social determinants of health
- Know your resources
- Create a safe space in practice for patients
- Look beyond individual and impact the community on them



Integrative Medicine definition

- “ a state of completed physical, mental and social wellbeing, and not merely the absence of disease or infirmity.”-
 - World Health Organization (WHO)
- *"Integrative medicine / Complimentary Alternative Medicine (CAM) and health reaffirms the importance of the relationship between practitioner and patient, focuses on the whole person, is informed by evidence, and makes use of all appropriate therapeutic and lifestyle approaches, healthcare professionals and disciplines to achieve optimal health and healing."*

Reasons for Integrative Medicine/ CAM

- Prescription drug cost
- Family/ friends recommendation especially in minority populations
- Tradition or beliefs
- Referrals

The New York Times

Medical Meditation? Clinical Yoga? Alternative Therapies Go Mainstream.

Matt Richtel

Sun, February 4, 2024 at 7:07 AM PST

4 min read



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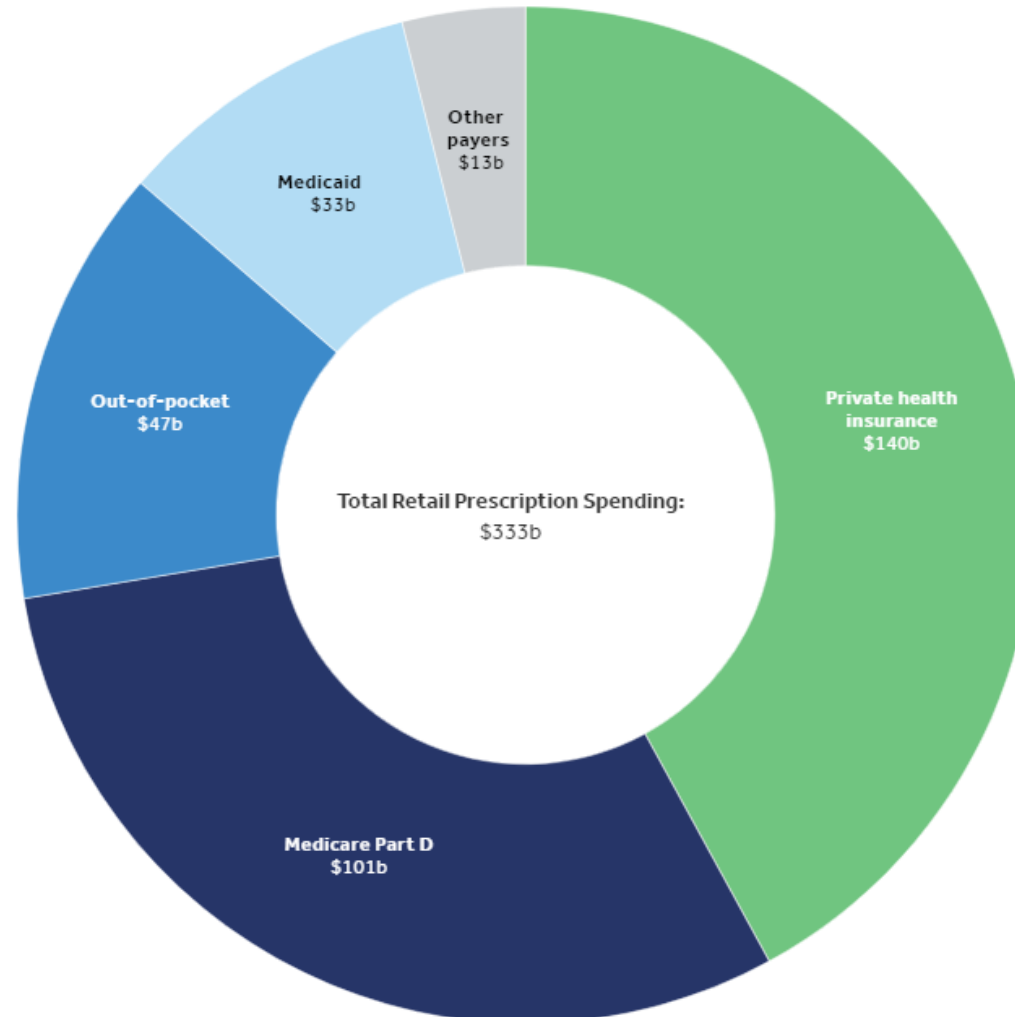


Perceived Benefit of CAM

- ❖ 2019 study- Johnson, of perceived benefits of CAM by race/ethnicity in midlife and older adults compared to whites
 - ❖ Blacks shows higher- 2 times as high for feeling better emotionally
 - ❖ Asians 1.7 times higher benefit of improved relations
 - ❖ Hispanic 1.6 times higher benefit of improved sense of control over health
 - ❖ American Indian/ Alaskan Native had 4.1 times higher for reduced stress and 3.3 times higher for better sleep

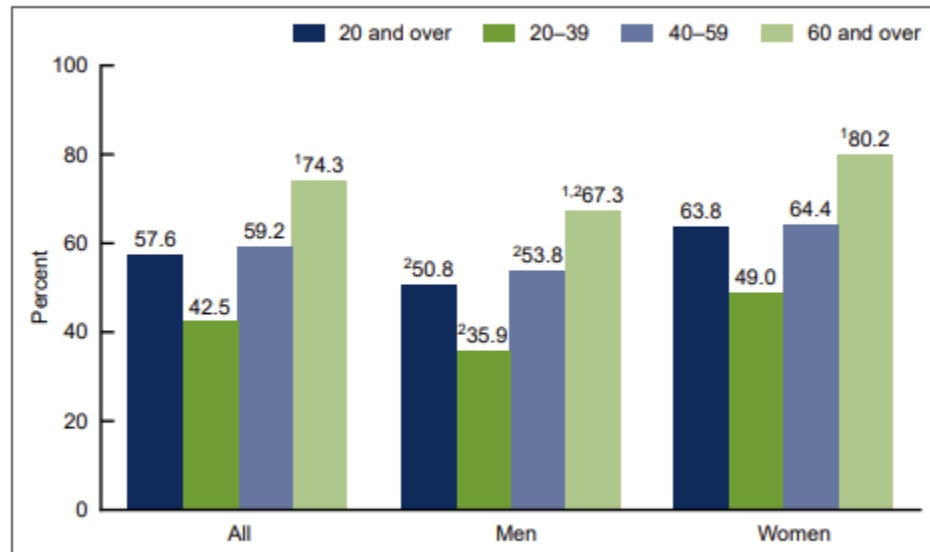
Spending by private health insurance, Medicare, and Medicaid accounts for more than 80% of total retail prescription drug spending in the U.S.

Total U.S. Retail Prescription Drug Spending, 2017



Demographics

Figure 1. Percentage of adults aged 20 and over who used any dietary supplement, by sex and age: United States, 2017–2018



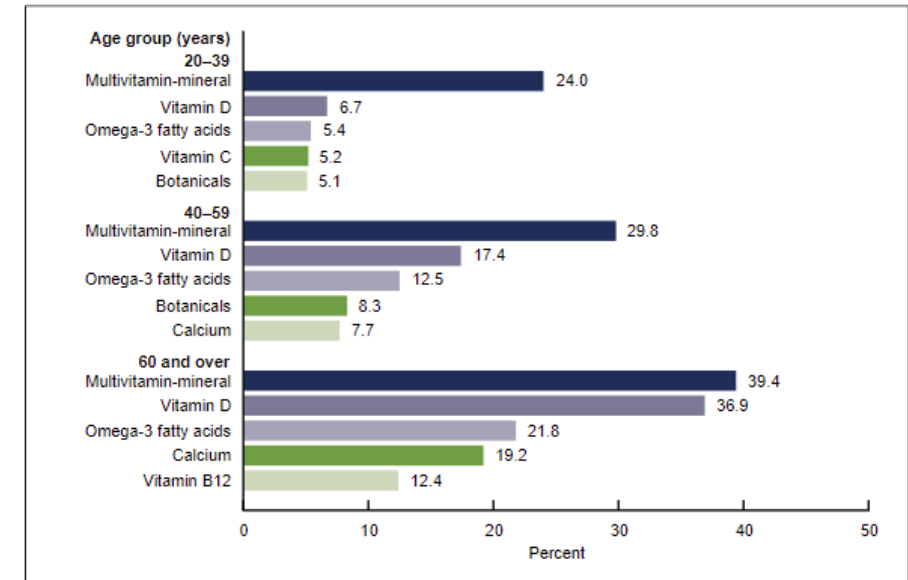
¹Significant linear increasing trend with age.

²Significantly different from women of the same age group.

NOTE: Access data table for Figure 1 at: <https://www.cdc.gov/nchs/data/databriefs/db399-tables-508.pdf#1>.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, 2017–2018.

Figure 3. Most common types of dietary supplements used by adults aged 20 and over, by age: United States, 2017–2018



NOTE: Access data table for Figure 3 at: <https://www.cdc.gov/nchs/data/databriefs/db399-tables-508.pdf#3>.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, 2017–2018.

Information Websites

- AMED (alternative and Allied Medicine Database)
- CINAHL (Cumulative Index to Nursing and Allied Health Literature)
- MANTIS (Manual Alternative and Natural Therapy Index System)
- PubMed
- The Cochrane Library

Clinical Information

- Evidence-based medicine
- Clinical overviews (designed for clinical support, resources prepared by universities and foundation)
- Herbal and dietary Supplement monographs (questions, effectiveness, dosages, interactions etc.)
- Information prepared by professional associations and university websites

Resources

- BMC Complimentary Medicine and Therapies
- National Center for Complementary & Integrative Health (NCCIH), NIH
- Memorial Sloan Kettering Cancer Center: Search about Herbs
- Dietary Supplements Labels Database (DSLDD)
- HerbMed, American Botanical Council
- LiverTox, NIH
- Natural Medicines Database
- Google Scholar

Patient-Friendly Resources

- ConsumerLab
- MedlinePlus Herbs and Supplements
- Academy of nutrition and Dietetics
- Havard School of Public Health: The Nutrition Source

Dietary Supplements

- 1994- the Dietary Supplement Health and Education Act (DSHEA) [Code of Federal Regulations, Part 111 (21 CFR 111)] passed.
- This landmark legislation granted the FDA authority to prohibit unsafe and mislabeled dietary supplements
- June 2010- all DS manufacturers required to be compliant with requirements of DSHEA
 - Safety: adverse event reporting, labeling
 - Consistency
 - Quality
 - Purity
 - Potency



Dietary Supplements

- Limited FDA resources reduce enforcement resulting in spotty enforcement
- Unlike pharmaceuticals, no premarket requirement to demonstrate efficacy, no way for the FDA to guarantee that all DS introduced into commerce are safe and effective.
- United States Pharmacopeia (USP)- an independent regulatory agency that has tested supplements
 - Usp.org
 - Consumerlabs.com

Dietary Supplement Labeling

- **Per 21CFR part 111- All supplements must display supplement facts:**

- Key ingredients
- Other ingredients in order of predominance
- Net quantity of contents (e.g. 60 capsules)
- **Disclaimer that the supplement is not intended for prevention or treatment of disease**
- Directions for use
- Serving size
- Name and place of business of manufacturer, packer or distributor
 - **For botanical supplements:**
- Plant part used must be listed
- Extraction ratio and quantity of starting material (dry herb equivalent used in the product)
- If the herbal product is a standardized extract, the marker compounds must be named and their percentage concentration identified

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• Net quantity of contents (eg 60 capsules)

• Disclaimer that the supplement

• Directions for use

• Serving size

• Name and place of business of

botanical supplements:

• Plant part used must be listed

• Extraction ratio and of

• If the herbal product is a

following are examples

percentage concentration identified

ance.

Sample 1

1. "Serving Size" — the

one

limit

is made

2. "Servings per Containe

3. "Percent Daily Values

what

4. Common

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common name must

5. Plant Part — the pla

differing effects, this

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extraction ratio provi

herb and the number

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7. Botanical

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species are sold in the

consumer has no w

8. Quantity of Extract

9. Quantity of Starting

Supplement Facts

Serving size: 2 Capsules

Servings per Container: 40

Amount Per Serving

% DV

Calories

2

Calcium

40 mg

4%

Echinacea Root 6:1 extract

112.5 mg

†

From Echinacea purpurea root

675 mg

(Containing alkaloids 2.1 mg)

Golden Seal root and rhizome 3:1 extract

166.7 mg

†

From Hydrastis canadensis root

and rhizome 500 mg

Percent Daily Values are based on a 2000 calorie diet.

† Daily Value (DV) Not Established

Other ingredients:

Calcium acid phosphate, cellulose, silica, magnesium stearate

(click the image to

another species.

Product.

Prescriber Caution

- *If medication is critical for life (transplant rejection, chemotherapy agents, anticoagulant, anticonvulsants), Patients must be counseled on concomitant usage of dietary supplements and botanicals medicines*

Vitamin B12

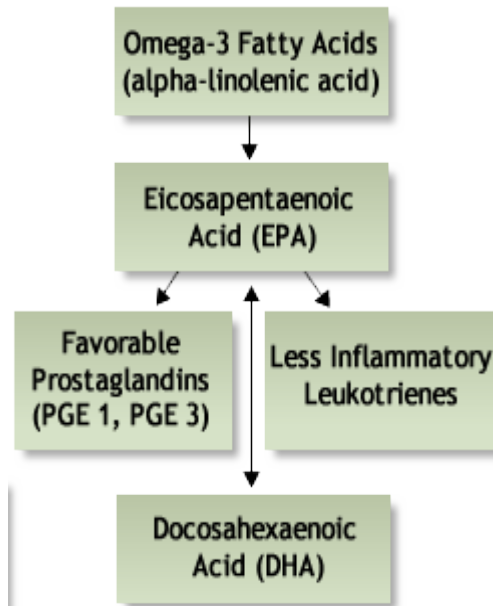
- Group of Cobalt containing compounds call Cobalamins
- Cyanocobalamin is a synthetic version found in supplements and injectables
 - DNA synthesis, red blood cell formation, function of nervous system and immune system
 - Treats pernicious anemia, ileal resection, spinal cord myelopathy
 - Food sources: Fish, meat, eggs, and dairy products
 - Vegan: Fortified cereals, shitake mushrooms, dried seaweed (spirulina or Nori) or fermented Soy
 - Recommend daily dose 2.4mcg to 2.8mcg (lactation)

Vitamin B12

- Clinical Management:

- Fatigue- not proven
- *Stein, 2021 Systemic analysis of 53 studies show that PN was significantly associated with decrease B12, treatment with B12 did not improve neuropathy*
- *Didangelos, 2021- 1 year trial on 90 patients with oral methylcobalamin (1000ug/ day) found reductions in pain and increased B12 levels, QOL and certain nerve conduction parameters*
- *Vitamin B12 deficiency is linked to dementia and cognitive impairment which can be treated if caught early*
 - **Treatment B12 IM 1000ug weekly x4-6 weeks. Maintenance given as needed**

Omega-3- Fatty Acids (Fish Oil)



- Constitute 1 of 3 major families of unsaturated fatty acids found in diet.
- Plays multiple roles in human body- cell membranes, precursors in synthesis of prostaglandins, leukotrienes and other eicosanoids
 - May reduce inflammation, oxidative stress

Table 1. Typical DHA content of selected fish, other seafood and meats

Food	DHA, g/100g food	Typical Adult Portion Size, g	DHA, g/portion	Contribution of DHA to EPA + Ω -3 DPA + DHA, %
Mackerel	1.10	160	1.75	55
Canned Pilchards	1.2	110	1.32	45
Canned Sardines	0.68	100	0.68	40
Salmon	1.3	100	1.3	60
Trout	0.83	120	1.0	55
Herring	0.69	120	0.82	50
Cod	0.16	120	0.19	65
Haddock	0.10	120	0.12	65
Plaice	0.10	130	0.13	35
Canned Tuna	0.14	45	0.06	75
Crab	0.45	85	0.38	45
Prawns	0.04	60	0.02	35
Mussels	0.16	40	0.06	25
Beef	<0.01	90	<0.01	<25
Lamb	0.02	90	0.02	25

Benefits of Omega-3-Fatty Acids

- Anti-inflammatory effect (suppression of the production of pro-inflammatory eicosanoids)
- Favorable alteration of lipoprotein metabolism
- Inhibition of atherosclerosis
- Prevention of thrombosis
- Improvement in arterial vasodilation
- Inhibition of the immune response

Omega-3- Fatty Acids

- Drug interactions:
 - Both fish oil and ASA (EPA and DHA) inhibits platelet aggregation
 - Clopidogrel and Fish oil. Clopidogrel inactive drug that's metabolize by hepatic cytochrome P450 enzyme, CYP2C19. Has the potential to potentiate or might result in excessive inhibition of platelet function
 - Supplementation with Iron exacerbates iron deficiency. Therefore, correct iron deficiency receiving Omega-3- fatty acids
 - High doses causes “fishy burps”, diarrhea and other gastric side effects
 - Caution with preop teaching

Turmeric (Curcuma longa)

- Member of the ginger family (Zingiberaceae)
- Used in Indian Cuisine has 5000- year history of medicinal use.
- Exert anti-inflammatory properties: Musculoskeletal complaints, OA and RA, digestive complaints, jaundice, dysmenorrhea and used topically for joint pain and bruises (turmeric root-antimicrobial actions)
- Used in Combination with Boswellia extract relieve OA symptoms and reduce Symptoms of Crohn's disease

Recognized in the US as generally safe



Ginger

- Enjoyed as spice and condiment in diet
- Known for it's anti-nausea and digestive properties
- May reduce PMS symptoms, menstrual cramping-2014 RCT Iranian study
- Dosing 250g every 12 hours 7 days prior to menses and continuing 3rd day of menses



Peppermint

- Widely available globally
 - Anti-inflammatory activity exert spasmolytic effectives throughout the GI tract, mild anti-emetic effect, antitussive action
 - Oils in peppermint blocked CA channels in intestinal smooth muscles cells providing antispasmodic effect. Effective in flatulence, colic and IBS
 - Enteric coated peppermint preferred
 - Enteric coated can caused transient sensation of anal burning as it's excreted
 - Concentrated peppermint can exacerbate GERD



Black Cohosh

- Found by indigenous tribes in North America as treatment for musculoskeletal pain, respiratory symptoms, menstrual pain and menopausal symptoms, and aid in childbirth (muscle relaxant properties)
- Mild SSRI-like properties make it helpful for mood issues
- Contraindicated in aspirin sensitive individuals as it contains salicylates
- Reports of rare hepatotoxicity. Avoid recommending for women hepatotoxic medication or other underlying liver disease



Sea Weed

- Sea vegetable, widely consume in many Asian cuisine. Different colors: brown, red and green
- High intake adversely affect thyroid function as it contains iodine. Brown seaweed has more iodine
- Pregnant women and children limit serving of brown seaweed to 1 per week



Kava (Piper methysticum)

- Native of Polynesia
- Kava is anxiolytic, muscle relaxant, anticonvulsant, anesthetics, analgesic, antifungal, spasmolytic
- Avoid in patient with liver disease, heavy alcohol use, or patients taking hepatotoxic medications
- Monitor liver function on all patients
- Should not be used along with CNS depressants due to additive effects
- Standard recommendation 120mg – 240mg daily



Valarian Root

- Known originally for efficacy in anxiety, later approved by German authorities as sleep aid
- Has improved efficacy when combined with St. John's wort or Lemon balm
- Dosage 500mg- 1gm taken 1 hour before bedtime
- Contraindicated for children under 3 years old and pregnant women
- Takes up to 2 weeks to be effective, best taken in pill form
- Low side effect but some studies may cause vivid dreams, or morning after sluggishness. Benzothiazine withdrawal symptoms with prolong use

Licorice root

- Glycyrrhiza- Native of Europe and cultivated in North America
 - Sweet tasting Glycyrrhizin (GL)
 - GL undergoes hydrolysis by intestinal bacteria yielding Glycyrrhetic Acid (GA)
 - GA inhibits the breakdown of cortisol to inactive cortisone
 - Preferred use in small doses



Licorice root

- Increase risk of pseudohyperaldosteronism
- People with kidney disease, HTN and high salt intake are sensitive to use
- High doses (290-370mg/day) causes increase extracellular fluid volume, increase large arterial stiffness, and elevated vascular resistance



Licorice

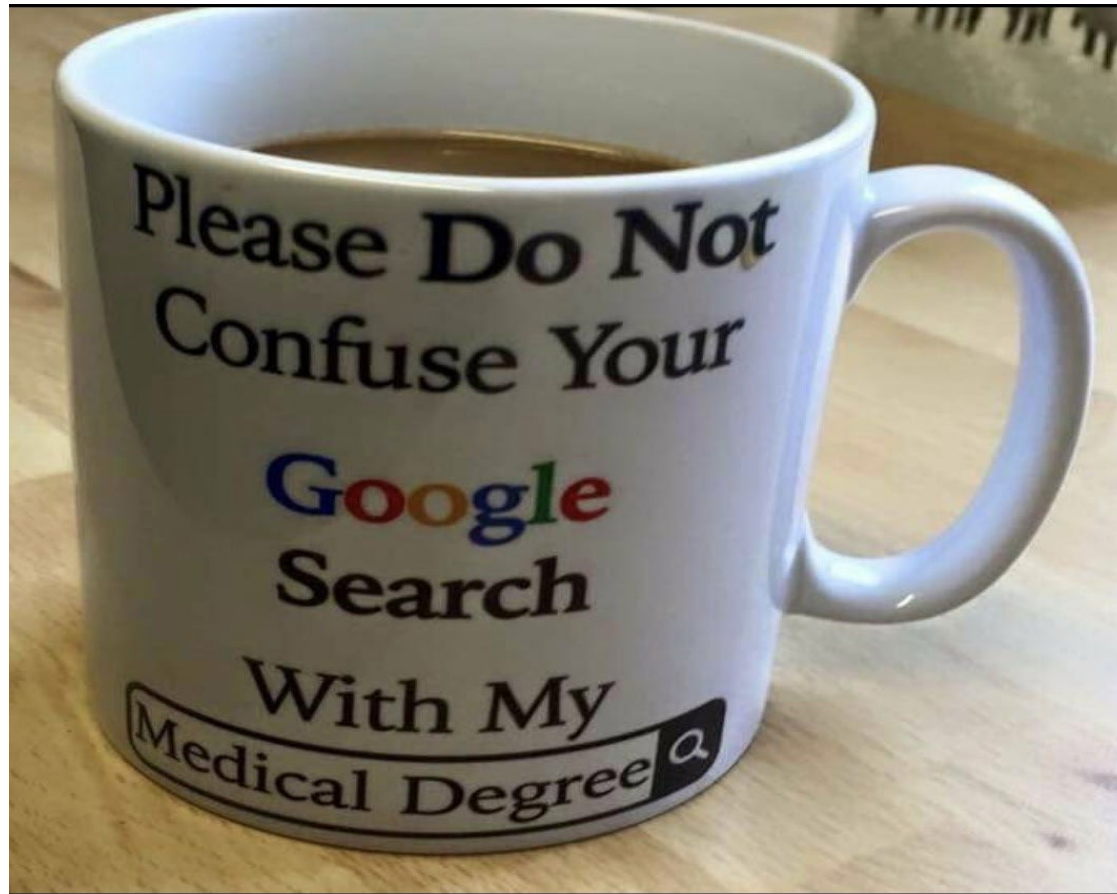
- Anti-inflammatory
- Works similarly to prednisone but weaker
- Prevents cortisol breakdown in the body. Prolongs the activity own cortisol
- Adrenal sparing effect
- Demulcent and expectorant
- Effective treatment GERD, sore throat, and mucous production
- Deglycyrrhizin Licorice (DGL) safe for long-term use and has less interactions

Licorice

- Should not be taken by people on warfarin. Increase metabolism of warfarin
- May inhibit the effectiveness of antihypertensive drugs and cisplatin chemotherapy
- Causes increase Cortisol in kidneys causing hypokalemia, Hypertension and fluid retention

Name that plant





Cannabidiol (CBD)



Cannabis and pain



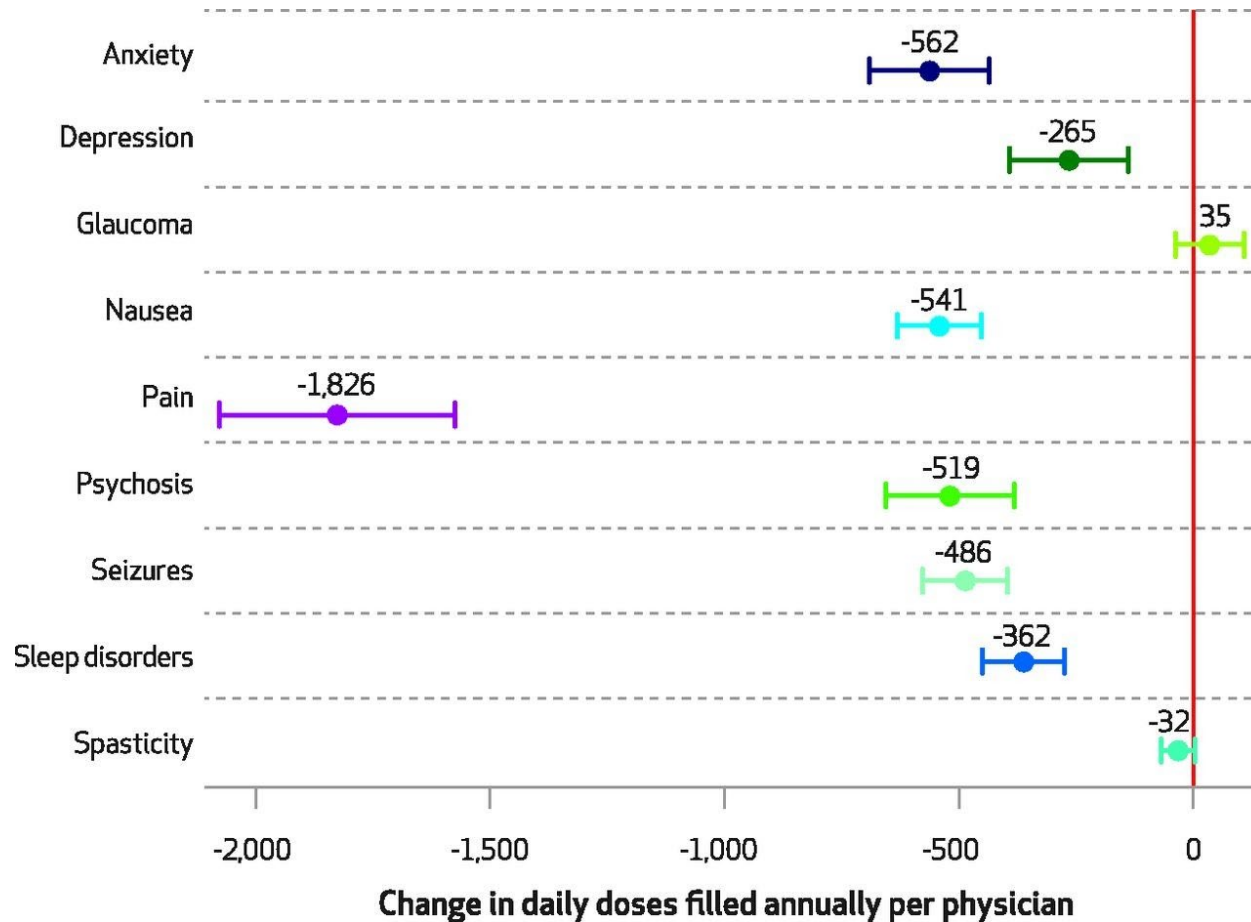
CBD

- Phytocannabinoid isolated from hemp, cannabis
- Shown efficacy in 2 rare forms of Epilepsy (Lennox-Gastaut and Dravet syndrome)- Epidiolex
- Shows promise managing anxiety, pain, inflammation, type 2 diabetes, cancer patients, Parkinson's disease, and Schizophrenia
- CBD both a substrate and an inhibitor of various CYP450
- Well-tolerated with mild side effects, THC more side effects
- Long term effects not been studied
- Low potential for abuse

CBD vs THC

- Marijuana has 400 different components
- Most psychoactive component delta-9-tetrahydrocannabinol (THC)
- CB1 and CB2 agonist found in the brain have peripheral analgesic effects
- CB2 exert anti-inflammatory effects
- 2007 study out UCSF, Abrams et al, Cannabis in painful HIV-associated sensory neuropathy: a RCT study of 50 patients
 - 30% reduction in 52% cannabis group and 24% in placebo. No serious adverse events reported
 - Smoked cannabis well tolerated and effective for HIV-associated sensory neuropathy. Findings comparable use of Gabapentin

States that implement Marijuana laws



Safety

- No effective study found to treat chemotherapy- induced PN
- No deaths ever reported from deaths of cannabis
- Low addiction
- Peak plasma concentration 1-6 hr., remain elevated for several hours. Terminal half-life 20-30 hrs.
- Peak plasma concentration (inhaled) 2 ½ minutes declines after 30 minutes

Hyperlipidemia – Red Yeast Rice

- Traditionally used in TCM to aid digestion
- Contains monacolin K (mevinic Acid) which identical to Lovastatin
- Used in Adverse reaction to statin and patients opposed to Statin
- Recommended 2,400- 3600 mg/day



RYR- Adverse effects

- Myalgias, rhabdomyolysis, liver and kidney abnormalities
- Should not be combined with statin
- Caution when used with other hepatotoxic herbs
- Reduce effectiveness in:
 - Grapefruit juice
 - Cyclosporine
 - Verapamil
 - Azole antifungals
 - Macrolides
 - HIV protease inhibitors
 - St. John's Wort

Hypertension

- Hibiscus Sabdariffa
- Used in treatment of colds, cough, and heart disorders
- Studies- Serban, 2015 and Jalayazdi, 2019 show effect in lowering BP
- Adverse effect: abdominal distension, nausea, increases clearance of simvastatin and reduces the effect (TRC, 2020)



Diabetes care

- Capsicum
 - Use as dietary supplements and pharmaceutical preparation
 - When applied activates sensory neurons causing increase pain sensation and reddening. Pain relief occurs after repeated application
 - Increase risk of diabetic foot ulcers
 - Rash and skin irritation



Patient case

- Robin is a 45 year old male with a history of panic attacks. His previous PCP prescribed SSRI, but he stopped taking due to loss of libido. He's currently seeing a therapist for CBT, but wants to try something "natural" for added benefit. He currently takes simvastatin for high cholesterol and Tylenol for shoulder pain.
- Which treatment would you avoid?
 - 1 . Vitamin B12
 - 2. Kava
 - 3. Inositol

Patient care

- 45 year old Hispanic female with history of severe OA and RA. She presents with petechial rash on both legs and arms which started 1 week ago. Patient states she was taking the supplement Artri King which helped with her arthritis pain. However, she stopped taking this when rash started to appear.



Patient case

- Hidden ingredients:
 - Dexamethasone
 - Diclofenac
 - Methocarbamol
- Adverse event:
 - Infections
 - Liver toxicity
 - Elevated blood glucose
 - Heat attack, stroke and GI bleed
 - Dizziness and low blood pressure



Public Notification: Artri King contains hidden drug ingredients

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On April 20, 2022, [FDA warned consumers not to purchase or use Artri and Ortiga products](#) as FDA has received adverse event reports, including of liver toxicity and death, associated with the use of Artri King and similarly named products. For the most up-to-date information, please visit the [CDER Alert](#).

Medication Health Fraud

FDA Actions to Stop
Medication Health Fraud

Medication Health Fraud
Questions and Answers

Content current as of:
10/31/2022

Regulated Product(s)
Dietary Supplements
Drugs

Topic(s)
Safety - Issues, Errors, and
— . . .

Summary

- Careful medication reconciliation
- Implicit bias
- Be aware of social determinants of health
- Know your resources/ Patient resources
- Always check for safety issues

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The end!





Thank you!

