

Oral Vitamins and Nutraceuticals in Oncology: Facts Over Fallacy

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Relevant Financial Disclosures

None

Presentation Outline



Today's Topics

Background >

The “hot list” >

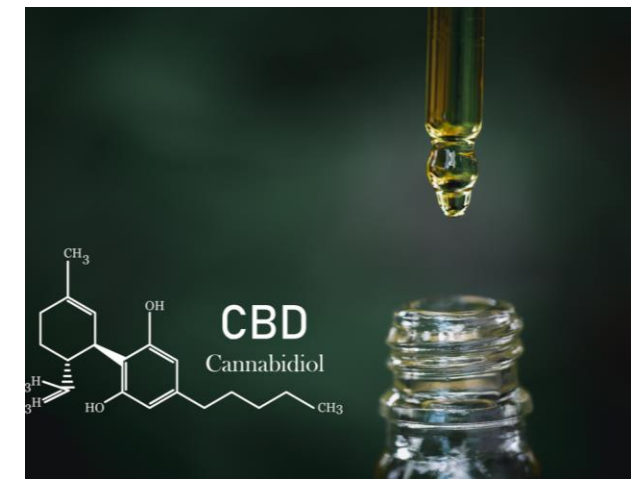
Uses during and after treatment: what we know >

Making safe choices >

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A Bit of Background



8000-5000 BCE

Well-established medicinal uses of plants in India and China

1910-1930

Identification of the "vital amine"

Diseases of deficiency that could be treated with food and synthesized vitamins

1920-1950

Isolation and synthesis of all major vitamins

First isolated vitamin was thiamine in 1926

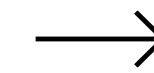
1989

The term 'nutraceutical' was invented in 1989

Herb drug interactions were first recognized

2021

The global dietary supplements market size was valued at USD 151.9 billion



Definitions

Products isolated from foods that are generally sold in medicinal forms

A substance, which has physiological benefit or provides protection against chronic diseases

Used to improve health, delay the aging process, prevent chronic diseases, increase life expectancy, or support the structure or function of the body



The "Hot List"

Common supplements used during cancer
treatment

60% of cancer patients use complementary and
alternative medicine products and practices

63% of survivors use at least 2 dietary supplements

Turmeric

ABOUT

- Traditional yellow-orange spice used to improve circulation and digestions
 - Curcumin is the active component
 - Powerful antioxidant and anticoagulant
-



PROS

- Potentially improves cancer cachexia
 - Topical creams can reduce radiotherapy induced dermatitis
-

CONS

- May interact with chemotherapy agents such as cyclophosphamide and doxorubicin
 - Known to interfere with CYP450
 - Can increase the risk of bleeding when used with anticoagulants
-

Ginger

ABOUT

- Rhizome of the plant *Zingiber officinale*
 - Culinary spice and traditional treatment for common cold, fevers, and GI and inflammatory disorders
-



PROS

- Can prevent and reduce nausea and vomiting due to pregnancy, motion sickness, following surgery and potentially chemotherapy
 - Improves digestion
 - May reduce inflammation and pain from inflammatory conditions
-

CONS

- Elevated risk of bleeding, especially when used with warfarin
-



Green Tea

ABOUT

- Leaves of the plant *Camellia sinensis*
- Origins in East Asia
- Active constituent is epigallocatechin-3-gallate (EGCG)



PROS

- Potentially useful to prevent and help treat hyperlipidemia, hypertension, and cancer
- Can be effective against radiation induced dermatitis and radiation-induced esophagitis



CONS

- Potentially negates the effects of bortezomib (Velcade)
- Increased toxicity when used with tamoxifen and irinotecan
- Risk of hepatotoxicity
- Known to interfere with CYP450

Ashwagandha

ABOUT

- Evergreen shrub grown in Asia and Africa
 - One of the most important herbs of Ayurveda
-



PROS

- Possibly useful to relieve stress and anxiety
 - Anti-inflammatory
 - May improve chemotherapy induced fatigue
-



CONS

- May increase testosterone levels- avoid with hormone sensitive prostate cancers
 - Can increase sedating effects of medications
 - High doses may induce abortions
 - Moderate inducer of CYP3A4 in vitro
 - Drowsiness, upper GI discomfort, loose stools
-

Turkey Tail

ABOUT

- Coriolus versicolor
 - Mushroom used in traditional Chinese medicine to treat cancer and improve immune function
 - A proprietary product derived from coriolus, was developed for cancer treatment in Japan: Polysaccharide-K (PSK)
-

PROS

- May improve survival rates in gastric and colorectal cancers
 - May benefit esophageal and advanced small cell lung cancers
 - PSP (another extract) may act as a prebiotic
-



CONS

- Potential for *low-grade* hematological and gastrointestinal toxicities when used with chemotherapy
 - Caution due to immune stimulating effects
-



Milk Thistle

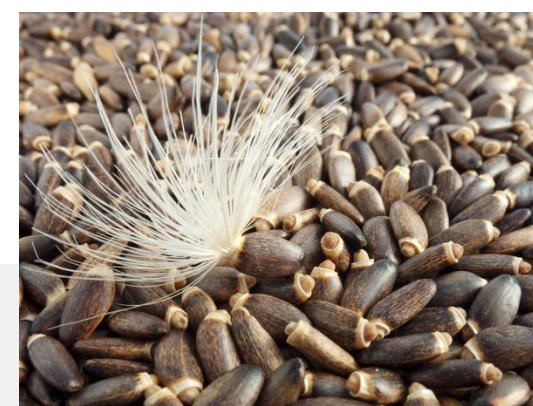
ABOUT

- Flowering herb native to Mediterranean countries
 - Silymarin is the active component extracted from the seed, pod, or fruit
-



PROS

- May lessen severity of toxicities like mucositis and hand foot syndrome
 - Limited studies show potential anti-cancer effects (colon cancer, prostate cancer, HCC)
 - May be useful in treating alcoholic liver disease and cirrhosis
-



CONS

- Can induce allergic reactions including anaphylaxis
 - Conflicting data regarding CYP450
 - Can interact with Warfarin, immunosuppressants, psychotropic drugs
 - Multiple extracts have estrogenic effects
-



Supplement Use During Treatment

Is it ever safe?



Herbal supplements should likely be avoided

Some vitamins and other nutraceuticals can be beneficial
when used appropriately

Herb Drug Interactions

● ○ ○ GI motility

Increased gastric motility decreases drug absorption

Examples: aloe vera, psyllium fiber

● ● ○ pH

Lowering the pH of the stomach can destroy enteric coating of a capsule allowing the drug to be destroyed by stomach acid

Examples: ginger, peppermint

● ● ● Metabolism

Induction or inhibition of metabolic enzymes, especially in the CYP family

Examples: grapefruit, St. Johns Wort



Herb Drug Interactions Continued

● ○ ○ Solubility

Minerals and tannins can bind to with drugs and decrease absorption

Example: herbal teas

● ● ○ Blood flow

Increased intestinal blood flow increases absorption

Example: curcumin mixed with black pepper

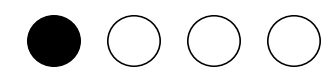
● ● ● Other

Some herbal supplements advertised for menopausal symptoms like hot flashes can have adverse effects on cancer treatment

Examples: Evening primrose oil, black cohosh, milk thistle



The more you know...



Antioxidants

Conflicting evidence: protect normal tissues and increase treatment response vs protect cancer cells along with healthy cells and diminish response

Increased hazard of recurrence in Breast Cancer Patients



Probiotics

Low fiber diets and probiotic supplements have impaired treatment response to anti-PD-1-based therapy

May be useful for patients on chemotherapy such as 5-FU



Beta Carotene

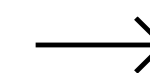
Supplementation with β -carotene increases the risk of lung cancer in smokers



Multivitamins

No significant findings on progression or survival

...the less you know



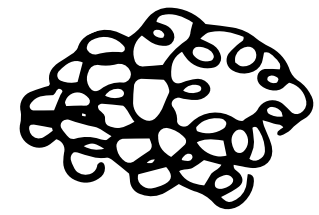
Clinical trials to study interactions between herbs, vitamins,
and other nutraceuticals are extremely limited

Case reports are also limited

Most of our current recommendations are based on limited
research, theoretical interactions, and clinical experience

Symptoms of Deficiency

What else causes these symptoms?



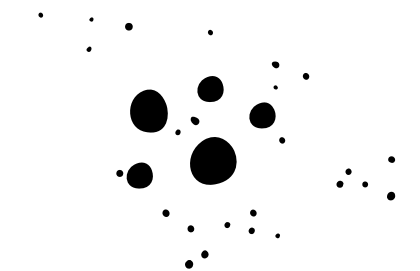
ALOPECIA



FATIGUE



BRITTLE NAILS



STOMATITIS



COGNITIVE
CHANGES

Useful Supplements

01. AMINO ACIDS

L-glutamine: radiation induced mucositis, repairs damaged epithelial cells of the GI tract

BCAAs: can maintain liver function, serum albumin levels, and QoL
Shown to improve progression free and overall survival after surgery, RFA, TACE

02. FISH OIL

Potential treatment for cachexia
Improved response rates, progression free survival
May protect against peripheral neuropathy

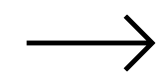
03. VITAMIN D

Important for bone health and immune function
May be beneficial in decreasing incidence and/or progression of cancer



Choosing a Supplement

Making the safest choice



There is an estimated 85,000 + supplements available in the U.S. market

Dietary supplements are regulated as food, not drugs

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

Guiding Patients to Safer Choices

01. USE FOOD FIRST

There are no significant risks associated with eating vitamins and herbs as part of a regular diet

Supplemental forms of herbs should be avoided during treatment due to lack of safety information

Vitamins and other nutraceuticals may be used in normal quantities when clinically indicated

02. AVAILABLE CLINICAL RESOURCES

Memorial Sloan Kettering Cancer Center: About Herbs

Natural Medicines Database (requires membership)

Medline Plus (NIH National Library of Medicine)



Guiding Patients to Safer Choices

03. THIRD PARTY TESTING



United States Pharmacopeia (USP)-tests for label accuracy, contaminants, proper bioavailability; made according to FDA Good manufacturing processes

National Sanitation Foundation: NSF/NSF Certified for Sport - tests for label claims, toxicology, presence of contaminants
provides certifications
reviews manufacturing processes

Lab Door- purity and label accuracy testing
buys supplements off retail shelves
provides grades and rankings but not endorsements

Consumer Lab- purity and quality testing
companies pay to be verified
publish lists of "approved" products



Final Thoughts

WHAT SUPPLEMENTS CAN DO

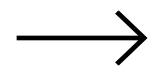
Correct deficiencies
Support specific body systems and functions

WHAT THEY CAN'T DO

Cure cancer
Replace a poor diet



Talking to your patients



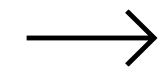
Patients are often scared, confused, and overwhelmed. Diet is one area of their life that they feel they can still have some control.

Shutting down their ideas or dismissing their questions

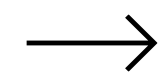
- can deepen a mistrust of the medical community
- prevent them from discussing other important questions and concerns
- harm the overall patient-provider relationship



Aim for a diet like this



Rather than this



Or maybe a little of both

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