

**Use of Nutritional Substances  
with/without  
Chemo and Radiation Therapy  
in  
Cancer Management**

**International College of Integrative Medicine**

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**Martin Dayton D.O., M.D.**

# Integrative Medicine

- uses various alternative and traditional methods
- incorporates various forms of wisdom and technology
- offers safer and more effective care
- emphasizes more nutritional holistic approaches

# Goals of Using Nutritional substances in Cancer Therapy

- ✓ reduction of toxicity from chemotherapeutic and radiation therapies while enhancing tumor killing capacity
- ✓ reduction of radiation and chemotherapeutic side effects such as fatigue, hair loss, mouth sores, nausea, vomiting, appetite loss, and organ wasting and failure
- ✓ enhancement of immunity
- ✓ prevention of cancer spreading via growth, metastasis and local invasion

- ✓ protection against developing new cancer due to cancer causing effects of radiation and chemotherapy
- ✓ protection against development of further cancer in cancer prone individuals
- ✓ complete or partial remission by exerting direct effects on the tumor and by changing the underlying bodily conditions that allow the cancer to exist
- ✓ augmentation of duration and quality of life

Beating Cancer with Nutrition, Quillin, 1998

# **The Conventional Nutritional Approach to Cancer is depicted by American Cancer Society Guidelines**

- ✓ Maintain an a desirable body weight.
- ✓ Eat a varied diet.
- ✓ Include a variety of both vegetables and fruits in the daily diet.
- ✓ Eat more high-fiber foods, such as, whole-grain cereals, legumes, vegetables, and fruits.
- ✓ Cut down on total fat intake.
- ✓ Limit alcoholic beverages.
- ✓ Limit salt cured, smoked, and nitrite preserved foods.

**Weinhouse, at all (for the work study group on diet, nutrition, and cancer of the American Cancer Society): CA 1991; 41:334 –30038**

# Conventional & Integrative Medical Oncology Differ in Emphasis

Cancer acts as a parasite that takes from the cellular community of the body, without contributing in return.

Cancer is like an unwelcome, free loading houseguest.

To get rid of the houseguest, two strategies prevail:

1. direct destruction of the guest
2. changing the internal environment of the house, so it is less hospitable to such an unwanted guests.

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The former strategy reflects the **conventional** approach

The later strategy reflects the **holistic** approach.

These two approaches may be used independently or together in a **complementary manner**.

**Nutrition may be  
manipulated  
to modify how the  
genes of an individual  
are expressed,  
in both healthy  
and cancerous tissue.**

# Nutrients are Biological Response Modifiers

Nutrients have different effects under different circumstances.

- Each **individual** is **unique** and responds differently to nutrients depending on genetic predisposition and circumstance.
- Individual response to and requirements for nutrients are subject to dramatic change with changes in activity and state of health.

- **Nutrients have therapeutic value when administered in quantities greater than that required to prevent deficiency diseases such as beri beri and scurvy**
- **RDA or Recommended Daily Amount is the amount of nutrients recommended to prevent such diseases**
- **RDA is suboptimal for top health and performance**
- **RDA is being replaced today with ranges of nutritional need called RDI, reference daily intake.**
- **Niacin, a B vitamin, administered in quantities of over 100 times the RDA (2000 mg/day) is accepted therapy for hyperlipidemia.**

# Quantity of Nutrients Influences Clinical Effects

- In a laboratory rat experiments, vitamin E at 7.5 mg /kg produces normal growth.
- At **27 times** that amount, it helps optimize immune T and B cell responses.

*Bendich: Dietary vitamin E requirement for optimal immune response in the rat. J Nut.,116:675,1986 nutrition*

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- In humans, the RDA of vitamin E, 30 iu /day, is the amount considered necessary for maintenance of health for the average person.
- At over **26 times** that amount, 800 i u /day, vitamin E improves immunity in the elderly.

*Meydani, Vitamin E supplementation cell-mediated immunity in healthy elderly subjects. Am J Clin Nutr, 52:557,(1990)*

# **Quality of Nutrients Used Influences Clinical Effect**

**Similar foods grown on different soils and prepared under different conditions have different biochemical makeup and nutritional bioavailability.**

**Vegetables grown in mineral rich soil have different mineral contents than those grown in depleted soil.**

**Micro-nutrients such as vitamin E coming from different sources may have different effects.**

**The form of vitamin E, **tocopherol**, prevalent in soy is less effective in limiting breast cancer growth than the form of vitamin E, **tocotrienol**, prevalent in rice.**

**Tocotrienols inhibit growth of malignant both estrogen sensitive and estrogen insensitive breast cells.**

# **Nutrients Prevent Cancer as Biological Response Modifiers**

**According to the Harvard School of  
Public Health survey involving 88,756  
R. N.' s, taking multiple vitamins over 15  
years lowers cancer of the colon risk by  
75%.**

***Ann. Intern. Med 126:517-24,1998***

**In a study involving 974 men who previously had skin cancer, supplementation with selenium, resulted in a 63% reduction in the incidence of prostatic cancer. The subjects were treated with 200mcg /day for 4.5 years and followed for 6.5 years.**

***Clark: Decreased incidence of prostatic cancer with selenium supplementation: results of a double-blind cancer prevention trial. Br J Urol 81:730-34,1998***

# Nutrients Modify Biological Response Independently and Synergistically

Vitamins A, D, B12, and folic acid all help repair DNA, down regulate tumor expression, and induce apoptosis in cancer cells.

*Prasad: Vitamins regulate gene expression and induce differentiation and growth inhibition of cancer cells. Arch Otolaryngo. Head and Neck Surg, 119: 1133,1993*

Vitamin C and B12 administered together in animals is associated with significant tumor regression and survival.

*Poydock, Am. J. Clin. Nutr, vol.54, 1261S,1991*

Administration of **vitamin C** and **vitamin K3** together inhibits cancer growth in culture at doses 90% less than required by either vitamin alone.

- *Noto, Cancer, vol.63,901,1989*

Administration of Vitamin C, intravenously approximately 15-65 grams, 1-2 times weekly has been associated with long lasting remission of terminal metastatic renal cell carcinoma in two published case reports.

- Riordan HD, Jackson JA, Schultz M. Case study: high-dose intravenous vitamin C in the treatment of a patient with adenocarcinoma of the kidney. *J.Ortho.Med.* 1990; 5:5-7.
- Riordan N, Jackson JA, Riordan HD. Intravenous vitamin C in a terminal cancer patient. *J.Ortho.Med.* 1996; 11:80-82.

# Parenteral Nutritional Support in Oncology is Controversial

## *The Negatives*

Findings of 12 cancer patient studies were used to analyze the benefits of parental nutrition on **quality and length of life**.

The results ranged from **disappointing** to **contra-productive**.

**Exceptions** included severely malnourished patients, where the risks of complications, such as infection and metabolic imbalances are outweighed by the potential benefits.

*Guidelines: American College of Physicians, Parenteral Nutrition in Patients Receiving Cancer Chemotherapy. Ann. Intern. Med. 1989; 110: 734-6*

The American College of Physicians declared:  
“Routine use of parenteral nutrition in cancer  
to improve survival or tumor response among  
patients receiving chemotherapy is not  
recommended.”

Some clinicians mis-interpret this to mean  
that parenteral nutrition is useless in cancer  
patients, **period**. Others generalize that **oral  
nutritional supplementation** is also useless.

**Should routine parenteral nutrition  
for cancer patients be  
categorically dismissed as  
useless?**

**Has something been overlooked ?**

# Parenteral Nutrition is Beneficial in Oncology

Malnutrition is said to be responsible for 22% to 67% of all cancer deaths. Up to 80% involve reduced albumin, a sign of malnutrition.

*Dreizen, Postgraduate Medicine, vol.87, no.1,163, Jan.1990*

The notion of starving tumors by withholding needed nutrition, at the expense of patient well being, is not well founded. Dietary protein restriction does not decrease tumor growth.

*Lowery, Surgical Forum, vol.28, 143,1997*

Tumors are resistant to starvation and most studies find the host is harmed more than the tumor by nutritional deficiencies.

*Axelrod, Vitamins and Hormones, vol.22, 591, 1979*

*Goodgame, Am. J. of Clinical Nutrition, vol.32, 2277, 1979*

Tumors grow more rapidly in starved animals.

*Norton, Cancer, vol.45, 2934, 1980*

Malnourished cancer patients given TPN had a mortality of 11%. Comparable patients without TPN feeding had 100% mortality.

*Harvey, Morbidity and Mortality in Parenterally Nourished Cancer Patients, Cancer, 43, 2065-9-702, 1979*

Of 49 patients with lung cancer receiving chemotherapy, those that had TPN had an 85% complete remission vs. 59% for those who did not.

*Valdivieso, Cancer treatment Reports, vol.65,145, 1981*

Parenteral feeding improves immune responses and tolerance to most chemotherapeutic agents.

*Eys, Cancer, vol. 43,2065,1979*

Pre-operative TPN in patients undergoing surgery for GI cancer provides for less complications, morbidity and mortality.

*Muller, Lancet, 68, Jan 9,1982*

(citations from Beating Cancer with Nutrition by Patrick Quillin, 1998)

# Can inappropriately administered nutrition proliferate cancer ?

- Diets high in simple sugar are known to worsen cancer progression. The routine use of traditional dextrose sugar rich, vital nutrient deficient parenteral feedings needs review .
- Tumors are obligate glucose users and have a relatively high rate of anerobic glycolysis.

*Rothkopf: Fuel utilization in neoplastic disease: implications for the use of nutritional support in cancer patients. Nutrition, Supp. 6(40):14s, July, 1990*  
*van Nys: Nutrition and Cancer, physiological relationships. Ann Rev Nutr,5:435, 1985*

Sugar in the refined form such as sucrose or fructose inhibits cellular immunity.

*Sanchez: Role of Sugars in human neutrophilic phagocytosis. Am J Clinical Nutr 26:1180-4,1973*

*Ringsdorff: Sucrose, neutrophil phagocytosis and resistance to disease. Dent Sur 52:46-8,1997*

*Bernstein, J: Depression of lymphocyte transformation following oral glucose ingestion, Am J Clinical Nutr 30:615,1997*

Progressive increases in sucrose in laboratory animal diets leads to a dose dependent decline in antibody production.

*Nadler, J of Nutr, Apr.1972*

A 16 country epidemiological study suggests that sugar consumption is a major cancer risk factor.

*Rothkopf, Nutrition, supp,(6):14-16S,1990*

Sugar intake is associated with increased risk of breast cancer while diets high in complex carbohydrates are associated with a decreased risk.

*Carroll, "Dietary factors in hormone- dependent cancers "Current Concepts in Nutrition Vol. 6:25-40, NY, Wiley & Sons, 1977*

*Carroll, "Dietary Fats and Cancer", Am J Clin Nutr, 53: 1964S-7S, 1991*

Animals fed equal calories from simple sugars developed more mammary tumors than the ones fed complex carbohydrates.

*Hoehn, Nutr & Cancer, 1:27-31, 1979*

Low carbohydrate parenteral formulas may have the ability to selectively starve tumors, slowing down tumor growth.

*Demetrakopoulos, Cancer Research, vol.42,756, 1982*

*Lowery, Surgical Forum, vol.28, 143, 1997*

# Effects of Extreme Sugar Reduction on Cancer

Two cases of metastatic cancer were reported as part of a study of psychiatric patients treated with parenteral insulin.

Hypoglycemic “coma” was induced by insulin.

# 1. **metastatic carcinoma of the cervix**

Patient had **metastatic disease** controlled with analgesics.

She had lost 16 pounds prior to initiating daily insulin therapy.

The initial dose of 20 units of insulin was gradually increased up to 180 units/ 5 days/week.

By the 6th week she was put into coma for 30 minutes. Subsequently, the duration of induced coma was increased to 2 ½ hours.

Therapy was administered 5 days per week for 6 weeks. The glucose level was never brought below 22 mg. %.

### Outcome

Both the mental illness and cancer disappeared with no return as of the last follow-up, a year and a half later.

## 2. malignant melanoma

- Woman was with treated for depression via insulin injections 5 days a week for 3 weeks with no apparent change in her mental status nor her tumor.
- Hypoglycemic therapy was then given for the next five weeks.

### Outcome

- At the end of this time, the depression cleared, weight increased by 17.5 pounds, and the melanoma was not to be found.
- Follow up one year later found no return of depression nor cancer.

# Cachexia (wasting)

## ■ Increased Cori cycle Activity

- In the Cori cycle, glucose is converted into lactic acid by the cancer cells.
- The lactic acid is converted in the liver into glucose.
- The cancer cells feed on the glucose and produce lactic acid.
- The starving normal cells die, decompose and serve as food for the growing cancer.
- The cancer cells reproduce at the expense of normal cells.

# Starvation

# Cachexia

## Cellular energy metabolism

Energy expenditure (basal metabolic rate) D (decreased) U (unchanged) or I

## Insulin metabolism

Insulin sensitivity D I

Insulin serum concentration D U

## Carbohydrate metabolism

Glucose production and turnover D I

Glucose serum concentration D U

## Protein metabolism

Protein turnover D I

Muscle catabolism D I

## Hepatic metabolism

Liver gluco neogenesis D I

Liver size D I

## Fat metabolism

Lipolysis I I

Triglyceride serum concentration U I

**\*Cori cycle metabolism** U I (increased)

Serum lactate U I

*Haskell: Cancer Treatment W.B.Saunders.1995: p225*

■ *Rivadeneira: Nutritional Support of the Cancer Patient. CA1998:Vol48.2:70*

# Fish Oil may help counter Cachexia

Eighteen inoperable pancreatic cancer patients with progressive weight loss were given 12 grams of EPA containing fish oil capsules daily. They gained weight. Another oil given by the same doctors was ineffective.

Wigmore, S., Ross, J., et al. *Nutrition (Suppl.)*, 12(1): S27-S30, 1996

Fish oil prevents cachexia and increases weight in experimental animals.

Tisdale, M and Dhesi, JK *Cancer Res.*, 50: 5022-5026, 1990

In a study of 64 patients with advanced refractory solid tumors given fish oil and vitamin E or placebo as a sole therapy, the fish oil *receiving group had a 39% increased life span* compared to the placebo group.

*Gogos: Fish oil in advanced cancer treatment.*

# Feeding the right nutrients makes a difference.

- Hydrolyzed whey tends to increase glutathione in healthy cells while reducing it in cancer cells.
- Glutathione defends against free radicals which cause cellular damage.
- Cancer cells weaken and healthy cells get stronger.
- Cancer cells are made more susceptible to chemotherapy and radiation toxicity, while the normal cells are made less susceptible.

# **Nutrition may improve chemotherapeutic clinical outcomes while reducing toxicity**

Nutrition may be used to reduce the need for potentially hazardous drugs, make them more effective, and increase tolerance to them, especially in the field of oncology.

**The concept has meaning for both  
drug oriented medical clinicians  
and non-drug oriented naturalists.**

This does not mean that the philosophically opposed diehard **chemophiles** and diehard **naturophiles** need change their respective therapeutic orientations.

- **Naturophiles** may rejoice in the idea that natural bodily defenses can work better
- **Chemophiles** may rejoice in the idea that the patient can better tolerate more chemotherapy.

# Nutrients work Synergistically with Immuno Therapy, Chemo , and Radiation

Nutritional supplementation was given to patients who had been treated surgically and with BCG for transitional cell carcinoma of the bladder in a randomized double blind study.

- RDA multiple vitamin, 40,000 iu vitamin A, 100 mg. B6, 2 gm. vitamin C, 400 i u vitamin E, 90mg Zinc

The 10 month recurrence rate of transitional cell carcinoma was 40% for the nutritionally supplemented group versus 80%, twice the amount, for the control.

*Lamm, Megadose vitamins in bladder cancer: a double blind study trial, J. Urol, 151:21-26,1994*

**Vitamins E and C and N acetylcysteine** provide cardioprotection from **chemotherapy** and **radiation therapy** in a randomized double blind placebo controlled study.

*Cardioprotection in chemo- and radiotherapy for malignant diseases- an echocardiographic pilot study Schweiz Rundsch Med Prax. 1995 Oct 24;84(43):p 1220-3*

The combination of **chemotherapy, radiation therapy and nutritional antioxidant supplementation** produced a **44%** survival of **18 lung cancer** patients where ordinarily **1%** survival without nutritional support would be expected at **30 months.**

*Jaakkola, Treatment with antioxidant and other nutrients in combination with chemotherapy and irradiation in patients with small-cell carcinoma, Anticancer Res 12,599-606,1992*

**Vitamin A and beta carotene provide for better outcomes in animals treated with radiation.**

*Seiter, J.Nat.Can.Inst.,vol.71,409,1983*

**Vitamin C supplementation was given to 98 patients with a variety cancer pathology while 32 served as the control. All received standard cancer therapy. The control group lived an average of 6 months while the treatment group depending on pathology lived 10 months to over 10 years, with patients still living at the end of the study.**

*Hoffer; Pauling, J. Orthomolecular Med, vol.5,3, 143,1990*

# Nutrients Impact Chemotherapy

Vitamin A protects the small intestine from methotrexate induced damage in mice innoculated with leukemia or sarcoma cells.

*Vitamin A, a useful biochemical modulator capable of preventing intestinal damage during methotrexate treatment. Pharmacol Toxicol. 1993 Aug.73(2).p 69-74*

High doses of Vitamin C prolongs life of tumor bearing mice receiving adriamycin without reducing the killing capacity of adriamycin.

*Shipo, Am.J.Cli.Nut.54,1298S,1991*

**Vitamin E succinate** enhances growth inhibition of **adriamycin** via in a variety of cancer cells in vitro.

*Vitamin E enhances the therapeutic effect of adriamycin on human carcinoma cells in vitro, J. Urol, 1986,136/2(529-531)*

**EPA**, eicosapentaenoic acid (omega 3 fatty acid from fish oil). made animal tumors more responsive to **mitomycin** and doxorubicin

*Guffy, Cancer Research, vol.49, p 3961,1981*

**Selenium** reduced toxicity of **cisplatin** in animals with implanted tumors without affecting killing activity of the chemotherapeutic agent.

*Ohkawa, Br.J. Cancer, vol. 58, 38,1988*

**Nutrients**  
**May be used as Alone**  
**or in**  
**Combinations**

# Vitamin C

- Vitamin C is correlated with lowering cancer incidence in a study encompassing 7 countries and 25 years.

*Ocke, Int. J Cancer, vol.61, 480, 1995* 132

- End stage untreatable cancer patients administered 10,000 mg vitamin C per day produced a 22% survival at one year vs. 0.4% survival in those without vitamin C.

*Cameron, Pauling, Proc.Nat.Acad.Sci., vol.75, 4358, Sept. 1978*

- Of 50 cancer patients treated with radiation, one randomly chosen group received 5,000 mg of vitamin C daily while the other served as a control. The group that received vitamin C had an 87% complete response vs. 55% for the control.

*Hanck, Prog. Clin.Biol.Res.,vol.259,307,1988*

# Proposed mechanisms of vitamin C activity in the prevention and treatment of cancer

- 1) enhancement of the immune system by increased lymphocyte production
- (2) stimulation of collagen formation, necessary for “walling off” tumors
- (3) inhibition of hyaluronidase, keeping the ground substance around the tumor intact and preventing metastasis
- (4) inhibition of oncogenic viruses;
- (5) correction of an ascorbate deficiency, often seen in cancer patients;
- (6) expedition of wound healing after cancer surgery
- (7) enhancement of the effect of certain chemotherapy drugs, such as tamoxifen, cisplatin, DTIC and others
- (8) reduction of the toxicity of chemotherapeutic agents, ie Adriamycin
- (9) prevention of cellular free radical damage
- (10) neutralization of carcinogenic substances

# Coenzyme Q10 (Ubiquinone)

*(CoEnzyme Q10 as described by William V. Judy PhD, 1998 conference in Ft. Lauderdale and selected papers.)*

## *General Information*

- ❖ derived from diet and is also manufactured in the body
- ❖ used in creating ATP, providing energy for life
- ❖ recycles vitamin E
- ❖ prevents the oxidation of LDL cholesterol and formation of foam cells
- ❖ used for prevention and treatment of cancer.
- ❖ reduces side effects and improves killing of chemotherapy and radiation
- ❖ improves the general clinical status of patients.
- ❖ **depleted by radiation, chemotherapy, and cigarette smoke**

# Doxorubicin (Adriamycin) and Co Q10

- Doxorubicin cardiotoxicity is generally reduced by CoQ10.
- In Italy CoQ10 is approved for doxorubicin toxicity.
- CoQ10 appears to improve tumor suppression of adriamycin with less cardiotoxicity
- Side effects of chemotherapy such as nausea and loss of hair are reduced.
- T cells levels are increased or maintained.

# Lung cancer reoccurrence and patient survival time in part appear CoQ10 dose dependent

- In a double blind placebo controlled study of 22 lung cancer patients with initially similar Co Q10 levels
- 11 patients received doxorubicin plus placebo
- 11 received doxorubicin plus 100mg of Co Enzyme Q10.

Blood Co Q10 levels during the course of the study increased in the Co Q10 treatment group while they decreased in the placebo group.

- The placebo group manifested side effects, low energy and reduced cardiac ejection fraction.

- **The CoQ10 group tolerated more doxorubicin versus the placebo group.**
- **The treatment group achieved 90% tumor suppression versus 68% for the placebo.**
- **At 4 years after the onset of the study, the 100% of the placebo group were dead.**
- **At the end of three years, when the Co Q10 was stopped, the Co Q10 treated group had one death out of 11 patients.\***
- **After 2 more deaths occurred, CoQ10 was resumed.\***
- **At 10 years, 4 out of 10 were alive.\***

**\*Unpublished data\***

## Breast Cancer Study

32 high risk breast cancer patients received chemotherapy and radiation and antioxidants, fatty acids, minerals and **CoQ10 (90 mg./day)**.

- At 18 months no deaths were found where 4 would ordinarily be predicted.

The patients were stable without metastasis and weight loss. Partial remissions were found in 6 patients. They had better quality of life and reduced side effects.

Natural killer cell and lymphocyte counts increased.

- At 24 months no weight loss, cancer progression nor deaths were noted.

Six deaths would have ordinarily been expected.

- At 36-60 months, disappearances of liver metastasis, pleural effusion and residual tumor were noted in a breast cancer patient who was increased from 90 mg. CoQ10 to 390 mg. per day

## Prostate (unpublished study)

15 patients with reoccurrent prostate cancer following conventional therapy received 600mg /day of CoQ10.

- Ten of 15 responded.
- Responses were noted after 3-6 months, not immediately.

### At one year:

#### Responders had a greater

78% reduction in PSA

68% reduction in mass

68% inc. lymphocyte count

413 % inc. blood CoQ10

#### Non-responders

4% reduction in PSA

4% increase in mass

20% inc. lymphocytes

125% inc. blood CoQ10

- The non-responders may have had an absorption or compliance problem.

# CoQ10 is Effective in Cancer Prevention

- A retrospective unpublished analysis of approximately 1000 heart failure patients taking 100 mg of Co Q10 or placebo daily for over 15 years found cancer developed in
  - 3% of CoQ10 treated group
  - versus 11% of placebo group,
  - a 3-4 fold difference.

The patients ranged in age 47-72 years at the start of the study

## **Published references:**

- Cortes, Administration of CoEnzyme Q10 to Adriamycin treated Cancer Patients in Biomedical and Clinical Aspects of CoEnzyme Q (1977), Folkers, Yamamura(eds), pp 231-241**
- Judy, Administration of CoEnzyme Q10 to Adriamycin Treated Cancer Patients in Biomedical and Clinical Aspects of CoEnzyme Q(1983)vol.4,Folkers, Yamamura(eds),pp231-244**
- Lockwood, Progress on therapy of breast cancer with vitaminQ10 and regression of metastases. Biochem Biophys Res Commun, 1995 Jul 6; 21291:172-7**
- Lockwood, Apparent remission of breast cancer in high risk patients supplemented with nutritional antioxidants, essential fatty acids and Coenzyme Q10. Mol Aspsects Med. 1994 Mar30,199(30: 1504-8**
- Lockwood, partial and complete remission of breast cancer in patients in relation to dosage of Coenzyme Q10. Biochem Biophys.Res.Commun 1994 Mar.30;199(3):1504-8**
- Folkers, Survival of cancer patients on therapy with CoEnzyme Q10.(1993) Biochem. Biophys. Res. Comm., Ms. No.G-8658**
- Mellstedt, A deficiency of CoEnzyme Q10 in conventional cancer therapy and blood levels of CoEnzyme Q10 in cancer patients in Sweden, In: Eight International Symposium on Biomedical and Clinical Aspects of CoEnzyme Q(1994) The Molecular Aspects of Medicine**

# **Nutritional Management may be used to control side effects of chemotherapy:**

- **vitamin E helps in prevention of hair loss from doxorubicin**
- **zinc helps eliminate the metallic taste caused by cisplatin**
- **ginger helps overcome nausea**

**Phytonutritionals  
contain powerful  
biological response modifiers.**

▪

# Garlic

Garlic has been recommended for multiple purposes including tumors since ancient times.

*Codex Ebers, Egypt, circa 1550 B.C.*

Garlic contains many active ingredients including allicin, which inhibits lactic dehydrogenase, a main enzyme in cancer cellular metabolism

*Jacobs, M., Vitamins and minerals in the Prevention and Treatment of Cancer, CRC press 1991 p69-75*

# Garlic

A chemical formed in aged garlic, s- allylmercaptocysteine, causes prostatic cancer cells to break down testosterone 2-4 X faster without forming DHT.

Concentrations achievable in humans via aged garlic supplementation decrease cancer cell growth rate by 70%.\*

*Pinto J., Rubin R., Garlic Constituents modify expression for human biomarkers for prostatic Carcinoma Cells. FASE B Journal 11 (Feb.28): A 439*

## Green tea

contains an antioxidant, epigallocatechin gallate, which **selectively shuts down an enzyme needed in cancer cells for cell division**, quinol-oxidase.

Growth and division of normal cells are not effected. When the epigallocatechin gallate treated cancer cells reach critical size for division and can not divide, they succumb to programmed cell death.

*Black tea contains only a small fraction of this antioxidant compared to green tea.*

# “Phyto-hormones”

Phyto-hormones are hormones found in plants. They are not the same as human hormones.

Tumor activity under hormonal control may be modified by phyto-hormones.

Herbal extracts can compete with estrogen and progesterone at cellular receptor binding sites.

Theoretically, phyto-estrogens may displace more estrogenic estradiol or xenobiotics which may adversely influence breast cancer.

Of 150 herbs laboratory tested on breast cancer cells,  
the 6 highest in hormone binding site affinity in are:

**for estrogen binding site activity:**

**Soy Licorice Red clover Thyme Tumeric Hops**

**for progesterone binding site activity:**

**Oregano Verbena Thyme Red clover Damiana Licorice**

Generally, estrogen receptor binding herbs are agonists, the  
progesterone receptor binding herbs are neutral or  
antagonists.

*Zava: Estrogen and progestin bioactivity of foods, herbs and  
spices. PSEBM 217:369-78, 1998*

# Soy

- Epidemiologically, high soy diets, rich in genistein, are associated with profoundly lower breast cancer rates.
- Japanese women who consume 45mg of soy daily, have 25% the breast cancer rate of women in the USA, who consume about 5 mg per day.
- In the laboratory soy reduces proliferation of breast cell about 30%, similar to tamoxifen.

*Childs, Family Practice News, Nov. 1, 1998*

# Soy contains multiple substances which:

- Exhibit anti cancer effects on various tumor cells.

*breast, prostate, sarcoma, lung, liver, esophagus, colon, melanoma, glioblastoma, etc.*

- Reduces nausea and vomiting of chemotherapy.
- Supports immunity and helps maintain WBC counts.

# Soy

- Directly suppresses and kills cancerous tissue.
- Removes carcinogens and stimulates detoxification.
- inhibits tyrosine kinase and ribosomal kinase
- Anti cancer activity is attributed to various constituents including: protease inhibitors, phytic acid, saponins and isoflavones.

# Genistein (the most studied soy isoflavone)

- Reduces tumor growth influence of sex hormones in both male and female.
- Induces apoptosis
- Inhibits metastasis
- Inhibits angiogenesis (new and old vessels)
- Induces differentiation

Therapeutics of Soybean Phytochemicals, US Research Reports, Inc  
Research Report No. 103, 106  
Beating Cancer with Nutrition, Quillin, 1998

Indole 3 Carbinol is found in broccoli, cauliflower, brussel sprouts, turnips, kale, cabbage and mustard.

## Indole 3 Carbinol vs. Tamoxifen

### Inhibits:

	Indole 3 Carbinol	Tamoxifen
Tyrosine Kinase (promotes Ca growth)	+++	+++
Ornithine decarboxylase (promotes Ca growth)	+	+++
Free Radicals and DNA Damage	+++	+++
Estrogen positive breast Ca cell growth	+++	++
Estrogen negative breast cancer growth	+++	+

Carcinogen induced DNA binding	+++	-
Ah receptor activation	y	n
16OHE build-up	y	n

# Indole 3 Carbinol vs. Tamoxifen

## Promotes:

	Indol 3 Carbinol	Tamoxifen
Restoration p21 and other tumor suppressors	y	n
Conversion of estradiol to safer estriol	y	n
Prevention of induction of other cancer	y	?

## Associated:

Development of resistance	<b>N</b>	y
Mutations in uterine tissue	<b>N</b>	y

## Side effects:

## Cost:

# Ashwaganda

Ancient ayurvedic herb, (*Withania somnifera*):

- Adaptogen: favorably modulates emotional, hormonal, autonomic and immune related conditions during stress.
- Helps general host balance and resistance
- Inhibits growth of induced tumors in animals
- inhibit translation (protein production) and transcription (RNA production including sarcoma 180 and mammary adenocarcinoma E0771.
- Induces sensitization to radiation
- Stimulates stem cell proliferation.
- Increases phagocytosis and intracellular killing

*Sharada: Antitumor and radiosensitization effects of withaferin A on mouse Ehrlich ascities carcinoma in vivo. Acta Oncologica (Stockholm), 1996;35(1):95-100*

# Digitoxin

- Digitoxin, the glycoside is found in foxglove, (*Digitalis purpurea*) was popularly used for cardiac conditions up until the 1960's when the pharmaceutical industry switched to digoxin.
- Digoxin a glycoside found in *Digitalis lanata*. Digoxin has a shorter half life and is easier to control. However, it does not have the anti-cancer properties if digitoxin.
- One non-published study of the Indiana School of Medicine cardiac unit records, 1900 to 1932, found no cancer deaths among patients maintained for life on digitalis.

# Digitoxin

- In 1982, at the end of a 5 year study involving 175 breast cancer patients in the University Hospital, Uppsala, Sweden, only one reoccurrence of breast cancer was found in the 32 patients receiving digitalis.
- The patient group not receiving digitalis had 9.6 times as many reoccurrences.
- The amount of digitalis used was that which cardiologists find safe to maintain non-toxic therapeutic blood levels.

# Digitoxin

- Follow up Breast Ca report after 23 years (1998)  
Of 143 patients who did not receive digitalis 33.8% had died. Of the 32 % who received digitalis 6.5% had died.  
*4-5 fold difference*
- Digitoxin inhibits both positive and negative breast Ca cells in concentration similar to that used by cardiologists
- Digitoxin Inhibits glioma and hematologic cell lines
- Digitoxin passes through the blood brain barrier.  
**Dr.J. Haux, Oncology hospital, U.of Trondheim, Norway**

# Phytonutrients Aid Chemotherapy

Astragalus and Ginseng prevent immune suppression and weight loss in patients treated with chemotherapy.

*Li, Chung Kuo Chung Hsi I Chieh Hosa Chih, vol.12, p.588, 1992*

Panax ginseng enhances uptake of mitomycin into cancer cells for increased cancer kill.

*Kubo, Planta Med, vol.58, 424, 1992\**

Vitamin E induces apoptosis in colorectal adenocarcinoma cells and enhances tumor growth inhibition of 5FU in vitro and in vivo.

*Antioxidants enhance the cytotoxicity of chemtherapeutic agents in colorectal cancer: a p53-independent induction of p21 WAF1/CIP1 via C/EBPbeta, Chinery, Nat Med: 3(11)1233-41 1997*

# Genistein (Soy) and Curcumin (Turmeric) synergism:

- Growth of estrogen positive breast MCF-7 cells is increased by beta-estradiol or a mixture of estrogenic pesticides containing (endosulfane, chlodane, DDT)
- Genistein or curcumin independently inhibit spontaneous and induced growth.
- **When used together inhibition is total!**

*Curcumin and Genstein, plant natural produbreast cancer MCF-7 cells induced by estrogenic pesticides Biochemical and Biophysical Research Communications, 1997, 233/3 (692-6)*

# Soy(fermented)

- Exhibit anti cancer effects on various tumor cells.

*prostate, breast, sarcoma, lung, liver, esophagus, colon, melanoma, glioblastoma, etc.*

- Reduces nausea and vomiting of chemotherapy
- Supports immunity and helps maintain WBC counts

# Designer Nutrition

A hemicellulose/ B 1-3 glucan /mycelial extract from rice and hybrid mushrooms was administered orally in a study involving 27 cancer patients who received conventional care.

( breast, multiple myeloma, prostate, leukemia, cervical)

NKC activity increased from **100% to 537%.**

Ghoenum M., NK Immunomodulatory function in 27 cancer patients by MG3 a modified Abrinoxylane From Rice Bran, 87th Annual Meeting of the American Association for Cancer Research

# BRM Nutritional substances may be Animal Based

- **Bovine Tracheal Cartilage** administered to 31 advanced cancer patients brought a 90% positive response. Eleven patients including those with rectal carcinoma, ulcerated breast carcinoma, and renal cell carcinoma became tumor free, while 17 others showed improvement.

*Prudden: Bovine cartilage in advanced human malignancies. J Biol Resp Mod 4:551,1995*

- **CLA (Conjugated linoleic Acid)** abrogates spread of transplanted human breast cancer cells to lungs, blood, and bone in immune deficient mice.
- CLA may block the spread of human breast cancer by mechanisms independent of the host immune system.

*Conjugated linoleic acid suppresses the growth of human breast adenocarcinoma in SCID mice, Anticancer Research(Greece),1997,17/2A (969-73)*

# Dr. Gonzalez's pilot-study **pancreatic enzymes, diet, detoxification**

- Eleven patients with inoperable pancreatic cancer were studied.
- Nine of the 11 survived at least 1 year, five survived 2 years, and four survived 3 years.
- Two patients were still alive after 3 years.
- In a another pancreatic Ca study using Gemzar, average patient survival was less than 6 months, and no patients lived for more than 19 months

# **Diet plays a key role in cancer care**

Of 147 pancreatic cancer patients who made no dietary change over 99% were dead after one year, while 52% of a matched group of 23 patients consuming macrobiotic foods remained alive.

*Carter, Macrobiotic diet and cancer survival, J Am. Coll of Nutrition 12:3:209-215,1993*

# Detoxification

Diets with whole grains, fresh fruits, legumes and vegetables have lower concentrations of toxic chemicals.

*Food Additives and Contaminants 1998; 15: 19-29*

**If immunity impeding toxins  
are removed early,  
the body can more easily  
do what it is programmed to do,  
prevent and overcome diseases.**

# Chelation

In a Swiss study involving 231 subjects, 59 patients received approximately 10 EDTA chelation infusions to remove toxic metals.

A matched control group of 172 were not treated.

After 18 years, 1 death (1.7% of the patients) due to cancer occurred in the treated group

as opposed to 30 in the untreated group (17.6% of the patients), a ten fold difference. \*\*\*\*\*

*Blummer, Ninety Percent Reduction in Cancer Mortality after Chelation Therapy with EDTA. J of Advan in Med 1989;2: 183-188*

# Anti-angiogenesis

prevention of blood vessel formation in tumors

## **Bindweed (convolulus arvensis)**

- Mouse sarcoma studies have demonstrated tumor kills as high as 85%

## **Tetra thiomolybdate (TM)**

- Binds copper which is needed for blood vessel formation and removes it from the body
- 18 patients in hospice with 11 different types of metastatic cancer were treated to reduce ceruloplasmin, a measure of body copper content, to 20% of baseline.
- This goal was achieved in 6 treated patients, 5 of these patients have had no tumor growth nor new tumors form for more than 2 years.
- **Diet:** Liver is loaded with copper and shellfish have intermediately high amounts

## **Nutrients**

Curcumin, N Acetyl Cysteine (NAC), Soy

# Musaceas Plant

## Tannins from the plant sap

(banana/plantain)

- Associated with reported remissions in various forms of cancer
- Strips away polysialic acid, a material used by cancer for spreading and avoiding detection by the immune system
- Affects genetic and enzymatic mechanisms with allow the cancer cells to reproduce
- Promote apoptosis

# Tannins from Musaceas

- Acute Lymphocytic Leukemia
- Colon
- Tongue
- Hodgkins
- Uterus
- Multiple Myeloma
- Kidney
- Cervix
- Breast
- Bladder
- Liposarcoma  
osteosarcoma  
leiomyosarcoma
- Gall Bladder
- Pancreas
- Squamous cell
- Prostate

# PC Spes Clones

7 Chinese herbs & 1 American herb

used synergistically :

- **Ganoderma lucidium** immunomodulatory
- **Glycyrrhiza glabra and uralensis** , Anti-mutagenic activity, anti-inflammatory. Enhances the cytotoxicity of daunomycin, doxorubicin and vinblastine Aids multidrug resistance.
- **Isatis indigotica**, immunostimulatory and antineoplastic activity
- **Dendranthema (Chrysanthemum) morifolium**
- **Panax pseudo-ginseng** , inhibits angiogenesis: mitotic activity towards T cells anti-carcinogenic effects increase the sensitivity of resistant tumor cells to several antitumor drugs
- **Rabdosia rubescens**, analgesic, anti-anorexic
- **Scutellaria baicalensis** (anti-proliferative, anti lipooxygnesase- and DNA topoisomerase activity)
- **Serenoa repens** (inhibitor of both type I and type II 5a-reductase, the enzyme that converts testosterone to dihydrotestosterone), lowers estrogen levels

# PC Spes

- Affects prostate carcinomas, breast carcinomas, melanoma, certain histiomonocytic lymphomas and leukemias
- Affects expression of the gene regulating the cell's propensity to undergo apoptosis
- Appears to sensitize cells to radiation
- Induces shrinkage of some prostate cancer tumors

## Side effects:

impotency,

lowered sex drive

thrombophlebitis ...2% to 4% risk

breast discomfort and enlargement

hot flashes

**Thank you**

**Dr. Martin Dayton**