Integrative Solutions for Prostate Cancer

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From information obtained in study under
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Incidence and Deaths

• In 2003, 221,000 cases were diagnosed with 28,900 deaths
• 1 patient died for every 8 cases diagnosed that year
Prostate cancer

• Of men who undergo definitive therapy with surgery or radiation, 1/3 will have rising PSAs within 10 years
  – 1/3 of these will develop clinical disease progression within 5 years
  – Salvage radiation in these situations is rarely beneficial
Androgen depression therapy

– Androgen depression therapy is effective for 1-8 years but leads to many side effects
– Intermittent androgen depression lessens these symptoms and appears to be as effective
Dietary risk factors

• **Total fat** intake, **animal fat** intake, and **red meat** consumption
• Cooking **red meat** at **high temperatures** or on grills
• Excess commercial **dairy** products
• Consuming >2000mg of **calcium** increased metastatic prostate cancer risk by 4.6-fold
• Every 500mg of **calcium** as a supplement increased risk 16%; calcium lowered vitamin D
Other risk factors

- Overweight and obesity
- Family history
- Lack of sunlight
- Smoking
- Pesticide exposure
- Smaller prostates are associated with higher grade, more advanced cancer
- Rotating work shifts increased risk 4-fold
Protective dietary factors

- Vegetables, fruits, & antioxidant nutrients
- Tomatoes and cruciferous vegetables
- Higher blood levels of selenium, vitamin E, and lycopene
- Omega-3 fatty acids from oily fish can stop prostate cancer spread
Protective dietary factors

- **Pomegranate juice 8 ounces** daily slowed the increase in PSA to $1/4^{th}$ its usual rate in prostate cancer
  - Clin Cancer Res. 2006Jul1;12(13):4018-4026
- **Flax seeds** are anti-estrogenic and reduce prostate cancer cell proliferation
- **Soy** is associated with less prostate cancer;
  - fermented soy may be best e.g. tempeh, tamari, miso
  - May be wise to avoid processed or GMO soy
Nutrition

• Consume **omega-3 fish** e.g. wild salmon, sardines
  – Avoid tuna due to mercury content
  – Avoid farm-raised fish except tilapia due to PCB contamination which has xenoestrogen effects
• Consume a lot of **eggs**, preferably omega-3
• Eat organic **fruits** and **vegetables**
• **Eliminate** processed and fast foods
• Drink water, **green tea**, and **pomegranate juice**
Spirituality

• Typically, cancer patients feel **panic** when they are diagnosed
• This can lead to poor **decision-making**
• Panic increases epinephrine and cortisol
• **Epinephrine** increases blood glucose, which facilitates cancer growth
• **Cortisol** suppresses the immune system, increases blood glucose, and increases clotting, all of which promote cancer
Why do systemic therapy before surgery?

• Surgery leaves tumor cells in the blood
• If the tumor can be shrunk or disappears entirely, long-term prognosis is good
• If the tumor has shrunk, surgery is easier, less invasive
• Because cancer is a systemic disease, metastasis is reduced through systemic approaches
Surgery vs. radiation

• In localized prostate cancer, surgery was superior to radiation in prolonging overall and disease-specific survival
Surgery vs. watchful waiting

• A radical prostatectomy for early prostate cancer offered no overall survival benefit over watchful waiting; we know surgery does not improve quality of life
  • Two studies in NewEnglandJMed Sept12, 2002
Casodex following standard care

• **Casodex** 50mg daily, an anti-androgen therapy in patients with early, non-metastatic prostate cancer while reducing disease progression **did not reduce overall survival**
Androgen suppression therapy

- Early prostate cancer is primarily regulated by androgens
- While only 13% of men in 2003 died from prostate cancer relative to those diagnosed, men are fearful of prostate cancer
- Cardiovascular disease should be of equal concern
Androgen suppression therapy

- Hormone suppressive therapy increases risk of depression, osteoporosis, diabetes, heart disease, cachexia, weakness, and impotence
- Therefore, hormonal treatment may worsen quality of life and shorten lifespan
Estrogen in prostate cancer

• High doses of estrogen in combination with high doses of androgens induce malignancy

• Finasteride reduced prostate cancer incidence but increased aggressive prostate cancer, perhaps because blocking 5 alpha reductase shifts testosterone metabolism to the aromatase pathway to estrogen
Blood tests

Obtain monthly in advanced disease

- White count
- Hemoglobin
- **Albumin** – consider keeping \( >4.4 \)
- **Platelets** – consider keeping \( <250,000 \)
- Dihydrotestosterone
- Estradiol
- Estrone
Blood tests

Obtain monthly in advanced disease

- Vitamin D 25OH
- Zinc
- Copper
- Ceruloplasmin
- Fibrinogen
- D-dimer
- Free T3 – target 300-400
- Free T4, TSH
Blood tests

Obtain monthly in advanced disease

• Glucose
• PSA
• Prostatic acid phosphatase
• ALT
• Hemoglobin A1c – target <5.8
  – Test it initially; can test less regularly if normal
Hypercoagulation in cancer

• 7-fold increased risk of **venous thrombosis**
• **Platelets** can release angiogenic factors such as VEGF
• **Inflammation** has been implicated in **coagulation** and **angiogenesis**

Hypercoagulation in cancer

- Emboli are the most common cause of stroke
- In addition to platelets, D-dimer and fibrinogen also assess clotting risk
- Assisting in maintaining normal hemodynamic balance:
  - Botanicals: curcuminoids, resveratrol, gingerols
  - Omega-3 fatty acids
  - Vitamin D
  - Enzymes: lumbrokinase, nattokinase, bromelain
Prostatic acid phosphatase

- While less sensitive than PSA in initial detection, it is more reliable
- PSA can be altered from causes other than cancer, and has a different scale in each individual
EGFR (Her1) & Her2 neu

- Her2 neu or Her1 (EGFR) causes prostate cancer to progress to an androgen independent tumor-type in about $\frac{1}{4}$ of prostate cancers
Chemotherapy plus nutrients

• A search of MEDLINE and CANCERLIT from 1965 found 50 peer-reviewed studies involving 8,521 patients; 5,081 received nutrients. They consistently showed that nutrients did not interfere with therapeutic modalities for cancer.

• In 47 of these studies, nutrients were found to protect normal tissues and reduce the often serious side effects of chemotherapy and radiation.

• In fifteen of the studies, 3738 patients had improved survival – a very unusual outcome for cancer studies.

Adaptogens

- **Rhodiola rosea**, which grows at 11,000 feet in Siberia, was discovered by the Soviets
- Rhodiola made ordinary people more fit and able to adapt to all forms of stress
- The Soviets utilized Rhodiola in their soldiers, Olympic athletes, and cosmonauts
- Other herbs have now been recognized to have similar abilities & are called ‘adaptogens’
Adaptogens in cancer

• Restore immune surveillance
• Build bone marrow, blood counts, reduce infection
• Protect and detoxify organs and cells
• Inhibit multi-drug resistance
• Improve healing after surgery, chemotherapy, and radiation
Adaptogens in cancer

- Inhibit cancer metastasis and recurrence
- Suppress angiogenesis
- Reduce cortisol levels
- Reduce cancer-related inflammation e.g. NF-kB, COX-2

- Kupin, VJ: Eleutherococcus and other Biological Active Modifiers in Oncology, Medexport, Moscow, USSR, 1984
Adaptogens in cancer

- Panax ginseng –
  - increases p21 and p27,
  - modulates MAP kinases,
  - enhances Taxol,
  - heals wounds despite suppressing cancer blood vessel growth
Adaptogens in cancer

• Ashwagandha
  – potent angiogenesis inhibitor
  – enhances chemotherapy & radiation therapy
  – inhibits survival of both androgen-responsive and androgen-refractory prostate cancer cells
Adaptogens in cancer

• Chinese skullcap
  – inhibits NK-κB, COX-2, LOX-5
  – reduces PG2
  – Blocks androgen receptors
  – inhibits beta-glucoronidase
  – induces apoptosis
  – inhibits angiogenesis (down-regulates bFGF & MMP-2)
  – 6 studies support specific prostate cancer benefit
Curcumin (80% of Turmeric)

- Down-regulates NF-κB, AP-1, STAT-3, & Egr-1
- Down-regulates COX-2, LOX-5, NOS
- Reduces MMP-2/9, uPA
- Reduces cancer cytokines TNF, chemokines
- Reduces CAMs and cyclin D1
Curcumin

• Down-regulates growth factor receptors (EGFR, HER2, bFGF, TGF-B1, VEGF)
• Inhibits several cancer-inducing pathways (kinases)
• Potent redox cycling agent — modulator of inflammation
• Can suppress tumor initiation, promotion, and metastasis
• Down-regulates androgen receptors
Green tea extract (GTE)

• In **men at high risk** for prostate cancer after taking GTE for 1 year, 1 of 32 developed cancer vs. 9 of 30 controls
  – GTE mediates clusterins which are important apoptotic genes in prostate cancer
• GTE is **synergistic** with **pomegranate** concentrate
• For 5 days prior to **prostate cancer surgery**, green or black tea significantly **suppressed prostate cancer cell proliferation**
Green Tea in cancer

• **Apoptosis** in a wide range of cancer cell lines
• **Inhibits:** NFkB, PG2, COX-2, angiogenesis, protein kinase C, VEGF, VE-cadherin tyrosine phosphorylation, Akt activation, MMP-2 and 9, and topoisomerase 1
• **Mediates** MAPKs
Green Tea in cancer

- Induces p21 and p27
- Protects and improves the gap junction
- Modulates IGF-1
- Inhibits aromatase
- Down-regulates tNO
Green Tea in Prostate cancer

- Inhibited development and metastasis in models
- Decrease in prostate cancer growth
- Synergistic with soy in an androgen-sensitive model
- Two studies: 1 year of extract use reduced prostate cancer incidence to $1/9^{th}$ of non-users in high-risk patients
Green Tea in Prostate cancer

- Derivative **EGCG** with copper was cytotoxic in a cell culture
- Synergistic with **lycopene** in **dramatically reducing prostate cancer incidence**
- Synergistic with a **COX-2** inhibitor
- **Powdered extract** is superior to the drink
- Use **3-4 grams of a 95% polyphenol/60% catechin extract**
Milk thistle constituents

• Milk thistle is 80% silymarin, which has 4 constituents including silibin and isosilybin
• Silibin inhibits prostate cancer through:
  – NFkB, VEGF, EGFR, IGF-1R signaling, cell-cycle regulators including cycoin-dependent kinases, Kip1/p27, Cip/p21, and anti-PCA, and through DHT telmerase inhibition
  – Antiproliferative, pro-apoptotic, anti-angiogeneic
  – Active in hormone-dependent & independent prostate cancer
• Isosilybin also suppressed prostate cancer
• Silymarin with lycopene and soy decreased PSA doubling time 2.6 times
Reishi

• Appropriately prepared, it has radiation and chemotherapy-protective attributes due to stimulating effect on bone marrow
• Helps weakness, dizziness, and sleeplessness
• Inhibited NFkB, AP-1
• Down-regulated jPA, PI 3-kinase & NF-jB
• Increased p21 resulting in apoptosis
• Inhibited angiogenesis by down-regulating VEGF & TGF-B1
• Reduced DHT by inhibition of 5 alpha reductase
Rabdosia

- Especially used for breast & esophageal cancers
  - 6 year survival was 6% in moderate or severe esophageal cancer with or without chemotherapy
- Especially Inhibited NFkB
- Up-regulated p21
- Down-regulated Bcl-2
- Inhibited telomerase
- Anti-angiogenic through VEGF inhibition
- Potent anti-prostate cancer actions
Licorice

• Increases overall vitality
• Protects against carcinogen-induced DNA damage
• Component glycyrrhizic acid inhibits LOX, COX, and protein kinase C
• Down-regulates EGFR when overactive
• Licorice polyphenols induce apoptosis in cancer cells
• Angiogenesis inhibitor, has reduced VEGF
Licorice

• Derivatives have inhibited pulmonary metastasis and inhibited breast cancer cell growth

• Effective in prostate cancer, especially when combined with Chinese skullcap and rabdosia

• Apoptosis and inhibition of cancer cell proliferation have been demonstrated in prostate cancer cell lines
Boswellia

- 75% boswellic acids recommended for cancer
- Inhibited COX-2, and 5, 12, and 15-LOX
- Down-regulates NFkB
- Potentiates apoptosis induced by TNF and chemotherapy
- Inhibited topoisomerase I and II
- p21 is increased
Boswellic acids

- Inhibited glioblastoma, melanoma, colon and prostate cancers, and several leukemias
- Re-sensitized drug therapies by inhibiting Pgp
- *Effectively crosses the blood-brain barrier*
- Inhibited androgen independent prostate cancer by inhibiting NFkB
Boswellic acids

- Inhibited chemotherapy-resistant human PC-3 prostate cancer cells
- 5-LOX is fuel for cancer cell growth by stimulating EGF, VEGF, and other growth factors
- 5-LOX inhibition induces cancer cell apoptosis
Nutrient support

• **Nettles** - nutritive; increases androgen binding to sex hormone binding globulin; anti-proliferative against prostate epithelial & stromal cells

• **Pygeum** – inhibits prostate cancer by blocking EGF, down-regulating bFGF, EGF, and IGF-1

• **Red clover** – isoflavones (phytoestrogens) have inhibited prostate cancer in animals & are apoptotic in low-moderate grade prostate cancer
Saw Palmetto

- **Dual** inhibitor of 5 alpha reductase,
- Inhibited **prostate cancer** in an animal model
- Suppresses **COX-2**
- **Anabolic & nutritive** helping to prevent cachexia
Feverfew

• Regulates LOX, COX-2, and NFkB
• Active compound parthenolide
  – can trigger apoptosis in acute myeloid leukemia and chronic myelogenous leukemia cells; it is more specific than chemotherapy drug Ara-C
  – it down-regulates Bcl-2, TRAF 1 and 2, & promoted sustained activation of JNK
  – inhibits NFkB, enhances Taxol in breast cancer cells, & stabilizes microtubules
  – Augmented docetaxel & restored sensitivity to anti-androgen therapy
  – In summary, it is anti-tumor, anti-angiogenic, augments chemotherapy & hormonal therapy
5 alpha reductase inhibitors

- Zinc
- Pumpkin seeds
- Saw palmetto
- Pygeum
- Nettles
- Green tea
- Reishi
- Lycopene
Resveratrol

- In peanuts & grapes
- Japanese knotwood is the richest source
  - Increased white count in radiation patients
  - Pretreatment enhanced radiation effects in a dose-dependent manner
  - Cardioprotective
Resveratrol

• Suppressed proliferation in cancers including:
  – Lymphoid and Myeloid leukemias
  – Multiple myeloma
  – Breast
  – Ovarian
  – Cervical
  – Prostate
Resveratrol

• Also:
  – Stomach
  – Colon
  – Pancreas
  – Thyroid
  – Melanoma
  – Head & neck squamous cell carcinoma
Resveratrol

• Inhibits growth through cell cycle arrest
• Up-regulated p21Cip1/WAF1, p53, and Bax
• Down-regulated of survivin, cyclin D1, cyclin E, Bcl-2, Bcl-xL, and cIAPs
• Activated capase
• Suppressed transcription factors including NFkB, AP-1, Egr-1
Resveratrol

• Inhibited **protein kinases** 1kappaBalpha kinase, JNK, MAPK, Akt, PKC, PKD, and casein kinase II
• Down-regulated **COX-2, 5-LOX, EGFR, VEGF, IL-1, IL-6, IL-8, AR, and PSA**
• These are its **anti-angiogenic** mechanisms
• It binds **estrogen alpha & beta receptors** equally unlike **phytoestrogens** which have greater **beta** affinity
• It is an **aromatase** inhibitor
Resveratrol

- It is cytotoxic to adriamycin-resistant breast cancer cells
- Increased the effectiveness of chemotherapy (taxanes)
- Inhibited cancer metastasis
- GSH (glutathione) levels are increased
- Blood clotting inhibited via PAF modulating effects, platelet aggregation inhibition, and altered platelet adhesion to fibrinogen
- Acts through different mechanisms on androgen or estrogen receptor cell status
Resveratrol

• **Grape** consumption or **red wine** 4-7 glasses/week reduced **prostate cancer** >50%
• It is **more effective** in aggressive prostate cancer
• Active in **androgen-sensitive and insensitive prostate cancer**
• Dose: **400-500mg** daily
• It is **more effective** with native cofactors e.g. as **Japanese knotwood** or **grape seed extract**
**Ellagic Acid - Pomegranate**

- Pomegranates are the richest source of ellagic acid
- Suppressed VEGFR-2 and PDGF receptors indicating anti-angiogenic activity
- A pomegranate extract inhibited aromatase 60-80%
  - BreastCancerResearch&Treatment2002Feb;71(3):203-217
- Pomegranate extract had anti-leukemic effects
Ellagic Acid

• **Synergistic** with quercetin & resveratrol in inducing **apoptosis** by caspase 3 induction

• **Ellagic acid** down-regulated **IGF-11**, activation of **p21(waf1/Cip1)**, & prevented **p53** gene destruction

• **8 ounces of pomegranate juice** increased prostate cancer stability 4-fold
Cruciferous vegetable derivatives

- **Isothiocyanates** (from crucifers e.g. broccoli, cabbage, Brussels sprouts)
  - In prostate cancer cell line, inhibited via AP-1 and MAPK suppression

- **Sulforaphane** (from crucifers)
  - Stimulated apoptosis via p53-independent means, Bcl-2 modulation, ROS and JNK-mediated G2/M arrest, autophagy induction, histone deacetylase inhibition, HDA inhibition
  - Stabilized p53, suppressed apoptosis inhibitors, increased BAX activation
Isothiocyanate and Sulforaphane

• In combination with other isothiocyanate-related compounds
  – Suppressed prostate cancer via NFkB inhibition & VEGF expression regulation
  – Regulated AP-1
  – ROS-dependent disruption
  – Angiogenesis inhibition by down-regulated VEGF
  – Activated detoxifying glutathione S-transferase which is usually deactivated in prostate cancer
  – Regulated the androgen receptors
  – Inhibited EGFR signaling
Wasabi

- **Wasabi** contains many unique isothiocyanates
- Extracts have shown repeated benefit in:
  - Melanoma
  - Stomach cancer
  - Breast cancer
  - Prostate cancer
  - Colon cancer
DIM (a crucifer derivative)

- A dimer of indole-3 carbinol (I3C) that is more stable and has greater anti-cancer effects
- Altered estrogen metabolism away from 16-hydroxylation toward favorable 2-hydroxylation
- Blocks estrogen receptors from more stimulating estrogens
- Induced phase I and phase II carcinogen metabolism
DIM

• **I3C**, unlike DIM, can be metabolized unfavorably to the **4-hydroxy metabolite**
• Inhibited expression of **cyclin-dependent kinase-6**
• Induced a **G1 cell cycle arrest in ER negative breast cancer**
• Inhibited **MDR**
DIM

• Induced **apoptosis in breast cancer** cells independent of estrogen receptor status via **Bax/Bcl-2** apoptotic factors & **NFkB** pathways

• Induced **G1 cell cycle arrest** via selective inhibition of **cyclin-dependent kinase 6** expression and **p21 (Waf1/Cip1)** stimulation

• Greatly reduced **EGFR**
DIM

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Quercetin

• Inhibited cell growth in cancer cell lines of:
  – Breast
  – Prostate
  – Ovarian
  – Squamous cell
  – Cervical
Quercetin

- Bladder
- Gastric
- Acute myeloid and acute lymphocytic leukemia
- Some lymphomas
Quercetin

- Redox/antioxidative
- Modulates COX and LOX, inhibiting PGE-2
- Inhibits cancer angiogenesis
- Down-regulated tumor promoters EGF & HER2-neu
- Activates PTEN
- Inhibits mutation of p53
Quercetin

- Inhibited mutation of p53
- Activated caspase-3, Bax, and Bak
- Elevated p21 and p27
- Down-regulated estrogen binding
- Reduced circulating IGF, increasing IGFBP
Quercetin

- Down-regulated NFkB, AP-1, Bcl-2, TNF-alpha, MMP-2 and 9, cyclin D and E
- Down-regulated expression of heat shock protein 70
- Improved chemotherapy effectiveness
- Improved radiation therapy effectiveness
Quercetin in prostate cancer

• Inhibited oncogenes
• Up-regulated tumor suppressor genes
• Down-regulated HER2-neu
• Inhibited metastasis; down-regulated MMP-9
• Inhibited AR binding
Quercetin in prostate cancer

- Reduced over-expression of c-Jun
- Potentiated & sensitized TNF-related apoptosis-inducing ligand (TRAIL)
- Inhibited Akt
- Inhibited AR expression
- Down-regulated c-Jun
- Inhibited Benzo(a)pyrene toxicity
Modified citrus pectin

• Inhibited prostate cancer metastasis in a rat model

• 4 of 7 patients experienced a lengthening of the PSA doubling time of over 30% at 15 grams/day in 3 doses

• Usual dose 10-30 grams daily in divided doses
Lycopene

• Scavenger of oxidative damage
• Enhanced Gap-junction communication
• Inhibited IGF-1, increased IGF-BP-2
• Inhibited HMG CO-enzyme A reductase
• Down-regulated 5-alpha reductase, reducing DHT
• Inhibited inflammatory cytokine IL-6
• G0/G1 cell cycle arrest
• Dose: Lycopene-rich diet or 30mg daily
Grape seed extract

- **Proanthocyanidins** 20X antioxidant power of vitamin E and 50X vitamin C
- Down-regulated **NFkB** for both androgen-sensitive and insensitive prostate cancer
- Increased **Cip1/p21**
- **Anti-angiogenic** via **VEGF** inhibition
- Upregulated **IGF binding protein-3**
Grape seed extract

- Inhibited IGF-II, MMP-2 and 9
- Down-regulated Bcl-2 and oncogene c-myc
- Inhibited tNOX (with green tea)
- Chemotherapy sensitizer
- Potent aromatase inhibitor
- Dose 200-800mg daily
Lumbrokinase

- Degrades fibrin and activates plasminogen (which is how tPA works)
- It is safe, non-toxic, and without obvious side effects except that it could worsen bleeding
- It is being utilized to dissolve cancer-induced fibrin
- It supports normal fibrinogen levels (bromelain is less powerful, more affordable)
Cocoa polyphenol extracts (CPE)

- Contains **beta-sitosterol** which is **cancer-protective**
- At the highest concentration, CPE induced complete remission in metastatic and nonmetastatic prostate cancer cell lines
  - CPE “have an **anti-proliferative effect on prostate cancer** cell growth but **not on normal cells**”
- CPE was **more active & faster** than **beta-sitosterol**
- Eat a small amount of 70% cocoa organic chocolate sweetened with whole raw sugar
Essential fatty acids (EFAs)

- EFAs (omega-3) come from fish oil and gamma linolenic acid (GLA)
- EFAs are vital for cell membranes
- Effective for malnutrition and inhibiting cachexia
- Improve immune function, improve the quality and prolong the life of cancer patients
Essential fatty acids

- Induce apoptosis
- Anti-inflammatory
- Can sometimes prevent immunosuppression
- Block angiogenesis
- Chemotherapy protective
- Inhibit cachexia
Essential fatty acids

- Derivatives EPA and DHA are related to lower prostate cancer risk and advanced prostate cancer risk
- Down-regulates PG2, COX-2, VEGF in prostate cells in mice
- **DHA** with **celecoxib** induced a COX-2 independent suppression of prostate cancer
- **GLA** suppressed PGE2 and 5S-HETE
Sea buckthorn oil

- Contains a **broad array of nutrients** including unique omega-7 fatty acids
- **Anti-carcinogenic** effects documented in many studies
Selenium

- **200 mcg** reduced **prostate cancer incidence** by **63%** in one study
- **52% reduction** in prostate cancer occurrence over 7.5 years with the strongest effect in those with PSA <4
- In Brazil nuts and sunflower seeds
- **Preventive**: 200mcg
- **Treatment**: larger doses may be cytotoxic; up to **800mcg** are being used
Copper

- Elevated copper and ceruloplasmin levels are associated with the risk of cancer and cardiovascular mortality
- Copper promotes cancer through inflammation and angiogenesis
- Serum copper correlates with tumor incidence, burden, progression, & recurrence in lymphoma, sarcoma, leukemia, cancer of the cervix, pancreas, breast, prostate, liver, lung, and brain
Copper

• Reducing copper levels reduced the following angiogenic mediators:
  – Vascular endothelial growth factor (VEGF)
  – Fibroblast growth factor 2 (FGF-2)/basic fibroblast growth factor (bFGF)
  – Interleukin-1alpha
  – IL-6
  – IL-8
  – NFkB levels and transcriptional activity
Copper and prostate cancer

- In mice rendered copper deficient:
- Optimal range of ceruloplasmin clinically appears to be in the lower 10-20% of normal
- (20-25)
  - the primary prostate tumor shrunk
  - fewer metastases occurred
  - survival was improved
  - there was excellent tolerability
Copper

• **Zinc** is the most effective way to lower copper - 30mg 1 to 4 times daily
  • J Lab Clin Med 2005Mar;145(3):139-43
• Clinically other nutrients have helped:
  – Molybdenum (1-6mg)
  – Green tea extract
  – Grape seed extract
  – Isothiocynates
  – N-acetyl cysteine
  – Cilantro
Zinc

• Deficiency is common in cancer
• Zinc is important for the immune system
  – T-cell function and regulation
  – Prostaglandin regulation
• Cancerous prostate cells contain less zinc
Zinc

• **Blocked copper** intestinal absorption and promoted excretion
• Excess zinc is **not stored**
• **Avoid** taking zinc with **soy** or **pasta** due to phytic acid
• Whole food zinc or liquid zinc sulfate may be better
Vitamin D

- Deficiency is widespread
- **Vitamin D3** is more stable and twice as powerful as vitamin D2 (which should no longer be used)
- Is involved with **20 genes** that determine cell proliferation, differentiation, and apoptosis (normal cell death)
- Research has identified **18 cancers** so far that it may help prevent, especially hormonal cancer
Vitamin D

• It may be able to arrest cancer
  – 1179 post-menopausal women receiving 1100IU of vitamin D3 in combination with 1500mg of calcium daily
  – 60% decline in cancer incidence the first year
  – 77% decline in cancer incidence in years 2-4

• Amer Jour Clin Nutrition June 2007
Vitamin D

- Enhances radiation and chemotherapy
- **Optimal dosing:** 2000-5000IU daily
- **Treatment of deficiency:** 5000-10,000IU daily
  - Monitor levels monthly
  - Up to 40,000IU daily was recently shown to have no adverse effects on calcium homeostasis in multiple sclerosis patients
  - Target blood levels of 60-80ng in early cancer
  - Target blood levels of 80-100ng in advanced cases
Immunonutrition

• **Important for bolstering the immune system:**
  • L-arginine – may increase WBCs, NK cells
  • Glutamine – multiple potential benefits
  • Whey protein – highest biological value of any protein
  • Magnesium creatine chelate
  • Omega-3 fatty acids
  • Branched chain amino acids
Vitamin E

- Alpha tocopherol succinate (dry vitamin E) reduced the abundance of androgen receptors in prostate cancer cells
- Consider 200-400IU
Boron

- A diet high in boron resulted in 64% less prostate cancer
- **Boron** lowered IGF-1
- In an animal study, boron 1.7mg/kg reduced prostate tumor size 38% and PSA 88.6%
- **Boron-rich foods**: plums, grapes, prunes, avocados, nuts including almonds & peanuts
Pain control

- The COX-2 activity of curcumin, fish oil, ginger, & others augment the cancer-fighting and pain-relieving COX-2 activity of celecoxib.
- Celecoxib with the herb corydalis are good choices for pain when used with nutrients which protect against myocardial infarction and intestinal ulceration.
Estrogen in cancer

- Estrogen receptors are commonly present in cancer
- Besides uterine, ovarian, breast, & prostate, estrogen receptors are present in cancers including thyroid, colon, lung, & melanomas
- Blocking aromatase and promoting estrogen metabolism are being utilized in controlling these cancers
- Aromatase blockers include pomegranate juice, zinc, broccoli/DIM, resveratrol with grape seed extract, and green tea
Case Study #1

• A roughly 60 year old man with prostate cancer had **failed chemotherapy, radiation, and hormone suppression therapy**; he was told by his oncologist that he had 4-6 months to live

• His **PSA** was 128.6, **vitamin D 25OH** was 17, and though his TSH and free T4 were normal, his **free T3** was low at 2.2 (N 2.4 – 4.2). **Zinc** was low normal & **copper** high normal.
Case Study #1

- He started an **integrative protocol**, though he only used half of the recommended doses
- **Vitamin D3 6000IU, zinc 30mg TID, & Armour Thyroid** were also started
- The next month his **PSA dropped to 82**
- **Peripheral neuropathy** from his Taxotere resolved quickly on the protocol
Case Study #1

- Over the subsequent 3 months his condition slowly deteriorated with his PSA rising to 225
- His dose of vitamin D was progressively increased and he did not start to stabilize until his vitamin D 25OH blood level reached the mid-range of normal on 50,000IU of vitamin D
- Also the patient agreed to do full, instead of 2/3rds, doses of his protocol supplements
- His vitamin D level peaked at 115 on 70,000IU of vitamin D
At that point, 4 months after initiating the integrative approach, he started improving.
In the subsequent 3 months his PSA dropped 5-10 points a month.
The prostatic acid phosphatase also dropped.
His weight climbed 7 pounds in that period.
The patient continued to drive, get out & about, and looked better.
Case Study #1

• He then chose to go to an out-of-state doctor who promised a 50% chance of cure
• The patient stopped his protocol except for vitamin D and zinc
• New chemotherapy was recommended but it was too expensive & not covered by insurance
• In the two weeks off protocol, the patient lost 7 pounds, looked worse, & PSA rose to >300
Case Study #1

• After restarting the protocol, his PSA stabilized but he had difficulty walking & urinary retention.
• A scan showed bilateral avascular necrosis of the hips, a side effect of cortisone that Hospice had placed the pt. on months before for pain relief.
• Under hospice inpatient care, a TURP was performed but the surgery was too debilitating and he subsequently died.
Case Study #1

• His last CT scan showed only prostate and bony involvement which, except for the avascular necrosis, was unchanged from a scan 3 months before

• He lived 11 months from when he was told he had 4-6 months to live and there was nothing more to be done
Case Study #2

• A roughly 70 year old one pack a day smoker had **Gleason’s 6** prostate cancer with a **PSA of 6.2**
• Blood revealed **vitamin D 25OH** was low, zinc low normal, **albumin** suboptimal, **d-dimer** was elevated, & **estradiol** was high-normal.
• Copper, fibrinogen, dihydrotestosterone, free T3, & prostatic acid phosphatase were normal.
Case Study #2

- He initiated the integrative protocol whole-heartedly except that he would not stop smoking.
- He ate 2 eggs extra daily to support protein.
- He took zinc 30mg twice daily & vitamin D3 6000IU daily.
- Fish oil 5000 EPA+DHA daily and bromelain 2400GDU twice daily to support normal blood coagulation.
- Natural aromatase inhibitors were started.
Case Study #2

• One month later his **PSA** has dropped to **3.0**
• Follow-up **blood work will be monitored** to assure optimal vitamin D 25OH, zinc, d-dimer, and albumin
• As importantly, he feels a **new vitality** and is substantially **stronger**, taking the short trail to the top of Natural Bridge
Case Study #3

- A 70 year old physician after prostatectomy for prostate cancer developed a rising PSA
- A bone scan performed at UK showed bony involvement in the pelvis
- He was started on an integrative protocol (no Rx)
- His PSA level dropped and stabilized
- A repeat bone scan after a three months showed regression in bone involvement
- He is happy, pain free, and doing well
Nutrient support program

• Quality combination nutrient products designed for cancer support are available
• Nearly all of the nutrients mentioned can be obtained in roughly twelve products
• Specific supportive protocols utilizing these combinations are being utilized successfully
Can integrative solutions succeed?

- One integrative setting is reporting great success in prostate cancer control.
- 1200 references support their approach.
- Successful support is also being achieved in other cancers including metastatic melanoma, glioblastoma, pancreatic cancer, hepatic cell carcinoma, and chronic lymphocytic leukemia.
References – Copy of Talk

• E-mail me at jproach@aol.com for 1200 references including all of the ones used in this talk that were not cited

• E-mail me for a copy of this power point presentation
Training, Product Sources, and Protocols

• **Opportunities for training** in integrative cancer approaches are available

• **Information on combination product** sources can be e-mailed

• **Specific protocols** will be available in the near future
Summary

• To be fully successful it is essential to optimize:
  • 1) Nutrition
  • 2) Spiritual vision
  • 3) Supportive home/work/social environment
  • 4) Blood test parameters
  • 5) Optimal nutrient support
  • 6) Targeted chemotherapy when necessary
  • 7) Pulsed hormonal suppression when needed
• To support **education** of integrative medicine concepts
• To support **medical education** of integrative concepts
• To be a resource in **cancer, autoimmune & thyroid disorders, chronic fatigue-fibromyalgia, and hormonal imbalance**
• Our focus includes **longevity, optimal brain health, wellness, optimal nutrition, & student health**
• **Your support** would be **very valuable**