



Winning the fight against cancer, every day.®

Integrative Breast Cancer Care: Using Supplements Safely Before, During & After Treatments

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Naturopathic Medicine



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Naturopathic medicine is based on the belief that the human body has an innate healing ability. Naturopathic doctors (NDs) teach their patients to use diet, exercise, lifestyle changes and cutting edge natural therapies to enhance their bodies' ability to ward off and combat disease. NDs view the patient as a complex, interrelated system (a whole person), not as a clogged artery or a tumor. Naturopathic physicians craft comprehensive treatment plans that blend the best of modern medical science and traditional natural medical approaches to not only treat disease, but to also restore health.

American Association of Naturopathic Physicians

Naturopathic Principles



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- Let nature heal
- Identify and treat causes
- First, do no harm
- Educate patients
- Treat the whole person
- Prevent Illness

Naturopathic Medical Education



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- 4 accredited naturopathic medical schools in the United States and 2 in Canada
- Pre-requisite pre-med undergraduate degree
- 4 year graduate medical education
 - 2 years basic sciences
 - 2 years clinical sciences
- 2 sets of Board Exams
- Optional Residency
- Specialty training: Fellowship of the Oncology Board of Naturopathic Physicians

Licensed States/Territories



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- Alaska, Arizona, California, Connecticut, Hawaii, Idaho, Kansas, Maine, Minnesota, Montana, New Hampshire, Oregon, Utah, Vermont, Washington, the District of Columbia, Puerto Rico and the United States Virgin Islands

Segregated Care Model



Gatekeeper Model



Integrated Care Model



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CTCA Offers Comprehensive Treatment

Fight cancer on all possible fronts

- Conventional therapy
- Complementary therapy

Treat the whole person—not just the disease

Goals of Naturopathic Medicine at CTCA



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- Side effect management
- Immune support
- Cancer-fighting support
- Synergistic effects with conventional therapies

Breast Cancer Treatment



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- Surgery
- Chemotherapy
- Targeted Therapy
- Radiation Therapy
- Hormone Therapy

Surgery



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- Partial Mastectomy/Lumpectomy
- Modified Radical Mastectomy
- Sentinel Node Biopsy
- Axillary Dissection

Naturopathic support with Surgery



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Homeopathic Arnica

- Arnica 200C: 3 pellets sublingual for 3 days
- Study: 60 patients were randomized to receive either Arnica or placebo following vascular surgery
- Arnica given once on the day before surgery, once just before surgery and hourly after surgery on the day of surgery, followed by 3 times on days 2-14
- Beneficial effect of Arnica with regard to reduction of hematoma and pain during the post-operative course

Forsch Komplementarmed Klass Naturheilkd. 2003 Oct;10(5):242-7.

Naturopathic support with Surgery



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Vitamin E

- Fat-soluble antioxidant, important for maintenance of stable cell membranes
- Increased breaking strength and collagen content of wounds were found in mice treated with Vitamin E preparation
- Supplemental Vitamin E led to decreased incidence and degree of peritoneal adhesions in mice

Arch Surg. 1985 Aug;120(8):949-51.

Chemotherapy



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Adriamycin and Cytoxan X 4 cycles

- Each 3 weeks
 - May be given without Taxanes for less aggressive approach
 - Considered equivalent to CMF chemo
 - Determined based on patient age, co-morbidities, etc.
 - AC q3wk X 6 (without T) may be given for more aggressive approach
- Dose dense = each 2 weeks X 4 cycles
 - More aggressive
 - More associated toxicities
 - Given with growth factors

Chemotherapy



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- Taxanes X 4 cycles
 - Taxol
 - Taxotere
- Targeted Therapy: Trastuzumab
 - Adjuvant therapy for HER+ breast cancer
 - 1 year

Adriamycin (doxorubicin): Potential Adverse Effects



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- **Cardiotoxicity**
 - Irreversible and dose-dependant
- **Myelosuppression**
- **Nausea/Vomiting**
- **Mucositis/Stomatitis**
- **Photosensitivity**
- **Radiation recall**
- **May turn urine red**
- **Half-life: 1-3 hours, metabolites 3-3.5 hours, terminal 17-30 hours**
- **P450 enzymes: substrate of CYP2D6, CYP3A4**
 - Inhibits CYP2B6 (moderate), CYP2D6 (weak)

L-theanine



Winning the fight against cancer, every day.®

- In M5076 ovarian sarcoma-bearing mice, theanine significantly enhanced the inhibitory effect of DOX on tumor growth and increased the DOX concentration in the tumor, compared to DOX-alone group. This was caused by **inhibition of DOX efflux from tumor cells due to inhibition of the glutamate transporter**
- Furthermore, the oral administration of theanine or green tea similarly **enhanced the antitumor activity of DOX** with the combination suppressing the hepatic metastasis of ovarian sarcoma.
- In contrast, an **increase in DOX concentration was not observed in normal tissues, such as liver and heart**
 - » Toxicol Lett. 2001 Apr 30;121(2):89-96.

Cardiotoxicity and Co Q10



Winning the fight against cancer, every day.®

Clinical trial: 79 patients treated with Adriamycin or Daunorubicin

- CoQ10 administered day before, day of and 2 days following chemo (40 pts)
- No significant differences in complete remission and mortality
- No significant differences in alopecia, fever, nausea and vomiting
- Incidences of **diarrhea** and **stomatitis** were significantly reduced
- **EKG:** Depression of ST waves and changes in T waves found in 20 of 40 patients given CoQ10 (50.0%) and in 18 of 25 receiving none (72.0%)
- 29 patients received chemo for 8 weeks or more: 17 were treated with CoQ10; 64.7% vs. 91.7% EKG aggravation

» Gan To Kagaku Ryoho. 1984 Jul;11(7):1420-7.

L-Carnitine



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- L-carnitine interacts with cardiolipin, **modifying membrane permeability and protecting the functions of the mitochondria**. This mechanism can be proposed to explain the protective effects of L-carnitine against adriamycin-induced cardiotoxicity.

» *Drugs Exp Clin Res 2001;27(1):27-49 {in-vitro}*

I-Carnitine



Winning the fight against cancer, every day.®

- The effect of the association of carnitine and coenzyme Q10 on doxorubicin cardiotoxicity has been investigated. The two drugs administered to rats for two weeks have lower protective activity when they are administered separately rather than given in association (carnitine 200 mg/kg/day, coenzyme Q10 10 mg/kg/day) for the acute toxic effect of doxorubicin on perfused functioning isolated hearts.

» *Drugs Exp Clin Res.* 1992;18(10):437-42 {in-vivo}

Adriamycin and Cardiotoxicity: Melatonin



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Study: the effect of melatonin against the toxicity of doxorubicin was investigated in rats.

- Hemodynamic function, pathological and biochemical changes were determined in hearts treated with Adriamycin
- Cardiac function was improved and lipid peroxidation decreased after melatonin treatment

» Int Immunopharmacol. 2004 Jan;4(1):91-9.

Adriamycin and Myelosuppression: Maitake



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- **Study (*in vitro*):**
 - Maitake d-fraction (MDF) promoted **bone marrow cell (BMC) viability** in the presence of Adriamycin
 - Maitake d-fraction **protected Colony Forming Unit granulocyte-macrophage colonies** from Adriamycin-induced toxicity
 - MDF treatment **promoted the recovery** of granulocyte-macrophage colony formation after bone marrow cells were pretreated with DOX
 - MDF acts directly in a dose dependent manner on hematopoietic BMC and **enhances BMC growth and differentiation** into colony forming cells

Int Immunopharmacol. 2004 Jan;4(1):91-9.

Cytoxan (Cyclophosphamide): Potential Adverse Effects



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- Hemorrhagic cystitis
 - Due to aldehyde breakdown product (acrolein) in bladder
- Myelosuppression
- Cardiomyopathy
- Nausea/Vomiting
- Alopecia
- Leukemia
- Half-life: 4-8 hours
- P450 enzyme: CYP2A6 (minor), CYP2B6 (major), CYP2C8/9 (minor), CYP2C19 (minor), CYP3A4 (major)
 - Induces CYP2B6 (weak), CYP2C8/9 (weak)

Ashwaganda



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- Administration of an extract from the plant *Withania somnifera* for five days along with cyclophosphamide
- **BUN** was drastically increased after the CTX treatment and was significantly reduced when the animals were treated with *Withania*
- **Glutathione content** in both **bladder** and **liver** was enhanced significantly ($P < 0.001$) in the *Withania*-treated group compared with the CTX alone-treated animals
- **Histopathological analysis** of the bladder of CTX alone-treated group showed severe necrotic damage whereas the *Withania somnifera*-treated group showed normal bladder architecture
- **Morphological analysis** of the bladders of the CTX-treated group showed **severe inflammation** and dark coloration whereas CTX along with the *Withania*-treated group showed **normal bladder** morphology

» Cancer Lett. 2000 Jan 1;148(1):9-17.

Cytosan and Myelosuppression: Ashwaganda



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- Study: Ashwaganda administered to mice with myelosuppression induced by one or more of the following three compounds: Cytosan, azathioprin, or prednisolone
 - Significant increase in **hemoglobin** concentration ($P < 0.01$), **red blood cell** count ($P < 0.01$), **white blood cell** count ($P < 0.05$), **platelet count** ($P < 0.01$), and **body weight** ($P < 0.05$) was observed in Ashwaganda-treated mice as compared with untreated (control) mice
 - » J Ethnopharmacol. 1996 Feb;50(2):69-76.

Cytosoxan and Cystitis



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- Mesna
 - pre-med used to reduce Cytosoxan and ifosfamide-induced hemorrhagic cystitis
 - not always used
- Hydration
 - Dilution of acrolein decreases tissue exposure
 - Frequent urination decreases tissue exposure and speeds elimination

Cytoxan and Cystitis



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- **Study:** Rats administered **melatonin** before and day after Cytoxan administration
 - Melatonin exhibited significant protection against Cytoxan-induced cystitis by diminishing bladder **oxidative stress** and blocking inducible nitric oxide synthase and peroxynitrite production

J Pineal Res. 2005 May;38(4):272-7.

- **Study:** Rats administered:
 - Nothing (control) → no cystitis
 - Cytoxan → cystitis
 - Cytoxan + Mesna → meaningful but not total protection from cystitis
 - Cytoxan + Mesna + B-Carotene → same as previous
 - Cytoxan + Mesna + a-tocopherol → full protection from cystitis
 - Cytoxan + Mesna + Melatonin → full protection from cystitis

Cancer Chemother Pharmacol. 2004 Nov;54(5):469-73. Epub 2004 Jun 30.

Adriamycin Cytosxan Interactions



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- **3A4 inducers –**
 - Hypericum, Ginkgo
- **3A4 inhibitors –**
 - Piper meth., Hydrastis, Uncaria tomentosa, Trifolium pretense, Matricaria chamomilla, Glycyrrhiza glabra/DGL, Echinacea, Polygonum, Allicin, Harpagophytum procumbens, Schisandra
- **2C8 inhibitors –** Quercetin
- **2C19 inhibitors –**
 - Ginkgo, Valerian, Harpagophytum, Polygonum
- **Inhibit JNK - *Avoid throughout:***
 - Curcumin, Quercetin
- **Caution with NAC and Glutathione-Enhances Multidrug Resistance of Adriamycin**

Taxol (Paclitaxel): Potential Adverse Effects



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- Peripheral neuropathy (Sensory and Motor)
- Myalgia/Arthralgia
- Stomatitis/Mucositis
- Cardiac arrhythmia
- Facial flushing
- Hypersensitivity reaction
- Myelosuppression
- Alopecia
- Fatigue
- Taxol is a vesicant, extravasation will lead to local pain, edema and erythema
- P450 Enzymes: CYP2C8, CYP3A4
- Taxol half-life: 19 hours

DHA



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- DHA enhanced the cytotoxic activity of taxanes against MDA-MB-231 cells
- DHA downregulates Her-2/neu oncogene expression in human breast cancer cells
 - » *Eur J Cancer Prev.* 2005 Jun;14(3):263-70. {in vitro}

Gastrointestinal Toxicity



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Glutamine

- **Study:** Glutamine use with high dose Taxol and Melphalan for BRCA patients
 - Administered as swish & swallow, 24 G daily in divided doses
 - Patients in the glutamine group demonstrated significantly fewer days of **mucositis** and a lower maximum grade of mucositis
 - Glutamine group had less **oral ulceration** and **bleeding**, and were able to **tolerate liquids** sooner than those in the non-glutamine group

Neurological Toxicity



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Glutamine

- **Study:** Patients receiving Taxol given glutamine vs. no intervention
 - Glutamine: 10 G tid given for 4 days, 24 hours after completion of chemo
 - Statistically significant reduction in:
 - severity of development of moderate to severe dysesthesias and **numbness** in the fingers and toes ($P < 0.05$)
 - degree and incidence of **motor weakness** ($P = 0.04$)
 - deterioration in **gait** ($P = 0.016$)
 - interference with **activities of daily living** ($P = 0.001$)

Clin Cancer Res. 2001 May;7(5):1192-7

Taxol



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Glutamine

- **Study:** Glutamine administered to patients receiving Taxol
 - Reduced **myalgias** and **arthralgias**

J Clin Oncol. 1998 Dec;16(12):3918-9.

- Glutamine: 10 G three times daily
 - Best if administered as swish & swallow away from food for direct tissue contact
 - Caution with liver disease (elevated LFT's)

Interactions with Taxanes



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- Avoid Berberine, Quercetin, Curcumin
 - decreases effectiveness of Taxol and possibly other Taxanes
- Avoid products that affect CYP3A4

Quercetin



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- Known general kinase inhibitor and an antioxidant, was able to prevent the onset of Taxol-induced cellular detachment in HeLa and MCF-7 cells and **protected from cell death**
- Blocked Taxol-induced phosphorylation of p38 and Bcl-2, and prevented a Taxol-induced change in relative mobility of the **apoptosis signal-regulating kinase 1 (Ask1)**

» *Exp Cell Res. 2001 Oct 15;270(1):1-12*

Curcumin



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- Contradictory data with taxanes:
- Slows development of multi-drug resistance, including resistance to Taxol, probably by down-regulating NF-kappaB.
 - » *J Biol Chem.* 2005 Feb 25;280(8):6301-8
- Taxanes initiate apoptosis by activating signal pathways, such as the jun N-terminal kinase (JNK) pathway. JNK activation and PARP cleavage induced by 30 nm Taxotere at 48 h were reversed by curcumin
 - » *Oncogene* (2004) 23, 426–433.

Herb/Drug Interactions



Botanical	Interaction (largely pre-clinical data)
Garlic	Avoid with decarbazine (CYP2E1 inhibition)
Ginkgo	Avoid during chemotx (CYP3A4 and CYP2C19 inhibition)
Echinacea	Avoid during chemotx (CYP3A4 induction)
Hypericum	Avoid during chemotx (CYP3A4, -2B6, -2C9, -2C19, -2E1 induction and induces p-glycoprotein expression → drug resistance). Especially avoid with irinotecan – reduces metabolism of active metabolite (SN-38)
Valerian	Avoid with tamoxifen and cyclophosphamide (CYP2C9 and CYP2C19 inhibition)
Quercetin	Avoid with taxanes (CYP2C8 inhibition)
Berberine	Avoid with taxanes (increases MDR transporter expression)
Curcumin	Avoid with camptothecin, mechlorethamine, cyclophosphamide, adriamycin, doxorubicin (interferes with apoptotic mechanisms).
Cimicifuga	Avoid with –platin chemotherapy (may decrease cytotoxicity of cisplatin)
Soy	Avoid with tamoxifen (may exert counter-productive effects)

Supplement/Drug Interactions



<p>NAC and alpha-lipoic acid</p>	<p>Interferes with –platins (Carboplatin, Cisplatin, Oxaliplatin) and Radiation therapy</p>
<p>Glucosamine</p>	<p>May interfere with anti-tumor actions of etoposide and adriamycin (interferes with topoII inhibition)</p>
<p>Quercetin</p>	<p>Interferes with anti-tumor actions of cyclophosphamide (JNK suppression) and taxanes (interferes with kinase inhibition)</p>
<p>Beta-carotene</p>	<p>Interferes with chromosomal damage from mitomycin-C and with radiation induced cytotoxicity</p>
<p>Vitamin E</p>	<p>Interferes with radiation induced cytotoxicity</p>
<p>Hardy & Alschuler 2008 CoQ10</p>	<p>High doses (>300mg daily?) interferes with radiation induced cytotoxicity</p>

Targeted therapies:

Herceptin (trastuzumab)



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- Monoclonal antibody selectively binding the human epidermal growth factor receptor-2 (HER2) receptor
- Cardiotoxicity
 - Ventricular dysfunction and CHF
 - Left ventricular function should be evaluated prior to and during treatment (q 3 months)
- Hypersensitivity
- Fever/Infections
- Diarrhea
- Nausea/Vomiting
- Rash
- Headache
- Metabolism: unknown; CYP450: unknown
- Half life: 5.8 days

Herceptin



Winning the fight against cancer, every day.®

- The results of a pivotal trial revealed a **53% improvement in the response rate** when trastuzumab was added to the standard chemotherapeutic regimen.
- However, a greater than **four-fold increase in the occurrence of congestive heart failure** was also noted.
- Trastuzumab-induced cardiotoxicity is thought to be mediated by the ErbB/neuregulin system, with exposure to trastuzumab partly blocking the protective effect of **neuregulins** on the myocardium.
- As a result, trastuzumab **increases the risk of anthracycline-induced cardiotoxicity**. Several strategies have been adopted in attempts to **minimize cardiotoxicity**, including patient selection on the basis of preexisting cardiac risk, monitoring of cardiac function during treatment, and early management of cardiac dysfunction.

» Ann Oncol. 2008 Sep;19(9):1530-9. Epub 2008 May 13.

Herceptin



Winning the fight against cancer, every day.®

- Causes a decrease in left ventricular ejection fraction (LVEF) in a minority of patients. Incidence is increased if trastuzumab is given in conjunction with paclitaxel or anthracyclines. It differs from anthracycline cardiotoxicity in that it is **not cumulative dose-dependent and often improves after withdrawal of treatment**. Re-treatment with trastuzumab is often possible.

» Am J Cardiovasc Drugs. 2005;5(4):233-43.

Effect of coenzyme Q10 therapy in patients with congestive heart failure: a long-term multicenter randomized study



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- Patients with a hx of CHF received placebo (n = 322) or coenzyme Q10 (n = 319) at the dosage of 2 mg/kg per day in a 1-year double-blind trial.
- The number of patients who required hospitalization for worsening heart failure was smaller in the coenzyme Q10 treated group (n = 73) than in the control group (n = 118, $P < 0.001$).
- Similarly, the episodes of pulmonary edema was reduced in the control group ($P < 0.001$)
 - » Clin Investig. 1993;71(8 Suppl):S134-6.

L-Carnitine



Winning the fight against cancer, every day.®

- 80 patients with moderate to severe heart failure (New York Heart Association classification III to IV)
- Patients were randomly assigned to receive either L-carnitine (2 g/d orally) or placebo and followed for a range 10 to 54 months
- Patients' survival was statistically significant ($P < .04$) in favor of the L-carnitine group

» Am Heart J. 2000 Feb;139(2 Pt 3):S120-3.

Beta-glucan



Winning the fight against cancer, every day.[®]

- Five tumor models were explored in BALB/c or C57BI/6 mice using tumors that expressed either high levels of naturally occurring antigens or recombinant human MUC1. In comparison with antitumor mAb or beta-glucan alone, combined treatment with mAb plus beta-glucan produced **significantly greater tumor regression** in all models that included mammary tumors.
- These data suggest that **the therapeutic efficacy of mAbs known to activate complement, including Herceptin, could be significantly enhanced if they were combined with beta-glucan**

» Cancer Res. 2003 Dec 15;63(24):9023-31.

Gamma-linolenic acid (GLA)



Winning the fight against cancer, every day.®

- *in vitro* studies show that GLA treatment substantially **reduced HER-2/neu protein levels** in Her-2/neu-overexpression cell lines from breast cancer
- Concurrent treatments of Her-2/neu-overexpressing cancer cells with **GLA and trastuzumab** led to **synergistic increases in apoptosis and reduced growth and colony formation**

» J Natl Cancer Inst. 2005 Nov 2;97(21):1611-5.

Radiation Therapy



Winning the fight against cancer, every day.®

- Breast Conservation
 - Lumpectomy + XRT
- Post mastectomy
 - Tumors greater than 4 cm in size or diffuse malignancy
 - Positive margins
 - 4 or more lymph nodes positive or 1 sentinel LN positive
 - Inflammatory breast cancer/locally advanced

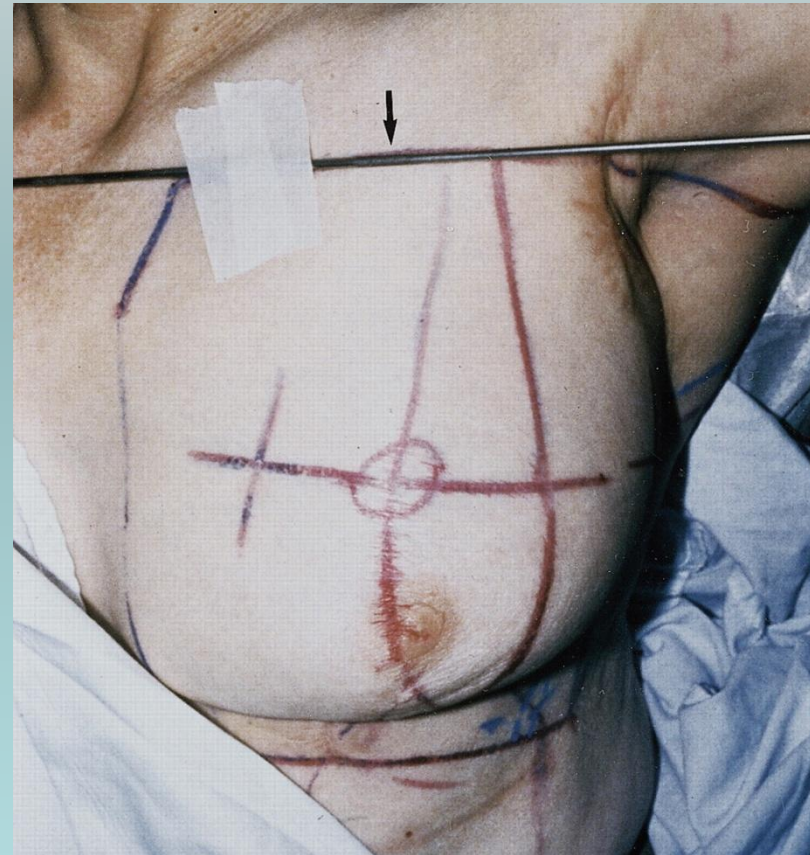
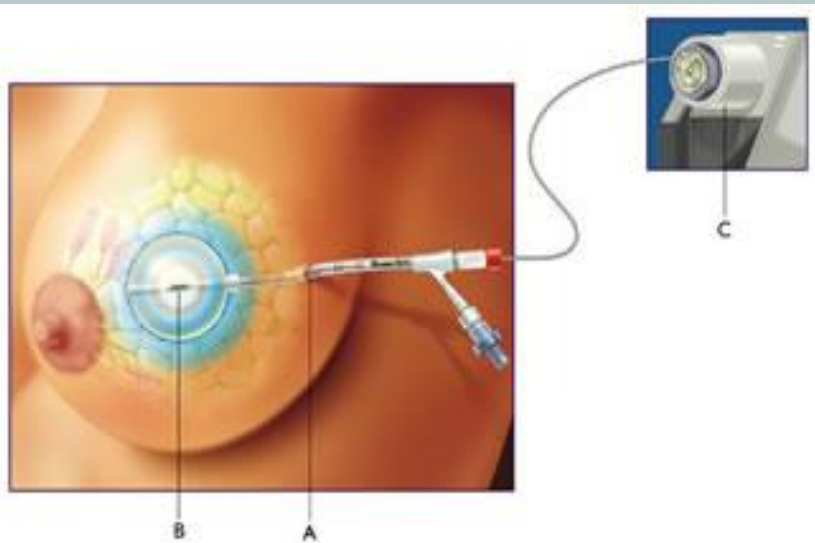
Radiation Therapy



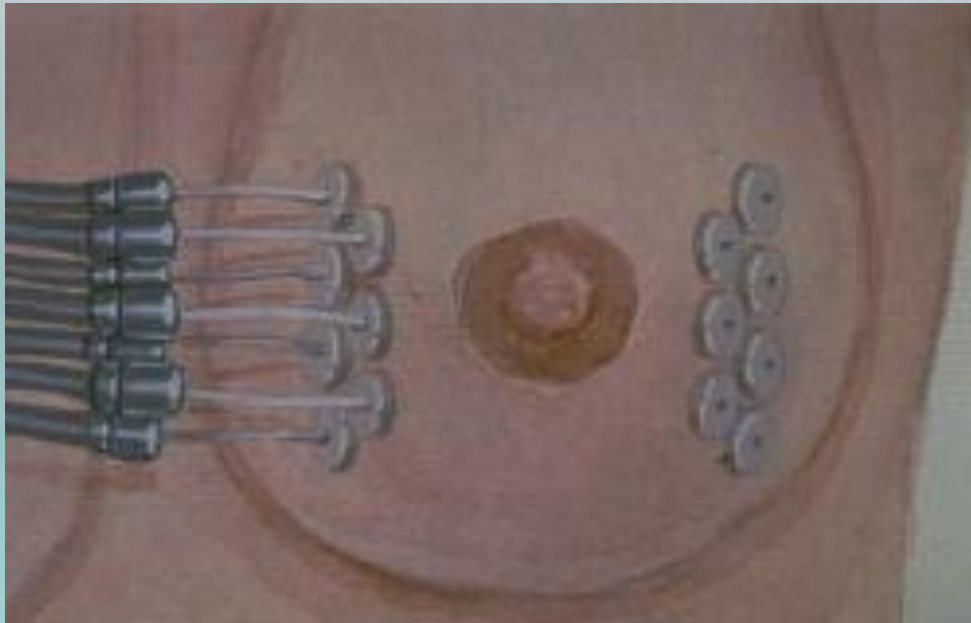
Winning the fight against cancer, every day.®

- Whole Breast Radiation (7 weeks)
- Partial Breast Radiation
 - MammoSite (5 days)
 - Breast Brachytherapy

MammoSite



Brachytherapy



Common Radiation Effects

- **Fatigue**
 - Most commonly seen regardless of radiation type
- **Dermatitis**
 - Usually minor with breast
- **Pulmonary Fibrosis**
 - Uncommon due to current technology in tailoring treatment fields
- **Cardiac effect**
 - Uncommon due to current technology in tailoring treatment fields
- **Myelosuppression**

Radiation-Induced Fatigue



Winning the fight against cancer, every day.®

- Risk of fatigue is higher in patients
 - With advanced-stage disease
 - Treated with large radiotherapy field area
 - Low pre-radiotherapy hemoglobin level
 - With poorer nutritional status
 - Lymphocyte counts are not correlated with fatigue

Radiation-Induced Fatigue: Exercise



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- A randomized controlled trial with breast cancer patients again showed that adherence to a home-based moderate-intensity walking exercise program may effectively mitigate the high levels of fatigue prevalent during cancer treatment
- Conclusion: Exercise may mitigate fatigue in breast cancer patients receiving radiation

» *Psychooncology. 2004 Oct 14*

Radiation induced esophagitis



Winning the fight against cancer, every day.®

- Ulmus lozenges
- Honey: PATIENTS AND METHODS: Forty patients diagnosed with head and neck cancer requiring radiation to the oropharyngeal mucosal area were divided in to two groups to receive either radiation alone or radiation plus topical application of pure natural honey. In the study arm, patients were advised to take 20 ml of pure honey 15 min before, 15 min after and 6 h post-radiation therapy. Patients were evaluated every week for the development of radiation mucositis using the Radiation Therapy Oncology Group (RTOG) grading system. MAIN RESULTS: There was **significant reduction in the symptomatic grade 3/4 mucositis among honey-treated patients compared to controls; i.e. 20% versus 75%** (p 0.00058). The **compliance** of honey-treated group of patients was better than controls. Fifty-five percent of patients treated with topical honey showed **no change or a positive gain in body weight** compared to 25% in the control arm (p 0.053), the majority of whom lost weight.

» *Support Care Cancer. 2003 Apr;11(4):242-8.*

Radiation Induced Dermatitis: Calendula



- Phase III randomized trial of Calendula officinalis compared with trolamine for the prevention of acute dermatitis during irradiation for breast cancer
- 254 patients who had been operated on for breast cancer and who were to receive postoperative radiation therapy were randomly allocated to application of either trolamine or calendula (Boiron) on irradiated fields after each session.
- The occurrence of **acute dermatitis** of grade 2 or higher was significantly lower ($p < .001$) with the use of calendula than with trolamine.
- Patients receiving calendula had **less frequent interruption of radiotherapy** and significantly **reduced radiation-induced pain**

» J Clin Oncol. 2004 Apr 15;22(8):1447-53.

Pulmonary Fibrosis



Winning the fight against cancer, every day.®

- Radiation-induced fibrosis (RIF) remains the most morbid complication of radiotherapy because of the absence of spontaneous regression and the difficulty of patient management. **PATIENTS AND METHODS:** Forty-three patients who had radiotherapy for head and neck or breast cancer and had developed RIF in the first year after irradiation and gradually worsened, without spontaneous regression. A combination of pentoxifylline (PTX) (800 mg/d) and Vit E (1,000 IU/d) was administered orally for at least 6 months.
- **RESULTS:** Treatment was well tolerated. All assessable injuries exhibited continuous clinical regression and functional improvement. Mean RIF surface area and SOMA scores improved significantly ($P < .0001$) at 3 months and 12 months and mean linear dimensions ([D]) diminished from the start of the study to the end of treatment 12 months later.
- **CONCLUSION:** The PTX-Vit E combination reversed human chronic radiotherapy damage and, because no other treatment is presently available for RIF, should be considered as a therapeutic measure.

» *J Clin Oncol.* 1999 Oct;17(10):3283-90.

Ashwagandha



Winning the fight against cancer, every day.®

- Administration of a 75% methanolic extract of the plant was found to significantly increase the total WBC count in normal Balb/c mice and reduce the leucopenia induced by sub-lethal dose of gamma radiation
- Increased bone marrow cellularity significantly (146.3%)
 - » Indian J Exp Biol. 1996 Sep;34(9):854-6.

Radiation Contraindications



Winning the fight against cancer, every day.®

- Beta Carotene > 5000 IU
- Beta Carotene in current smokers
- Vitamin E over 200 IU
- N-acetyl-l-cysteine
- Apha-lipoic acid
- Coenzyme Q10 >300 mg daily

SERM's



Winning the fight against cancer, every day.®

- Potential Adverse Effects
 - thromboembolism
 - endometrial CA
 - hot flashes
 - nausea/vomiting
 - vaginal discharge
 - menstrual irregularities
 - lightheadedness/dizziness
 - peripheral edema
 - fatigue
 - headache
 - vaginal dryness
 - hair thinning/loss
 - elevated LFTs
- Metabolism: liver; CYP450: 2C9, 2D6, 3A4 substrate
- Half-life: 5-7 days (tamoxifen)

Aromatase Inhibitors



Winning the fight against cancer, every day.®

- Potential Adverse Effects
 - endometrial CA
 - thromboembolism
 - osteoporosis
 - arthralgia
 - hot flashes
 - nausea/vomiting
 - headache
 - insomnia
 - weight gain
 - constipation
- Metabolism: liver primarily
- CYP450: Arimidex (none); Aromasin (3A4 substrate); Femara (2A6, 3A4 substrate; 2A6, 2C19 inhibitor)
- Half-life: Arimidex (50h); Aromasin (24h); Femara (2d)

Tamoxifen and Melatonin



Winning the fight against cancer, every day.®

- Phase II study of tamoxifen plus melatonin in metastatic breast cancer patients progressing under tamoxifen alone
- 14 patients with metastasis who did not respond ($n = 3$) to therapy with TMX alone or progressed after initial stable disease (SD) ($n = 11$). MLT was given orally at 20 mg day⁻¹ in the evening
- A partial response was achieved in 4/14 (28.5%) patients (median duration 8 months)
- Mean serum levels of insulin-like growth factor 1 (IGF-1) significantly decreased on therapy, and this decline was significantly higher in responders than in patients with SD or progression

» *Br J Cancer. 1995 Apr;71(4):854-6.*

Naturopathic Support



Winning the fight against cancer, every day.®

- Increased risk for endometrial cancer
 - Monitor with regular pelvic exams
 - Ask about uterine bleeding
- Osteoporosis
 - Mineral support
 - Vitamin D

Exercise



Winning the fight against cancer, every day.®

- Exercise decreased risk of mortality from breast cancer in breast cancer patients
- Nurse's Health Study
 - **2,987 registered nurses** who had prior diagnoses of stage I, II or III breast cancer
 - Monitored exercise levels
 - Benefit more apparent in Estrogen Receptor positive breast cancer patients
 - Those women who walked at average pace of 3 miles per hour for 1-3 hours per week had **lower risk** of dying from breast cancer by **one-quarter**
 - **Those women who walked for 3-8 hours per week decreased risk by half**

Naturopathic Support



Winning the fight against cancer, every day.®

- Arthralgia
 - Natural anti-inflammatories, homeopathics, topical agents (capsaicin)
 - May need to switch AI
- Hot flashes
 - Black cohosh
 - Hesperidin, vitamin E
 - Lifestyle: caffeine, exercise, alcohol, nicotine

Black Cohosh



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- Previously thought to be a phytoestrogen
- Effects now attributed to effects on cAMP
- **Decreased rates of recurrence of breast cancer:**
18,861 total patients followed, 1,102 had received Black Cohosh. Over an observation time of 3.6 years, Black Cohosh was associated with prolonged disease-free survival. After 2 years following initial diagnosis, 14% of the control group had developed a recurrence, while the study group reached this proportion after 6.5 years
 - » Int J Clin Pharmacol Ther. 2007 Mar;45(3):143-54
- Safe to use with AI's
 - » Planta Med. 2007 Apr;73(4):318-22. Epub 2007 Mar 12.

Conclusion



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- Integrative therapies provide an increase in Quality of Life during conventional cancer treatment and decreased negative long-term effects of conventional treatment
- Integrative therapies support effectiveness of conventional cancer therapies through increase in compliance with treatment schedules and synergistic effects

Resources

- www.oncanp.org
- www.aanp.org



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