

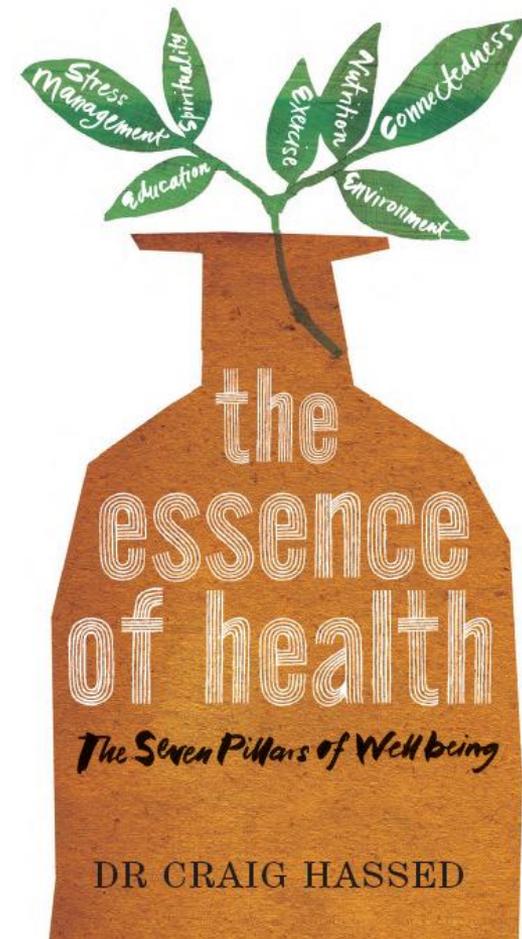


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The Essence of Surviving Cancer

The ESSENCE of health

- Education
- Stress management
- Spirituality
- Exercise
- Nutrition
- Connectedness
- Environment



Education

- **Education is more than giving factual information**
- **Education is also about enabling strategies e.g.:**
 - Mindfulness and stress management
 - Behaviour change strategies
 - Goal setting
 - Cycle of change
 - Self

The mind and body

- **“You ought not to attempt to cure the body without the soul (psyche) for this is the great error of our day (400BC), in the treatment of the human body, that physicians separate the soul from the body.”**
 - Attributed to Socrates by Plato in Charmides

Depression and risk of cancer

- “After adjustment for age, sex, race, disability, hospital admissions, alcohol intake, and smoking, the hazard ratio for cancer associated with chronically depressed mood was **1.88**. The excess risk of cancer associated with chronic depression was consistent for most types of cancer and was not specific to cigarette smokers. ... **When present for at least 6 years, depression was associated with a generally increased risk of cancer.**”
 - > Penninx BW, Guralnik JM, Pahor M, Ferrucci L, Cerhan JR, Wallace RB, et al. Chronically depressed mood and cancer risk in older persons. J Natl Cancer Inst 1998;90:1888-93.

Allostatic load

- **Prolonged stress leads to wear-and-tear on the body (allostatic load)**
 - Mediated through the Sympathetic Nervous System
 - Neural changes mirror pattern of long-term damage
- **Allostatic load leads to:**
 - Immune dysregulation
 - Atherosclerosis
 - Metabolic syndrome
 - Bone demineralization
 - Atrophy of nerve cells in the brain
 - Changes are seen in chronic depression and anxiety
 - > McEwen BS. Ann N Y Acad Sci. 2004;1032:1-7.

Healthy lifestyle and NK-cell activity

Kusaka Y. et al. Preventive Medicine 1992;21:602-15.

- **Behaviour**

- Exercise
- Managing stress
- Enough sleep
- Balanced meals
- Not smoking
- Eating breakfast
- Not overworking
- Avoiding alcohol

- **Adv. NK-cell activity**

- 47%
- 45
- 44
- 37
- 27
- 21
- 17
- 0

Melatonin and cancer

- **Produced by pineal gland**
 - Setting the body clock
 - Antioxidant
 - Immunomodulator
 - Antitumor, anticytokine, anti-insomnia, anticachexia
 - Improves survival in advanced cancer
 - Reduces radiation and chemotherapy-induced toxicity
 - > Am J Hospice & Palliative Care. 2005;22(4):295-309.
- **Enhanced by:**
 - meditation
 - sunlight
 - subdued lighting after sunset
 - calorie restriction
 - exercise
 - foods rich in Ca, Mg, B6, niacinamide
 - tryptophane rich foods

Stress and genetics

- **Mental state effects genetic function**
- **Stress increases genetic mutations**
- **Impairs the body's ability to repair genes**
 - DNA repair capacity
 - Implications for carcinogenesis and other illnesses
- **Changes genetic expression**
- **Accelerates genetic ageing (telomere shortening)**
 - > Adachi S et al. Cancer Research 1993;53(18):4153-5.
 - > Fischman H et al. Int J Neurosciences 1996;84(1-4):219-27.
 - > Kiecolt-Glaser J. et al. Psychosom Med 1999;61(3):271-2.
 - > Cohen L et al. J Behavioural Medicine 2000;23(6):531-45.
 - > Epel ES et al. Proc Natl Acad Sci U S A. 2004;101(49):17312-5.

Mindfulness

- **The faculty of voluntarily bringing back a wandering attention over and over again, is the very root of judgment, character, and will. No one is compos sui if he have it not. An education which should improve this faculty would be the education par excellence.**
 - William James, Principles of Psychology, 1890

Applications of mindfulness

- **Mental health**
 - E.g. depression relapse prevention, anxiety, panic disorder, stress, emotional regulation, addiction, eating disorders (psychosis)
- **Neuroscience**
 - E.g. structural and functional changes in the brain, neurogenesis, dementia prevention, amygdala, executive function, working memory
- **Clinical**
 - E.g. pain management, symptom control, cancer, metabolic, hormonal, genetic function and repair
- **Performance**
 - E.g. sport, academic, leadership
- **Spiritual**
 - E.g. deep peace, insight, oneness

Results suggest that MBSR may help a broad range of individuals to cope with their clinical and non-clinical problems. Grossman P. J Psychosomatic Research. 2004;57(1):35-43.



Mindfulness and cancer

- **Controlled trial demonstrated:**
 - Significantly lower scores on Total Mood Disturbance and subscales of Depression, Anxiety, Anger, and Confusion but more Vigor
 - Fewer overall physical and stress symptoms
 - 65% reduction in mood disturbance and a 31% reduction in stress
 - > Speca M, et al. Psychosom Med. 2000;62(5):613-22.
- **Associated with decrease in afternoon cortisol level**
 - Cortisol one of the stress hormones: a prognostic factor for outcomes for cancer patients
 - > Carlson LE. Et al. Psychoneuroendocrinology. 2004;29(4):448-74.

Mindfulness and cellular ageing

- **Meditation may slow genetic ageing and enhance genetic repair**
 - “...we propose that some forms of meditation may have salutary effects on telomere length by reducing cognitive stress and stress arousal and increasing positive states of mind and hormonal factors that may promote telomere maintenance.”
 - > Epel E, Daubenmier J, Moskowitz JT, Folkman S, Blackburn E. Can meditation slow rate of cellular aging? Cognitive stress, mindfulness, and telomeres. *Ann N Y Acad Sci.* 2009 Aug;1172:34-53.

Spirituality and cancer

- **Spiritual wellbeing demonstrated significant positive association with QOL and Fighting spirit**
- **Significant, negative relationship with Helplessness/hopelessness and Anxious preoccupation**
- **“By failing to assess spiritual wellbeing, the 'true' burden of cancer is likely to be miscalculated. However, at this stage, the exact clinical utility of spirituality assessment is unclear.”**
 - > Whitford HS, Olver IN, Peterson MJ. Spirituality as a core domain in the assessment of quality of life in oncology. *Psychooncology*. 2008 Nov;17(11):1121-8.

“Religious commitment” and health

- **Religious commitment is widely used in the medical and psychological studies**
 - Most common interpretation of spirituality / easy to measure
- **Protective for:**
 - Depression and suicide
 - Substance abuse
 - Physical illness
 - Longer life expectancy
- **Links hold even when controlled for other risk factors**

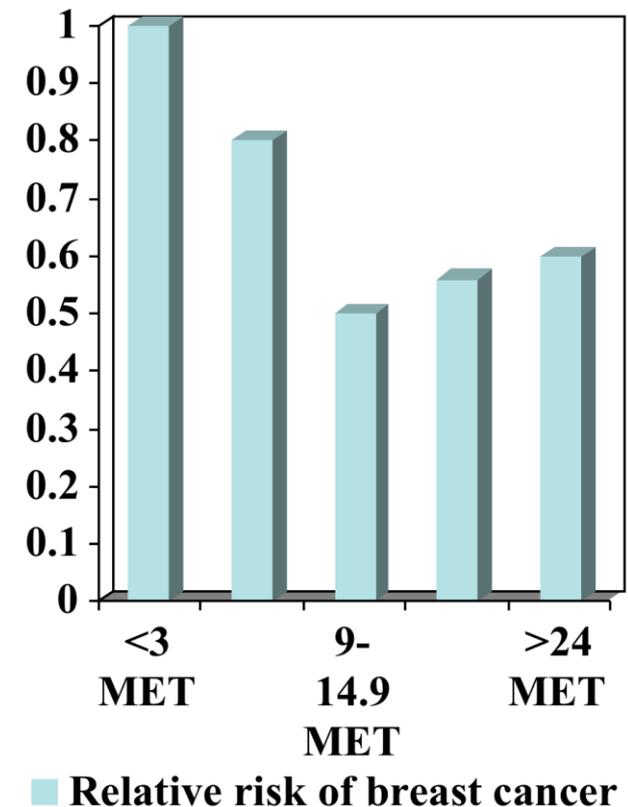


Exercise has many health benefits

- **Less chronic illness including cancer**
- **Physical fitness**
- **Vitality**
- **Reduced pain**
- **Reduced anxiety and depression**
- **Better cognitive function**
- **Reduced side-effects of treatment**
 - Bones, N&V, pain ...
- **Reduced risk of other illnesses**

Physical exercise and cancer survival

- 2987 women with breast cancer followed for up to 18y**
 - Halved the risk of death for those who engaged in regular exercise (~walking 3-5 hr/wk)
 - > JAMA. 2005;293(20):2479-86.
- 47620 men, ~3000 with prostate cancer, 14y follow-up**
 - In men >65 risk of advanced prostate cancer 0.33
 - > Arch Int Med 2005;165:1005-10.
- 526 patients with colorectal cancer followed for over 5y**
 - Risk of death 0.49 for stage II&III
 - > Gut 2006;55:62-67.





Lifestyle and cancer: WCRF

- 1. Be as lean as possible without becoming underweight**
- 2. Be physically active for at least 30 minutes every day**
- 3. Calorie restriction: avoid sweet drinks and limit energy-dense foods particularly processed foods high in added sugar, low in fibre, or high in fat**
- 4. Eat more of a variety of vegetables, fruits, whole-grains and pulses such as beans**
- 5. Limit red meat, e.g. beef, pork and lamb, and avoid processed meat**
- 6. Limit alcoholic drinks to 2 for men and 1 for women a day**
- 7. Limit consumption of salty foods and food processed with salt**
- 8. Don't use supplements to protect against cancer**

http://www.wcrf-uk.org/research_science/recommendations.lasso

Calorie restriction

- **Caloric (or dietary) restriction (CR) extends lifespan and lowers risk for age associated diseases including cancer and heart disease**
 - > Willcox DC, Biogerontology. 2006 Jun 30; [Epub ahead of print]
- **CR is a diet which does not contain calories excess to requirements**
 - Most westernised diets are calorie-dense (empty calories with little nutritional value)



Nutrition and breast cancer

- **Women in the highest quarter of intake of vegetables and fruit had a 43% reduction in risk and controlled for other factors influencing prognosis.**
 - > Rock CL, et al. J Clin Oncol. 2005;23(27):6631-8.
- **Phytoestrogens: risk estimate (breast cancer) for the highest versus the lowest third was 0.68**
 - > Verheus M, van Gils CH, Keinan-Boker L, et al. J Clin Oncol. 2007 Jan 2; [Epub ahead of print]
- **RCT on women with 2437 women with breast cancer found that a low-fat diet was associated with a 24% reduction in recurrence and 19% improvement in survival after 5 years**
 - > Chlebowski RT, Blackburn GL, Elashoff RE, et al. J Natl Cancer Inst. 2006 Dec 20;98(24):1767-76.

Soy and breast cancer

- **4 year f/up on 5042 breast cancer patients**
- **Those with the highest intake of soy protein had a 29% lower risk of death and a 32% lower risk of breast cancer recurrence c/w patients with the lowest intake of soy protein**
 - > Xiao Ou Shu, Ying Zheng, Hui Cai, et al. Soy Food Intake and Breast Cancer Survival. JAMA. 2009;302(22):2437-2443.

Breast cancer and social support

- **Women with metastatic (advanced) breast cancer divided into two groups**
 - One had support group (communication, relaxation, dealing with difficult emotions) plus usual care
 - Control group had usual care alone
 - > Spiegel D et al. Effect of psychosocial treatment on survival of patients with metastatic breast cancer. Lancet. 1989 Oct 14;2(8668):888-91.

Breast cancer and social support

- **Results 1 year later**
 - Support group had better adjustment, coping, dealing with pain, QoL, mood, relaxation
- **10 years later**
- **Average doubling of survival time in support group**
 - 3 long term survivors in support group
 - > None in control group
 - Divergence began at about 20 months after commencement of study



Stress management and melanoma

- **68 patients with early stage malignant melanoma divided into two groups**
 - Usual care vs. usual care plus stress management
- **Intervention - 6 weeks of stress management**
- **Immune function monitoring showed that after being originally comparable the stress management group significantly improved by 6 months**
 - > Fawzy F. et al. Arch Gen Psych 1993;50:681-89.

Stress management and melanoma

- **6-year follow-up: halving of recurrence and much lower death rate (p=0.03)**
 - > Fawzy F. et al. Arch Gen Psych 1993;50:681-89.

| | Recurrence | Deaths |
|---------------------|-------------------|---------------|
| Intervention | 7/34 | 3/34 |
| Control | 13/34 | 10/34 |

Psychosocial support and cancer survival

- **LONGER SURVIVAL**
- **Metastatic breast cancer**
 - Spiegel D. Lancet 1989;2:888-891*
- **Malignant melanoma**
 - Fawzy F. Arch Gen Psych 1993;50:681-89*
- **Liver and other GI malignancies**
 - Kuchler T Hep Gast 1999;46(25):322-35*
- **Lymphoma**
 - Richardson J J Clin Oncol 1990;8:356-64.*
 - Ratcliffe M Psychooncology 1995;4:39-45.*
- **NO LONGER SURVIVAL**
- **Various cancers**
 - Cunningham A Psycho-Oncology. 2000;9(4):323-39
 - Ilnyckyj A Ann R Coll Physicians Surg Can 1994;27:93-6*
 - Linn M Cancer 1982;49:1048-55
- **Breast cancer**
 - Edelman S Psycho-Oncology. 1999;8(6):474-81
 - Goodwin P N Engl J Med 2001;345:1719-26*
- ***studies where program effective (associated with showed improved QOL or mental health)**

Sunlight and cancer

- **Regular moderate sun exposure associated with less cancer, less heart disease, less depression, better immunity, better sleep, less MS...**
- **Risk in areas of low sun exposure nearly twice as high as high exposure areas**
 - Reduced risk of breast, colon, ovary, and prostate cancer, lymphoma and eight other cancers
 - 23,600 annual premature deaths from cancer due to lower UV-B exposure in USA
- **“Many lives could be extended through increased careful exposure to solar UV-B radiation and more safely, vitamin D3 supplementation, especially in non-summer months.”**
 - > Grant WB. Cancer 2002;94(6):1867-75.

Ornish program for cancer

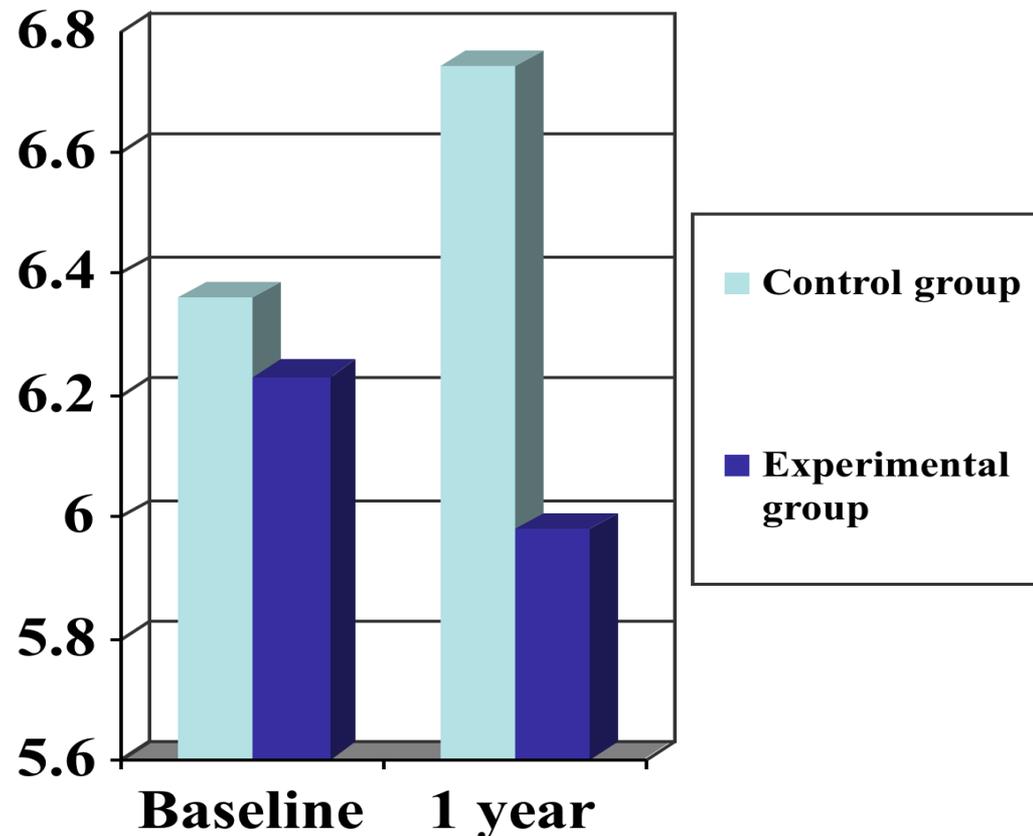
- **Men with early prostate cancer (biopsy and raise PSA) who chose not to have treatment (watch and wait)**
- **92 patients randomised to lifestyle (experimental) group vs. usual treatment (control) group**
 - > Ornish D. Weidner G. Fair WR. et al. Intensive lifestyle changes may affect the progression of prostate cancer. *Journal of Urology*. 2005;174(3):1065-9.

Ornish lifestyle intervention

- **Vegan diet**
 - Fruits, vegetables, whole grains, legumes and soy
 - 10% calories from fat
 - Supplemented by soy (tofu), fish oil (3gm daily), vitamin E (400IU daily), selenium (200mcg daily), vitamin C (2gm daily)
- **Exercise**
 - Walking 30min 6 times weekly
- **Stress management**
 - Gentle yoga, meditation, breathing and PMR
- **Support group 1 hour weekly**
 - > Ornish et al. Journal of Urology 2005;174:1065-70.

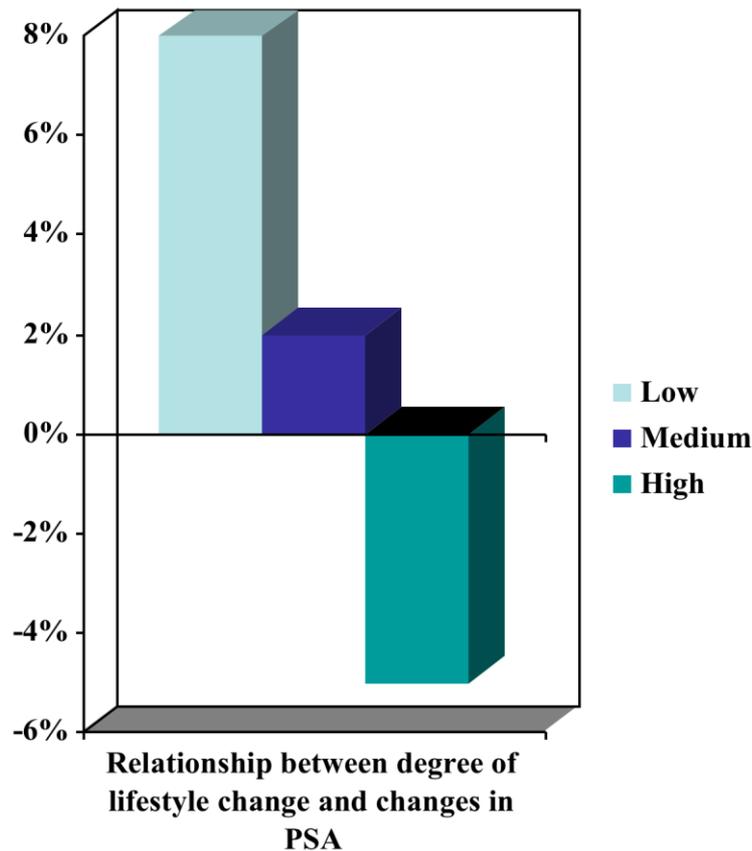
PSA readings

- Mean changes in PSA (ng/ml) after 1 year
- PSA decreased by 4% in experimental group and increased by 6% in control group (p=0.016)
- Ornish et al. Journal of Urology 2005;174:1065-70.





Level of lifestyle change and PSA



Ornish et al. J Urology
2005;174:1065-70.

Ornish lifestyle intervention

- **2-year follow-up**
 - 27% (13/49) patients in control group have gone on to require cancer treatment because of disease progression but only 5% (2/43) patients in lifestyle group
 - > Frattaroli J, Weidner G, Dnistrian AM, et al. Clinical events in prostate cancer lifestyle trial: results from two years of follow-up. *Urology*. 2008 Dec;72(6):1319-23.
- **Ornish program down-regulated prostate cancer gene expression**
 - > Ornish D, Magbanua MJ, Weidner G, et al. Changes in prostate gene expression in men undergoing an intensive nutrition and lifestyle intervention. *Proc Natl Acad Sci U S A*. 2008 Jun 17;105(24):8369-74.
- **Comprehensive lifestyle change increased genetic repair (telomerase activity)**
 - > Ornish D, Lin J, Daubenmier J, Weidner G, et al. Increased telomerase activity and comprehensive lifestyle changes: a pilot study. *Lancet Oncol*. 2008 Nov;9(11):1048-57.