Natural therapies for enhancing wellness and managing side effects during and after cancer treatment

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KNOWintegrativeoncoloogy.org

KNOW is database of published human clinical trials in integrative oncology care

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Welcome to Goodapple Wellness

Wellness begins with self care and awareness, and growslike all things in nature- when nurtured.

Whether you or your loved one is diagnosed with cancer or

Get scheduled today!
Access the portal here:

https://goodapplewellness .clientsecure.me/



Integrative Oncology goals:

- Shift the environment in the body, mind & spirit toward greater health & ease
- Provide supportive care using safe approaches with nutrition, lifestyle & supplements
- Improve quality of life during and after treatment using evidence-based therapies
- Support individual values and health goals such as: improve energy levels during chemo, support bone health, support kidney function or prevent progression/ recurrence
- Investigate health history and patterns for each individual; explore modifiable and nonmodifiable factors in health; due diligence in protecting against interactions.







Let's prioritize!

What factors have the *most* potential to help you feel better & support health?

Nutrition with wholesome food, taking time to nourish, 7+ fruits and veggies daily!

- Plan meals in advance, explore recipes, diversify fruit and veggie intake, small snacks and meals
- Explore the Mediterranean diet!

Relaxation practices - guided imagery, breathing meditation, tai chi, counseling, support group, acupuncture, stress reduction

- 90 minutes weekly has great benefits
- Decreases inflammation, healthy circulation & oxygenation

Movement shake your tush, move your bod, do a little dance; be physically active; go and do!

150 minutes of brisk activity with 2-3 sessions of resistance training and 1-2 periods of stretching per week

Rest & Sleep –create a routine to prep for bed

Gratitude, Purpose, Meaningful relationships, Social support, Spiritual connection

The best food nutrition strategy for people in treatment or surveillance:

- A 2020 systematic review and meta-analysis found:
 - Adherence to the Mediterranean diet (MedDiet) is associated with a lower risk of cancer mortality
 - Decreased all-cause mortality among cancer survivors
 - Analysis of 117 studies, 3,202,496 participants
 - Results suggest that highest adherence to the MedDiet was related to lower risk of cancer mortality, and allcause mortality among cancer survivors.
- Med diet improves conditions like diabetes and cardiovascular disease
- Nurses study –reported Med diet improves cognition (lengthens telomeres!)

Crous-Bou M, Fung TT, Prescott J, Julin B, Du M, Sun Q, Rexrode KM, Hu FB, De Vivo I. Mediterranean diet and telomere length in Nurses' Health Study: population based cohort study. <u>BMJ</u>. 2014 Dec 2;349:g6674.

Another study reports Med diet supports aging healthfully

Samieri C, Sun Q, Townsend MK, Chiuve SE, Okereke OI, Willett WC, Stampfer M, Grodstein F. The Association Between Dietary Patterns at Midlife and Health in Aging: An Observational Study. <u>Annals of internal medicine</u>. 2013 Nov 5;159(9):584-91.



Mediterranean Diet

Recommended

- Olive oil ≥4TBSP/day
- Tree nuts and peanuts ≥3 servings/wk
- Fresh fruit ≥3 servings/day
- Vegetables ≥2 servings/day
- Fish (especially fatty fish), seafood ≥ 3 servings/wk
- Legumes ≥3 servings/wk
- Sofrito ≥2 servings/wk where Sofrito="sauce made with tomato and onion, often including garlic and aromatic herbs, and slowly simmered with olive oil"
- White meat instead of red meat
- Wine <7 glasses/wk
- Unlimited calories from raw nuts, whole grain cereals, eggs, fish, seafood, low-fat cheese, chocolate (only black chocolate, with more than 50% cocoa)
- 2 or more meals daily where you sit for 20 minutes and socialize

Discouraged

- Soda <1 drink/day
- Commercial bakery goods/sweets/pastries <3 servings/wk
- Spread fats <1 serving/day
- Red and processed meat
 <1 serving/week
- ≤1 serving per week of cured ham, red meat (after removing all visible fat), and cured or fatty cheeses
- Low amounts of meat, poultry and full fat dairy



- MUFA, phytosterols and phenols, carotenoids, tocopherols, squalene
- Microbiome benefit: reduces pathogenic bacteria, stimulates growth of good bacteria Improve health of GI mucosa/lining
- Decreases intestinal injury
- Increases SCFA (short chain fatty acids)
- Anti-inflammatory

What's so special about fruits, vegetables & herbs?

- Plants contain flavonoids that can help decrease inflammation and reduce some of the drivers of cancer & chronic disease!
- Diversity of molecular compounds in plant foods are beneficial to health!
 - Fiber, chlorophyll, enzymes, vitamins, EFA's, flavonoids
 - The diversity of molecules in plants is a factor that helps provide humans protection from side effects during chemo and supports health in multifaceted ways that are safer than single molecular compounds





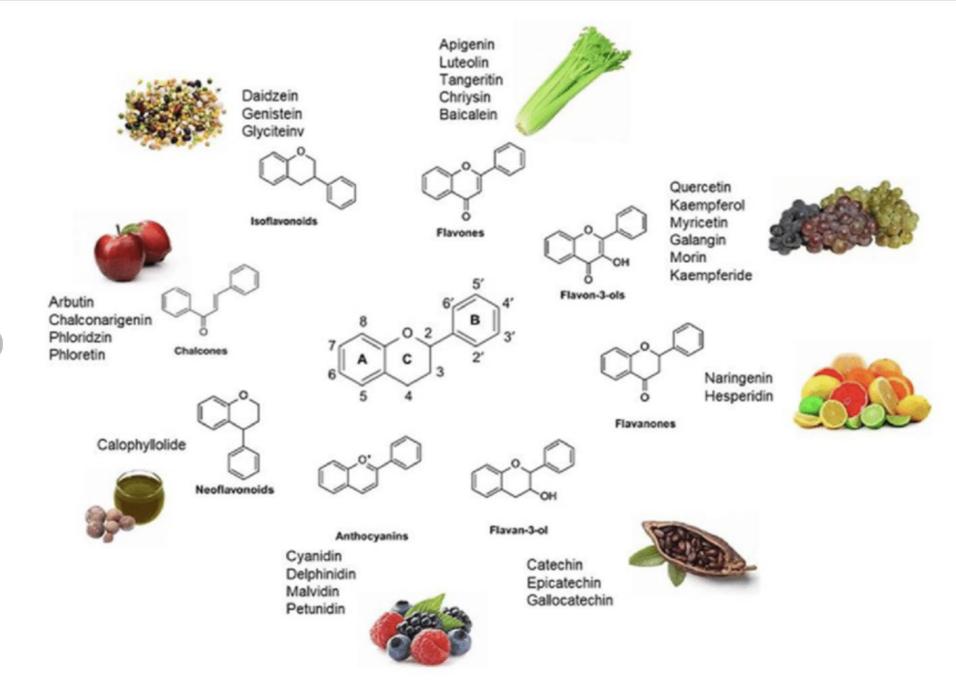
Plants have:

Macro/micronutrients

 Fat, protein, fiber, vitamins, minerals

Secondary phytonutrients

flavonoids, polyphenols,
 carotenoids, glucosinolates,
 anthocyanins → anti-mutagenic



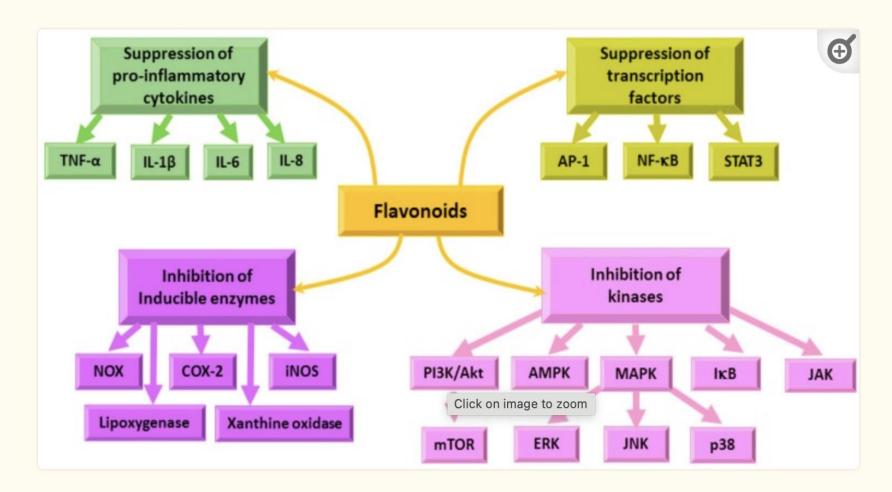


Figure 11

Flavonoid targets during inflammation processes. TNF—tumor necrosis factor, IL—interleukin, AP-1—activator protein 1,

Flavonoids = safe, supportive adjunctive therapy

Foods rich in flavonoids

- Olives & olive oil
- Walnuts
- Green tea
- Lemons
- Limes
- Berries
- Celery
- Cacao
- Pomegranate





A word about organic...

Organic crops have higher exposure to soil microbiota that influence plants to make defense related phytochemicals = good for us!

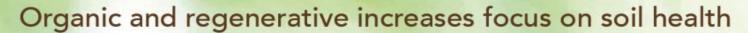
Organic fruits and vegetables have 20-60% higher phytochemicals (like quercetin!)

Vs. Conventionally grown - increased pesticide residue, and other issues ex. cadmium

Best organic: berries, spinach, kale/greens, grapes, peach, pear, apple, nectarine, bell peppers, cherries, green beans

Safe as non-organic: sweet corn, pineapple, onions, papaya, cabbage mushroom, mangos, sweet potato

Baranski, M., et al. 2014. Higher antioxidant and lower cadmium concentrations and lower incidence of pesticide residues in organically grown crops: A systematic literature review and meta-analyses. British Journal of Nutrition 112:794–811.



Quercetin — Kaempferol — Carotenoids



Other helpful nutrition factors in the Mediterranean diet:

- Whole grains these look the way they grew ie. Whole oats, brown rice, quinoa, barley
- Legumes garbanzos, black beans, navy, lentils
- Nuts walnuts, pistachios, almonds!
- Wild caught fish safe fish sources arctic and pacific salmon, cod, haddock & wild caught US shrimp
- Dairy –sheep or goat best!
 - ½ butter & ½ olive oil trick!(or just olive!)
 - Yogurt + nuts & berries, flax!



^{**}Back Roads Ancient Grains is superb! Whole organic oats grown in VT, raw almonds, pumpkin seeds, chia –can be made into overnight oats, porridge, or cereal for mornings!

^{**}Barilla pasta in the yellow box! Made using legumes and flax!

Pasture raised EGGS, poultry, meat

- Organic and Grassfed:
 - Increased CLA
 - Increased Carotenoids
 - Increased Vitamin E
 - Increased anti inflammatory essential fatty acid compounds

Howe, P., J. Buckley, and B. Meyer. 2007. Long-chain omega-3 fatty acids Nutrition & Dietetics 64:S135—S139.





Natural therapies in the supportive care of people with cancer

- Anxiety / distress in diagnosis and treatment
- Support for blood counts
- Side effect management: fatigue, nausea, mucositis, constipation, neuropathy
- Safety considerations in the use of natural health products (supplements) for specific conditions

Therapies that support **CALM**

- Relaxation practices breathing, meditation, guided imagery, support groups, counseling, time in nature
- Acupuncture, massage, reiki
- Exercise 150 min weekly! Pool! Yoga! Tai chi! Nia!
- Aromatherapy well designed human clinical trials support it's use in QoL, decreasing anxiety and nausea
 - Sweet orange/tangerine, holy basil, lavender
- Art therapy, music, explore creativity
- Theanine 100-200 mg can be taken to support calm
 - An amino acid that comes from green tea
 - Check with your integrative doctor, PCP or oncology team
 - Can lower blood pressure , increase serotonin



Botanicals and nutrients that support calm

GABA

Ashwagandha

Holi basil/Tulsi tea

Magnesium glycinate

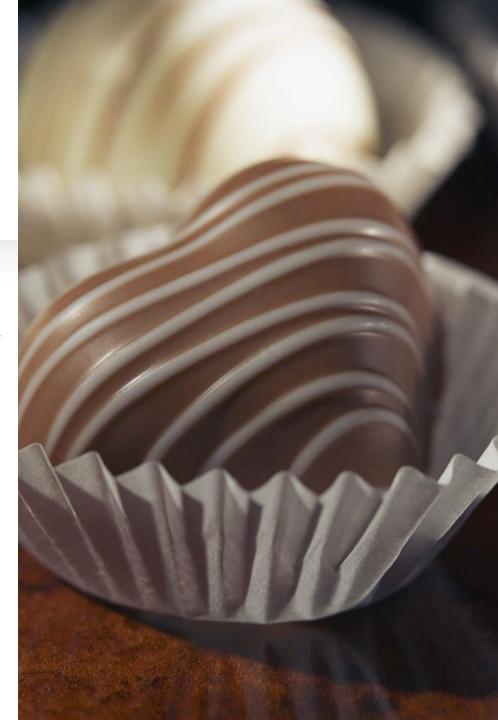
200 mg once or twice daily

Theanine

100-200 mg once or twice daily

Theanine is an amino acid that supports calm

- Theanine was discovered by scientist, Kikunae Ikeda, exploring difference in sweet, sour and savory tastes - 'Umami' in Japanese means savory /deliciousness. A key component in Umami is L-Theanine – in foods like green tea, chocolate and grapefruit
- L-Theanine can promote calm by stimulating neurotransmitters that help with relaxation and wakeful creativity in the brain: GABA, serotonin, and dopamine.
- L-Theanine also reduces levels of chemicals in the brain that are linked to stress and anxiety
- **Some studies suggest that I-theanine may improve the effectiveness of SSRIs in treating depression and anxiety.
- **Some studies suggest that theanine may lower BP slightly



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RESEARCH ARTICLE: CLINICAL TRIAL/EXPERIMENTAL STUDY An investigation into the stress-relieving and Outline pharmacological actions of an ashwagandha (Withania somnifera) extract **Images** A randomized, double-blind, placebo-controlled study Lopresti, Adrian L. PhDa,b,*; Smith, Stephen J. MAa,b; Malvi, Hakeemudin MBBS, MDc; Kodgule, Rahul Download MBBSd Editor(s): Wane., Daryle Cite Author Information ⊗ Medicine 98(37):p e17186, September 2019. | DOI: 10.1097/MD.000000000017186 @

- In 2, double-blind, placebo-controlled studies, ashwagandha was associated with greater reductions in anxiety in adults presenting with predominately generalized anxiety disorder.
- In an 8-week, randomized, double-blind, placebo-controlled study ashwagandha was associated with greater reductions in anxiety, c-reactive protein, pulse rate, and blood pressure in chronically stressed adults.



Have a cup of tea and relax!

- Overall, a growing body of evidence suggests that tea (such as green and oolong) and herbal infusions, at relatively low intakes (around 1 to 2 cups daily), can help to facilitate sleep, alleviate psychological stress and anxiety, primarily by facilitating relaxation.
- Evidence for German Chamomile, Lavender, Rose, Jasmine, and Passionflower tea is emerging and looks promising.

Natural therapies supportive to Blood counts

- RBC- green foods such as cooked spinach in soup, spirulina, heme protein
- WBC unrefined sesame oil 1 tsp per day, belly lying 15 min per day
- Nurture your bone marrow – soups, nut butters, fish, olive oil
- Eat small snacks and meals throughout the day – don't skip
- Try using a grass-fed whey protein powder for complete amino acids

Fatigue

Integrative providers seek to:

Understand the causes

- Low nutrient intake/ low appetite/taste changes
- Thyroid function
- Nutrient deficiencies: vit A, vit D,
 Protein, Fat, calories
- Sleep disturbance, insomnia
- Uncontrolled pain
- Chemotherapy/ radiation
- Other medication side effects
 - Statins, antihistamine, antidepressants

Chemo-related fatigue

- Exercise non sedentary behavior, chair yoga, pool walking
- 1.0-1.2 g /kg protein intake daily divide your weight in pounds by 2.2 then multiply by 1.2 = your protein need daily)
- Hydrate Even 5% reduced hydration status can worsen nausea, fatigue and QoL significantly
- Vitamin D deficiency may be a factor
- Arginine/Citrulline/Carnitine amino acids
- Maca in small amounts ¼ tsp could be used in smoothie – a food grade starch/powder that improves endurance
- Rhodiola improves energy levels + focus,
 200 mg 400 mg is likely safe
- American Ginseng 2000 mg/day was found to be safe and reduce fatigue in people during chemotherapy treatment

***In an RCT, out of 244 people treated palliatively with opioids for advanced or metastatic cancer who were vitamin D deficient, those who took 4000 IU vitamin D3 for 12 weeks had less opioid use and improved fatigue.



Cancer Related Fatigue (CRF)

- Exercise -meta-analysis of 9 RCT's. Supervised aerobic exercise and resistance training reduced cancer fatigue
- Fatigue Reduction Diet RCT; whole grains, vegetables (one leafy green, one tomato, and one yellow/orange), fruit (one high in vitamin C), fatty fish and nuts and/or seeds. Fatigue improved by 44% in FRD vs 8% in control (p= 0.01). Sleep quality improved by nearly 50% in FDR group, with no improvement in control (p=0.03).
- Ganoderma/Reishi mushroom 1000 mg 2-3 x/day for 4 weeks decreased TNF-α and IL-6, improved fatigue, anxiety, depression, sleep, cognitive function, physical function and global QOL.
- ASCO -Phase III evaluation of American ginseng (panax quinquefolium) to improve cancer-related fatigue: NCCTG trial N07C2. In 364 patients receiving chemo w/ curative intent, American Ginseng reduced general and physical fatigue over 8 weeks without side effects.



Tools for nausea

- Aromatherapy (lavender, sweet orange, coffee beans)
- Peppermint tea, peppermint oil gelcaps
- Sea bands / acupressure
- Homeopathic Nux vom 30 c 5 pellets prn (there may be other homeopathics to try)
- Gin Gin ginger chews (peanut butter flavor!)



Lemon and Peppermint can help with nausea

- In an RCT of 90 participants undergoing chemotherapy for leukemia, those who received aromatherapy (peppermint and lemon essential oils) had significantly lower nausea and vomiting compared to those who received no aromatherapy (placebo or no treatment); they also had a significantly lower pulse and higher quality of life score.
- In botanical medicine, the smell of lemons and lemon balm tea, is said to bring "joy to the heart"

Yağmur Şancı, Suzan Yıldız, Ali Ayçiçek, Naciye Möhür. Effect of peppermint-lemon aromatherapy on nauseavomiting and quality of life in patients with leukemia: A randomized controlled trial, Journal of Pediatric Nursing, Volume 72, 2023, e217-e227,

chemotherapyinduced nausea

- Aromatic herbs can distract the GI signal to the brain for nausea:
 - peppermint, ginger, lavender safe for tea or aromatherapy
- Peppermint Gels by Now brand contain a tiny amount of peppermint, fennel and ginger oil that can be taken as 1 capsule for nausea 1-2 x / day
- Homeopathic Nux vom 30c 5 pellets chewed orally may be helpful for nausea & can be tried as needed

**Some anti nausea meds or pain meds can cause constipation – taking 1-2 Senakot S at night is safe and may be helpful on the day you've taken odansetron/Zofran



Mucositis support

- Glutamine 1-3 g per day on day
 2,3,4 post chemotherapy or longer
- LL Laser / Cold laser
- Aloe (Lakewood or Lily of the Dessert) swish and spit/swallow, mix 1-2 oz in glass of water
- Zinc carnosine
- Olive oil
- Tulsi tea (holy basil)
- Raw honey in glass jar





Glutamine during chemotherapy treatment

- In an RCT of people receiving chemotherapy, those randomized to receive oral glutamine starting from 24 hours before chemotherapy to 14 days after had significantly less incidence of oral mucositis compared with the placebo group patients.
- Length of hospital stay and total cost for hospital treatments were significantly higher in the placebo group than the treatment group.

Constipation care

- Fluid hydration –get 70-80 oz of liquid per including at least 2-3 glasses of pure water
- Movement walking, stretching, steps, can help GI transit
- Gentle stool bulking cooked fiber 1-2 servings daily such as:
 - cooked oats, brown rice, wild rice, quinoa, chia, lentils; stir into soups or have with small meals or snacks
 - make a batch for the next 2-3 days; overnight oats; chia pudding
- Bowel softening foods for daily use (help both constipation and diarrhea):
 - Avocado, Olive oil, Apple sauce, nut/seed butter, Unrefined sesame oil (Spectrum brand), Berries, Prunes/Dates/Figs, Bananas, Coconut milk, Kefir, yogurt, Ground flax seeds, chia seeds, fish

Probiotics make sense!

Gastrointestinal & Immune support-

probiotics nurture the Gut Breast Brain microbiome & reduce both diarrhea and constipation

- Lactobacillus casei, L acidophilus, L rhamnosus, Lbulgaricus, Bifidobacterium breve, Bifidobacterium longum, Streptococcus thermophilus, and prebiotic fructooligosaccharides
- In a DB RCT of 106 patients in maintenance chemotherapy, taking one probiotic twice daily on the first day of chemo for one week had significantly reduced GI side effects compared to the control group, (p< 0.05).
- Diarrhea incidence was significantly reduced in the treatment group vs. control (p< 0.05).
- How to make probiotic rich food! https://www.youtube.com/shorts/Rvqn8RatndY?feature=share
- Course on home vegetable fermentation:

https://ediblealchemyacademy.com/p/vegetable-fermentation

Neuropathy supportive care

- **Glutamine** 3-15 g daily or twice daily in water
 - RCTs evaluated glutamine in prevention and treatment of chemotherapy-induced peripheral neuropathy (CIPN), with paclitaxel, oxaliplatin, taxol and others.
 - In a randomized trial of metastatic colorectal cancer patients receiving oxaliplatin, oral glutamine (15 g twice daily for 7 days every 2 weeks) significantly reduced the incidence and severity of neuropathy without affecting chemotherapy efficacy or survival.^[1]
 - In patients with vincristine-induced neuropathy, glutamine supplementation (6 g/m² twice daily, max 10 g/dose) improved sensory neuropathy scores and quality of life compared to placebo.^{[2]R}

Other considerations in neuropathy

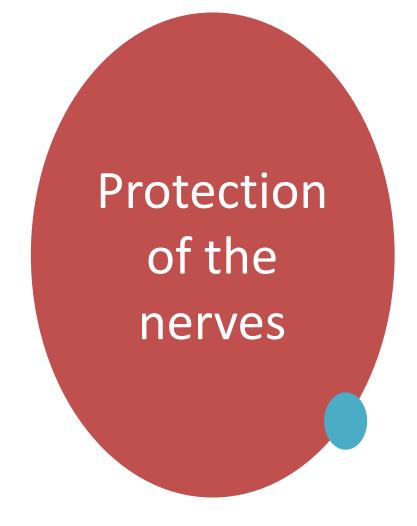
- Blood glucose, diabetes, existing neuropathy can worsen during chemotherapy
- Having good control of blood sugar through diet, exercise, medications can be helpful
 - Alpha lipoic acid supplementation may help both blood sugar and chemotherapy / diabetic neuropathy 300 mg per day with meal
 - Is a safe antioxidant
- Vitamin E (mixed natural tocopherol) 400 IU/day may help reduce cisplatin induced neuropathy



- Fish oil 1-3 g / day EPA + DHA
- Glutamine 3-5 g twice daily
- Alpha lipoic Acid 100-300 mg
- B6 100-300 mg + B complex

Glutamine Source - cabbage!

- √ 1 hearty cup is 300mg
- ✓ GI healing & Nerve support
- ✓ Or could rough chop 1/2 head and soak in water over night –for hydrating glutamine rich cabbage water



Support for healthy sleep



- Prepare for bed prior to 10 pm each night, experience a little darkness – in rhythm w/ nature!
- Drink 70-80 oz hydration prior to 7pm (to reduce trips to bathroom @ night)
- Sip some herbal tea such as chamomile or bedtime tea
- Consider safe use of added support:
 - Melatonin 1 mg 20 mg
 - Gaba 300 mg
 - Talk with your doctor about trying these if you are on a sleep medication!

Natural molecules from plants that may help fight cancer

- Turmeric (Curcumin)
- Green tea (EGCG)
- Resveratrol
- Quercetin



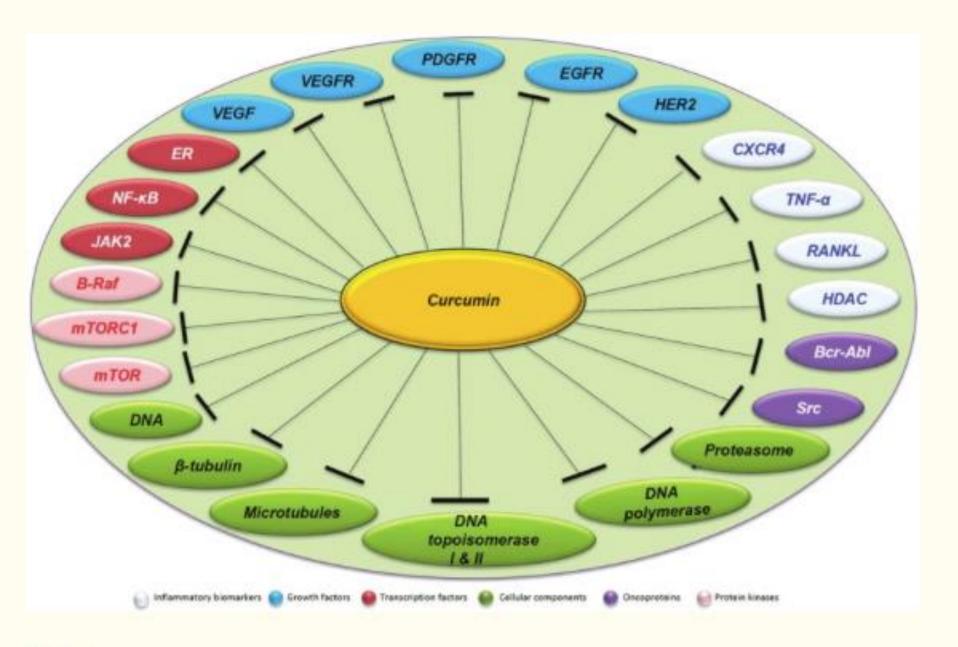


Figure 1



Curcumin

- Best *not* to use forms with bioperine which can elevate liver enzymes & irritate GI
- If using powdered or grated whole turmeric excellent to combine with healthy fat like olive oil or coconut milk
- Phytosomal curcumin or C3 are better options
- Dosing common in clinical trials 1-3 g per day
- Caution: curcumin can impact drug metabolizing enzymes in your liver so it is best to work with your integrative doctor in deciding if this is right for you!

SMM & MGUS – lengthening time to progression

- Curcumin 4 g & 8 g daily significantly decreased serum light chain ratio, involved free light chain and uninvolved
- Significantly reduced total serum protein and random urinary protein levels
- Increased effect was seen at 8 g daily dose vs. 4 g
- Patients with higher paraprotein levels & abnormal ratios benefit the most from curcumin supplementation

Golombick T, Diamond TH, Manoharan A, Ramakrishna R. Monoclonal gammopathy of undetermined significance, smoldering multiple myeloma, and curcumin: a randomized, double-blind placebo-controlled cross-over 4g study and an open-label 8g extension study. Am J Hematol. 2012 May;87(5):455-60. do



CURCUMIN + FOLFOX in colorectal



A PHASE II RCT COMBINED FOLFOX TREATMENT PLUS CURCUMIN 2,000 MG DAILY ORALLY



IMPROVED PROGRESSION FREE SURVIVAL



SAFE & WELL TOLERATED



DID NOT REDUCE EFFICACY
OF THE TREATMENT

Chronic Lymphocytic Leukemia

Clinical trial of patients with early stage CLL

Green tea daily x 6 months

80% showed reduction in lymphocytosis and absolute number regulatory T cells

10% had stabilization of lymphocytosis and reduction in absolute number of regulatory T cells

10% had disease progression

Anthracycline Cardiotoxicity Prevention

https://knowintegrativeoncology.org/patient-resources

TIPS TO BE PROACTIVE

FOLLOW THE 7 HEALING PRACTICES:



- Make "Heart Healthy" lifestyle choices that include several of the 7 Healing Practices, including: eating well,² moving more,² managing stress,¹⁰ sleeping well¹¹ and sharing love and support.¹² See BCCT's 7 Healing Practices¹³ for in-depth descriptions.
- Get regular aerobic exercise, aiming for 150 minutes weekly.^{14,15}
- If you smoke, consider seeking support to help you quit.
- Optimize body weight.
- Avoid drugs that stress the heart: cocaine, diet pills, ephedra (also known as ma huang), performanceenhancing drugs and caffeinated energy drinks.¹⁶
- Adopt a Mediterranean diet emphasizing vegetables, whole grains and healthy fats—good for both your heart and reducing your risk of dying from cancer.¹²



REFERENCES

To download this brochure or view the references, please visit: https://bcct.ngo/patient-brochures



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PROTECTING YOUR HEART

DURING
ANTHRACYCLINE/ADRIAMYCIN/
DOXORUBICIN CHEMOTHERAPY

AN INTEGRATIVE ONCOLOGY APPROACH



A COLLABORATION OF KNOWoncology.org, BCCT.ngo and OICC.ca

Anthracycline Cardiotoxicity Prevention

https://knowintegrativeoncology.org/patient-resources

ANTHRACYCLINES AND INTEGRATIVE CARE

Anthracyclines are a class of drugs that include Adriamycin (also known as doxorubicin), daunorubicin, epirubicin and idarubicin.

Anthracyclines are important chemotherapy agents but they can also damage the heart.\(^1\) With people living longer after a cancer diagnosis than in the past, the problem of long-term heart damage has become more important. Early treatment of heart problems can prevent serious damage.\(^2\) In this setting, complementary medicine may be helpful to protect the heart.



WHO IS AT RISK?

Risk of heart damage depends on many factors including types and doses of treatment. Some risk factors include anthracycline chemotherapy, radiation to the heart area, trastuzumab therapy, previous heart attack or heart disease, and other heart disease risk factors such as smoking, high blood pressure, diabetes, high cholesterol, obesity, and being over 60 years old.3 Please talk to your doctor to understand your individual risk. If you have risk factors, ask your oncologist or primary care physician about seeing a cardiologist for a baseline test of heart function (usually an echocardiogram) and repeat testing at the end of treatment & 6-12 months later.4 If you received doxorubicin or other anthracycline treatment for childhood cancer, have an echocardiogram every one to five years throughout life⁵ and during late-stage pregnancy.⁶ Some patients with risk factors are given beta blockers, a type of blood pressure medication, to help prevent heart damage.Z

NATURAL THERAPIES

Studies on some herbs or natural supplements show how these therapies have helped reduce heart damage from Adriamycin/doxorubicin or epirubicin.

Natural products are not safe for everyone and there can be problems with quality control of natural products, 18 so please consult with a naturopathic doctor (www.oncanp.org) or integrative oncology professional (integrativeonc.org) for specific guidance.

Milk thistle: In a controlled trial, children taking milk thistle with doxorubicin had better heart function compared to children who took the placebo.¹² Milk thistle is not likely to change the way most drugs are broken down in the liver²², and no known interactions have been found in studies combining milk thistle with chemotherapy.^{19, 21}



- ➤ CoQ10: In a small controlled trial, CoQ10 taken during doxorubicin treatment preserved heart function in children with acute leukemia.²² In other small controlled trials, CoQ10 preserved heart function in cancer patients receiving doxorubicin and radiation.^{23,24} Researchers hypothesize that CoQ10 prevents doxorubicin from binding to heart muscle cells.
- Ginkgo: In a controlled trial, people who took a ginkgo extract during doxorubicin treatment maintained



normal echocardiograms following treatment. ^{2.5} Ginkgo is likely safe to combine with chemotherapy because it does not affect the metabolism of many medications, ^{26, 27} nor does it affect bleeding risk when used with aspirin. ^{28, 29}

lodine: In a randomized controlled trial, women who took iodine during epirubicin chemotherapy for breast cancer had significantly lower levels of heart distress enzymes than those taking placebo.³⁰

NATURAL THERAPIES

- L-carnitine: In a meta-analysis not specific to cancer patients, taking L-carnitine after a heart attack was associated with a 27 percent lower risk of dying and 65 percent lower risk of irregular heart rate. 31 Because young cancer survivors receiving doxorubicin have lower plasma carnitine levels than controls, L-carnitine use may prevent heart damage. In a controlled trial, L-carnitine supplements safely led to an increase in plasma carnitine during doxorubicin treatment without interfering with chemotherapy effectiveness.32 A deficiency of L-carnitine during chemotherapy can weaken arm muscles or thighs (notable when climbing stairs) or result in cardiomyopathy and irregular heart rates (cardiac arrhythmias). Note: L-carnitine is different from acetyl carnitine, also known as acetyl-L-carnitine. Caution should be used with combining acetyl carnitine with Taxol (paclitaxel) chemotherapy.33
- ➤ L-arginine: In a small controlled trial, L-arginine use during doxorubicin treatment prevented shortness of breath, palpitations and ECG changes seen in patients not receiving L-arginine. ³⁴ Note: L-arginine should not be used by those who have had a recent heart attack. ³⁵
- Traditional Chinese medicine (TCM): In a large observational study, TCM treatments decreased the risk of congestive heart failure by 32% in people with breast cancer receiving doxorubicin, either with or without radiotherapy.²⁶



MORE INFORMATION

National Comprehensive Cancer Network Patient and Caregiver Resources: Cardiac Toxicity, www.nccn.org/patients/resources/life_with_cancer/managing_symptoms/cardiac_toxicity.aspx

Up to Date Milk Thistle Evaluation



In a double blind RCT, people who received silymarin 140mg 3x daily for a week following each doxorubicin dose had more favorable cardiac test results including maintaining lower troponin levels (7)



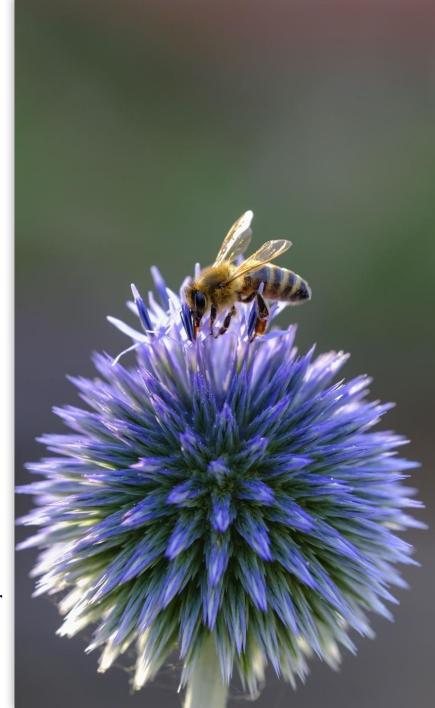
In a double blind RCT, children with ALL receiving chemotherapy (methotrexate/mercaptopurine/vincristine), who also received Silyphos Milk Thistle (15-20 kg: 80 mg/day, 21-40 kg: 160 mg/day, 41-60 kg: 240 mg/day and 61-70 kg: 320 mg/day), experienced reduced liver toxicity (8)



Women with breast cancer who had received dose-dense AC-T adjuvant chemotherapy that caused liver injury who took milk thistle 140 mg of 3x/d for four weeks post-treatment had improved bilirubin and reduced grades of fatty liver and no changes in liver enzymes (9)

Milk Thistle

- **Milk thistle helps support liver function** when combined with chemotherapy
- Milk Thistle helps protect the heart from anthracycline heart damage
- Over 10 human studies showing that milk thistle doesn't influence drug metabolism
- Option for regular milk thistle (safe up to 900mg daily) or Silyphos™ 340mg (has positive trial for liver support in children with ALL)
- Naturopathic doctors trained in oncology use milk thistle alongside cytotoxic chemotherapy, opposite time of day from targeted agents, when liver enzymes elevated



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<u>Chemoprevention:</u> <u>Soy</u>

- Soy is a flavonoid that is antiinflammatory
- In breast cancer survivors, 2 metaanalysis of prospective trials including over 9,500 breast cancer survivors & 11,000 in another showed decreased mortality and/or breast cancer recurrence with dietary soy intake
- 2017 study with 1600 breast cancer survivors followed for 9 years - 21% decrease in all-cause mortality for highest versus lowest soy intake
- Soy is associated with reduced risk of prostate cancer, gastrointestinal cancers, lung cancer, non Hodgkin's lymphoma

<u>Immune</u> Support

Natural therapies that Increase NK Cell lymphocytes in # &/or Activity:

Turkeytail/*Coriolus*Astragalus, Maitake,
Shiitake, Melatonin,
Zinc

Fish oil

Daily Blueberries

Forest Bathing

Exercise, Relaxation,

Music Therapy, Laughter,

Social and emotional support

Turkeytail, Coriolus, Trametes versicolor

- Meta-analysis of 13 double blind, placebo-controlled trials (breast, gastric, colorectal, esophageal, nasopharyngeal) on Coriolus/PSK in conjunction with chemo, radiation or surgery
- Absolute risk reduction of 9% in 5 year mortality, Numbers Needed to Treat (NNT) of 11
- Duration of 3-12 months in studies, so continue in survivorship
- Important that the label for mushrooms should say "hot water extract" and not alcohol extracted.

Supplement Cautions

- Copper don't take supplements that include this;
- Boron 3mg/d increases serum estradiol
- Beta carotene contraindicated in smokers or former smokers
- Don't take iron supplements unless your oncology provider recommends it, usually they have checked your ferritin (iron stores are low) and/or your hemoglobin is low
- Let your oncology team know you take supplements

"Here is my list of over-the-counter medications and supplements"

Thank you! Heather Wright ND **FABNO** Goodapplewellness.com KNOWintegrativeoncology.org

